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ID

MEMO TO ADVERTISERS

INDUSTRIAL DESIGN

...the magazine for the men whose decisions today shape the products of tomorrow

The 7th Annual Design Review -- December 1960

Based on twelve full months of study and planning, INDUSTRIAL DESIGN's December issue, the 7th Annual Design Review, will single out the new, the trend-setting, the worthwhile, for presentation to the men whose designs today will sell the products of tomorrow. It will be read and referred to again and again through the year to come by a majority of America's independent and company designers.

Your advertising message in this long-lived issue will be noted repeatedly by the men whose business it is to specify methods and materials that will enable products of every description to succeed in the market place.

The advisability of your advertisement in the 7th Annual Design Review is further indicated in the following statement by Mr. Chester H. Brown, President, Allied Chemical Corporation. (Mr. Brown's company has been a substantial advertiser in INDUSTRIAL DESIGN since 1957.)

> "Industrial design has achieved a significant influence in a short span of years. The time is past when good engineering alone sold a product; good engineering and good design have become interdependent. We at Allied Chemical appreciate the contribution the industrial design profession makes in broadening the field of application for many of our products."

May we suggest that you contact this office for further information regarding this highly significant 7th Annual Design Review?

Cordially,

Paul R. Kane

Paul R. Kane, Vice-President
and Director of Advertising

SEPTEMBER, 1960 VOLUME 7 NUMBER 9

INDUSTRIAL DESIGN

A monthly review of form and technique in designing for industry. Published for active industrial designers and the executives throughout industry who are concerned with product planning, design, development and marketing.

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Coming

IN OCTOBER—a special issue on New York as a center of design activity.

IN NOVEMBER—Testing: how products are tested and what they are tested for. The new American cars.

COVER: The symbol of the XII Triennale of Milan, designed by Roberto Sambonet, is adapted into a cover motif by art director Peter Bradford.

FRONTISPIECE: Airbrush rendering of a milling machine by Jean Davio, Design Associates, Springfield, Massachusetts.

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HERCULES Plastics Hi-Lites

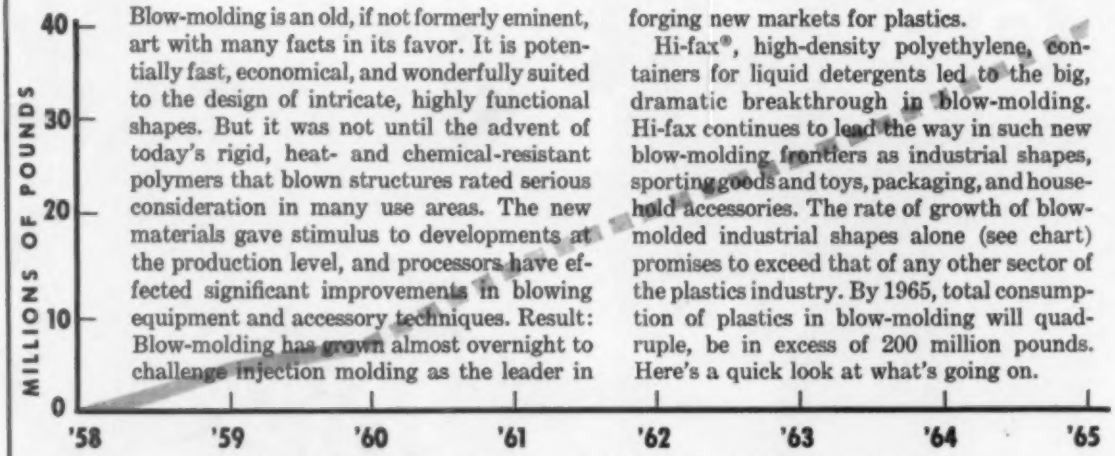
Vol. II, No. 2

Blow-Molding challenges injection

As blown containers move full steam ahead, engineers see sizeable new markets for many types of blown structures.

Blow-molding is an old, if not formerly eminent, art with many facts in its favor. It is potentially fast, economical, and wonderfully suited to the design of intricate, highly functional shapes. But it was not until the advent of today's rigid, heat- and chemical-resistant polymers that blown structures rated serious consideration in many use areas. The new materials gave stimulus to developments at the production level, and processors have effected significant improvements in blowing equipment and accessory techniques. Result: Blow-molding has grown almost overnight to challenge injection molding as the leader in forging new markets for plastics.

Hi-fax®, high-density polyethylene, containers for liquid detergents led to the big, dramatic breakthrough in blow-molding. Hi-fax continues to lead the way in such new blow-molding frontiers as industrial shapes, sporting goods and toys, packaging, and household accessories. The rate of growth of blow-molded industrial shapes alone (see chart) promises to exceed that of any other sector of the plastics industry. By 1965, total consumption of plastics in blow-molding will quadruple, be in excess of 200 million pounds. Here's a quick look at what's going on.



PROJECTED GROWTH OF BLOW-MOLDED INDUSTRIAL SHAPES

(1965 consumption of all forms of blow-molding will be in excess of 200 million pounds)

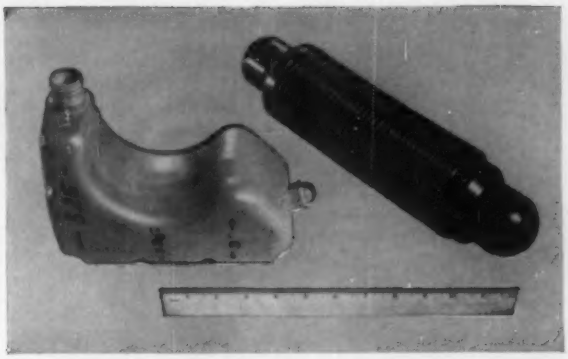
HOLD EVERYTHING?

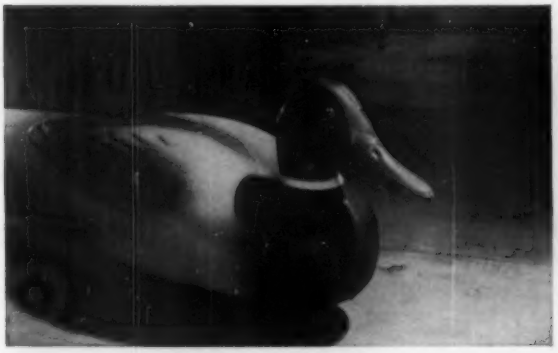
WELL, NOT QUITE

The leading and pioneer material among the new polymers used in blow-molding is Hi-fax, high-density polyethylene. Hi-fax bottles are continually undergoing torture testing at the Hercules Plastics Applications Laboratory, where hundreds of candidates for plastics packaging have been checked out (see cut). Hi-fax won't package everything, and such testing has pointed up the few instances where the product was not compatible with plastic containers. No other high-density material has such an extensive exposure history either in the laboratory or in actual commercial use.

INDUSTRIAL SHAPES

Advanced automotive engineering concepts such as these point the way to tremendous growth in the use of Hi-fax for blown industrial shapes. The complex shape of windshield solution container (left) makes it possible to utilize former under-the-hood waste space in a compact car. Built-in bellows feature of high-density heater duct (right) provides a flexible, low-cost part adaptable to rapid, economical assembly. Both parts exemplify the fine combination of properties and processability offered by Hi-fax blown structures.





SPORTING GOODS AND TOYS

Blow-molded Hi-fax shapes offer the short, fast, low-cost route to the production of readily merchandised sporting goods and toys. Lifelike realism achieved in the duck decoy shown at left is typical of the effects possible with Hi-fax. Exciting new surface textures, excellent mold detail reproduction, and a broad color spectrum, combined with lightweight toughness, in a pleasant-to-handle, nontoxic material, make blown Hi-fax shapes a natural for these fast-moving, highly competitive markets.

DRUGS AND COSMETICS

Hi-fax has greatly broadened the horizons of designers of blown containers. Its combination of rigidity and chemical resistance now permits the use of plastic packages for a wide variety of drug and cosmetic products in exciting new shapes. Unique "Whitey the Whale" container in background holds bubble bath solution; later will serve as an appealing toy. Hi-fax blown shapes are ideal for secondary use and premium packages, at down-to-earth prices competitive with metal and glass.

HOME AND OFFICE

This handsome group of lampshades is a good example of the interesting and pleasing blown shapes which can be achieved in home and office accessories. Hardware, housewares, machine housings and decorative fittings are all fields where the esthetics and economy offered by Hi-fax blow-moldings must prompt their immediate consideration by all forward thinking producers.

Want more information about blow-molding? Look to the leader and pioneer in this field. Call or write:

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HERCULES

IN THIS ISSUE

Ferar

Landell

Blumenfeld

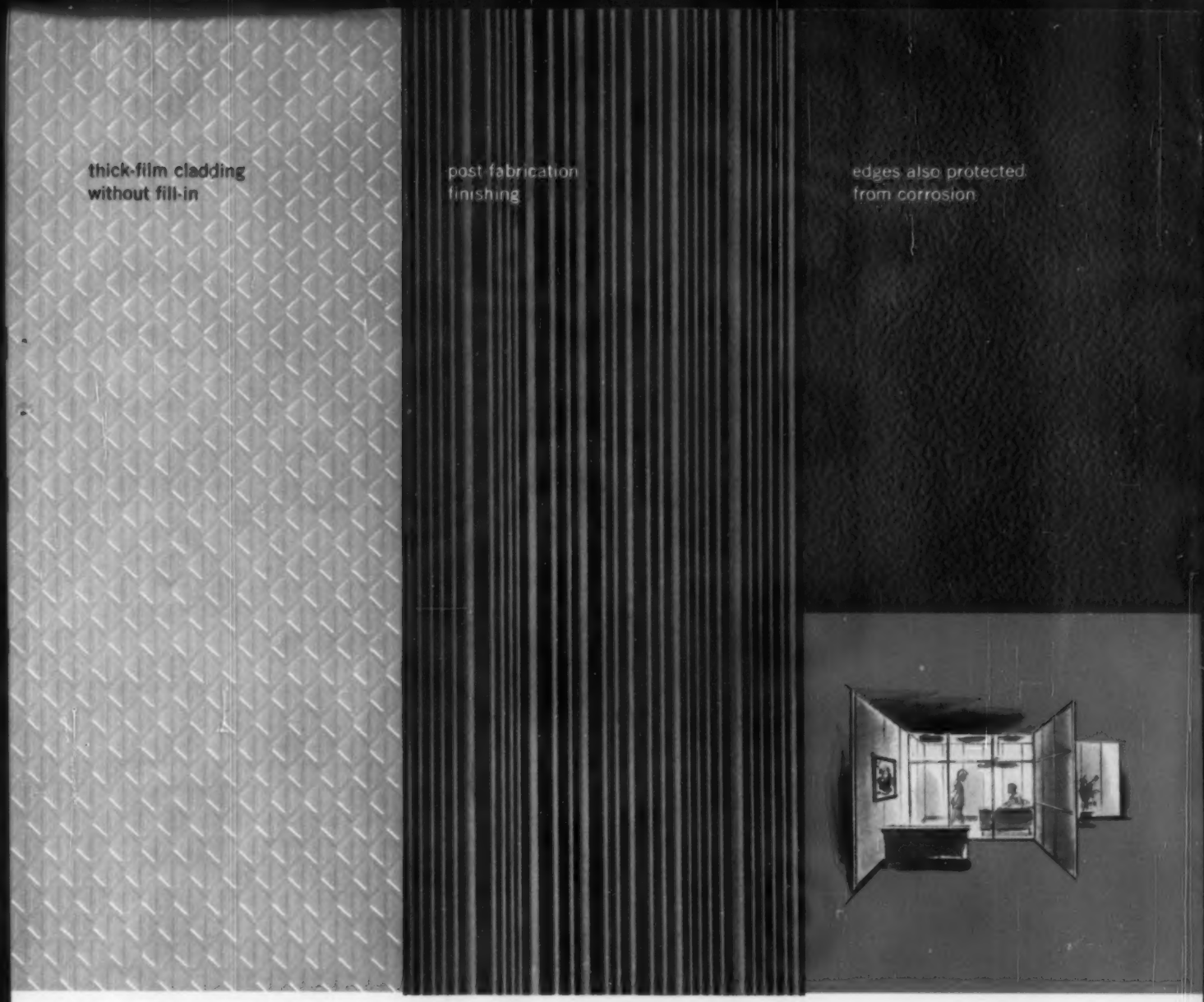
Keck

Montgomery Ferar, who writes about the bright future of blow-molding as a forming process for the new plastics (page 78), does so from the vantage point of an insider: as consultant to the Hercules Powder Company on the design exploitation of its plastics, he has considerable acquaintance with the technique. Co-partner in the Detroit design firm of Sundberg-Ferar, he is an architect by training (graduate of MIT) and still practices it in such peripheral areas as the design of the firm's new building. At this time of year, he spends a good many off hours with five other Ferars in the 22-foot family catboat; in the winter he skis and, winter or summer, he enjoys trying his hand at gourmet cooking.

Henry Keck, who reports on the results of this year's design competition at the Western Electronic Show and Convention (page 88), was one of the jurors responsible for selecting the five top winners. He is one of the principals in the Pasadena design firm that bears his name (the other is Burnie Craig, with whom he formed Henry Keck Associates in 1948). Having graduated in industrial design from the California Institute of Technology, Keck is particularly interested in the mechanical engineering aspects of the profession. His practical design experience was acquired at the Corning Glass works and with Raymond Loewy.

Harper Landell collected and researched the material for the history of the Dexter washing machine (page 92) in the course of an assignment to design the most recent model. Landell's own professional history has gone through almost as many phases as the washing machine: during World War II he worked on the design of the M-3 tank for Baldwin Locomotive Works, later he established and headed a technical publications section for General Motors' Eastern Aircraft Division, still later was staff designer for the Carrier Corporation. For 10 years he was associated with the late Harold Van Doren; since 1957 he has headed Harper Landell & Associates, Philadelphia.

Morton Blumenfeld, who discusses the design possibilities of acrylic plastics (page 70), is design coordinator for the Plastic Sales Development Group of Rohm & Haas where, since 1952, he has been explaining to designers what plastics will do, and how to work with them. Blumenfeld studied industrial design at the Philadelphia Museum School and Pratt Institute, worked as a designer for Norman Bel Geddes and Raymond Spilman, and was for several years chief designer of Design Associates Ltd., New York. He frequently writes about plastics for professional publications as well as for R & H service bulletins.



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LETTERS

The hidden persuaded

Sirs:

I was very much interested in the quotation from *Consumer Reports*, March 1960, in the June 1960 issue of ID.

As one package development technician, and I think most of my contemporaries will agree with me, I get tired of reading these silly complaints about deceptive (sometimes it's costly) packaging. I note that names are seldom mentioned except on rare occasions, and then it is usually some unknown brand, frequently little known even in the confines of a very limited market area.

While we recognize that there are a few sharpies always on the lookout for a fast buck (name me a business that is without them), packaging is probably as carefully policed as is the marketing of securities. Established brand names, recognition of which has been built up over many years, are far too valuable to dissipate with cheap devices. Certainly "the size, shape, color, etc.," of packages has been employed as point-of-sale advertising to stimulate sales. Even *Consumer Reports* itself is a package designed by its color, format and argument to stimulate, or mitigate [sic] against the sales of, certain products. What's the difference?

But what really gets me is that *Consumer Reports* never reports on the consumer. They never mention the shopper who pinches bruises into the fruit, who trades larger berries for smaller ones in the 29¢ baskets, who swipes a few extra coffee beans from another bag to grind into her pound. They never mention the sneak who snitches price tags when possible, opens a package of frozen foods to see what is inside, then leaves it only partially closed, or, deciding later that she does not want the frozen peas, leaves them on a shelf among the canned goods. She tears open a corner of a sealed pouch or bag, squirts whipped cream from aerosol cans, switches the cracked egg for a good one from another carton, accidentally drops and breaks a bottle of catsup, then tries to kick it under the base of the shelving and puts a new one in her basket.

Otherwise very nice people indulge in these petty practices which are a real headache for the supermarket manager. And this says nothing of the out-and-out pilferage of easily hidden items, the total of which exceeds the supermarket's operational net profit.

If a consumer has a complaint about "deceptive" packaging, she has a number of alternatives already provided. First, she can complain to the store manager, who will give serious consideration to her problem. He does not want to carry products which are dishonest in appearance and which could detour traffic to a competitor.

Second, she can complain to the manufacturer or distributor, who is usually very sensitive to assaults on his brand.

Third, she can talk with the Better Business Bureau in her city, who will certainly lend a sympathetic ear.

Fourth, if she has a legitimate complaint, there are legal avenues of redress.

The truth is, of course, that these so-called complaints are seldom real, that they are emotional rather than physical, the noisy chattering of busy-bodies with nothing else to talk about at the weekly meetings of the local gossip society.

I think it is time that *Consumer Reports* reported on consumers, or is that too much to expect?

Leonard A. Wheeler, President
Leonard Arthur Wheeler & Associates
Toronto, Canada

Consumer Reports *has more to say about "deceptive packaging" in its September issue.—Ed.*

The challenge of the sixties

Sirs:

Victor J. Papanek's letter in the July issue regarding "Design Responsibility" is most timely and appropriate to comment upon, because out of the desire to explore these very questions and problems has come the theme of the Seventh Annual Symposium of the Southern New England Chapter of the IDI.

Our theme is "The Professional Challenge of the Sixties," and the following concept will be thoroughly explored.

Now, in the 1960's, the industrial designer must determine whether or not the future will identify him as a truly professional person. Faced with creeping bureaucracy and super organization, he cannot avoid the inevitable threat which would reduce his status and curtail the ability to produce creatively. Acknowledging his recognized past impact on industry and merchandising, it is reasonable to inquire as to how the industrial designer's role as a creative participant in industry has changed in the past thirty years. What new qualities must he now represent? Are his talents and energies being diffused or distorted through lack of professional discipline in both education and practice? Is identification as a professional person required in order to maintain effectiveness? The answers to these and other questions will help to illuminate directions now sought for the kind of quality of organization demanded by the professional challenge.

This program concept was prepared by our program chairman, Joseph Parriott; symposium chairman Ralph Kruck, John Vassos, and members of the Southern New England Chapter, IDI, who invite all who are interested in this vital challenge to attend our symposium on October 15th, 1960, at the Longshore Country Club in Westport, Connecticut.

George Goshco, Chairman
Southern New England Chapter, IDI
Valley Stream, New York

The meaning of design

Sirs:

While perusing the July issue of ID, I came across articles on page 46 ("World Design Conference") and an announcement on page 26 ("Report on Aspen"), which resensitized a nerve that had been jolted in June.

At that time, after attending and enjoying the Tenth International Design Conference in Aspen, I found that an articulate Chamber of Commerce official still could not define or describe "Design," and he had attended the excellent conference.

I am only an engineer—with no pretense at claiming to be a "designer." Yet my course at Cornell, 1939, taught me to know what is meant by "Design."

Can't you undertake a campaign for laymen to upgrade my college-trained Aspen Chamber of Commerce official, and the millions like him, to the first step in the reception of a clear image when the word "Design" is used, as in the title, International Design Conference?

Make it broad! Hit the newsstands! At least incur a mild deficit by sending a copy of the broadside to each Chamber of Commerce in our nation — perhaps with a copy of your publication attached.

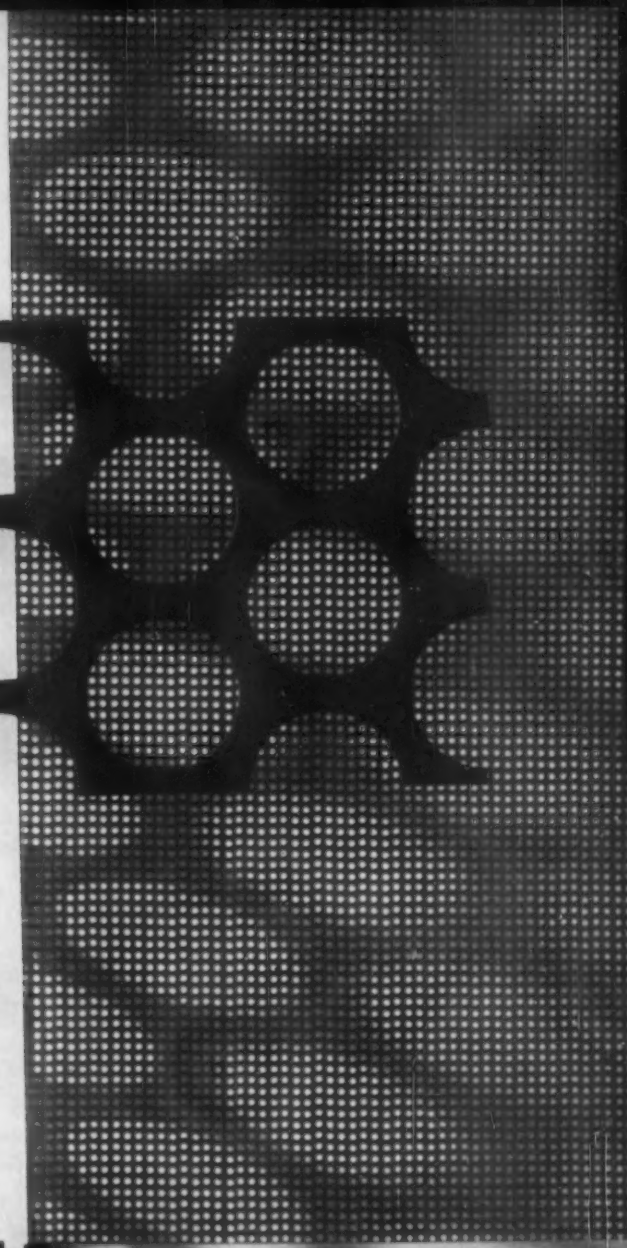
At the very least, send a copy to each citizen of Aspen — we can't have our pre-teenagers roaming the streets partially ignorant of Aspen's place in the "Design" sun, and admitting it to visitors in the bargain.

W. Harry Johns Jr.
Aspen, Colorado

Erratum

The "atomic problem" described on page 16 of the June issue was done by students at the University of California in Los Angeles, not at the University of Southern California.

H&K



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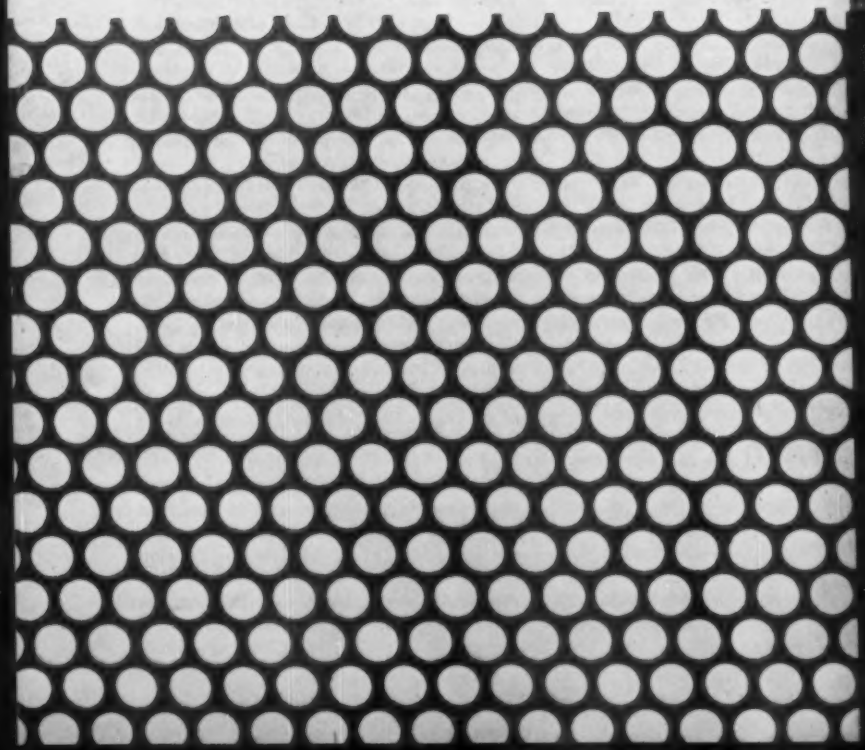

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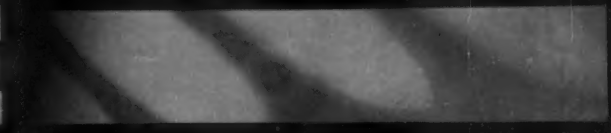


BOOKS

Masters Of World Architecture

Le Corbusier *by Francoise Choay;* **Frank Lloyd Wright** *by Vincent Scully;* **Pier Luigi Nervi** *by Ada Louise Huxtable;* **Antonio Gaudi** *by George R. Collins;* **Ludwig Mies van der Rohe** *by Arthur Drexler;* **Alvar Aalto** *by Frederick Gutheim. George Braziller, Inc. New York, 1960. $3.95 each.*

In her study of Le Corbusier, Francoise Choay attempts to show that the Swiss-born architect has consciously aimed to incorporate the machine-age in his buildings and paintings. The author represents him as the "true man of his time." Since it is hard to say just how far he has succeeded until time puts the magnitude of his work in greater perspective, the author's portrayal smacks at times of hero-worship. Her thoughts on contemporary esthetics are not always convincing. It is implied that certain contemporary forms—the "cool", rational lines—are the only ones worth considering. The reader can quarrel with this. In analyzing the development of Le Corbusier's style, which has evolved to the stage when "massing ends in sculpture", and in indicating how this is expressed in what might be the architect's summation of his work—the famed Marseille block—the author does an effective job.

The poem *The American Sublime* by Wallace Stevens, which opens the book on

Detail from Midway Gardens by Wright

Frank Lloyd Wright, reads in part: And the sublime comes down/ to the spirit itself,/the spirit and space,/the empty spirit/ in vacant space./ In his perceptive study, Vincent Scully shows that this is an apt quotation for Wright—who aimed always to extend the human range into an artistic order, a oneness with sky and space and earth, a spiritual harmony in which nothing less than the sublime was contained. Scully defines the single concept underlying all of Wright's work: "He clearly believed that, when a building built by men to serve a specifically human purpose not only celebrated that purpose . . . but became an integrated structure as well, it then took on the character of an organism which existed according to its own and complete laws." Scully demonstrates his respect for Wright by interpreting his work in such a way that the sum of it is seen as an integrated, a noble whole.

Ada Louise Huxtable has much admiration for Pier Luigi Nervi, the master builder of engineering structures who has solved rational problems with colossal individuality. She praises his structures as a fusion of science and art because "they begin as structural concepts for a stated function, and are developed as sound solutions to specific needs". This is no doubt so, but is this continued emphasis not overstressed by commentators? There are needs with which the architect must cope other than those prescribed by engineering dimensions. The solutions found to express a harmony perceived through intuition and not suggested by mathematical signs, are all too often minimized by some commentators. Mrs. Huxtable does say that the architect's true solutions come out of a superior insight, but on concluding her book one is nevertheless left with the impression that what she celebrates is not the artful expression of a human condition as much as the esthetics that result from the mathematical harmony inherent in technology.

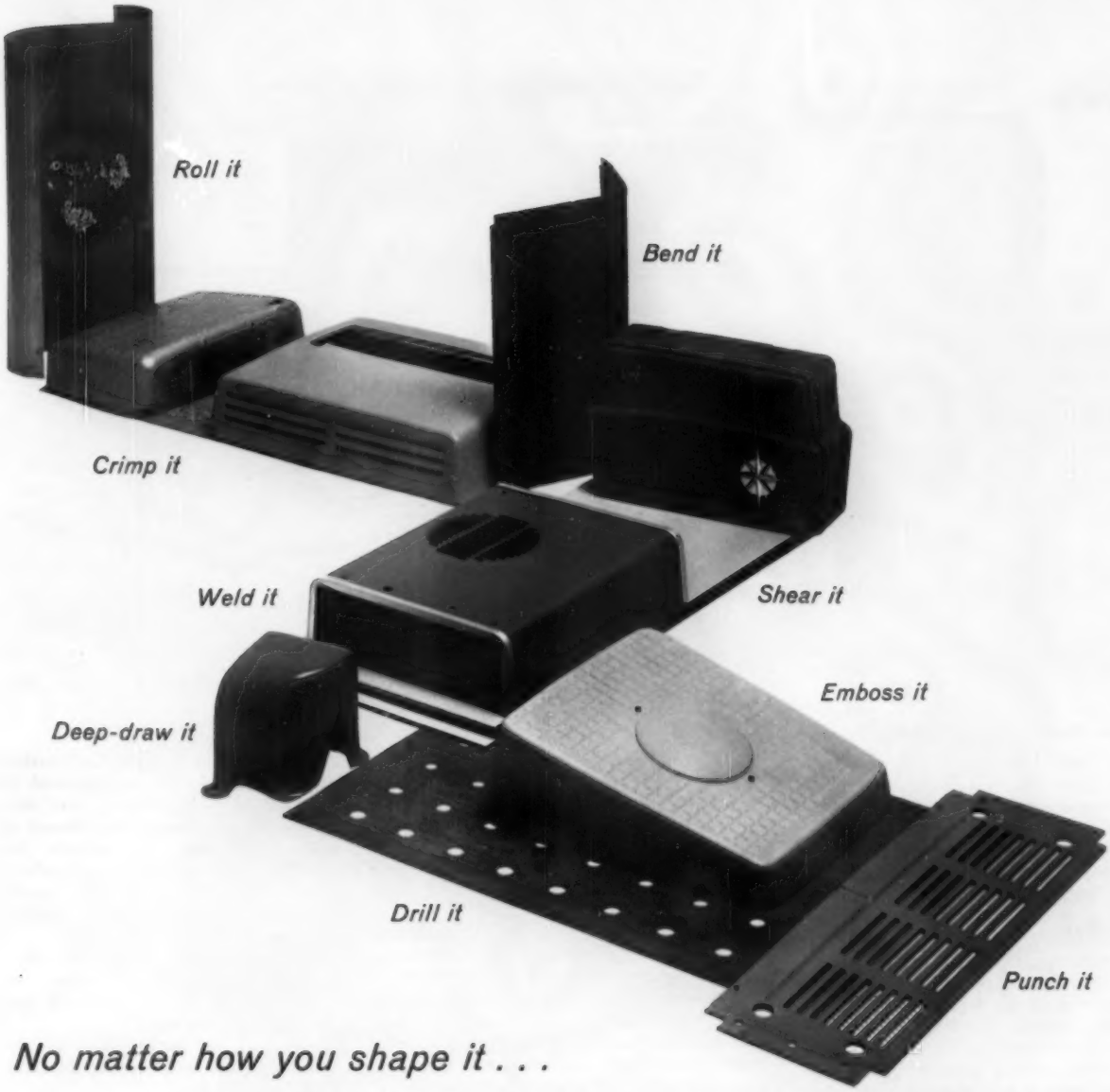
George R. Collins gives a perceptive account of Antonio Gaudi, whose work reflects a period and region as well as a privacy which bear no resemblance to the twentieth-century characteristics expressed by most of the other architects discussed in this series. Gaudi was born in 1852 and died in Barcelona in 1926. Except for a short trip to North Africa, he never left Spain. A Catalan, he gave himself with passion to the expression of the color, the history, the very texture of his native province. He was a towering figure in the two strong cultural movements that swept over Spain in his younger years: the Catalan renaissance, and Modernismo. Gaudi expressed the poetry of his region, the lyricism peculiar to that part of the Mediterranean in whose past Orientalism figured prominently, in an intensely private, almost dreamlike architecture, perhaps best examplified by Park Güell—the *Lustgarten* he constructed for the Güell family on the slopes of a hill outside Barcelona. Gaudi's powerful sense of mission finally expressed itself in a religious direction, and the sum-total of the poet-architect is realized in the church to which he devoted himself during the last part of his life: the haunting and unique cathedral of the Sagrada Familia in Barcelona.

Arthur Drexler proves himself an architect of ideas in his book on Ludwig Mies van der Rohe. His introducion is beautifully stated in terms of highest veneration. "His (Mies') architecture" he says "seeks an absolute and unvarying principle, assumed to be independent of the senses through which its manifestations are perceived. Plato would not be ill at ease in the Miesian world of form".

Ceramic roofing and pinnacle by Gaudi

Drexler proceeds to point out the consistent philosophic-architectural principles evident in the architect's work, which prompt the author to assign him such noble stature. It is indeed refreshing that Drexler does not attempt to stress the significance of Mies as a man of his time. He is important not only because he incorporated contemporary attitudes in his various works, but above all because he established and expressed powerful timeless principles of architecture and art.

In the book on Alvar Aalto, Frederick Gutheim discusses the work of the architect against the background of Finland's history and resources. Aalto was only twenty-one when he took part in the Finnish war of national liberation in 1919, and his deep concern for the needs and values of his country is expressed in his buildings and furniture: all his work is a strongly individual expression of a collective condition. When post-war Finland could supply no reinforcing for concrete, Aalto adjusted his designs to the requirements of bricks, and in the four important post-war projects cited here—the Town Hall at Säynätsalo, the Pension Bank, the Hall of Culture, and the University at Jyväskylä—the author sees the architect's social obligation.—*A.G.*



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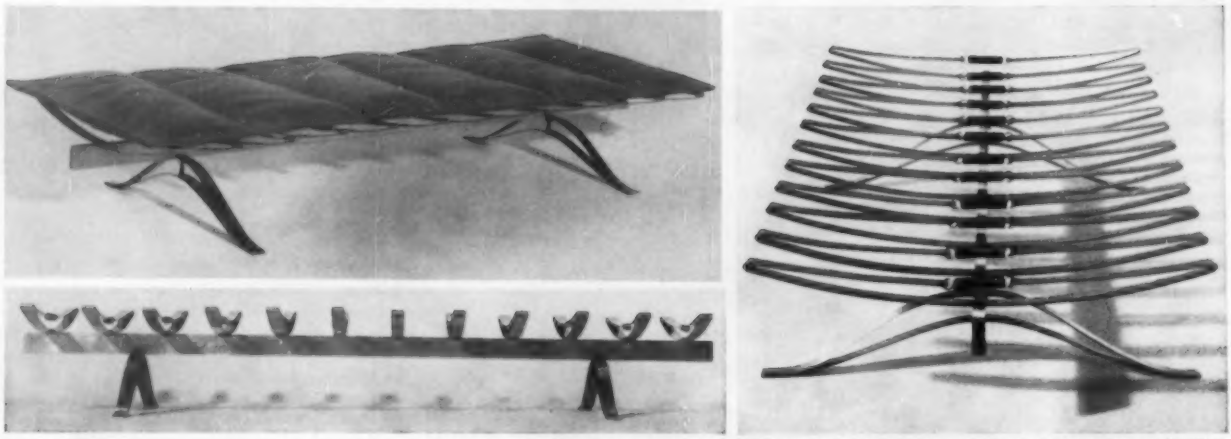
vinyl metal laminates

NEWS



Zographos' prize-winning bench of steel, leather, and cotton

Muller-Munk reports on tour

Peter Muller-Munk, who has just returned from the first six months of his year-long assignment as consultant to the European Productivity Agency, held a press conference in New York, August 15 to report his findings. He was introduced by Jacques Mosimann, Administrator of the OEEC, parent body of the Agency. Mr. Muller-Munk, acting as a representative of American industrial design, delivered a series of lectures to businessmen in six European countries: France, Ireland, Norway, Denmark, Greece, and Austria. He described the relationship in this country between industrial design and management, engineering, and marketing: the three groups from which his audience was drawn. The lectures (which ID will publish in forthcoming issues) were illustrated by 200 slides of products by a number of American designers.

In response to a question from the floor, Mr. Muller-Munk said that planned obsolescence was not yet a problem in Europe—"the European public is used to buying for keeps; perhaps too much so." However, European manufacturers, aware that Europe is ceasing to be a seller's market and that the consumer will soon be able to choose among the products of many countries, are turning their attention, often for the first time, to the effect that design has on sales, and *le marketing* is an increasingly popular word among European industrialists.

Mr. Muller-Munk expressed himself as pleased with the interest his audience displayed in industrial design; an interest, he said, which was not necessarily related to the level of the country's industrial development — "Response in Ireland was stupendous." William A. Richards of the Muller-Munk office is continuing the project, and Mr. Muller-Munk will himself return to Europe next February to wind up the assignment.

Furniture design awards

Industrial designers and an industrial design student won six of the eight prizes awarded in the third annual furniture design competition conducted by the National Cotton Council and National Cotton Batting Institute. They were: Edward Asadoorian (of Chaix and Johnson, architects, Los Angeles), Ronald M. Rusling and Phil Crossman (of Lockwood Associates, Grand Rapids), Marlan H. Polhemus (of Dave Chapman, Inc.), Nicos Zographos (of Skidmore, Owings and Merrill) and Thomas Stanton Gould (Parsons School of Design). Zographos, a prize-winner in the 1959 contest for a chair that is now in production, won a $500 award for the steel, leather, and cotton bench shown (above).

Awards also went to: Lola M. Tweed (of Tweed-Zimmerman Design, San Francisco) and Wentworth G. Wong (W. & J. Sloane, Inc., San Francisco).

Established in 1958 to promote the use of cotton in furniture design, this competition has become something of a design event. It offers prizes totalling $6,000 and the display of winning entries at furniture markets. This year, 115 designers from five countries entered the contest, which was judged June 28th by a jury composed of Jens Risom (Jens Risom Design, Inc.), Eleanor Pepper (Pratt Institute), and Olga Gueft (Editor of *Interiors*).

Human Engineering Institute

The eighth annual Human Engineering Institute, featuring the management of human engineering programs and oriented toward the analysis and design of products, processes and systems for human use, will be held in Stamford, Connecticut, October 4-7. Faculty for the institute is made up of senior members of the staff of Dunlap & Associates, Inc. The program will present the latest concepts and current trends concerning man and his relation to the products and equipment which he uses.

Applications for participation will be accepted through September 15th. Fee is $225.

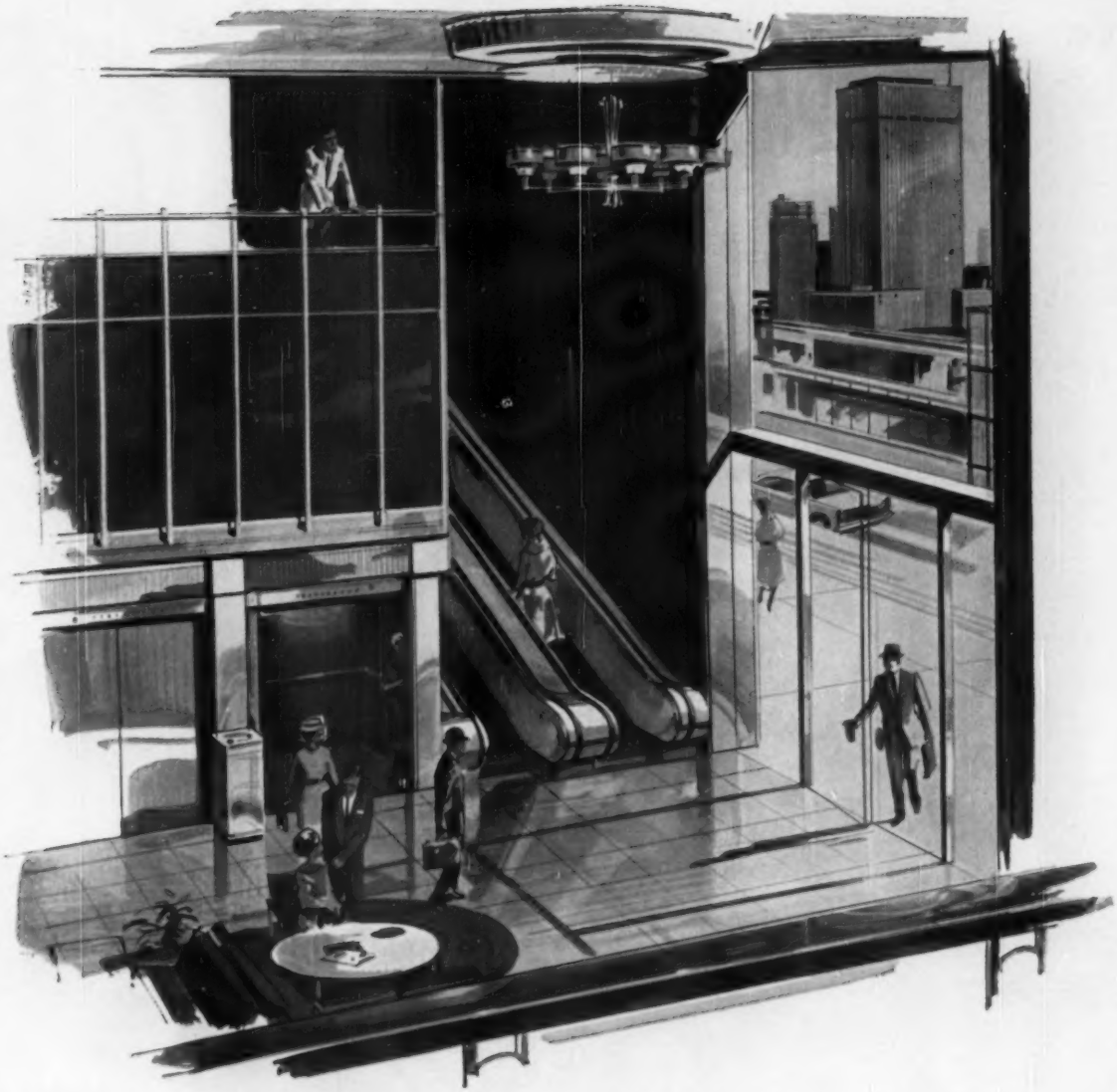
The program includes discussions and demonstrations on the following subjects: Determining System Requirements; Man-Machine Dynamics; Design of Controls and Displays; Workplace Layout and Environment; Decision-Making; Social Environment. Other subjects are: Experimentation, Training, Maintenance, Management (of the human factors engineering program), and New Techniques.

Further information is available from: Jerome H. Ely, Dunlap & Associates, Inc., 429 Atlantic Street, Stamford.

ASID and IDI meetings

ASID's 16th annual design conference is scheduled for October 27-30 at the Edgewater Beach Hotel in Chicago. As at last year's meeting in New York, discussions with representatives of industry will be featured during the first two days of the conference. In this connection, Alcoa and the Olivetti Company will send some of their top executives to discuss their cele-

Continued on page 16



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brated design programs. The second two days of the conference will be devoted to discussions of intra-professional problems. Jay Doblin and William Goldsmith are co-chairmen of the conference; Coleman Finkel (James O. Rice Associates) is program coordinator.

IDI's Southern New England Chapter will hold its annual conference on October 15th at the Longshore Country Club in Westport, Connecticut. Theme of the conference, which follows by a day the IDI national board meeting in New York, is: "The Professional Challenge of the 'Sixties." Chairman of the symposium is Ralph Kruck; program chairman is Joseph Parriott.

Scholarship fund

Robert Lee Kirby and Leland Ray Page, both seniors in industrial design at Milwaukee's Layton School of Art, are the first recipients of a new scholarship established by Milwaukee designer Jack Collins (right).

Collins

In the future a sophomore or junior pursuing a BFA in industrial design will be selected each year, by the school, for a scholarship to help him (or her) through the following year.

Collins is president of Jack Collins Associates and chairman of the Midwest Chapter of the ASID.

Design course at ICA

The Design Division of Boston's Institute of Contemporary Arts will direct an Evening Design Course (one night a week for 16 weeks beginning in October) concerned with the "problems brought about by the wider sharing of design decision" in industry. "The design contributions of the non-designer, and the non-design contributions of the designer will be examined in order to relate the designer effectively to his associates in industry and commerce." Further information is available from Theodore S. Jones, Design Division, Institute of Contemporary Arts, Soldiers Field Road, Boston 34.

Arts of Denmark

A major exhibition of "The Arts of Denmark" will open at the Metropolitan Museum of Art in New York on October 14th. Arranged as a survey of both the fine arts and the applied arts, the exhibition will display as much contemporary work in these fields as historical. Edgar Kaufmann, Jr., who is the U.S. coordinator of the show, served on the selection committee, and the installation has been designed by architect-designer Finn Juhl. After its stay at the Met, the exhibition will travel to Chicago, San Francisco, and, tentatively, to Texas. After a year, the historical section of the show will return to Denmark, while the modern section will continue to circulate among U.S. museums for another year as an exhibit of contemporary applied arts in Denmark. It will include objects of modern Danish furniture, porcelain, glass, flatware, textiles, rugs, and kitchenware.

The show is being organized by the Danish Society of Arts and Crafts and Industrial Design, in conjunction with various Danish museums.

"Design in Germany Today"

A major exhibition of contemporary German design began an extensive tour of this country with a showing last month at the National Housing Center in Washington. It includes over 500 pieces, both handcrafted and manufactured, representing all areas of useful objects from ceramic tableware to radios. Included are a number of household appliances produced by Max Braun and toys by Hugo Kuekelhaus.

Circulated by the Smithsonian Institution, the exhibit will appear next at

"Design in Germany Today"

Cooper Union in New York (September 30-October 23) and will be seen later in the year at the Institute of Contemporary Art in Boston; the Currier Gallery of Art in Manchester, N. H.; the Hunter Gallery of Art in Chattanooga, Tennessee; and the Toledo (Ohio) Museum of Art.

The collection was organized by Dr. Hans Eckstein, Director of the Neue Sammlung of the Munich Museum of Applied Arts.

Venice preserved

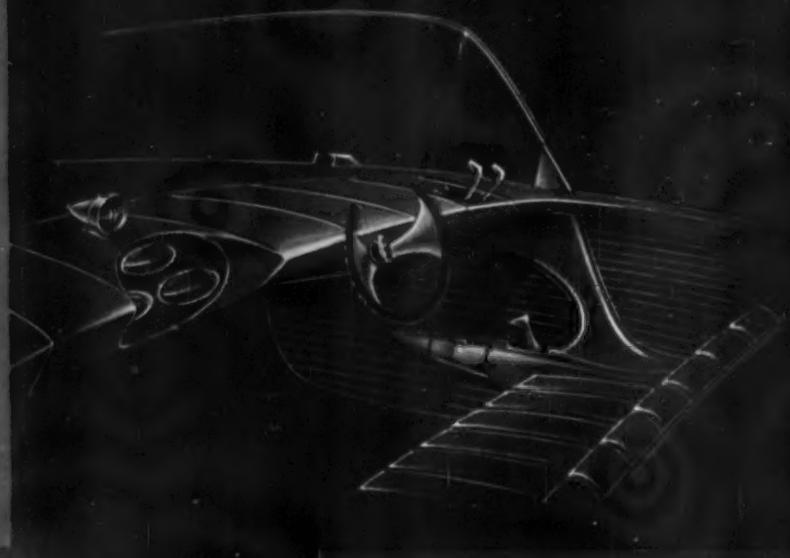
Latest addition to the growing list of super-sumptuous, history-hung New York restaurants (e.g., Café Chauveron, Forum of the Twelve Caesars) is the new Marco Polo Club, designed by Donald Deskey. Set up as a private club, it opened last month in the Waldorf-Astoria.

Designed to take nostalgic diners back to the Byzantine luxury, if not to the seething canals and rickety bridges, of medieval Venice, the new luncheon and supper club ("primarily dedicated to the cosmopolitan male") is named for the celebrated 14th century Venetian traveler to Cathay. It is shown at left.

The theme is announced at the entrance, where an adaptation of the bronze winged lion of the Piazza San Marco is mounted on a wall of dark gray Italian marble. The focal point of the first-level lounge is an Edward Chavez fountain sculptured in bronze, copper, and glass,

Continued on page 18

Marco Polo Club designed by Donald Deskey



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set in a reflecting pool of Venini deep-aqua and turquoise ripple glass blocks illuminated from below.

The third-level dining area (for 175 guests) is separated from the second-level walnut-and-mahogany bar by an impressive "cathedral wall," ten feet high and 27 feet long, inspired, according to the designers, by the Doges' Palace. It is composed of 210 ceramic blocks, fabricated of highly-fired, over-glazed clay in shades of terra cotta, amber, and off-white, and glued together with epoxy resins to form a wall of "Gothic" arches. Each block was handcrafted to achieve differences in texture and coloration suggestive of ancient stonework.

The main dining room features, besides the Edward Miller mural that depicts Marco Polo's routes to the Orient, six four-foot-high chandeliers executed in Venice and composed of 250 4½-inch Venini glass polyhedrons.

The Deskey office is responsible for specially-designed glassware (fabricated in Mexico), china, furniture, uniforms, and other appurtenances to the restaurant. Chief architect for the project was Stanley C. Reese; interior designer was Russell Heston — both of the Deskey office. Lighting consultant was Leslie Wheel.

Three shows in Holland

The Netherlands' second international plastics exhibition, "Macroplastic 1960," will be held October 19-26, and will be designed, according to the sponsors, to give a total picture of application developments in the industry. The displays will be organized into separate groups such as: basic materials, ancillary materials, semi-finished products, processing machinery, measurement and control apparatus. This is intended to help the visitor get a comprehensive view of the industry quickly and easily, even though the exhibit is expected to be larger than its predecessor, which was held in 1957. The recent developments in each specific field will be seen in a special Information and Instruction Center right on the grounds of the exhibition. Its displays on the aspects and applications of plastics will be divided into branches of industry. The site of the show, organized by N. V. 't Raedthuys of Amsterdam, will be the Croeselaan Exhibition grounds in Utrecht.

