INDUSTRIAL DESIGN

1

February 1955

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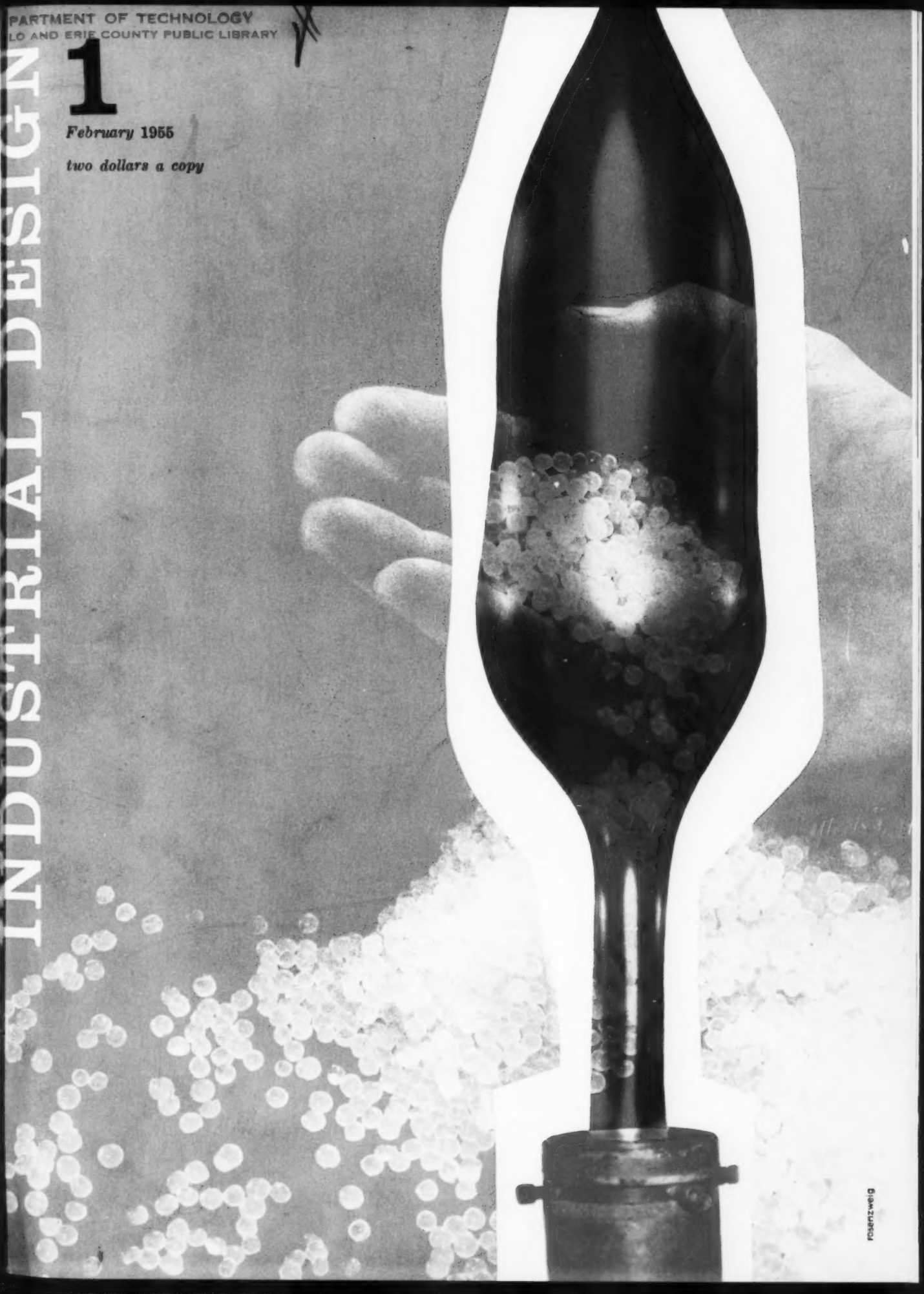

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VOLUME 2 : NUMBER 1

INDUSTRIAL DESIGN

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

CONTENTS FOR FEBRUARY, 1955

On the cover: *Spherical pellets of polyethylene, made by Eastman Chemical, seem to tumble into DuPont's experimental machine, which forces air into the extruded tube to make it wider and thinner before flattening it again. Full story on pages 48-57.*

Frontispiece: *In Part II of his series on pages 75-82 Jay Doblin maintains that some distortion is inevitable in perspective drawing. To find out how much distortion can be tolerated, or detected, by professional designers and laymen, Mr. Doblin concocted the cube test shown at the right. Three of the cubes are correct; the rest have varying degrees of distortion. Which three?*

Reading left to right: top row, cube 3; second row, cubes 1 and 3.

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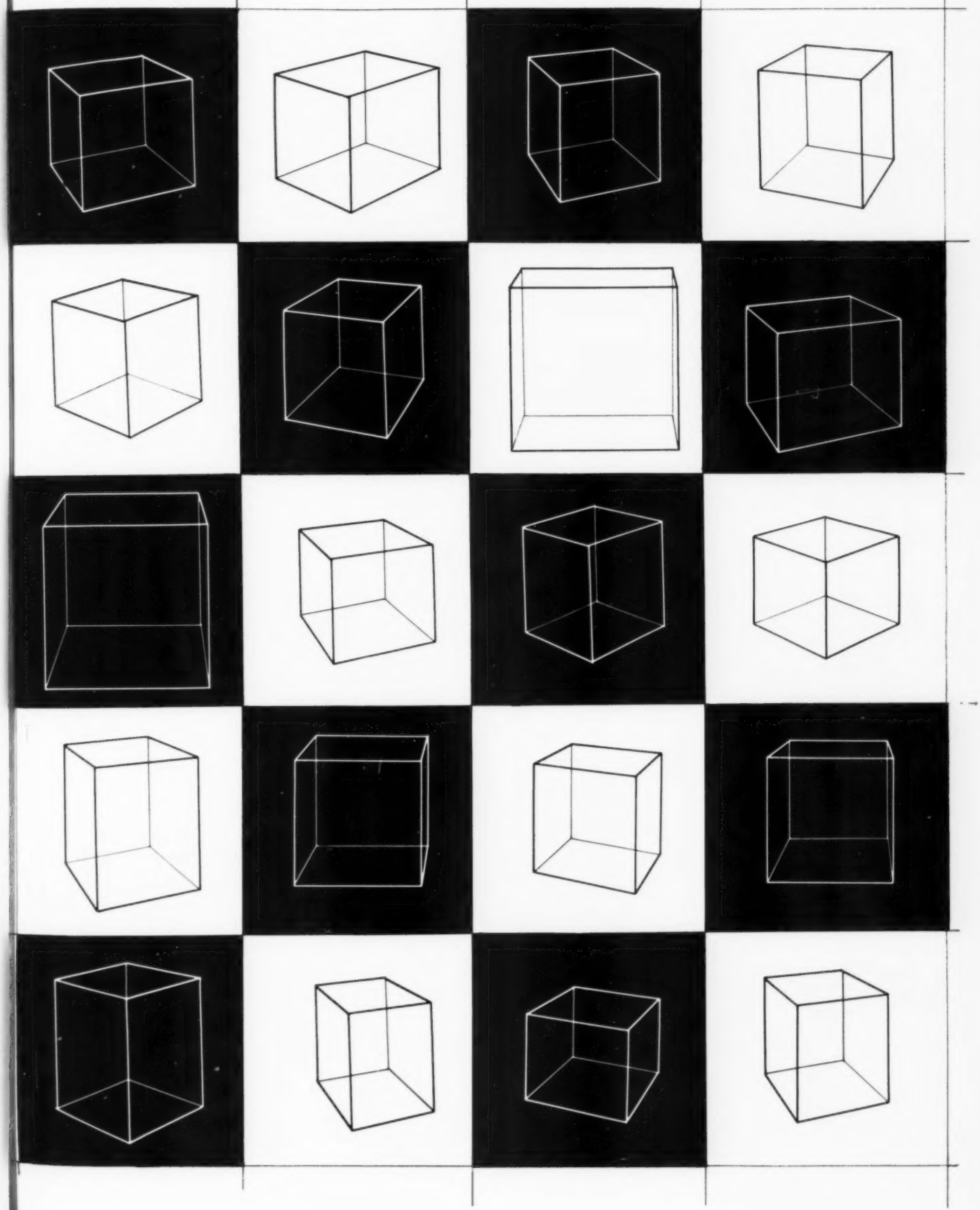

in this issue...

Doblin

Donnelly

Larrabee

Nelson

BecVar

Sandin

Earl

Mitchell

Kiefer

Wheeler

William B. Donnelly, who explains a new use for the ship curve on pages 70-71, has been a member of the Industrial Design Department of General Electric's Electronics Division in Syracuse since 1935. While preparing for a theatrical career, he became fascinated with industrial design and was graduated from Pratt before joining GE's radio division. He is active in the new Syracuse Chapter of the Industrial Designers Institute.

Jay B. Doblin, author of the five-part series, *Perspective, a new system for designers,* is an executive designer for Raymond Loewy Associates. From 1947 to 1952 he was chairman of the Evening School of Industrial Design at Pratt Institute, where he began to develop his system of perspective drawing as substitute for conventional free-hand and mechanical systems. He's a graduate of Pratt and a member of the Society of Industrial Designers.

Eric Larrabee modestly refrained from quoting his own remarks at the Ann Arbor conference on design and the American consumer, which he reports on pages 62-63. He concluded, "What we must realize is the variety and mobility of the many American markets . . . What's wrong with designing for any of the minorities within the American majority that increasingly make it possible for the manufacturers of fine products to find purchasers?"

Arthur N. BecVar and **George Nelson** both contributed to the GE kitchen shown on pages 64-65, Mr. BecVar as Manager of the Product Planning Division that designed the appliances and package system, Mr. Nelson as designer of the kitchen that shows how the units might be installed. Mr. BecVar, who joined GE in 1945, is a member of the Society of Industrial Designers; Mr. Nelson, who works with GE as a consultant designer, heads his own design organization.

Raymond C. Sandin is Manager of Visual Design for the Hotpoint Division of General Electric, whose kitchen is presented on page 66. Born in Sweden, he came to the United States at 20, and studied architecture at the Illinois Institute of Technology before joining Hotpoint 20 years ago. He is a member of the Society of Industrial Designers, and won the Electrical Manufacturing Award in 1948.

Harley J. Earl and **William L. Mitchell** supervised the development of Frigidaire's Kitchen of Tomorrow shown on pages 67-69. Mr. Earl, who is vice-president in charge of GM's styling staff, comes from a family of coach builders and body makers, and he has directed the design and color work for GM since 1927. Mr. Mitchell first joined GM in 1935 as chief of special projects for the Styling Section, of which he is now director.

Leroy Kiefer and **David B. Wheeler** were in charge of design and execution of this year's Frigidaire kitchen, which was originated by the late Alexander Kostellow. Mr. Kiefer is head of GM's Product and Exhibit Design Studio, which handles all non-automotive designs. He graduated from the University of Michigan School of Architecture in 1926, joining GM in 1935. Mr. Wheeler was project designer for the kitchen. A graduate of Pratt Institute, he served on the staff of the Kansas City Art Institute before joining GM in 1953.

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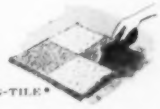

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BOOKS

Man-made machine art

ART AND INDUSTRY. *by Herbert Read.* 238 *pages, with* 150 *illustrations.* 6¼" *x* 9½". *Horizon Press, New York,* 1954. $6.00.

The only outstanding change in industrial design during the last two decades seems to have been a "failure of nerve" on the part of industry and designer, Herbert Read notes in a preface to the first American edition of *Art and Industry.* It was first published in England twenty years ago, and the American edition is based on the last of a series of revisions, and includes additional pictures of American products in the 100 pages of design photos from all over the world.

It's a pleasure to have Mr. Read discarding, at the very start, the old notions of "fine" and "applied" art; he focuses instead on three constituent art elements: formal elements with direct sensory appeal, elements of emotional or intellectual expression that may be combined with them, and intuitive or subconscious elements. What the machine produces can be called *art* in the realm of the abstract or non-figurative, "which has no concern beyond making objects whose plastic form appeals to the aesthetic sensibility," and which "might be intuitional as well as rational." But it is not possible to achieve satisfactory art objects simply by applying "art" to machine productions as Wedgewood, Morris and their successors have tried to do. More conscious attention to the artist's relation to the machine is needed. "In every practical activity, an artist is necessary to give form to material."

What this form can be, as related to materials and methods of construction and ways of working materials, is taken up in the second part of the book. There is a third section on color and ornament, with emphasis on their physiological and psychological aspects, and a concluding section on some of the studies of art education in the industrial age.

"It is no exaggeration to say that years of discussion have been wasted, and many markets lost, because the artist is not consulted as is the physicist or chemist," says Mr. Read. He attributes much of this to the failure to understand the art fundamentals essential to machine production, as well as to "the massive inertia represented by manufacturers and consumers," and their "tendency to pass the buck" when it comes to responsibility for bad design. It is a simple essay, and Mr. Read carefully defines his use of words to make his meaning clear. The pictures focus attention on the conflict between form and decoration, and how it is being resolved in such diverse machine products as street signs, pictures and typewriters. The book was designed by Marshall Lee, and the arrangement and juxtaposition of pictures add meaning to the compressed and deceptively simple text. This is a good book to read and to look at. Designers will find that it is also a good book to re-read and to think about.

The seeing eye

USEFUL OBJECTS TODAY. *by Greta Daniel.* 16 *page introduction with* 40 *gravure plates, in slipcase.* 8½" *x* 11". *Teaching Portfolio Number* 4, *Museum of Modern Art, New York. Distributed by Simon & Schuster, New York,* 1955. $2.95.

This is a collection of objects designed during the past twenty years that are part of the permanent collection of the Museum of Modern Art, beautifully photographed and handsomely printed. The Assistant Curator of Design, Greta Daniel, has written a clear introductory essay for the portfolio, which is intended to aid teachers in organizing an approach to design in the world around us. The essay is illustrated with a group of objects from other times, which show some of the lines of continuity and change.

Miss Daniel's text in many ways distills the discussion of machine art presented by Herbert Read. She stresses the idea that the perception of the artist "becomes the perception of his society," and comments that the role of the craftsman has changed to that of the "pioneer and experimenter, developing with special sensitivity ideas which may in time be adapted for mass production." Many of the designs, such as the Sitterle pepper mill and the silverware designed by Dominioni and Castiglione, show this sort of experimentation, while such refreshing designs as Nizzoli's Olivetti typewriter and Rex Stevens' stainless steel pitcher are the results of the pioneering of artists who work as abstract painters or sculptors in a new medium. She points out that perhaps the most striking result of the current focus on abstract geometric form in machine production is an emphasis on uniformity of texture. The slightest irregularity becomes a flaw, whereas irregularities have been considered pleasing in handcraft objects.

The perfection and refinement of today's objects, she concludes, are "the direct expression of a way of thinking as new in its interpretation of the world of today as it is old in its return to the basic elements of good design." Her selection of illustrations clearly illustrates her thesis.

Shooting for the moon

MATERIALS FOR PRODUCT DEVELOPMENT. 1954. *Proceedings of the Basic Materials Conference.* 159 *pages.* 6¼" *x* 9¼". *Clapp & Poliak, Inc., New York,* 1954. $7.50.

These papers, presented by top authorities in the various fields at the Second Basic Materials Exposition held in Chicago last May, contain much of the new information about materials and processes.

There is an introductory section on materials of the future, which includes a separate paper on rockets and guided missiles, describing the most advanced progress and needs. Following this there are sections on corrosion protection, materials management, and on joining, this last with an emphasis on adhesives and adhesive bonding of metal and plastics. The two longest sections deal with plastics and metal-forming processes. Use of carbon-graphite, ceramics, glass, and plastics are dealt with in separate papers. The metal-forming section presents papers on precision casting, powder metallurgy, and forging, extrusion and stamping. Each section concludes with excerpts from question-and-answer sessions that followed presentations of the papers. All of these papers should interest the designer, for they sum up in orderly form the latest developments in the various categories. The concluding paper concerning the running of a materials department goes into some detail about the relations of the designer and the materials specialist. As these relations are a frequent source of friction, involving questions of responsibility in product development, the analysis is helpful in recognizing problems that may arise before they get out of hand, and in suggesting an attitude that is helpful in working them out.—*w.e.m.*

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LETTERS

Omission

Sirs:
I have just received the December issue of INDUSTRIAL DESIGN, and I want to tell you what a really fine job I think it is. The "Design Review" is really fascinating and has many excellently organized products in it which even we in the profession might normally not have seen or may even have overlooked.

That project with the five designers for under $5.00 was a really lovely idea. To have Raymond Loewy turn up with a whole carton full of neatly chosen products and still return $1.00 to the editors, brings out a very attractive bourgeois quality in him of which I had not previously been aware. To discover that my good friend, Milt Immermann, on top of all his other talents is apparently also an experienced woodsman was to me also a not unimportant discovery.

The first of Jay Doblin's articles on perspective is a real achievement on a very difficult subject and will be of tremendous value to every professional designer. Thank you also for the coverage on the American products at the Triennale which Jay Doblin helped to organize for the S.I.D. and which has not always been reported so accurately.

In your entertaining coverage of the S.I.D. Williamsburg meeting I very much missed recognition of the presence of Mr. Robert Gruen, President of I.D.I. We were proud to have Bob Gruen with us to represent our sister organization, and his address to our members was to me one of the highlights of our meeting.

However, your December issue was a fine one, and I am sure that all designers, manufacturers, and suppliers will profit from it.
Peter Muller-Munk, President
Society of Industrial Designers

We sincerely regret that we failed to report Mr. Gruen's significant talk on the common aims of the S.I.D. *and the* I.D.I. *—Ed.*

Hits the spot

Sirs:
Industrial Design hits the spot with me. Wishing you continued success, I am
Haight M. Reiniger
Product Development Manager
Chemical Division
The Borden Company
New York, N. Y.

Correction

Sirs:
Needless to say, we are highly pleased with your presentation of our KW bolt assembly in the Annual Design Review. Some of your readers, however, may take exception to the statement that "(the bolt assemblies) . . . are cadmium plated to resist high temperature." The alloy steel components of the fastener are cadmium plated to prevent corrosion. Above 500°F. the cadmium plate on the fastener no longer offers protection against corrosion.

With your first year's endeavors ending with this Annual Design Review, you and your INDUSTRIAL DESIGN staff are to be congratulated on creating such a stimulating publication.
John T. Hales, Advertising Manager
The Hi-Shear Rivet Tool Co.
Los Angeles, California

G.D. to I.D.

Sirs:
Warmest congratulations on the first Annual Design Review in INDUSTRIAL DESIGN. It is rich, stimulating, and satisfies a real need. As an old colleague in selectorosis, I think you're off to a good start.
Edgar Kaufmann, Jr.
Director, Good Design
Museum of Modern Art
New York, N. Y.

Inspiration

Sirs:
I must commend you on a very fine publication which seems to grow better with each issue. INDUSTRIAL DESIGN is a refreshing source of inspiration in all phases of design indicating what can be done by competent designers and farsighted management.
Charles P. Schock, Design Director
Design Associates
Philadelphia, Pennsylvania

Tops

Sirs:
. . . We, at Bill Jack's, feel that your magazine is tops — clearly presenting the design problems and solutions from all sides of the industrial scene and linking them together so well pictorially that there is not a page that doesn't carry impact.
John B. Miller
Bill Jack Scientific Instrument Co.
Solana Beach, California

Useful

Sirs:
The text material and design reviews presented by your publication fulfill a need within the broad designing profession. Simultaneously, you provide a most useful publication to industrial management, bringing with it a new awareness to many executives of the industrial designer's role in the picture.

In short, we like it fine, and wish you continued success.
Felix Gilbert, Industrial Designer
Kahn and Jacobs
New York, N. Y.

Old Wives' Tale

Sirs:
I marvel at your statements concerning the efficiency of the engine in the dayliner *Robert Fulton* (August issue). Although its *mechanical* efficiency — its freedom from friction losses — is undoubtedly comparable to that of a modern engine, its *thermal* efficiency — its overall ability to get energy out of fuel — is deplorable, and that is the main reason it is obsolete.

What you call "inefficient, short-lived high-speed machines like the turbine" are used to generate your electric power. They run twenty-four hours a day for years between maintenance inspections, without the tightening of a single turnbuckle. And this sort of design is in accordance with modern engineering practice, which says that anything that outlives its usefulness is wasteful of material.

If the designer is often troubled by his conflicts with "practical, hard-headed engineers," who cannot see any reason why a product's appearance should receive attention, let him remember that just as the designer knows the difference between "design" and "styling," and recognizes its importance, the engineer takes seriously the difference between efficiency as defined mathematically and efficiency as vaguely conceived by the layman. The next time you appraise the mechanical function of an object, look beyond the surface, ignore the folklore and old wives' tales, and get your story straight. It'll impress us engineers.
John H. Fries, Jr.
Louisville, Kentucky
Engineer Fries is absolutely right — except in his interpretation of our story. We merely wished to point out that the engine's high mechanical efficiency is connected with its good mechanical appearance.—Ed.

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NEWS

IDI panel (l. to r.): Noyes, Wheeler, McCarthy, Muller-Munk, Beyer, Peter.

Newly re-elected IDI president Robert Gruen (l.) presents medal to John Vassos.

What's cooking in the kitchen?

The Industrial Designers' Institute held their annual National Meeting in New York January 28, 29, and 30. Opening an evening program at the Museum of Modern Art, John Vassos received a medal for "inspiring leadership and outstanding service in 1954" from Robert Gruen, I.D.I.'s newly re-elected president. Main business of the evening was a panel discussion, "What's Cooking in the Kitchen?" Moderator John Peter, design editor of *Look*, introduced the five panel members, each of whom showed slides of his or her dream kitchen and made pertinent remarks. There was remarkably little heckling, considering that kitchens (or "family food preparation centers" and "homemakers' work stations") are such a hot subject nowadays. Herewith some random quotes.

Glenn H. Beyer, Director of Housing Research, Cornell University (Cornell Kitchen Project): "Counter working surfaces on all of these cabinets are adjustable to suit the height of the homemaker."

Peter Muller-Munk, president of the S.I.D. (17th-century Dutch Kitchen): "I do not believe that anyone has yet come up with a really convincing answer to what a kitchen should be like. . . . The finest food that I have had was cooked in kitchens that were a complete mess. . . . This is a 17th-century kitchen in Amsterdam. It has a very ingenious barbecue, a four-burner oven, and another oven. I think it has more of the sense of living, more of the sense of food, more of the sense of people getting together and enjoying themselves than almost anything that I have seen."

Josephine McCarthy, home economist and TV food editor (several women's and home magazine kitchens): "Let's face it, these men can design anything we women want, and the reason that they are designing all these horizontal refrigerators . . . is because we have built a bonfire under them. I am the victim of a builder's kitchen. It is loaded with cabinets; it has the right work centers but it is uncomfortable to work in. . . . I do not like fluorescent lighting. At five or six o'clock in the morning fluorescent lighting around your range . . . is very garish."

David Wheeler, designer in GM's styling section (Frigidaire Kitchen of Tomorrow): "I think the dream kitchens and cars have a tremendous impact on the public. For one thing they make them aware of design as such. . . . In addition to that it gives us an opportunity to present new ideas to our management."

Eliot Noyes, architect (his own): "I have just completed for myself a dream living center; we call it a house. . . . We started with a big idea about how we would like to live and we decided the kitchen would have to find its way into this scheme somehow, and it did. . . . I do not want to suggest this is the perfect kitchen. It is an awfully good one for me right now in this particular house. There can be so darned many different kinds of kitchens. . . . I think that the thing that we as architects want . . . is a greater variety of units that can be put together in different ways."