Immediately preceding "Macroplastic 1960" there will be an international Congress in Amsterdam, October 17-19, on the techniques used in processing plastics. In an attempt to bring two very different kinds of interests together, the forum will consider both scientific research and practical application in plastics. The Congress will include plenary and group lectures, discussions on the general subject of the relationship between properties of plastics and processing machinery, as well as excursions to the Dutch State Mines' polyethylene plant in Limburg and the Royal Dutch Shell Company's laboratory in Delft. The forum will be held in the Royal Tropical Institute at Mauritskade 63, and its chairman is Prof. Dr. A. J. Staverman, senior lecturer in organic and physical chemistry at Leiden University.

Holland will also be the site of "Macropak," an international packaging exhibition to be held May 2-9, 1961. The exhibition will include displays of packages, packaging materials and packaging machinery. The show's title, "Macropak," was chosen to suggest its international character as well as its extensive coverage of the field. It, too, is being organized by N. V. 't Raedthuys and will be held in Amsterdam's R. A. I. exhibition halls.

Airwayte "hotels" installed at National Airport

Airport "Pullmans"

Latest comfort for harried airlines passengers is a prefabricated "hotel," designed for installation at airports, which contains Pullman-like compartments where passengers can hang their hats before, between, and after flights. Called "Airwayte," each T-shaped structure (above, installed at National Airport in Washington) contains 18 compartments which may be rented on an hourly basis for brief stop-overs. Each compartment, 7½′ x 6′ and air-conditioned, is equipped with bed, desk, radio, telephone, toilet and shower.

The units are assembled from prefabricated curtain wall panels made of polyurethane foam core sandwiches covered with sheets of porcelain enamel steel and vinyl-coated steel. Interiors are coated with tan and blue-gray vinyl surfaces. Each compartment is soundproof and insulated. The units are manufactured by Airwayte International. They were designed by L. K. Shostak, president of the firm.

First installation of Airwayte units at Washington's National Airport last May has proved so successful that Airwayte is now setting up facilities for producing 20 units a month for installation at some of the other major metropolitan airports.

Moving sidewalks

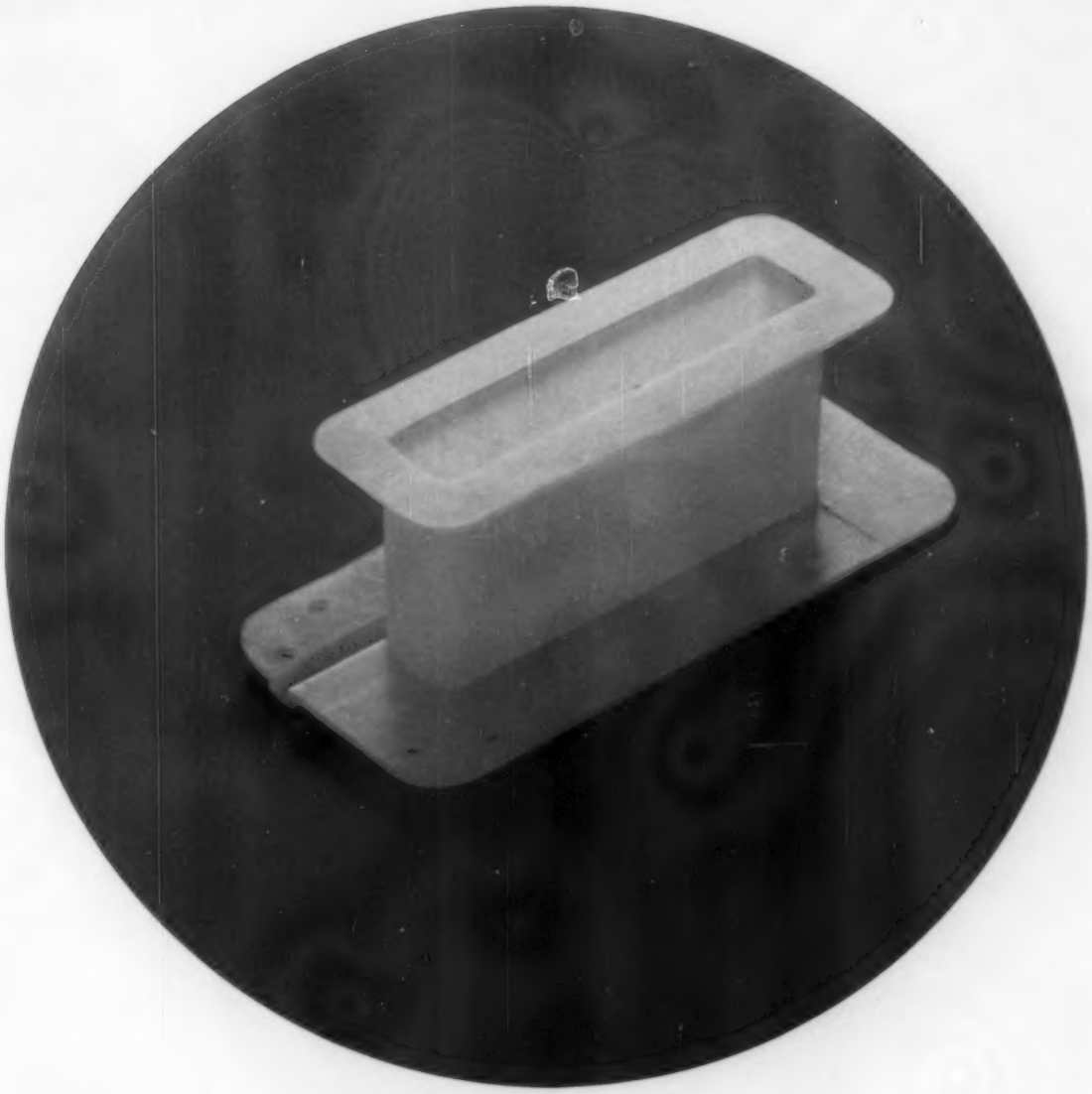
Pedestrians of hilly Tacoma, Washington, will be spared the effort of climbing the steep grades of the main business section of the city when an automatic pedestrian transportation system is installed this winter.

Four pairs of "Speedramp" passenger conveyors, made by Stephens-Adamson Manufacturing Company and featuring a special grooved belting made by Goodyear, will carry pedestrians up and

Continued on page 24

Above: Members of the jury for this year's WESCON (Western Electric Show and Convention) industrial design competition, judged August 23rd, were: Thomas Tweedie (Lewis and Tweedie, Industrial Design), Bert Gasteneau (chief engineer, Avionics division of Aerojet-General), Strother MacMinn (Art Center School), Harry Greene (Merendino, Greene and Associates), George Walker (Ford Motor Co.), Henry Keck (Henry Keck Associates), George Jergenson (Art Center School), Frank Gianninoto (Frank Gianninoto & Associates), and Wilson Bradley (Endevco). Full report on this year's WESCON awards appears on page 88.

Plaskon NYLON 6, GLASS-FILLED, TAKES HEAT, STRESS



Bobbins like this, of Plaskon Nylon 6 reinforced with glass fiber, contribute to a better exciter generator, according to Electric Machinery Mfg. Co., Minneapolis, Minn. . . . "The molded bobbins provide a durable and economical means of providing the field winding in one unit for insertion on the pole." Glass fiber reinforced Nylon 6 provides better dimensional stability and rigidity plus good thermal stability, important to trouble-free operation.

The molding compound used in the bobbin, Nylafil G3, consists of Plaskon Nylon formulated with glass filler in a rigidly controlled process by Fiberfil, Inc., Warsaw, Ind. Plaskon Nylon 6 offers toughness, light weight, resistance to abrasion, corrosion and heat, lower shrinkage, greater impact strength and easier colorability. It molds at lower temperatures, easing the problems of thin-section molding and providing better dimensional stability. Several varieties of Plaskon Nylon 6 are available for extruded products . . . and their extrudability is good.

Write us for more information about hard-working Plaskon Nylon — or Nylafil G3.

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Allied Chemical

Plaskon WOOD-FLOUR FILLED UREA...EFFICIENT

Efficient both electrically and economically, this Plaskon Wood-Flour Filled Urea circuit breaker case delivers superior arc resistance . . . 80-100 seconds (ASTM). The maker states that its dielectric and insulating properties have proven satisfactory in this circuit breaker case, as well as other cases in his line.

Allied Chemical Corporation developed this material specifically for high-speed automatic molding of electrical parts; Plaskon Wood-Flour Filled Urea is now thoroughly proven in the field. It matches or exceeds the more expensive alpha-cellulose urea in all properties except translucency and color range. Available in NEMA brown or standard black.

Other important properties of Plaskon Wood-Flour Filled Urea: Superior color-fastness • Impervious to household solvents • Non-electrostatic surface.

You may well profit by switching to Plaskon Wood-Filled Urea . . . write us for more information and for samples.

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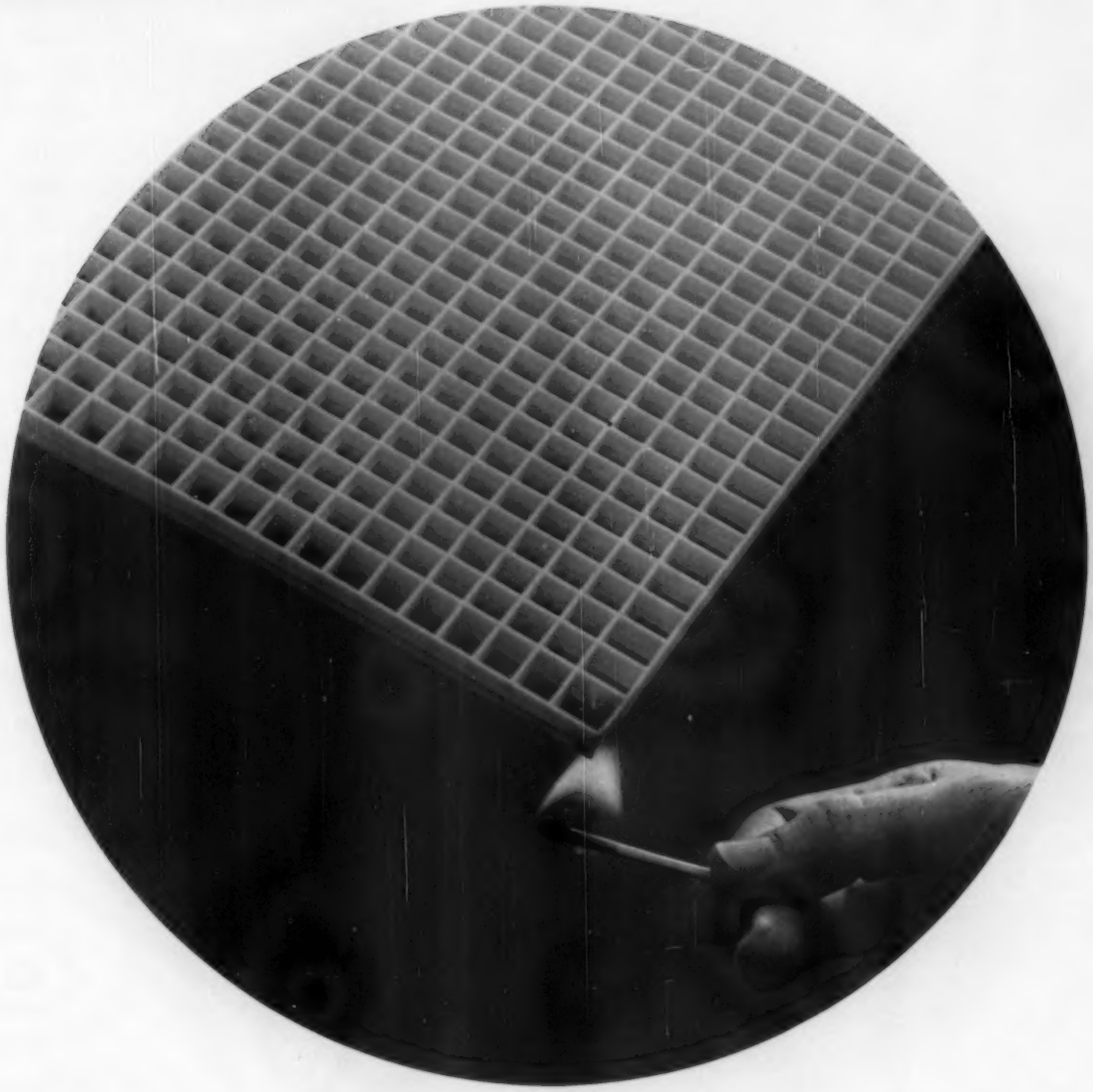

Lighting grids like this made of Plaskon Fire-Resistant Urea UFR-28 stand up well to flame!

Where the UL fire tunnel test may cause other white and pastel materials to blister, drip or contribute readily to flame spread, this grid has a low UL flame spread rating of 25 . . . considered "Non-Combustible" in general practice! In addition, its ASTM rating is "Non-Burning."

Called "N. C. Gratelite" by maker Edwin F. Guth Co., St. Louis 3, Mo., this new grid eliminates static electricity charges, too . . . doesn't attract dust.

Other important properties of Plaskon Fire-Resistant Urea UFR-28 . . . high dielectric strength; rigid enough to support itself; hard surface resists scratching and abrasion and facilitates cleanup; colors are spectro-photometrically controlled for precise lighting values.

Look to Allied for Urea Molding Compounds when you need good fire resistant and electrical properties, rigidity, strength, wide color range, or combinations of these. Plaskon materials and know-how to help solve your problems are freely available. We'd like to hear from you.

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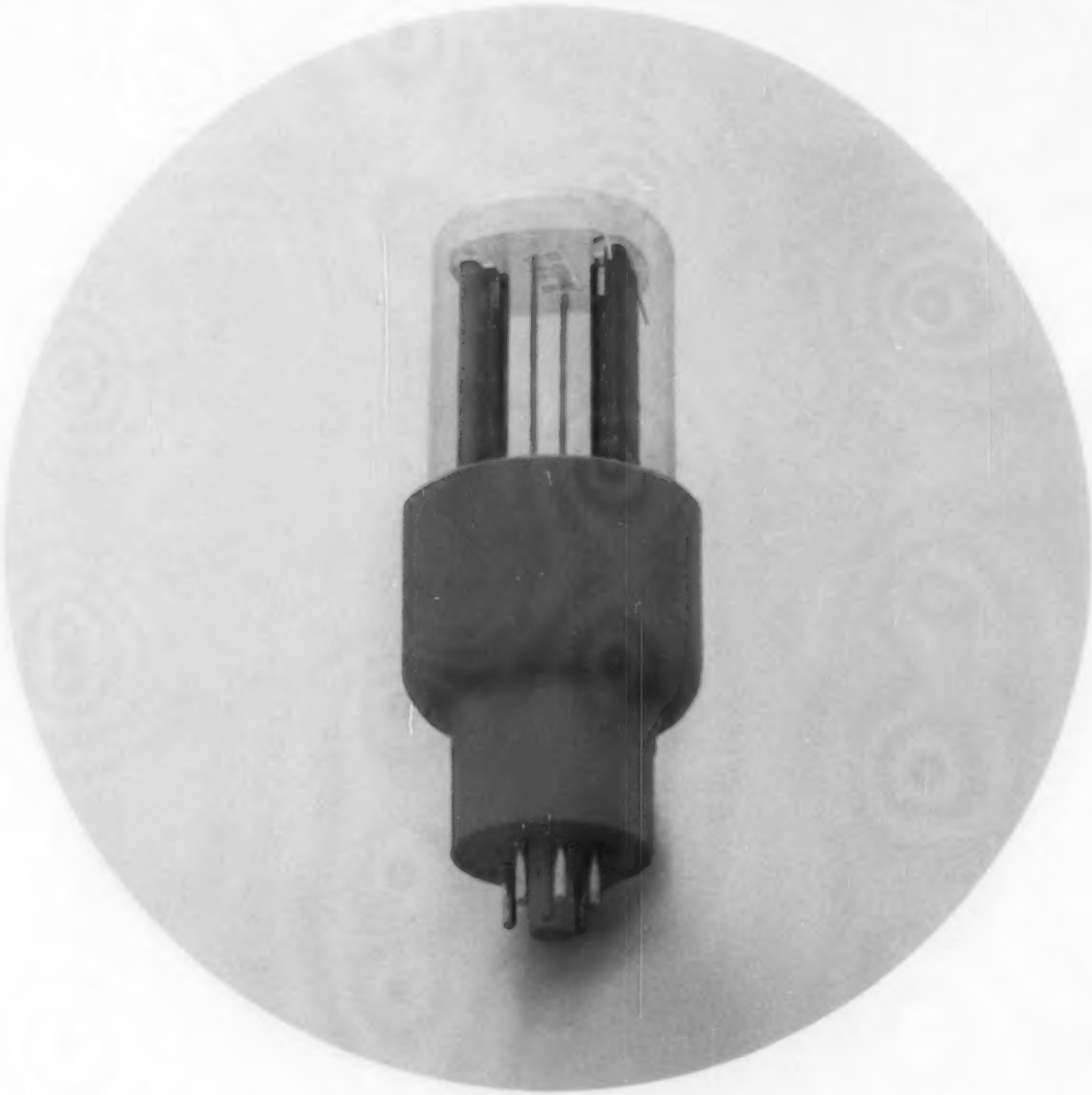
Plaskon ALKYDS PROVIDE HIGHEST ARC RESISTANCE



The base of this rectifier tube is made of Plaskon Alkyd Molding Compound. The tube's maker, Chatham Electronics, Division of Tung Sol Electric, Inc., states that . . .

1. Plaskon Alkyds provide high arc and insulation resistance. A three kilovolt potential between base pins presented no problem.
2. The high mechanical shock resistance of Plaskon Alkyd helps this tube to withstand 900 G's, as required by military specification.
3. In this application, a maximum bulb temperature of 250°C (482°F) has no adverse effect on the Plaskon Alkyd base.
4. The fast cure rate, dimensional stability and uniformity of Plaskon Alkyd permit high-speed, high-precision parts production.

Plaskon Alkyd Molding Compounds are available in three forms . . . free-flowing granular for high-speed automatic molding; glass-reinforced impact grades combining excellent mechanical and electrical properties; putty types for encapsulation. For more about Plaskon Alkyd Molding Compounds, write or call our Alkyd sales department.

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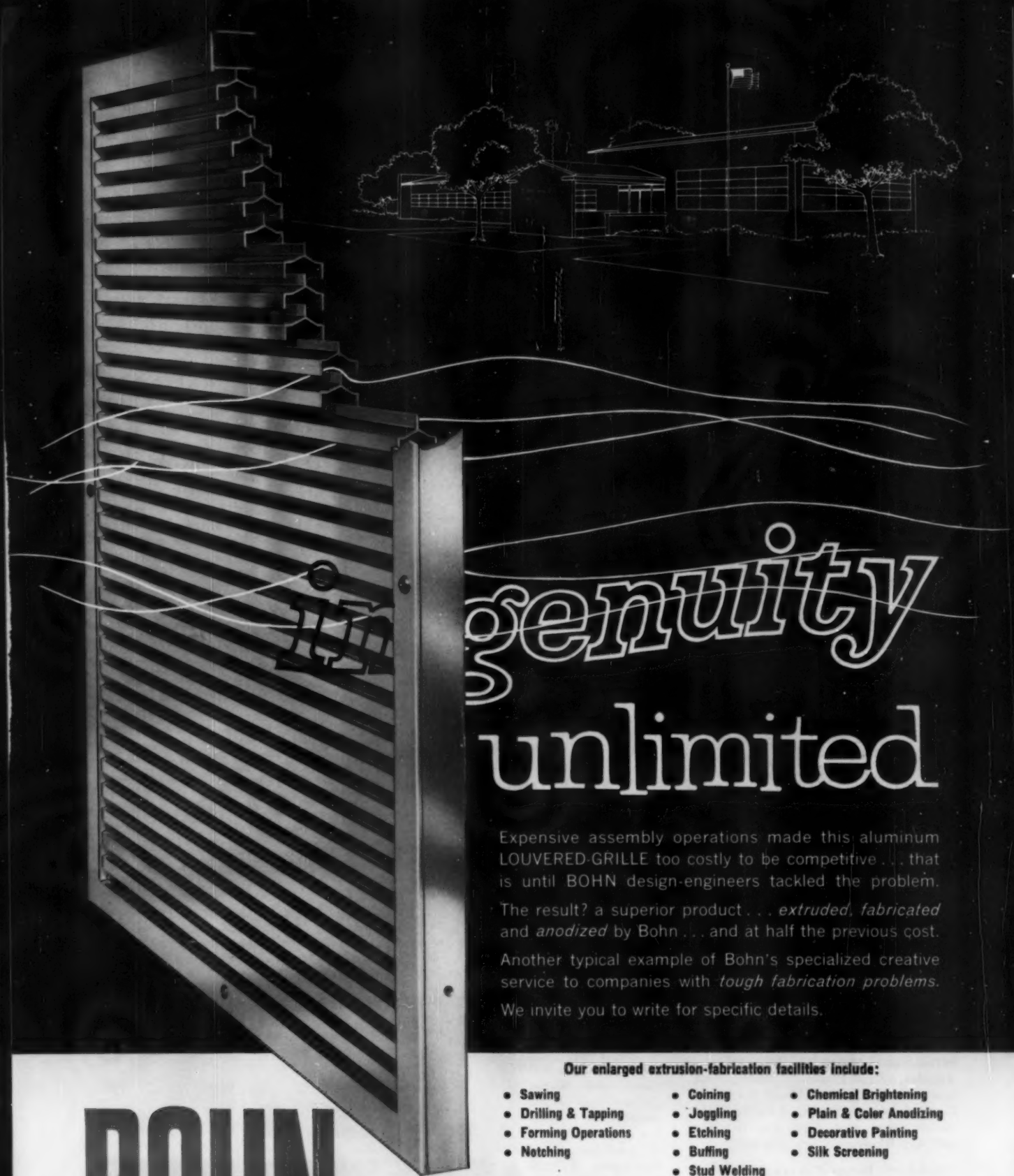
Allied Chemical



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down four separate blocks in the business area. Average incline of the ramps will be about 11 degrees. They will be installed in lighted tunnels through existing buildings or in a covered and protected areaway where existing buildings are being demolished.

The problem of safety—a big one—is solved, according to City Manager David D. Rowlands, by a floating comb plate at the threshold points and a double system of micro-switch cut-offs designed to stop belts and handrails instantly in emergencies.

Company News

RETAINED: **Samuel Ayres Associates,** Boston, by the Emerson Manufacturing Company and United Electric Controls Company. . . . **Stowe Myers,** Evanston, by Encyclopaedia Britannica Films (for the purpose of developing a corporate identity program) and by the Central Scientific Company. . . . **Dickens, Inc.,** Chicago by Booth Fisheries, Diamond Crystal Salt Company, Faultless Starch Company and Kurly Kate Corp.... **Design Analysts,** New York, by Suburban Appliance Company of Morristown, N. J., to redesign their line of window and wall gas space heaters. . . .

Christo

Bruce Kamp Associates, Philadelphia, by the Astatic Corporation, as consultants on two Astatic microphone projects. . . . **Ken Saco Associates,** New York, by the Television Bureau of Advertising. . . . **Van Christo** (above) **Associates,** recently established in Boston, by Accuracy, Inc., to develop a complete corporate identification program.

GOING PLACES: **Tony Paul & Associates** to 53 East 54th St., New York. . . . **Tor Peterson** to Laguna Beach, California. . . . **Ken Saco Associates** to larger quarters at One Rockefeller Plaza, New York.

ESTABLISHED: **Mason-Vise Design** in Los Angeles, by Les Mason, formerly consultant art director at Allen, Dorsey, & Hatfield, advertising, and John Vise, previously associated with Art Direction and Art Dimension, Los Angeles.

PURCHASED: **Revere Camera Company** of Chicago by Minnesota Mining & Manufacturing Company. Theodore S. Briskin will serve as vice-president and chief operating officer of Revere and Sam Briskin, Revere's chairman of the board, will be a consultant.

EXPANDING: J. William Mason Associates, Glenview, Ill., to **Mason-Dyle Associates,** with the addition to the firm of Charles A. Dyle, former mechanical engineer with the Admiral Corporation in charge of new products.

Events

The **Atlanta Merchandise Mart** has set Monday through Wednesday, September 26-28, as the dates for its annual fall furniture show. Dates for the AMM Winter Market will be announced at a later time.

Industrial application of electronics is the topic at the ninth annual **National Symposium on Industrial Instrumentation** sponsored by the American Institute of Electrical Engineers and the Institute of Radio Engineers to be held September 21 and 22 at the Manger Hotel, Cleveland, Ohio. There will be two sessions on measuring devices and one each on data handling devices and process control and techniques.

The **1960 Metal Show,** sponsored by the American Society for Metals, is scheduled for October 17-21 in Philadelphia. More than 25,000 registrants are expected.

The ninth **National Plastics Exposition,** with booth space already sold out, will be held in the New York Coliseum June 5-9, 1961. The Exposition is sponsored by the SPI. Chicago Molded Products Corporation will open the competition for its **Bachner Award** for outstanding plastics applications this fall. The award will be announced next spring to coincide with the National Plastics Exposition. The purpose of the award is "to stimulate and encourage the imaginative use of plastics materials in the initiation and improvement of plastic products and the production of those products."

People

APPOINTED: **Thomas C. Butcher** as chairman of the board and chief executive officer of Jim Nash Associates (Eric Teran continues as president and Gerald Frisch as executive vice president of the firm). . . . **Allen L. Carlsen,** formerly with Walter Dorwin Teague Associates, as a member of the industrial design department of Remington Rand's Univac Military Division, St. Paul. . . . **A. Peter Agusztiny** as director of design for Hoover Ball and Bearing Company's new subsidiary, Furniture Dynamics, Inc., in Los Angeles. . . . **Phillip J. Luth** as head, and **Alvin Schecter** (former director of decor and graphics at Amos Parrish & Company) as design coordinator, of the store planning and hotel design department of Lippincott & Margulies, Inc. . . . **Duane James Quintal** as executive associate with Van Dyck Associates, Westport, Conn. (He was formerly design director of Waltman Associates, Chicago.) . . . **Lawrence Mitchell** as a design associate at Good Design Associates, South Bend, Indiana. . . . **Kalman J. Durik,** formerly product designer for Smith, Scherr & McDermott, Akron, and **Giacinto Carlo D'Ercoli,** previously with Reinecke & Associates, Chicago, as members of the industrial design staff of Latham-Tyler-Jensen, Chicago. . . . **John Price** as vice president and **Dewey Hodgdon** (formerly with architects Reid, Rockwell, Banwell & Tarics) as assistant to the president of Camden Associates, Salem, Mass. . . . **Roy H. Johnson,** as director of graphic arts at KVP Sutherland Paper Company. . . . **Richard Nelson Gregg** as head of Museum Education for the Art Institute of Chicago. . . . **W. P. Benghauser** as general merchandising manager of Wear-Ever Aluminum. . . . **Felix Waser** as an associate with W. B. Ford Design Associates, Inc., Detroit.

ELECTED: Los Angeles designer **Hunt Lewis,** as chairman of the Los Angeles County Commission on Human Relations. . . . **Joe H. Hughes,** president of the Albany Housefurnishing Company and the Georgia Retail Furniture Association, as a member of the Atlanta Merchandise Mart's board of governors.

Durik

Carlsen

Butcher

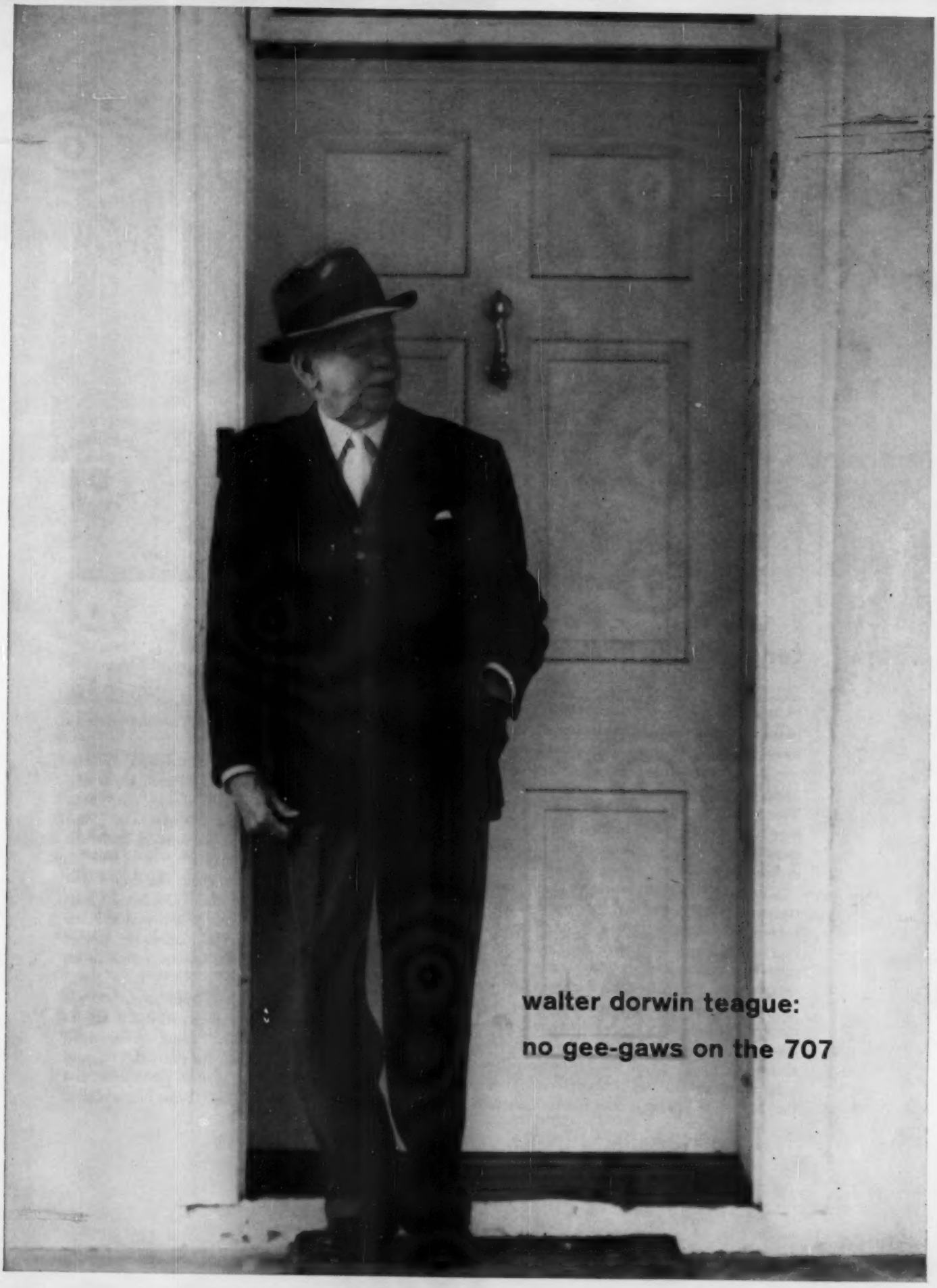
D'Ercoli

Quintal

Waser

Maurizio Tempestini

Architect and industrial designer Maurizio Tempestini died on Jutly 28th of a heart attack in his native Italy. Mr. Tempestini was associated with Lightolier, Inc., as a designer for a number of years.



walter dorwin teague:
no gee-gaws on the 707

teague talks design

In 1942 a man named Walter Dorwin Teague published "You Can't Ignore Murder," a mystery novel. It is probably the only attempt at bafflement in his long history, because Walter Teague has been making products speak clearly for themselves since the Twenties.

Teague has rightly been called the dean of industrial design. He began as an artist in 1908 designing advertising, books and magazine illustrations. If you're old enough to remember Locomobile and Pierce Arrow ads, Teague designed them. In 1927, Eastman Kodak asked him to redesign their cameras. He made a proposal to spend one week a month in their plant observing production problems and techniques, and *then* redesign the cameras. That simple principle of knowing how a product is made, of understanding all the complexities of the production line, is still a Teague trademark. And Eastman Kodak is still a Teague client.

In the thirty-plus years since that camera assignment, Teague has explored just about every nook and corner of the wonderful world of three dimensions. He designed the classic Marmon 16 automobile in 1930, with his son as collaborator; he was on the Design Board of the 1939 World's Fair. When World War II exploded, the Navy asked Teague to perform design work on their 16-inch guns in order to eliminate possibilities of explosions caused by loading malfunctions. Today he still works for the Bureau of Ordnance. He has 120 people in his organization, a branch in San Juan and task forces scattered across the United States

Teague has designed service stations, railway equipment, plane interiors, heating appliances, business machines and machine tools, offices and furniture, showrooms and department stores, even periodicals. One of the most impressive things he has done is the Boeing 707 jet interiors. Mr. Teague recalls: "Boeing was concerned about their ability to sell the 707 because they hadn't made civilian planes for years. We convinced them to build a full-size mockup of the interior. They gave us *carte blanche* with body engineers to collaborate, and they refused to look at it until it was finished. We made it complete to the tiniest detail. It cost half a million

dollars and helped in selling most of the huge fleet now in the air. Our staff is responsible for the final interiors of the planes purchased by eighteen or more airlines, and for the interiors of executive planes purchased by the United States Government."

Whether mammoth jet airliners or chairs, a product is designed to five principles that are the *modus operandi* of the Teague organization. "First of all, the redesigned product has to work better for our efforts," Teague says. "It should be more convenient to use, more humanized. It must make honest use of the material it's made of, and it's got to be capable of being efficiently manufactured at the proper price. We assiduously avoid gee-gaws or extraneous ornamentation that adds nothing but price to the product. Finally, the design must give the user an emotional pleasure or gratification each time it is used." Selection of the right material for the job is important to each of Teague's requirements. "We endorse no material over another," Teague says. "We first look for the material that is best in keeping with the product's desired personality. Strength and durability are highly important in material selection. Then we make sure our client's tooling can handle the material we have in mind. Above all, it takes the right material to sell the product to the consumer."

Teague has used practically all materials known to man and it is no accident that a great many of his designs use steel in one way or another. "The wonderful thing about steel is its versatility," says Teague. "Its many alloys, old and new, give it adaptability that other materials don't have. Its strength, both in tension and compression, qualifies it for literally thousands of uses. And stainless steel is another reason why steel is a modern metal because it gives so many designs their contemporary look."

The moral is this: steel is an ageless metal, as much at home in the Boeing 707 and today's elegant tableware as it was in medieval days. Its enduring modernity will always be recognized and used by designers like Walter Dorwin Teague.

designing with stainless steel

The ideal design has been described as one in which the properties of the material are fully utilized in the finished product. This ideal is difficult to achieve, and no group of materials comes as close to permitting this ideal as stainless steel.

To put it differently, no other material combines so many outstanding properties as the stainless steels. Stainless steels have high tensile strength. All are hardened and made even stronger by cold working. As a family they offer superb resistance to the corrosive effects of an enormous variety of reagents. They have unusual resistance to high temperature oxidation, and are distinguished by relatively low heat conductivity. And on top of their remarkable physical properties, stainless steel's lustrous appearance and sales appeal scarely need mention.

There are over 30 types of stainless steel today.

The history of stainless steel's use is marked by designers who turned a healthy profit with a quality material but mainly with sound ideas. They're the men who used stainless for its strength and sales appeal in toaster covers, its appearance and machinability in wrist watches, its structural properties and cleanability for truck trailer parts. Stainless steel cuts weight and adds years to the life of architectural panels; its corrosion resistance and smooth, pocket-free surface have made it the standard of the dairy industry. There are literally thousands of applications of stainless steel in which designers have utilized one, two or more of the remarkable properties of stainless steel.

By reflecting the color of its surroundings, stainless steel contributes to harmonious design.

Types 302, 410 and 430 make up 75% of stainless steel's uses.

Good design is honest design, whether it uses stainless steel or other materials. Yet the fact remains that there is no other commercial material quite as versatile as stainless steel. The applications shown on these pages are just a few of the hundreds of uses to which stainless is put every day. To learn more about stainless steel and its design properties, call our nearest sales office or write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

Successful designers don't substitute stainless steel sections for sections of other materials. They design to stainless' unique properties.

Good design doesn't stop with function and sales appeal. It must also be capable of economical manufacture. As a comprehensive guide, send for the free book described at the right.

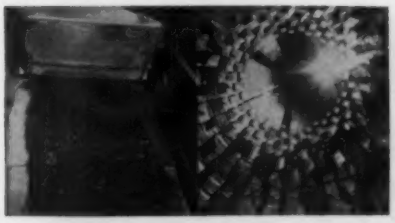
Stainless steels represent but a few of the thousands of grades of steel in existence today. United States Steel makes a complete line of stainless steels as well as alloy, high strength and carbon steels. Bring your design problems to us.

USS **United States Steel**

No Material comes close to stainless steel's versatility. By way of illustration, here are a few "opposites" that prove our point.

HOT. Temperatures in a jet afterburner reach 1400°F.

COLD. Stainless heat exchanger operates at temperatures as low as —443°F.



WET. Combination of moisture and coal would corrode nearly anything but stainless.

DRY. Rotary dryer is used to dry pharmaceutical ingredients.

CLEAN. Milk dispensers of stainless steel prevent contamination.

DIRTY. Stainless piston rings resist high temperature corrosion.

INSIDE. Chemical tanker needs simple wash-out for cleaning.

OUTSIDE. Stainless automobile trim stays bright and good-looking.

LIGHT. Stainless steel jewelry has a light, graceful appearance.

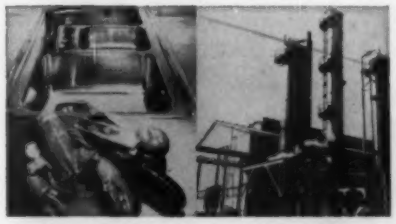
HEAVY. Strength and hardness of stainless combine to make safe doors safe.

ROLL. Stainless ball bearings take a lot of punishment.

SLIDE. Abrasion resistance of stainless steel makes chutes last longer.

FORM. Stainless steel wrist watch keeps time and beauty.

FUNCTION. Stainless steel muffler defies heat with silence.



WATER. Stainless sinks stay bright and beautiful.

FIRE. Stainless steel shingles inside cat crackers are red hot.

This mark tells you a product is made of modern, dependable Steel.

Stainless steel's properties require close control over processing and in some cases, special fabricating techniques. Its cold working and joining characteristics are of special interest to the designer and will often influence final design. For complete coverage of the subject, send for your free copy of our newly revised manual:

FABRICATION OF USS STAINLESS STEEL

Welding Austenitic Stainless Steels
Welding Ferritic Stainless Steels
Welding Martensitic Stainless Steel
Brazing
Joint Preparation
Jigs and Fixtures
Removal of Scale from Stainless Steels
Soldering
Joint Design
Lining of Vessels
Riveting
Machining
Cold Cutting
Flame Cutting
Cold Forming
Hot Forming
Annealing
Scale Removal
Passivation
Standard Mill Finishes
Surface Finishing
Grinding, Polishing and Buffing
Etching
Protection of Stainless Surfaces
Cleaning of Stainless Steels

United States Steel
Room 6140
525 William Penn Place
Pittsburgh 30, Pa.

Send me your new, just-off-the-press "Fabrication of USS Stainless Steel."

Name_____

Title_____

Company_____

Address_____

City_____

Zone____ State_____

Joe Foster, President,
tells why Nylon-6 is one of the
great molding resins.

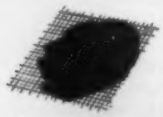
"There are four good reasons why Nylon-6 is one of the great molding resins," *says Joe Foster*

COLORABILITY

Fosta Nylon accepts a wide range of colors. To suit your manufacturing requirements, Fosta Nylon may be pigmented *during* formulation. Or, articles may be colored in water-soluble dyes *after* fabrication.

NON-FLAMMABILITY

Fosta Nylon is one of the few self-extinguishing materials and is ideal for use in portable electric appliance housings. Also, Nylon-6 provides good heat-resistance and good electrical properties.



EASE OF MOLDING

Higher melt viscosity of Fosta Nylon makes it easy to injection mold or extrude. Thick or thin cross-sections and large surface areas may be produced with greater ease than ever before.

STRENGTH

Fosta Nylon will resist severe impact and heavy stresses in all directions, even in thin sections. It has excellent wearing properties due to a low coefficient of friction and is resilient, recovering readily from deformation under load.

IF DESIGN, development or marketing of profitable, efficient end products is your responsibility, you can't afford to overlook Fosta® Nylon's unique combination of advantages as a fabricating material.

One of the great molding resins, Nylon-6 lends itself to a wide-range of end products, including: portable electric appliance housings, drapery hardware, gears and football cleats. And, our customers' experience plus our own work as the world's largest manufacturer of sunglasses indicates there are countless other applications for this resin.

Its basic properties make us confident that versatile Nylon-6 has a wonderfully promising future. In addition to colorability, strength, non-flammability and ease of molding, Fosta Nylon also provides toughness, abrasion- and impact-resistance, flexibility, heat-stability and is self-lubricating. This is why Nylon-6 can do almost anything a molded product may require.

Still another product advantage is the magic name of "Nylon." Consumers everywhere know that a "Nylon" product is something special, is different from any other materials and possesses greater product features. You'll find the extra merchandisability of "Nylon" can add magic sales-power to all types of products.

As an incentive to make Nylon-6 a more widely used material, we recently reduced the price of Fosta Nylon to 98 cents a pound in quantity. Our confidence in Nylon-6 prompted this move.

To make Fosta Nylon more familiar to you, we would like to send you our current literature. Whatever your product design, development and marketing strategy, we'll be glad to demonstrate why Nylon-6 should be part of your thinking. Just call or write Foster Grant Co., Inc., Leominster, Mass., KEystone 4-6511. We're ready to work with you right now!

FG
FOSTER GRANT

Your Partner in Plastics Progress

Plants in Leominster, Mass.,
Manchester, N. H., Baton Rouge, La.
Branch Offices and Warehouses in principal cities

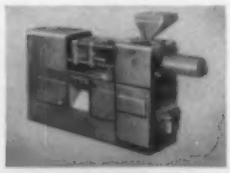
imagination
AND DU PONT PLASTICS

DELRIN®
acetal resin

Du Pont "Delrin" acetal resin is a completely new material that offers designers distinct performance and cost advantages in many applications once reserved for metals. Today, "Delrin" is being used in hundreds of products where die-cast zinc and aluminum, cast and machined brass, stainless steel and cast iron were once considered "standard". Imaginative and cost-conscious designers have taken advantage of the unique properties offered by "Delrin" to make such products better and at lower cost. Household items, sporting equipment, telephone components, gears, housings, plumbing fixtures, valve parts, clothing fitments are examples.

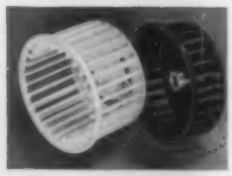
On these pages you will find some of the good reasons why "Delrin" opens the door to improved designs and examples of how industrial designers have profited from these new opportunities.

What DELRIN offers to designers

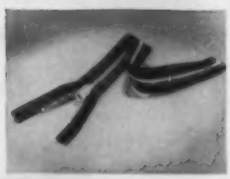


rapid, economical fabrication: Parts of "Delrin" are rapidly mass-produced via conventional injection molding or extrusion. There is usually no need for finishing operations. Assembly is simplified by a variety of fastening and joining methods. Complex parts can often be molded in integral units, thus making possible savings in costs and simplifications in design. Models and prototypes can be machined easily from stock shapes, which are readily available.

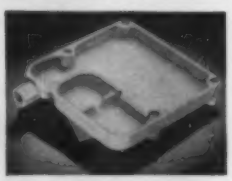
attractive appearance: "Delrin" is available in a variety of colors. In addition, varied surface effects can be achieved by texturing, vacuum metalizing or painting. "Delrin" offers designers new latitudes in décor, in such applications as the integrally colored instrument cluster (left), in bathroom fixtures, in automotive and appliance handles and in clothing fitments.



strength, toughness, dimensional stability: Outstandingly strong, rigid yet resilient, "Delrin" retains its desirable properties over a wide range of temperatures and under exposure to water, solvents, oils and greases and stress and strain. The "squirrel-cage" blower (left) is an example of many of these properties at work. A variety of gears and hardware fixtures takes advantage of the dimensional stability and toughness of "Delrin".



resistance to stains, rust: "Delrin" is unaffected by long exposure at room temperatures to a wide variety of common and usually troublesome substances—among them tea, catsup, vinegar, greases and oils and lemon juice. It cannot rust. The resistance of "Delrin" to body oils and perspiration, as well as its toughness and good frictional properties, makes it a logical choice for zippers (left) and other fitments.



cost savings: Because one part of "Delrin" can frequently replace several parts of another material, because costly finishing operations are usually eliminated, and because assembly is simplified, "Delrin" often permits dramatic cost savings. The textile solution pan (left) costs $25 in stainless steel; injection-molded of "Delrin", it requires no finishing, and costs approximately $3, with a weight saving of 75%.

New designs made possible by DELRIN

The Zebco Company of Tulsa, Okla., cites "Delrin" as making possible a truly corrosion-proof salt-water spinning reel. In their "Fabulous Zebco 88", "Delrin" is used for the housing, thumb control, body, pickup pin and thumb stop. Zebco found in "Delrin" the stiffness, toughness, light weight, wear and corrosion resistance it needed. The "Fabulous Zebco 99" is also made of "Delrin" for long-lasting *fresh-water* spin fishing. (Molded by Ajax Plastics, Tulsa, Okla., and Continental Plastics Co., Oklahoma City, respectively.)

The head unit (top) of the new "Lady Ronson" Superbe electric shaver is molded of "Delrin", saving 80% of the weight of the previous gold-plated die-cast zinc part. Ronson Electric Shaver Corp., Stamford, Conn., specified "Delrin" because it could be molded to and hold the necessary dimensions, have a smooth, attractive luster without finishing and resist body oils and colognes.

The Lionel Corporation, Irvington, N. J., recently introduced a new HO train line featuring a one-piece coupler molded of "Delrin". Because "Delrin" has the resilience to provide the desired springing action, Lionel designed the integral unit to replace a two-part assembly of coupler and coil spring. The result: a significant assembly saving plus a new sales feature. "Delrin" is also used for the axles, journals and two other truck parts. (Molded by Lionel and Gries Reproducer Corp., New Rochelle, N. Y.)

Four parts (in white) of this self-seating faucet are molded of "Delrin", saving 80% of the cost of the machined brass components formerly used by the Kel-Win Manufacturing Co., Inc., Richmond, Va. Kel-Win chose "Delrin" because it resists corrosion and mineral build-up, remains dimensionally stable and keeps handles comfortable to the touch. Cost savings also accrue from the elimination of machining operations and rejects. (Molded by Dominion Plastics Co., Colonial Heights, Va.)

What problems can DELRIN help you solve?

The applications shown on these pages are only a few of the hundreds of remarkable design improvements already made possible by "Delrin" acetal resin. We suggest that you investigate further the many ways in which this versatile new material may help you solve some of your design problems. Du Pont technical personnel are ready to assist you in your evaluation of "Delrin" as well as the other high-quality plastic materials offered by Du Pont, such as ALATHON® polyethylene resins, ZYTEL® nylon resins, LUCITE® acrylic resins. For more information on any of these materials, write us. Address: E. I. du Pont de Nemours & Co. (Inc.), Department T-9, Room 2507D, Nemours Building, Wilmington 98, Delaware.

IN CANADA: *Du Pont of Canada Limited, P.O. Box 660, Montreal, Quebec.*

POLYCHEMICALS DEPARTMENT

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

ALATHON® DELRIN® LUCITE® ZYTEL®
polyethylene resins · acetal resins · acrylic resins · nylon resins

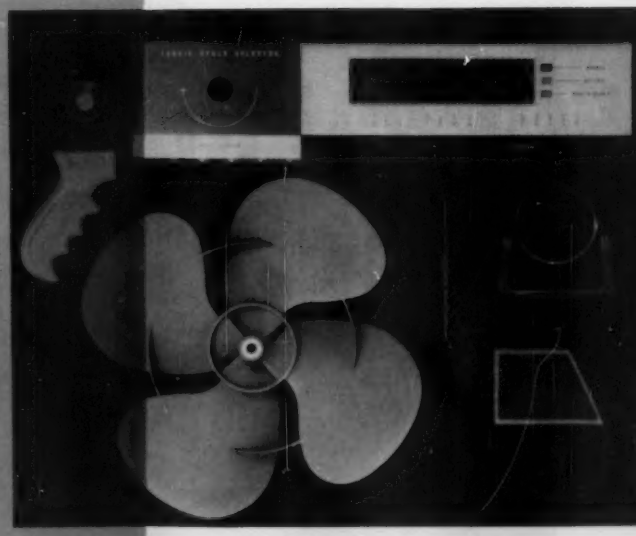
Du Pont's problem-solving plastics

How the custom molder can help bring your product idea to life

The custom molder is well-known as a mass producer of molded plastics parts and products. But he is much more. Most helpful to the designer, the custom molder knows the design limits of the different plastics. He can recommend the best formulation for the job. He can also engineer the design to capitalize on the inherent advantages of plastics materials and the efficiencies of plastics manufacturing. His toolmakers build the master molds to the closest tolerances. His productive facilities can turn out plastics parts with unusually consistent quality, at rates to meet the tightest schedules and budgets.

Monsanto keeps the custom molder supplied with molding formulations of Monsanto Polyethylene, Lustrex® Styrene, and Opalon® Vinyl, specially developed and constantly perfected to meet a wide range of design requirements.

Which molding compounds to consider? Use the Plastics Properties Calculator, an easy-to-read slide rule that provides comparative property data on the many different plastics molding materials. For your free calculator, write to Monsanto Chemical Company, Plastics Division, Room 732, Springfield 2, Mass.



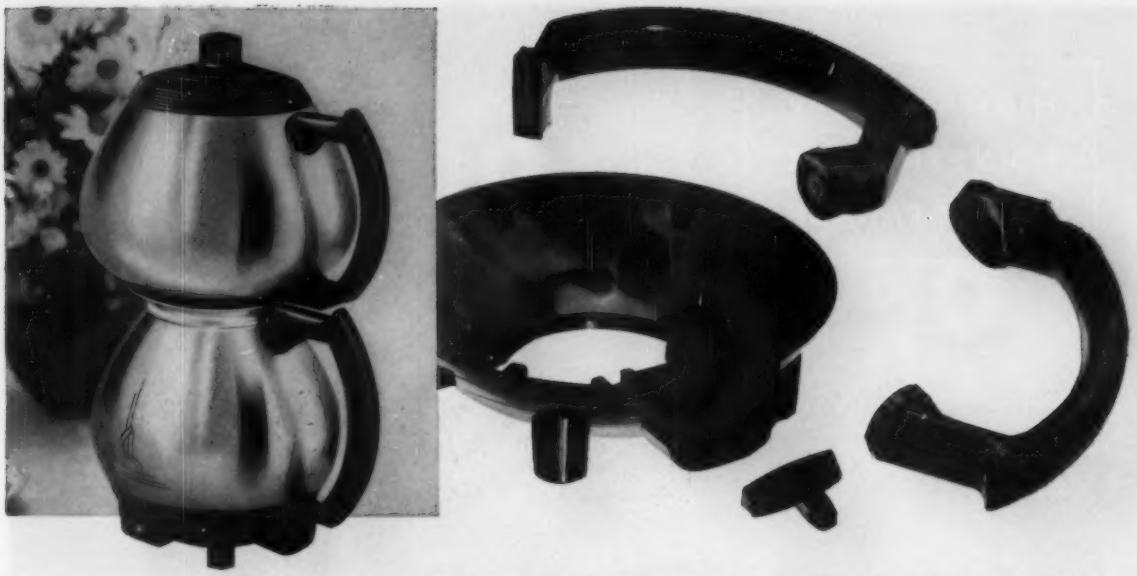
MONSANTO ACTIVATOR IN **PLASTICS**

Monsanto

Molded Vinyl Provides Flexibility and Color Harmony in Steering Wheel Grommet. Color matching without painting, flexibility as needed—these are two advantages BAKELITE Brand vinyl offers in these grommets for Mercury cars. Used to enclose the steering column at the instrument panel, the grommets are molded in colors to harmonize with car interiors. Flexibility of the vinyl permits the grommet to fit snugly and eliminate road vibration. A cost saving over the rubber used previously was another important advantage.

FOR A FRESH NEW LOOK,

Colorful High-Impact Styrene's Light Weight Makes This Portable Sewing Machine Easier to carry. Durability and a pleasing appearance enhance the sales appeal and service life of the carrying case for Singer's new portable sewing machine. The BAKELITE Brand high-impact styrene plastic cut four pounds from the weight of the old-type case, and gives a high-gloss finish in lasting color. Moldability of the BAKELITE high-impact styrene proved best of several plastics tested before production began. Matching base and accessory box are molded from the same material.



Phenolics Improve Looks and Service Life of an Automatic Coffee Maker. Main considerations in the design of this utensil were attractive appearance and heat resistance. BAKELITE Brand phenolics met both requirements at low cost. Base, handles, and upper rim were molded from phenolic resins developed by Union Carbide Plastics Company. They don't warp or blister and keep their lustrous finish even though frequently exposed to hot fumes and coffee grounds.

REDESIGN IT IN PLASTIC

When your product must be handsome as well as efficient, molded plastic components can give it fresh eye-appeal and durability that influence buyers

Is the sale of your product hampered by an unattractive or outmoded appearance? Then start anew, and design it freely, according to your ideas of what it could look like.
You have more freedom when your design calls for fabrication with BAKELITE Brand plastics. Choose from numerous BAKELITE Brand plastics—polyethylenes, epoxies, phenolics, styrenes, and vinyls—all are high quality, and offer you a wide range of properties. You can get colors, impact strength, heat and ultraviolet resistance, light weight; plus the fabricating characteristics you need. And more than likely you'll realize a cost saving besides.

See your Sweet's Product Design File, Sec. 2a/ui for properties of BAKELITE Brand plastics. For specific information, just mail the coupon.

BAKELITE and UNION CARBIDE are registered trade marks of Union Carbide Corporation.

UNION CARBIDE

Dept. DH-73
Union Carbide Plastics Company
Division of Union Carbide Corporation
270 Park Avenue, New York 17, New York

Please send me details about BAKELITE Brand plastics for molding applications. Application being considered is

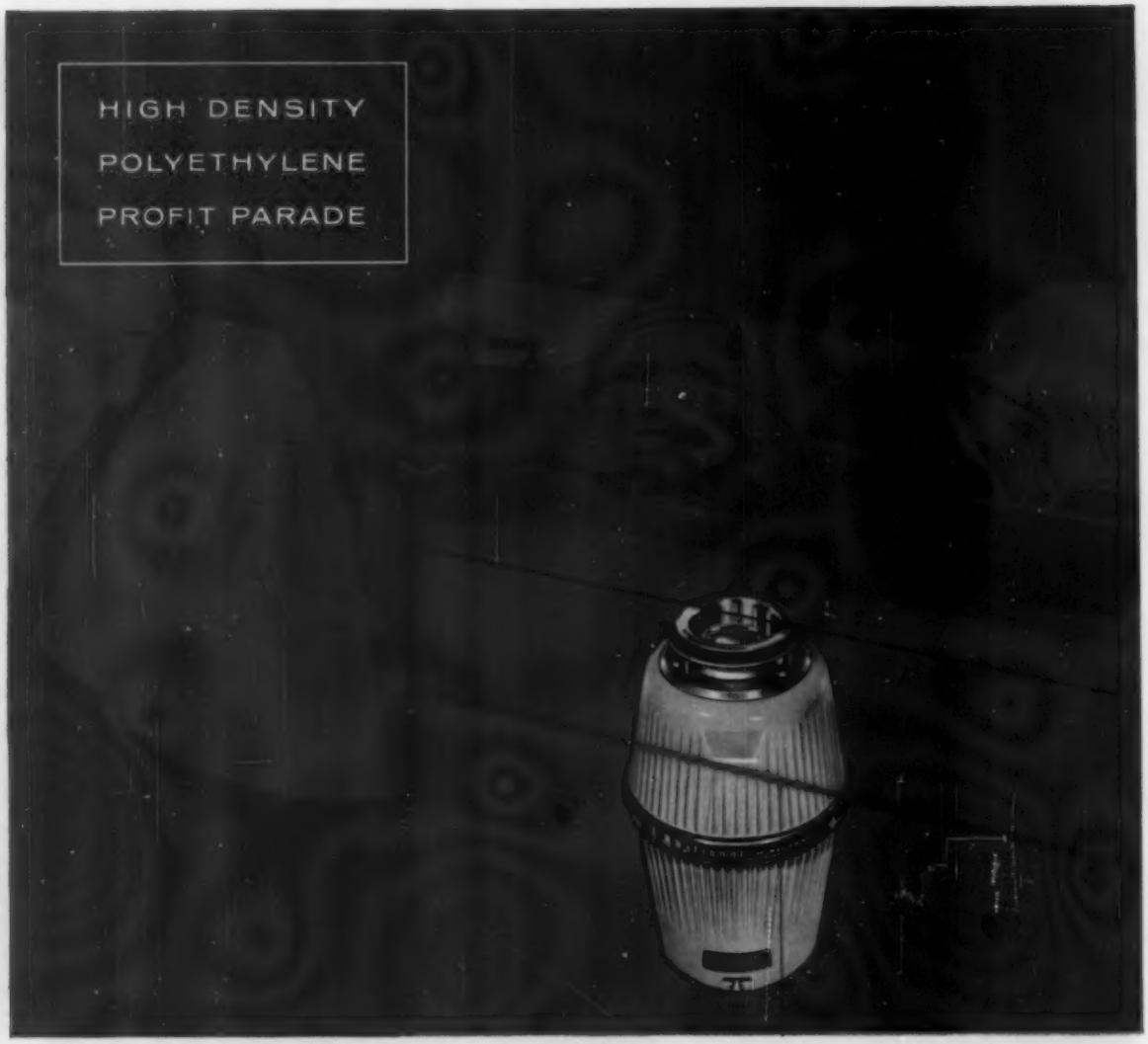
_____

NAME _____

FIRM NAME _____

STREET _____

CITY _____ ZONE ____ STATE ____



Grace Plastic Upgrades New Appliance Model

The new Citation Model National Disposer shows how the use of Grex high density polyethylene results in upgrading a product to increase its consumer appeal.

Made by the Plumbing Equipment Division of National Rubber Machinery Company, the appliance grinds food wastes into micro-sized particles that wash down the drain. Its primary appeal is freedom from garbage-handling chores. Three additional sales-stimulating features are direct results of specifying Grex for the housing:

1. Freedom of design due to the moldability of the Grace plastic provides clean, fresh styling.

2. A choice of attractive colors is offered. Colors are molded into the Grex housing—can't peel, chip or fade.

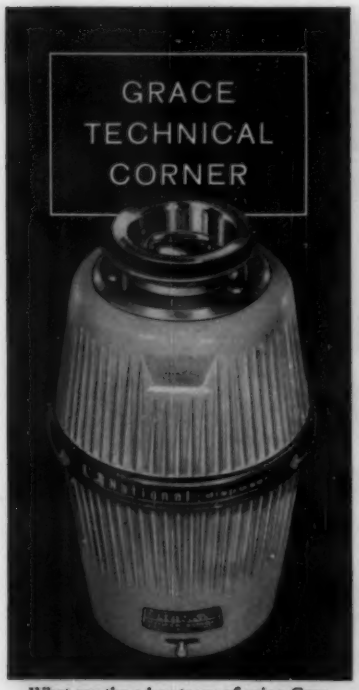
3. The plastic's sound-deadening properties are utilized to help make the Disposer operate "whisper quiet."

In addition to these features, the housing is strong, rigid and virtually indestructible. It cannot rust, is unaffected by chemicals normally corrosive to other materials and withstands the high temperature of boiling water.

If you are looking for ways to upgrade your product it will pay you to find out exactly what high density polyethylene has to offer by calling in the experts. Grace has the production, technical, and marketing facilities to help put your product in the Grex profit parade. Everyone says we're easy to do business with.

Grex is the trademark for W. R. Grace & Co.'s Polyolefins.

W.R. GRACE & CO.
POLYMER CHEMICALS DIVISION
CLIFTON, NEW JERSEY



What are the advantages of using Grex to make a product prototype?

The prototype for the new model National Food Waste Disposer shown here was vacuum formed from Grex sheet in our Clifton Laboratories. Whenever possible, prototypes of products designed for production with high density polyethylene should be made of the same material. This is the best way to see how the product will look and feel before costly molds are built and production actually started.

Helpful in marketing. Although most prototypes are required from an engineering standpoint they are often useful to guide marketing decisions as well. This was the case with the Grex prototype of the National Disposer. The object was to determine, in advance of production, how the trade would react to the new model by presenting prototypes or samples that come as close as possible to the finished product.

Grace's part. Working from the manufacturer's engineering drawings Grace designed wooden molds and vacuum formed a number of samples from Grex sheet. The samples were sent to the manufacturer for finishing (trimming of flash and drilling the necessary holes), and returned to Clifton for surface finishing. The samples were completed in time for display at an important trade show. Trade reaction was highly favorable, just as you would expect from reading about the product on the opposite page.

You are invited to take advantage of Grace technical service. Perhaps we can help you by making a Grex prototype for your high density polyethylene application. Or perhaps you need assistance on other aspects of design or production of high density polyethylene parts. If so, now is the time to contact:

Technical Service Department
W. R. Grace & Co., Clifton, New Jersey

Coming in October

Normally in this space we describe what's coming next month in ID. But we've just finished describing it pretty fully on pages 116 and 117, and frankly it seems a little immodest to say it twice. So, for a detailed account of

INDUSTRIAL DESIGN's
October issue

See page 116

THIS IS GLASS

A BULLETIN OF PRACTICAL NEW IDEAS FROM CORNING

NO PLACE FOR AN ACROPHOBE

When first we read of the seven who are eager to blaze a route to the stars, we pondered what we thought of as man's inborn fear of great heights.

Now we learn that the first of the astronauts will have a window in his capsule, that he will peer *down* at the spinning earth and *out* at the wheeling stars.

We are producing these unique, space-going viewports for McDonnell Aircraft Corporation, prime contractor for the National Aeronautics and Space Administration's Project Mercury capsule.

The window is an excellent piece of engineering. Not just because we made it, but because it *has* to be.

It will take the slams and whams, the blistering heat, and the embrittling cold of blast-off, orbitation, re-entry, and a soak in the briny. All during this it must remain transparent, intact, and sealed tight.

There are four panes to the window. The outer two are VYCOR® 96% silica glass. The inner two are aluminosilicate glass specially tempered to phenomenal strength.

Each pane is ground and polished to the precision finish of a telescope mirror. The outermost panel curves to the contour of the capsule, so it trapezoids from an 11″ base to a 7½″ top along a 21″ height.

The glasses present a delicate balance of optical qualities, thermal shock resistance, and low weight. The last is vital when you consider that it takes about 100 gm of fuel to orbit 1 gm of payload.

So, remember, when you see the first astronaut smiling quietly, confidently from his capsule, you are looking at him through Corning glass.

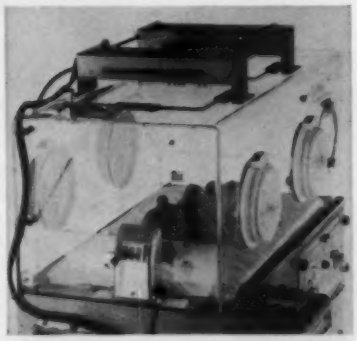
HOW ABOUT A DEGREE IN MEDICAL ENGINEERING?

The mechanics of modern medicine are fast maturing to the point where some engineers are specializing in the building of machines like this Infant Servo-Controller for the Isolette, manufactured by Air-Shields, Inc., Hatboro, Pennsylvania.

This particular machine is used with prematurely born infants who must keep their body temperature at a constant level, but lack a well-developed thermal regulatory device.

You attach a thermistor to the babe's abdomen and let him work as his own thermostat. He automatically requests heat from infrared lamps whenever his skin temperature drops below 97°F. When things are just right again, he switches off the lamps and takes a rest, with the odds for survival more in his favor.

If you've ever tried to unbulb an infrared lamp, you know that it gives off *direct* heat as well as IR energy.

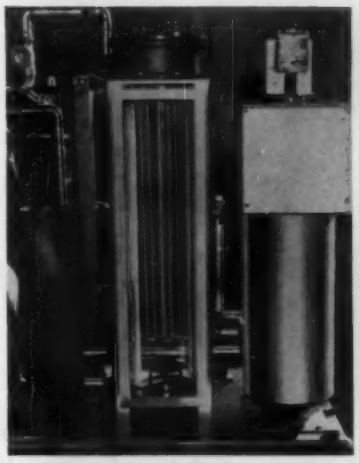


That's why there are two PYREX No. 7740 glass plates sitting on top of the plastic chamber in the picture. You can see them, if you look closely. The PYREX plates are heat resistant and will also dissipate the *direct* thermal output of the lamps. So, the plastic forgets the lamps are there.

As far as the IR energy is concerned, the PYREX plates don't exist either, so practically all the IR gets through to the baby.

The over-all relationship between IR and glass is an odd one. We can give you glass which transmits as much as 92% of the IR or a glass which transmits as little as 8% of the IR.

Happily for our product specialists, there is demand for both situations. We've prepared some bulletins on many of these IR characteristics, a copy of which you may have by sending the coupon.



SOMETIMES GLASS IS SO OBVIOUS

Leafing our way through the 4th Annual Shirt Issue of "Cleaning Laundry World" (April 1960), we took note of an advertisement which concerned a machine which displayed a feature which we consider the soul of genius.

The machine is a dry cleaner manufactured by Detrex Chemical Industries, Inc. The feature is a glass-enclosed filter which keeps the dry-cleaning solvent cycling unpolluted. The soul of genius, to our minds, consists of intelligent manipulation of the obvious . . . in this case, an application of the first known and longest respected of the myriad properties of glass . . . to wit, its *transparency*.

When you locate such a place, it doesn't necessarily take a lot of redesigning of custom fabrication to put glass to work, either. We checked and found that Detrex, for example, simply orders standard 6″ O.D. PYREX brand Heavy Duty Tube for its filter wall.

The result is that the operator of the Detrex Cleaner can watch the filter at work. He can spot trouble while it's still potential, determine its cause exactly should it occur . . . all without any dismantling or shutdown.

Is there anything you're working on that you wish you could watch working? If there is, and you want to put glass to work, you can start by sending the coupon for a copy of Bulletin IZ-1, "Designing with Glass for Industrial, Commercial, and Consumer Applications."

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DOW

NEWS ABOUT PRODUCT DESIGN AND MATERIALS

In selecting new items for her home, the housewife favors products with attractive design to complement practical function. Because today's plastics help the creative designer meet this two-edged demand of the consumer, these modern materials are fundamental to more and more of today's new designs. In products for the home, for instance . . .

DESIGNERS CREATE GOOD LOOKS THAT LAST IN NEW IDEAS FOR THE HOME

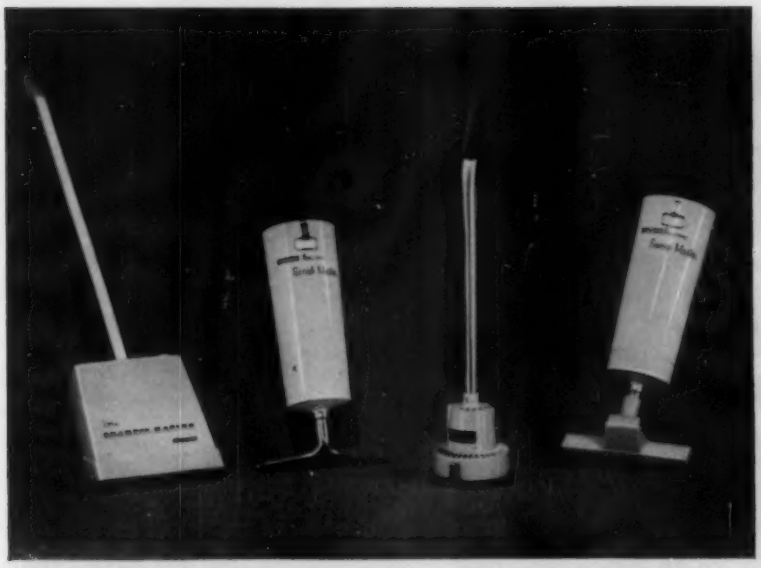
Whether it's a new product or fresh, new styling for an old standard, Dow plastics are ready to help the designer. Dow provides a vast array of thermoplastics materials in many specific formulations — each with particular specialties to assist designers in achieving color, modern appearance and durable performance in their products.

Take PVC cord in chairs, for example. Designed for outdoor relaxation, handsomely styled chairs are laced with cord of PVC, Dow polyvinyl chloride. This plastic material for cord or fabrics serves the imaginative designer with a wide choice of colors and color combinations.

Excellent aging characteristics, together with quick recovery from loads, combine to provide durability as well as long-lasting chair comfort. In addition, cords or fabrics of PVC clean easily with a damp cloth — need warm water and soap only for the most stubborn dirt.

Styron, the workhorse of today's plastics, permits the designer complete color selection, with attractive surface finish assured. This durable material

PVC cord permits wide color choice, assures extra-long service in new chairs for outdoor use.



Styron provides durable tanks and housings for these two modern home appliances—one for shampooing rugs, and a combination device that either scrubs bare floors or vacuums rugs and floors, depending on the attachment used.

Styron affords wide color and design latitude in cases for such products as clocks and clock radios.

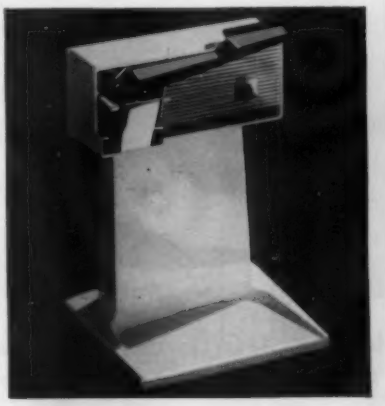
affords good flexural strength, excellent dielectric properties and low water absorption. Styron® (Dow polystyrene) is low in cost—molds, extrudes and thermoforms easily—and is offered in 18 different formulations that spotlight particular design characteristics.

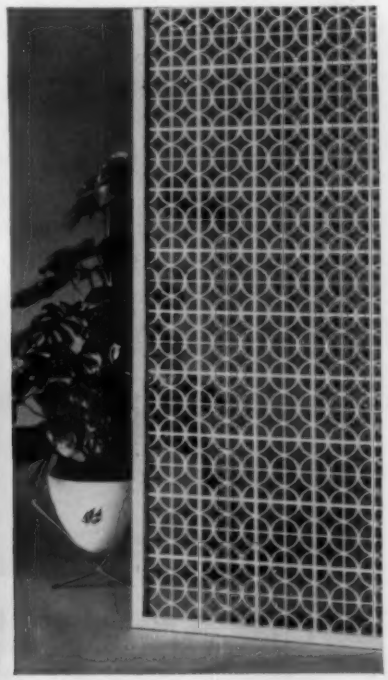
In the new combination appliance designed both to vacuum rugs and scrub floors (illustrated above), tanks are made of Styron 475, specifically formulated for high impact strength—three to five times greater than general purpose polystyrene formulations. This formulation also provides the tank housing for the lightweight rug shampoo device.

Styron 369, a formulation that combines excellent heat resistance and good impact strength, makes a colorful case for the high-styled clock radio. And the wall clock takes advantage of another feature of Styron — the case is opaque while the protective dial cover is crystal clear.

For privacy on the patio, new wall divider grilles offer novel designs and maintain their good looks for years. Molded of Zerlon®, they are exceptionally strong, resist outdoor weathering . . . and stand up under blazing sun or freezing cold.

Cans open in a hurry, with electricity turning the crank. And the glossy stand and housing of this can opener are a breeze to keep clean because they're made of Tyril®. Remarkably stain-resistant, Tyril plastic withstands food, oils, waxes, soaps . . . even solvents and many chemicals.





NEW MATERIALS, ANYONE? More than likely, Dow plastics can help you with a design now on your board. The Dow family of thermoplastics is one of the widest lines of materials and formulations available in the industry today . . . and Dow also provides specialized technical service to help use them. Can we be of assistance? Just write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Merchandising Department 1722BR9.

See "The Dow Hour of Great Mysteries" on TV.

THE DOW CHEMICAL COMPANY

Midland, Michigan

DOW

If you now cast it, maybe you should mold it

This is a reverse clutch cone. It used to be cast from aluminum, then machined. Not now.

Now they mold it from a Durez® phenolic that's reinforced with fibrous glass. It comes out of the mold weighing only 4 ounces and ready to transmit the full engine power of a 2½-ton car.

If you are now designing parts in metal, using costly fabricating methods to get the tolerances and structures you want, think about these newer phenolics.

Molding is often less costly than any combination of casting and machining.

Many of the new phenolics have properties that in many respects are superior to metal: surface finish, resistance to corrosion, dimensional stability.

We've got a booklet for you that spells out many of these properties and characteristics . . . along with suggestions on proved applications that may spark some ideas for you. Ask for Bulletin D400.

DUREZ PLASTICS DIVISION

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INDUSTRIAL DESIGN'S

7th Annual Design Review

What Will It Include?

This year's Annual Design Review will cover every facet of industrial design from the newest forms of basic materials and technological components to the most outstanding products and packages for home, office, and industry.

1 Consumer Products

Furniture
Fabrics & rugs
Lamps
Decorative accessories
Electric housewares
Housewares
Radio & tv
Hifi
Photography
Garden (including outdoor cooking)
Hand tools
Personal (razors, hair dryers, etc.)
Toys & recreational equipment
Educational materials and equipment
Silver, flatware & china

2 Design for Selling

Packaging
Point-of-Sale display
Symbols and trademarks
Vending devices

3 Building Products

Prefab structures
Systems and materials (panels, grilles, etc.)
Components (skylights, doors, fireplaces, etc.)
Finish materials (tile, wall covering, etc.)
Hardware (locks, hinges, handrails, etc.)
Heating and cooling equipment
Plumbing (mostly bathroom fixtures)
Lighting (built-ins, ceiling grids, etc.)
Appliances (ranges, freezers, home laundries)

4 Business, Professional & Industrial Products

Design materials (electronic & industrial)
Communications equipment
Business machines
Institutional furniture
Transportation (planes, boats, helicopters, moving sidewalks, etc.)
Rolling equipment (tractors, lift-forks, etc.)
Professional hand tools
Machines (lathes, riveters, pumps, etc.)
Electronics (components as well as products)
Laboratory equipment

appearing in December 1960

A major feature in each December issue of INDUSTRIAL DESIGN, the Annual Design Review is a portfolio of the year's major innovations in industrial design, and a valuable permanent reference for designers and manufacturers.

Final submission date: September 30

INDUSTRIAL DESIGN *18 E. 50th Street, New York 22, N. Y.*

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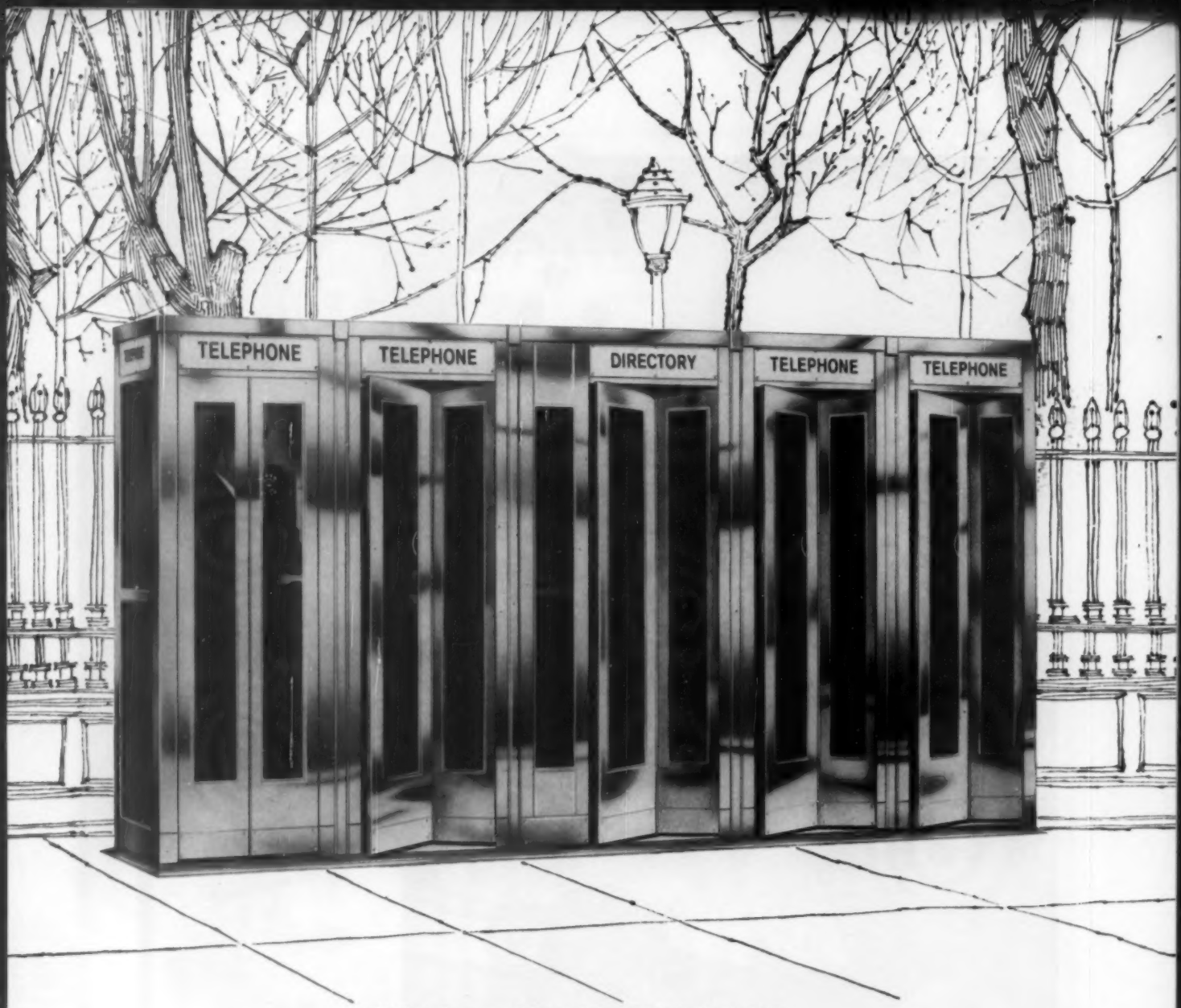
THE BORG-WARNER PLASTIC THAT'S TOUGH, HARD, AND RIGID

Homelite Division of Textron Inc. specified CYCOLAC for the body sections of its ride-on lawn mower because this lightweight, ABS material was the one plastic that offered the rugged durability required by such outdoor equipment. With the high impact strength of CYCOLAC, the body is protected against damage from knocks and blows. In addition, CYCOLAC eliminates corrosion and staining, insuring a mower body that will retain its attractive, glossy appearance. Because of its unique combination of properties, CYCOLAC can be used for many products formerly made of metal—at substantial savings. It may be the material that will make **your** product more profitable. Why not discuss this with one of our representatives? Write today.

MARBON CHEMICAL DIVISION **BORG-WARNER**
WASHINGTON WEST VIRGINIA



This illustration was made from a photograph taken in New York City.

If you wanted to top this design, you'd have to invent a new metal

It may seem easy to design a telephone booth, but it isn't. Especially when you consider what a phone booth has to go through: rain, hot sun, corrosive atmospheres, vandals, heavy traffic. But it is easy to select the material for the booth.

Sherron Metallic Corporation, Brooklyn, N.Y., used Stainless Steel here because no other metal can equal its *combination* of properties. It's harder than non-ferrous metal, so it won't dent as easily. It resists corrosion like no other commercially practical metal. It can be *welded* into a tight solid unit. It requires literally no maintenance because the gleaming, corrosion-resistant surface goes all the way through.

To substantially improve the design of this booth, you'd have to invent a new metal . . . one that has all the wonderful characteristics of Stainless. There's only one such metal. That's why so many designers use Stainless Steel.

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USS

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

Use this mark to tell the public that a product is made of modern, dependable Steel.

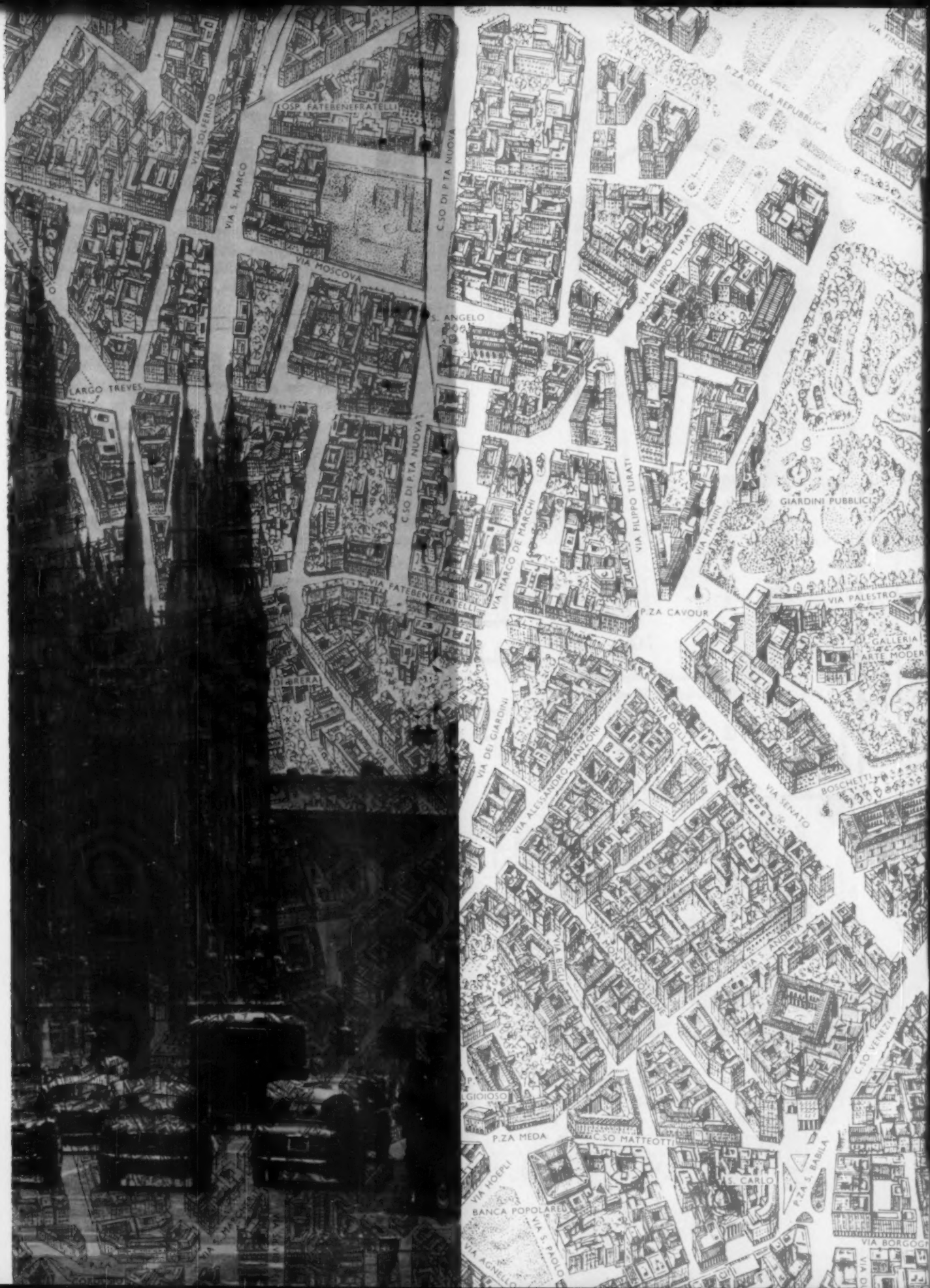
On the road and off

Along all our roads you see them. They invite the motorist to buy real Vermont maple syrup (in New York), Mexican silverwork (in Vermont), genuine Indian camel bells (in Pennsylvania), Pennsylvania Dutch ash trays (in Ohio and Indiana and Illinois). Some of them, mounted on the billboard bumpers of our cars, announce that the occupants have bought exposure to Ausable Chasm, the Natural Bridge, Fort Ticonderoga or Storyland or Gaslight Village or the Lake Champlain Ferry. Any roadside merchant with the audacity to attach his unpaid advertisement to a customer's car finds that the customer will gladly carry the sales pitch from coast to coast. Once on the road, we are a nation of shills.

Of all the signs speeding by us on the highway, the dominant one is the simple injunction EAT. But running a close second is the ubiquitous legend GIFTS. Towns too small to support barbershops or gas stations find room in the local economy for at least one gift shop. And the gift shop signs are the most honest of all advertising. For what these shops sell are, in absolutely the purest sense, gifts. As such, they represent an efficient, if somewhat unlovely, turn of events. A gift never used to be a gift until someone gave it. Up to that time it was a useful object with an independent value of its own. *These* gifts, however, were never designed to be used; they were *designed* to be given. Giving is their function, and their form follows it boldly where angels fear to tread (with good reason: they may get kitchen timers stuck in their bellies.) We all know that what counts is not the gift itself, but the spirit; and these gifts have the spirit designed right into them. You just add postage and serve. The most candid highway statement of this curious truth is the sign on a Great Barrington, Massachusetts shop: "Designs for Giving." It is no great shakes as a pun, but it makes its point.

If you had driven safely past a thousand gift shops, home to New York last week, it was too soon to touch base and cry Safe: the Trade Show Building was host to part (it wasn't large enough for all) of the mammoth semi-annual Gift Show. And if—after acres of ice buckets, cigarette lighters, brass cherubs, cherubic brasswork, barbecue aprons, and beaded moccasins —you reflected that the gift industry offered no rest to the weary, you might also reflect that it did offer some intriguing food for contemporary design thought. Industrial designers are constantly being told (usually by each other) that the products they design are status symbols, manufactured not only to be driven, cooked with, or lived in, but to make a public statement about the owner. This is troublesome, since often the design elements that presumably make for status also make for ugliness, discomfort, and inconvenience. Perhaps it could all be rectified if the designers of status symbols were to make their art as pure as that of the gift designers—if they were to create status symbols that unapologetically made no pretense to any other function. This would free designers to create working products that did not have to confer status. And in the process, someone just might achieve not *status*, which is as available as the nearest installment plan, but *stature*, which even the Diners' Club doesn't offer yet.—*R.C.*


P.ZA MORSELLI
MELZI D'ERIL
VIA CESARIANO
VIA BERTANI
SEMPIONE
V.LE BYRON
P.ZA
V.LE MALTA
PARCO
TRIENNALE
V.LE SHAKESPEARE
VIA CORSE
VIA LEOPARDI
STAZ. FERROVIA NORD
VIA JACINI
P.LE CADORNA
P.ZA VIRGILIO
VIA BOCCACCIO
VIA VINCENZO MONTI
VIA CARDUCCI
C.SO MAGENTA
VIA MELCHIORRE GIOIA
TANCAMANO
LARGO GARIBALDI


P.ZA DELLA REPUBBLICA
OSP. FATEBENEFRATELLI
VIA SOLFERINO
VIA S. MARCO
VIA MOSCOVA
C.SO DI P.TA NUOVA
S. ANGELO
LARGO TREVES
VIA FILIPPO TURATI
VIA MANIN
GIARDINI PUBBLICI
VIA MARCO DE MARCHI
VIA PALESTRO
P.ZA CAVOUR
GALLERIA ARTE MODER
VIA DEI GIARDINI
VIA ALESSANDRO MANZONI
VIA SENATO
BOSCHETTI
P.ZA MEDA
C.SO MATTEOTTI
C.SO VENEZIA
VIA HOEPLI
BANCA POPOLARE
VIA S. PAOLO
VIA BORGOGNA

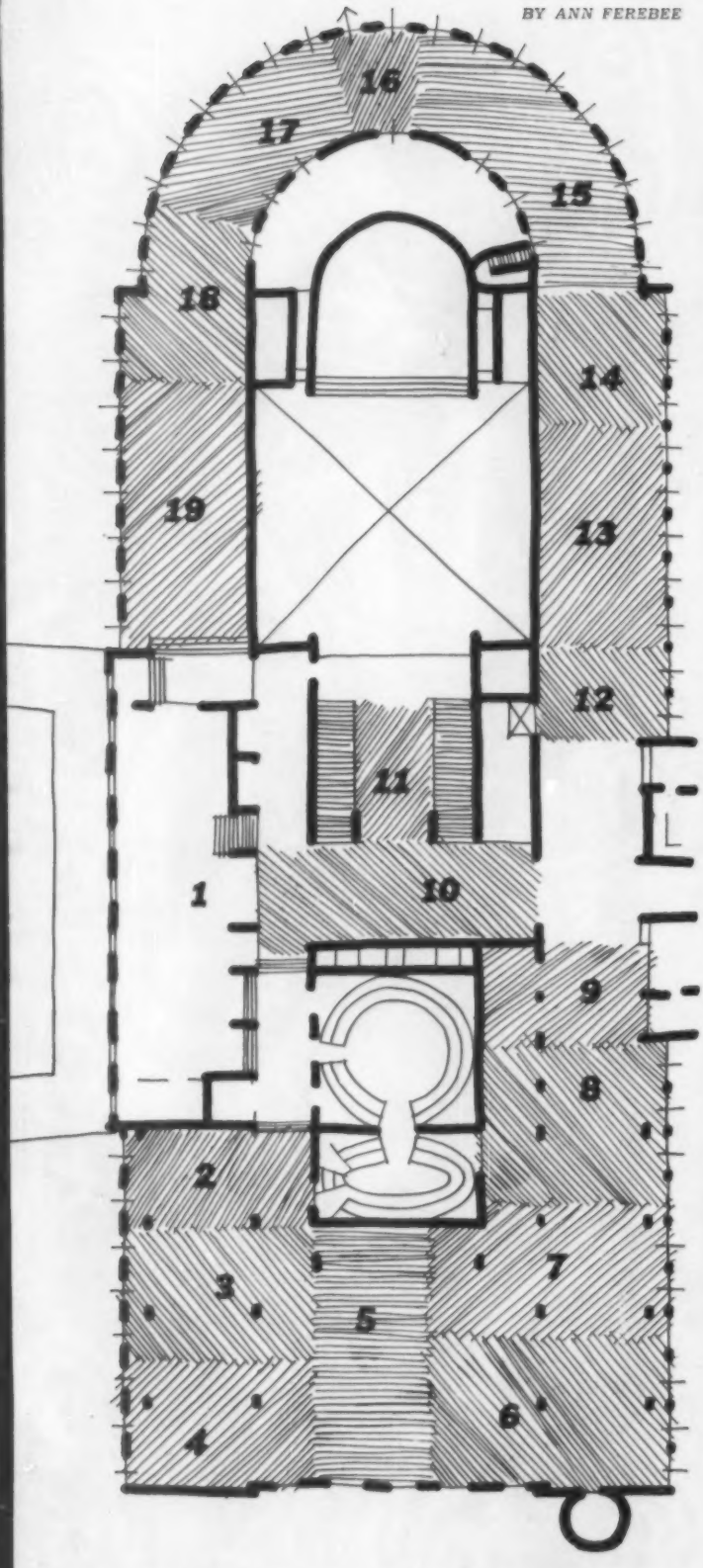
BY ANN FEREBEE

Triennale di Milano

Milan's green and leafy Parco Sempione, setting of the Palazzo dell'Arte, which houses the Triennale, is a special blessing this summer. In addition to the normal roar of unmuffled scooters and automobiles, the city is disrupted by construction on the recently begun subway system. But if the pleasures of the Parco are total, those of the Palazzo are not. The 12th Triennale di Milano, which opened on July 16th and will run to November 4th, offers the visitors a plethora of unusual exhibition ideas, opulent displays of arts and crafts from 16 nations, but only a few new designs in mass-produced goods. This year, for the first time in its history, the Triennale has, rather than an amorphous theme, a concrete subject: the home and the school. This year, also, the problem of the Palazzo's overblown entrance has been laid to rest—by a rather drastic measure. Officials have simply sealed it off, opening a new main entrance (below) on the park, rather than on noisy Viale Alemagna. The building is still Mussolini Modern, of course, but no one seems to mind this too much because it has one great advantage as an interior space: it is an empty shell, ideal for exhibit design. The Triennale is a designer's design show with no limits except those imposed by the designer's own imagination.

The space allocation this year groups the national exhibits of the 15 participating countries on the ground

floor, and turns over the second floor to Italian exhibits related to the Triennale's specific subject, subdivided into three environments: home and school in the country, in the suburbs, and in town. Scattered throughout both floors are such special exhibits as the memorials to Adriano Olivetti and Frank Lloyd Wright. The two autonomous exhibits outside the Palazzo (there are only two because the Milanese object to having the show overrun their park) are England's complete primary school, which delights the Italians, and Alcoa's Casa Americana, which is finally open after more than the usual number of pre-show calamities and is also much admired, although many visitors are skeptical



1) Lobby; 2) Switzerland; 3) Japan; 4) Czechoslovakia; 5) Belgium; 6) Finland; 7) Sweden; 8) Denmark; 9) Norway; 10) Exhibit of individual architects; 11) Glass and steel; 12) Exhibits from schools of industrial design; 13) France; 14) Holland; 15) Mexico; 16) England; 17) Austria; 18) Poland; 19) Germany.

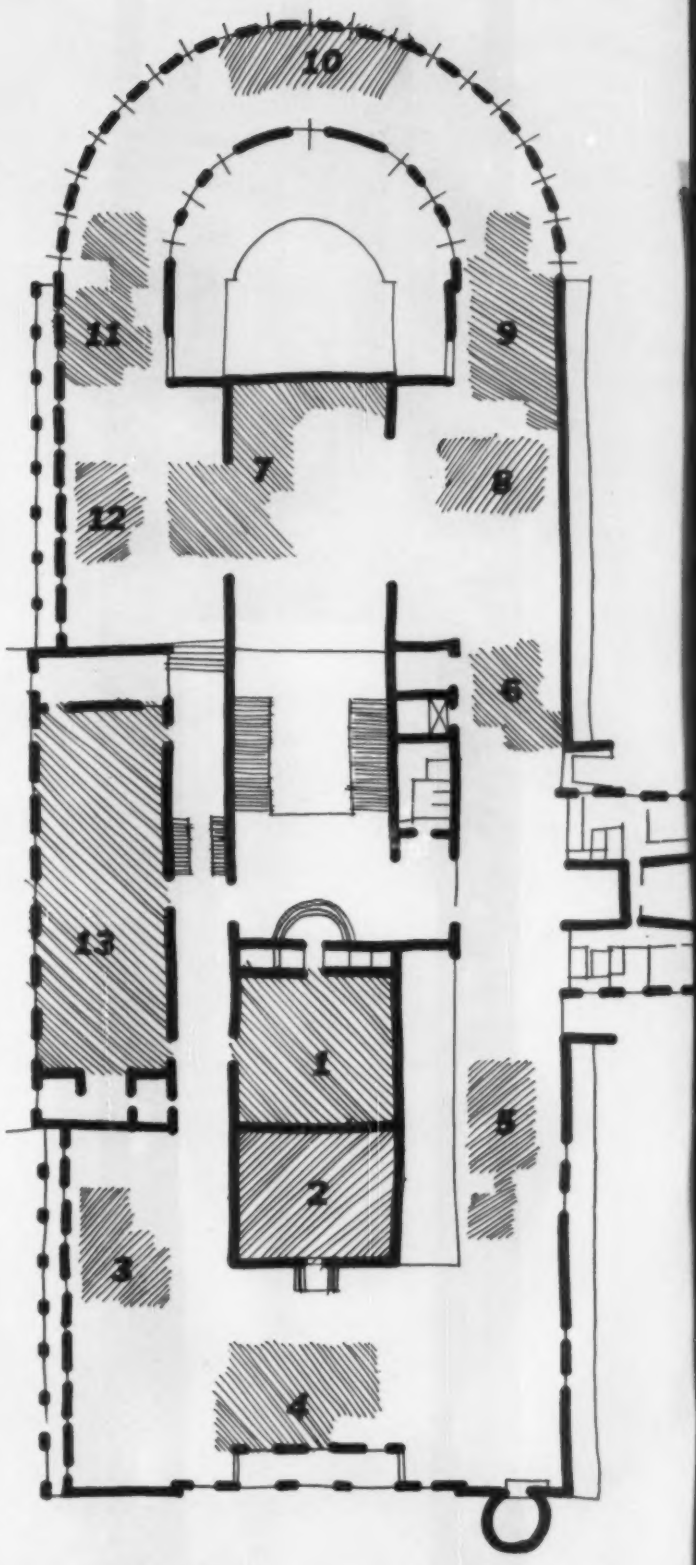
about the claim that its furnishings are those of an average-income American family.

The Triennale is a unique institution. Although the Italian government underwrites its 500 million lire triennial bill, more than a dozen nations also contribute with their own exhibits. And although it is ostensibly a cultural show (Milan's annual Samples Fair is its commercial counterpart), price lists may be found under most desks if not on the actual products. The whole venture is governed by a technical executive committee that includes sculptor Agenore Fabbri, artist Enzo Morelli, designer Roberto Sambonet, and architects Ignazio Gardella and Vico Magistretti; its administration is handled by energetic secretary Tomasso Ferraris. The committee is responsible for the continuity of the Triennale from edition to edition, and for such major decisions the new program policy which eliminates such former exhibition categories as industrial design and home furnishings, asking instead that each nation develop its exhibit around a home and school theme.

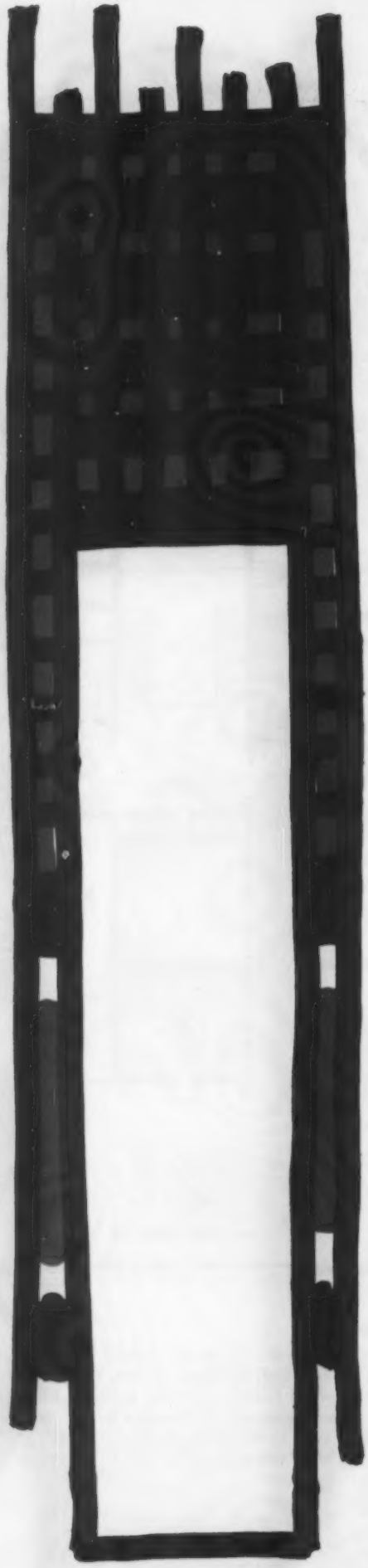
The objections to this controversial policy stem from the fact that nations have responded to it unequally, making comparisons misleading. Denmark and Sweden, for instance, ignore the school completely, offering instead a predictably exquisite collection of flatware, crystal, and fabrics. England, on the other hand, has built an actual, fully equipped school. Italy itself swallows the idea like a dose of medicine: the second floor of the Palazzo is filled with maps, charts, and graphs outlining the nation's school problem, and if there is no joy in this part of the show, neither are there many new insights into the problem (the two bright spots on this floor are the dramatic Venini exhibit, page 68, and the more subdued, but intelligent Frank Lloyd Wright memorial, page 67). The conclusions tacked on the end of Italy's school exhibit might have been copied from an educational primer—and perhaps they were.