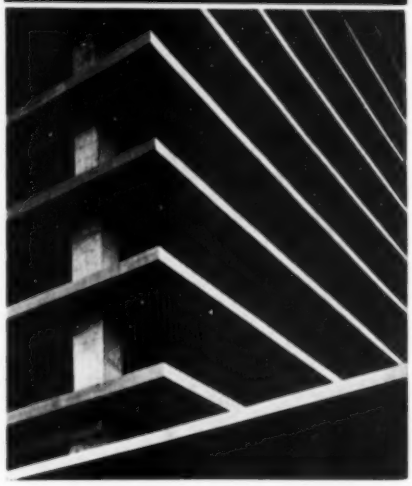
Flash . . . Kaufmann leaves G. D.

Word was received as we went to press that the resignation of Edgar Kaufmann, Jr., Director of Good Design, was accepted by New York's Museum of Modern Art on February 11.

Nor iron bars . . . .

A curtain wall which is literally just that —a cage of stainless steel wire strands— will shield cars in Chicago's new Public Garage Number One. The strands, each consisting of seven wires twisted together, are ⅜" thick and 8" apart. In 100-foot lengths the strands are anchored to stainless steel fittings near the edge of the floor slabs and pulled taut by turn-buckles which apply 1000 pounds of tension. It is said that these walls will be capable of retaining the force of a car going 40 miles per hour, and we keep getting a mental picture of a sort of giant badminton game with a car for a shuttlecock, or perhaps a 3-D harp. The design is by Shaw, Metz and Dolio; the strands are by American Steel and Wire Division, U. S. Steel.

Chicago's cars in a stainless cage.



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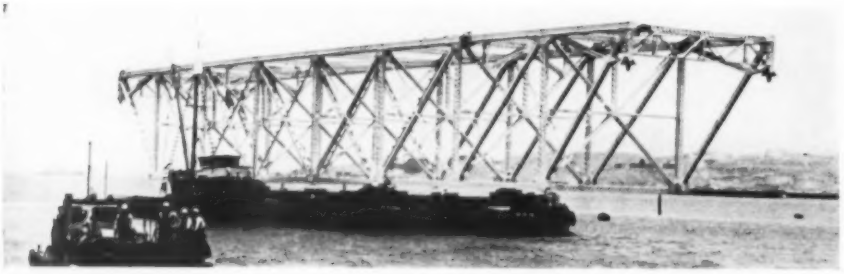


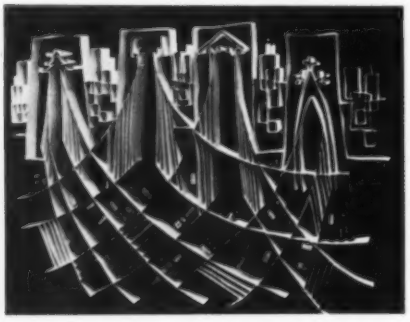
Not a runaway bridge but an aluminum scaffold going out to work.

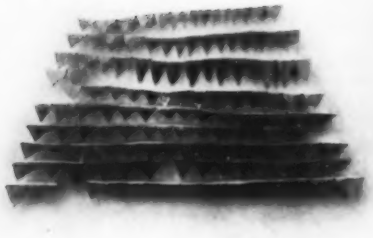
New use for aluminum

Two aluminum erection truss units are replacing large barges and a great number of steel or wood piers on construction of the great Richmond-San Raphael bridge in San Francisco Bay. The relatively lightweight scaffold units, 280 feet long, can support over 400 tons of steel. The aluminum scaffold is hoisted, by two derrick barges, into place between two steel towers rising 170 feet above the water. One section of the permanent steel trusswork is hoisted into place on the aluminum scaffold; then an erection traveler, operating from tracks laid on this section of steelwork, can hoist the rest of the heavy steel members from barges to their permanent positions. As each 289-ft. long steel truss is completed, the aluminum structure is lowered and hoisted again between the next two towers. These aluminum trusses will be usable elsewhere after this bridge is finished (around August, 1956) and on this job are expected to save some $64 per ton of steel erected over the cost of steel falsework. With a total of about 15,000 tons of steel to be erected, this is not bad. The trusses were made by Judson Pacific Murphy-Kiewit from Alcoa shapes and plates.

Finnish metal at home

A new kind of metal sculpture and some lamps in brass and sand-blasted opal glass were shown recently in New York by a Finnish designing couple, Helena and Paavo Tynell. Paavo Tynell's lamps are those which are well-known from Finland House, for whom he designs: pierced brass bowls, buds, and lacy, dangling mobiles. Added to these are new, nice shapes in the sand-blasted opal glass which glows white instead of yellow. His wife's wall sculptures are welded steel ribbon on black or white baked enamel-on-metal plaques. The quite delicate color, in the *Romantic Landscape* below, is done with oil.





Metal designs from Finland: Paavo Tynell's sand-blasted opal glass and brass lighting fixture and his wife's wall sculptures, Manhattan *(top) and* Romantic Landscape.

Colored curtain walls

Colored, interlocking aluminum panels are yet another last word on curtain walls for commercial architecture. These, in the photograph, enclose Alcoa's Cincinnati office. They are 4 feet wide, ranging in height from about 8½ to 17½ feet. The extruded aluminum panels are color-impregnated by an electrochemical process and are said to need no exterior maintenance because they will not chip, peel or rust. This building is clad in gold and blue, but a more sober grey, brown and yellow are available.

Blue and gold aluminum panels sheathe Alcoa's Cincinnati office, one color per wall.

Rubber railroad roadbed

Fittingly enough, Akron, Ohio, now has the world's first rubber railroad crossing. Invented by C. H. Rennels and made by Goodyear, the roadway actually consists of slabs 36″ by 59″ by about 3″, which includes a sheet of heavy-gauge steel sandwiched between two layers of rubber. These slabs rest on a bed of treated wooden planking, laid over the regular railroad ties, and are designed with tapered flanges where they meet the rails. When sprung into place, these flanges are expected to form a watertight union, preventing the seepage which causes deterioration of the ties; according to the engineers, they should last indefinitely.

Triennale Awards

American prizes at the Tenth Triennale of Milan (ID October, December 1954) have been listed (awards seem to have been conferred vertically, by country). *Grand prize*: Buckminster Fuller, as a scholar of prefabrication. *Honor diploma*: Raytheon "Challenger" TV set. *Gold medal*: DKR-2 chair designed by Charles Eames and executed by the Herman Miller Co.; chair no. 400 designed by Finn Juhl for Baker Furniture Inc. *Silver medal*: electric drill designed by Garth Huxtable for Millers Falls Co. *Bronze medal*: Anscoflex camera by Raymond Loewy for Ansco.

The American section of the Industrial Design exhibit will arrive in Houston, Texas, for a month's showing at the Contemporary Arts Museum (March 4 to April 3), marking the Southwest's first major show of industrial design.

ARA-RESIN the new envelope adhesive

that is three ways different and many ways an improvement

The envelopes your firm sends out are more than wrappers – for correspondence, printed matter, samples, etc. Each envelope is your representative to a particular customer, sometimes the only representative he sees for months at a time.

Because envelopes hold this double importance, there is a never-ending search to improve them. That is why Ara-resin, Arabol's new Synthetic Resin Adhesive for envelopes, should be enthusiastically accepted – by envelope makers and envelope users alike.

An envelope with Ara-resin is, in our opinion, three ways better. (1) You have no bulging or seal impression to distort printing – to damage dies. Ara-resin makes a flatter, neater seal.

(2) With Ara-resin, there is less spoilage when envelopes are stored for any length of time – less tendency for the paper to curl. This is especially important to firms who process their mail through automatic postage machines.

(3) Ara-resin has more power to stick than dextrine type adhesives – and remains stuck. It actually out-performs the conventional envelope adhesives–even those made especially for "difficult" stocks like 100% rag and kraft. More than that, Ara-resin tacks and adheres only when brought in direct contact with water – it is less affected by high humidity.

Ara-resin is colorless (almost to invisibility), and odorless. However, Ara-resin can also be produced to your order, in a wide range of color, and to taste, if necessary, as well as to a degree of gloss. With any combination of these qualities, Ara-resin retains its basic characteristics.

By the pound, Ara-resin costs more than Arabol's Dextrine adhesives for envelopes. However, tests indicate that a pound of Ara-resin goes appreciably further than do conventional envelope adhesives. If this works out in terms of *your* requirements, then once again, it is a case where the best adhesive should have the least overall cost.

The Envelope Industry is one of a hundred in which Arabol is privileged to serve the leaders. We urge you to talk with your envelope supplier on the practical advantages, the added refinements and, quite possibly, the greater economy of having your envelopes made with Ara-resin.

For any of your other adhesive requirements – in the making, labeling, packaging, or shipping of your product . . . we invite the opportunity to submit samples for you to test in your own plant – under your particular working conditions – for your specific requirements, whatever their nature. That is the one kind of testing that assures you of satisfactory results. Your inquiry to Department 24 will bring a prompt response.

ADHESIVES ? ARABOL !

★ ADHESIVES ? ARABOL ! ★

70

YEARS OF PIONEERING IN THE MAKING OF ADHESIVES

ARABOL

★ ADHESIVES ? ARABOL ! ★

ADHESIVES ? ARABOL !

THE **ARABOL** MFG. CO.

. . . a nationwide organization serving major users of industrial adhesives

EXECUTIVE OFFICES: 110 E. 42nd ST., N. Y. 17, N. Y.

CHICAGO • SAN FRANCISCO • LOS ANGELES
ST. LOUIS • ATLANTA • PHILADELPHIA • BOSTON
PORTLAND, Ore. • ITASCA, Tex. • CINCINNATI
LONDON, Eng.

Honorable mention, food: tilt bottle designed for Arrowhead Puritas water by Walter Landor & Associates.

Redesign: Sears' Cross-Country Rose blooming on its carrying-handle carton.

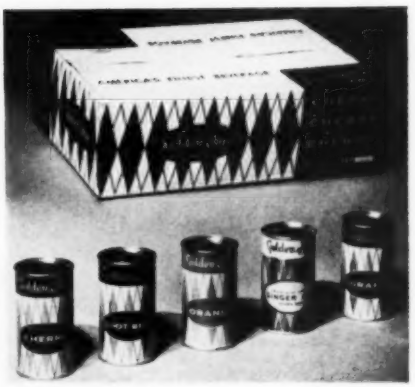
Best-in-show, best gift package: Sylvania's Gift Pak, a transparent merry-go-round of flashbulbs with built-in guide, by Case-Hoyt Corp.'s Willard Lustenader.

Coordinated packaging: Ansul Chemical Company design program by Raymond Liewy. (Complete coverage in ID, April 1954.)

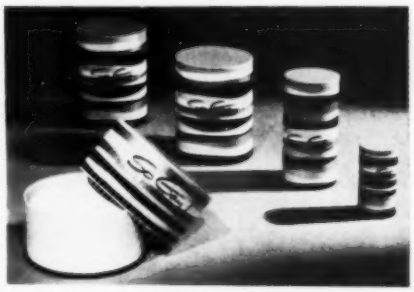
Package prize winners

The cream of 1954's packages has been skimmed; the judges of the Package Designers Council's annual competition announced the winners at lunch on February 9 at New York's Hotel Plaza. The Irwin D. Wolf Award, for the outstanding package of the year, went to Sylvania's Bantam 8 Gift Pak, which also was voted best in the Gift category. Winners in ten other categories are: Coordinated program, Raymond Loewy's program for Ansul Chemical Company; food, Golden Age soft drinks by Smith & Scherr for the Golden Age Beverage Co.; drugs, Nowland & Schladermundt's Band-Aid boxes for Johnson & Johnson; cosmetics, "So Gay" by William Greenfield for Elmo, Inc.; toys, Charles Eames' Giant House of Cards for Tigrett Enterprises; liquor, the Old Forester decanter by Raymond Loewy Associates for Brown-Forman; textile & soft goods, Piccolino Swim Trunks by Mel Gussow Associates for McGregor Sportswear; hardware, Tac-It-Tite envelope container for Whiting-Adams Company's paintbrushes, developed with the U. S. Envelope Co.; redesign, the Cross-Country Rose container developed by C. W. Harper of Sears, Roebuck with W. A. Ringler of Gardner Board & Carton; new product, the box for AD detergent, by William A. Troy of Colgate-Palmolive-Peet. PDC added an international division to this year's competition with the cooperation of the U. S. Department of Commerce: top winner was a line of stationery boxes which become little writing cabinets, manufactured by Hein. Arthur Hoesch of Kreuzau uber Duren, Germany. Chairman of the judging board for the competition was Irwin D. Wolf, vice-president of Kaufmann's Department Store, Pittsburgh. Winners and selected entries will be shown at the Institute of Graphic Arts February 5-20 and at the Chicago Packaging Exposition April 18-25.

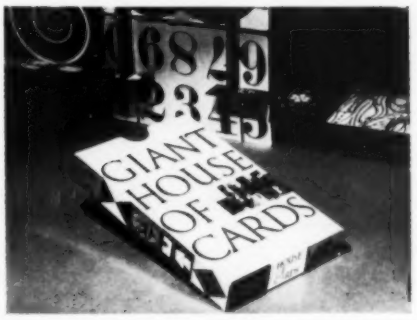
International: German Bentz-Papier stationery in desk-like fitted boxes.



Food: Golden Age soft drink cans, carton in flavor-keyed colors by Smith & Scherr.



Cosmetics: all-cylindrical containers by William Greenfield for Elmo's "So Gay."



Toys: Giant House of Cards by Charles Eames for Tigrett Enterprises.

Materials handling show

Materials handling techniques will be the subject of a conference to be held in conjunction with the National Materials Handling Exposition at Chicago's International Amphitheater from May 16 to 20. Engineers who actually handle this equipment will be on hand to answer questions and offer advice. More than 200 companies will exhibit at the show, last held in 1951. L. J. Riege, materials handling engineer with U. S. Gypsum Co., is chairman of the conference, which is jointly sponsored by the American Material Handling Society and Clapp & Poliak, Inc. Advance registration cards and information may be had from Clapp & Poliak, 341 Madison Avenue, New York 17, New York.

CORNING GLASS BULLETIN

FOR PEOPLE WHO MAKE THINGS

Three problems . . . one "E-C" answer

How would *you* shield a complex, static-sensitive hunk of machinery from stray electric charges and still keep its innards open to inspection?

That's a problem IBM faced in designing their now-famous electronic calculator—and solved with E-C glass. Ordinary glass wouldn't do. It wouldn't keep electrons in line. Metal would have been ideal for the shielding job, but not so good for seeing through. E-C coated glass does the one and allows the other.

E-C coated glass is a PYREX brand glass. It stands up well under physical and thermal shocks. But its main claim to fame is the transparent, conductive coating (about 20-millionths inch thin) that's permanently bonded to one side of it. It's this coating that keeps static charges from gumming up IBM's complex circuits busy calculating.

But there's more to E-C coated glass than shunting off unwanted electrical charges. Run a current through it and you've got a heating element that gives forth with a *uniform*, dry, controllable, radiant heat, up to 350° C. The emphasis is on *uniform*—no furrows of heat with coolth in between; no dead spots.

This uniform heating element is already at work in medical sterilizers, drying ovens, room heaters, chicken brooders.

And here's a third kind of application. Turn an E-C panel around and you have a highly efficient heat *reflector*. A well-known steel company protects shear pulpit operators from the fiery heat of billets in process with transparent E-C panels.

Product or process—the potential of E-C coated glass hardly seems tapped. We've learned a lot about it that we'd be glad to share with you.

Multi-aptitude problem—So many folks have exhibited so much interest in the ability of our VYCOR brand 96% silica glasses to survive, unscathed, wide temperature variations (quick switches from below freezing to 1800° F. or higher) that its other attractions for a designer may fall into oblivion.

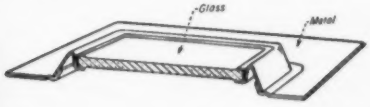
This we don't want to happen, and you might not either. Actually, there are seven VYCOR brand glasses available today—all high silica, but each compounded to develop specific aptitudes. Glass 7911, for example, we control especially for uniform, high transmittance of short-wave ultraviolet. It has notably high electrical resistivity, too, and low power loss. Glass 7910 meets germicidal lamp requirements for transmitting ultraviolet at 254 millimicrons. Glass 7950 will absorb most of the visible light from a tungsten filament (2700° K.), but let infrared radiation pass freely.

Our brand new bulletin B-91, "VYCOR brand Industrial Glassware by Corning," completes the story with all the basic data we can put in print about all seven VYCOR brand glasses—with curves and illustrations. It just might stimulate an application idea or two for you. Would you like a copy?

On becoming attached—Nothing personal—just a first step, we hope, toward informing you about ways of attaching glass to metal.

We've found a lot of our customers have more than a passing interest in this subject. We do too, as you might imagine, what with some 50,000-odd formulas for glass hankering to be put to new uses.

Below, for example, is *one* of the "recommended methods of attaching glass to metal structures"—from a bulletin of that name!



This particular one is a soldered joint between glass and metal. The glass panel has a metallized edge to accommodate soldering to the metal frame.

The brochure (actually an editorial reprint from "Product Engineering") shows some 16 other types, including threaded joints, pressure-tight joints, spun-metal joints and electrical connections. We'd be delighted to send you a copy.

* * * *

Which brings us to our basic theme—glass itself. That's a world amazing even to those of us who spend most of our waking hours exploring its apparently endless boundaries.

What progress we've made to date, mostly working with folks who have materials problems to solve, is spelled out in a little volume we've offered before and offer again in light of the sustained demand for it. A copy of "Glass and You" will show how this centuries-old material fits 20th century technology. It's a good starting point for getting acquainted. May we send you a copy?

Corning means research in Glass

CORNING GLASS WORKS, 32-2 Crystal Street, Corning, N. Y.

Please send me the information checked below:

☐ E-C glass; ☐ "VYCOR brand Industrial Glassware by Corning"; ☐ "Methods of attaching glass to metal structures"; ☐ "Glass and You"; ☐ Send a representative to call on me.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Robert Davol Budlong

Robert Davol Budlong, head of his own industrial design firm in Chicago, died suddenly at his home in Evanston on February 12. He was 53 years old. Born in Denver, Colorado, he studied art at the Cummings School of Art in Des Moines and received his A.B. in architecture at Grinnell College. After courses at the Chicago Academy of Fine Arts, he started to do advertising and product design in Chicago. Among other firms, Robert Budlong worked with Zenith, Sunbeam, Cory Corporation, and Sears, Roebuck. He was a member of the S.I.D.

Split

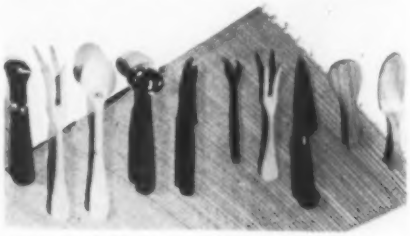
Nowland & Schadermundt announces a change of name. The product and marketing planning division becomes Nowland and Company, Inc., in Greenwich, Conn.; the design and product research division, Peter Schladermundt Associates, in New York.

Tooling for the West

"Tooling for Western Industrial Expansion" is the theme for the first Western Industrial Exposition, to be held in Los Angeles' Shrine Auditorium and Convention Hall, March 14-18, 1955. Sponsored by the American Society of Tool Engineers, some 270 companies will show production machines and processes, concurrently with the ASTE's annual meeting.

Pennies for design

Pratt Institute students once more came up with an assortment of 300 well-designed, pretty or imaginative objects available on the market for pennies. *Good Design, Penny to a Dollar* has now become a yearly expedition for Pratt's second year design students, who scour the shops around Christmas time, bring back the objects, and arrange their own exhibition under the supervision of instructors Jeanette Osborn and Arnold Friedman. This year's finds included a Japanese paper cutter which looked like a tiny wood-sheathed knife (1.00), an ingenious silver tea strainer — a cone suspended to swivel over its own drip-saucer ($.79) — from a Brooklyn department store, a polyethylene lettuce basket ($1.00), some delightfully colored and ingenious toys, and from the dime store, of all places, a hand-hewn stool ($.98).



Under a dollar for good design: Pratt students' 1954 selections included cutlery.

1

2

3

4

The George M. Humphrey, *ore carrier on the Great Lakes, is probably the most luxurious cargo vessel afloat* (1). *Quarters for officers, guests and crew were designed by Arnot-Jamestown division of Aetna Steel Products Corp. known for their ubiquitous office partitions. The guest lounge* (2), *for example, has toast-colored wall-to-wall carpet, walnut panelling, an orange sofa, and lime, gold and white chairs. Crew members all have twin-berth cabins with private bath. A desk slides out from the chest of drawers* (3). *The crew mess room is in shades of grey, light blue and maroon, with natural waxed wood chairs* (4).

Packaging show

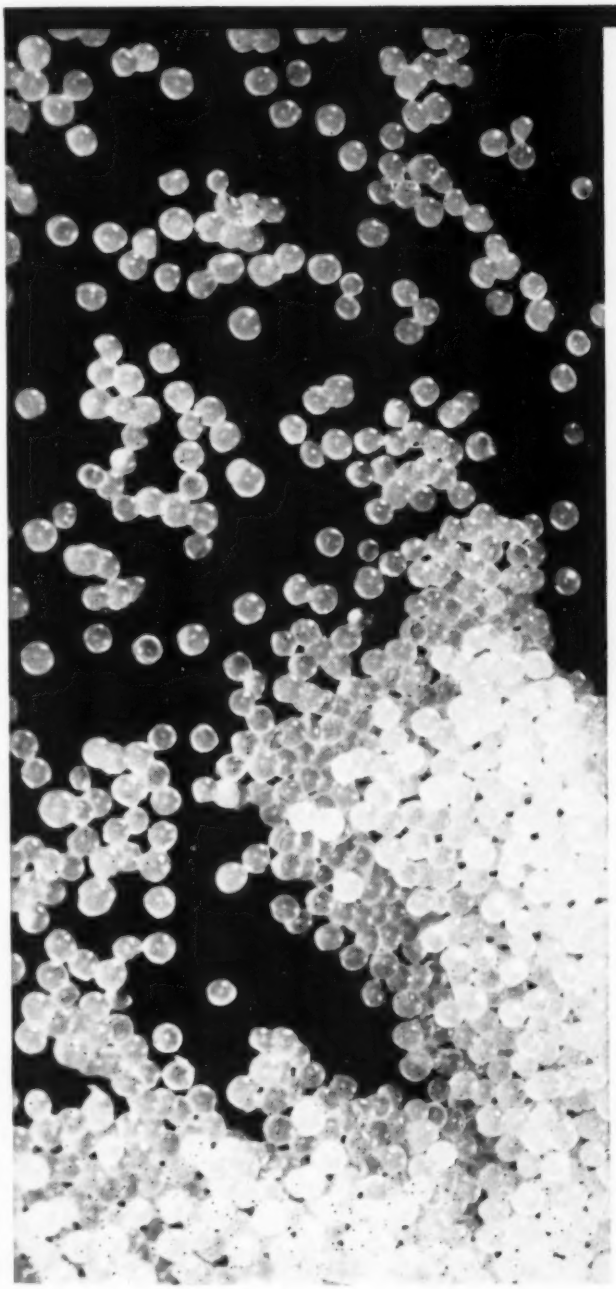
The "how-to" of packaging — methods and techniques for reducing packaging costs— will be one of the major topics at the 3-day Packaging Conference to be held April 18-20 at Chicago's Palmer House. In conjunction with the Conference, the American Management Association will hold its 24th National Packaging Exposition April 18-21 at the International Amphitheater. About 375 exhibitors are expected to participate in the large show, with equipment, materials and services for the packaging, packing and shipping of industrial and consumer goods. Conference sessions will include case studies on such varied aspects of packaging as automation, developing and testing of packages, packaging laboratory equipment and industrial relations; other sessions will deal with such materials as film, foils, paper, boxboard and foam and expandable plastics, analyzing their advantages for specific applications and possibilities for the future. Anyone with business affiliations may attend.