The Triennale's critics argue that this policy puts the exhibition in the position of assuming a function that, by its nature, it cannot adequately fulfill. Solutions to educational problems lie first in the areas of sociology, economics, and government, only second in architecture and design. If the governing committee continues to select special areas for concentration—an excellent idea in itself—the subjects might more profitably relate to technology rather than sociology. The show's critics are also suggesting that if future Triennales have similar themes, officials should make clear in advance just how closely nations must adhere to them.

In one respect the 12th Triennale comes up to almost everyone's expectations—the installations are full of no-holds-barred experimentation. The Triennale has come to be considered a workshop in exhibit design as well as an exposition of products. Not surprisingly, some bold dreams don't come true entirely, but this opportunity to experiment—even to fail—is one of the Triennale's biggest contributions to architecture and



1) Introduction to the "Home and School" exhibition; 2) The problems of the school; 3) Country house; 4) Multiclass room; 5) First suburban house; 6) Second suburban house; 7) Example of a joint classroom; 8) Proposals for a residential quarter; 9) First town house; 10) Paolo Venini exhibit; 11) Second town house; 12) Third town house; 13) F. L. Wright Exhibit.



design. Among the successful experiments this time is Italian architect Franco Albini's exhibit of steel and glass (page 00), the show's lone salute to industrial design. Albini, who is also the subject of one of the eight one-man architectural exhibits on the main floor, arranges his objects with mathematical severity on black steel ramps which follow the incline of two parallel staircases. Fluorescent lighting, concealed in channels just above the displays, sparkles down on an international cross-section of steel and glass products selected by Albini and Jay Doblin. On the ceiling above the stairwell spreads a giant mural by Gianni Dova.

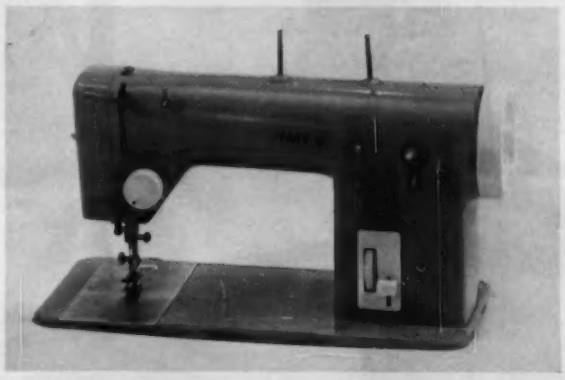
Roberto Menghi's shimmering setting for a retrospective exhibit on Paolo Venini (page 66) is completely different in spirit. By joining together transparent gray-pink glass rods, he creates crystal waterfalls under which the brightly colored Venini pieces are displayed on low, white, cloth-covered drums. And Egidio Bonfante's handsome memorial exhibit to Olivetti eschews trickery of any kind to concentrate on the deeds of the man himself. Among Italian designers, Adriano Olivetti has already achieved the status of patron saint. They feel that no other man in Europe—or, indeed, in the world—did so much to reintegrate commerce with design and art. Bonfante's installation uses stark, unsheathed fluorescent tubes to illuminate both the panels and the simple red brick wall.

The most prized design assignment of the Triennale is always the entrance foyer. This year the plum went to architect Ettore Sottsass, Jr. Reversing a long-standing trend (previous designers have made the entrance an imposing "shocker"), Sottsass has designed a space that is intimate in scale and intimately concerned with the function of the area (all drawings and photographs, this spread). The ceiling is dropped to 12 feet in the center, nine feet on the sides, and the giant windows are cut in half horizontally so that the lower ones, at knee height, open on the park, the upper ones on the sky. He has allowed a sensibly-scaled space for information and press sections, as well for a lounge where people can comfortably rest and talk. Sottsass, who is himself a painter, is particularly concerned with the relation between painting and architecture, and the foyer has works by nearly a dozen artists including Lucio Fontana, Piero D'Orazio, and sculptors Arnaldo and Gio Pomodoro. His own contributions include the large wall mural in tiles based on several of his paintings, the tile floor design, and the ceramic ashtrays. The Italian quality of the foyer is emphasized by traditional Italian materials—wood, ceramics, tile—and by the light, gay, humorous, almost naive way in which they are used. In one unusual technique used, for example, in mirror frame (sketch, left; far left of photograph, opposite page), he stains wood planks with analine dyes in bright yellow, orange, red, and green.

On the following pages is a closer look at the most important of the Triennale's exhibits.

Foyer

Germany, with Japan, is the only country at this Triennale to really emphasize mass-produced goods in its display. The Braun portable heater and Pfaff sewing machine (right) are typical of the many products shown. The Pfaff machine is brand new, and designed by Hans Gugelot of the Ulm Hochschule für Gestaltung; it supports Douglas Kelley's contention, in the March 1960 issue of ID, that there *are* national styles (particularly when compared with the Salmoiraghi machine that illustrates Kelley's article). Germany divided its space into three parts devoted to home, school, and child, and used photographs of recent play equipment at Ulm (left) along with actual toys, educational equipment and three kinds of school furniture to illustrate its school section (below). Spatial divisions between the three sections are supplied by a system of skeletal frames strung with fine black wires which support both shelves for products and panels for graphics; occasional panels are covered with rattan. The exhibit is by Berlin designers Karl Otto and Claus Peter Gross.



Germany


VIVRE
A L'ECOLE
COMME
A LA MAISON

Belgium's attractively arranged exhibit invites the visitor to climb around on a series of large cork-tiled platforms graduated up to four feet off the ground (left). The platforms help to isolate various products, nearly all of which concern the classroom. The panel dividers show room arrangements in rough sketch, photo-murals of children in school, and some truly uninhibited child-art. Belgium's examples of school furniture are among the most original at the Triennale; for instance (right), round, plastic-topped desks on bent plywood bases for very young children are sliced out on one side so that they may be arranged in a semi-circle around the teacher; designed by M. J. Wabbe. Exhibit by M. A. Constant.

Triennale

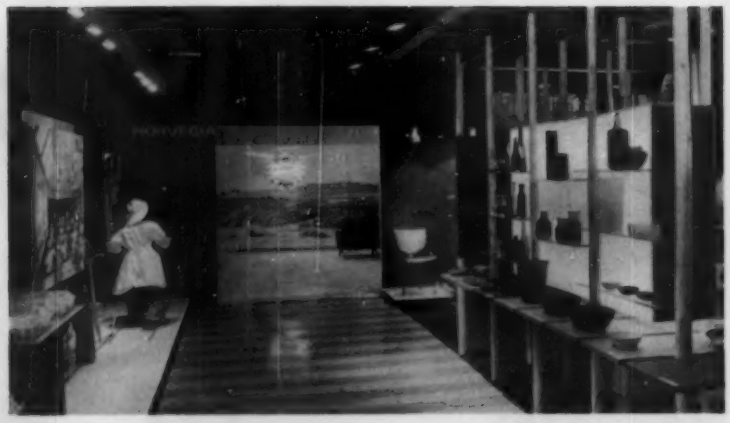
Mexico brought an entire rural school, but found no space allotted for it in the park and so ingeniously managed to put up most of it inside the Palazzo (below), creating one of the best-liked exhibits at the show. Especially designed for easy, inexpensive erection, equipped only with modest pine benches and desks, and decorated with portraits of national heroes, the school is completely unpretentious and winning. Exhibit by J. Salazar Portillo.

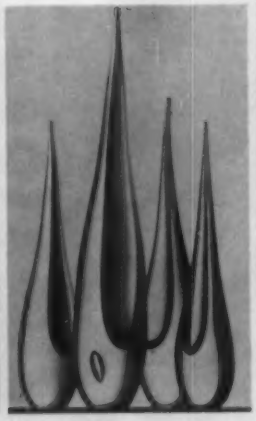
Mexico



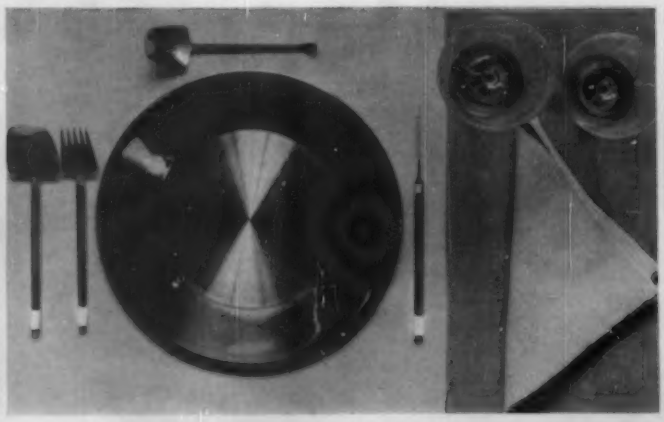
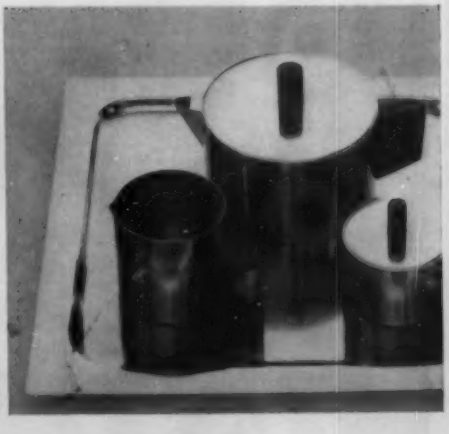


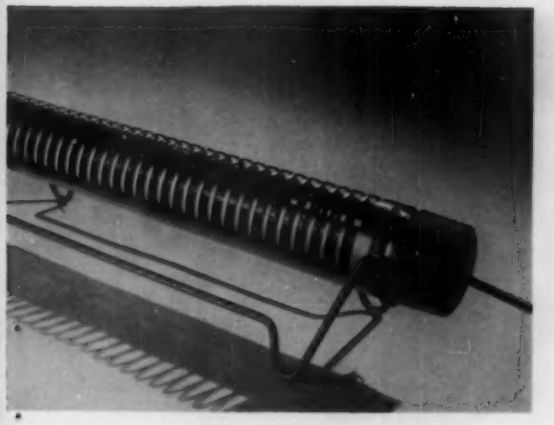








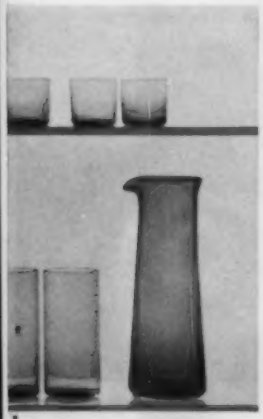





England concentrates most of its effort on its school in the park which, in terms of audience-reaction, is one of the most successful exhibits at this Triennale. Its space within the Palazzo also gives considerable emphasis to Britain's handling of the school problem, but there are, in addition, some straightforward product displays. The woven cane-plastic chair, meat grinder, and tubular electric heater shown here are school projects by F. Watkins, Geoffrey Baxter, and Christopher Pugh respectively, in the Royal College of Art's exhibit; the two-tone telephone for Siemans Edison Swan Ltd. is designed by Allen Bowden Ltd.

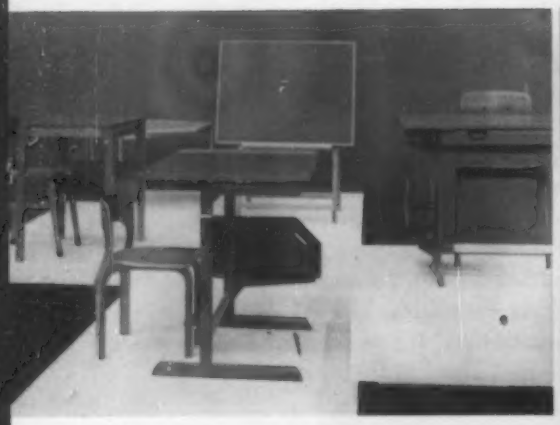
Poland's exhibit is remarkable only for its chairs, but they are just about the most original seating at the Triennale. The two shown here (far left) are by Wladyslaw Wolkowski.

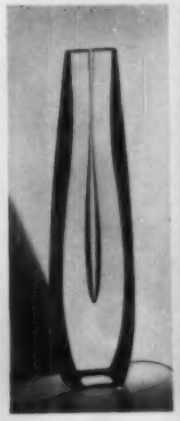
Norway uses rough-hewn birch poles for uprights in its display system (center) and the effect is rather like strolling through a cleared forest. The rear wall is hung with fabric samples in muted greens, purples, and tans. Odd Brochmann designed the exhibit. Norwegian products on display include sterling silver tea kettle designed by T. Lie-Jorgensen; ceramic vases by E. Ploen-Ljan.

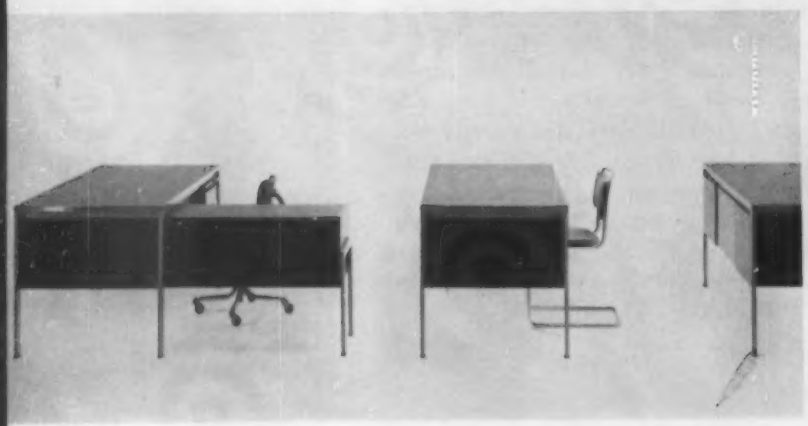


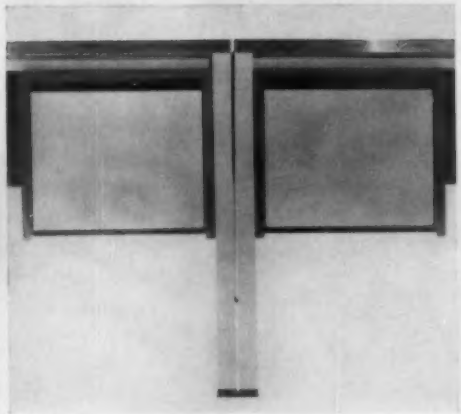
Sweden drapes bolts and bolts of its textiles into a tent (far left) that looks like the huge reel of a loom —probably the most sumptuous exhibit in the Palazzo. Hans Asplund designed it. Swedish rugs are on a low platform down the center of the space; ceramics and glass are on long white counters at the sides. Among the individual entries (left to right): Vicke Lindstand's crystal "Drops," K. E. Ekselius' oak and black leather chairs for J. O. Carlsson, Sven Palmquist's tumblers and pitchers for Orrefors, and Kjell Blomberg's smoke-green glass vases and plate for Gullaskrufs Glasbruks AB.

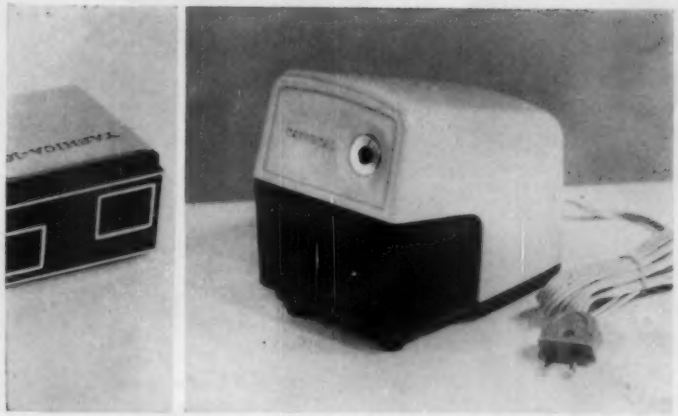
Austria shows products whose forms range from Bauhaus to Art Nouveau, the latter represented by Fritz Lischka's porcelain coffee service with attenuated spouts and handles (far left), the former by Franz Hagenauer's stainless steel tea service with indented wood-block handles (center). Between them, a place setting using Professor Norbert Schlesinger's enamel-rimmed steel plate and enamel-embossed cutlery. The angular chair (directly left) is aluminum with taut black leather upholstery and a white fur cushion; also by Professor Schlesinger.



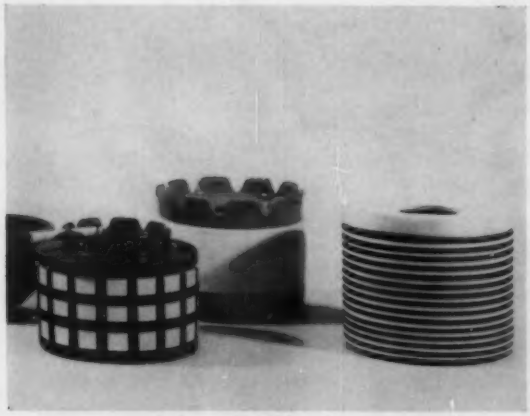






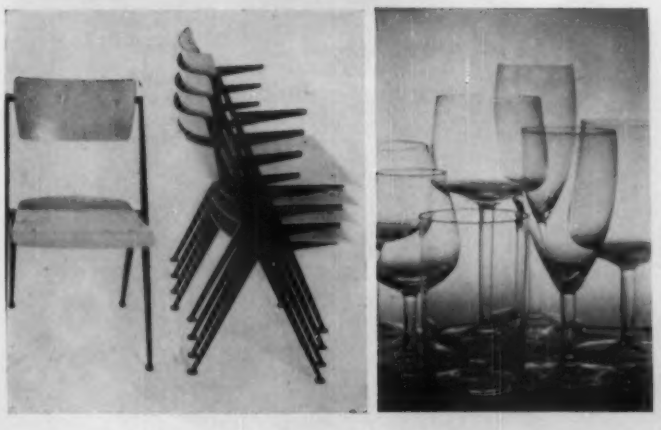


Japan shows a number of pieces of molded plywood furniture—chairs, tables, storage units, and the bed (far left) designed by Daisaku Choh; its virtues include economy of construction (the three head and footboard sections are curved in the same mold) and facility of transportation (it disassembles completely). Other products in the Japanese space are (left to right) a Nippon Gakki motor scooter with calligraphic lines, Yashika's neat Y-16 camera, and an electric pencil sharpener obviously designed for export (the logo reads "National") from Matsushita Electric Trading Company. All three are by the respective companies' design staffs.

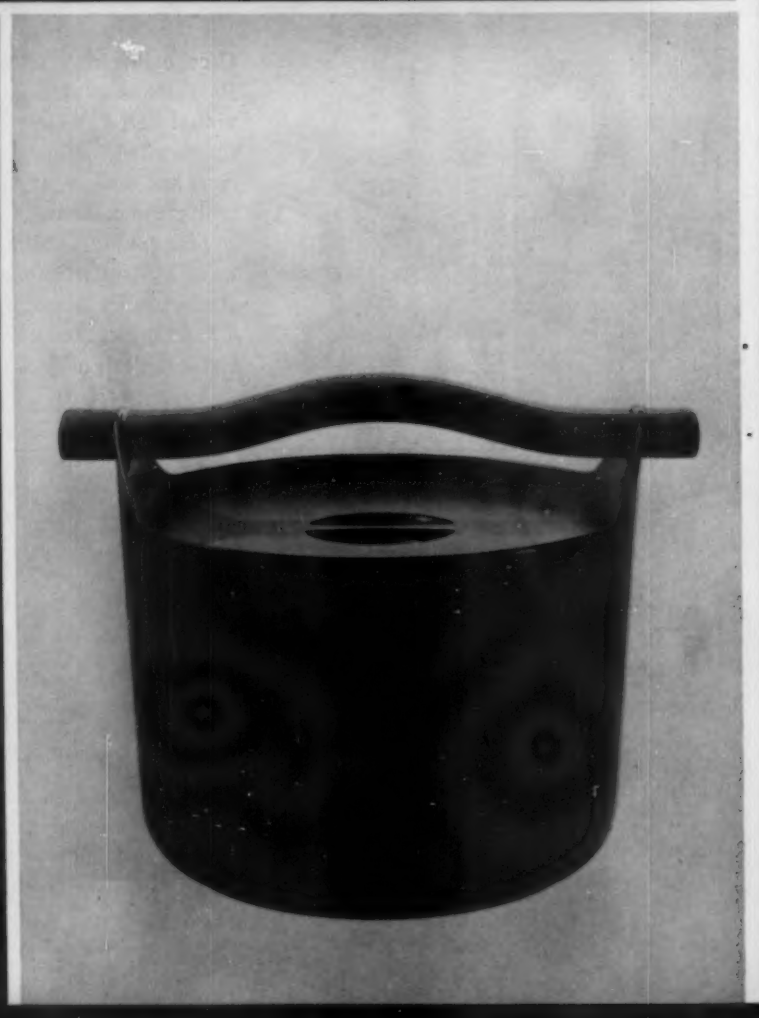


Italy, naturally paying attention to the Triennale theme, shows numerous versions of school furniture but its quality is uneven. Some desks in particular (far left) seem cluttered with angles and outcroppings, caused partly by the book storage arrangement. But even Italy occasionally digresses from the sociological theme to include decorative objects such as designer Flavio Poli's dimple-bottomed glassware (center) and Ettore Sottsass' ceramic serving pieces and ashtrays (right).

Czechoslovakia's checkerboard exhibit (far left) for its famous glassware and china includes such individual items as (left to right) Eva Havelkova-Linhartova's silver coffee service with palisander handles on cups and spoons, and red-enamelled lining in the sugar bowl; Pavel Hlava's crystal and blue glass vase for Borske Sklo; Vladimir Fleissig's stainless steel flatware with plastic-backed handles for Mikov; crystal stemware by Alena Kudrova for Spojene Sklarny, and a black-patterned stoneware vase by Alena Kroupova. Exhibit design by Ivan Sova.



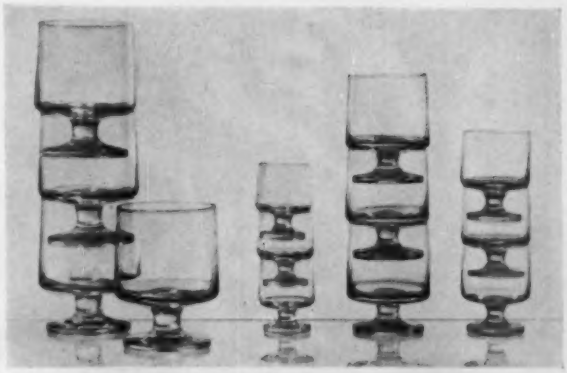
Holland has made a point of selecting products for exhibits that particularly mirror the character of its people — their tastes and standards — as well as the best efforts of its industries. Consequently some of the items it shows are, in a sense, contemporary folk art and their designers are anonymous. From the known-designer items in the Dutch show are Coen de Vries' steel office furniture for Lips (far left and in adjoining detail), wood and steel stacking chairs for auditorium seating by Wim Rietveld for Ahrend-Cirkel, and Royal Leerdam glassware by A. D. Copier.



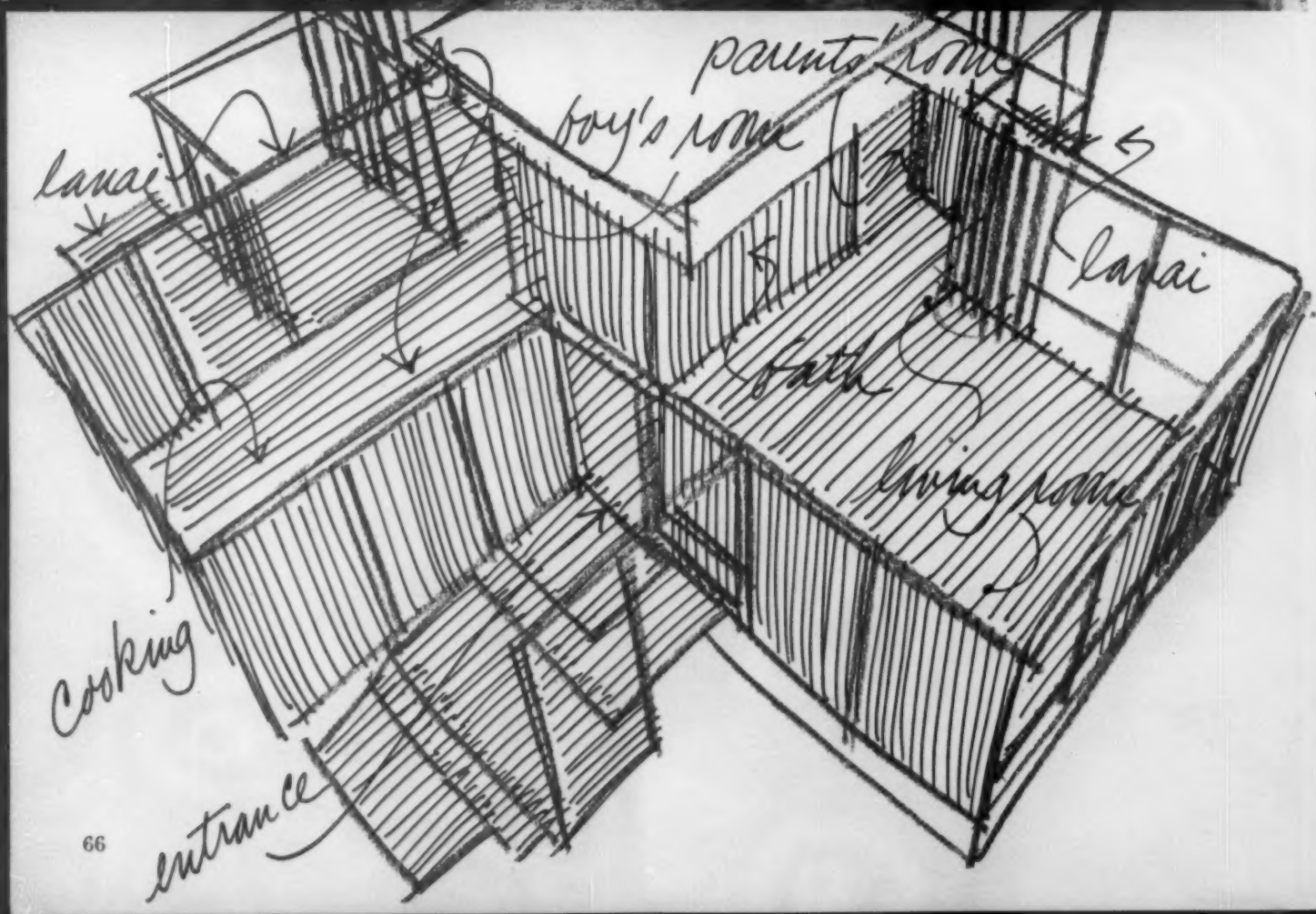
Triennale

Finland suspends its lighting and textile displays from the ceiling (left)—the textiles back-to-back on recessed-frame panels, the lighting fixtures in clusters of related forms. In one cluster (below, left) the diamond-shaped bulbs are the decorative element. Unlike many countries, Finland wisely avoids cluttering its space with too many objects. The judiciously selected flatware, crystal and ceramics which do appear are displayed on several two-level tables—granite slab below, plate glass above. One of the best single products is Timo Sarpaneva's enameled cast iron pot with wooden yoke handle (below, left) which may be detached when the pot is being heated. A few new chairs are dispersed at random in the space, but the only concession to the school theme is a puzzlingly luxurious student's desk and chair. Exhibit design by A. Nurmesniemi.

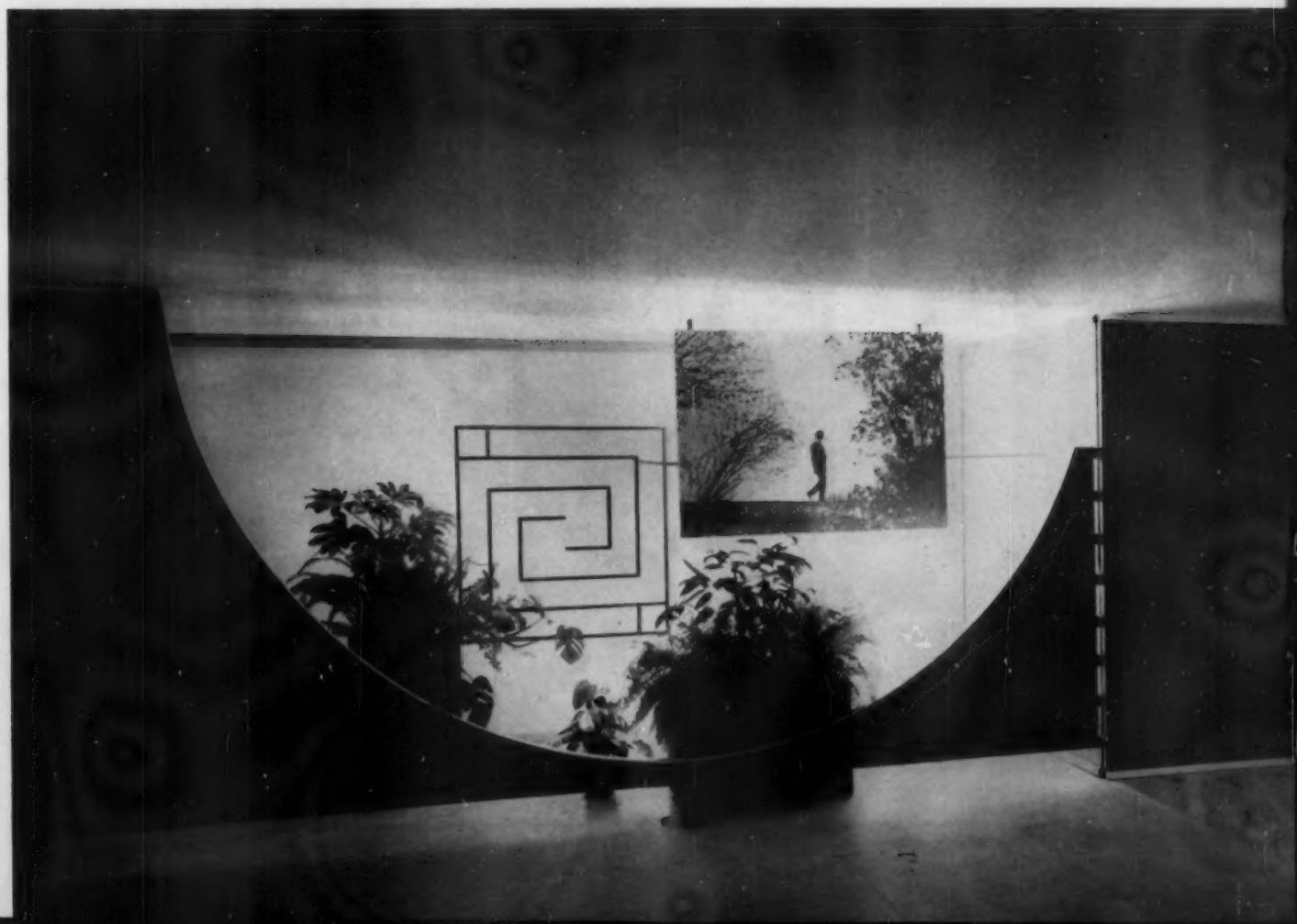
Denmark



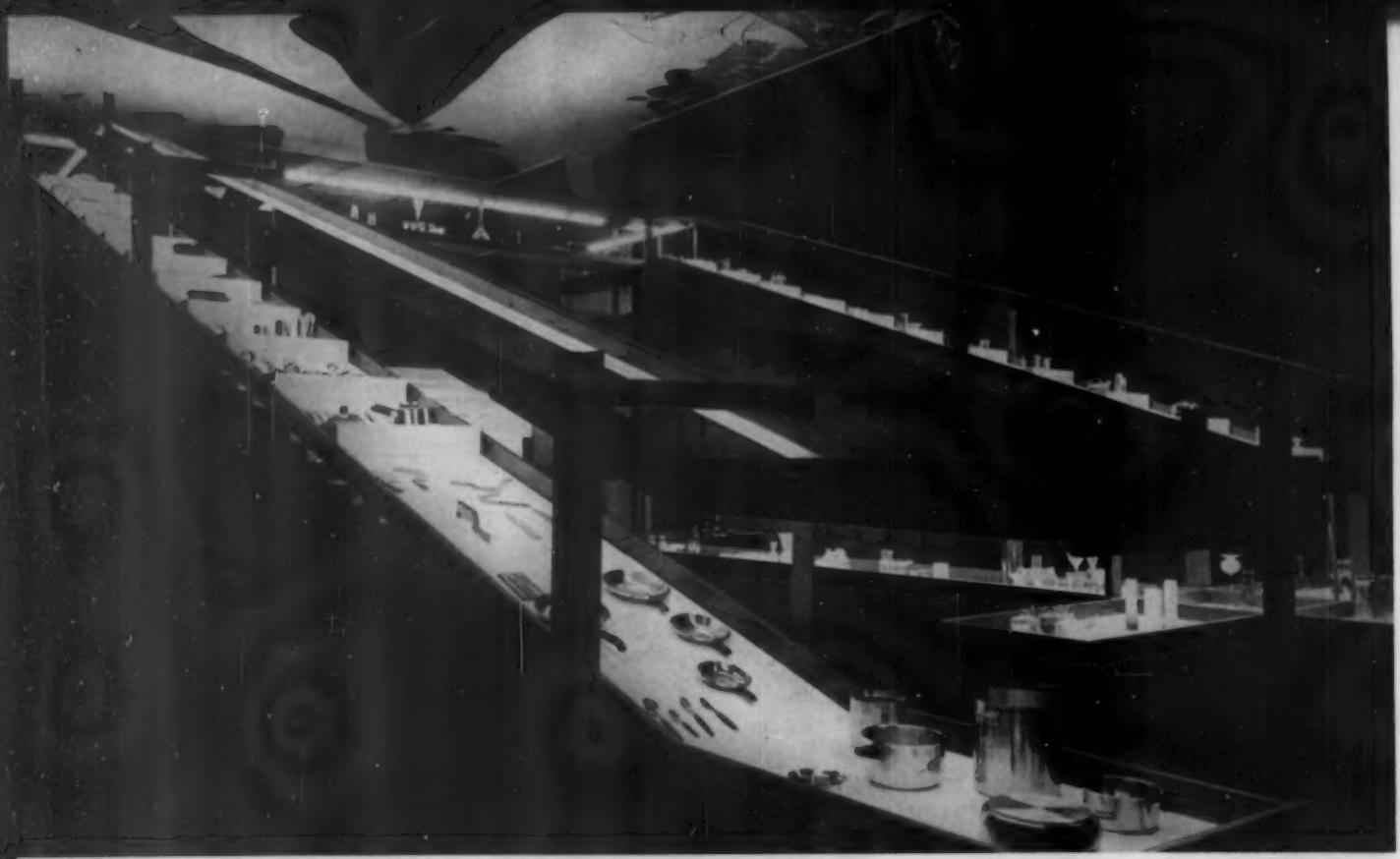
Denmark, like Finland, is very selective in what it shows, and displays it with subtlety on sandalwood tables and platforms, reserving the surprise for the ceiling. White paper pyramids cover light bulbs, and both the quality of the light and the lowered ceiling create a pleasant intimacy. The glassware is in a row of wooden cubicles along one wall and suffers from inadequate illumination; among their contents are Grete Meyer's and Ibi Trier's stacking crystal stemware (right). Exhibit design by Poul Kjaerholm.


parents' room
boy's room
lanai
lanai
bath
living room
cooking
entrance

United States: The two shows representing the United States at the Triennale are the Frank Lloyd Wright memorial and the Alcoa-sponsored Casa Americana. The Wright memorial (below), planned and executed by Paul Grotz (official U. S. Commissioner to the Triennale) and Walter McQuade for the United States Information Agency, concentrates mainly on the architect's work of the past ten years. The installation is by Carlo Scarpa. This loving, thoughtful exhibit suffers from being almost entirely photographic in the midst of other displays predominantly of actual objects. The white and orange Casa (left and right) is designed by John Matthias, coordinated by Samuel Fahnestock, and furnished under the direction of Walter Dorwin Teague. Based on Matthias's "Viewbox" for the Forecast program, it is built of aluminum structural members and Alply panels on a cruciform plan that contains less than 1,000 square feet of floor space into which are compactly fitted kitchen-dining, living and two bedrooms around a central core for storage and bath. Participating U. S. firms include Arcadia Metal Products, Armstrong Cork, General Electric, Knoll, Herman Miller, Jens Risom, Directional Furniture, American Seating, Lightolier, Heifetz, Gotham Lighting, James Lees, V'Soske, American Telephone & Telegraph, Rowen, Inc., Royal McBee, American Radiator & Standard Sanitary Corp., and Wearever Aluminum.

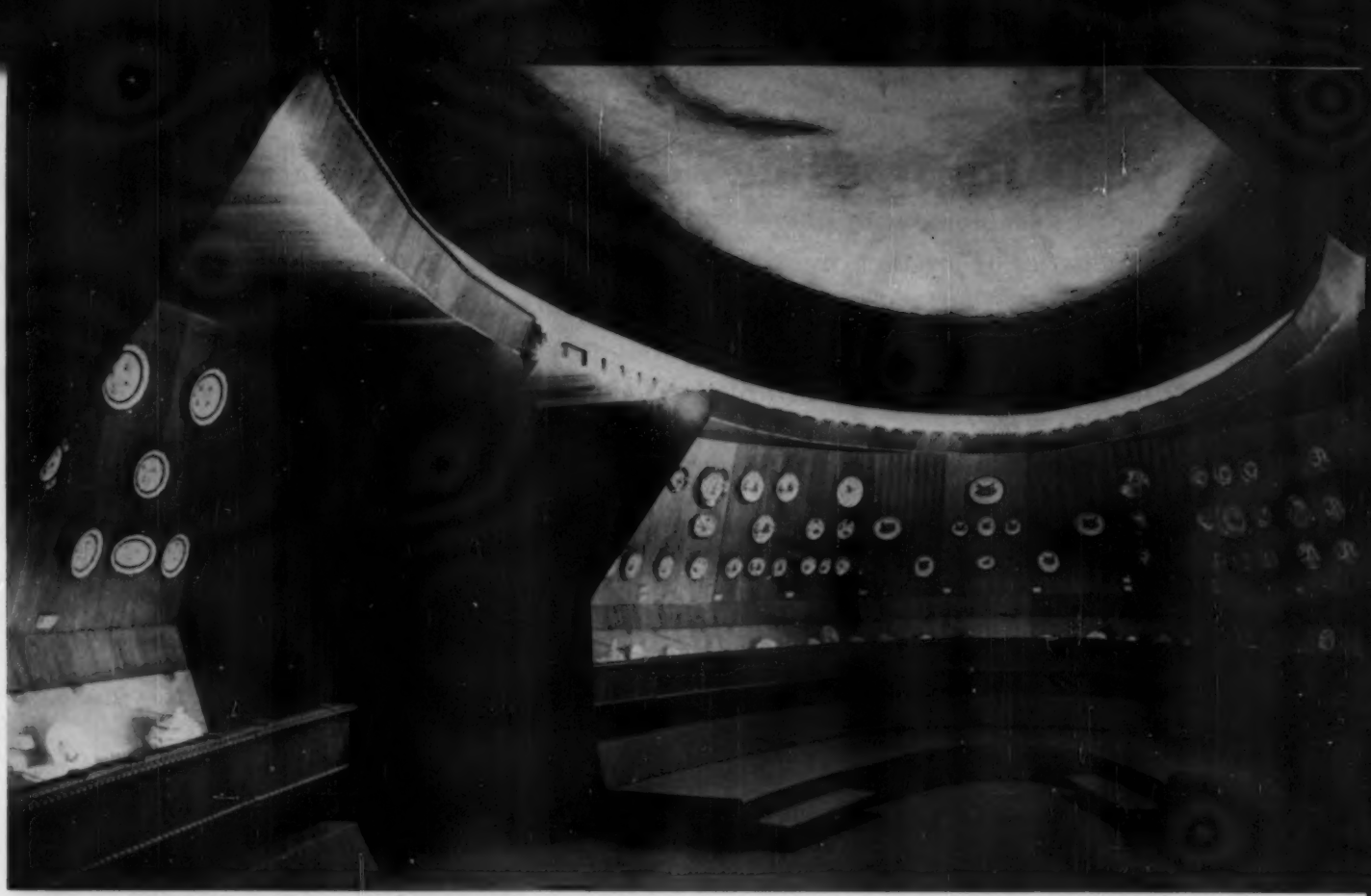


Wright exhibit



Stairwell is setting for exhibit of steel and glass products from every participating country. Designer: Franco Albini.

Backdrop for exhibit of Venini glass is curtain of glass tubes suspended from metal yokes. Designer: Roberto Menghi.

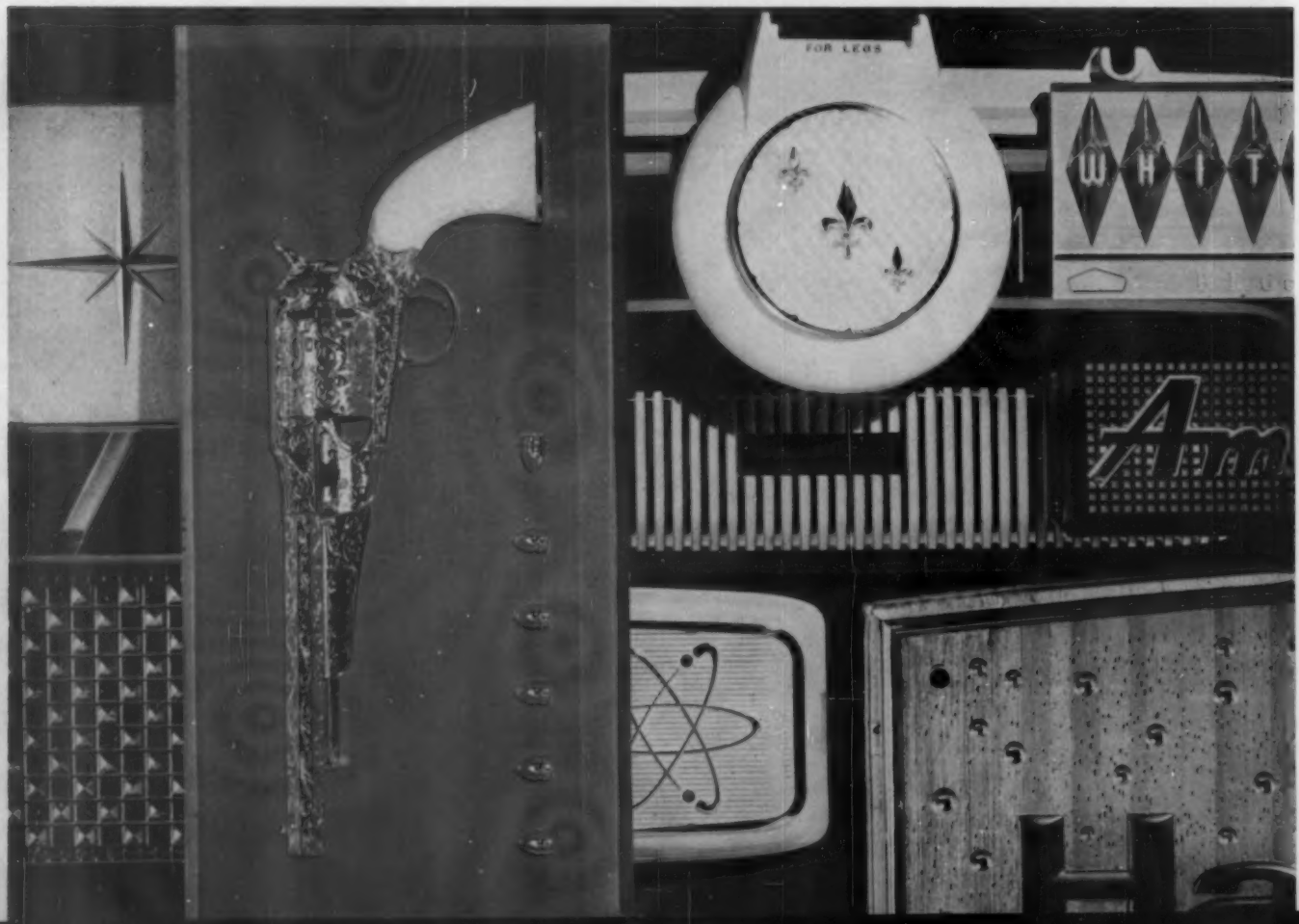


Retrospective exhibit of tableware in Hall of Honor (also used for meetings). Designers: Enrico Peressutti and Ernesto Rogers.

Periscope lighting fixtures illuminate exhibit of art used in architecture. Designers: Vittoriano Vigano with Aldo Colombo.

The year in plastics *has seen astonishing, although expected, progress in the development of new materials and processes, and especially in the invasion by plastics of product areas ordinarily preempted by other materials. New applications open up entirely new areas for design in plastics: a hardware lock mechanism made of Zytel nylon, brass plumbing fixtures replaced by Delrin, a tougher-than-metal Fiberglas-reinforced rifle barrel, a line of injection-molded high-density polyethylene luggage, polyester-faced concrete building blocks, house walls made of wood-faced styrene foam cores, an automotive transmission clutch cone of reinforced phenolic, and a host of other products reveal how much the continuing boom in plastics is a boon to designers.*

The most exciting new developments in plastic materials—polypropylene and Delrin—are already familiar to designers and in fact are now getting into full-scale commercial production; so they are not included in the round-up of new materials on pages 82-87. But one of the oldest plastics forming techniques—blow-molding—has been rejuvenated by the elixir of high-density polyethylene and other recent materials. What this process holds out for designers is discussed by one on pages 78-81. ID's survey of plastics at mid-year begins on the following page with an expert's study-in-detail of various techniques by which designers can best make use of what is both old and new in acrylic plastics.



Decorative uses of acrylics

BY A. M. BLUMENFELD

Acrylic molded parts have come a long way in the last 15 years, and it may now be helpful to draw together in one place a primer of know-how on Decorative Techniques — for the designer who would like to have a ready reference to guide him. In order to limit the scope of this article, I shall: (1) consider decoration to cover only control of color and texture, whether it is inherent in or applied to the plastic part; (2) treat only production molded parts, which offer the widest ranges of effect, although the same principles generally apply to parts or signs formed from cast sheet and rod material; and (3) omit special lighting of parts as a parameter of decoration (since I have already fully treated the subject in a previously published paper).*

The techniques covered will range from the simple tinting of a transparent part (a hairbrush, for example) through painting, to force-fitting a stamped metal bezel over a molded lens (auto tail-light). Dramatic qualities can run the gamut from quiet good taste (prestige merchandise) to vigorous salesmanship (point-of-purchase command in visually busy environments), depending upon the function of the item and the taste and judgment of the designer. The variables are (1) color, (2) texture, (3) finishes and coatings, (4) applied decorative materials, and (5) second-surface relief (3-D effects) in transparent parts.

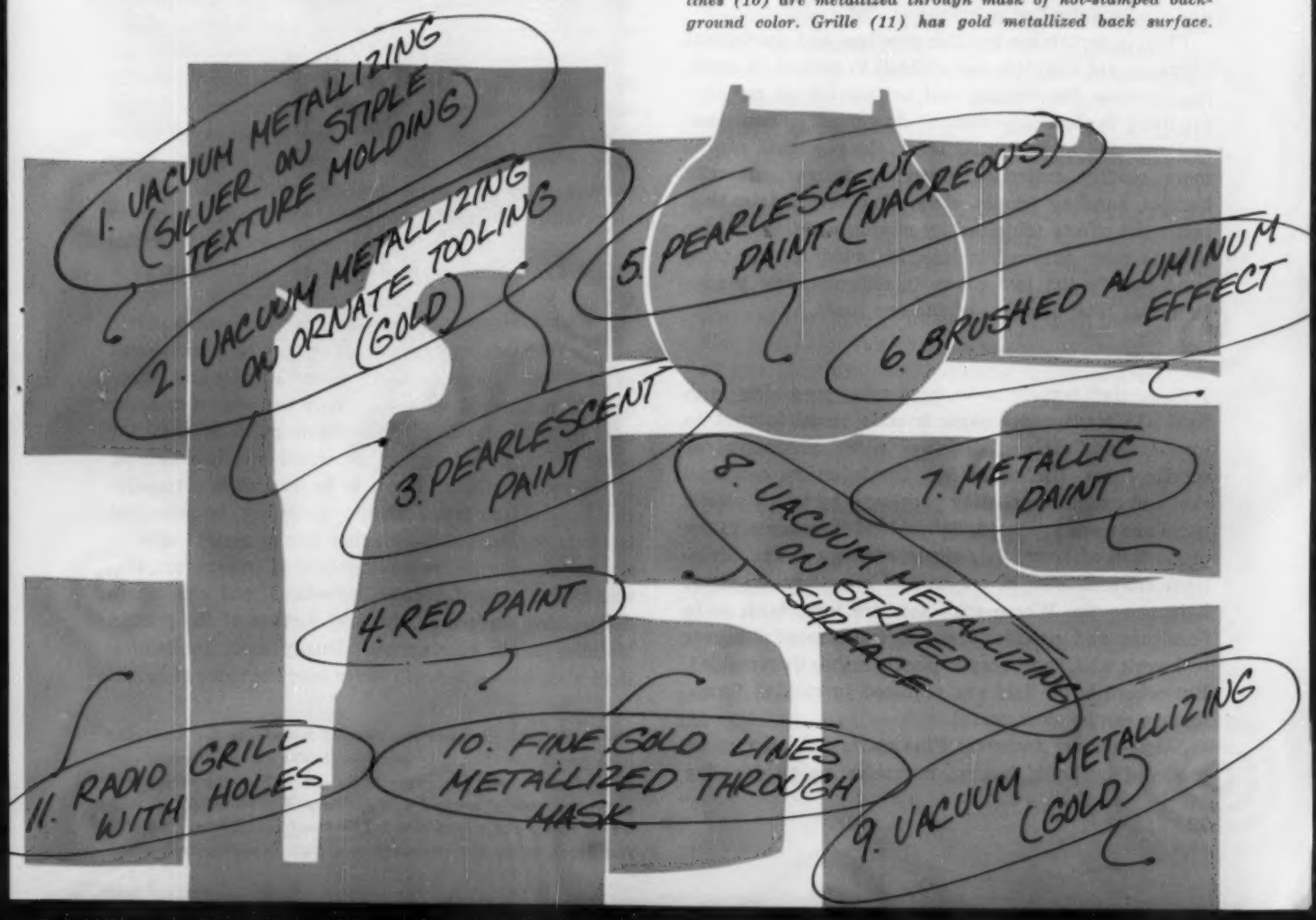
*"Designing With Transparent Plastics," SPE Journal, February, 1956. (See also author's article, "Parts That Glow," Machine Design, October 29, 1959.)

Color

Acrylic molding powders are available to produce parts which may be: (1) transparent (clear or tinted to almost any hue and density of color), permitting easy discrimination of rear decoration; (2) translucent (in white or color and any degree of translucency from faint haziness to near opacity) for visual obscurity with light diffusion; and (3) opaque. Thickness increases optical density in tinted transparent parts. By varying thickness, wedge and tonal effects are possible (as in gradient filters or traffic lenses). With translucent acrylics the spacing between the lamps as well as the distance from the translucent panel determine light uniformity.

Colored acrylic plastics are manufactured from a wide variety of dyes and pigments from all over the world, and the range of hues available is enormous.

Assortment *of acrylic parts, opposite, shows variety of decorative effects made possible by the different techniques of fabrication. Note dead flatness of red paint on pistol ornament (4). Sheen on razor (5) results from pearlescent paint on quilted surface. Brushed aluminum effect (6) is produced by vacuum metallizing on textured molded part. The "Am" (7) is metallized gold lettering with hot-stamped white outlines. Fine gold lines (10) are metallized through mask of hot-stamped background color. Grille (11) has gold metallized back surface.*



But a truly complete spectrum with outstanding permanence does not yet exist. For critical applications, therefore, the choice should be reviewed with the manufacturer. A selector kit offered to designers by Rohm & Haas permits the "construction" of many special transparent color blends as well as some degrees of translucency.

Five values of each of five transparent colors (red, yellow, green, blue and neutral gray) are included in the kit, along with four steps of white translucency, and a vacuum metallized clear mirror chip. One example of the way the kit can serve the designer is by allowing him to create a bright metallic gold by backing amber (created from chips of pink and pale yellow) with the metallized (mirror) chip as a second surface. An amber molding powder can then be ordered to this specification.

There are a number of tested and proved colors which are highly resistant to fading in sunlight and are non-yellowing on long-term close exposure to artificial light sources. The superiority of the acrylics over various other plastics in non-yellowing often shows up in as short a time as three months; and after five to ten years the difference is dramatic. No other plastic has come close to the acrylics in resistance to prolonged sunlight and weather (witness the signs on any highway or commercial block). When fashion trend colors are required for items not intended to be permanently exposed outdoors nor constantly close to lamp bulbs (parts for shavers, pens, compacts, dresser sets, etc.), a virtually unlimited palette is available.

Plastics containing metallic powders and pearlescent pigments are available but difficult to control in molding, because distribution and orientation of particles are likely to show objectionable flow lines. In cast sheet and rod, and in laminated form, the pigments can be more readily controlled (eyeglass frames, umbrella handles, handbag frames, etc.). However, tortoise-shell and swirl effects (obtained by mixing molding powder pellets) come out well in injection molding. One trick is to specify the two colors in different flow grades to inhibit total blending of the two tones.

Textures

I think that texture is to form what seasoning is to food. On transparent parts it adds visual interest to monotonous flats and disguises either production or service flaws. Unlike casting, the injection, compression and extrusion molding processes, by which plastic parts are mass produced, do not lend themselves to the production of large, flat, glossy surfaces where deviations from flatness of one-half of one wave length of light show up. Where such flats are important, as in furniture and architecture, the experienced designer will work with sheet acrylic plastic rather than molded. But where large flats are required in molded forms, texture can be most useful.

Single-surface textures: Fine matte finishes may be produced by liquid honing, microblasting or stippling the mold. They are useful on parts subject to high brightness and reflection (data panel covers) and are used on the fresnel rings of auto lenses to disperse lamp filament images.

Decorative textures range from *methodical* engine-turned effects—ribs, flutes, reeds, cross-hatching, knorling and all-over dot patterns—to *random* effects of irregular machining and scattered elements of various sizes and shapes. Textures transferred from both man-made and natural materials may be reproduced either mechanically or by electroforming (see Rohm & Haas bulletin on "Formolding" for experimental methods). Examples are moiré, linen, lace, netting, wood grains, wire mesh, fish scales, chain mail, etc. By using delicate textures on the second (rear) surface of transparent acrylics they remain safe from abrasion and dirt.

Two-surface textures: Texture on the first (front) surface breaks up reflection; texture on the second surface creates sparkle and remains clean. By using different textures on both surfaces, exciting results can often be achieved. The texture selected for the front surface should be in low relief and rounded. Deep crisp textures should be relegated to the back for both tactile effect and sparkle. Metallizing heightens the second surface effect. Mirrorlike internal reflective patterns may be controlled.

Finishes and coatings

The types of finishes and coatings which have proved successful on acrylic plastics are many and dramatic, but must be wisely specified. Often a desired effect can be achieved by either of two production methods—at widely differing costs. In some cases a minor change in the design would markedly reduce tooling and production trouble. In other instances, only mediocre results can be achieved, and the design should be abandoned. Therefore designers will find it wise to consult with molders and/or suppliers' field groups before developing the final specification for decorative finishes and coatings.

Varieties of finishes and coatings: Pigmented paints may be transparent, translucent or opaque. Transparent paint is usually applied to the second surface and subsequently metallized with aluminum to create a metallic gold or colored effect. Translucent paint is used for parts to be second-surface decorated and backlighted. If the second surface is not to be decorated, a translucent plastic material should probably be specified instead. Opaque paint—whether flat or glossy—always appears flat on the second surface of transparent material. The gloss (specular reflection) will ride above the painted surface on the first surface of the plastic. Metallic paints may appear visually more interesting than plain colors, but will never take the place of bright

The dial, ***right, demonstrates several techniques for designing with acrylic plastics. The graphics in the center recessed disc are raised lettering hot-stamped on white. The numbering and gradation marks around the dial are depressed, filled with white paint, and wiped clean. The front surfaces are painted flat black, while the enclosure is a high impact plastic bezel.***

metallics. Pearlescent pigments add sheen and are good secondary colors. *Brightness and sparkle on the second surface are achieved only with vacuum-metallized or hot-stamped-foil detail. This bright metallic effect—in either restrained or liberal use—is basic to decorated acrylic nameplates and medallions.* The rule should be: (1) use a little or a lot of bright metallic accent or area; (2) support this with a little or a lot of metallic or nacreous paint, particularly in textured areas; (3) finish off with plain color, depending upon desired esthetic effect. Step 1 is always necessary; steps 2 and/or 3 are optional.

Paint application methods: The designer who knows what the decorator-molder must do will know how to specify—to get the most out of the part and the production dollar.

Spray-mask: Molded plastic parts are shielded for painting with close-fitting metal masks—made either by electroforming copper on an actual part and cutting away the spray areas later, or by casting low-melting alloys into an actual part. A separate mask is required for each color. Two colors should not meet on a flat surface. Instead, provide steps, ridges or valleys to locate masks and separate the colors. Specify sprays of translucent paint only on simple surfaces (without ridges which deflect the spray, or recesses which invite puddles). The use of plug masks in recessed letters or other detail permits the sprayed background of paint to serve as a mask after the plugs are removed.

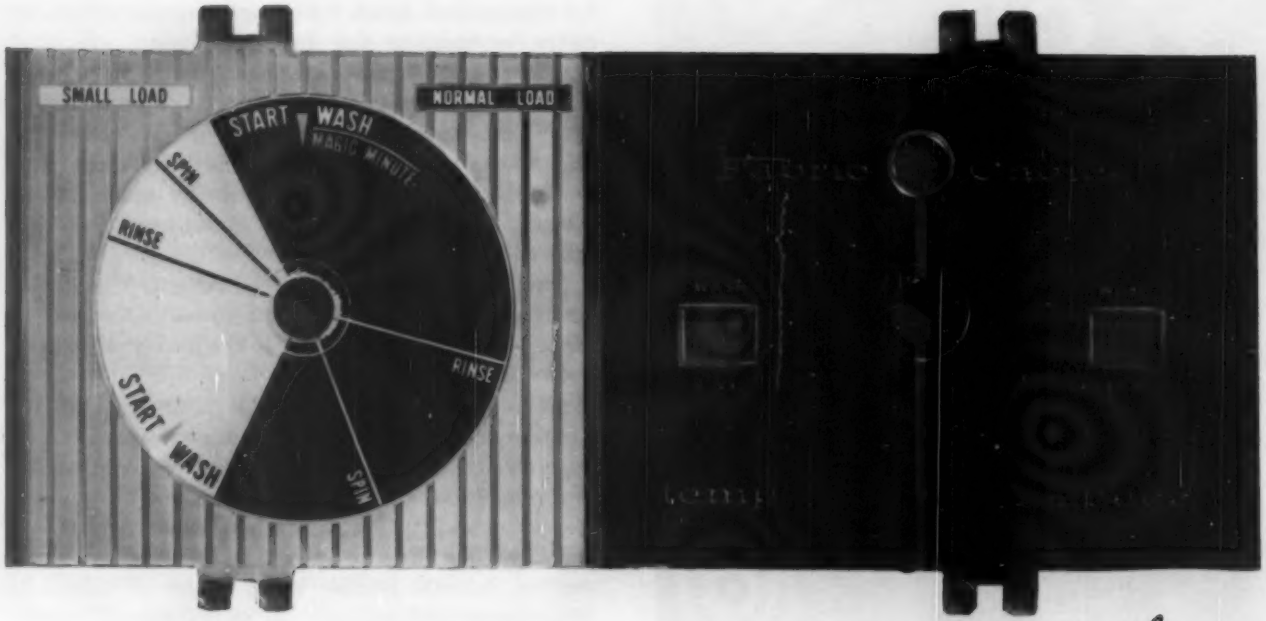
Spray-and-wipe: Spray-and-wipe is used for painting recessed decoration, as in edge-lit dials. Overspray is removed either by hand-wiping or gentle wheel-buffing.

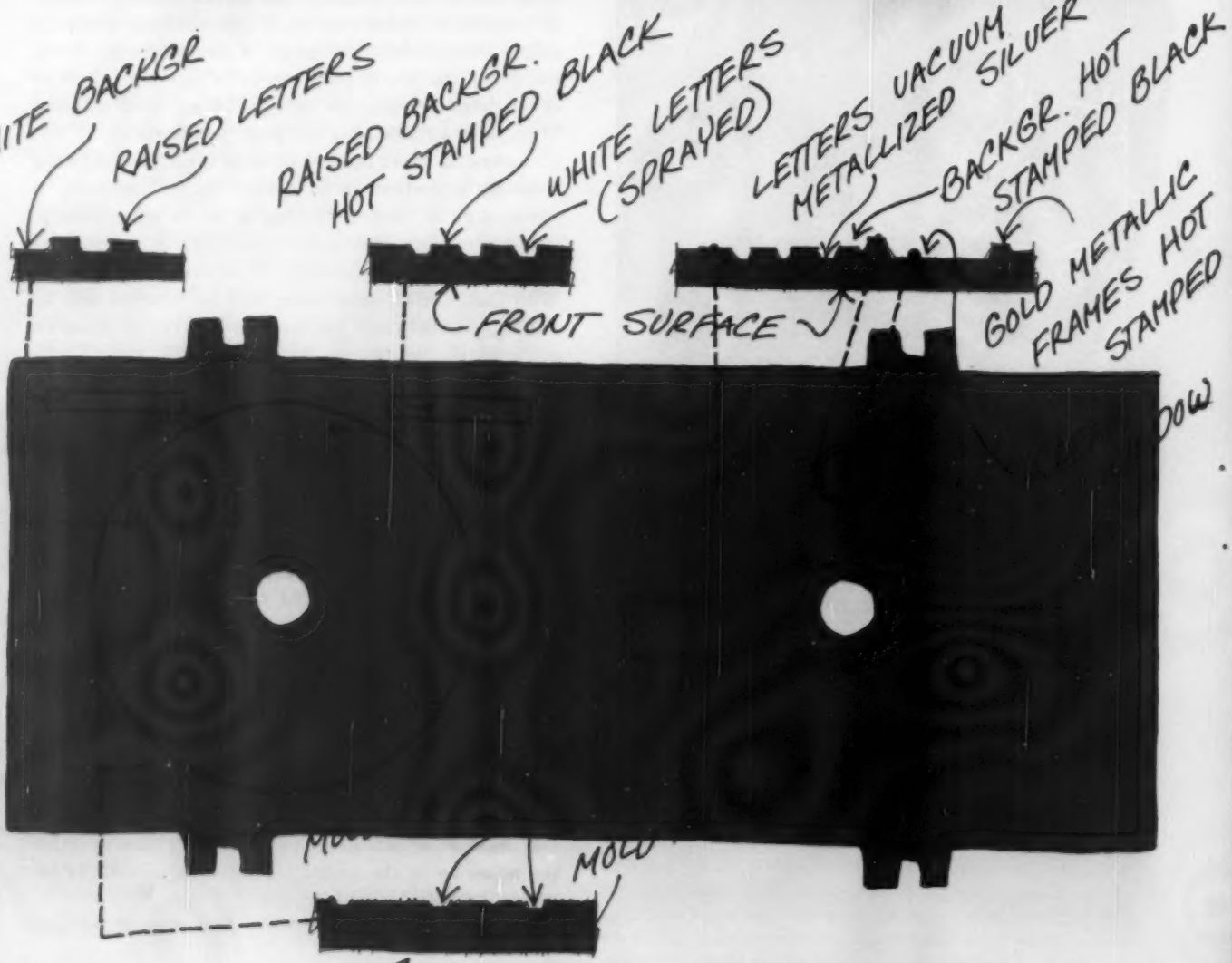
Silk-screening and roller painting: Silk-screening permits intricate decoration of smooth flat surfaces. With care, two or more colors may be screened side by side in one operation. Light-colored markings screened on smooth transparent dials edge-light well. Large areas of translucent paint for backlighting may be laid down evenly and economically by screening. Roller painting is employed for coloring coarse raised decoration and the edges of lighted dials.

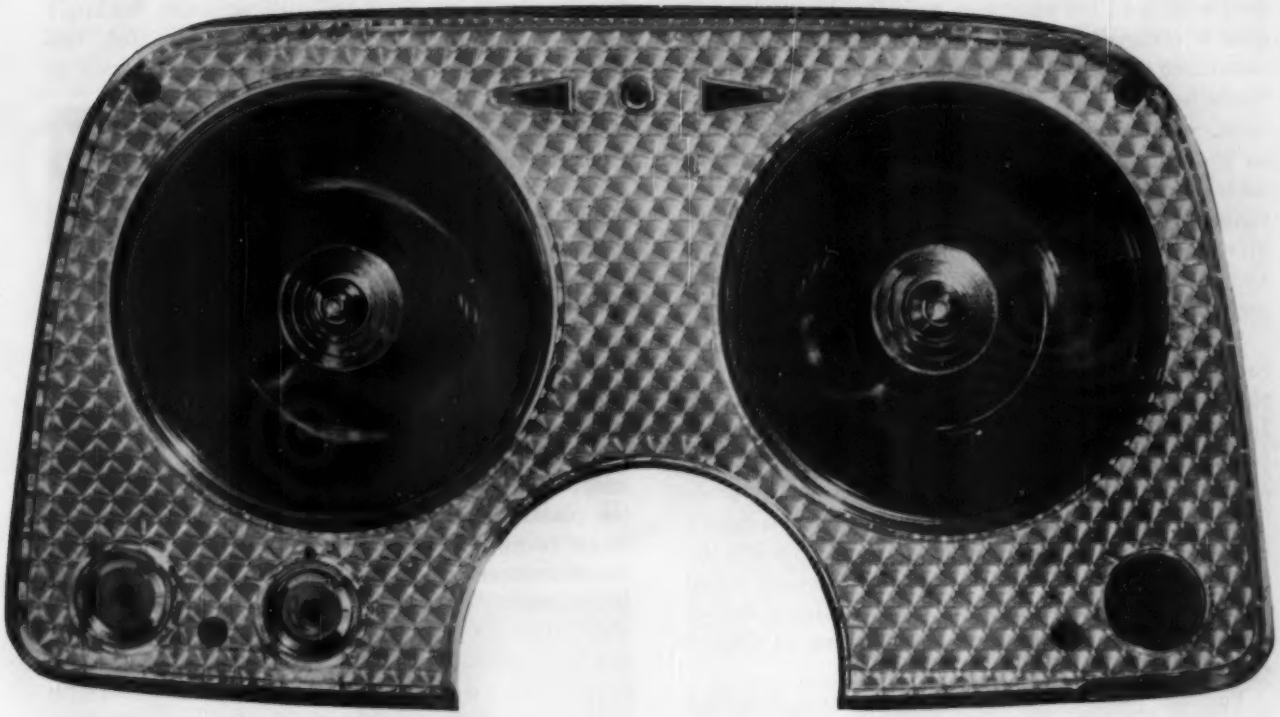
Hot stamping: Also known as "foil stamping" and "roll leaf printing," hot stamping is one of the most useful and economical means for decorating plastics—and it has yet to be fully exploited. *Wise use of this technique permits simplified tooling, easier molding, and more economical decorating (often supplementing costlier spray-masking and vacuum-metallizing).*

Colored or metallic foil is transferred from a tape carrier by heat and pressure from type or a flat belt. The transfer may be gold leaf, aluminum, transparent tinted lacquers or opaque paints—and it is usually laminated between a heat-sensitive adhesive and a protective transparent coating for wear resistance. Gold and anodized effects are accomplished by tinting either the adhesive or the protective layer, whichever is between the transfer and the eye.

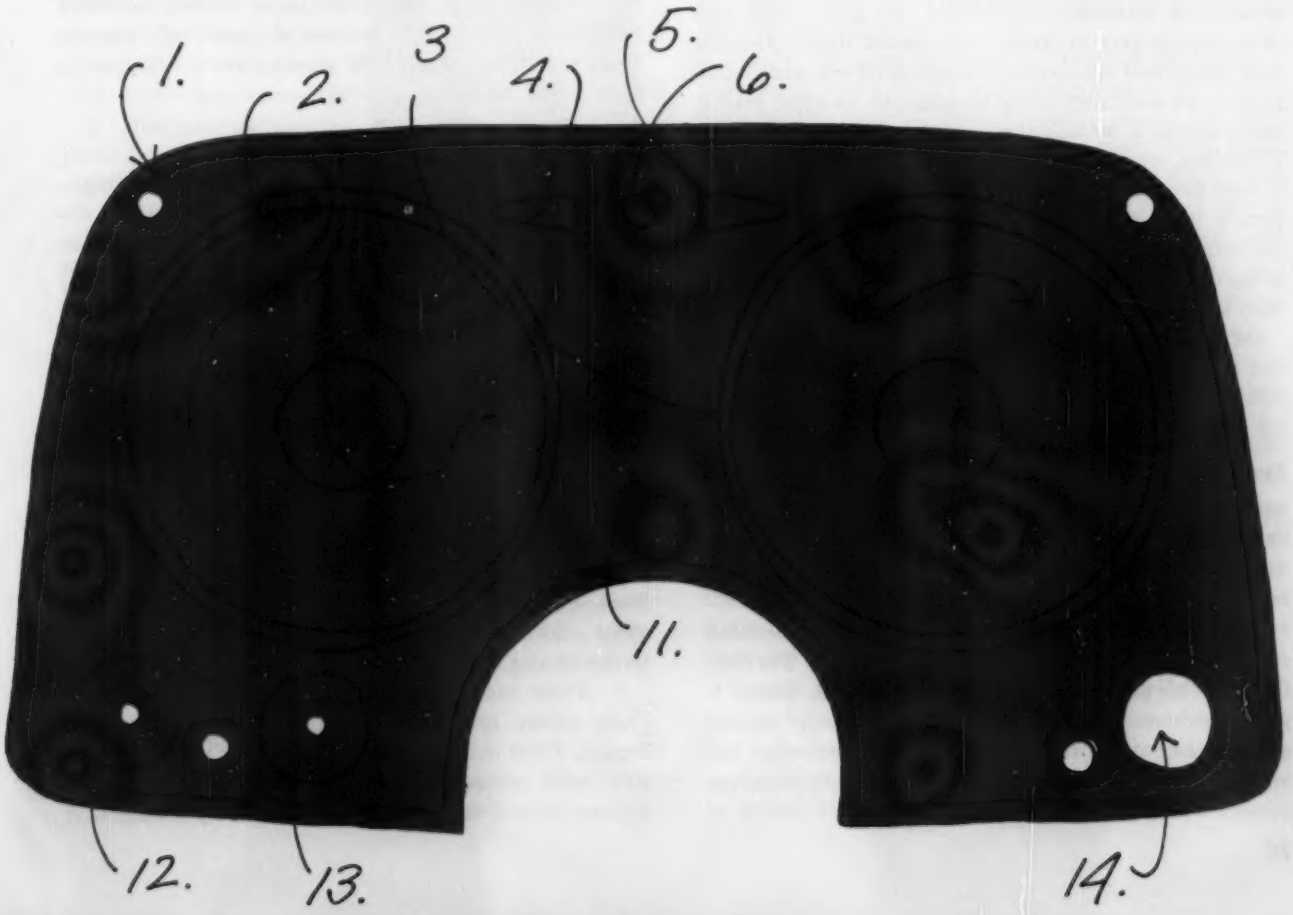
Because there is a momentary heat cure of the pro-


SMALL LOAD
NORMAL LOAD
START WASH
MAGIC MINUTE
SPIN
RINSE
RINSE
START WASH
SPIN


WHITE BACKGR
RAISED LETTERS
RAISED BACKGR.
HOT STAMPED BLACK
WHITE LETTERS
(SPRAYED)
LETTERS VACUUM
METALLIZED SILVER
BACKGR. HOT
STAMPED BLACK
GOLD METALLIC
FRAMES HOT
STAMPED
FRONT SURFACE
MOLD
VACUUM METALLIZED SILVER ON
BOTH SURFACES



Left, a **washing-machine control panel** *showing the decorative "high-style" for which acrylics are gaining usage. On this page, the* **one-piece Plexiglas control panel** *for the 1960 Valiant. This integrated molded part replaces, at a cost saving of 60 per cent, the 14 separate parts which the use of different materials would have required. These separate parts would be: (1) die-cast main bezel, (2 and 3) die-cast dial bezels, (4 and 5) die-cast turn signals, (6) die-cast high beam, (7 and 8) clear plastic windows, (9 and 10) die-cast spinners, (11) textured metal face-plate, and (12, 13, and 14) die-cast accessory bezels.*



tective layer in hot stamping, superior abrasion resistance is achieved — generally superior to the abrasion resistance of the top coating over vacuum metallizing. While hot stamping is in its present stage of development, solid areas larger than 15 square inches should be avoided. Hot stamping is ideal for bright raised decoration—which is strongly to be recommended over recessed decoration for reasons of mold cost, background texture uniformity, hot stamping simplicity, and the reproduction of thin-stroked scripts, sharp serifs and fine-line detail.

Lettering which is hot stamped on a flat may be recessed slightly by sufficient pressure, heat and dwell time to deboss the character. This technique is common. In the past the possibility of ragged edges due to puckering of the tape and the upsetting of hot material at the edges limited this method's use on quality products. Now, there is a two-step technique which lightly kisses the transfer, removes the tape, and then hits the impression again to lightly deboss the image. Crisp results are obtained this way. Modern silicone rubber plate technology permits some hot stamping on shallow spherical sections.

Vacuum metallizing: Since the vacuum-deposited metal layer is seldom more than two molecules thick, protective layers are necessary to provide adhesion. Where the metallized plastic part is to be attached by adhesive, or the metallized surface is an exposed one, the practice is to base lacquer, metallize and top-coat lacquer again, so that the two organic coatings tend to bond and entrap the metallizing. The usual vacuum-metallizing material is aluminum; but gold, silver and other metals may be used. Transparent tinted lacquers over metallized layers create striking effects, simulated golds from aluminum being an example. To mask plastic parts inside a metallizing chamber is often difficult. Therefore, whenever possible, the background painting is done first and the paint itself serves as a mask. Temporary latex films, sprayed on before the metallizing and later removed, are also used today. Large unbroken areas of mirror metallizing should be avoided, because even small imperfections are cause for rejection.

Offset-printing and photo-etching: Offset-printing and photo-etching are rare as special methods of decoration, but are useful in technical and military products for applying rules, scales, grids and precision markings.

Applied decoration

Appliqué—as opposed to painting, printing and metallizing—refers to added solid materials. In the films, decals and metallized films (of acetate, Mylar or Videne) are familiar. But neither is yet considered quality decoration for acrylic parts. They are tedious to position accurately and require nearly flat surfaces. Further, the cost of plates for four-color half-tone decals is generally not yet justified in the relatively modest quantities of most molded parts. As the technique advances, this may well change—for color photo transfers present intriguing design possibilities.

Foil-cals (true metal foils with adhesive backing) can be lithographed, etched, anodized, painted, embossed, and even slightly formed. They are handy as front surface decoration on opaque parts, but they have been so widely used as inexpensive nameplates that they must be used sparingly to avoid cheapening a product by this association.

Automobile tail-light *and washer dial show two types of metal appliqué. Tail-light consists of a stamped bezel of heavy-gage plated-steel that was press-fit over the acrylic plastic part while it was still warm from molding. The washer dial's metal ring is a conical formed-steel trim glued into a recess in the top surface of the acrylic part.*

Metal stampings are perhaps the best permanent appliqué. If formed with edge turned slightly in toward the plastic, and snapped in place while the plastic is warm and fresh from the mold, a fine permanent assembly is produced. The classic illustration is the auto tail-light bezel-lens unit. Even flat or slightly formed stainless trim is now adhesive-bonded to acrylic parts—for beauty, protection against wear, or camouflage of rear-attachment bosses. Sufficient wall sections of plastic are important, as are allowances for thermal movement in large parts.

Another means of appliqué is *electrodeposition*, but this is costly because it requires extensive hand polishing. Smooth parts and large parts present adhesion difficulties. Currently successful uses of electrodeposited silver over acrylic plastics include filigree on spike heels and ladies' personal accessories.

Second-surface relief

Although accustomed for centuries to handling highlights, shadows and textures in opaque materials, designers have only recently begun to work actively in transparent media. There are only the traditions of cut glass and gemstones for guidance. Some of the new problems are: rear fastening which will show through, a back surface which often becomes more important decoratively than the front surface, transmitted and refracted images, and visual distortions. Here are a few of the newer design considerations born of transparent acrylic plastic usage:

1. *Avoid flat surfaces.* Even the slightest crown or concavity will go a long way toward overcoming disturbing reflections on the first surface; and large metallized second surfaces exaggerate every sink mark or other flaw on the plastic surface, unless slightly crowned and broken up by pattern or texture.

2. *Avoid sudden changes in external surface form.* These create prismatic distortions and even double-images. Treat exterior contour in a "soft" or "organic" way, with generous radii at all corners. The place to express oneself in changes of plane, crisp forms, and

in broken textures and forms, is on the second surface —*not* the front one. Think of it as though you were designing *under* a layer of melting ice.

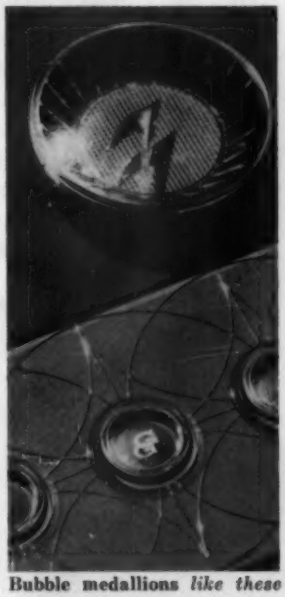
3. *Second-surface relief should be shallow without steep changes of plane.* Bevel from one surface to the other at 15° to 25° (130° to 150° included angle). Metallized bevels will then look steeper than they are, and catch more light and sparkle. Restrained bevels will also prevent bad cross-reflections within the part.

4. *Be alert to unwanted color reflections and ghosts within thick parts.* Such internal reflections from one element into another (e.g., red splotches from distant lettering showing over clean silvered areas) can be avoided only by some knowledge of optics, and cured only by optical tricks. It pays to get experienced advice early.

5. *Provide paint stops between adjacent colors.* A change of plane may do it; a ridge is standard. Do not let textural effects (fluting or waffling) butt into the returns of letters or design elements of different color; counter-boring to the depth of the texture will provide clean cut-offs without esthetic objections.

6. *Add interest to metallic and nacreous paint areas* with slightly heavier sections over the center of the area than over the edges—a gentle lens effect. About 50 degrees of convergence angle between front and rear surfaces is enough.

7. *Combine as many parts as possible into one molding with second-surface differentiation.* For example: panels and nameplates and bushings; lenses and bezels; housings and windows and scales. It saves on assembly cost, inventory, malfunction and weight.



Bubble medallions *like these are familiar as decoration for automotive and appliance parts. Double image of the letter "G" printed in the "canopy" of the lower bubble (part of a refrigerator nameplate) is produced by a metallic reflector strip behind the plastic part. Other effects are possible with other types of bubble medallions. (Upper medallion, above, is from the steering wheel of the "Lark.")*

8. *Conceal unwanted second-surface detail, notably shafts and mounting studs or lugs.* Lose them in dark painted areas; use first-surface decoration (metallizing or hot stamping) to hide them; locate them behind a knob or other part; and reduce their visibility by using fillets and radii.

Special effects

"Bubble medallion" is a term denoting the use of two or more parts with a trapped air space between. Usually the top part is predominently or completely transparent. It may contain second-surface decorations. Through this may be seen the lower part, which will be first-surface decorated. The lower part may be designed like an opaque plastic with very high relief designs raised on the first surface. Textured backgrounds are easily tooled for, and decorated and vacuum metallizing may be used unstintingly without concern for protection from abrasion because of the clear cover portion above. This means fine stipple or brushed (Butler) finishes may be specified. *Both parts* should meet with mating flanges, preferably in a flat plane, and sealing against moisture is helpful but not required if the fit is close.

Multiple-shot molding permits the incorporation of a part of one color with a part of another. This is done by injection-molding the smaller and then using it as an insert (while warm) in the mold cavity for the larger. The two plastic parts weld into one. Examples are: the letters in typewriter keys; clear back-up-light lenses within red tail-light lenses; automotive control panels with clear, white-translucent, and black-opaque sections.

Two-for-one parts are designed so that, with different decoration, different parts for different models of appliances can be produced from the same mold. A classic case is simply changing from silver to gold metallizing to denote deluxe models. In one interesting case, duplicate lettering and design were debossed into the second surface, and that lettering which was not wanted for a given model lost into the background by painting it black, while the desired lettering was metallized to make it show up.

Finally, the designer must be aware of the molder's possible difficulty with defects known as *welds* (joints made as the material flows around a pin in the mold and reunites on the opposite side), *tails* (little welds which occur off the corners of recessed letters and details which interrupt material flow), *sink marks* (which occur on the surface when heavier sections cool more slowly than adjacent thinner sections), and *warpage* (occasioned by unequal cooling rates along extensive thin sections).

Designers can often avoid such molding troubles by obeying some rules of thumb: (1) shy away from deep sharp detail; (2) keep to reasonably uniform sections; (3) do not use webs or bosses more than two-thirds as thick as the part at that point; (4) use radii and fillets to avoid notch-weakened points; and (5) keep all angles of debossing relatively gentle. The molder will know other tricks, such as drilling holes rather than molding them, using cooling fixtures to control flatness, gating the mold from the proper point for best flow, and so on.

Design and technical representatives are ready and willing to assist you with their specialized knowledge and experience, and will maintain tight security on confidential designs when requested; but they should be invited in as early in the program as possible.

Blow-molding

BY MONTGOMERY FERAR

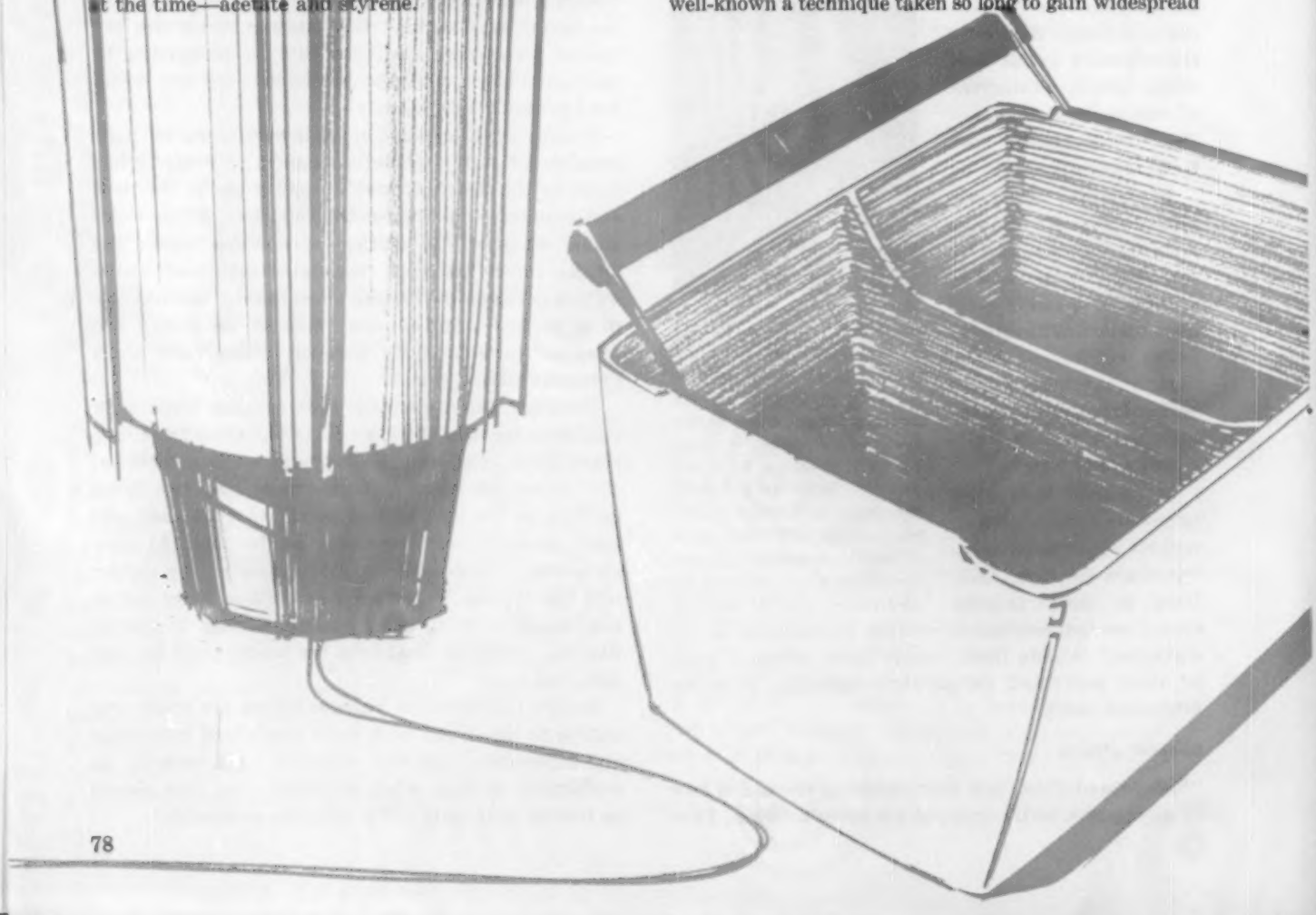
The technique is simple: a semi-fluid "tube" of plastic resin is forced under pressure of air to conform to the shape of the mold — much in the manner of glass-blowing. What advantages blow-molding offers over other forming procedures, and how designers might put them to use, is the subject of this discussion.

Although blow-molding has recently gained widespread attention as a "new" plastics fabrication technique, the original process actually antedates almost every other forming method now in use. Even before the plastics industry was recognized as such, fabricators were shaping products by primitive blow-molding procedures. The granddaddy of modern blow-molding was a process which utilized bituminous materials, air pressure, and crude molds to achieve hollow, waterproof shapes (circa 1880). Another early and cumbersome process employed sheets of nitrocellulose (later, cellulose acetate) for making such products as floating toys; but they were delicate, highly flammable, and subject to embrittlement and deterioration with aging. Another close relative in blow-molding's family tree (at least by marriage) is the glass-blowing machine. And in fact the first plastic-bottle blowing resulted, naturally enough, from attempts to duplicate the glass-blowing technique with the synthetics available at the time—acetate and styrene.

Blow-molding received its first big impetus with the advent of conventional polyethylene, whose flexible properties made the "squeeze bottle" possible. But the technique was not fully established as a major method of plastics processing until the development of such newer materials as high-density polyethylene, whose properties include improved chemical resistance and increased rigidity.

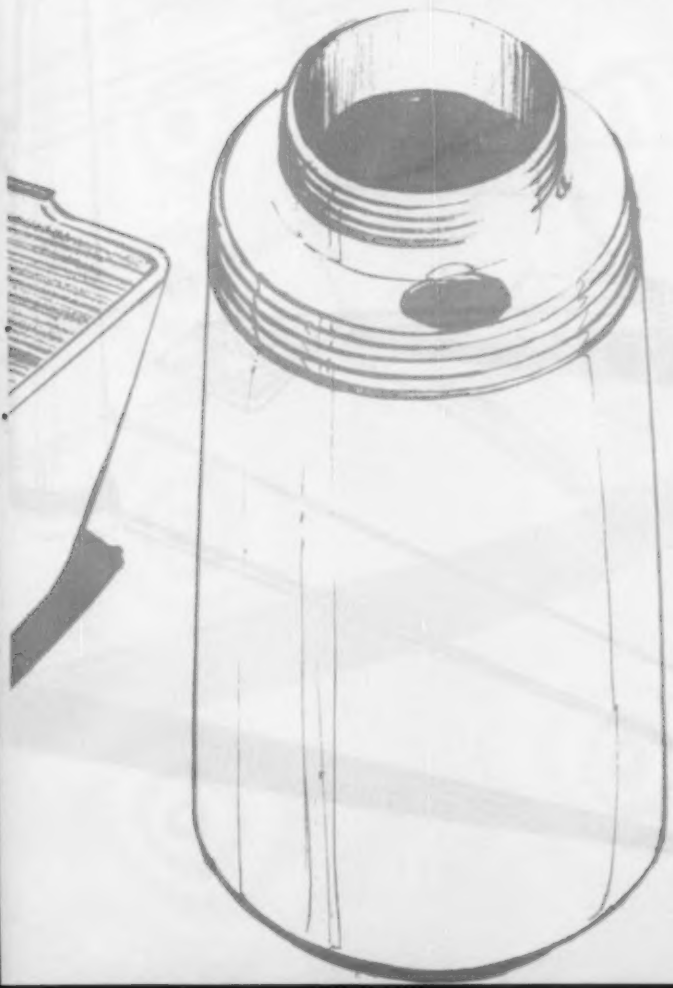
Up to that point, there was little to interest designers (except specialists in packaging) because advances in both materials and production methods seemed to be concentrated solely in the container field. Certainly there was nothing to suggest the evolution of a processing system that might alter the designer's concept of plastics usage. Yet today, barely a year after the first broad-scale commercial application of a carrier-type blow-molded plastic container, we are on the threshold of a host of widely diversified uses — many of them directly in the areas of the designer's major interests: automotive products, appliances, furniture, sporting goods, and toys, to mention but a few of the immediate practical possibilities.

The basic process of blow-molding (fig. 1) is simple and cheap. It lends itself naturally to exciting new forms: complex shapes and undercuts inconceivable with other plastics processing methods. Why has so well-known a technique taken so long to gain widespread



use? The explanation lies in the lack of highly-refined manufacturing equipment and know-how needed for fully automated, high-speed, economical production, as well as in the lack of materials having the structural characteristics required in products designed for long-term use.

It was the development of high-density polyethylene that put blow-molding over the top. After that, equipment and know-how began to improve overnight. The first major application of blow-molded high-density polyethylene was in the thin-wall rigid plastic bottle; but usage has spread fast, both in the U.S. and abroad, to such other areas as drug and cosmetics packaging, sporting goods, toys, and a variety of industrial shapes. Other new materials should prove equally practical in blow-molding, including polypropylene, the polycarbonates, chlorinated polyether, and polyacetal. Some of the older plastics such as nylon, modified styrene, acrylics, cellulosics, and the vinyls would also appear qualified for usage in certain product areas. In fact, since all of the thermoplastics can be processed by blow-molding, the designer finds himself with a wide choice of materials. Any standard reference book on plastics will permit him to pinpoint his selection to the most economical and functional polymer for a given need. Furthermore, considering the rapid growth of plastics technology, blown structures which are beyond the scope of existing plastics may conceivably be achieved by the use of new materials not yet on the market but



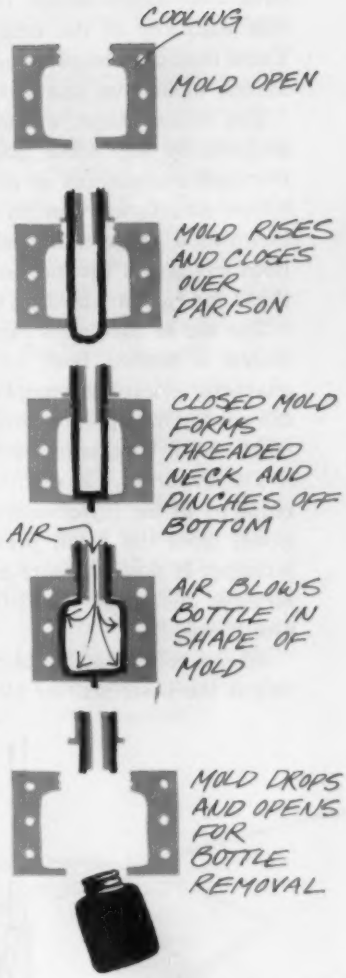


Figure 1, *right, shows extrusion-blowing technique, the most common type of blow-molding. Bottle in this illustration would be formed in an upright position, with neck shaped by the mold and a metal mandrel. Air enters through a core in mandrel to inflate tube. Inflation can also be done by an air-probe injected in tube at the side of the neck. Other blow-molding systems inflate from beneath, inverting the process. Multiple extruders feeding into a single manifold may also be employed.*

Blow-molded lamp shade, *far left, is one of an infinite variety of lighting effects possible with this process. One of the interesting facets of blown plastic lighting is the effect of unity which can be achieved by designing a single module for use alone, in clusters, or joined in a vertical pillar or horizontal strip.* Engineering notes: *The shape shown poses no molding problems. Other shapes, featuring snap-together elements, could be achieved by molded bosses and lips, although threaded plastic or metal-insert joints would be more desirable for a long string of units. In addition to silk-screen printing, inserts of wood, metal, or glass could easily be employed to achieve a great variety of desirable decorative motifs.*

Double mop pail (*left, middle*) *is made possible by the use of lightweight plastics and eliminates the main drawback of a chore that doesn't seem to be threatened—unlike most cleaning tasks—by mechanization. Single buckets require the use of the same soiled water continuously; but this blown shape provides separate compartments for wash- and rinse-water. The step-on wringing attachment could have an aluminum base.* Engineering notes: *Metal mechanism for wringer would be attached by rivets. Wringer roller would consist of an extruded plastic rod with metal end-pins.*

The bottle-within-a-bottle (*left*) *offers a solution to many industrial packaging problems. The type sketched here could be used to deliver exact quantities of different ingredients to be mixed just prior to use. It might package 50 ounces—or 50 gallons.* Engineering notes: *This sketch combines injection-molded parts (neck separator, cap) with blow-molded parts (bottles). Inner and outer bottles could be made of plastics with different degrees of chemical resistance and permeability. In this case, they would have to be blown separately. (If made of the same plastic they could be blown together as one molding, and then later cut apart.)*

about to emerge from the laboratories.

A number of design effects, previously ruled out because of prohibitive mold and assembly costs, are "naturals" now for the blow-molding process. The technique permits the designer to consider a number of structures which cannot be achieved in one molding step with any of the established forming techniques. These include: one-piece hollow structures, compound curves, undercuts, and complex shapes.

The *hollow shape*, without bonded joints, cannot be achieved by any other plastics production technique. For such components as machine-housings, which are hollow structures open on one end, two parts can be blown as a single unit, and then cut in half (fig. 2). Both molds and production costs would be well below those for regular molding or vacuum forming.

The use of *compound curves* in conventional plastics design is limited both by mold costs and the flow characteristics of thermoplastic material. Blown shapes can readily incorporate compound curves without added mold cost or processing problems.

The *undercut*, as distinct from the normal taper required of an injection-molded plastic for ready removal from the mold, presents no problem in blow-molding. If desired, parts can even be designed with a series of undercuts — a virtual impossibility with other procedures.

Since a column of air, instead of a male mold, is what shapes the inner wall of blown parts, outside contours are limited only by the structural needs of the product and by the designer's imagination and taste. Almost any kind of *complex shape* is conceivable.

The upper limit on the size of blown shapes is not yet established. But designers should know that it is presently possible to blow-mold a 125-gallon container having the structural strength and kindred physical properties required for such a product. This opens the way to blow-molded furniture, automotive components, small boats, and other products of similar size.

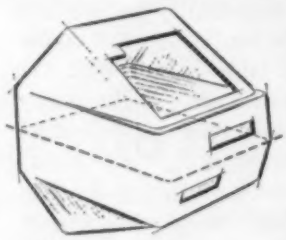
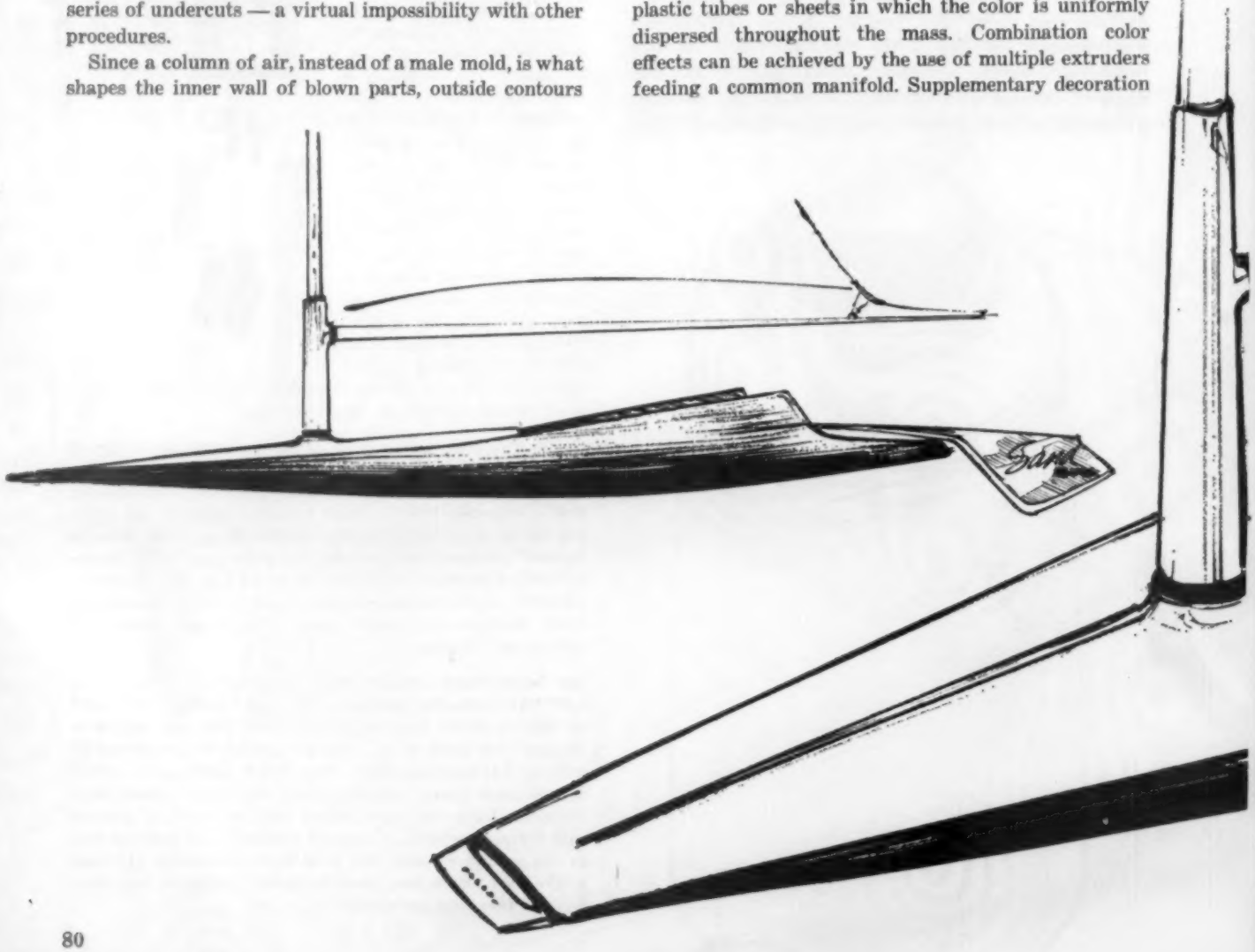


Figure 2

Thus far, I have been talking about blow-molding in terms of plastic products already made by other forming methods. However, it is important to realize that blow-molded structures will make superior replacements for parts now being manufactured in such non-plastic materials as metals, wood, ceramics, and glass. The accepted advantages of plastics as a product material apply to blow-molded shapes as they do to others:

Integral color: Blown structures are formed from plastic tubes or sheets in which the color is uniformly dispersed throughout the mass. Combination color effects can be achieved by the use of multiple extruders feeding a common manifold. Supplementary decoration



techniques such as silk-screening, hot-stamping and various printing methods are fully adaptable to blown structures.