Design engineering show

Replacing the Basic Materials Exposition, the Design Engineering Show, to be held May 31 to June 3 at Philadelphia's Convention Hall, is planned to help design engineers with two major problems, according to Saul Poliak, president of Clapp & Poliak, Inc., producers of the show. "Manufacturing costs must be reduced through skilled design engineering, while products must be designed to be more functional, less costly, and more attractive to consumers." This show will retain many of the features of the Basic Materials Exposition, but will add to the basic materials exhibits many mechanical, electrical, hydraulic and pneumatic components of end products, finishes, coatings, and other parts, shapes and forms. The board of sponsors for the show and conference is headed by Don G. Mitchell, chairman of the board of Sylvania Electric Products, Inc. Advance registration cards and information are available from Clapp & Poliak, 341 Madison Avenue, New York 17.

The big news
in plastics is

TENITE POLYETHYLENE



In November 1954 the first shipment of Tenite Polyethylene left the new Texas Eastman plant at Longview, Texas. This made Eastman the first new supplier of polyethylene in over ten years.

Along with this new primary source comes a new form of polyethylene . . . *spherical* pellets.

Spherical pellets offer many advantages. They flow freely through molding machine hoppers without bridging-over. The new pellets are easier to keep clean during storage and use. Their smooth surfaces do not readily catch dust and foreign particles. Spherical pellets also mean fewer fines, making it easier to clean the hopper when changing colors.

This new form has a 10% lower bulk factor. You can store or ship 1,000 pounds of Tenite Polyethylene pellets in the space that would hold only 900 pounds of ordinary pellets.

Tenite Polyethylene is available for injection molding, blowing or continuous extrusion (including wire covering). It can be furnished in a wide variety of colors and color concentrates.

For more information on Tenite Polyethylene, write
EASTMAN CHEMICAL PRODUCTS, INC.,
Subsidiary of Eastman Kodak Company,
KINGSPORT, TENNESSEE.

TENITE
POLYETHYLENE
an Eastman plastic

Information regarding Tenite also can be obtained from local representatives listed under "Plastics—Tenite" in the classified telephone directories of the following cities: Chicago, Cleveland, Dayton, Detroit, Houston, Leominster (Mass.), Los Angeles, New York City, Portland (Ore.), Rochester (N. Y.), St. Louis, San Francisco, Seattle, and Toronto —elsewhere throughout the world, from Eastman Kodak Company affiliates and distributors.

World Plastics Fair

The plastics world of tomorrow as well as the latest in materials equipment and applications today will be shown at the big World Plastics Fair in Los Angeles National Guard Armory, April 6-10, 1955. Although such sections of the "world of tomorrow" and a big plastic toy exhibition are expected to be crowd-stoppers, major emphasis will be on techniques, new materials, and advanced methods of manufacture. A big section will show such machines as extruders, presses, tumblers, formers and drawers, many in operation. A live vacuum-forming exhibition, using such materials as styrene, Lucite, Plexiglas and Formica, should be of particular interest; among other new items will be an improved-formula rigid vinyl and a sheet material called Gravoflex, developed by U. S. Rubber and said to adapt to engraving, die-cutting, shearing, forming and many other techniques.

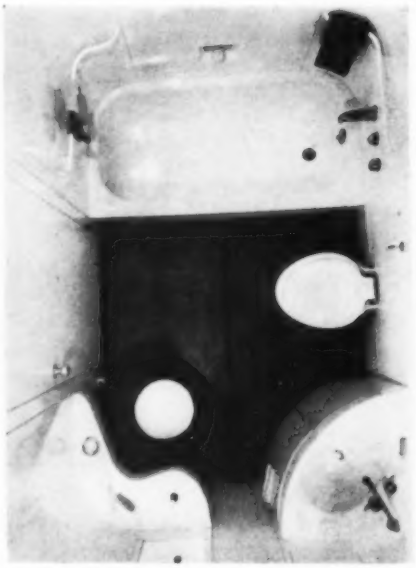
This very comprehensive exposition will be open not only to industry, but also to the public, which will be admitted at times which do not interfere with the main business of the show: to furnish a well-rounded marketplace for the exchange of information between Western industry and plastics manufacturers not only from the East Coast but foreign countries as well.

The exposition management has published a 40-page Exhibitor Handbook, describing all details of the show; it may be obtained by writing to Philip Kent, managing director, 8762 Holloway Drive, Los Angeles 46, California.

Behind the design exhibit at the forthcoming Plastics Fair (l. to r.): Samuel S. Oleesky of Micronics, Inc.; Paul Tuttle, Furniture designer; Thornton Ladd, architect and chairman of the Fair Design Committee; Philip M. Kent, managing director of the Fair; and Austin Herbst, Minnesota Mining and Manufacturing Co.

Plastic prefab

Tying in the forthcoming Plastics Fair and the recent Plastics in Building Conference (neither of which it has anything



Plastic prefab bathroom: pick your panels.

official to do with), is a plastic, prefabricated bathroom unit developed by Guy G. Rothenstein. The design of these lightweight, reinforced plastic panels is based on the designer's similar metal prefabricated units, manufactured by the Fiat Metal Manufacturing Company. Called "Fixturepanels" (Tubpanel, Lavatorypanel, Fillerpanel, etc.), the plastic units might be ordered separately, in any combination, and be put together in a number of ways. A manufacturer has not yet been chosen.

Nautilus Ahoy

After many a tribulation, the U.S.S. Nautilus (ID August 1954) finally dived beneath the waters of Long Island Sound and began, it is hoped, a new era in transportation. The historic moment came at 11:01 AM on January 17, as the atom-powered submarine cast off from her dock at the Groton, Conn., yards of her builder, Electric Boat Division of General Dynamics Corporation. How the men will fare in their super-industrially designed quarters is yet to be proven, but General Dynamics has declared a 100% stock dividend.

Jet research

Westinghouse Electric has announced plans for a new jet engine research and development center to cost $12½ million. The new facilities, to include both high- and low-power laboratories and an experimental engineering shop, will be at the site of Westinghouse's present jet engine plant south of Kansas City. The New York firm of Sanderson and Porter are already at work on architectural and engineering phases of the new high-power laboratory, and will be in charge of all new construction, expected to begin this Spring.

Executive Development Program

Young executives with a potential for management ability are eligible for MIT's year-long Sloan Fellowship executive development program. The fellowship is competitive; only some thirty or thirty-five men will be chosen. Each candidate must be nominated by his employer and have from him the promise of financial support for the year, thus assuring, says Professor Gerald B. Tallman, Director of the program, that each nominee will be "a man whose promise for future service is so great that it justifies finding a way to release him from his job for a full year of study." Final selection of candidates will be based on the nominee's apparent potential for growth into major responsibilities, rather than a particular background. Employers will be glad to hear that the awards, made possible by the Alfred P. Sloan Foundation, Inc., provide some money to help defray the cost of the year. Applications are due by March 4, 1955; members of the 1955-56 program are expected to be in residence for twelve months starting in June, 1955. Complete information on the program and applications for Sloan Fellowships may be obtained from the Director of the Executive Development Program, M.I.T. School of Industrial Management, 50 Memorial Drive, Cambridge 39, Massachusetts.

Inspiration Gala

For the benefit of the Industrial Design Division of the Brooklyn Museum, an "Inspiration Gala" supper ball and show will be held March 2 in the sculpture court of the Museum. The evening will honor Michelle Murphy, the late director of the Division, and funds raised will be used to expand the services of the Industrial Design Division to designers, manufacturers and retailers, as well as to provide aid to young designers and industrial art students. Requests for reservations ($100 per couple, and deductible) should be addressed to "Inspiration Gala" at the Museum, Eastern Parkway at Washington Avenue, Brooklyn 38, N. Y. Checks are payable to Walter N. Rothschild, treasurer.

Engineers' Job Directory

A new annual publication, Engineers Job Directory, is designed to help both graduating engineers and companies on the watch for new talent. The guide lists some 129 companies such as Alcoa, Pittsburgh Plate Glass, and I.B.M., with key facts in capsule form. These include such precise information as number of employees, whom to contact for what, which companies offer summer jobs to undergraduates, and the types of engineers they want. Copies may be obtained for $2.25 from the publisher, Decision, Inc., 105 E. Fourth Street, Cincinnati 2, Ohio.

...Top designers choose No-Sag

The spring has to be an integral part of any design that comes from their drafting boards. It has to be strong, durable, most comfortable, light of weight and line. It has to be a No-Sag spring.

no-sag®

NO-SAG SPRING COMPANY
21590 Hoover Road • Detroit 13, Michigan

75% of all springs made today are of the NO-SAG type

the INDUSTRIAL DESIGNERS' INSTITUTE announces the

FIFTH ANNUAL DESIGN AWARD PROGRAM

The I.D.I. DESIGN AWARD is open to every designer in the industrial design field — regardless of affiliation.

An award medal will be presented to no more than three individuals or groups of designers for their noteworthy and fresh approach to design and function — combined with a practical use of appropriate materials — for a product that is mass-produced and nationally distributed.

submissions

A product may be submitted to the jury by the designer, or anyone else on his behalf, using submission forms available from the Chairman (see coupon below). Submissions must be postmarked no later than May 14, 1955.

past recipients of the IDI design awards

1954 Dave Chapman, SID
Franz Wagner, SID & Richard Latham, SID &
Don De Fano of Raymond Loewy Associates

1953 Carl Otto, SID, IDI
Donald Dailey, SID

1952 Henry P. Glass, IDI
Donald L. McFarland, SID

1951 Charles Eames
Carl Otto, SID
George Cushing &
Thomas Nevall, IDI

ANNOUNCEMENT & PRESENTATION of the award medals will be made at a luncheon on June 23, 1955 — at the Sarah Siddons Walk — Hotel Ambassador East — Chicago, Illinois.

Paul R. MacAlister, Chairman; Walter C. Granville, Co-Chairman
Fifth Annual IDI Design Award Committee

request for submission form

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to:

Paul R. MacAlister, Chairman
5th Annual IDI Design Award Committee
1226 North Dearborn Parkway, Chicago 10, Illinois

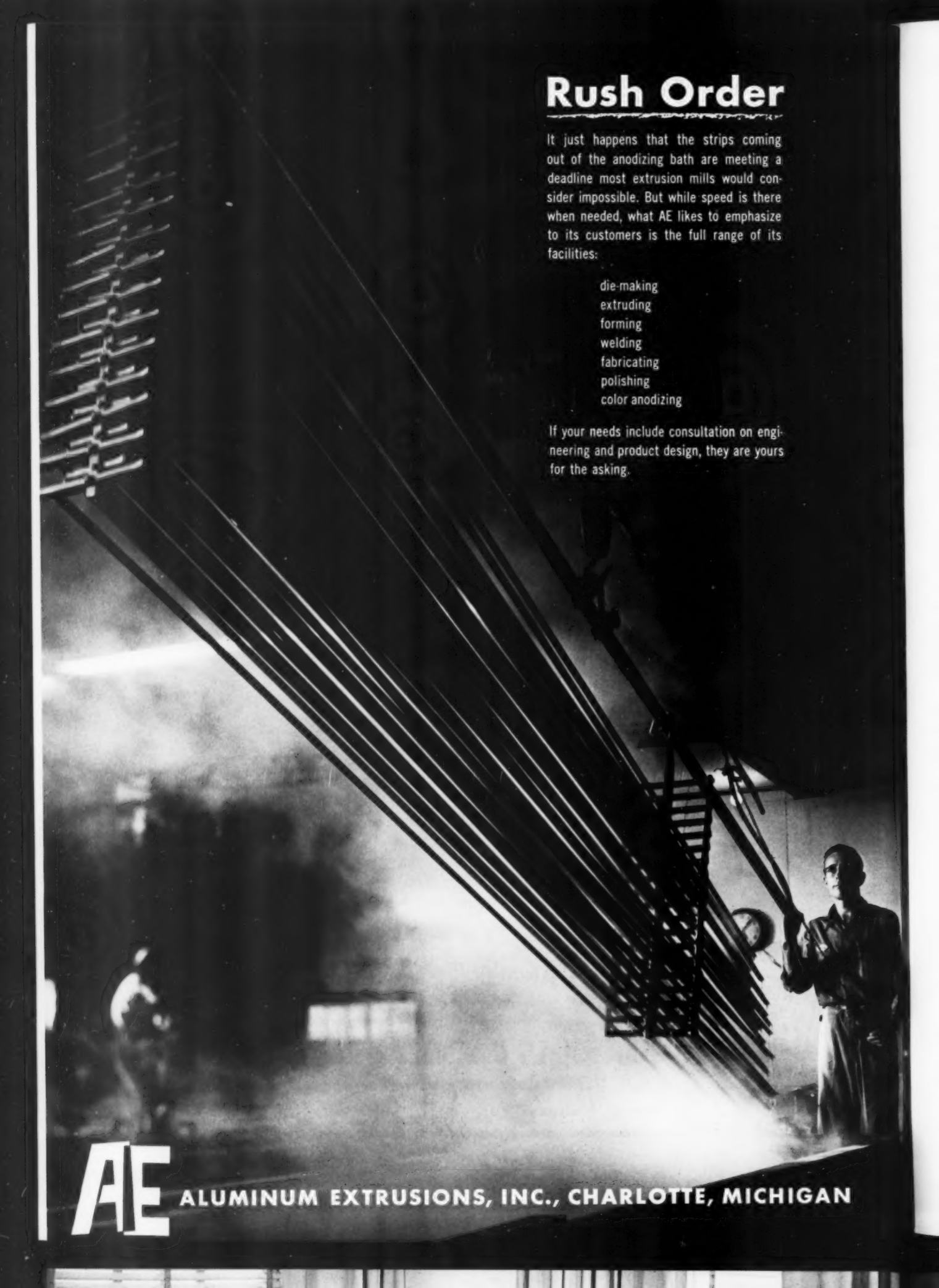
I plan to submit the work of .... designer(s) for consideration for the Fifth Annual IDI Design Award.

Please forward .... submission forms to:

Name _____

Company _____

Address _____



Rush Order

It just happens that the strips coming out of the anodizing bath are meeting a deadline most extrusion mills would consider impossible. But while speed is there when needed, what AE likes to emphasize to its customers is the full range of its facilities:

die-making
extruding
forming
welding
fabricating
polishing
color anodizing

If your needs include consultation on engineering and product design, they are yours for the asking.

AE ALUMINUM EXTRUSIONS, INC., CHARLOTTE, MICHIGAN

Our Year

1954

February —President heads into fourth week with 83rd Congress.
—*Business Week* predicts beef headed for record year.
—First issue of INDUSTRIAL DESIGN launched with plea for small taxis.

March —Early warm spell thaws auto market.
—President off to Key West.
—New York City rewrites law to permit small taxis.

April —Good news and bad just about cancel out in steel.
—ID flies to Delaware to discuss industrial design with executive of major chemical company. At end of friendly meeting, he asks, "Now exactly what does an industrial designer *do?*"
—Used houses sticky.

May —Industrial designer flies in from Delaware to discuss industrial design with ID. Ask him, "Exactly what do you *do?*"

June —Figures for the month show no great change, but no one expected them to.
—President off to Aspen.
—1.3% of ID readers write in to suggest *stylist* as better word for industrial designer.

July —Barometers indicate sogginess in money market.
—Inventories continue an enigma.
—13.5% of ID readers write in to insist styling not synonymous with designing.
—ID holds conference on Good Design; agree it is a good idea; conclude subject needs much further discussion at unspecified future date.

August —Steel sags.
—*Business Week* reports the urge to merge; *Sports Illustrated* reports the wish to fish.
—ID uncovers terrifying trend in article, "Is the Kitchen Disintegrating?"

September —The consumer is less of a wet blanket.
—Market research reveals that 99% of ID copies sent through the mails reach final destination (top management, product designers, independent and collateral designers, engineers, architects, independent research laboratories, and miscellaneous.) 77% disappear immediately, of which 66% assumed stolen. 11% miscellaneous assumptions.
—ID notes evidence in own home that kitchen is disintegrating.

October —Autumn at last — the treacherous period is over.
—President off to Williamsburg.
—ID publishes article generally sympathetic to plight of distillers faced with growing demand for Christmas decanters.

November —What voters had in mind still in considerable doubt.
—Turkeys rise; beef slumps.
—ID awaits gift decanters from sympathetic distillers.

December —Unfilled orders continue to chill business picture.
—Packaged liquor soars, even in Kentucky.
—ID observes drafting boards covered with decanters (1955 campaign, off to early start.)

1955

January —Good Design Show features more industrial design; INDUSTRIAL DESIGN shows more good design.
—Appliances unveiled. The kitchen *has* disintegrated. ID decides to publish more positive article next time.

February —President heads into fourth week with 84th Congress.
—Major chemical company invites ID to press preview of new products just created by prominent industrial designer.
—Editor trips descending from new small taxi; drops gift decanter.
—Telegram from Audit Bureau of Circulations announces "INDUSTRIAL DESIGN becomes provisional member under Section Eight Article Two of Bylaws."
—ID takes hour at noon to celebrate. Happy birthday. Too bad about decanter.

How a big design office works

Walter Dorwin Teague Associates

An industrial design office, like any other office, is set up to do business, serve its clients, get out the work. It is special mainly in the degree to which it depends on the indefinable element of creative activity. Beyond these simple facts, generalizations are pretty useless: the only way of describing how an industrial design office works is to tell the story of one particular office. This story won't explain how any other design firm operates, but it may give us some picture of the unique services any one of them can provide.

Walter Dorwin Teague heads one of the oldest industrial design firms in the country. Mr. Teague accepted his first client in industrial design in 1926, and was a founder and the first president of the Society of Industrial Designers. In 1950, the firm adopted its present name, Walter Dorwin Teague Associates, to give full credit to the seven young partners who work with Mr. Teague.

We would have had good reasons for choosing a number of offices to illustrate this story; here are some of the things that distinguish this one: WDTA have an unusual number of long-term accounts; some of their clients have been with them over ten, fifteen, and even twenty-five years. Unlike many firms, they do not try to "sign" their work, and few people outside the profession know that Boeing planes, Polaroid and Kodak cameras, National cash registers, the service stations of Texaco and Richfield, Dick mimeographs and Steinway pianos have gone through this office. Some designers prefer to be known as stylists, but Walter Dorwin Teague, with an entire floor of engineers and a development laboratory fully equipped with machine and woodworking tools, has no doubt that "industrial design" describes the work to which he has devoted his life.

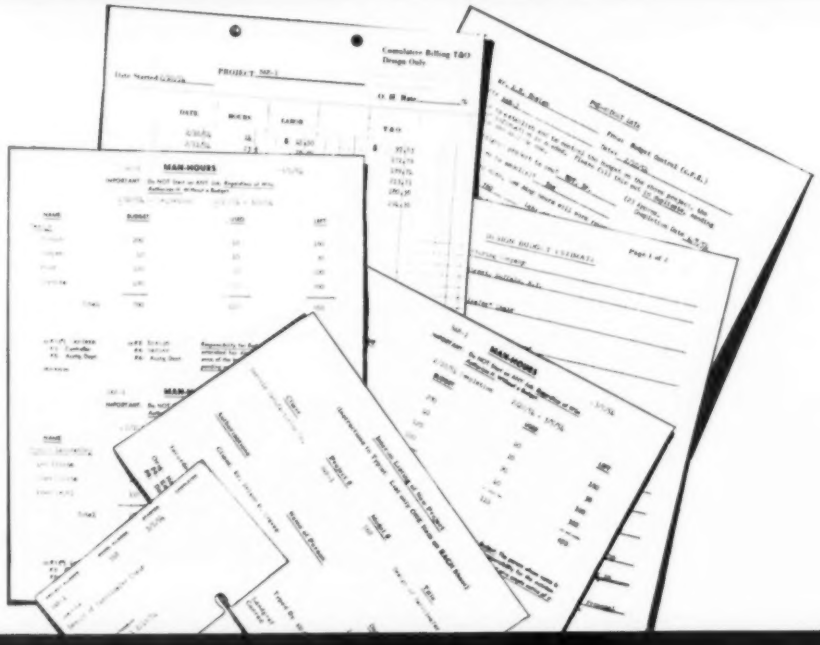
WDTA seldom simply perform a face-lifting to add sales appeal to a completed product. The office expects to make a basic functional contribution to each product it touches, and sometimes make a contribution where no product is involved. WDTA design is intended to be sound rather than spectacular, has a way of pleasing the client and his customer, and frequently lives long. Mr. Teague says, "Work comes to us only through our satisfied clients. We are not designers for obsolescence."

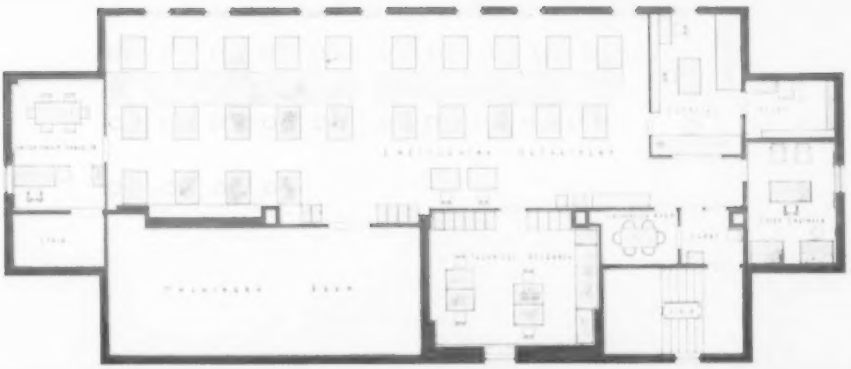
Case history: We can get a picture of the way the Teague office handles its work by following a typical project through the office. Early in 1954 the Barcalo Manufacturing Company of Buffalo decided to have the style of its BarcaLoafer chair improved. WDTA were among several designers invited to consider the project. According to their usual practice, WDTA obtained a sample Barca-Loafer from a New York dealer for study purposes so that they would have the job clearly defined before making a proposal to the client.

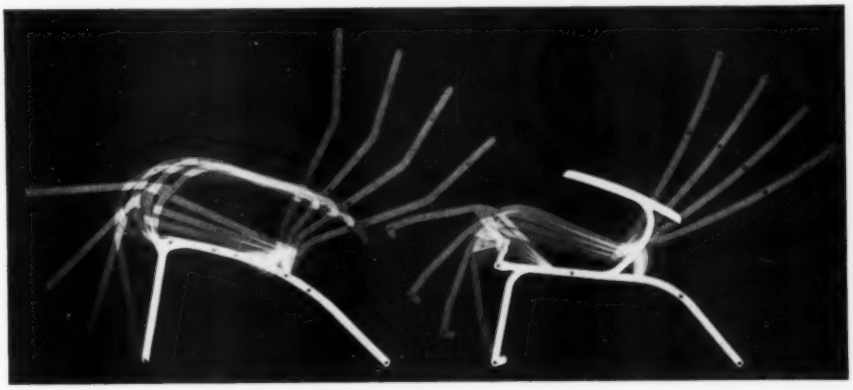
WDTA

A typical project at WDTA travels through many departments and comes under the scrutiny of many people. From start to finish it is guided by the job captain, who not only oversees the design but keeps close tabs on status of work and cost control. In this he has the help of the accounting department and Comptroller John D. Brophy, who has his office on the 29th floor between Mr. Teague and Mr. Harper, Director of Design. Mr. Brophy is not a partner because he is not a professional, but he is regarded as a partner, and an invaluable one. The accounting department, on the twenty-third floor, is at the other end of his intercom. Although Mr. Teague is proud of the businesslike methods of his office, he firmly maintains that good design comes only from the creative ability of individuals. "But when we are serving 40 or 50 clients simultaneously, organization is necessary to see that each job receives the attention it should, that it is delivered on time, and that its cost is reasonable to the client."

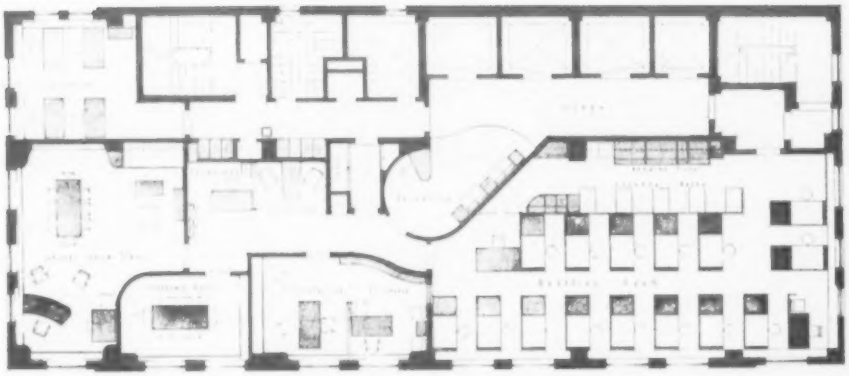
Accounting: The very first step in making a proposal to a client is the drawing up of a budget. First, the Director of Product Design supplies the data necessary to a cost estimate on the Pre-Budget Data form. This is used to draw up a Design Budget Estimate showing the number of man hours required in various categories of the staff and the dollars this time represents. The budget estimate is put in the proposal to the client, and when the proposal is accepted, it becomes the governing document in cost control. After work has started, accounting receives daily time cards from each project member and records the time used and time left on Man Hour forms, which are sent to the job captain each morning (if the budget is getting out of hand, he knows it early). Budget reports are made once a week to WDTA management, once a day if the budget gets tight. Assistant Comptroller Edward F. Kibble and Chief Accountant William D. Hennessy work with three accountants and a secretary on the twenty-third floor.







Engineering: Although the mechanism of the original BarcaLoafer was perfectly adequate, it required that the arm act as the link that raised the foot-rest. WDTA felt they would have greater freedom in the design if the arm was not involved. Within 24 hours, and before the first conference with Barcalo, WDTA engineers had conceived a new mechanism, which they later explained to Barcalo with the cardboard diagram at right. The linkage in the right-hand scheme is concealed beneath the seat; the arm remains in a fixed position and can be omitted if desired. Patents on the new device will be assigned to the client as usual. WDTA has an unusually big engineering department. Walter Dorwin Teague, Jr., Supervisor of Armed Services Contracts, Gordon Peltz, Chief Engineer, and a staff of nineteen occupy the entire 41st floor at 444 Madison Avenue.



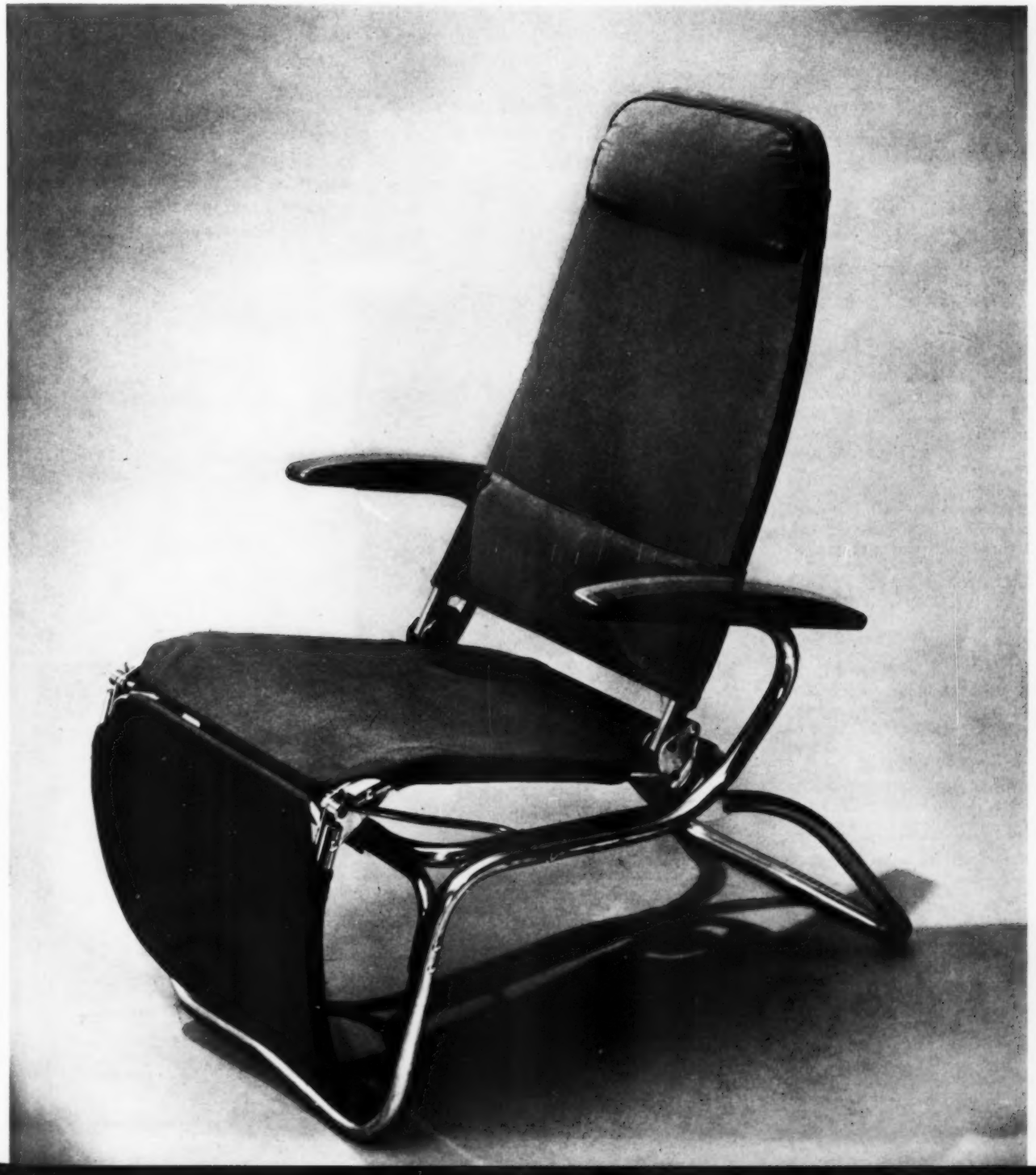
Design: WDTA does not present contracts but simply defines the task and terms in a letter to the client. When a copy of the letter is returned "Accepted" work proceeds. The proposal to Barcalo was based on the new mechanism conceived by Engineering. It was accepted on March 5, 1954, and with this mechanism as a starting point, Danforth Cardozo, Jr. and a group of three designers went to work on the design. As in all Teague work, the design was aimed at two objectives: functional improvement and simplicity of form. Although Cardozo directed the project at every stage, WDTA emphasizes that its work represents the organization rather than any individual, and frequent meetings are held to coordinate the suggestions of everyone interested in each project. In the bottom photograph, preliminary sketches are being discussed by Bob Harper (Director of Design), Dan Cardozo (Assistant Director of Product Design and captain of this job), Bob Ensign (Director of Product Design), and Ken Wood. Design Direcrector Harper supervises all work of two departments—: Product Design, which is headed by Ensign and Cardozo, and Architecture and Interiors, which is in charge of Carl Conrad. The drafting room shares the 29th floor of 444 (Madison) with the executive offices.

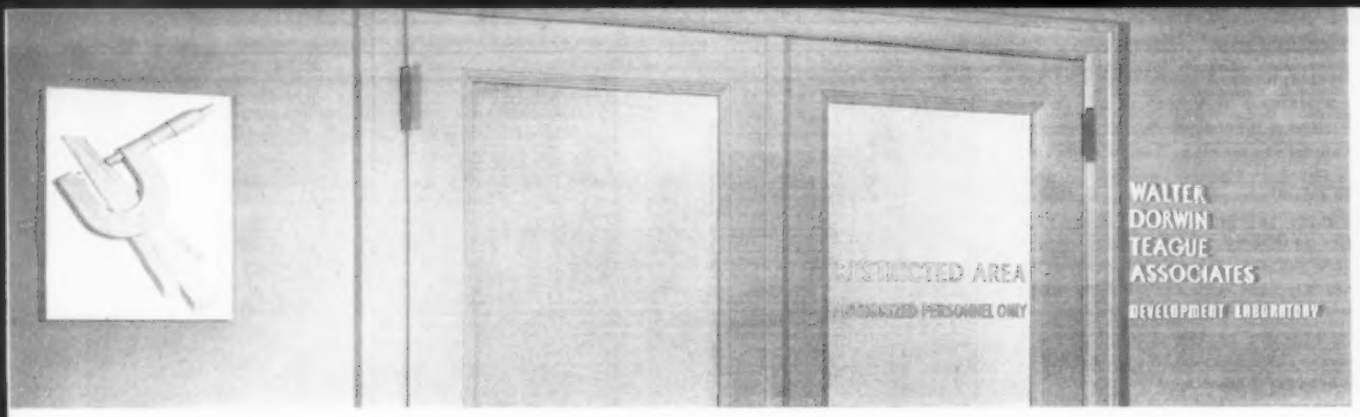
WDTA

WDTA assumes that there is only one best solution to any problem, and that it's the designer's responsibility to discover it. For this reason the office almost never gives the client alternatives to choose from, and it seldom shows him renderings. The Barcalo people saw just three exhibits: when the engineering had been worked out they saw the engineering diagram (below) and a wooden mock-up built at the lab to prove it would work (right). When they had approved the mechanism, design work went ahead, and on their next visit to the lab they saw a full-scale operating prototype in steel and canvas. After a series of conferences attended by everyone interested the client approved the prototype and at Barcalo's request WDTA went to work on production drawings (usually WDTA supplies dimensioned drawings from which the client makes his own working drawings). This was WDTA's first job for Barcalo; they are now working on various additions to the line.

The Product: The new BarcaLoafer has cantilevered wood arms in place of tubular metal ones. Flat metal plates at movable joints are strong in the right direction and avoid pinching the tube for joining. The older version had an upholstered seat and back held by springs; on the new model resilience is economically achieved with a canvas slipcover stretched across the frame. It is lighter, folds flatter, costs $57 instead of $68.

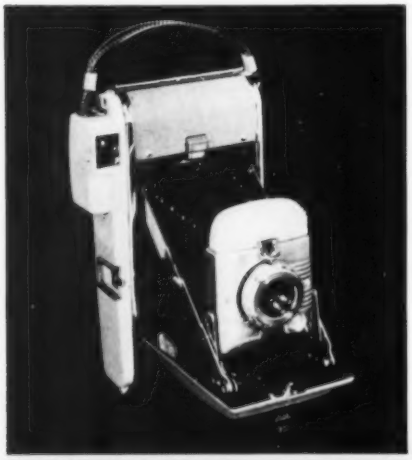
Development Laboratory: WDTA maintains a loft floor at 245 West 55th as a laboratory for experiment and model-making. The Director of Product Design is head of the lab. The 5000-square-foot area includes a machine shop, woodworking section, drafting room, and a conference room where the client usually has his first look at WDTA's work for him. It is a rule that design solutions are presented as full-scale mock-ups or operating prototypes whenever possible.



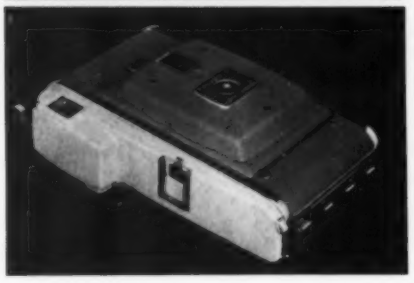


Samples of the work WDTA turned out during 1954 are shown on these two pages; a part of it that cannot be published is represented by the photograph above. Since 1942 WDTA has been continuously engaged in research and development work for the armed services — principally the Bureau of Ordnance of the Navy — under contracts that have totaled over $3,600,000. Military assignments are supervised by Walter Dorwin Teague, Jr., and are largely responsible for Teague's large engineering staff and extensive workshop facilities. The office also maintains a permanent field staff of five in California and a representative in Indiana doing work on guided missiles. The military, like many clients, has found that WDTA's usefulness is not limited to product design. A few years ago, for example, the office was challenged with a materials inspection problem that seemed incapable of solution; WDTA's painstaking analysis resulted in an inspection system that is now standard BuOrd procedure.

Polaroid: WDTA has worked with Polaroid for 16 years, designing cameras, range-finders, lamps and Polaroid glasses. The new Polaroid Highlander Camera is smaller, lighter and cheaper than the first model; it takes a 2¼ by 3¼" picture in the same 60 seconds. The new small case was designed by WDTA and Polaroid engineers to please women without being overly feminine. The case is stamped bright steel with gray wrinkle finish; the finder side is gray plastic.

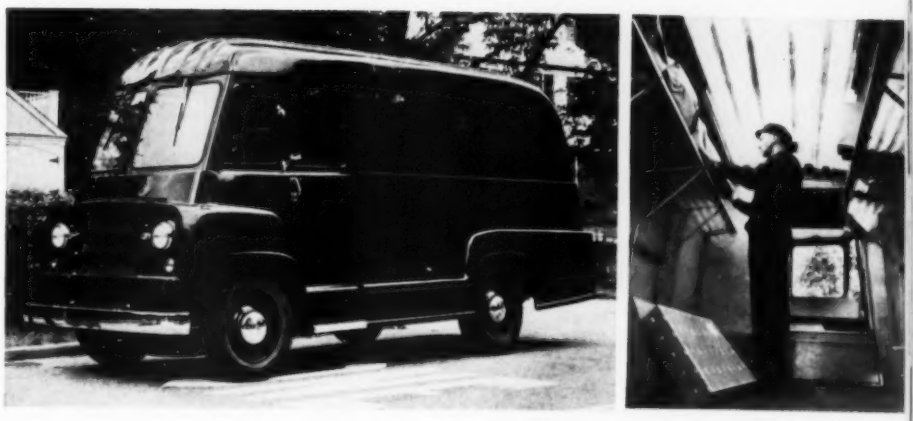


Ritter: The new Ritter dental unit is designed into a sleek column. At the touch of a switch the front panel recedes and the instruments move forward. The panel behind the assembly is backlighted for viewing radiographs. Collaborating with Ritter engineers, WDTA gave the unit its final form. A matching dental chair by WDTA has just been introduced and other equipment is under development.



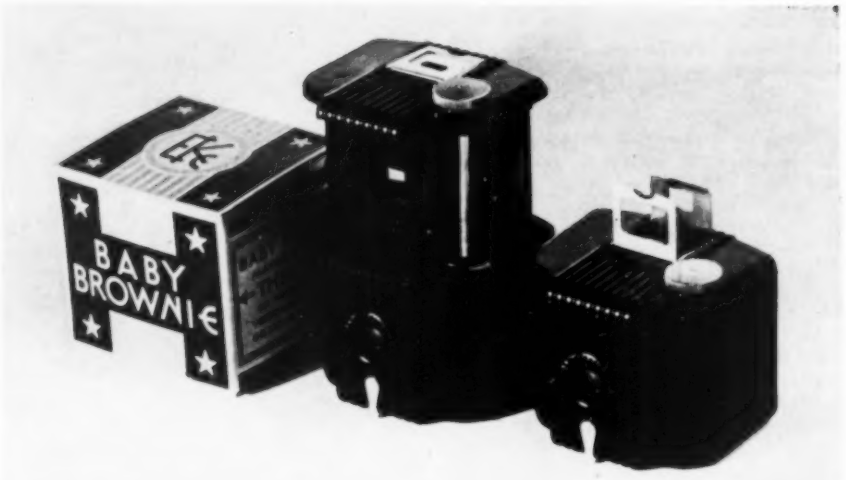
Continental Oil Company: In designing a service station for Conoco (below right), WDTA drew from years of experience. The Texaco station, designed in 1935, was the first standardized station adopted by a major oil company. The simple standard plan and the decoration of green stripes and red stars were calculated to give identity to a building of any size or material. With 10-20,000 built, the design has not changed. The Richfield station (1946) has larger glass areas, a canopy striped with fluorescent lights, brilliant yellow and cobalt coloring. The new Conoco station, now building in several parts of the country, has floating roofs and large sloped windows. The diamond lattice insignia is found on cans, against outside walls, and in a light steel pylon erected to attract speeding motorists.

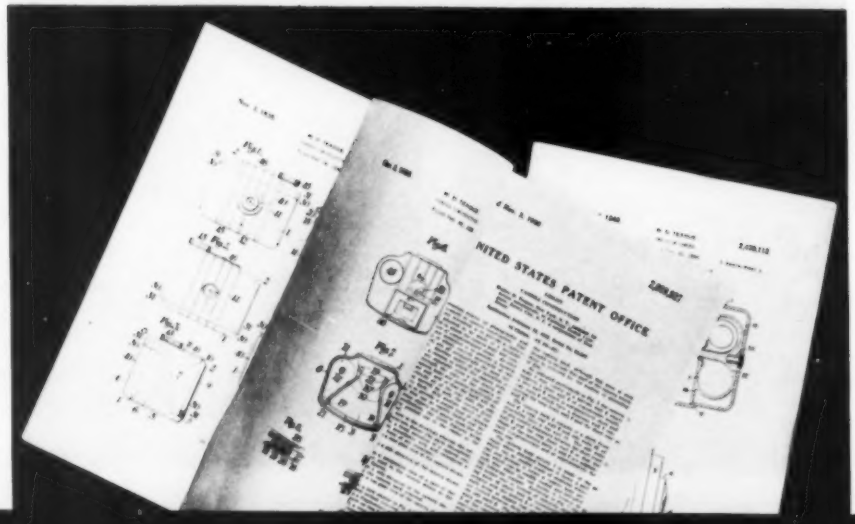
United Parcel Service: WDTA recommended reinforced plastic for the new UPS truck at a time when no fabricator had had experience with moldings of this kind. When the design was completed, a WDTA representative personally supervised the construction of a Fiberglas and polyester prototype at Lunn Laminates. The new body is molded in 9 pieces, has sliding doors and an unpigmented roof to allow natural lighting of the interior. The body weighs 650 pounds, against 1700 for conventional aluminum and steel. It is strong, cooler than metal, and needs no paint.



Colonial Stores: A standardized supermarket for Colonial Stores is a simple combination of banner headline, plate glass walls, and flat brick piers. The pipe pylon carries perforated metal light housings and Colonial's trademark in red and white plastic on a ground of blue enamel. Inside the store its base provides a raised office for the manager, storage for carts, and display space for posters, which are not allowed in the windows. A plastic canopy along one side of the store screens out rain and heat rays. Forty markets are under construction, ten completed, and many others are contemplated.

Eastman Kodak was Walter Dorwin Teague's first important client in industrial design. He joined the company as consultant designer on January 1, 1928, and has been working for them ever since — the longest record of service in the profession. For twelve years he designed all Eastman Kodaks and packages himself, spending a week of every month in Rochester so that he could work in close collaboration with the Eastman engineering staff. He also designed Eastman offices and retail stores and the Kodak exhibit at the New York World's Fair. Inevitably, he contributed far more than styling. In the WDTA files an entire drawer is given over to patents the office has assigned to clients; among these the largest group covers mechanical ideas Mr. Teague himself worked out for Kodak. As Eastman's development activities expanded after the war it became plain that the company needed its own design staff, and Teague helped to organize the Styling Division under Ted Clement. Nevertheless, the company is unwilling to give up the old relationship. As consultant to the Styling Division, Mr. Teague still makes frequent trips to Rochester to review work in progress, and he is now carrying out several projects for Eastman in New York.



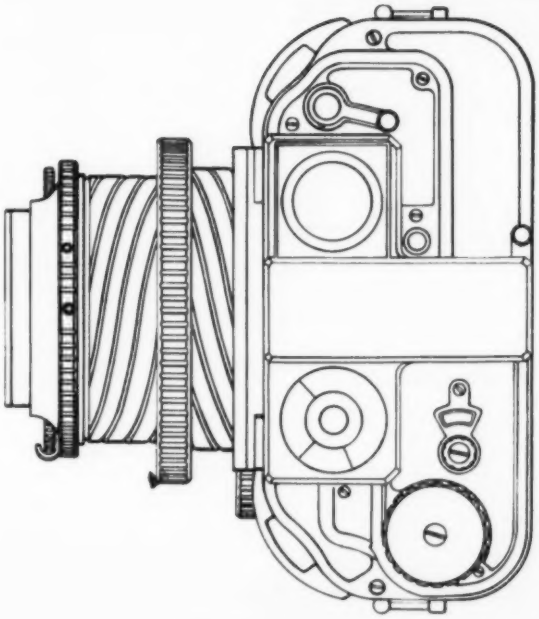


Consultant: Mr. Teague visits Rochester frequently to review the work of the Eastman Kodak Styling Division. He is the author of many camera innovations. One of the patents in the bottom photograph is for a box camera to be molded in two pieces. The Baby Brownie shown above it was the first all-plastic camera made by Eastman, and sold for a dollar or less. More than 4,000,000 were sold before the wartime shortage of plastics caused it to be discontinued. The box camera described in the patent at the right can be loaded with both color film and black-and-white film to be exposed alternately as desired.

Bantam Special (above): This was Eastman's first die-cast camera. Teague introduced raised stripes in the aluminum to reduce the areas of lacquer and prevent cracking.

Super Kodak (above right): A light meter built into the top of this camera automatically controlled the diaphragm opening by way of the upper cover, which also connected the range finder and lens. This unique model, like the others shown here, was finally discontinued because of wartime restrictions.

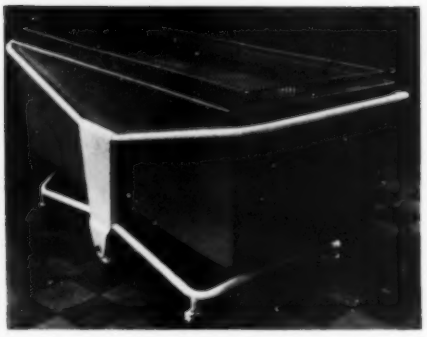
Kodak Medalist (right): A compact die-cast camera taking 2¼ x 3¼ film, it became a favorite with news photographers and a standard in the armed services. The double threaded screw-out front, shown in the patent diagram below, gave adequate focal length in a compact camera. The patent was issued to Walter D. Teague and Joseph Mihalyi, an Eastman engineer with whom Mr. Teague collaborated. On the second-hand market these three cameras command more than their original price, and it is believed that every one Eastman made is still in use.



WDTA

Partners: This meeting of all eight partners and the comptroller of Walter Dorwin Teague Associates was made possible by Del Giudice's arrival from Seattle. From left to right they are Milton Immermann, Director of Client Services; Robert H. Ensign, Director of Product Design; Frank Del Giudice, Director of the Boeing Task Force; Walter Dorwin Teague; Robert Jordan Harper, Director of Design; Gordon Peltz, Chief Engineer; Walter Dorwin Teague, Jr., Supervisor of Armed Services Contracts; John D. Brophy, Comptroller (although not an actual partner, Mr. Brophy is always present at such meetings); and Carl R. Conrad, Director of Architecture and Interiors.

On Boeing's 707 jet prototype, shown across the page, WDTA counseled on the nose contours and designed the exterior markings—golden-yellow top, silver belly, and chocolate brown striping and engine pods. Interiors of the Stratocruiser shown in the background were Teague's first job for Boeing. Other assignments have included the design of offices and equipment. At right is the personnel reception room of the engineering building, and beyond it a cafeteria bus cart with a white frame and a gray-green Fiberglas tub: trays floating on the surface sink to the bottom as they are filled. The traffic chart on the opposite page shows the movements of 30,000 employees and 10,000 cars with arrows of varying widths. 14 such charts accompanied recommendations that were approved by city, county and state traffic authorities.