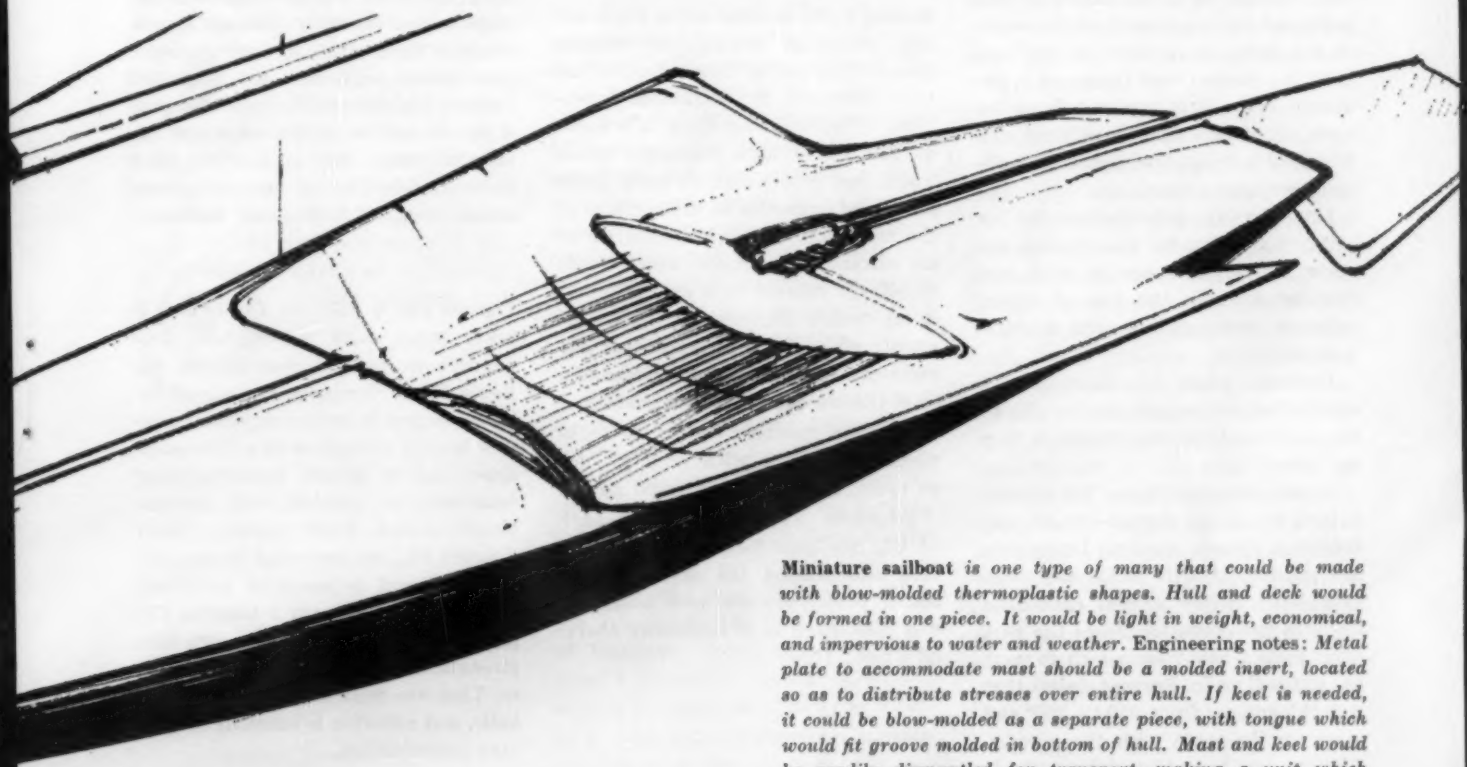
Texture: Texture can be achieved on the outside of blown shapes by any of the conventional techniques employed in injection molding, such as embossing, engraving, sand-blasting, etc. Materials such as high-density polyethylene and polypropylene have excellent reproduceability of the mold surface.

Resistance to heat, chemicals, and pressure: Many of the newer plastics adaptable to blow-molding offer greatly increased levels of resistance to temperature (both high and low), chemicals, and pressures, making them excellent candidates for replacing conventional materials, particularly in areas of use subject to corrosion, weathering, etc.

Inserts: Metal inserts can be readily incorporated into blown structures in the course of the blowing operation. Because of the excellent bond which results, the insert may serve as a supporting member, provide anchorage for mounting to structural metal parts, magnetic couplings and the like. Metal inserts, of course, offer many interesting possibilities for appearance-design using escutcheons, trim, etc.

Many of the unique design effects which can be achieved in blown structures can be seen in the new containers now employed to package liquid detergents —the development responsible for the large-volume breakthrough in blow-molding. And the thin-wall hollow shape, with undercuts and compound curves, becomes a powerful marketing tool — a far cry from the workaday metal can or commonplace Boston Round bottle which it replaces. Even more interesting design effects can be seen in drug and cosmetics packaging, where size limitations are less stringent and costs more flexible. Avon's "Whitey the Whale" package for bubble bath solution marries one of the earliest of blow-molding ideas — the floating toy — with one of the newest — a high density polyethylene container resistant to soap and chemicals. The result is a package with excellent secondary uses that have helped greatly in the success of this recent product.

But the blown container, regardless of its size and purpose, must, for such practical reasons as shipping, handling and storage, remain essentially a modification of a cylinder or a cube. And the blown structure, serving as a container, represents the replacement of an existing product, rather than the evolution of a new idea. This is also true of many of the other blow-molding applications which have followed, both in the U. S. and abroad, on the heels of the blown plastic bottle. While it is true that any new design serves to replace something which has come before, the most dramatic and at the same time most effective design is achieved only by a radical departure from accustomed ways and concepts. It is in this spirit that I have approached blow-molding, and the newer plastics materials, in the design suggestions which accompany this discussion.*



Miniature sailboat *is one type of many that could be made with blow-molded thermoplastic shapes. Hull and deck would be formed in one piece. It would be light in weight, economical, and impervious to water and weather.* Engineering notes: *Metal plate to accommodate mast should be a molded insert, located so as to distribute stresses over entire hull. If keel is needed, it could be blow-molded as a separate piece, with tongue which would fit groove molded in bottom of hull. Mast and keel would be readily dismantled for transport, making a unit which might be packed in a station-wagon.*

** Sketches by the author; engineering commentary by William O. Bracken, Hercules Powder Company.*

Some recent techniques for plastics fabrication

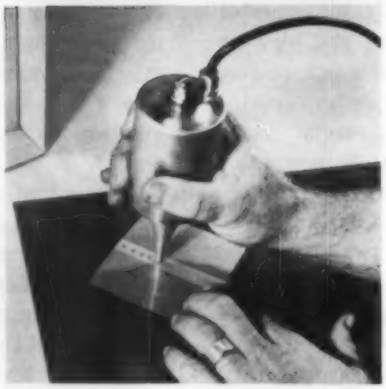
Thermofusion, a new process for molding thermoplastic materials, eliminates expensive tooling and allows polyethylene and other thermoplastics to be formed into objects of almost unlimited size, according to Spencer Chemical Company, owners of the U.S. rights to this European invention. The products shown in the picture above were made by this process.

The process is extremely simple. First, a steel mold is filled with the powdered resin. The filled mold is then heated in an oven to a temperature high enough to cause fusion of the powdered resin adjacent to the walls of the mold. It remains in the oven until the desired wall thickness is obtained. When it is removed from the oven, the excess resin is dumped out. The mold is then baked again until the resin surfaces are smooth.

Low density polyethylene is the primary material for this process, but other polyethylenes can be used, and Spencer foresees the use of nylon, cellulose acetobutyrate and polycarbonates.

Products made by Thermofusion are limited in size only by the size of the molds and the oven in which they are baked.

Design considerations: The process is best for simple shapes—round, rectangular, square, conical. Under-cuts are possible if split molds are used. Completely hollow shapes cannot be made in one operation, since the part must have a hole from which to pour the unfused resin. Spencer claims that wall thicknesses from .030 to .250" and more can be made with the process. Ribbing can be achieved by suitable design of the mold wall; reinforcement by a metal framework is possible.



Sewnar, a non-thermal device for bonding, stitching, sealing, or welding plastic films and synthetic fabrics has been developed by Ultrasonic Industries, Albertson, New York. It is based on the use of high frequency sound waves that induce high strength interlocking of molecules on the surfaces of the materials. The device consists of an ultrasonic oscillator which feeds 40,000 cps current to a special transducer which focuses the ultrasonic energy at its tip. The transducer element can be used by hand or mounted in a fixture for automatic sealing.

The manufacturer claims the technique is effective with such plastics as nylon, acrilan, Dacron, and Saran.

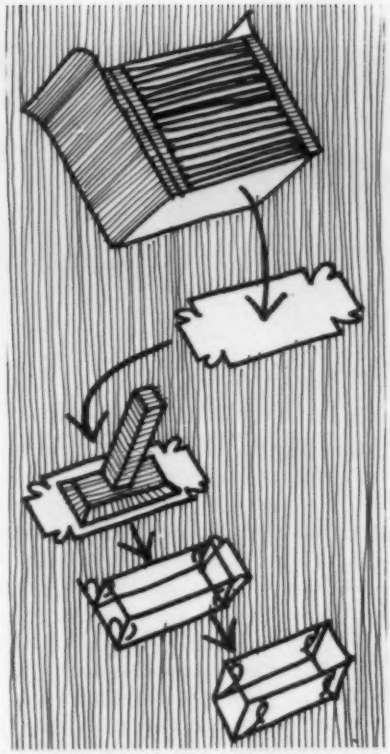
Sonadyne Corporation, a subsidiary of UI, has been formed to manufacture and market the device. Field-tested prototypes are now available, and production is to commence shortly. Price: $495.

Pfaudler 301: The Pfaudler Company, a division of Pfaudler-Permutit, Inc. has developed a technique for maintaining Penton (a chlorinated polyether polymer developed by Hercules Powder Company) in water-suspension for spraying applications in the chemical, pulp and paper, and pharmaceutical industries. Particularly useful for its resistance to corrosion at temperatures up to 275 degrees F., and for its good abrasion resistance, this new form of Penton, known as Pfaudlon 301, is applied in approximately the same way as other organic suspensions. However, because it has a water base, elaborate safety measures are not required to guard against toxicity and flammability. In addition, it can be applied in a thicker coating so that only two applications are needed while four or more are commonly required with other methods.

Capcote PE: A process for coating kraft paper with polyethylene, announced earlier this year by the St. Regis Paper Company, is claimed by its developers to impart superior moisture barrier protection to a PE-coated sheet and to permit manufacturing economies not possible with conventionally-coated kraft papers. Called Capcote PE, the new sheet is especially significant to users of multiwall bags. Bags made with a Capcote PE ply are claimed to have greater strength and pliability in cold weather. They are resistant to acids and alkalis, and adhesion is adequate to prevent delamination.

Ready-Strip, a process for furnishing self-sticking, metallized, die-cut, decorative plastic shapes on a continuous web, has been developed by Coating Products, Inc., Englewood, N. J. Rolls of metallized (chrome or gold) Mylar provide the base material. This metallized film is laminated to various gages of vinyl and subsequently embossed on the top surface with any one of a variety of possible patterns. First coated on the reverse side with a high-tack pressure-sensitive adhesive, and then backed with a heavy paper strip, the laminate is finally run through a rotary die-cutting machine that reduces the roll to desired width, cuts the shape desired, and removes excess material, leaving a roll of decorative plastic shapes which can be removed from the backing and applied to any surface for decorative effects.

Labeled Mirro Brite, the laminate can be used on consumer products, automotive and industrial equipment, product parts, business machines, and packages and linings.



Plasti-Lok: The drawings above illustrate how a new packaging machine, called Plasti-Lok, forms pre-cut plastic sheet into packages without the need for either heat or adhesives. The manufacturer foresees extensive application of the machine to the packaging of tomatoes, cookies, cigars, paper products, meats, drugs, etc. In some cases, the Plasti-Lok machine can be connected with automatic filling and wrapping equipment to make it the first high-speed, automatic, rigid plastic sheet packaging system.

The machine works by cold-folding to a 90-degree angle the plastic sheet blanks which are fed to it from a magazine, locking them together by inserting the proper corner flap into its corresponding slot, and discharging the completed package base to the packing line.

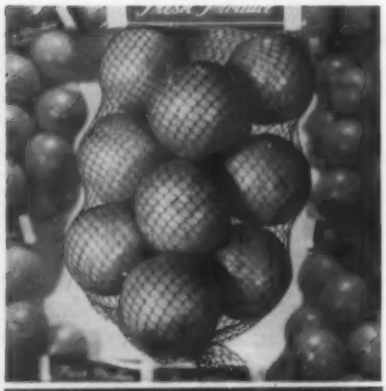
The plastic sheets, known as Polyflex and sold by the Plax Corporation of Hartford, Connecticut, are made from a Monsanto Chemical Company styrene formulation. Charles E. Palmer & Associates of Somers, Connecticut designed the package and developed the package folding principle. The machine was built by R. A. Jones & Company of Covington, Kentucky.

Epoxy construction: Built with a spray gun, and capable of transporting a 40,000-pound payload by rail, motor, or ship, the giant reinforced plastic cargo carrier (above) was unveiled in Chicago last winter by Union Carbide Plastics Company. The spray gun technique demonstrates one recent answer to the problem of handling epoxies as a construction material.

One of the largest epoxy-reinforced plastic containers ever built, the carrier is 24′x8′x8′. It weighs 2800 pounds, or a fourth less than a comparable aluminum carrier. It is claimed to be more rigid, and is resistant to abrasion, fatigue, and chemical and salt water corrosion.

The prototype carrier, undergoing evaluation tests, consists of built-up epoxy-fiberglass panels (each 4′x8′) that were bonded to a steel frame. The 4′x8′ section consists of a central corrugated sheet of epoxy and fiberglass, together with a flat "skin" of the same material bonded to both sides. The core for the corrugated wall and ceiling sheet is heavy cardboard; that of the floor panels is aluminum. These are designed to carry a floor loading of 250 pounds psi. After the panels were bonded to the steel frame, a curved sheet metal molding was bonded to all interior right angles and then laminated with epoxy-fiberglass. Once the panels were in place, manhole covers were installed, intake and dumping spouts were added, and finally an epoxy "gel" coat was sprayed over the entire surface.

A roundup of recently developed materials



Vexar: Polyethylene in net form is now available for a variety of packaging applications. Known as Vexar, the material is manufactured by a process that extrudes the plastic directly in net form in a single operation; each strand intersection is an integral part of the material, in contrast to interwoven or heat-sealed netting where the joints are made after the material is extruded. The process is a British development to which Du Pont acquired United States rights last year. The netting, which retains all the properties of polyethylene resin, can be produced in an unlimited variety of mesh sizes, filament diameter, strength, stiffness, and color.

As a covering around cans and bottles (above), Vexar netting can be used not only to enhance the appearance of the container, but also to prevent sampling before purchase. To form the container jacket, a tubular length of netting is heat sealed at one end to form a bag, and then slipped over the container and heat sealed underneath.

Other thin-gage netting can be used in the packaging of various kinds of produce such as potatoes or oranges.

Daponite: A decorative and protective laminate for furniture and panelboard applications has been developed by Food Machinery and Chemical Corporation. Known as Daponite, the material is based on Dapon diallyl phthalate, a resin known to the electrical field. It is said to offer cost savings and other advantages over melamine and phenolic laminating materials. It can be applied with presses exerting 200 to 250 psi whereas the other two mentioned materials require presses exerting up to 1000 psi; thus, it permits the use of a greater variety of core materials. Daponite-impregnated paper, which is used in the lamination process, can be rolled up and no special care is needed for handling, while other types of impregnated papers are quite brittle. In addition, it does not create water during the lamination process.

The Daponite surface is said to have inherent resistance to water and alkalies, and good resistance to heat.

The resin is supplied as a dry, free-flowing powder which can be impregnated in special paper and then applied to various types of plywood, hardboard, chipboard, and other flat, smooth surfaces. The paper can be clear or patterned with decorative effects. The clarity of the resin is said to allow the natural wood grain or printed decoration to show through brilliantly.

Fiberglas: An important refinement in the manufacture of glass fibers for reinforced plastics, making it possible to mold plastic parts for major consumer and industrial products ordinarily made of other materials, was announced in July by Owens-Corning Fiberglas.

The new material—characterized by what the manufacturer calls "high strand integrity"—replaces the usual filament-bonding agent (starch) with a polyester resin. This gives the fibers greater strength and permits the fabrication of large-area thin-wall shell moldings of greater surface uniformity than has so far been possible. The new Fiberglas strand is already being used to manufacture lids for a Westinghouse dishwasher, as well as some major automotive parts. Further applications in major appliances and automotive parts, as well as in industrial housings, are also foreseen.

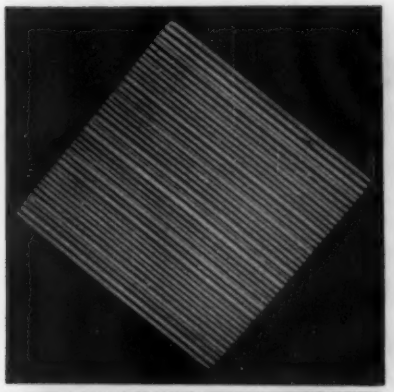
Scottfoam: A urethane foam (above) that is more porous and resilient than conventional foams has been developed for filtration purposes in the air-handling equipment field. Known as Scottfoam, the material, manufactured by the Scott Paper Company, is already being used on many of the 1960 room air conditioners. The geometry of the foam is said to minimize the possibility that open channels will form in it. The material's high strength and durability permit it to be washed repeatedly, even in automatic washers, after which it can be wrung out and reinstalled. It need not be sprayed with oil or other fluids to trap particles. It can be easily fabricated by conventional methods.

Geon, B. F. Goodrich's new vinyl plastic, can withstand temperatures 60 degrees higher than its regular vinyls without loss of properties. It can be used in temperatures of 180 to 200 degrees F., and at pressures of up to 150 psi. These characteristics will make it useful for many applications in the building, chemical processing, and automotive fields. It will be suitable, for instance, for such things as process piping, tanks, ductwork, hot and cold water lines, valves, glove compartments, hoods, etc.

It has been suggested that Geon piping might be used in the prefabrication and installation of plumbing walls for the home building industry. Besides being only one-sixth the weight of copper piping, it offers the advantage of low conductivity — a hot fluid passing through a Geon pipe will not heat the surrounding area, and a cold fluid will not cause it to sweat.

The picture above illustrates the high temperature resistance of Geon. Four weighted strips of various plastics are shown being subjected to boiling water. Only Geon, on the extreme left, does not sag. The other strips, from left to right, are conventional vinyl, high-density polyethylene, and polyamide.

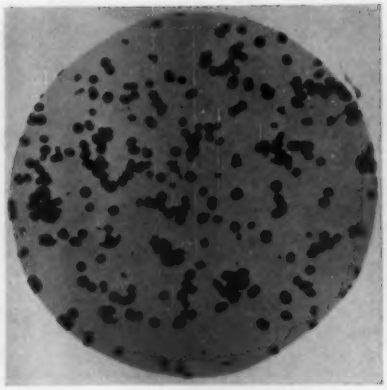
Products made with the material can be processed on existing plastic processing machinery.



Teslar, a polyvinyl chloride film developed by Du Pont, is inherently weatherable and offers great promise as a decorative and protective coating for outdoor use, replacing paint and similar materials. Its weatherability is indicated by the fact that an early laboratory sample of unsupported Teslar exposed in Florida for ten years showed no embrittlement or discoloration. The properties of the transparent film, which are a consequence of its chemical structure, and are not dependent on additives or plasticizers, include chemical resistance, toughness and high "flex life" over a broad temperature range, heat sealability, and excellent electrical properties.

In the building industry, Teslar has a particular potential as a laminated film finish for prefabricated industrial and commercial metal buildings as well as house sidings and roofing. In addition, it can be used as a glazing for inflatable structures, and for packaging and plastics surfacing.

The top photograph shows Teslar formed to the corrugated face of an acoustical tile. The other picture shows a white-pigmented Teslar film laminated to heavy-gage PVC.



Microthene: Polyethylene in powdered form, a product first used in Europe, and introduced in this country by U.S. Industrial Chemicals Company, has several advantages — particularly in fabrication—over conventional polyethylene, which is supplied as tiny pellets to be fed into extruding or injection molding machines.

The powder, known as Microthene, can be used with other types of equipment which are less expensive and not necessarily limited to the plastics industry. Dispersed in water or alcohol, it can be sprayed or slush-coated on objects which are then heated in an oven to form the coating. Or the dry powder can be applied directly to a heated object to form a coating. It can be coated on objects by the fluidized-bed process in which an object is preheated and dipped into a container with the fluidized dry powder, after which it is frequently heated to give it a smooth and pinhole-free surface. In addition, the powder is used with the Thermofusion process (discussed on page 82) which requires less expensive and simpler molds than conventional molding processes.

Besides metal coating applications, the powdered polyethylene will be used to coat both woven and non-woven textiles. For this, it is spread evenly onto a moving textile web passing through an oven which sinters the powder so that it becomes a coating.

Microthene is available in two sizes: smaller than 200 screen mesh—produced by a solution process; and between 50 and 200 screen mesh—produced by mechanical grinding.

Epoxy additives: Union Carbide Chemicals Company has announced commercial production of a family of high purity, light-stable epoxy compounds which subdivide into two groups. The Flexol group of JPO and EPO epoxy plasticizers and stabilizers increase the resistance of vinyls to heat and light degradation. The former will be particularly applicable to vinyl flooring, and the latter will be used in vinyl formulations such as clear sheeting to impart long-term compatibility, stabilizing action, and resistance to both color development and rancidity. Other vinyl products that will benefit by the addition of these compounds include electrical insulations, coated fabrics, garden hose, gaskets, foam, and molded articles. Another of the group, Flexol EP-8, can be used with vinyls to provide flexibility as well as heat and light stability at low temperatures.

The Unox epoxide group is said to be the only one of the commercially available epoxides which does away with light-unstable groups in its formulation; this means that it can offer plastics with low initial resistance to discoloration from ultra-violet light, heat, and air oxidation. Unox 201, the most versatile of the group, can be formulated to give a wide range of high temperature properties, toughness, cure speeds, and handling characteristics. Its most probable end uses will be in electrical and electronic components and encapsulation, tooling coatings, laminates, adhesives, and cross-linking applications.

The photograph above shows various products which can be used outdoors because of light-stabilizing additives.

Two new adhesives developed by Plastic Associates, Inc., Laguna Beach, California, now make it possible to bond nylon to metal and rubber to metal. Previously, these materials had to be joined by mechanical fasteners.

The nylon-to-metal process, which employs an epoxy paste, may be used to bond nylon gears to metal shafts, or to secure threaded screws or rods in nylon and metal assemblies. The fastening operation can be performed at room temperature, and is said to achieve a tough, shock-resistant union within a few hours.

The rubber-to-metal process uses an adhesive based on polyurethane and requires several days to set. The bond is said to have a tensile strength greater, in some cases, than the rubber itself.

Oxiron: A family of new epoxy resins has been developed which is said to offer more versatility and more curing possibilities than conventional epoxies. Manufactured by Food Machinery and Chemical Corporation, the resins —known as the Oxiron series—react readily with anhydrides, and can be cured at low temperatures, after which they exhibit low shrinkage and low heat release. They are suitable for many casting and tooling requirements, and in addition, because they wet glass well and have good adhesion when cured, they have a strong potential use in lamination. Other applications include protective coatings.

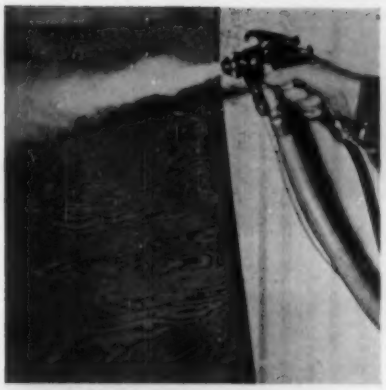
The Oxiron resins differ from the conventional epoxies in structure, and consequently in reactivity and properties. Whereas the conventional epoxies possess only terminal epoxy groups, the new series has such groups located internally and externally along the basic hydro-carbon chain. They have superior strength and stability at high temperatures, excellent electrical properties, and resistence to chemical attack, and a high strength-to-weight ratio.

Use of the Oxiron resins also offers a cost advantage. When formulating them, it is possible to use a higher proportion of lower priced reactants. And their lighter weight gives greater volume per pound.

Santofome: A flexible plastic film manufactured from styrene foam was marketed last month by Monsanto. In addition to being waterproof, sanitary, non-abrasive, and grease-resistant, the plastic has insulating properties that make it especially useful for frozen food packaging and for containers requiring thermal insulation.

Priced to compete with paper (between $4.00 and $7.00 per 1000 square feet), the new material, called "Santofome," can be used either as a film or laminate, and it can be printed on by most conventional methods. It can also be embossed. It is available in thicknesses between .010 and .030 inches, and in rolls 36 inches wide and up to 7,000 feet long.

The Food & Drug Administration has accepted it for food packaging.



Fiberglas Flake protective coating, a spray coating which gives a corrosion-resistant surface to metals, wood, and concrete, was announced this month by Owens-Corning Fiberglas Corporation. Concurrently, a spray gun unit especially designed for applying this new material was developed by the De Vilbiss Company.

The coating is a homogeneous mixture of Fiberglas Flake, resin, fillers, and accelerator, and—since it can be pigmented—it can be used for decorative as well as protective purposes in such applications as swimming pools and masonry walls.

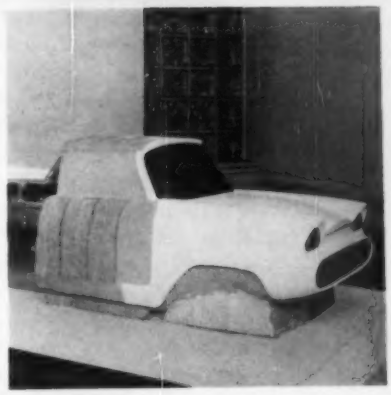
A 20-mil-thick coating of this material has 50 layers of Fiberglas Flake and is roughly the equivalent of 50 coats of paint. Weathering tests have shown virtually no deterioration of the coating.

Application is in two steps: spraying (above, top) and then rolling (bottom) with a paint roller to give the desired smoothness, and to orient the flakes to eliminate any possibility of "pinholing."

Aclar, a new fluorohalocarbon film featuring "crystalline" transparency and virtually zero moisture absorption, was announced in July by Allied Chemical Corporation. The film is expected to have important uses in the packaging of drugs, chemicals, and other products, and will bring significant economies to the military in the packaging of electronic and other delicate mechanical equipment components.

The film offers a number of interesting properties: it has an extremely low moisture vapor transmission (a polyethylene film would have to be 400 times as thick to achieve the same barrier); it retains flexibility between —320° and 390°F.; it is not subject to attack by inorganic acids, alkalies, oxidizing acids, and resists most organic compounds; it can be sterilized; and since it is a thermoplastic, it seals by electronic and thermal methods.

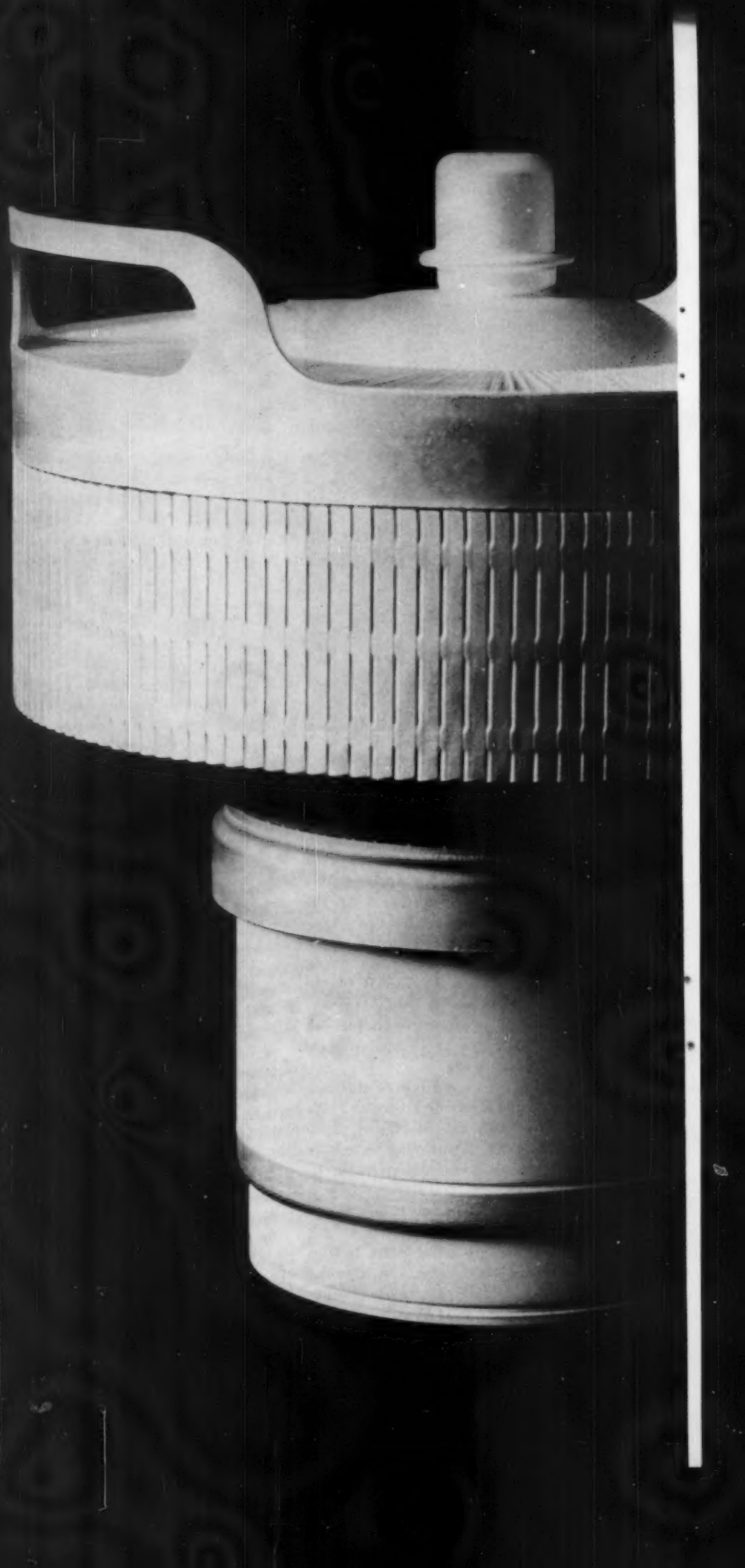
The film can be printed, vacuum-formed, extrusion-coated, metallized, and laminated to other films, paper, cloth, metals, etc. But it should be noted that since the film is so highly impermeable, special inks for printing it must be used. Aclar films can be bonded with both pressure-sensitive adhesives and thermosetting or permanent adhesive systems. However, because of the film's chemical resistance and, again, its extreme impermeability, only certain adhesives can be used, and with most of these the surface of the film must first be altered by treatment with chemical reagents.



Ren Wood: A new plastic, known as Ren Wood (top), has been introduced by Ren Plastics, Inc. to replace mahogany—the traditional material for making master models. Mahogany has been used for this purpose because it is one of the most dimensionally stable of all woods; however, even its stability is not great enough for some applications. In addition, its appearance and properties vary from plank to plank. The dimensional stability of Ren Wood is illustrated by the results of the following test: When exposed to 100 per cent humidity at 100 degrees F. for three days Ren Wood planking swelled only 0.020 inches per foot in any direction.

Its properties are uniform from plank to plank (it is supplied in standard lumber sizes of one foot wide by six feet long, in thicknesses of two and two and a half inches), and it has a density (36 to 44 pounds per cubic foot) comparable to that of mahogany. It can be carved and worked with ordinary wood working tools, and it will hold screws and nails.

A companion material is a paste called Ren Shape (above, bottom), which is supplied in powder form.



1960 WESCON awards

BY HENRY C. KECK

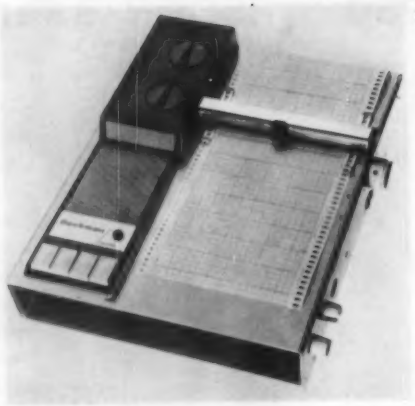
From a field of 25 electronic products which had already received certificates of merit in a preliminary judging, a jury of 10 industrial designers and electronic engineers selected five products for awards of excellence in the second annual design competition sponsored by the Western Electronic Show and Convention (WESCON) held in Los Angeles, August 23-26. The winning five are shown here, beginning with the Eimac power triode at left. Overleaf are the other four—Ampex tape recorder-reproducer, Beckman potentiometric recorder, General Precision computing system, and Beckman data processing system — along with a selection of entries that received certificates of merit. In the text below Henry Keck, one of the jurors, discusses the jury's general reactions to all the entries, and, in the captions for the winning five, sums up the jury's reasons for selecting them.

The jury was impressed by the interest and variety of the more than 100 submissions to the second annual WESCON design exhibit. But despite this variety we were left with the feeling that many electronic manufacturers pay very little heed to the impression created by the external aspects of their products. There was a disturbing similarity of appearance in some of the products submitted, as well as in many other electronics products we have observed. They give the impression of having been made by home workshop methods and of using only standard purchased parts for knobs, escutcheons, meters, and other external details. It seems unfortunate that this should be the case, since many electronic firms have poured a tremendous amount of money and engineering effort into developing outstanding products. As a result of this "home workshop look" a large number of entries were eliminated at once without further consideration.

In choosing the products designated for merit and excellence awards, we judged on the basis of photographs and written explanations of equipment supplied by the manufacturers. Since many electronic products receive their first screening by customers under the same circumstances, i.e. from

1. Eimac 3CX10000A3 Power Triode, Eitel-McCullough, Inc. This handsome component stands 5½ inches high, is 7 inches in diameter, weighs approximately 12 pounds. It could easily have been a very pedestrian product, had the manufacturer not paid attention to good design detail. The integral handles are straightforward in design, yet pleasingly incorporated into the unit. The silver-plated copper fins are neatly bent over at their outside extremity to form a housing.

2



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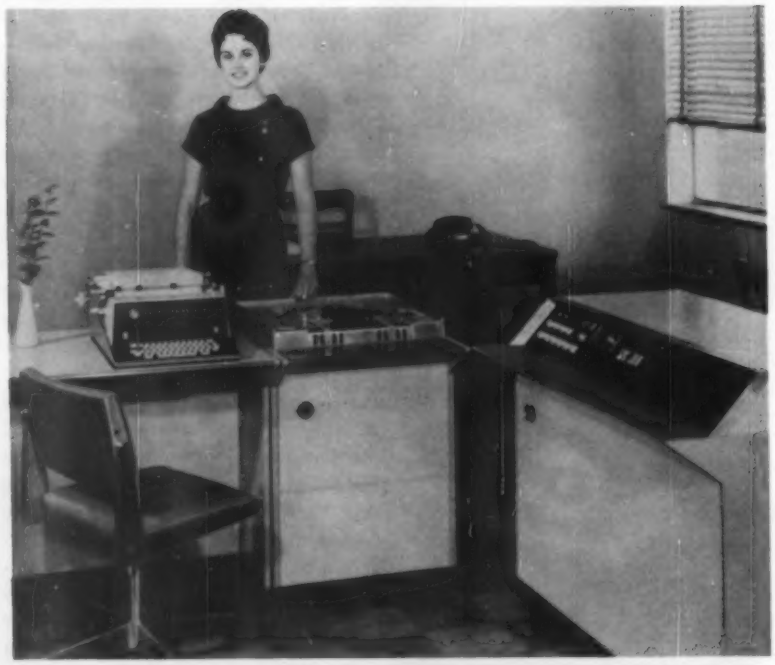

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just such pictorial and written material, the jury's opinions may be of special interest to manufacturers.

The criteria for the final judging were excellence in the areas of appearance design, human engineering, and fitness of product to its purpose. We were ably assisted in technical considerations by the two engineers on the jury: Bert Gasteneau, Aerojet General; Wilson Bradley, Endevco. (Editor's note: For a full list of all the members of the WESCON jury, and a photograph of them, see this month's News, page 18.)

Originally the awards were to have been assigned to five design categories: components, products, systems, instruments, and graphic treatment. However, we were unable to find any products or group of products which deserved an award in the last category, and therefore we gave awards of excellence to two systems designs. It is extraordinary that we could not find an outstanding graphic treatment —as represented by nameplates, panel lettering, trade mark design—since almost all front panels and name plates for electronic equipment are specially designed in terms of the graphic material on them. And since it is relatively inexpensive to apply special treatment to a nameplate by silk screening, etching, anodizing, or other methods, it is surprising that manufacturers do not use these simple means of giving their products legible markings for controls and attractive trade mark displays.

2. FR600 Tape Recorder/Reproducer; Ampex Data Products Company. Designers: Frank T. Walsh, F. Arden Farey, staff.

Businesslike recorder-reproducer has an orderly arrangement of parts. Despite the large number of components on one rack, the design engenders a feeling of operational simplicity. It should be noted that on this equipment a standard knob has been used widely, but since other elements in the design have been carefully refined, and the knobs visually enclosed, they look specially made for this application. The company name on the product is obvious yet unobtrusive.

3. Potentiometric Recorder; Beckman Instruments, Inc. Designers: David Molk, staff, with Tor Peterson and Melvin Best, consultants.

There is a subdued feeling of design

coherence in this product. The textured metal on the top and front face, which is provided for ventilating purposes, creates an attractive pattern. It is a heartening change from the standard ventilating louver. The two flush knobs on the top surface show the effectiveness of a specially designed knob on electronic equipment. The serviceable nameplate is neat, simple, and inexpensive. The standard purchased knobs on the side are well proportioned and can be easily grasped by the operator standing in front.

4. RPC 4000 Electronic Computing System; Librascope Division of General Precision, Inc. Designers: George H. Kress Associates.

This equipment is noteworthy for presenting an extremely unusual, yet very functional, look to this type of computing system. The various elements in the system are not exact duplicates of each other, yet they are closely related and modular in concept. Of particular interest from a use standpoint is the projecting shelf for writing and holding data papers as well as for providing knee space. It is also interesting that the manufacturer was concerned enough about the overall design coherence of the system to have a special chair made.

5. Model 210 High-Speed Data Processing System; Beckman Systems Division. Designers: Zierhut/Vedder/Shimano Associates.

Although modular in concept, this design avoids the extreme appearance dullness of many designs of this type by varying the appearance of the modules. The design conveys the impression of precision equipment, carefully engineered.

Other WESCON entries, recipients of certificates of merit, included (right):

6. G-20 Data Processing System, Bendix-Computer Division. Designers: Emerson/Johnson/MacKay, Inc.

7. R-W Standard Cabinet, Thompson-Ramo-Wooldridge. Designer: Joe Police, staff.

8. X-Y Plotter, Librascope Division of General Precision, Inc. Designers: Zierhut/Vedder/Shimano Associates.

9. GE-312 Digital Control Computer, General Electric Company. Designer: H. H. Bluhm, staff.

10. Precision Standing Wave Detector, De Mornay-Bonardi. END

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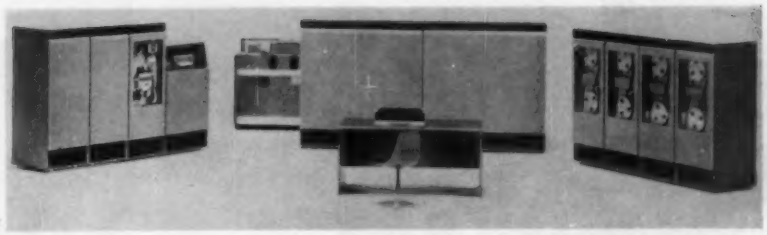

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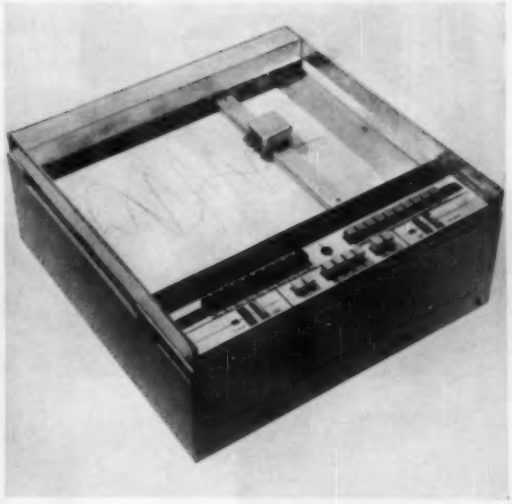

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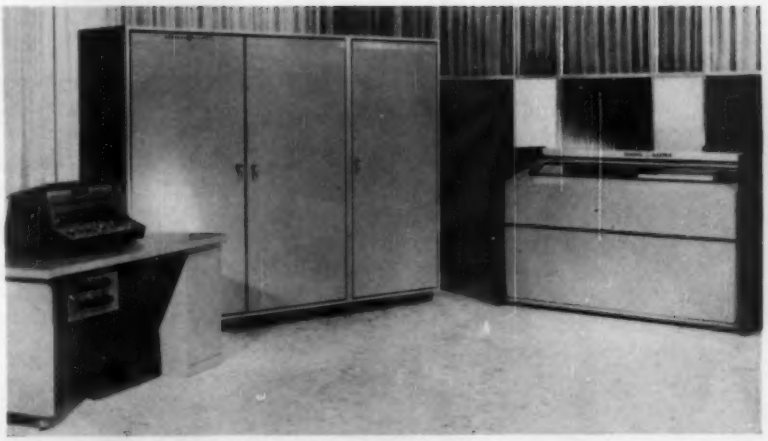

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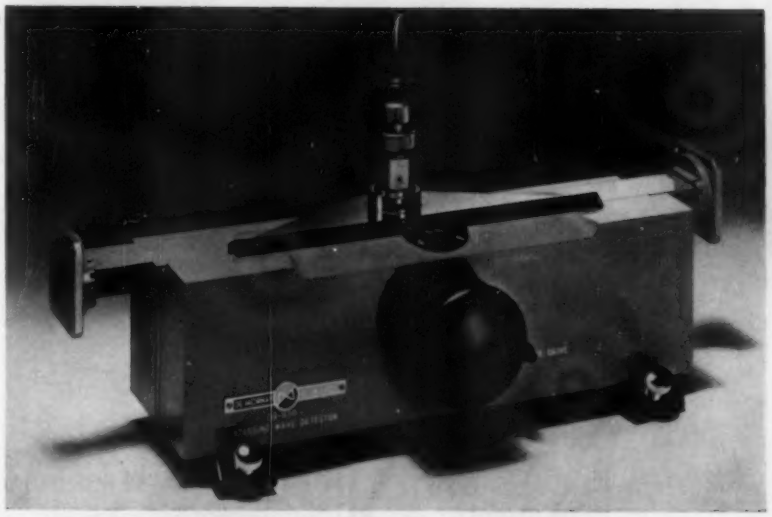
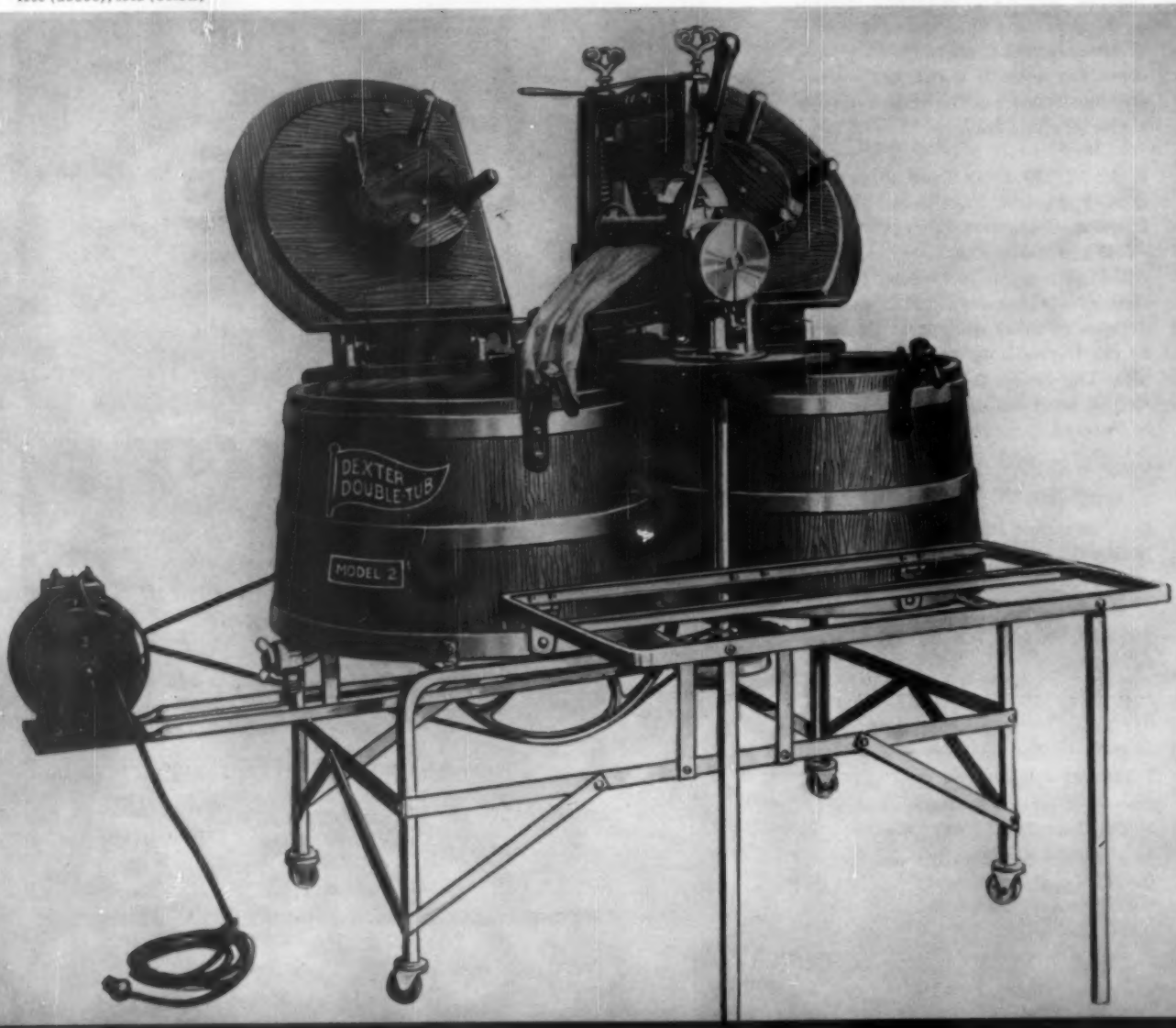
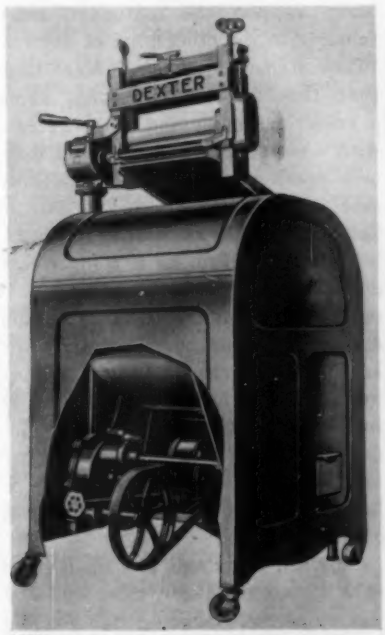


1900 (above), 1905 (below)

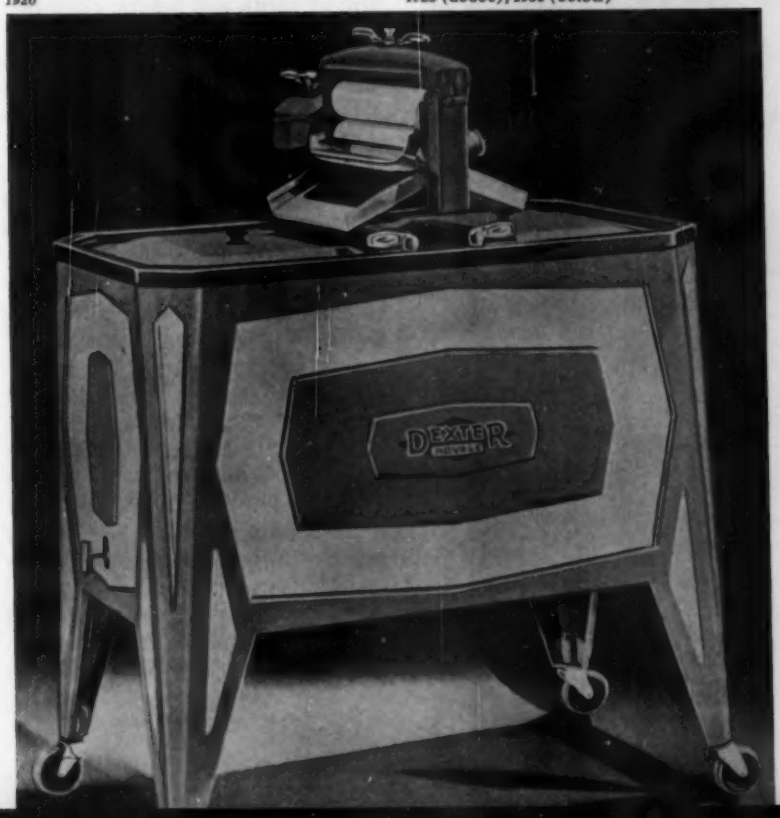


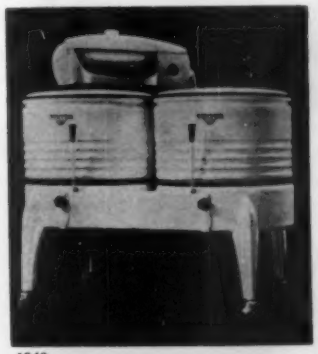
Wringer washing machines *have evolved from an externally powered wood tub (upper left corner) to the "deluxe" unit introduced last month (lower right corner), boasting a plethora of controls and a control center from which to control them. It was designed by Harper Landell & Associates for Philco's Dexter Division; and Mr. Landell collected and researched the material shown here. In 1905 an electric motor appeared, and in 1910 it was incorporated into the tub circumference. In 1920 the product was redesigned in metal, and five years later, according to Mr. Landell, "industrial design principles were applied—superficially." 1930's twin-tub mechanism was concealed and graphically disguised, but the tubs came out of hiding by 1940. The 1950 model included an automatic safety wringer that was first introduced by Dexter in 1947.*



1920

1925 (above), 1930 (below)





1940

1950

1961

F. Eugene Smith

Gene Smith's quiet announcement, four months ago, that he was leaving the firm of Smith, Scherr and McDermott caused comparatively little stir outside his own office: those of his acquaintances who heard the news felt that it was vaguely "too bad," although they cannot even now pin down the reasons for their regret. Many express the sentiment, more familiar in the other kind of divorce, "They seemed so happy." More than that, they were so successful. From a precarious beginning 13 years ago, with a mortgaged Chevrolet and their own brash optimism as their only assets, F. Eugene Smith and Samuel Scherr, and later Bernard McDermott, had built the firm to a point where one estimate predicted that the 35-man office would do half a million dollars worth of business this year. Last year, *Fortune*, using its own mysterious calculations, ranked them sixteenth among the twenty biggest industrial design offices, and last year they moved into their own new building which they are already thinking of enlarging.