Walter Dorwin Teague Associates does not have its full complement of partners on hand until Frank Del Giudice flies in from the branch office at Boeing Airplane Company in Seattle, Washington. WDTA sent Del Giudice and a group of five designers out to Boeing in March of 1946 to design interiors for Boeing's new Stratocruisers. The job was supposed to last for three months, but it turned out to be bigger than expected. WDTA designed Stratocruiser interiors for five different airlines; then they worked on military aircraft, exhibits, brochures, plant interiors, and even bus carts. Now they are working with Boeing engineering on interiors for what may be America's first jet passenger plane, the 707 Stratojet. Last year, when the Boeing contract came up again, the client decided that it had not been making full use of Teague's services. Among the assignments that resulted from a new enlarged contract was a study of parking and traffic conditions at the Seattle Plant, which was carried out in collaboration with Boeing's Plant Planning Department. Boeing gave the job to Teague in the belief that specialists in the field could not take such an unfettered approach to the problem. They seem to have discovered the real contribution of the design office: it is not a talent for dressing up products but the systematic application of creative thinking.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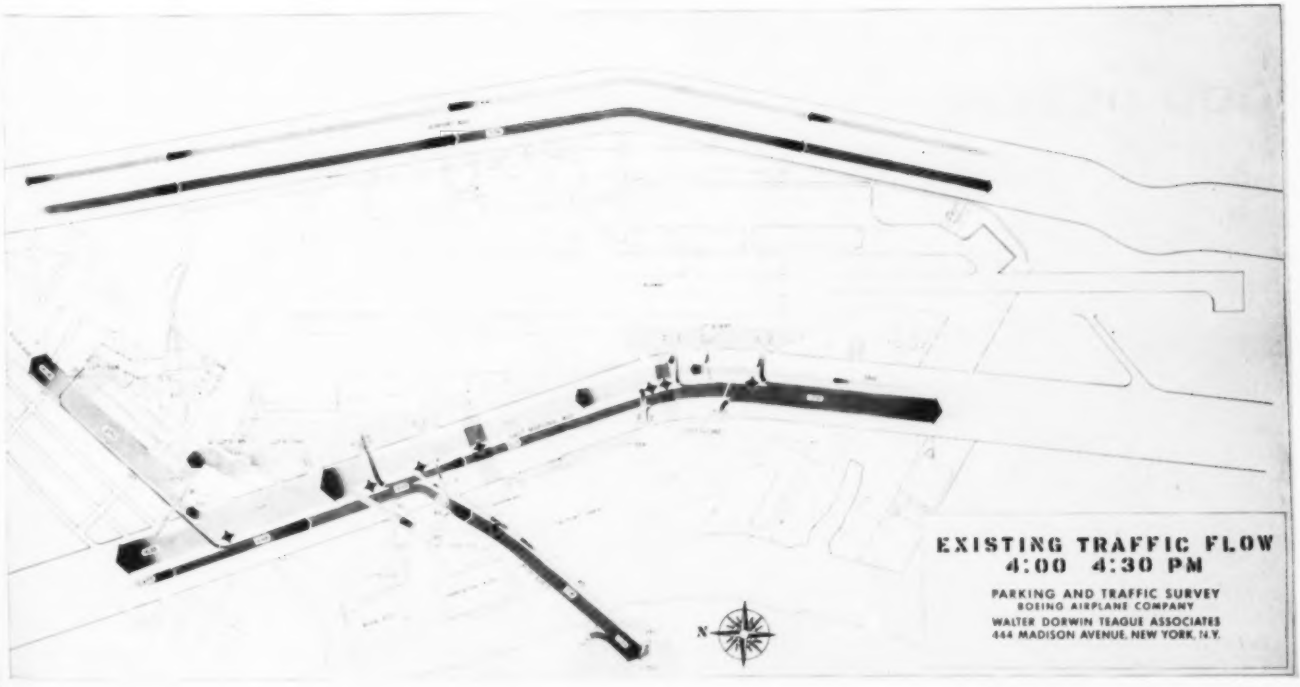
EXISTING TRAFFIC FLOW
4:00 4:30 PM
PARKING AND TRAFFIC SURVEY
BOEING AIRPLANE COMPANY
WALTER DORWIN TEAGUE ASSOCIATES
444 MADISON AVENUE, NEW YORK, N.Y.
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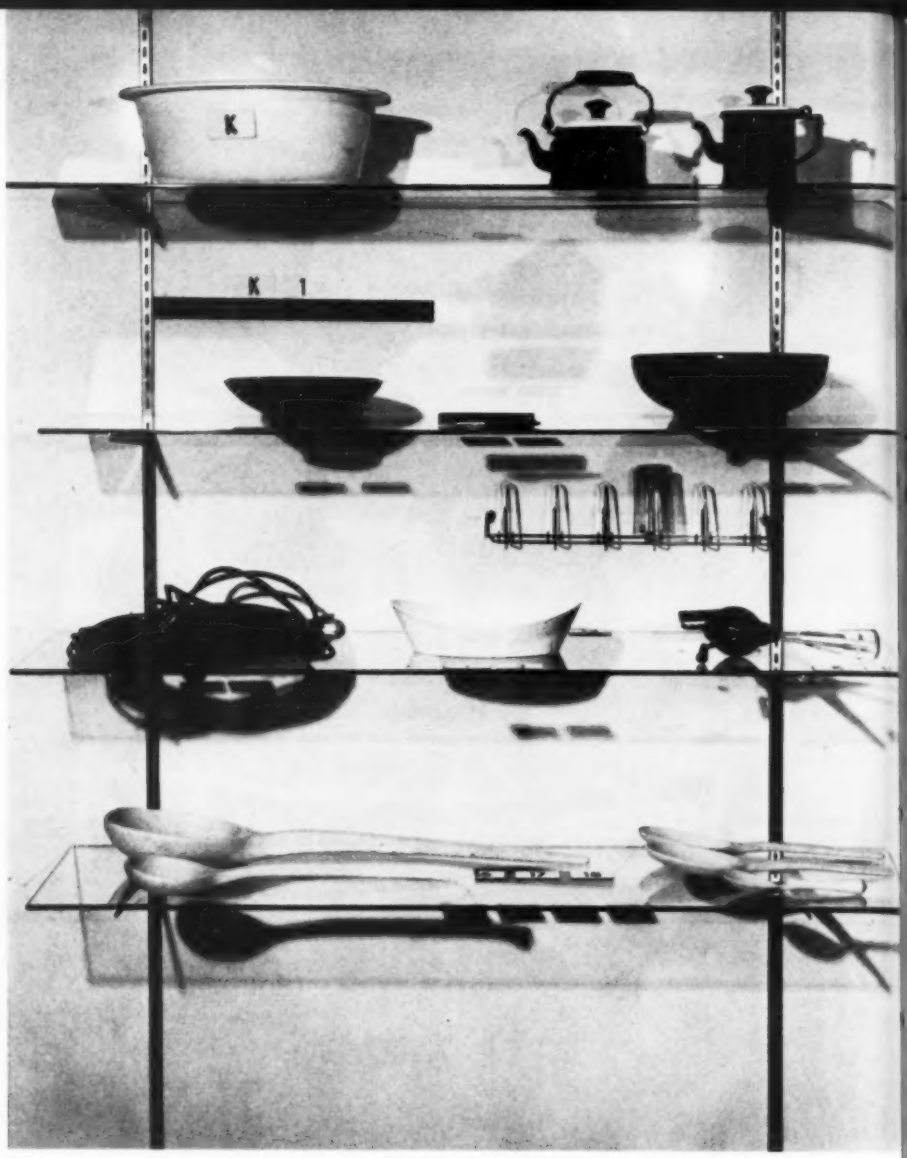
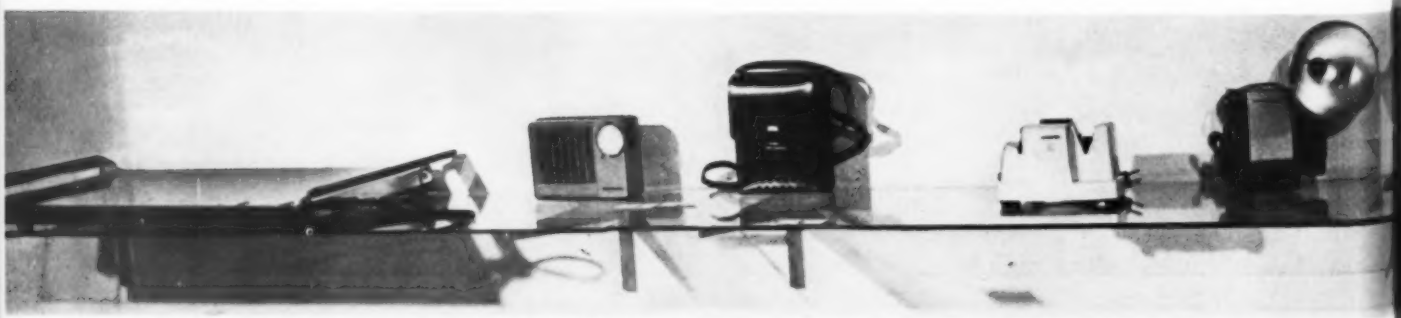


Entrance to Merchandise Mart installation by James Speyer, Dan Brenner

GOOD DESIGN:

Last month's opening of Good Design held a collection of surprises: Four colored telephones, two refrigerators, a dishwasher, television set, and numerous electric housewares were among some 400 new designs selected for 1955. Not only were there more appliances than ever, but industrial design was proportionately more important throughout the show, which is sponsored by the Museum of Modern Art and Chicago's Merchandise Mart. The jury, Arthur N. BecVar of GE, Just Lunning of Georg Jensen, Inc., and chairman Edgar Kaufmann Jr., noted a few reservations in the catalog: The trademarks on the refrigerator and dishwasher seemed "out of key with the admired general design," and the colored knobs of the television set "restless and noticeable." The dishwasher's casters looked "too modest compared with the finish lavished on the rest of the product," and "considerations other than visual harmony were decisive on the corners of the telephone base, but the general harmonious appearance shows that visible excellence was a goal, reached very nearly."

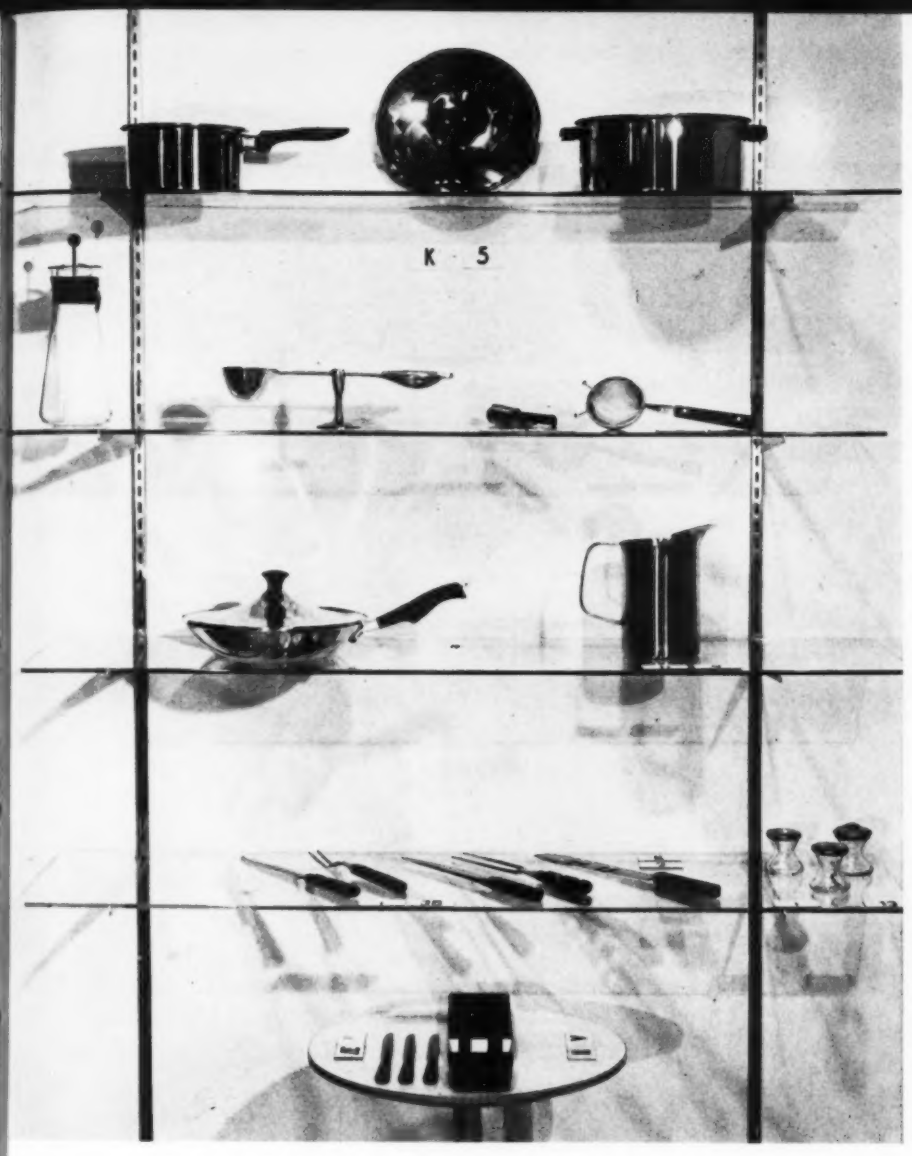


Lakeside electric hot tray (Waltman Associates)

CBS-Columbia portable radio (Paul McCobb)

Dormeyer knife sharpener (Jack Morgan)

Anscoflex camera (Raymond Loewy Assoc.)



Across shelves, left to right:

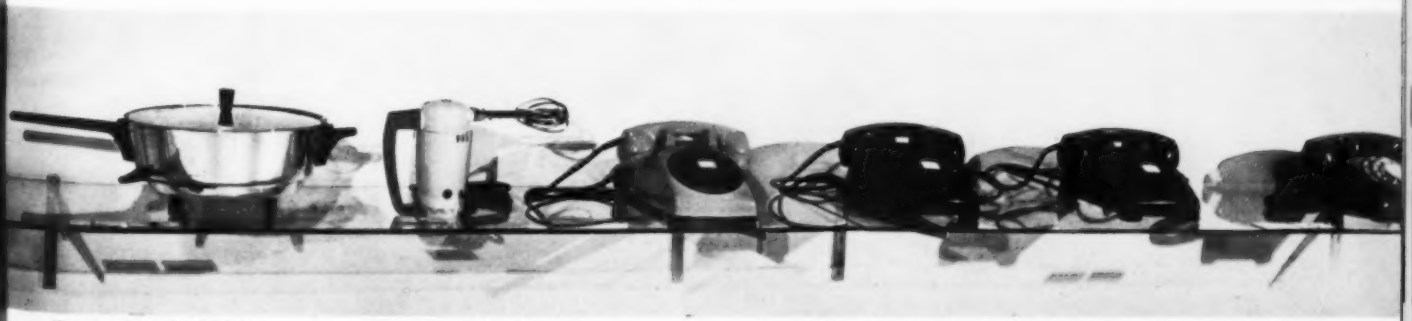
White rubber dishpan (Wooster Rubber), Black enameled kettle and percolator (United States Stamping Co.), Stainless steel saucepan and covered pot (James Hvale, for Ekco Products).

Kitchen rack (Albert Leebow, for Berkeley Industries), Red plastic vegetable bowl (Kenro Corp.) Jotter ball point pen (Parker Pen Co.), Red plastic mixing bowl (Lewis Gustafson, for Prophy-Lac-Tic Brush Co.), Coffee bottle with leather handle (Ben Seibel, for Gilley, Inc.), Measuring spoon and balance (H. A. Mack), Portable lock (Yale and Towne Mfg. Co.), Strainer (James Hvale, for Ekco).

Green plastic plant soakers (J. L. Woodside, for Jons Mfg. Co.), Serving bowl (Eric Herlow, at Bonniers), Wall rack (Washington Steel Products), Egg beater, Nylon blades (Mark Maynard, for Maynard Manufacturing Co.), Aluminum frying pan and cover (R. F. Krause, for Enterprise Aluminum Co.), Pitcher (A. H. Hansen, at Bonniers, Inc.).

Natural wood salad servers and spoons (Swedish, Elizabeth Hanna Imports), Carving set (Jerry Moburg, for Robeson Cutlery Co., Inc.), Frozen food knife (W. R. Case & Sons), Glass and stainless salt and pepper shakers, pepper mill (Wilhelm Wagenfeld, at Fraser's, Inc.). On table: Steak knives, with black and white plastic handles (Jerry Moburg, for Robeson Cutlery Co., Inc.).

more mass production than ever before



Presto electric skillet (Mel Boldt)

West Bend electric mixer (Painter, Teague & Petertil)

Western Electric telephones (Henry Dreyfuss)

Not shown: Western Electric telephone answering set (Henry Dreyfuss)

1

Space and structure

New materials create new forms in twentieth century architecture

Vault

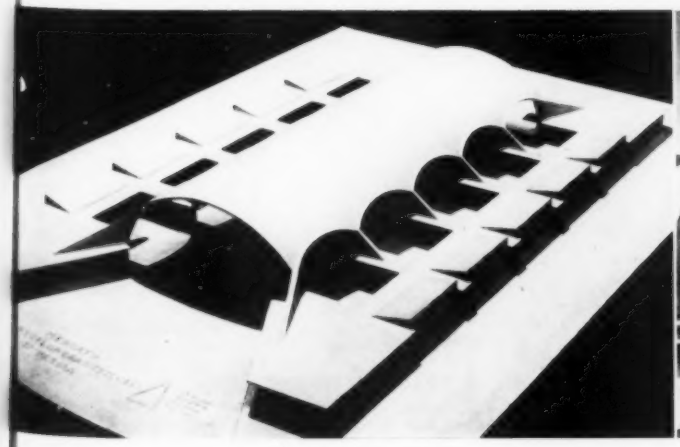
The idea that strength can be obtained with certain shapes is so elementary that even a child knows how to curve a piece of paper to carry a small toy. The strongest forms are those that make use of the tensile strength of materials as well as their compressive strength, but until recently architects and designers were limited by the materials at hand—stone, wood and brick—to those forms which exploit compression—arch, vault, and dome. Modern technology has created at least two new materials which, when properly exploited, offer almost unlimited flexibility of form: steel, which offers great tensile strength, and reinforced concrete, which combines steel's tensile strength with the compressive strength of concrete in a material of great lightness, strength, and flexibility. As a result, buildings may now assume an endless variety of shapes. One of the most exciting developments is the thin-shell structure, in which the enclosure itself is a single, load-carrying membrane.

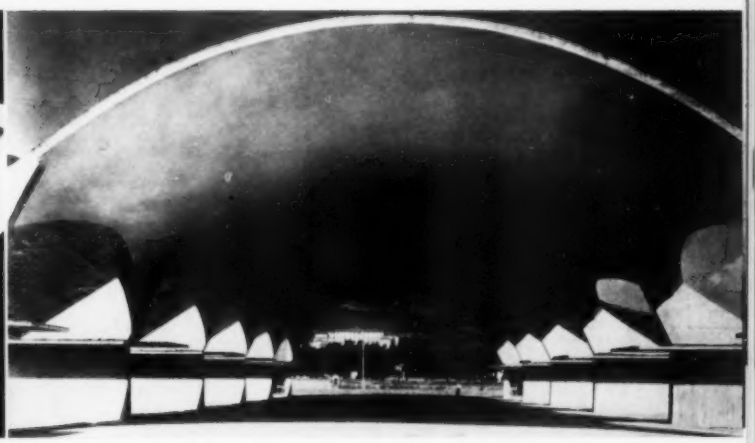
The examples of modern structure on these pages are taken from a traveling exhibition prepared by William Alex for the Department of Circulating Exhibitions of the Museum of Modern Art. The structures are alike only in that they all answer a basic problem: What is the most efficient and economical way of enclosing a large space? or, how can maximum strength be obtained from a minimum of material with a minimum of interior obstruction? Imaginative answers are not a familiar sight because the problem itself is uncommon. Many of the most exciting buildings of our time have been erected on airfields and playing fields, where the need for large spaces demands ingenious structure. Most of the examples are from Europe, where the shortage of materials and low cost of labor have encouraged imaginative structural design. In this country these constructions, particularly those in reinforced concrete, have generally been regarded as impracticable, partly because of the difficulty of explaining them in terms that fit the building codes, and particularly because of the high cost of formwork and the great skill required to cast concrete in strong thin sections. But the United States, with plentiful steel and a mass-production mentality, has produced some of the most exciting ideas in metal, notably the demountable, modular space frames of Konrad Wachsmann and the Geodesic Domes of Buckminster Fuller. Whatever the material, in all these examples. a daring architectural expression has evolved from an understanding of the forces inherent in shapes and materials.

Steel and concrete

The Hall of Machines, built for the Paris Exposition of 1889 by the engineer Cottancin and the architect Dutert (1) exploited structural steel to span 377 feet with twenty huge three-hinged arches. Hinged point supports at the floor permitted movement to compensate for temperature and pressure-induced changes. The flower market at Pescia, Italy, 1952, by architects Gori, Gori, Ricci and Savioli with engineer Brizzi (2), spans 90 feet with a monolithic flat barrel shell. Poured over prefabricated hollow tiles (actually hollow bricks), the concrete membrane is reinforced with thin steel wires. Because stresses automatically redistribute themselves in a membrane, it was possible to make large cuts in the barrel. These cuts form arches, which carry the weight down to buttresses.

1 2





Vault

Although vaulting is an ancient way of covering space, modern steel and reinforced concrete allow spans that could never be achieved in masonry or wood. The designer often curves his vaulting in two directions to get more strength from reinforced concrete. To span the huge (312′ wide) exposition hall at Turin (4), Nervi and Bartoli used light-pierced corrugations 8′ wide, which were poured in sections on the ground and bonded to form a monolithic corrugated barrel vault. The logic of the structure is fluently exposed in the fan ribs, which carry the vault load through slender piers to the massive foundations (3).

The mysterious strength of thin-shell construction is illustrated in a spectacular enclosure engineered by Eduardo Torroja (5). His now-destroyed Madrid sports arena consisted of two parallel intersecting shells only 4½ inches thick. Unsupported by ribs or beams, the thin-shell barrels hang like fabric from the stiff end walls and are anchored only at the center of the long walls. Loads are distributed like wind on a covered wagon. The versatility of the doubly-curved thin shell is shown in the Madrid Hippodrome, also by Torroja (6): the warped surface of the shelter is curved in two directions at right angles to each other and cantilevered front and back from the supporting columns.

In another stadium, at Cartagena, Colombia, by architects Salano, Gaitan, Ortega and Burbano, with engineer G. Gonzalez (7), a thin-shell shelter is hung from ribs curved in a powerful parabolic cantilever. In this country, the new St. Louis Airport terminal (8) by Hellmuth, Yamasaki & Leinweber, architects, and William C. E. Becker, Roberts & Schaefer, engineers, gives contemporary expression to an ancient construction. Shallow thin-shell cylinders intersect at right angles to form huge monolithic groin vaults.