Thirteen years ago, one small room in a downtown Akron office building was more than large enough for the firm of Smith and Scherr, since they had neither clients nor employees to clutter it. A $1000 mortgage on a jointly-owned '46 Chevrolet was their only capital, and Smith's one-day-a-week teaching job was their only steady income. They were both 24, and Scherr was married, with a child on the way. Their credentials consisted of diplomas from the Cleveland Institute of Art and a year of experience each: Scherr at GM and Smith at the George Walker office. Few young designers today would establish a business on so shaky a foundation, but Smith and Scherr had known since high school that they wanted to start a studio together (in those days, it was a commercial art studio, and their youthful sense of humor invented the name Smear Studios as an appropriate combination of their two surnames), and neither of them much enjoyed being an employee. There was no question about the choice of Akron as

GALLERY 3

"Who leaves an established hit for an experimental production?"

BY URSULA McHUGH

their location: they had always lived there, any acquaintances they might be able to turn into clients lived there, and, most important, Akron was the center of a manufacturing area that was as yet virgin territory as far as industrial design was concerned.

In many ways the city itself was the determining factor in the young firm's development. For many years its biggest business, rubber, was almost its only industry; the chateaux and Norman castles of Akron's rubber barons are still its most imposing architecture. In 1918, its citizens proudly tell visitors, Akron had twenty millionaires; in 1920 the rubber market collapsed and the city began tardily to learn the value of diversification. When Smith and Scherr began to offer their talents to the local business world, therefore, they found that their prospective clients were for the most part adolescent industries, innocent of design experience and still too small to pay for very extensive design services. What experience they did have lay chiefly in graphic design; and Smith and Scherr's first jobs were mostly murals in recreation rooms, advertisements—"anything we could get." Some advertisements turned into products: Rubbermaid, today one of the firm's most important product accounts, was signed up as a result of a call Scherr made on its advertising department ten years ago.

From the first, Scherr was responsible for recruiting clients while Smith spent nearly all his time on the actual designing. This was completely a matter of individual preference: their design training had been almost exactly the same, but Scherr is by nature a salesman, with a boundless energy, optimism, and enthusiasm which he is anxious to communicate to anyone who will listen to him. He is fascinated with the color and glamor of big business and with the excitement of setting projects to spinning all around him. Smith never shared this enthusiasm, although once the account was obtained he worked with the client's engineers and product planners. It was impossible, of course, to separate the functions completely in a two-man office, and when Scherr wasn't making calls he took his turn at the drawing board.

Their first big account was Sunray, in 1950. Scherr had called on Carl Bjorncrantz at Sears, who referred them to an ex-Sears man who had bought out a stove company in Delaware, Ohio, and might be in need of a designer. The line of stoves they designed for Sunray was the first of the major appliance designs that have been a mainstay of the firm. Gradually they added a few designers to their staff and in 1954 Bernard McDermott became the third partner. He too had been born in Akron and graduated from the Cleveland Institute of Art a few years before Smith and Scherr. He had taught there part-time—his future partners were two of his students—and worked part-time as staff designer for the Sun Rubber Company. McDermott's primary responsibility became package design, as Smith's was product design, although they drew no hard line between their departments. McDermott also took over a good deal of the internal administration of the company as it began to mushroom.

From 1955 to 1959, the design staff tripled, and the company, which had long since outgrown the downtown office building, began to strain the seams of the converted farmhouse they rented from a local restaurant owner. Of necessity, the atmosphere in the farmhouse was informal; the partners' offices were little more than closets and no one could help knowing all the office news. Departing visitors might find their hats decorated by frivolous staff members, and client presentations were often interrupted by designers passing through to the communal coffee pot in the rear. The farmhouse was scheduled to be torn down in 1959, however, to make room for a parking lot, and partners and designers began to scout the countryside for a new location. Smith favored a barn or an old carriage house, but since none seemed likely to present itself before the eviction date, the firm went ahead with plans for a building on a newly-cleared tract on South Miller Road. The new offices were in sharp contrast to the farmhouse: each of the partners had a large private office up front; the dignified conference room was furnished with Saarinen pedestal chairs and a coffee table that could be raised or lowered completely into the floor; and the decorations were mostly Asian art objects collected in the course of the government projects the firm had begun to undertake.

One Saturday morning last April the three partners were completing plans for the latest of these projects: an ICA mission to Japan. (The firm, which had recently raised four of its designers to the status of associates, had a regularly scheduled management meeting on Monday evenings, but the partners had continued their old custom of talking things over together on Saturday mornings.) McDermott and Smith were scheduled to leave shortly for Japan, and that morning's meeting was to discuss their trip. At the end of the session, Smith announced diffidently that he had one more thing he'd like to say: he was leaving the partnership.

Scherr and McDermott were not the only ones to be thunderstruck by the news. Not even Smith's wife had known of his decision, and to Akron acquaintances and professional colleagues, the news was incomprehensible. Why does a man leave a firm he has helped build for thirteen years, a firm which has just succeeded in establishing itself as a solid success, a firm in which his partners are two men who have been his friends all his adult life? And where does he go from there? what sort of man and what sort of designer poses himself this problem and makes this decision?

The bewilderment which Smith's decision caused among his friends might in another man indicate some element of mystery, yet "mysterious" is the last word most people would use in connection with Gene Smith. His extremely round, innocent blue eyes and soft, hesitant voice are enough to dispel any suggestion of guile, and his crew cut and ingenuous manner make most strangers mistake

him for a well-brought-up college student who has strayed into a meeting of his seniors. ("He's rather a sophisticated country boy, though, isn't he?" one of his confreres remarked drily recently.) To all appearances, his life is crystalline. Not only has he remained close to the people and places he has always known and who have always known him, but his own manner is remarkably candid: obscurity distresses him, and he will return to a point again and again until it is clarified for others and for himself.

F. (for French) Eugene Smith was born in 1923 in Ashland, Ohio, and moved with his family soon after to Akron, where his father was an official in one of the city banks. The earliest dramatic event in his life occurred when a car ran over him (the wheels, fortunately, passed on either side of him and he was untouched)—an event which introduces two of the motifs which recur throughout his career. The first is the lucky break. "We used to have a saying that Gene could fall down a manhole and come up covered with gold," says one of his acquaintances in a voice tinged with a certain human envy. The second is the automobile. (Smith gives it a Midwestern accent on the third syllable.) From the day he was first run over,

Directly above, F. Eugene Smith Associates hold a staff meeting on the terrace. Clockwise, starting at the bottom: Smith, Richard Oborne, Roy Ozake, and Roger Sweet. The new firm is housed in the remodeled barn at left, which contains both air conditioning and the original rough-hewn log supports. Above, left, is the entrance to what is now Scherr and McDermott and Associates.

Smith's life has been involved with cars to a degree unusual even in America. Most people, trying to describe him, think first of his sports cars, and even the moustache he wore for several years was originally grown during a long convalescence that followed a bad collision between his car and a truck.

In high school, Smith won a number of county poster competitions and a scholarship to the Cleveland Institute of Art. It was only then, when he saw the work of the industrial design department, headed by Victor Schreckengost, that he learned there was such a thing as industrial design, but he decided with no hesitation that it was for him. His teachers remember him as a bright, but not brilliant, student, particularly good at learning from criticism, and with an unusual sense of his direction and his goals. Cleveland Institute of Art sends most of its industrial design graduates to Detroit, usually to GM or to Ford. In 1946, when Smith graduated (his schooling had been interrupted by wartime service) George Walker still had his independent design office, and Victor Schreckengost arranged a job interview for Smith. He did not debate long about taking the job; there were few openings in 1946, competition was stiff, and he was, he says now, almost completely ignorant of the field. He enjoyed the Walker office, as much as he could ever enjoy working for someone else, and he worked on the '49 Ford, his first and last chance at automotive design, although this is the kind of design that would give him the most personal satisfaction—if it could be done his way.

His extracurricular activities that year included flying lessons, and in the course of these he collected a summons for flying too low. He stopped off on his way to the office one morning to pay the fine, and found himself handcuffed to a convict and clapped into a cell. In his neat business suit, bow tie, and brown and white shoes, he was obviously, to his cell-mates, a highly successful criminal, especially as Smith, who believes in doing everything well, dropped hints of murder and other big-time offenses. Finally, George Walker, informed that one of his designers needed bail, peeled off a hundred dollar bill from the wad he always carried with him, and instructed a henchman to spring Smith. Shaking hands all around, Smith parted from his fellow-prisoners in the glow of amiability that accompanies him wherever he goes, and took with him a list of new friends who hoped for employment as bodyguards when they too were free.

Both Smith and Scherr were growing impatient as the year wore on: they had never wavered in their intention to open their own office, and it seemed to them that a year of experience was more than enough to prepare them for independence. Once they had achieved it though, it seemed their education had just begun. Smith now feels that the first few years of the firm were a rather lonely learning process. The very lack of competition that made Akron such a good choice for a young firm meant also that there were no other designers to learn from. Since their clients in most cases had no previous experience with industrial design, Smith and Scherr had to proceed by trial and error, working out their own solutions to problems as they arose.

Scherr

McDermott

Mostly to establish some means of communication with the rest of the profession, they joined the ASID as soon as it would let them in, and attended meetings determinedly. They were far younger than most of the other members and parties seemed to them the most natural way of making friends, so they gave them. But they tolerated no half-way measures; their party at the annual ASID meeting always lasted all night (except for one time when the police closed it up). The gatherings had a certain wholesome, boyish atmosphere that is probably Smith's own most obvious surface characteristic. The highlight of one of them, remembered by both Smith and his guests with real nostalgia, occurred when they took the hotel room door off its hinges and awarded it as the door prize.

The same inclination toward conviviality appears in his non-design life. In 1950 he married Ramona De Laney, whom he met while she was a student and he was teaching at CIA. For several years after their marriage they lived in a tiny apartment over a garage, into which they would periodically pack fifty or so friends. Besides parties, they are also involved in community activities and since Mrs. Smith is an illustrator, most of these have put their joint design talents to use.

Four years ago, the Smiths bought a farmhouse on the edge of the Seiberling estate, of timber and brick construction like the estate's main house, which is a replica of a Tudor mansion. The Elizabethan style is not one which is particularly fashionable today, but Smith, who has always been oblivious to vogue, proceeded to construct his own version of a Tudor back porch and a Tudor garage, with leaded windows and timbers salvaged from demolished barns.

He worked very slowly, refusing to move ahead until he was completely satisfied with each detail, and for years the family, which by now includes two small children, lived in the basement and second story of the house while the kitchen and living room were taking form. He decided that the kitchen should be fitted with a certain very expensive kind of cabinet; he bought them one at a time as he could afford them, refusing to compromise on anything less than perfection. The same perfectionism is applied to every detail of his environment; his wife complains, only half jokingly, that it takes him weeks to buy a new suit, and when he ordered his Aston Martin (the first in Akron),

he was not completely satisfied with the standard upholstery, so he sent to Italy for leather, which he then shipped to England, where the car was being built.

An aspiring perfectionist's life becomes more complicated where it touches other people. Smith has never enjoyed the process of argument: the sound of raised voices makes him acutely uncomfortable, but neither is he willing to give in or to compromise when he is sure that he is in the right. When he applies the terms "good" or "bad" "honest" or "dishonest" to design, he is not speaking figuratively; he judges products and behavior by the same ethical standards, and his conscience will not excuse wrong-doing in either. Often he sees a moral question where, to another observer, none is present: he wonders, for example, whether it is not hypocritical for a modern designer to live in a Tudor house.

Curiously, his refusal to compromise does him the most good in the most unexpected place: with clients. Several of them proudly describe Smith's unwillingness to change one of his designs to accord with a market survey or with a less troublesome method of manufacture. Seemingly, Midwestern manufacturers expect a designer to exhibit the "idealism" and unworldliness they attribute to an artist, and a former associate says of Smith, "I've seen him lose the account, but never the client's respect."

He feels as strongly about design education as he does about design. On an informal level, he will spend endless effort and hours of what free time he has in working with a young designer who comes to him for help. He was an instructor of industrial design for seven years at the Cleveland Institute of Art, where he gradually formulated his ideas about how design ought ideally to be taught. These ideas he presented to the directors of the Institute in a long report proposing a complete reorganization of the industrial design department. But the plan would have necessitated a five-year course, which the Institute did not feel ready for, and Smith felt that this called for his resignation from the faculty.

A few years later, when he resigned from the firm, he had not submitted any proposal for reorganization; his ideas of how a design firm should ideally be run were still too vague for formulation. He explained to his partners only that he felt he was becoming too enmeshed in administration. They were bewildered, for they felt they had done everything they could to isolate him from the details involved in running a big design firm. None of the three of them, however, had reckoned with the perfectionist's feeling that, for him at least, there is only one right way for the world to be run, nor for the fact that a man who will stand behind his decisions will also probably insist on making the decisions he stands behind. In a big firm, there are too many decisions for one man to make all of them, or participate in all of them, or even know about all of them. Scherr and McDermott feel that only in the last year has the firm become large enough to handle large assignments in the proper depth. They feel that, from a standpoint of efficiency and scope, it is important to have an expert modelshop on the premises and to employ a substantial group of experts. You only get the challenging assignments, they argue, if you are ready for them, and while you wait for them you keep your staff busy doing the best job it can on the work at hand. Less abstractly, both Scherr and McDermott frankly enjoy running a big office, and count it as one of their professional accomplishments that they have helped build the means by which so many people earn their livelihood.

Despite his liking for large parties, however, Smith is not essentially a person who works well with large groups; observers at his parties say he is much more likely to be sitting in a corner talking to one person than holding the center of the floor. He is, in fact, that increasingly rare thing: a lonely individualist who goes his own way, sure that it is a good way. Perhaps because this is not a fashionable characteristic in an era of teamwork, Smith, at 37, tends to align himself with an older generation, speaking regretfully of the young designers who come in for job interviews and ask about fringe benefits, who value security more than anything, and who want to leave a party at two o'clock in the morning instead of staying up all night taking doors off their hinges and talking about design.

He might be thinking of his own professional beginnings when he criticizes young designers for being afraid to take risks, but Smith says now that he thinks it was a bad decision, that he would have served his early clients better if he had had more experience, and, in fact, for the sake of the profession, no young designer should start an office fresh, or nearly fresh, out of school.

On the 1st of June, when he established F. Eugene Smith Associates in a barn in Bath, a village outside Akron, he was admittedly taking a risk, although probably not the financial risk many people assume. For one thing, Smith is not beginning at the beginning: he has the financial backing of his share of the partnership, and he already has a substantial roster of clients, a majority of whom he has worked with before. For another, Smith does not worry a great deal about money—not, probably, because it means nothing to him, but because he shares the Puritan belief that the godly will prosper.

What he does risk is the possibility that the vision may not become a reality; that the things that led him to resign from his former firm may be a necessary part of the business of design. He envisions a group of eight or ten designers, working as independently as possible, and all sharing in the profits and in the management of the firm. He even hopes to collaborate with other design offices on special projects and has already made an agreement with Paul McCobb to that effect. He has allotted one corner of the barn to a small modelshop, but he wants to farm out most of the modelmaking and drafting and other routine tasks, leaving the design group free for more creative

work. In this way, he thinks, they can handle even large assignments, and yet not have to accept any job they can get simply to pay the salaries of a big staff. He would like eventually to concentrate on experimental projects. Specifically, he is going to try to avoid seasonal model changes and has already refused a number of clients.

So far, Smith has a staff of three designers. He has eliminated one sign of hierarchy by maintaining a large open studio area, where all four of them can work together. The next addition to the staff will be the perfect business manager he hopes he will discover one day soon.

To anyone who has heard Smith describe his plan, sitting on the brick terrace outside the barn, where he and his designers will eat their lunches on sunny days, the charm of the vision is irresistible. However, the firm is still too new to give any indication of whether it will succeed in solving the conflict of designer as individual creator and designer as member and director of a business enterprise, of whether the real can match the ideal, or of what Eugene Smith will do if it doesn't. END

As director of product design for Smith, Scherr and McDermott, Smith was largely responsible for these three products. Above is the Tappan 400, perhaps the firm's best-known design. Its sales astonished the manufacturer, who had intended it as chiefly a prestige item. The two products at right were designed for Rubbermaid; the mixing bowls above were the manufacturer's first venture into plastics.

Cooking, once confined to the kitchen, continues to spread all over the house and garden with a multitude of portable electric gadgets. Some of these, such as the hamburger toaster, or thermostat egg cooker, are engineering specialties; and some, such as the shishkebab cooker, are exotic novelties. Others follow the Scandinavian lead toward cookware that is not out of place at the table—Pyrex has put out an electric coffee maker and casserole combination designed to appear in the dining room, while Proctor has dressed up the toaster with porcelain panels. Outdoor cooking has become so scientific and mechanical it might as well come inside again. Salton's hot-tray with dome is hardly less cumbersome than an oven itself, and the barbeque-and-grills may give the appearance of roughing it but most of the cooking is done with electric heat. No muss, no fuss, no fun.

Corning *Pyroceram skillet is claimed to be the first use of a non-metallic material in an electric cooking unit. Handles are of black plastic and the casserole dish is decorated with black scroll. Staff design: James H. Bierer, head.*

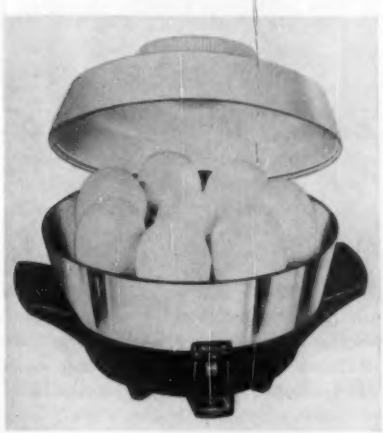
Corning *coffee percolator now has an electric attachment which is completely immersible for easy cleaning. The pot is made of Pyroceram and gives the appearance of chinaware. Staff design.*

Salton *patio hot-tray is covered with a plastic dome hinged to the base but removable for cleaning and storage. Dome has walnut handles to match handles on the tray; adjustable temperature control. Designer: Peter Quay Yang.*

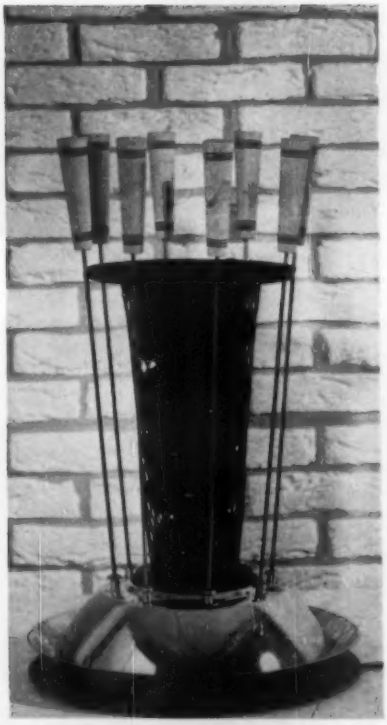
Stanthony *patio cart broiler has a rustic redwood frame around a complicated machine with tilting grill for grease run-off, crank for position adjustment, and a bed of ceramic cerra-coals for easy cleaning. Staff design: Anthony Joseph.*

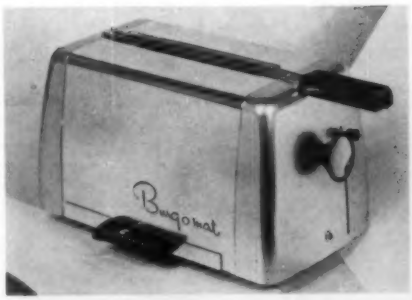
G.E. *portable grill is another barbeque without muss or fuss. Electric heating element can be removed and the rest is immersible. Hood tips back or can be removed. Design is simple and temperature unit is not adjustable. Staff design.*

Sunbeam *egg cooker prepares 8 at a time; it has a small pin at the center to pierce shells and prevent breakage. Cover is Melamine; base resembles current coffee pot styling. Staff design.*



GE *has gone back to the square rotisserie-broiler and added ventilation at the top and bottom of the glass door. The exterior is chrome plated with red, white and blue push-buttons and an electric timer. Staff design.*





Cole *Burg-O-Mat portable broiler works and looks like a toaster with vertical timer and meat holder. It is finished with chrome sides, coppertone ends and bakelite legs. A small drawer below catches the drippings. Staff design.*

Proctor-Silex *new toaster has an ebony trim and porcelain end panels decorated with the stylized stars that appear on so many recent housewares. (Another new Proctor-Silex toaster has porcelain panels with butterfly designs.) It has automatic bread-lowering device. Staff design.*

West Bend *Kabob'nGrill of chrome and black-enameled steel has an upright charcoal basket, drip shield, rotating skewers, and a motorized base. Staff design.*

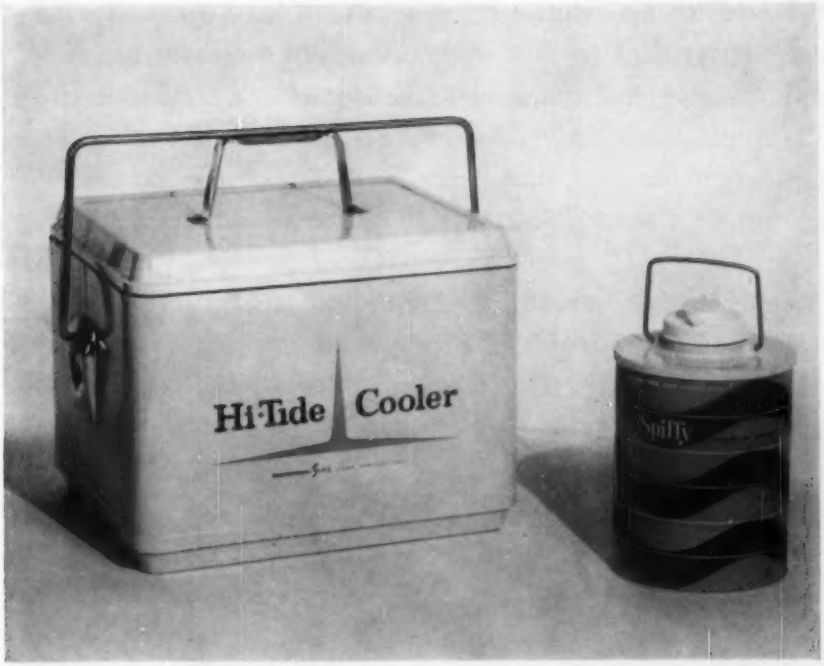
Non-electric housewares have long been appearing in plastics but often the shapes have remained the same. Only recently have new forms, colors, and patterns been developed that are specifically related to plastics. For instance, Ekco's classic kitchen cutlery has branched out into a new line with decorative handles, and the garbage can, whose corrugated ghost haunts several plastic models, has been redesigned for Loma Industries with a variety of patterns embossed on the surface. The rural mail box, another familiar item, has also been redesigned, not because of new materials or uses, but perhaps in recognition of fashion and the new suburbia. After more than 50 years of countless submissions, the Post Office has finally found and approved a box with no tricky devices but plenty of styling: this one is visored, chromed, and two-toned.

Loma Industries *new garbage cans have embossed designs with matching lids. Colors are strong and more adapted to outside surroundings than the usual pastel tones: Burgundy, dark green, blue-gray, yellow. Designer: Alan Berni.*

Loma Industries *new program for combining plastics with other materials is shown in a bread-box with plastic body and aluminum lid. The plastic tray which fits below the top has wood on one side for slicing. Designer: Alan Berni.*

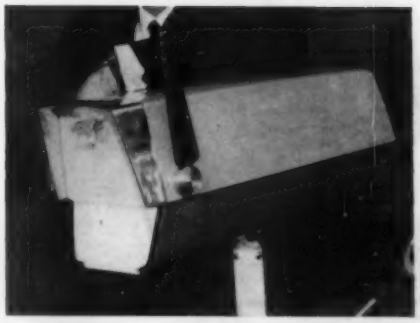
Plastray *high-density polyethylene pitcher with high-gloss finish has a slim, curved handle and slightly tapered base. Lid has threaded screw and scalloped finger grips. Turquoise, yellow, pink. Designer: Robert O. Burton Associates.*

Como *polyethelene fruit and vegetable bins nest into one another for shipping, are easy to assemble. Colors are copper and white. Designer: Roy A. Lain.*



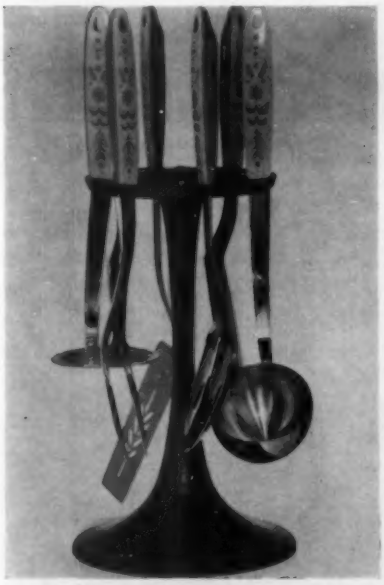
Hamilton Skotch *cooler has interlocking handles, identical flange contour on base and lid. Vacuum jug with bail handle is striped in red and white or two tones of blue. Staff design.*

Lee Silver Service *has put out the new multicolor mail box with white top, metallic grey bottom, blue hood, chrome trim, and red "quill"-shaped flag. Designer: William M. Schmidt.*

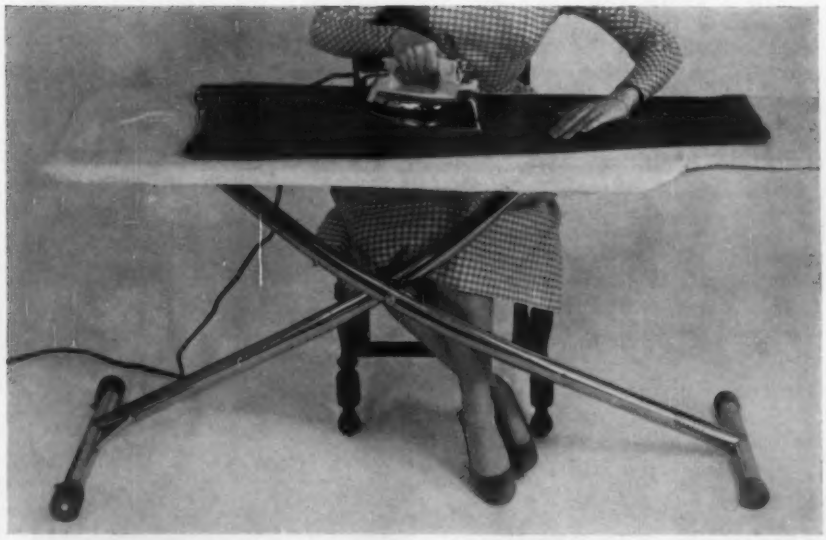


Aladdin Industries *vacuum jug has handle and jacket molded in one piece from red polypropylene. Serving cup fits over screw-top lid. Ribbed exterior prevents slipping. Staff design.*

Proctor-Silex *ironing board has an adjustable working surface with two flip-flop edges; one squares off the tapered end of the board and the other adds two inches to the width. The legs are curved outward to provide more knee room, and the turquoise rollers on the feet lock when the board is in position. Staff design.*

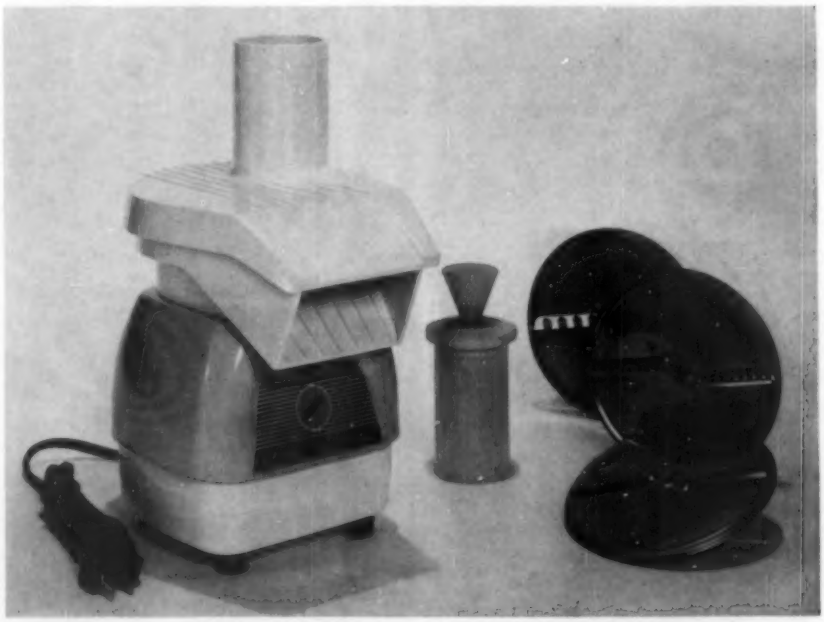


Ekco stainless steel *utensils now come in cook-and-serve version: beige and white melamine handles are decorated with gold and umber floral pattern. Holder is a Lazy-Susan. Designers: Latham-Tyler-Jensen.*

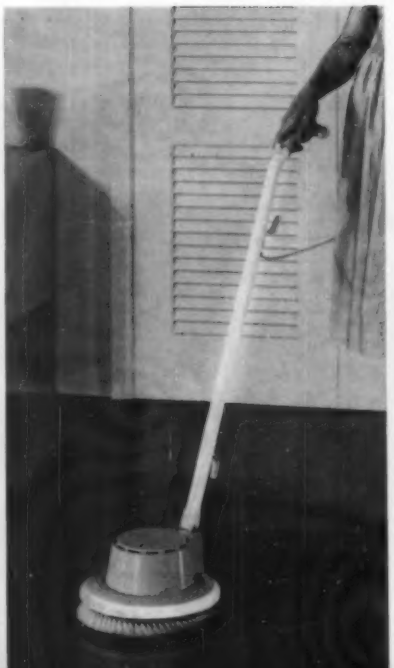


Cogs, levers, cranks, and handles may clutter the silhouette of hand-operated housewares, but they do differentiate a meat grinder from a potato peeler, egg beater, or broom. Electric housewares have no such automatic identity-through-function. Since a similar mechanism and the same buttons tend to run them all, their differences (if difference is wanted) have to be acquired. Unfortunately the search for these too often settles for fads and fancies, with some curious results: this year GE has a boat-decked beater, and Proctor, a steamship iron. Meanwhile the visored grid keeps wrapping itself around more and more products, with the inevitable result that it defeats its purpose—underneath, the device could be a vacuum cleaner, a hair dryer, or a vegetable shredder; who knows? Is *this* design distinction?

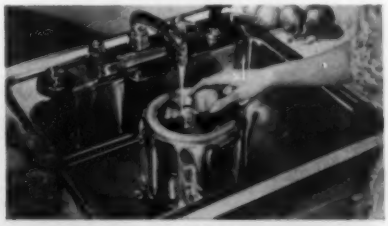
Whirlpool *Imperial Mark XII vacuum cleaner follows current trend of supplementing suction action with motor-driven brush; motor for the Mark XII's brush is in the wand. Cannister is two-toned blue with visor and grid; it houses cleaning attachments, as well as motor. Staff design.*



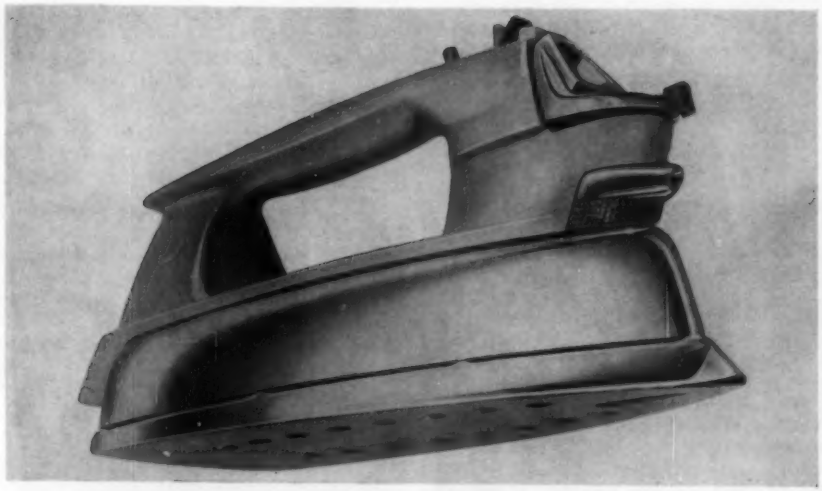
Silex *plastic shredder-slicer-grater has two-tiered enamelled steel base of gray blue and white with softly rounded corners. Housing for cutting discs relates to base in contours and detailing. Staff design.*



Westinghouse *scrubber-polisher has a neat housing; brush and buffer are held by rubber gaskets and can be attached without stooping. Brush action is from side to side, rather than circular. Staff design.*



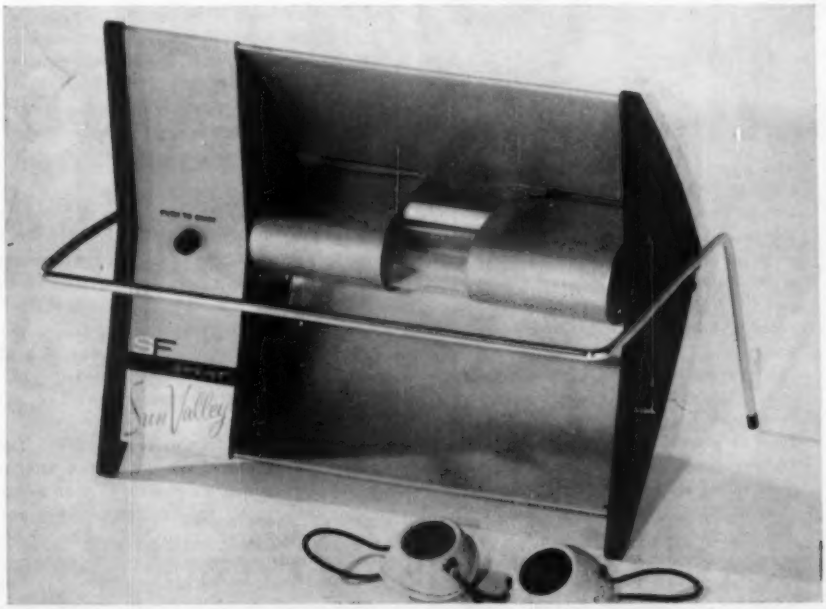
Manesco *vegetable and fruit peeler operates on sink disposal unit, has a plain polished aluminum hopper with an abrasive disc on the drive shaft. Rubber cup on bottom attaches it to disposal unit. Staff design.*



Proctor Silex *spray, steam and dry iron has sleek lines but looks complex because of white and blue switches and gilt finish on main body and around apertures on handle. Handle is white, black or brown. Staff design.*

Universal *hair dryer is housed in a turquoise plastic case with curved, swept-back sides tapering to back and framing a gilt control panel in front. Staff design.*

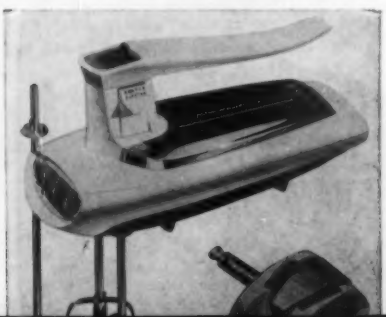
Sperti Faraday *economically designed sun lamp reduces components to a minimum. Black Bakelite sides follow the wide curved reflector and also serve as two front feet; guard surrounds the unit and also supports it in back. Designers: Waltman Associates.*

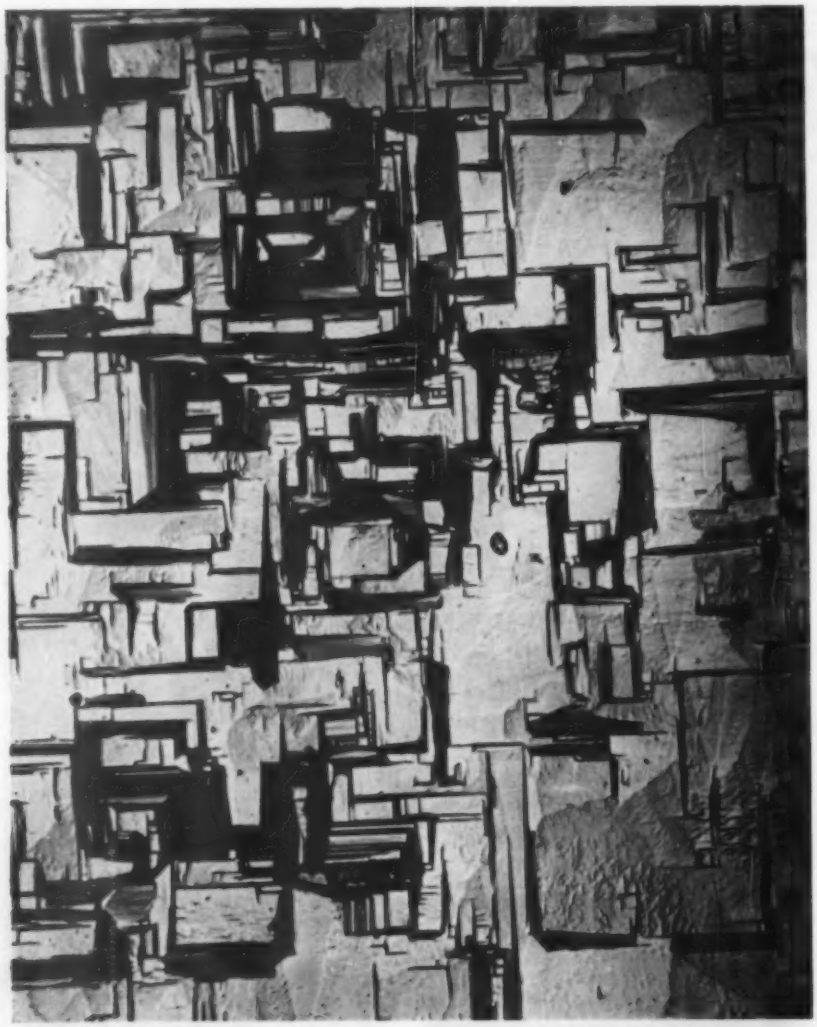


Kitchen Aid *new portable mixer is restrained in design with an unusual triangular front, but panel design recalls the popular framed look (see Westinghouse model below). Designers: D. A. Meeker, C. M. Allen.*

Westinghouse *portable mixer is a typical example of the current visor style, with overlapping top, and decorative front panel. Base is white with yellow or pink, or all white. Staff design.*

GE *mixer may be harbinger of shift from square to windswept look in housewares; elongated, flattened oval body is a departure from rectangular styling. Knife sharpener snaps into rear end, continuing tapering line of body. Designers: Staff, and Paul Rawson.*





Growing electronic components

The photograph above, which appears to be that of a modern, non-representational painting, is actually a photomicrograph (350 X) of a new type of semiconductor material in which a layer of one substance is grown on top of another. Vapor growth, the fabrication process which makes this possible, is a major advance in solid-state electronic technology. It will be used to produce functional circuit-building blocks for future high-speed computers that will be faster, more complex, and more compact than any presently available. In addition, the vapor growth process promises precise and automatic control for volume production of solid-state components because it may eliminate the need for manual assembly.

The vapor growth method of growing semiconductor materials is markedly different from the usual process of freezing the molten semiconductor, cutting it into minute pieces, and introducing the desired impurities by separate operations of alloying or diffusion, followed by careful hand assembly under a microscope.

In vapor growth fabrication, the semiconductor device is grown in one operation layer by layer from the vapor. This type of growth is done at extremely low temperatures, whereas growth from the melt, alloying and diffusion are all carried out at high temperatures with the result that one layer is disturbed by the treatment necessary to form another. Complex structures are thus difficult to make by conventional means.

The vapor growth process takes place through the intermediary of semiconductor iodide vapors which pick up the semiconductor (germanium or silicon) at a high temperature. The vapors then move into a cooler zone where the semiconductor grows from the vapor onto a suitable single crystal seed. In this type of growth, known as epitaxial, the top layer automatically duplicates the structure of the crystal beneath it, thus allowing best advantage to be taken of the properties of each material.

The process may be carried out in two types of apparatus. In one, a continuous flow of gas carries the vapors in one end of a furnace and out the other. In the other, a closed tube is used and the iodide vapors recirculate, carrying the semiconductor from the hot end to the cooler end. Selected impurities are incorporated into the growing semiconductor at the cooling end during the growth process.

The purity of the vapor grown material is said to be very good, and although it might be expected that a large amount of iodine would be incorporated, measurements have shown that the grown material contains as little as one part in a hundred million of iodine, and this has no effect on its electrical properties. In addition, the crystalline structure of the grown material is excellent; and it may be that because crystals can be grown without dislocations, they are the most highly perfect crystals—each atom in its exact place—known to science.

Devices fabricated by the new method include simple diodes, variable capacity diodes, Esaki tunnel diodes, and transistors. *Manufacturer: IBM, New York.*

Electronic converter

An electronic converter, said to be 50 times faster than any similar unit now available, has been developed to convert an analog or continuous signal into a digital or number form for processing by a digital computer. The device, which is capable of pouring out two and one-half million samples of information per second, will be used in the conversion of data from missile and space flights, nuclear explosions, and from other advanced research.

Digital computers are considered far more accurate and versatile than analog computers, and they can be used in many cases where the analog cannot. For example, a converter and analog combination can be used to measure the stress or strain of an airplane wing — as the wing stretches under strain, a tiny "pick-

off" device gives off analog signals which are then converted into a usable digital form. It would be extremely difficult and impractical, if not impossible, to handle all the analog signals relevant to a single problem without conversion to digital form. The new converter is less than a cubic foot in size. *Manufacturer: Raytheon, Waltham, Mass.*

Radio testing device

A testing device has been introduced which automatically guides a radio repairman in pinpointing faulty circuits and components in a transistor radio. Known as TRACE (Transistor Radio Automatic Circuit Evaluator), the device (below) is a facsimile of the actual radio circuitry; it contains color-coded circuit paths and printed locations of all major components.

During testing, the TRACE panel is positioned directly over the circuit side of the radio's printed circuit chassis. The

panel has small holes punched in it at each signal or voltage test point. The repairman simply inserts a signal test probe in the appropriate hole, and by working along the signal path from the speaker to the antenna, he can determine when a faulty stage is reached by the change in sound emitted from the speaker. The stage in question is then checked by a voltmeter. If the voltage varies either above or below the correct values (listed on the panel), the faulty stage can be replaced or repaired. The manufacturer has designed TRACE panels for each transistor radio model in the line. *Manufacturer: Philco Corporation, Philadelphia, Pa.*

Vibration analyzer

A vibration analyzer has been developed which is capable of detecting the exact source of vibration in an assembled jet engine. The device, known as Autotrack (below), promises to save the millions of dollars that are presently being spent to remove entire jet engines in order to locate sources of excessive vibration—the number one headache of the mechanic. Such vibration may be caused by any one of dozens of bearings, shafts, turbine blades or other components

which, if isolated, could be individually replaced without removing the entire engine.

Most conventional vibration analyzers are only able to determine the total vibration of an engine and cannot differentiate among the various components. The Autotrack instrument can be tuned so that it listens to the exact frequency of vibration of a particular component, and to no other. It is so sensitive that it can detect the difference between two separate vibrations just one cycle per second apart, provided one signal is larger than the other. In addition, it is able to listen to the vibration of any shaft as the engine is accelerated from idle to full power. It has a frequency range of 5 to 2,500 cycles per second. *Manufacturer: Convair Division, General Dynamics Corporation, San Diego, Cal.*

Ceiling lighting plus

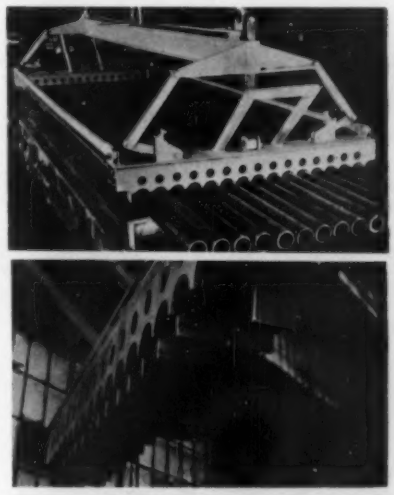
The combination of two plastic materials makes it possible to construct an over-all ceiling lighting system that not only has good light diffusion, but, in addition, provides balanced sound absorption throughout the entire frequency range. Known as Soundsheet, the new material consists of a rigid, perforated vinyl sheet that has a thin layer of vinyl latex saturated paper laminated to both sides. The saturated paper forms a thin, flexible member over the perforations, turning them into tiny sound traps. Soundsheet is available in both translucent and opaque sheets in corrugated or flat form, and in decorative preformed units. The vinyl latex coating, a product of the B. F. Goodrich Chemical Company, is said to provide a smooth, washable surface. *Manufacturer: Contrex Company, Chelsea, Mass.*

All-purpose wood preserver

A new all-purpose, water-repellent, liquid preservative to protect wood against insects, decay, surface molds, mildew, and fungi has been developed. Trade-named the Oz Wood Preserver, the product contains Butinox, a liquid organotin compound produced by Metal & Thermit Corporation. It is non-injurious to plants, and is said not to affect sensitive skin, as do many existing preservatives. In addition, it does not stain, or leave a residue to complicate painting, and it improves the paint-holding properties and dimensional stability of wood subjected to weather changes. *Manufacturer: Osmose Wood Preserving Company of America, Inc., Buffalo, N. Y.*

Pipe lifting device

A recently developed device, which can lift an entire row of pipe or tubing at a time, has substantially reduced pipe handling costs. Known as Protolift, it consists of a spreader bar supporting two tubular engagement bars. In each engagement bar, there are two rows of curved finger bars, working in opposite directions, so that each length of pipe is gripped around more than half its



circumference, at both ends. Protolifts presently in use lift as many as 15 lengths of pipe at a time. *Manufacturer: Materials Handling Division, Hoppenstall Company, New Brighton, Pa.*

High temperature refractory

A new high-temperature refractory material is expected to have wide application as a structural ceramic; it is relatively low in cost, high in physical strength and in resistance to attack by heat and molten salt. The material — Crystolon 63 — has already been used experimentally as a lining in aluminum reduction cells, and test results are said to have indicated that wall thickness of the cell linings can be reduced about 75 per cent because of the material's high resistance to heat. Other potential applications for Crystolon 63 include melting and alloying high-purity metals, transferring molten materials, and as struc-

tural ceramic for package boilers, incinerators, and kilns.