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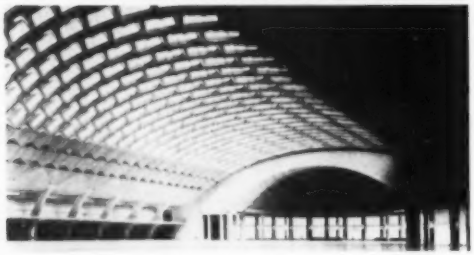

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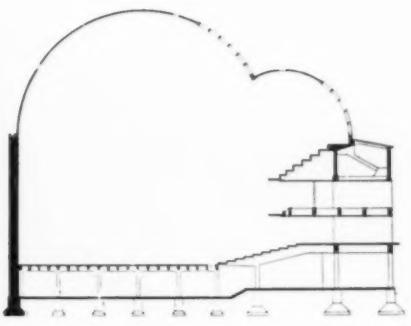

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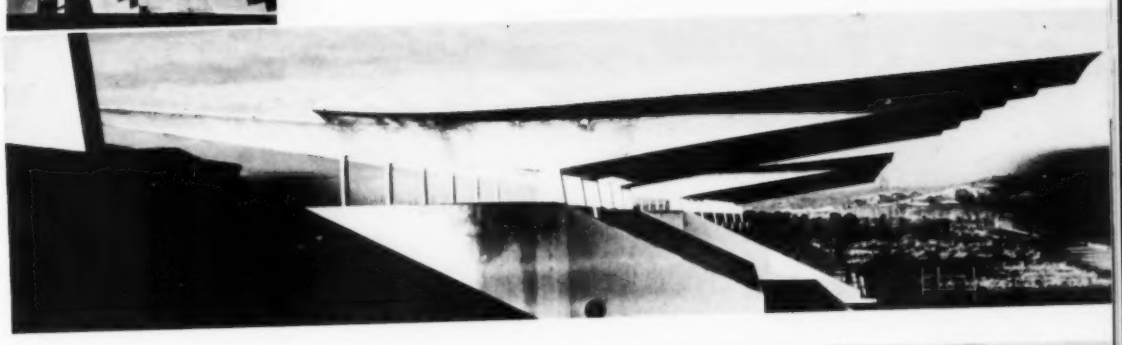

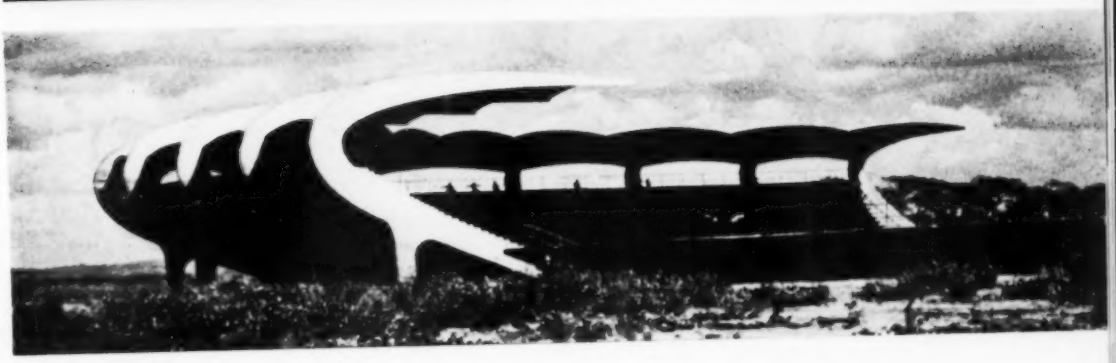

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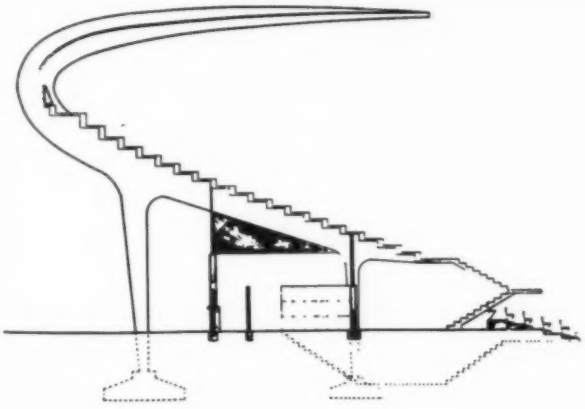

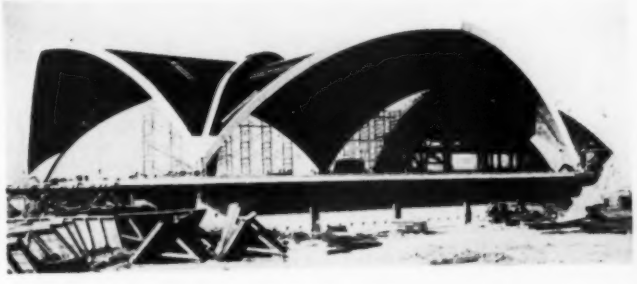

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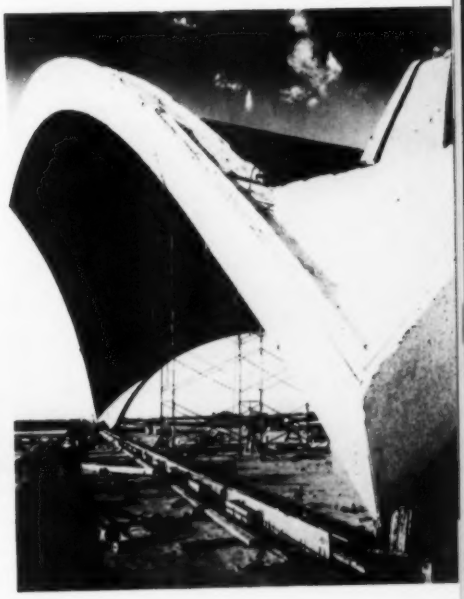

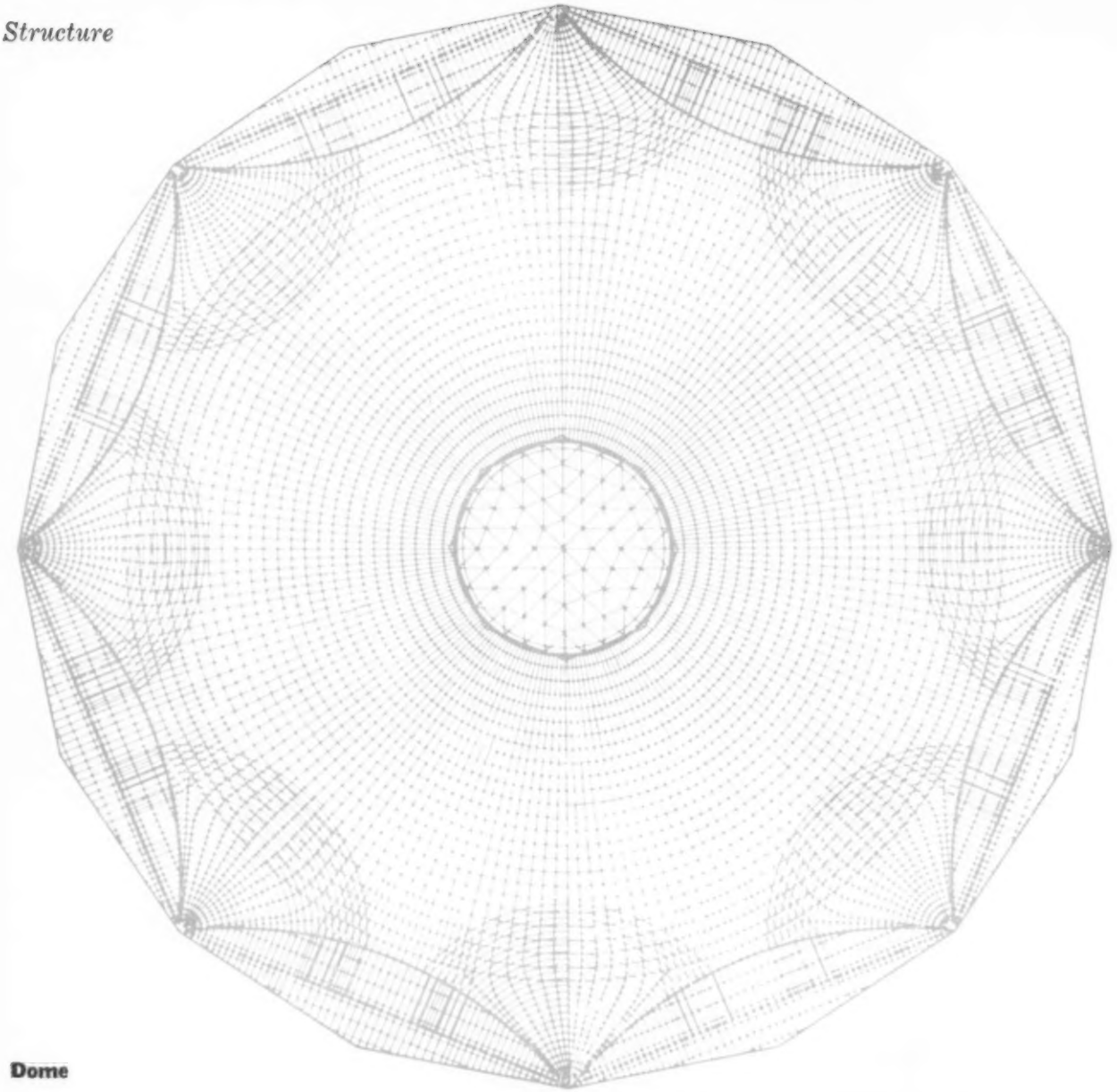

Dome

The naked patterns of stress in domes by Torroja (9) and Buckminster Fuller (10-11) indicate the fluidity possible with modern materials. Torroja's dome, built in 1935, spans 160 feet over the Algeciras market hall with a ribless concrete shell. The steel reinforcing, shown in the diagram, followed the lines of stress in the shallow dome; the thickness of the shell varies from 3¼" at the center to 23½" at the corners to compensate for bending stresses where it meets the supporting columns. An octagonal ring counteracts outward thrust. The discontinuous compression sphere built by Buckminster Fuller at Princeton in 1953 (10) is based on one of the most complex structural theories to date. All compressive loads are carried by struts; all tensile ones by a light web of steel cables. A load imposed at any point is distributed in a pattern of concentric rings. Another of his strong, light structures (11) is a lattice of thin oak frames laced with fiber glass cord.

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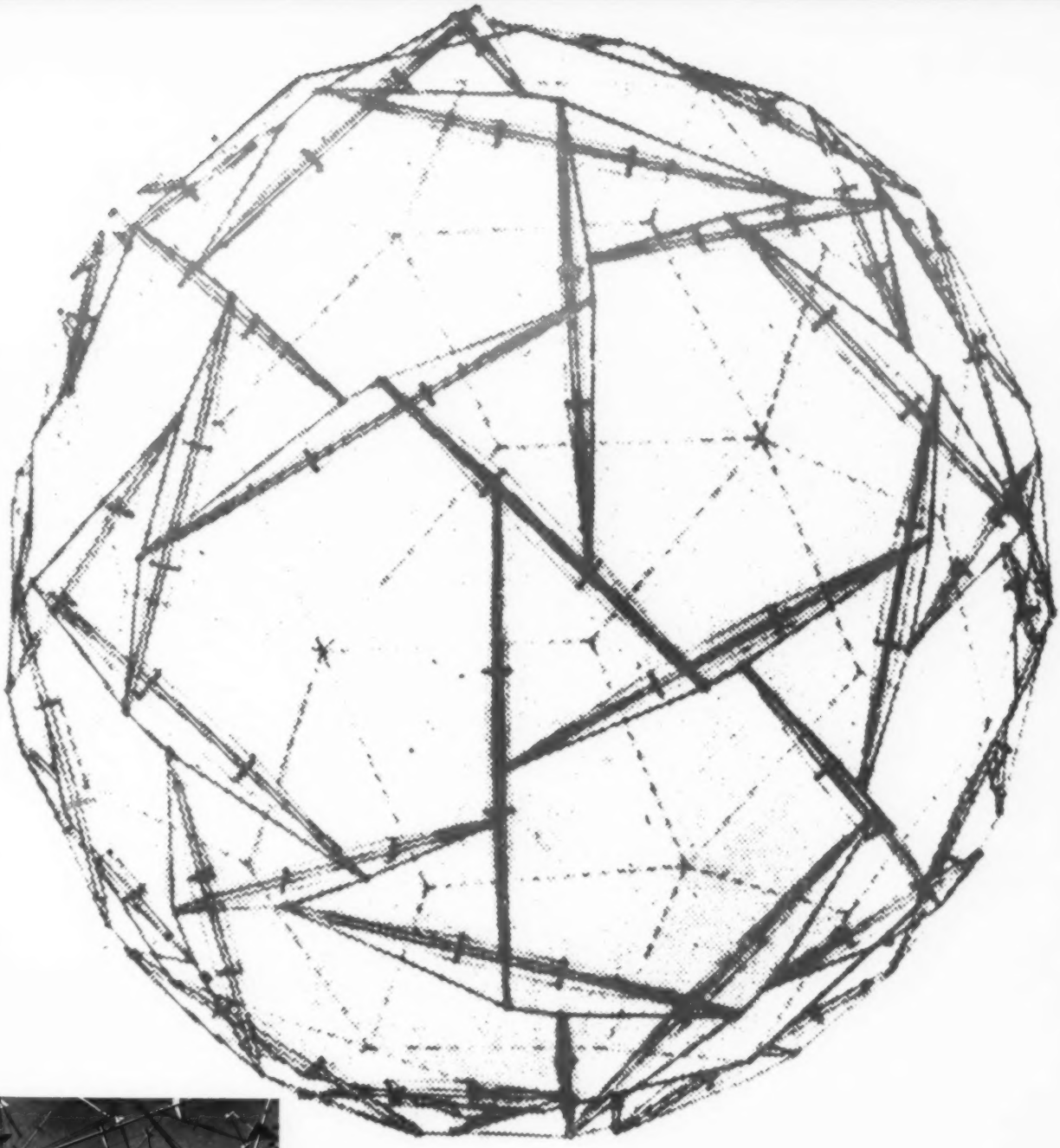

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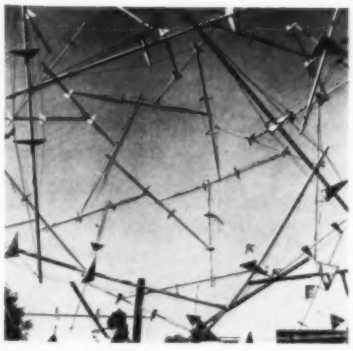

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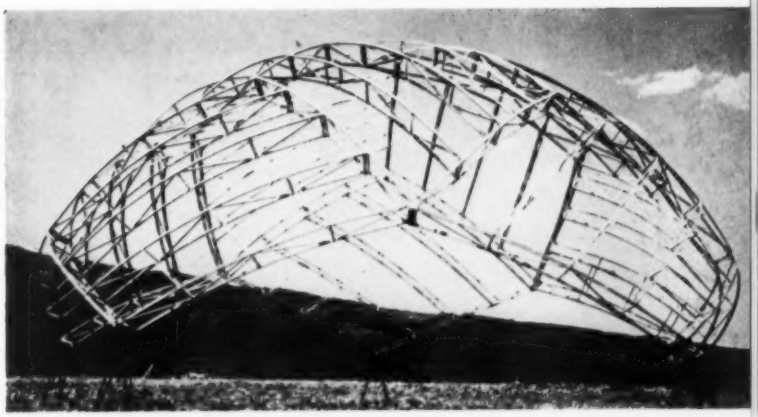

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New forms

Barely earthbound, buildings now may revolve, float, perch on incredibly small supports or even hang from them. Hangars by Pier Luigi Nervi and Konrad Wachsmann show quite different concepts of the relation of a building to space. Nervi's diagonal grids seem thrown out like a net, pinned down by the concrete ribs (13). Wachsmann's space frame (14), composed of numerous modular tubular steel members mutually trussed in every direction and joined *in situ* by forged swivel connectors, forms enormous double-cantilevered wings, tied at the top by high-strength cables. The structure hovers over a space 387′ by 805′.

For complete mobility to house a radio telescope mirror 300′ across, Buckminster Fuller has proposed a fittingly space-man structure (12): a ¾-sphere composed of 28′ glass-reinforced plastic tubular grids, floating in a huge, water-filled basin.

Based on the tensile strength of steel, the concept of the suspended structure, familiar in bridges, is gradually being exploited in other kinds of building. At the Paris Exposition of 1937, several projects proposed this novel idea, among them a huge circular hall 1300′ in diameter by Baudoin and Lods (15). A system of braced arches around the circumference held up a compression ring from which cables were strung to support the roof. A remarkably similar concept, at least superficially, is the livestock judging pavilion at Raleigh, North Carolina, conceived by Matthew Nowicki and executed after his death in 1950 by W. H. Deitrick and associates. Giant arches, tipped on their sides and crossed near the ground, are laced together by a network of wires which also support a canvas roof. Steel box columns help to support the arches and roof.

These buildings, and the systems they employ, are still rather rare experiments. But in them can be seen the seeds of a new architecture based on the structural forms made possible by modern materials.

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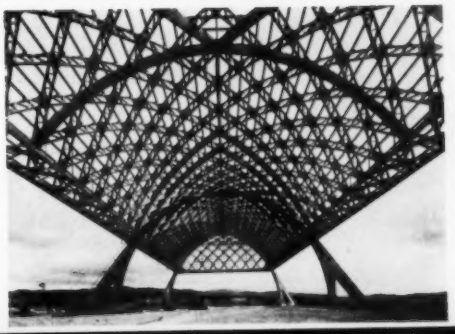

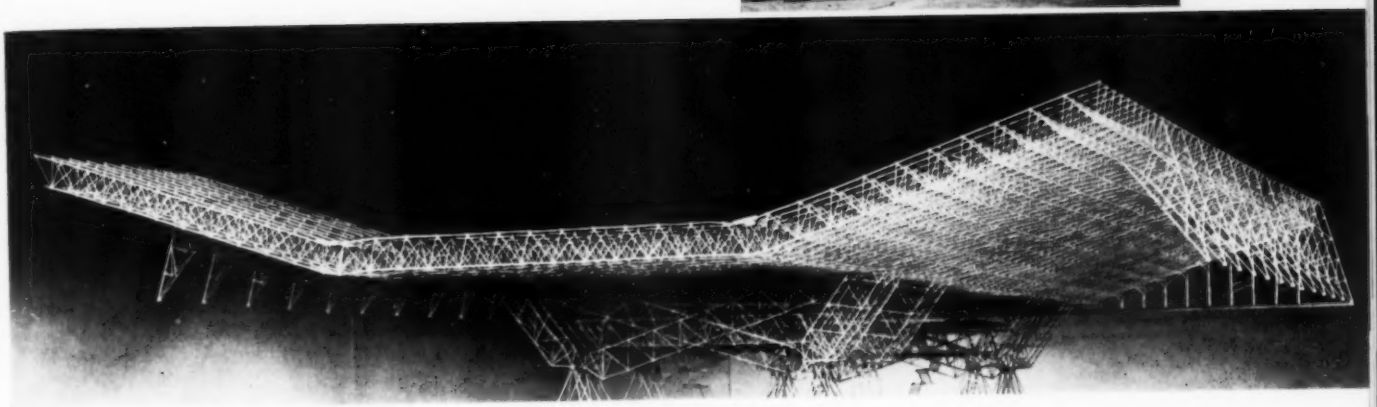

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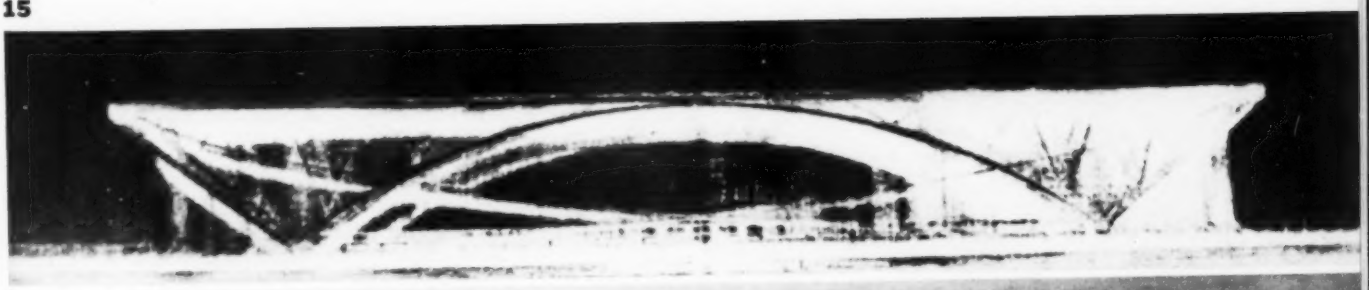

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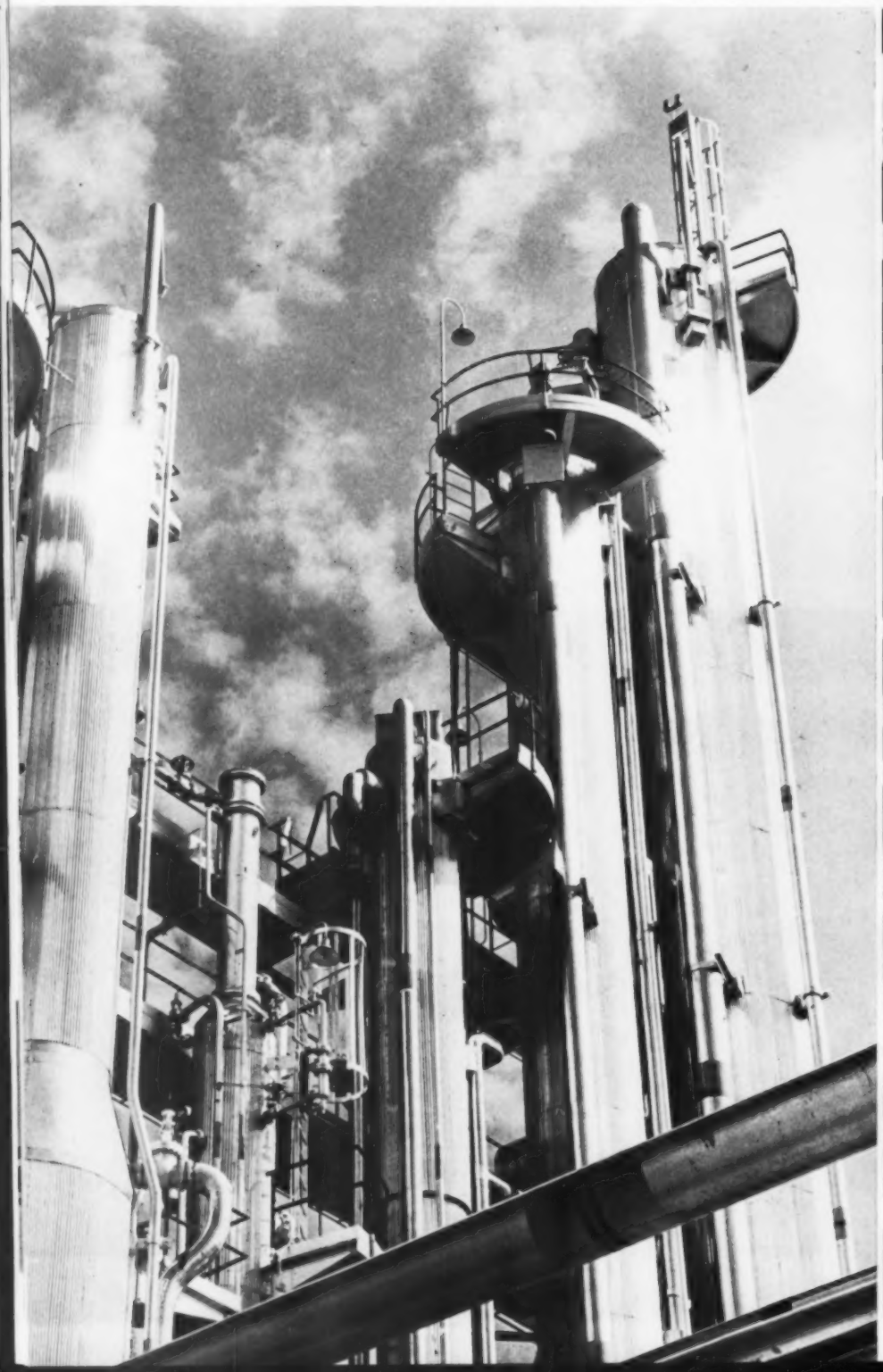
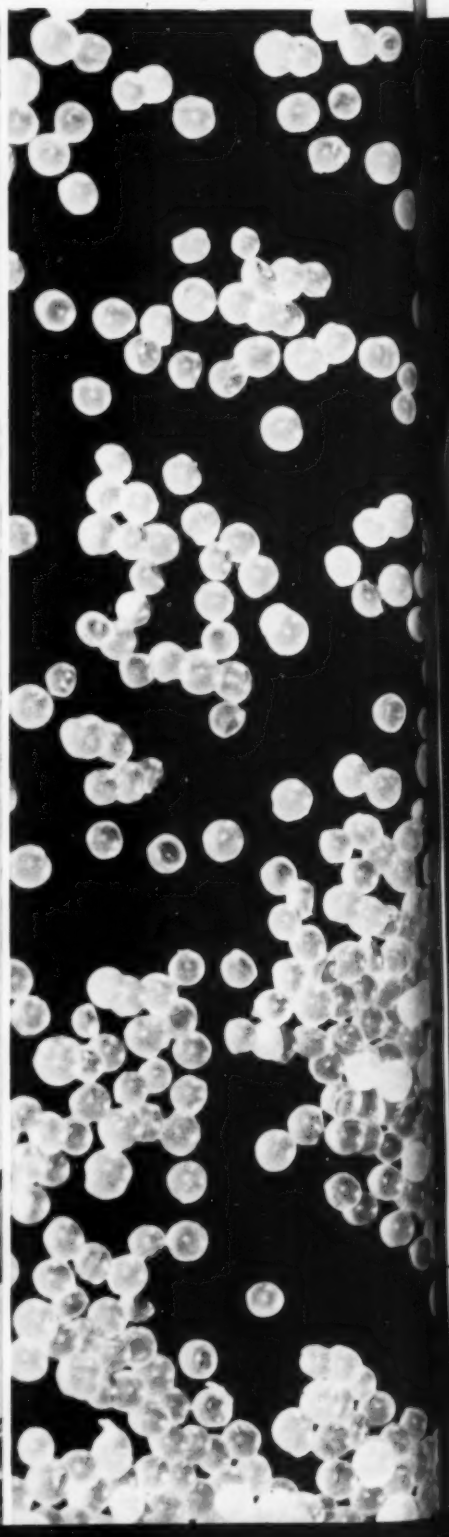
Furnaces below these separation columns crack propane to produce ethylene, from which translucent polyethylene pellets are produced.