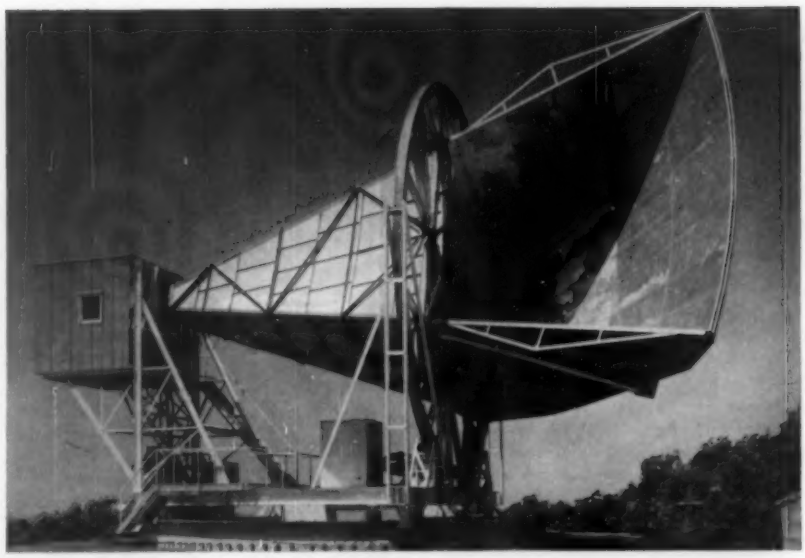
Crystolon 63 is a silicon nitride bonded refractory (silicon carbide). Conventional refractory materials have oxide or silicate bonds; however, these bonds quickly break down in the presence of salts limiting the effectiveness of the refractory. The new refractory is said to resist attack from these conditions. *Manufacturer: Norton Company, Worcester, Mass.*

Underwater robot

A robot with a television camera, four self-contained 500 watt floodlights, and powerful claw-like pincers is being built to work on the floor of the ocean. The robot (below), known as Solaris, is designed to swim along the ocean bottom (at a maximum depth of 2,000 feet) and retrieve desired objects (weighing up to 7,500 pounds). It does this by flashing images of what it sees with its television eye to a monitoring screen aboard a surface ship to which it is connected. Its shipboard masters can guide it to an object, and make it clamp the object in its claw for retrieval to the surface. A sonar system augments the television for use in turbid water where visibility is limited.

The Solaris system has five major parts: a vehicle, power and control cables, a winch that maintains constant tension on the cables as the vehicle prowls underwater, a monitoring console

on shipboard, and an electric power plant, also on shipboard. The vehicle itself is composed of a three-foot metal sphere, two variable pitch propellers, a work attachment below, and a tv camera in a watertight case. The sphere houses the electric motor for driving the propellers, and other instruments. A variety of work attachments can be used: a general purpose claw; a scoop; an electromagnet; a grapple; and special movable lamps for inspection. *Manufacturer: Vitro Laboratories, Silver Spring, Md.*



Long distance communications

Since 1946, when they first bounced a radar echo off the moon, scientists have wondered about the feasibility of using the moon or some other orbiting object as a passive reflector (of radio energy) for radio and telephone communication between distant points on earth. Now that Project Echo's balloon satellite has been launched and proved, this dream has materialized. In early August, prior to this recent success, Bell Telephone Laboratories in Holmdel, New Jersey, and Jet Propulsion Laboratory in Goldstone, California, demonstrated the possibility of such communications by using the moon itself as the passive reflector.

All this interest in satellite communications systems arises from a concern over the anticipated heavy increase in communication needs in coming years. At present, long distance telephone communications are accomplished by either short wave or submarine cables. However, the submarine cables are very expensive and difficult to maintain, and the short wave method requires a multitude (one every 30 miles) of transmitting and receiving towers because microwaves travel in straight lines and would escape into space if they were not repeatedly caught before they diverge from the earth. A satellite orbiting at 3,000 miles, for example, could serve as a microwave tower (because it could be in line-of-sight of two very distant points on earth) and relay telephone signals by way of microwave frequencies. In addition, it could be used to provide rapid communication for television, high-speed data information, facsimile mail, and other types of transmissions.

The satellite communications system employs two different types of antennas. The transmitting station has a standard 60 foot diameter parabolic antenna, and the receiving station has a 50 foot long horn-shaped antenna in combination with a ruby maser amplifer (see ID, June 1960, page 108) and a special circuitry. The horn-shaped antenna (above), which is a larger version of a horn antenna developed several years ago for overland radio relay, is used because it picks up considerably less noise interference from the earth than a conventional antenna. This is important because the radio signals received via satellite are extremely faint and any excess noise from irrelevant sources might mask them. The antenna is rotated on its base, and also on an upright wheel in order to track the satellite reflector.

Mechanical upholstery

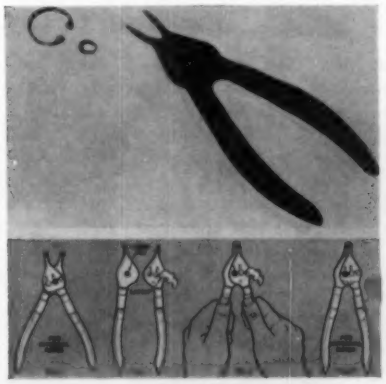
The upholstery on the two chairs illustrated below (top, designed by Kroehler Manufacturing Company; bottom, designed by Simmons Company) was man-

ufactured by a new mechanical process which promises to make possible the introduction of new designs not now feasible with hand upholstery. The process, known as U.S. Raval, shapes or forms cushions in one piece; thus, in the Kroehler chair, the base, Koylon foam cushioning, and Chromata Elastic Naugahyde upholstery were mechanically formed in one unit.

The process can be used to form both contoured and tufted surfaces with concave and convex styling. The new process also offers a great latitude in material content. Initial production is in slip seats; but the manufacturer expects that it will be used for deeper cushions also. Patents are still pending on the process, and further information has not been released. *Manufacturer: U. S. Rubber Company, New York, N. Y.*

Convertible field pliers

A convertible field pliers has been introduced for use with a wide range of internal and external retaining rings. The pliers may be used in two ways: to compress internal rings for insertion into a bore or housing, or to expand ex-



ternal rings for assembly over a shaft. A simple adjustment of the pivot pin on which the two halves of the pliers turn permits the tool to be set so that the tips come together or spread apart when the handles are compressed. *Manufacturer: Waldes Kohinoor, Inc., New York, N. Y.*

Coating computer sub-assemblies

In order to increase the reliability of digital computer logic cards—the printed circuit boards which comprise the computer's intelligence—they are being encapsulated in an epoxy resin. This protects them against humidity, contamination, shock, and vibration. Epoxy was selected for this purpose because it can be applied at room temperature, and then set at temperatures low enough (150 degrees F.) to prevent damage to the sensitive precision transistors, diodes, etc. which it encloses. The coating process consists of dipping or spraying individual circuit boards. To protect stacks of

two or more boards, a potting operation is used. Here the boards are joined in parallel to form an open-sided box-like construction which is filled with the epoxy material. *Source: Librascope, General Precision, Inc., Glendale, California.*

Multi-purpose machine tool

A new, automatically controlled machine tool has been made available that is said to operate over a wider range, doing more operations at greater accuracy, than any other machine on the market. Known as the Precision Versa-Tronic, the machine (below) will be used for drilling, boring, milling, and tapping of large castings such as side frame sections for earth-moving equipment, printing presses, and other heavy machinery. It is designed to reduce the overall machining time cycle in medium and short run production, where maximum flexibility is needed from lot to lot. The manufacturer claims that use of the machine will reduce work-piece handling, jigs and fixtures, set-up time, tooling, manual adjustments, machining error and scrap losses.

The Versa-Tronic operates under a punched tape numerical control system (developed by the General Electric Company) which allows manual, semi-automatic, or completely automatic program control of all machine functions. The machine will work to repeatable accuracies of two ten-thousandths of an inch.

The basic design of the machine consists of a long cast bedway supporting the sliding table. Two stationary upright columns on either side of the table support a crossrail, which moves up and down, parallel to the table. A vertical spindle head moves crosswise on this rail. Range of the machine is 132 inches long, 78 inches wide, and 72 inches high.

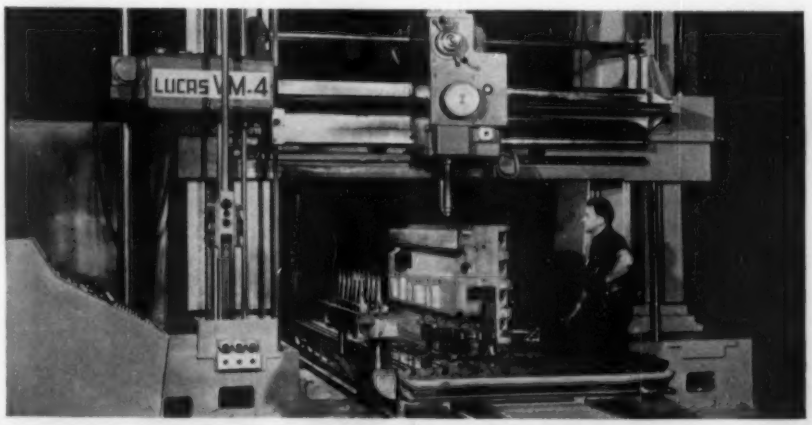
Automatic tool selection and changing has been vastly simplified. No tool-carrying arms or mechanical linkages are required since the tools stand upright in a "pigeonhole" magazine mounted to the side or on the surface of the work table. The location of the tool in the magazine is programmed into the tape. When a new tool is to be selected, the spindle automatically locates the proper point in the magazine for pickup. The tool is then fitted into place by a downward motion of the spindle, and secured by a power tool lock and ejector built into the spindle. *Manufacturer: Lucas Machine Division, New Britain Machine Company, Cleveland, Ohio.*

Automatic contouring operations

A numerical control system for metalworking machines has been announced which will make possible punched tape programming directly from engineering drawings for contouring operations. Substantial cost savings will be realized because the new control system obviates the need for the usual expensive and lengthy computer interpolation of curves and slopes into thousands of positioning points.

The system, part of the Mark Century series, has a built-in capability to order slopes or arcs of circles without need for detailed, point-to-point programming instructions. Given length and direction of slope, or radius and length of arc, it can translate them directly in terms of machine motion.

The new control incorporates solid-state computer-type logic circuits. *Manufacturer: General Electric Specialty Control Department, Waynesboro, Va.*



Machine tool control systems

A line of automatic, electrohydraulic control systems for the machine tool industry have been introduced which are claimed to be capable of automating every machining operation in either large or small manufacturing plants. The new control systems, said to be highly versatile, require a minimum of set-up time, and as a result, the manufacturer believes that they will make it economically feasible for a small machine shop operator to utilize automation techniques. At present, only the large manufacturer with a highly skilled crew of programmers and large-volume production runs can afford to invest in such systems.

The line includes four control systems each of which can produce parts at accuracies of 1/1,000 of an inch. The control consoles are completely transistorized and utilize modular construction techniques.

The numerical control system will control any three-axis machine used in turning, milling, punching, drilling, slotting, or routing operations. Punched paper tape which automatically determines the work tool's position, speed of travel, and depth of cut, and signals the operator to change tools, can be prepared with a tape-perforating typewriter directly from blueprint information.

The multi-mode tracer control system can be used with any machine that does contouring or die sinking. It is capable of operating through 360 degrees and full die sinking with automatic pick and feed without requiring a change in machine setup, template, or tracing head.

A hydraulic press control system automatically programs the rate and position of the hydraulic ram of a large press.

Another system (above, right) can be used with an engine lathe, and is said to be able to turn out parts that would be impossible to produce manually on a lathe. It will also control the machining of elliptical and square parts as well as glass and plastic mold dies. *Manufacturer: Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.*

Pattern-recognizing machine

A newly developed experimental machine, known as the Mark I perceptron, can be trained to automatically identify objects and patterns such as letters of the alphabet. The present device, which is strictly a research model, is a limited-capacity version of what eventually may become a family of efficient pattern-recognizing machines. Such machines would have great importance for processing of non-numerical information, and would supplement existing types of digital computers which, fundamentally, handle numerical data. A perceptron could be used to read print of various type faces and to recognize spoken words; in addition, it might also be used to extract salient features from photographic information.

The Mark I is an electromechanical device (below) consisting basically of a sensory unit of photo cells which views the pattern shown to the machine, association units which contain the machine's memory, and response units which visually display the machine's pattern-recognition response.

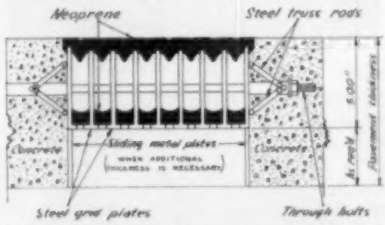
It differs from other pattern-recognition machines in that it does not recognize forms by matching them against an inventory of stored images or by performing a mathematical analysis of characteristics. Instead, its recognition is direct and almost instantaneous since its memory is in the form of pathways through the system rather than a coded representation of the unique stimuli.

When a pattern is shown to the machine, electrical signals are sent by the sensory units to the association units. If the input signal to an association unit is large enough, it transmits a signal to the response units, which emit one output if their input is positive and another output if their input is negative.

The output of an association unit is controlled by a memory device. In training the perceptron, the object is to change the memory of the association units so that their signals will have the proper sign. With a large enough perceptron, such a procedure will always ultimately lead to the correct response for all stimuli to which the perceptron is exposed. The Mark I was developed by the Cornell Aeronautical Laboratory, Inc., and is under the sponsorship of the Office of Naval Research.

Expansion joint

A new type of expansion joint, constructed of neoprene synthetic rubber and steel, has been developed for use on concrete highways, bridges, and airfield runways. According to the manufacturer, it is able to absorb the movement of concrete during extreme temperature changes without permitting any bulges, dips, or gaps to develop, and, in addition, it maintains a tight seal against water and dirt. The joint (see diagram below) is designed like an accordion with nine



neoprene cells in a row; it will accept a movement of three inches, and each cell will account for ⅜ inches of movement. It is anchored in the concrete by steel truss rods that loop out from both sides, and which also serve to keep the surface of the joint flush with the top of the concrete. Movement of the concrete closes the cells or pulls them apart.

Before installation, the joint is precompressed to the correct width by tightening a through bolt placed across its face. As soon as the concrete has sufficiently hardened, a precompression holding pin is released, allowing the joint freedom to contract or expand as it rides between the concrete panels. *Manufacturer: B. F. Goodrich Company, Akron.*

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Manufacturers' Literature Supplement

Materials—Metals

Malleable Products. Canton Malleable Iron Company, Canton, Ohio. 16 pp. Ill. Brochure describes facilities for making high quality malleable castings; all production sequences are discussed.

Phosphor Bronze. Riverside-Alloy Metal Division, H. K. Porter Company, Riverside, N. J. 18 pp. Ill. Technical handbook presents information on phosphor bronze wire, bars, rods, strip, sheets, circles, and special shapes.

Titanium Alloy. Titanium Metals Corporation of America, 233 Broadway, New York 7, N. Y. 32 pp. Ill. Manual describes Beta-titanium alloy which is a titanium based composition with vanadium, chromium and aluminum. Data covered includes metallurgy, design, welding and forming characteristics of the alloy—considered by the manufacturer to be the most formable, high strength titanium grade commercially available.

Space Age Metals. Universal-Cyclops Steel Corporation, Refractomet Division. Bridgeville, Pa. 12 pp. Ill. Brochure describes the InFab process for production of high quality mill products of molybdenum, columbium, tungsten, tantalum, and their alloys.

Magnesium Boxes. Zero Manufacturing Company, 1121 Chestnut St., Burbank, Calif. 24 pp. Ill. Catalog describes standard line of magnesium boxes, covers, and military cases. Stock sizes available are from 1½ inches square by 7/16 inches high by .040 gage to 18-15/16 inches square by 9 inches high by .090 gage.

Electrical Conductivity of Copper Alloys. Bridgeport Brass Company, 30 Grand St., Brideport 2, Conn. 8 pp. Bulletin provides a check list for electrical conductivity ratings of 56 copper alloys. Also listed are available mill shapes for each alloy and typical uses in electrical and electronic apparatus.

Materials—Plastics

Nylon Processing. National Vulcanized Fibre Company, 1060 Beech St., Wilmington 99, Del. 2 pp. Ill. Technical article discusses the factors to be considered when choosing between machining and injection molding of nylon parts. The former is said to be better for short runs and symmetrical parts, and the latter for volume work.

PVC Masonry Control Joints. Electrovert, Inc., 124 E. 40th St., New York 16, N. Y. 4 pp. Ill. Booklet describes Durajoint PVC masonry control joints, masonry and brick expansion joints, and waterstops.

Thermoplastic Ball Valves. Tube Turns Plastics, Inc., 2929 Magazine St., Louisville 11, Ky. 4 pp. Ill. Folder describes top-entry, top-adjusting ball valves made of unplasticized polyvinyl chloride or Penton chlorinated polyether, which are said to be suitable for corrosion resistance work.

Plastics Products Catalog. Durez Plastics Division, Hooker Chemical Corporation, N. Tonawanda, N. Y. 8 pp. Ill. Catalog offers data on the physical, mechanical and electrical properties, and includes numerous applications, of various thermosetting phenolic and diallyl phthalate molding compounds, and Hetron fire-retardant polyester resins for reinforced plastic laminates and molded shapes.

Silicones. Dow Corning Corporation, Midland, Michigan. 8 pp. Ill. Brochure describes how silicones in various physical forms are being used in the design of autos, trucks and other land vehicles.

Expanded Polystyrene Insulating Blocks. Gilman Brothers Company, Gilman, Conn. 6 pp. Ill. Brochure discusses the Cellulite line of expanded polystyrene insulating blocks for use in the building and construction trades. Also included are directions for use of the material as an insulation plaster base, shingle backer, cavity wall insulation, roof insulation, perimeter insulation, and in flotation applications.

Sintered Nylon. Polymer Corporation, Reading, Pa. 4 pp. Ill. Bulletin describes nylon wear components formed by cold pressing and sintering nylon powders. In addition, it discusses Nylasint, a micro-porous nylon which absorbs and holds from 15 to 50 per cent oil by weight, and which is used for bearings, rollers, cams and general wear parts.

Delrin. E. I. Du Pont de Nemours & Company, Wilmington, Del. 4 pp. Ill. Folder illustrates and describes four new applications of Delrin acetal resin. The applications are an air hose coupling, air pressure control valve, sprocket used in agricultural equipment, and gears and rollers in a data indicator.

Laminated Plastics. Formica Corporation, Subsidiary of American Cyanamid Company, 4550 Spring Grove Ave., Cincinnati, Ohio. 115 pp. Ill. Technical reference book on laminated plastics contains property and application data covering 70 standard, special, and molding grades of high pressure thermosetting laminating plastics, and military specifications, a Grade Comparator chart, tolerance and weight specifications, fabricating facilities, and other relevant information.

Silicone Rubber Insulation. Dow Corning Corporation, Midland, Mich. 6 pp. Ill. Brochure describes Silastic brand silicone rubber insulation for wire and cable. Such insulation is said to provide greater load carrying capacity, long time resistance to environmental extremes, and resistance to radiation and corrosion.

Methods

Furred Ceiling Construction. Metal Lath Manufacturers Association, Engineers Bldg., Cleveland 14, Ohio. 4 pp. Ill. Bulletin discusses when and how to use furred ceilings, which are made by attaching metal lath to steel channels, pencil rods or furring strips in direct contact with the construction above. These ceilings are used mostly on the underside of steel joists, junior steel beams, and concrete or wood joists, where they provide metal lath support at closer intervals than are available from the construction members themselves.

Computer Uses in Mechanical Engineering. Bendix Corporation, 5630 Arbor Vitae St., Los Angeles 45, Calif. 8 pp. Ill. Booklet describes applications of the Bendix G-15 digital computer in 27 highly diversified companies and mechanical engineering firms.

Beginning with this issue of ID, readers are asked to please direct their requests for manufacturers' literature directly to the company concerned.

Pressure Sensitive Materials. Fasson Products, Painesville, Ohio. Folder describes various ways in which company's pressure sensitive materials are being used and, in addition, contains samples of the materials.

Modular Packaging Concept. Zero Manufacturing Company, 1121 Chestnut St., Burbank, Calif. 16 pp. Ill. Brochure describes a modular packaging concept to use with shipping and storage containers. It illustrates how standard components are assembled in modules to make containers from 2 feet by 2 feet by 2 feet to any size requirement. The containers are said to comply with rigid military specifications as to environmental and stock conditions.

Design of Power Supplies. General Electric Company, Schenectady 5, N. Y. 12 pp. Bulletin provides information regarding the design of power supplies for voltage tunable magnetrons, which are high-frequency CW oscillators designed for operation in the microwave bands.

Palletless Handling. Automatic Transportation Company, 149 W. 87th St., Chicago, Ill. 8 pp. Ill. Brochure discusses the pros and cons of palletless and pallet handling methods with an industrial lift truck.

Grouting Practices. Master Builders Company, Cleveland 18, Ohio. 16 pp. Ill. Booklet describes grouting techniques with Embeco non-shrink grout, which is used under heavy machinery to support it and to transmit operating forces to the foundation.

Measuring and Controlling Systems for Extruded Plastics. Industrial Nucleonics Corporation, 650 Ackerman Rd., Columbus 2, Ohio. 12 pp. Ill. Brochure describes methods of measuring and automatically controlling the three significant thickness variables of extruded plastic materials: long-term machine direction variables; short-term machine direction variables, and profile variations. Materials covered include extruded brown film, flat die extruded film and sheet, and extruded coatings.

High Strength Bolt. Russell, Burdsall & Ward Bolt and Nut Company, 100 Midland Ave., Port Chester, N. Y. 4 pp. Ill. Bulletin describes a new type of high strength bolt that has a larger head and shorter thread length, use of which is said to result in up to 40 per cent savings on bearing-type connections.

Disconnect Couplings. E. B. Wiggins Oil Tool Co., 3424 E. Olympic Blvd., Los Angeles 23, Calif. 16 pp. Ill. Catalog describes line of fluid, self-sealing, quick-disconnect couplings.

Components and Machines

Work-Holding Fixtures. Flotron Industries, Inc., 1608 Centinela Ave., Inglewood 3, Cal. 8 pp. Ill. Catalog presents information on line of work-holding fixtures for use in electronic assembly.

Sound Control. Allied Witan Company, 12500 Bellaire Rd., Cleveland 35, Ohio. 12 pp. Ill. Brochure describes sound control applications of the Atomuffler noise silencer on aircraft components, marine components and various kinds of industrial equipment.

Tabular Data Display. GPL Division, General Precision, Inc., 63 Bedford Rd., Pleasantville, N. Y. 4 pp. Ill. Folder describes the Tabtrol Tabular Display, which is a scanner-printer-display unit with an optional computer input. It has three independent functions: display of data cards in individual, removable cardholders; high-speed scanning of a binary code set into the cardholders; and printing of alpha-numeric data onto an addressed card.

Television Replacement Knobs. GC Electronics Company, 400 S. Wyman St., Rockford, Ill. Fully illustrated wall chart pictures exact television replacement knobs for all major manufacturers' sets.

Temperature Regulator Catalog. OPW-Jordan Corporation, 6013 Wiehe Rd., Cincinnati 13, Ohio. 8 pp. Ill. Catalog contains full information on line of sliding gate and plate temperature regulators which are designed for use with steam, water, air, oil, gas or chemicals.

Servo Systems and Gyros. Kearfott Division, General Precision, Inc., Little Falls, N. J. 56 pp. and 44 pp. Ill. Two technical booklets present information on servo motors, motor generators, synchros and gyros. Important aspects of these components are described in detail with text, diagrams and other illustrations.

Moving Track Storage. Rapids-Standard Company, 342 Rapistan Bldg., Grand Rapids, Mich. 8 pp. Ill. Bulletin explains principles, operation and applications of a method for live storage of various materials. This method of storage makes use of a moving track and the force of gravity to move materials from the entering side to the selection, or leaving, side.

Tubing for Aerospace Industries. Superior Tube Company, 1712 Germantown Ave., Norristown, Pa. 12 pp. Ill. Bulletin describes tubing for fluid-handling lines, various engine applications, aircraft instruments, air-frame applications such as ducting and pneumatic systems, etc.

Electric Motors. Doerr Electric Company, 100 N. Fourth Ave., Cedarburg, Wisc. 14 pp. Ill. Catalog describes line of fractional and integral horsepower electric motors as well as various motor modifications available. To suggest practical methods of solving unusual job problems, the catalog also illustrates special motor designs.

Spray Painting Machines. Conforming Matrix Corporation, 433 Toledo Factories Building, Toledo 2, Ohio. 2 pp. Ill. Sheet provides information on an air-operated, automatic reciprocating-type spray painting machine.

Electric Walk Trucks. Raymond Corporation, 223-183 Madison Ave., Greene, N. Y. 4 pp. Ill. Bulletin describes line of electric walk trucks designed for narrow aisle operations.

Hole Punching and Notching Units. Punch Products Corporation, 370 Babcock St., Buffalo 6, N. Y. 16 pp. Ill. Catalog describes line of Unipunch Series "A" hole punching units for punching up to 3 inch diameter round or shaped holes in up to ¼ inch thick material, and Unipunch Series "A" notching units for corner, edge, and V-shaped notches.

Tractor. Napco Industries, Construction Equipment Division, 834 N. Seventh St., Minneapolis 11, Minn. 4 pp. Ill. Brochure describes a new model Napco Crab four wheel drive, four wheel steer industrial tractor. The new tractor has a fiberglass hood and built-in headlights.

Bolts and Locknuts. Standard Pressed Steel Company, Jenkintown, Pa. 8 pp. Ill. Bulletins describe a new family of bolts and companion locknuts for applications up to 900 degrees F. According to the manufacturer, the new fasteners comprise the first threaded joint of 200,000 psi tensile strength at 900 degrees F.

Pressure Instrumentation. Ultradyne, Inc., 2630 San Mateo, N.E., Albuquerque, N. M. 4 pp. Ill. Booklet covers a variable reluctance pressure transducer which makes use of a single moving part, a metal diaphragm in an electro-magnetic circuit, to sense absolute, gauge, or differential pressures in ranges from 0 to 0.1 through 0 to 5000 psi.

Geared Speed Reducers. U. S. Electrical Motors, Inc., P. O. Box 2058 Terminal Annex, Los Angeles 54, Calif. 12 pp. Ill. Brochure contains technical information on shaft-mounted geared speed reducers. High and low gear ratios are provided for each horsepower and frame size, with the preferred ratios for specific motor rpm's indicated.

Miscellaneous

Fiber Glass Duct Liner. Johns-Manville, Inc., 22 E. 40th St., New York 16, N. Y. 8 pp. Ill. Booklet describes the Micro-Bar dual-density fiberglass duct liner for use in checking air erosion, cutting noise, and improving insulating efficiency. The material is a semi-rigid, blanket insulation composed of a strong inorganic glass fiber bonded by a thermosetting resin to form two densities of insulation, a tough, heavy density on the surface, and a light density underneath.

Porcelain Enamel Panels. Erie Enameling Company, Erie, Pa. 12 pp. Ill. Booklet contains product information and case histories involving the use of architectural porcelain enamel panels.

Solid Lubricants. Alpha-Molykote Corporation, 65 Harvard Ave., Stamford, Conn. 24 pp. Ill. Brochure discusses the theory and practice of lubrication by molybdenum disulfide solid lubricants which are available in powder, grease, resin-bonded coating and dispersion forms.

Fluorescent Paint. Lawter Chemicals, Inc., 3553 Touhy Ave., Chicago 45, Ill. Folder contains side-by-side panels representing regular and Hi-Viz fluorescent safety color paints. The company claims that the latter is four times brighter than international orange, the brightest regular safety color.

Classroom Applications of Chalkboard. Johns-Manville Corporation, 22 E. 40th St., New York 16, N. Y. 16 pp. Ill. Brochure describes and illustrates a number of classroom applications of Colorlith chalkboard including free-standing partitions, easel-reversible units, movable panels, and convertible units that combine table surface, tackboards and chalkboards in one compact assembly. Designs are by Peter Schladermundt Associates. Colorlith is a light-weight rigid material composed of cement, asbestos and selected pigments.

Graphite Cloth. National Carbon Company, Division of Union Carbide Corporation, 270 Park Ave., New York 17, N. Y. 4 pp. Bulletin presents detailed property data on graphite woven fabrics and their relation to a variety of industrial applications. The material, which became commercially available in 1959, is made of high purity graphitic carbon fibers which have extremely high strength and temperature resistance.

Silicone Protected Motor Windings. U. S. Electrical Motors, Inc., Box 2058, Terminal Annex, Los Angeles 54, Calif. 4 pp. Ill. Technical sheets describe the Everseal silicone rubber protection process for protection for windings of form-wound motors. Such protection is said to prevent damage to windings in adverse environments that ordinarily cause their rapid deterioration.

Electrical Wiring Techniques. AMP, Inc., Harrisburg, Pa. 10 pp. Ill. Booklet tells the story of company's customer service program which was created to help manufacturers improve the reliability of electrical and electronic circuitry through the use of AMP's solderless termination techniques.

Machine Tools. Buhr Machine Tool Company, Ann Arbor, Mich. 32 pp. Ill. Brochure describes company's facilities in the machine tool field.

Wash-Off Drawing Film. Keuffel & Esser Company, Hoboken, N. J. Data sheet describes a polyester wash-off film, known as Dupro, which produces erasable ink-black lines from pencil originals, and permits ink or pencil additions. The lines are said not to smudge; they are erasable with a soft, moist eraser.

X-Ray Literature. Philips Electronic Instruments, 750 S. Fulton Ave., Mt. Vernon, N. Y. 20 pp. Bibliography of X-ray analysis subjects gives authors and publication names, article titles and publication dates of 376 papers published between 1930 and 1960. Subjects include atomic and automotive problems, biological studies, smelting, pharmaceutical research and other work in the chemical and metallurgical fields.

Electrical Insulating Oils. Sun Oil Company, 1608 Walnut St., Philadelphia 3, Pa. 6 pp. Bulletin gives technical information on electrical insulating oils for transformers and cables. Data includes functions of a transformer oil, gassing characteristics of oils, properties of electrical oils, etc.

Security Panels. Resolite Corporation, Zelienople, Pa. 4 pp. Ill. Booklet describes security panels which are made of a combination of steel mesh and polyester resin translucent panels and are said to have the appearance of old-fashioned leaded glass.

Tape. Johns Manville, Dutch Brand Division, 7800 S. Woodlawn Ave., Chicago 19, Ill. 12 pp. Ill. Booklet covers 24 specific tape jobs from protecting electrician's tools to use of color-coded tapes to speed mass assembly of electrical components and products.

Packaging Engineering. Zero Manufacturing Company, 1121 Chestnut St., Burbank, Calif. 16 pp. Ill. Brochure describes facilities for packaging engineering and tool design, as well as shock protection engineering and testing. Also includes a description of company's method of deep drawing with inverted dies to produce a satin-smooth finish that does not need surface preparation prior to finishing.

Optical Leveling. Keuffel & Esser Company, Third and Adams Sts., Hoboken, N. J. 8 pp. Ill. Brochure describes components and operation of a new optical leveling kit. Data is given on industrial alignment problems and solutions including foundation or bed leveling, profiling, differential leveling, and checking movement of equipment.

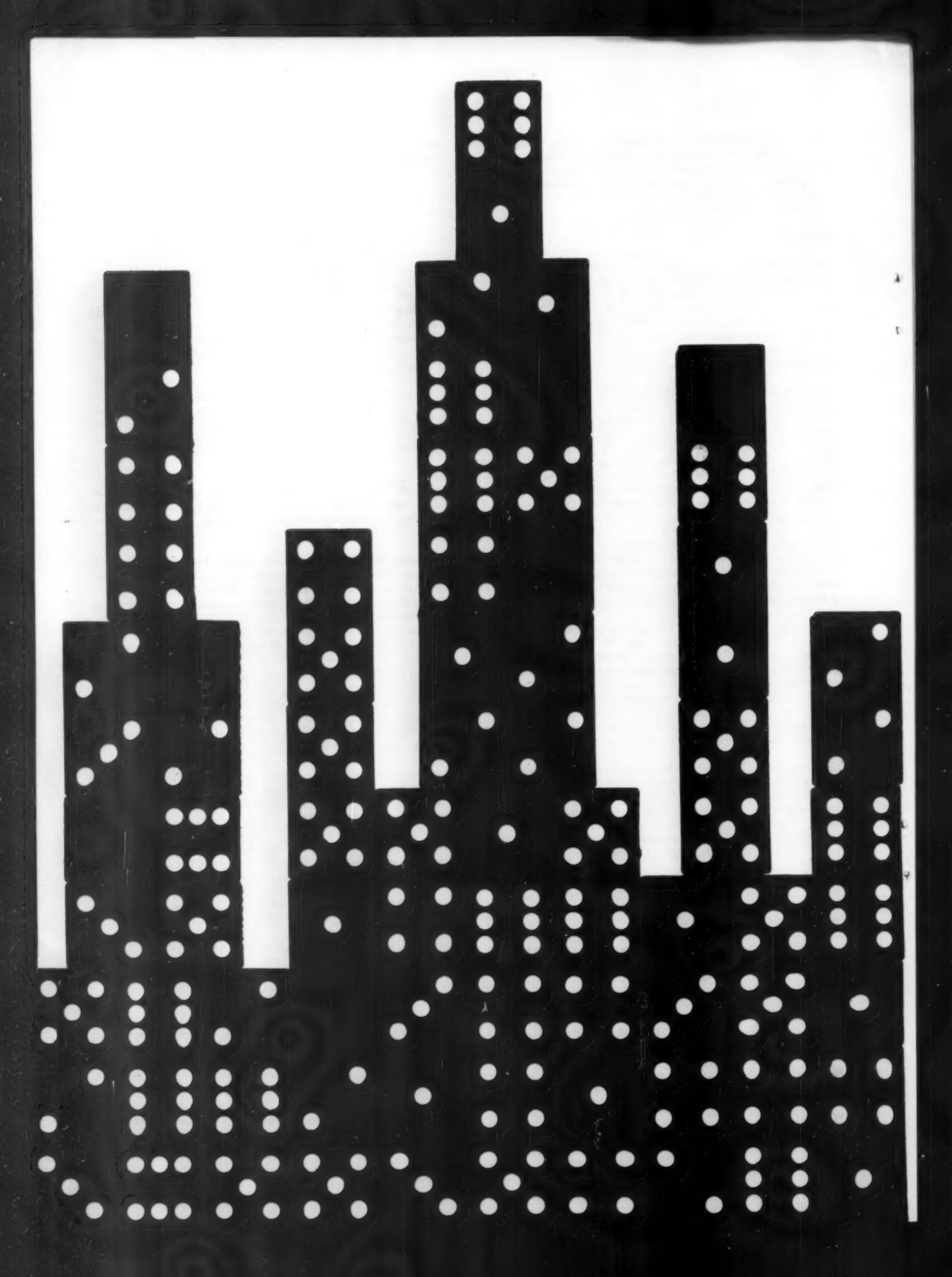
Solid Plastic School Furniture. American-Standard, C. F. Church Division, Holyoke, Mass. 8 pp. Ill. Folders describe solid plastic desk tops, single arm tops, trapezoid tops, and contour chair seats and backs.

Shelving. Penco Division, Alan Wood Steel Company, 200 Brower Ave., Oaks, Pa. 36 pp. Ill. Catalog describes complete line of industrial and commercial steel shelving. Information is given on boltless T-line shelving, angle shelving, tool storage inserts, drawer case units, bin units, and custom shelving arrangements and truck shelving.

Filing Equipment. Remington Rand, 315 Park Ave. South, New York, N. Y. 12 pp. Ill. Brochure describes mechanized filing equipment and insulated units which protect cards from destruction by fire. Also included is storage equipment for tabulating cards and magnetic tapes.

Electric Eye. Photomation, Inc., 96 S. Washington Ave., Bergenfield, N. J. 6 pp. Booklet presents new information and development in the design and application of electric eyes. Included is a comparison between the human eye and the electric eye.

Computer Jargon. Minneapolis-Honeywell Regulator Company, Minneapolis, Minn. 22 pp. Glossary defines 82 terms commonly used in the computer industry.



DESIGN IN NEW YORK is the subject of INDUSTRIAL DESIGN's October issue — the first comprehensive presentation of New York as a center of design for industry. The series of articles will cover the personalities and the practice of design in New York together with those aspects of the city that attract the designer and the industry he serves.

One of the paradoxes of New York is that although it is not itself a center of heavy industry, it is a place where industry makes its decisions, including its design decisions. To analyze the importance of New York as a center from which design influence spreads, INDUSTRIAL DESIGN will treat:

The design climate: What are the currents that surround the designer and influence his work? Perhaps most important, there is the vitality that surrounds any headquarters, and New York is the center of management for an increasing number of national firms—the point at which control is exercised. New York is a purchasing center, and as such serves as a showcase for products manufactured all over the country and all over the world. New York is a center for many of the specialized services peripheral to both design and industry: advertising, market research, photography. New York is the nation's cultural center, and the barometer of the contemporary climate of taste — as such it foreshadows the direction in which design for mass production will move.

The designers: Who are the men who make up the largest single regional design group? Large or small, each office has its own personality, and in addition to introducing the cast of characters on the New York design scene, INDUSTRIAL DESIGN will include statements by some of the best-known figures.

The design categories: What kinds of design are done in New York? Almost every kind: products, packaging, displays, and store planning. Each category has its specialists, but many of the New York offices try to include all four in their scope.

The economics of design: Admittedly, New York is an expensive place to live—and to work. INDUSTRIAL DESIGN will analyze the expenses of both client and designer, and will describe here, as in the rest of the issue, the prices and rewards of design in New York.

In the October issue of **INDUSTRIAL DESIGN**

Whitney Publications, Inc., 18 East 50th Street, New York 22, N. Y.

INTERIORS BOOK OF OFFICES . . .

contains examples of offices of all sizes and types and in all sections of the U. S. Besides running explanatory captions the book has a penetrating text about every aspect of office design, starting with the lobby and reception areas and including secretarial and executive offices, general offices, dining and free-time facilities.

Flexibility appears to be the keynote of design these days and *Interiors Book of Offices* has a section on partitioning systems which explains when and where flexibility makes good economic sense.

The offices of Time, Inc., in the new Time-Life Building in New York City, are described by their designer, Gerald Luss, and several of the new offices are shown in color.

Below is a list of some of the subjects covered in this new book.

executive offices
one-room offices
partitioning systems
secretarial corridors
single-floor offices
multi-story offices
urban offices
offices for rural areas
reception rooms
combination offices
general offices
executive dining rooms
tenant owned space
rental space
sales offices
lobbies
who designs offices today
lounges
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conference rooms
lunchrooms
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N.Y.C. INDUSTRIAL DESIGNER—*free lance, part time. Product, packaging, interiors, etc. Capable of creative, exciting, dynamic design. Experienced through the top world-renowned industrial design organization. PLaza 3-6352 or Box ID-316,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22, New York.*

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Small growing giftware manufacturer, New York City, desires full time services, competent female designer, familiar with gifts and housewares market. Box ID-318, INDUSTRIAL DESIGN, *18 East 50th Street, New York 22, New York.*

MISCELLANEOUS

FRESH IDEAS IN TOYS. *Leading eastern toy manufacturer, marketing prestige line of educational toys interested new ideas. Heavy TV advertiser. All ideas given full and prompt attention. Royalty and per item payment arrangements. Please write for submission forms. Box ID-317,* INDUSTRIAL DESIGN, *18 East 50th St., N.Y.C.*

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Index to Advertisers

MANAGEMENT LOOKS AT DESIGN

Competent design with styling that motivates product acceptance avoids countless hours of defensive selling. Accordingly, the fast pace of technological development in business communications equipment is a special challenge to industrial designers.

Lloyd M. Powell, *President*
Dictaphone Corporation

For Your Calendar

Through October 15. Photographic exhibition of Korean art, including sculpture dating from the seventh and eighth centuries and great monuments of architecture. Brooklyn Museum, New York.

Through November 4. 1960 Triennale. Palazzo dell'Arte and Parco Sempione, Milan, Italy.

September 6-16. Production Engineering Show at Navy Pier; and Machine Tool Exposition, sponsored by the National Machine Tool Builders Association, at the International Amphitheatre, Chicago.

September 10-18. "Electra City, U.S.A." An exhibition featuring electrical appliance demonstrations. New York Coliseum.

September 18-21. Annual Petroleum Mechanical Engineering National Conference sponsored by the American Society of Mechanical Engineers. Jung Hotel, New Orleans, Louisiana.

September 21-22. Annual National Symposium on Industrial Electronics sponsored by the American Institute of Electrical Engineers and the Institute of Radio Engineers. Manger Hotel, Cleveland, Ohio.

September 21-23. National Power Conference sponsored by the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. Bellevue-Stratford Hotel, Philadelphia, Pennsylvania.

September 22. "Plastics in Business Machines." A regional technical conference sponsored by the Society of Plastics Engineers. Sheraton Inn, Binghampton, New York.

September 26-28. Annual meeting of the Standards Engineers Society. Hilton Hotel, Pittsburgh, Pennsylvania.

September 26-29. American Welding Society fall meeting. Penn-Sheraton Hotel, Pittsburgh, Pennsylvania.

September 26-30. Instrument-Automation Conference and Exhibit sponsored by the Instrument Society of America. New York Coliseum.

September 26. Beginning of a weekly evening design course for New England designers and engineers to run through January, 1961. Boston Institute of Contemporary Art, Boston 34, Massachusetts.

September 27-30. Annual convention of the Prestressed Concrete Institute. Statler-Hilton Hotel, New York.

September 28-November 27. "Visionary Architecture." An exhibition of architecture that was considered unbuildable at the time it was conceived. Museum of Modern Art, New York.

October 3-7. 1960 Southern Textile Exposition. Textile Hall, Greenville, South Carolina.

October 4-6. Atomic Energy Commission welding forum of the Southwest Research Institute. Hilton Hotel, San Antonio, Texas.

October 4-7. Annual Human Engineering Institute sponsored by Dunlap and Associates, Inc. Stamford, Connecticut.

October 11-12. A technical seminar on high energy rate forming sponsored by the American Society of Tool and Manufacturing Engineers. Sheraton Towers, Chicago.

October 13-14. Annual conference of New England section of the Society of the Plastics Industry, Inc. Wentworth-by-the-Sea, Portsmouth, New Hampshire.

October 14-15. Fall symposium of the Society of Photographic Scientists and Engineers. Washington, D. C.

October 17-21. Metal Show sponsored by the American Society for Metals. Trade and Convention Center, Philadelphia.

The roughest duty is routine to signs of tough BUTYRATE plastic

Bubble Up signs manufactured for Coca-Cola Bottling Co., Los Angeles, Calif., by Plastic Sales, Inc., N. Hollywood, Calif. Butyrate sheet extruded by Ist Specialties Co., Inc., Los Angeles, Calif.

The front of buses or trucks could be a hazardous location for most plastic signs—but that's just where a West Coast soft drink advertiser displays this colorful vacuum-formed medallion. The material selected to do the job? Tenite Butyrate, of course, in special weather-resistant formulation.

Tenite Butyrate is the only weather-durable plastic sign material with the right combination of high impact strength and resilience necessary to take the hard knocks which this sign will receive. It is the same rugged material so widely used in sports equipment, appliance housings, marine accessories, and outdoor pipe.

But toughness is only part of the Butyrate story. Sign manufacturers know that vacuum forming with Butyrate sheet is both quick and economical. Decorating may be done prior to or after forming, and there is no need to preheat the unformed sheet in special ovens. After forming, the Butyrate cools quickly; is ready almost immediately for subsequent fabricating or assembly operations. What's more, in-shop breakage is virtually eliminated because of the ability of this Eastman plastic to take abuse.

Next time you have a job that requires a truly tough, easy-to-form outdoor plastic material, use the plastic that makes the roughest duty routine—Tenite Butyrate. For further information on this versatile plastic, write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

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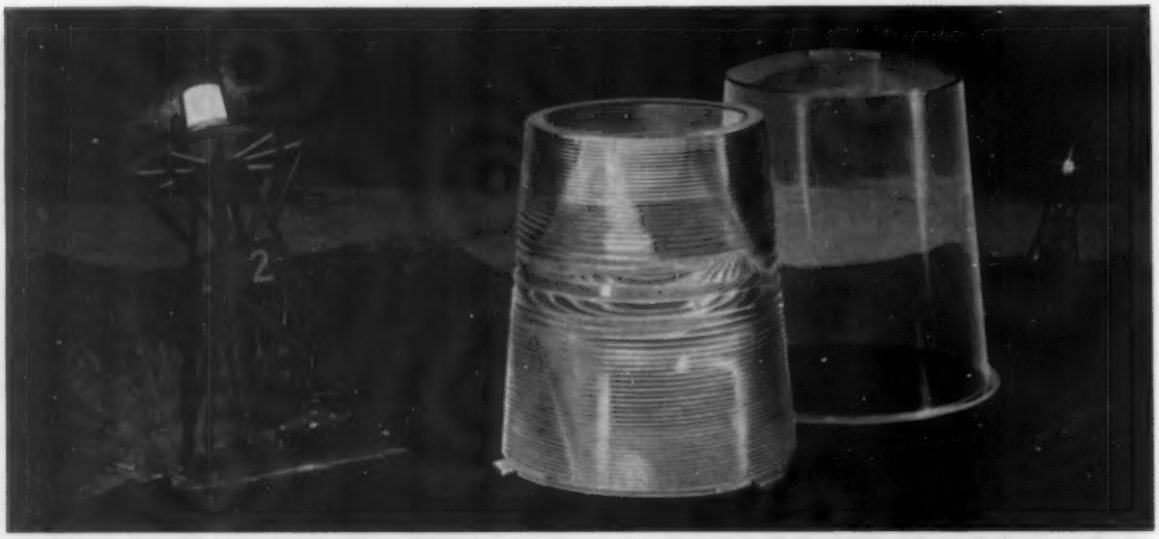

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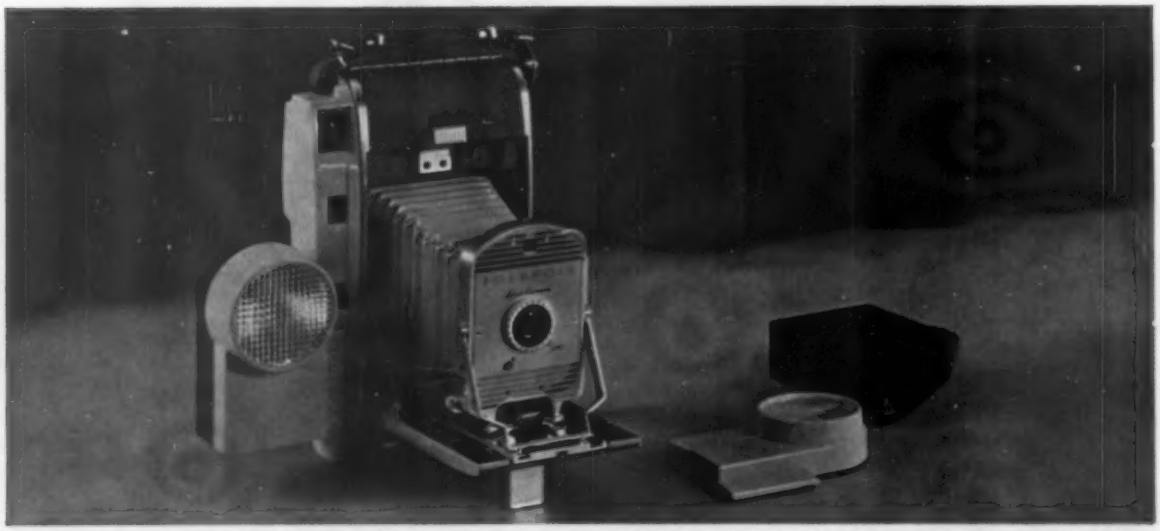

Flashing lights at sea shine brightly through large lenses and covers molded of PLEXIGLAS® acrylic plastic. The PLEXIGLAS parts are used in navigation lights for the U. S. Coast Guard, at a fraction of the cost and weight of cut glass lenses. Precision molding of the lens pattern gives the PLEXIGLAS lens maximum efficiency in light control, and the material resists weather, breakage and salt water.

Winking lights at home are revolutionizing indoor photography by making indoor pictures without flashbulbs possible, with the new wink-light attachment shown above. Tough IMPLEX®, the high impact acrylic, gives handsome appearance and rugged durability to the housing. PLEXIGLAS is used for the lens.

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