Ten new products in one new material suggest some answers to the question,

Why Polyethylene?

Polyethylene weather balloon: tough, light, translucent and huge.

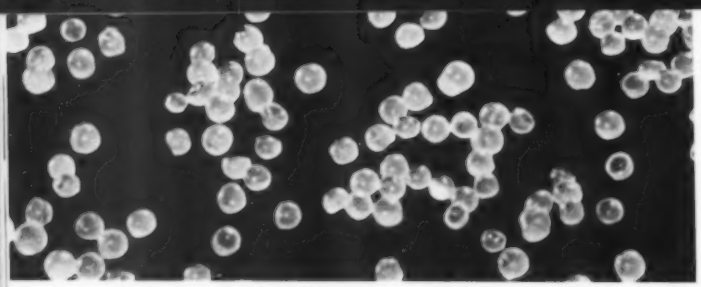
Last year there were only two major producers of polyethylene powder: Bakelite and DuPont. This year there may be as many as nine: first of the new suppliers to get into production is Eastman Chemical. The increased tonnage on the market means two things to American industry: more possibilities for design in this material, and decreasing cost. Last year it was 49¢ per pound. Today it is 41¢ and the suppliers foresee a considerably lower price.

Polyethylene is a thermoplastic material which may be molded in very complex forms, extruded, or formed from sheets, melted, and then re-formed. It can be made flexible, semi-flexible or rigid. It is odorless, tasteless, non-toxic, and chemically inert. It is a good electrical insulator (it was first put out by DuPont as an extruded coating for wire). It can be made in practically any color, nearly transparent, milky or opaque; it can be given surface texture; it can be imprinted, stamped or embossed.

Polyethylene's limitations are fairly simple. Being a thermoplastic material, it cannot stand too much heat and tends to deform at steady temperatures above 180°F., although some formulations and irradiated products can stand boiling water. On the other hand it will stand temperatures below —50°F. without embrittling.

The greatest advantages of polyethylene from a design standpoint are its flexibility and its chemical inertia. It is compatible with other plastics such as polystyrene, and is impermeable to water and moisture. The packaging advantages are obvious. Polyethylene is also unaffected by many strong acids — particularly hydrofluoric, which eats through glass. A new development is shrinkable polyethylene film: it can be shrunk to form a tight skin around an object, and any printing shrinks proportionately. The real limitation to polyethylene in packaging is its permeability to oxygen (a substance which would go rancid in air would do likewise in polyethylene), to some organic solvents, and to certain essential oils (you can't put toothpaste in it).

The design potentials of polyethylene have barely been explored. The case histories on the following pages are presented to give some specific examples of how, why and where polyethylene *has* been used to advantage, together with the manufacturers' recommendations and comments.



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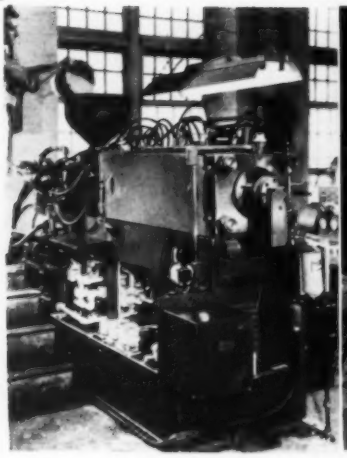
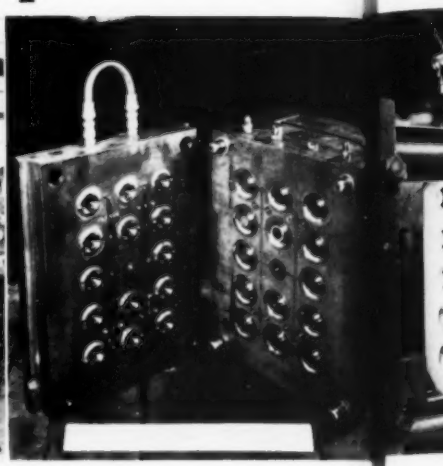




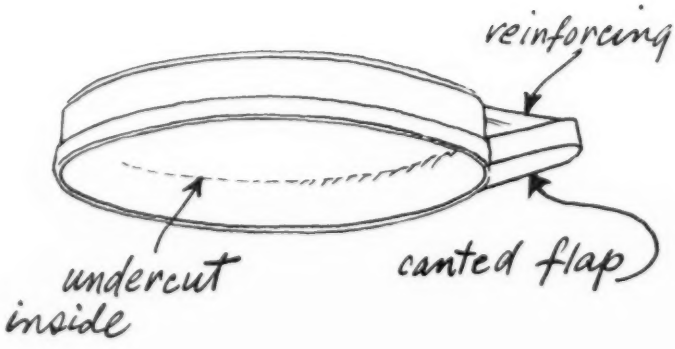
Injection Molding

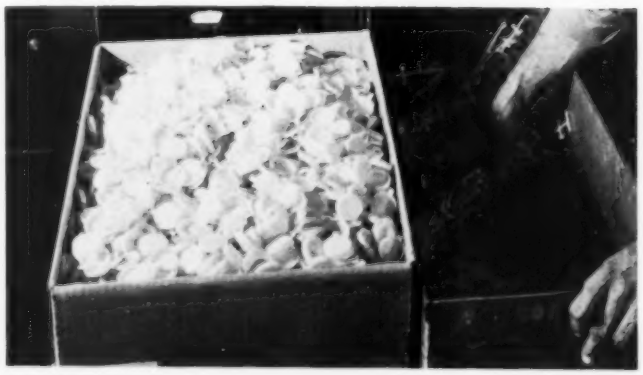
Injection molding is the basic process by which thermoplastics are molded. Injection-molded forms may be large or small, and remarkably complicated and, with a multi-cavity mold, turned out in great quantity. Design of the mold is exacting for polyethylene, as it must allow for some shrinkage in the material, but according to some manufacturers polyethylene tolerances can be held to .001″.

Polyethylene flows at 300-320° F. In the injection molding setup pictured, the molding powder is injected into the machine in repeated measured doses, rammed into a mold, melted *en route*, then cooled and ejected as a finished product, all in a matter of seconds. The finished objects are pushed off the mold by air-jets or knockout pins. Although polyethylene permits undercuts impossible with a rigid material, forms for mass-produced parts nevertheless should be those that *can* be pushed off a pin quickly; otherwise, mold attachments, to permit ejection of a difficult shape, may drive costs sky high.

Product 1: *flexibility*

The photos above show the molding process for a new polyethylene snap-cap, an object which looks simple enough but incorporates many refinements made possible by the nature of polyethylene. Hygienic Products Co. wanted a new look for Sani-Flush, hitherto packaged in a wide-mouthed, flat-topped can. Wheaton Plastics designed a 1″ cap for the new can, to make pouring neater. A carefully calculated undercut, which snaps over a ridge in the can's neck, was designed to allow for difference in the expansion of metal and cap. The flexure that allows the polyethylene to snap onto the can also made the undercut possible: polyethylene's slight "give" allows the caps to be pushed off the mold whereas in a stiff material they would break. The flap was canted at 45°, leaving just enough room to get a finger between it and the concave top of the new can; an integral reinforcing spine keeps the flap rigid enough for leverage. The combination of color (yellow), polyethylene's surface, and the flat top permits the grocer to stamp his price on the cap.





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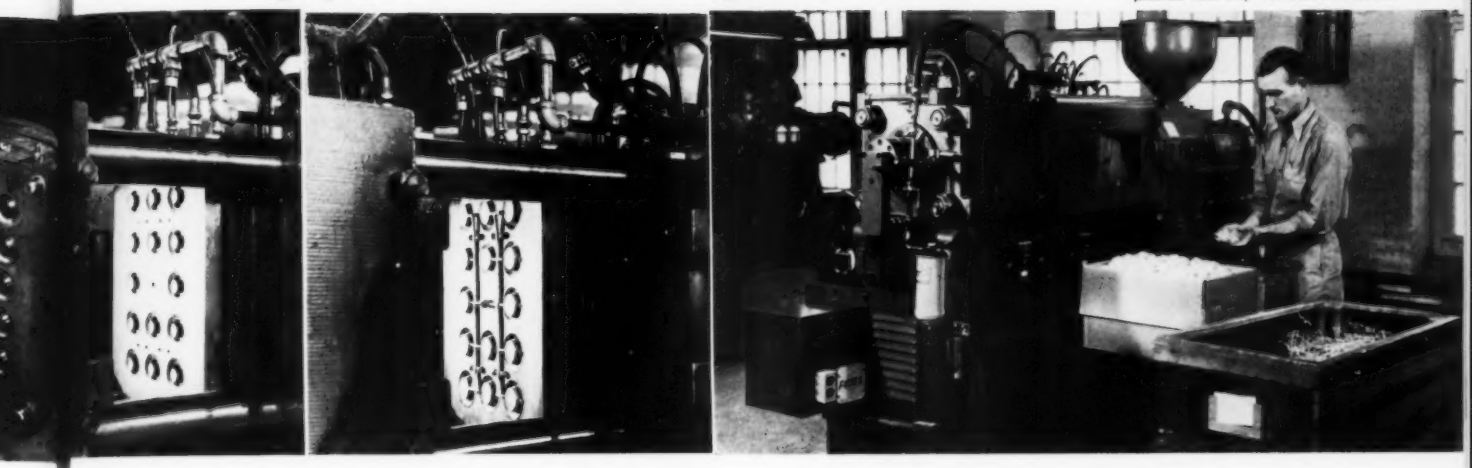
photos courtesy Wheaton Plastics



The process

Injection molding with a multi-cavity mold (left to right): polyethylene pellets, mixed with appropriate dry pigment, are poured through hopper to machine, where a measured dose is heated to liquid state (1). *After the two-part steel mold* (2) *locks, liquid is forced through tiny center gate and through sprue channels to fourteen cap-shaped cavities. Mold is water-cooled to control exact temperature and pressure. Machine with side panel removed shows open male mold empty* (3), *then with completed caps* (4). *Spike of waste material marks point where liquid entered at center. Pushed off by air jets, batch of caps and sprues shoots out of the machine 5 times a minute* (5).

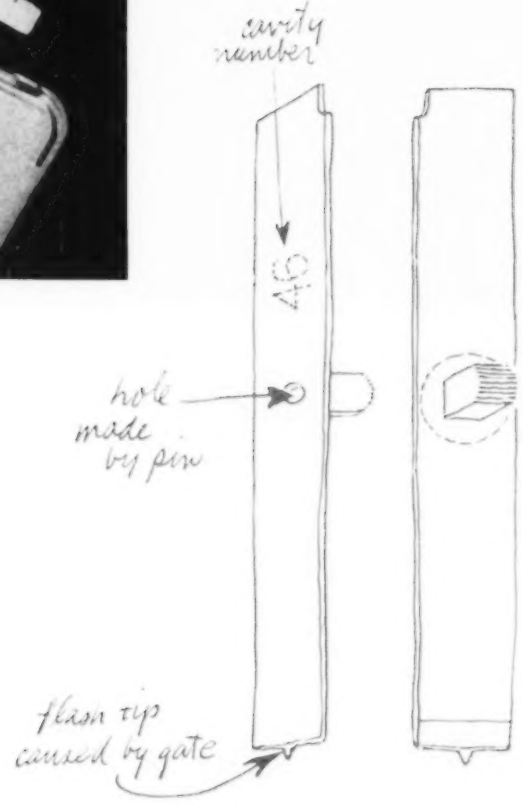
Product 2: precision

An aspirin manufacturer wanted a sales gimmick: a refillable plastic pocket dispenser; the "gimmick" had to offset the fact that the plastic would cost more than the customary tin. Filling machines required a flat, open box. Atlantic Plastics submitted several designs; the one selected was a little flat box with a flexible sliding closure. The box halves, snapping together with a self-forming lock, were polystyrene; the slide could have been one of several materials: polyethylene was chosen.

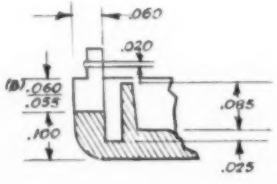
All parts were injection molded on multiple-cavity machines; maximum tolerance allowed was .003" (photo top left is actual size). Had the slide been too thin, it would have kept falling open; too thick, it wouldn't have slid at all. The hole in the track is left by a pin in the mold: besides saving material (multiplied, even these tiny scraps amount to something), the hole facilitated material flow and quickened cooling by coring out the thick section. As a result, maximum cycle time was 40 seconds. A cavity number on each track, left by the knockout pin, enables mold faults to be located.

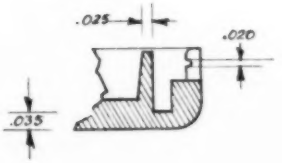
The drawing of the finally-realized track shows an unforeseen benefit from the material itself and its molding process: the little tip of material at the end of the track, left by the gate to the mold cavity, snaps reassuringly against the box when the track slides shut.

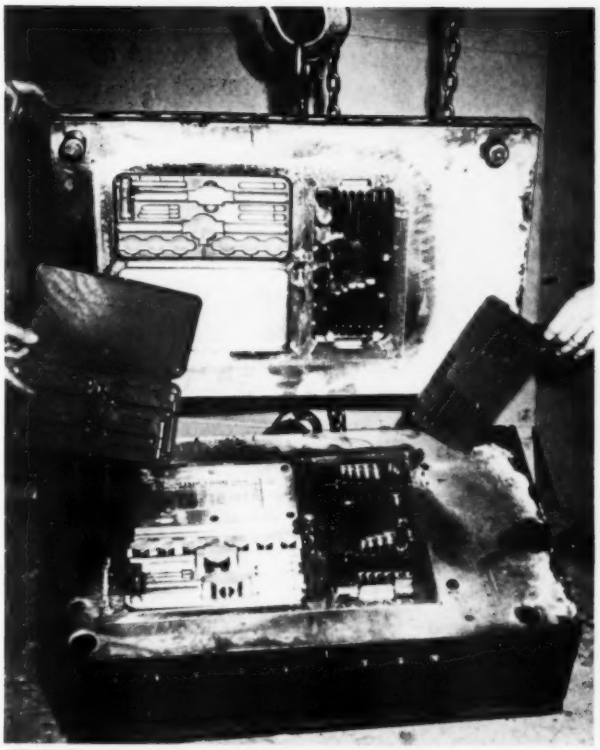
Advice from Neil S. Waterman, Atlantic vice-president and designer: Don't design too thin. The saving in material is offset by design and molding difficulties. Cost in polyethylene is governed not only by material but by mold design and production speed.



Section through polystyrene halves (left) shows a self-forming lock, track for the slide. Sections at another point (below) indicate tolerances.





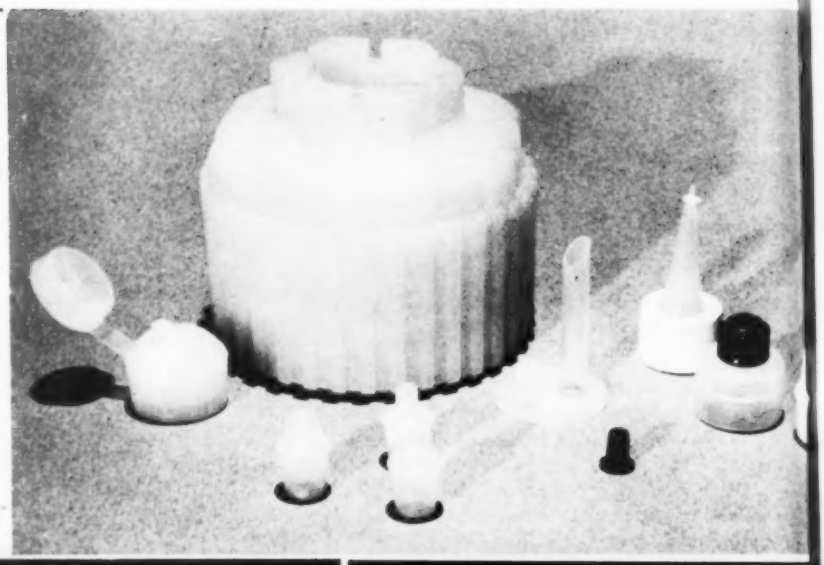


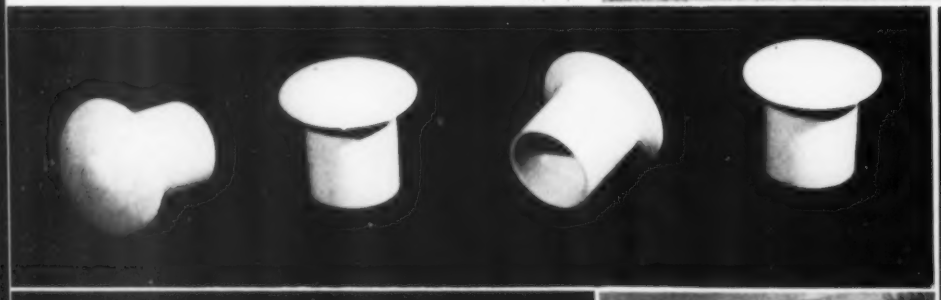
Product 3: complexity

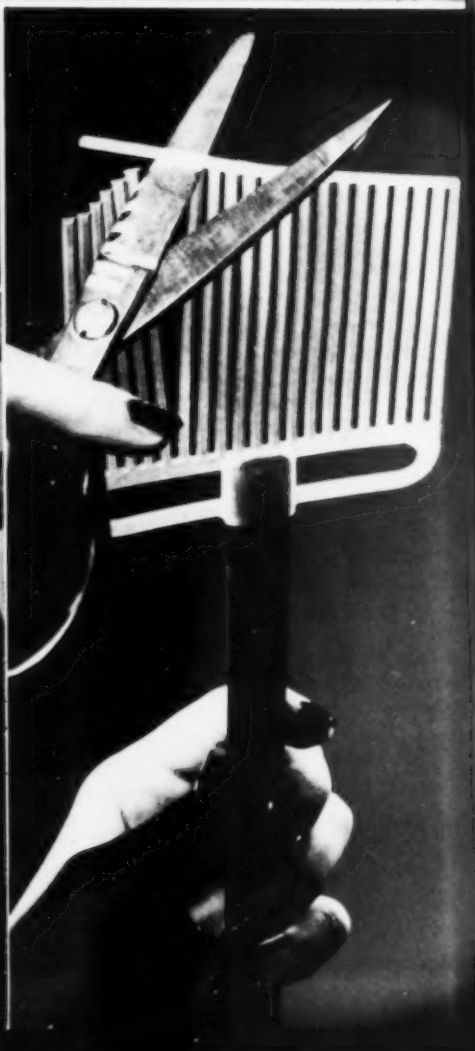
Hanson's tap-and-die and drill boxes are a heavy-duty example of the virtues of lightweight polyethylene. The tools now packaged in a single, double-decker polyethylene box (larger of the two is shown in the photos) formerly took up two wooden boxes and a lot of cushioning material. The manufacturers, Henry L. Hanson Co., were not satisfied with the situation. After some experiment, they went to Prolon Plastics, Division of the Pro-Phy-Lac-Tic Brush Co., and tried polyethylene. Design in this flexible material permitted integral cushioning; moldability permitted complicated niches and varying wall thickness. In fact the designer, L. J. Halberstadt of Prolon, found that the walls could be so thin that he could fit two boxes' worth of tools into a single polyethylene box with a fitted tray. Lightness (the new box weighed less than the one wood one) and tough resilience obviously simplified shipping problems. The tap and die box is made in a three-cavity hardened steel mold so that a complete unit is turned out with each operation: top, bottom, and tray. A thin bridge of polyethylene left between top and bottom forms an integral hinge. When it comes out of the mold the box has instructions embossed on the lid, and decorative grain on the outside surfaces. The deep-cored sections have a sandblasted surface, which is easier to remove from the mold than a polished one would be. The integral coloring is green; it only remains to print the name in yellow. On the smaller drill box even the need for the snap-fastener insert was eliminated: a pair of chunky but flexible undercut sections snap the box shut when pressed.

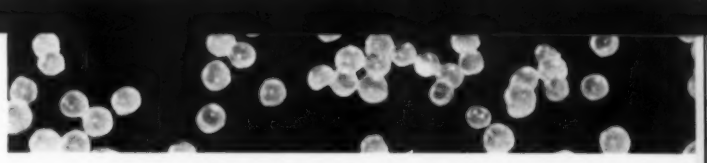
Products 4-8: *versatility*

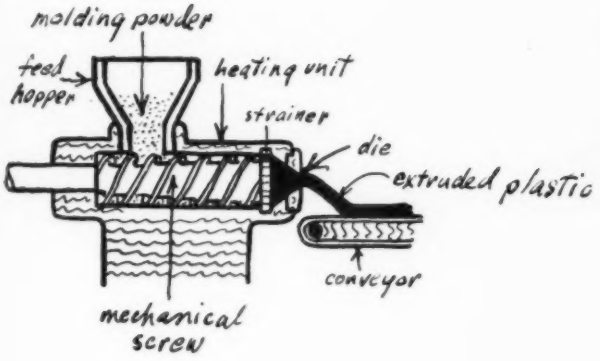
4 Bottle closures injection molded with integral hinges, nozzles, spray tubes. The large heavy cap, which fits a five-gallon carboy, is almost rigid and, of course, unbreakable. Small dark-top closure by Atlantic, others by Plax.
5 Switchcaps by Perry Plastics molded of Bakelite polyethylene mixed with fluorescent powder to glow in the dark.
6 Translucent fly swatter by Tupper. Polyethylene can be machined, cut, trimmed.
7 Ice chipper tray by Gits Molding. Standard polyethylene remains flexible from —50° to 180°F.
8 Double wall cosmetic jar, injection molded by Imco Container to solve usual oxygen permeation problem. Complicated shape of jar shows easy flow of polyethylene: material flows in through gate at bottom center of inner cup, up inner walls and down outer ones. Flat bottom disc snaps in later.









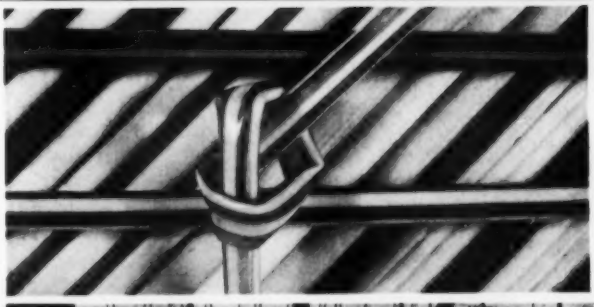


Extrusion

Extrusion is a continuous process of fabrication, as the diagram above shows. This means that the material—whether tubing, rod, film or sheet—will be of constant section as it comes through the die. Extruded products are widely used. One processor makes decorative multicolored strip, tube and rod. American Agile Corp. welds lengths of tube into cold water ducts, and new building uses include radiant ductwork, moisture barriers, and polyethylene as a concrete surfacing agent.

Because this is a cheap, fast method of production, ways have been found to modify extruded forms. An idea of what can be done is seen in DuPont's experimental machine (right), where a continuously extruded tube is filled with air until it expands to the required diameter and wall thinness, and then is flattened to form a wide, thin sleeve. Polyethylene may be stretched remarkably thin without bursting and has a "memory" that tends to return it to the shape it was given when hot.

One of the most touted products of polyethylene is the squeeze bottle. Some have been made by injection molding, but this process requires shapes that can be pushed easily off a mold — i.e. straight-sided or conical. Since many manufacturers want a more distinctive shape, combined with low enough cost for real mass production, they have turned to blow molding and modified extrusion techniques (see next page).



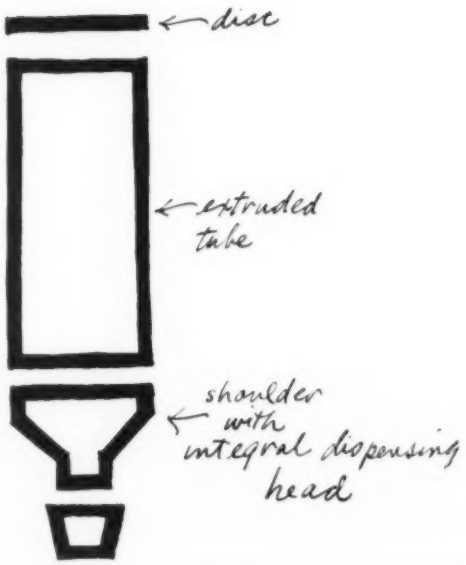
Product 9: convenience

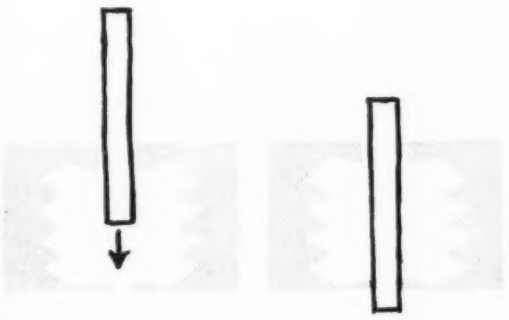
From lengths of extruded tube, Bradley Container Corporation makes a squeeze container which is fairly simple and above all cheap. A length of extruded tube, which forms the body of the container, is dropped into a mold where the shoulder and neck are being formed by a patented European process. The hot shoulder welds to the tube, which is then ready for filling. Bottles and tubes are sent capped to the client, to be filled through the open bottom. Bottom filling permits the tiniest or most complicated orifice to be built into the neck, avoiding the need for the separate plug which is ordinarily needed to allow such containers to be filled. After filling, a disc is heat sealed to the bottom of the bottles; tubes are simply pinched and sealed.

One advantage of the Bradley system is fine printing, heretofore a problem, Bradley says, on squashy polyethylene containers. Because these tubes are straight sided, they can be printed on mandrels, which offer a rigid backing to meet the force of the high-speed presses.

An interesting variation of this tube is the one-drop dispenser. "Suckback" is calculated by correlating wall thickness to viscosity of the contents (clients include Borden's glue); client can get any degree he wants. Polyethylene tubes can't be rolled up, but remain flat to display the trade name.

The cap can also be polyethylene. Neck threads in this material have to be sharply edged; properly designed, they grip well. The cost of these polyethylene tubes is said to be comparable with that of aluminum.

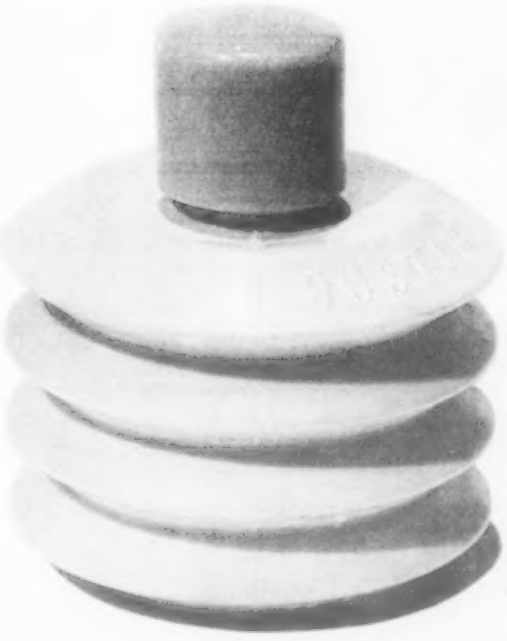




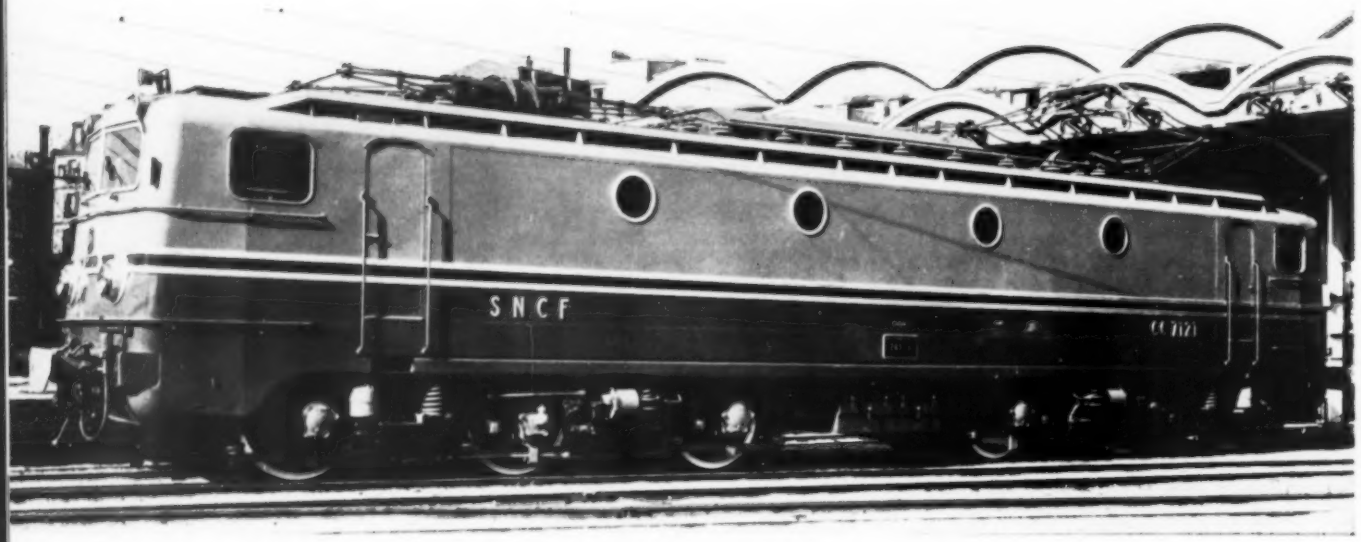
Product 10: *innovation*

Complicated hollow shapes are made by blow molding, which takes advantage of polyethylene's stretchability when hot and its memory. Imco Container Corp. takes a length of tube, drops it into a two-part mold which pinches and seals the bottom as it closes, and then blows in a stream of air which forces the tube out into the contours of the mold. Temperature of the mold must be rigidly controlled so that the material gets a chance to flow to the farthest ridges before it cools, yet it must not take so long that the cycle becomes impracticable for large-scale production.

The accordion squeeze bottle molded by Imco for a prominent cosmetic manufacturer shows quite a few pointers on polyethylene design. *Variations in wall thickness*: As shown in the diagram, the material thins as it flows out to the edges. This is caused not only by the natural thinning as the diameter increases, but by cooling as the material touches the near angles, impeding the flow to the far corners. Ordinarily the molder advises against sharp corners for this reason, but in this case they worked in favor of the design, resulting in a bottle that squeezes vertically instead of in and out. *The neck*: In this blow-molded type of container, the original tube is the diameter of the neck. If a dispenser top is required it must be a separate insert. *Undercuts*: Although polyethylene *permits* undercuts, in high-speed operation they can be a hindrance. In the 2-oz. size, the undercut shoulder of this bottle sometimes caused it to cling to the mold.

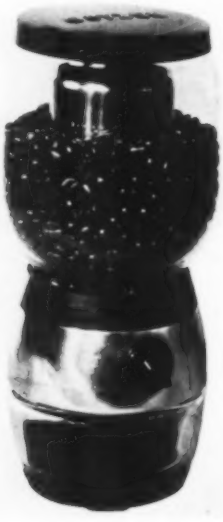


DESIGNS FROM ABROAD



Electric engine for the French National Railway designed by Paul Arzens and built by Alsthom. It was awarded a "Beaute-France" citation, and will be produced also for Dutch and Spanish railways.

Electric coffee grinder. Designed by G. Gorbetta for Gotzen, Milan.

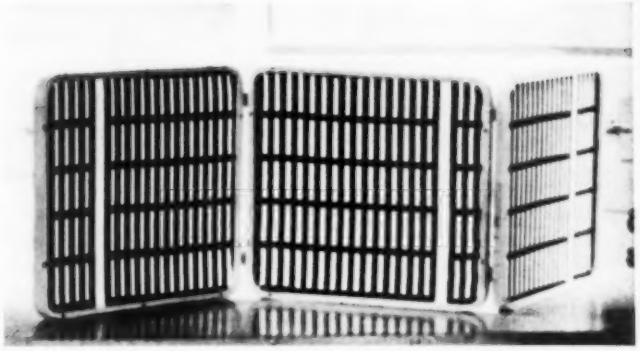


Electric grinder and grater produced by CGE, Milan.

Restaurant kitchen equipment on this page, from Triplex in Milan, has a straightforward look that goes well with the job to be done.

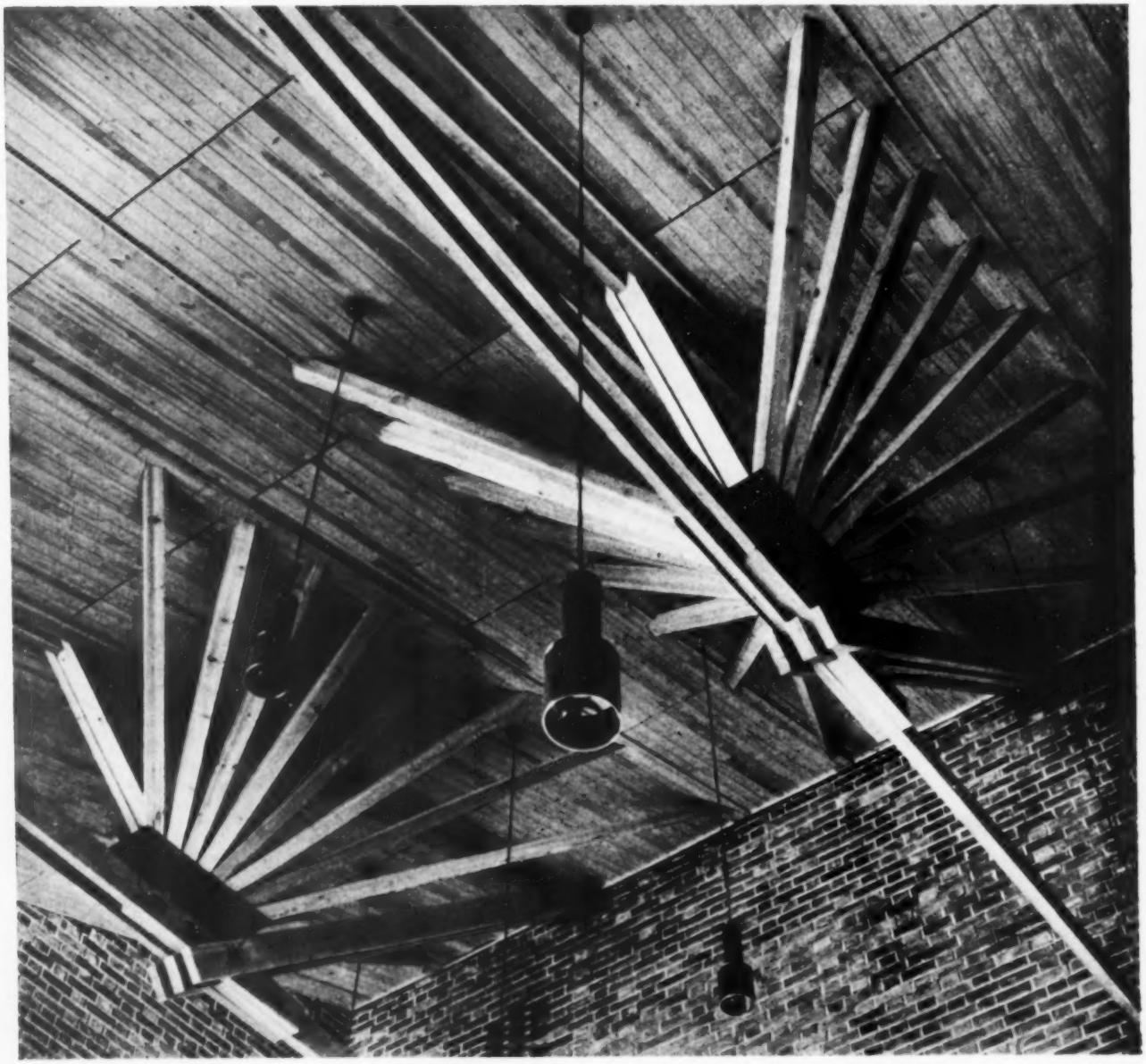
Gas range, above, has a deep well for cooking soups and a crane to lift the heavy pots. The pressure cooker is fitted with a stainless steel lid and inner pot (picture below).

The spit, left, can be operated by liquid gas or electricity, and is supplied as a counter unit, or with warming ovens below it.



Three-part sun screen, Nordiska Kompaniet, Stockholm. Set on a window sill, it offers shade without cutting out much light.

Prefabricated wooden girder, iron plates and bolts. Alvar Aalto, Finland.



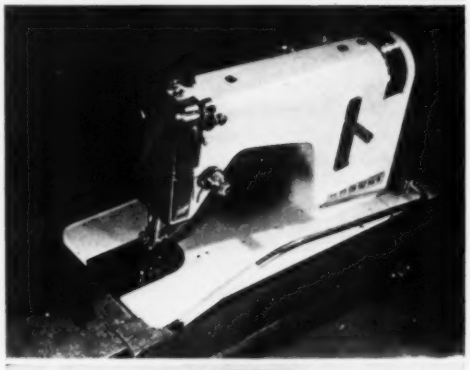
Rattan chair, Noorkoping, Sweden.

Intercommunication system and phone, below, from Hasler, Bern, Switzerland.

Brandt sewing machine by Technes. France.

Oscillating electric fan. CGE, Milan.

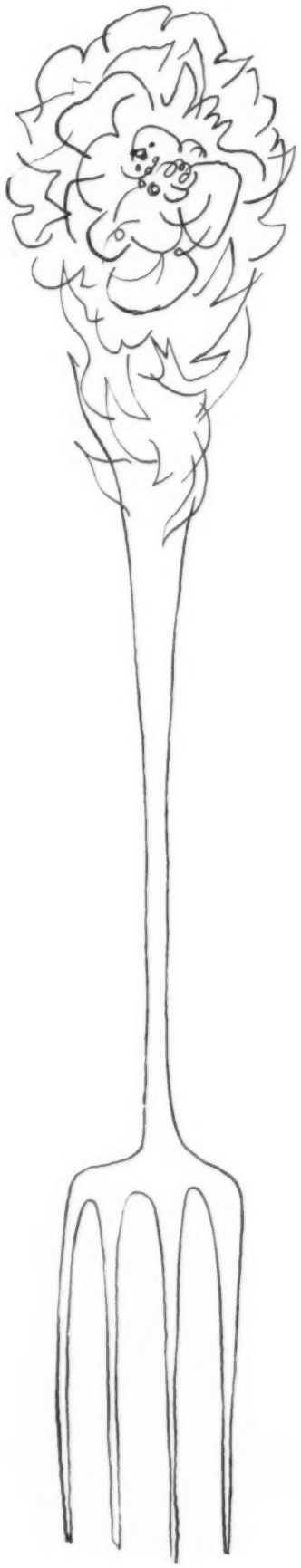
Swedish iron by Elektro Helios.



Letter from Ann Arbor

by Eric Larrabee

Rosebuds on the silverware



The 11th Ann Arbor conference took place this year on December 9th and 10th in, appropriately enough, Ann Arbor, Michigan. Its subject was "Design and the American Consumer," a simpler way of saying, "The Relationship between Design and Consumer Research." We might have put it as a question: "Should designers pay any attention to what the consumer wants, or thinks he wants, or thinks he ought to want, or what people say he wants, or what he says he wants but doesn't really, and so on?" In two days we managed to give these weighty matters quite a kicking around.

The conference, which was jointly sponsored by the University of Michigan and the Institute of Contemporary Art of Boston, seemed to move well without any particular pushing, and the panels were nicely balanced among professions, brow-levels, and degrees of cheerful unscrupulousness. The audience joined in without hesitation and was generally as relevant and helpful as the panelists. (They added up to about 150 designers, manufacturers, artists and educators.) The program was set up: (1) to introduce the hypothetical consumer, (2) to describe the present state of consumer research as a technique, (3) to show what, if anything, it could do for design, and (4) to relate these themes to a specific case problem: the unitized kitchen. All in all, a fine party.

Any conference profits from sharp definition in the personalities of its participants. It asks — even demands — that they take the most extreme positions their views will allow. Veteran conference hounds, which most of us obviously were, slip into exaggeration easily, expect it in one another, and sacrifice the subtleties for the sake of being clear-cut — that is, they use the insult as a way of being polite.

Like any conference, therefore, this one spent some time exchanging judgments that everyone knew were not wholly fair. There were the usual references to the imaginary genius of design who pays no attention whatever to the needs and desires of his customers. No such designer appeared to be present, nor did any specific examples crop up. Many speakers, nonetheless, showed such an animus to the very idea of "pure" design that you would think (until you remembered this *was* a conference) that they spoke from daily, bitter experience. At the other extreme, outrageous demands were made on the consumer — that he miraculously reveal to consumer-researchers what his buying patterns would be in the predictable future, and thus relieve the designer of any risk in making up his *own* mind. Most conferees, however, recognized both approaches for the stratagems they were, and discounted them accordingly.

At the next level of veiled ambiguity, the blows were more shrewdly aimed. It seems safe to assume that most designers are interested in knowing about their consumers, and the real question is how they can acquire this knowledge without compromising themselves. Design has built itself into the industrial process, and in acquiring manipulative functions — the coercing or placating of engineers, salesmen, cost accountants and managers — it has opened itself to manipulation by others. Mr. Donald Dailey of Servel was most acute in sharpening the contrast between the present and the recent Golden Age of Design, when designers in their moustaches and shaggy tweeds still looked sufficiently outlandish to make a strong impression in managerial circles. Now, by comparison, they are taken for granted, and must fight for their rights among the other industrial groups that seek to control the product. Worst of all, new witch doctors have arisen with their own arcane ritual for the charming of executives; not the least of these are the high priests of consumer research. Many a designer, knowing he can't lick them, has cagily decided to join them.

But the bright ones — and in thir front ranks I would put Mr. Albert Kner, director of the design laboratory of the Container Corporation — have more devious ways of dispelling the sorcery of consumer research; they have smothered it in such an enthusiastic

embrace that it all but disappears. Mr. Kner takes great relish in camouflaging his motives one behind another. First off, he can defend research as one of the designer's best devices for bamboozling clients into doing what he wants them to do anyhow, while in the same breath he ridicules designers for not paying proper attention to the customer. Scarcely breaking stride, he can lecture executives on their failure to consider consumer attitudes that are, or should be, part of the designer's normal awareness. His was a virtuoso performance; stripped of comedy, it was also the most challenging prescription for the designer's duty — the responsibility to take account within a single person of the conflicting demands made by art and audience.

The vast majority of other contributions — not to disparage them — fell into a category quite different from Mr. Kner's. Many were observations of the most practical kind on the pitfalls that infest the American market. Mr. Arleigh C. Hitchcock of the Herman Miller Company gave an especially frank and poignant account of two examples from his company's experience — a tale of triumph and a tale of woe: (1) the unexpectedly rapid acceptance of the plastic bucketseat chair, and (2) the equally unexpected difficulties with the steel-frame cabinets that were deliberately planned to capture a mass market, and ultimately appealed to the contract business. Like many firms with a high-brow reputation, Miller found it was not easy to climb off a pedestal.

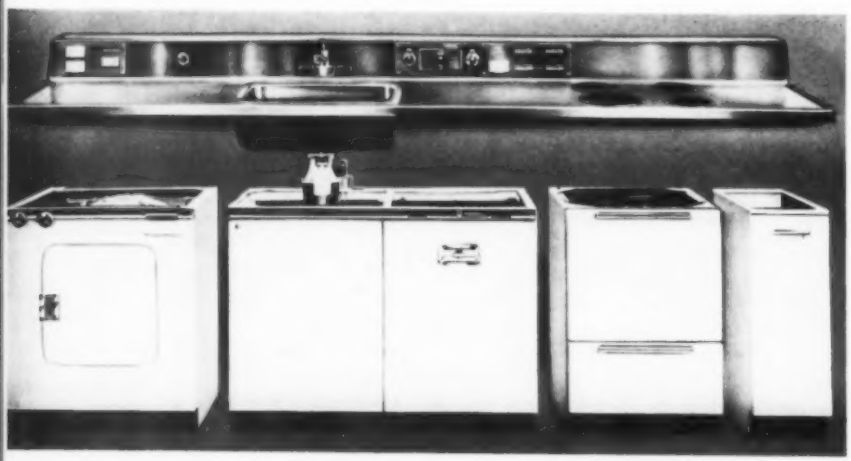
Nearly everyone was professionally prepared to be fascinated by the social and psychological needs and aspirations that have such an impact on the consumer-acceptance of such designs. But we were not always prepared to discriminate among the contradictory images of consumer motivation which kept coming up. Each new picture of that handy abstraction, *the* consumer, seemed to burst on many listeners with the blinding illumination of revealed truth, and one account — I am not exaggerating — brought tears to the eyes of hardened designers who had apparently never been convinced before that their clientele actually exists. This poetically persuasive picture of a consumer group was the work of Miss Esther Foley, home economics adviser to the McFadden Publications, who simply talked about "her" readers, — that is to say, working-class wives, blue-collar folk, wage earners. She had obviously so saturated herself in this milieu, yet was so objective about it, that she compelled universal admiration. She did not want "her" people to be ignored or slighted, and she did not like their motives to be misunderstood. Best of all, she was able to speak without embarrassment of Design as Symbolism, as the embodiment of hopes, dreams, fantasies and despairs. The rest of us seemed to think we were too wordly-wise to talk this way. Miss Foley, with her feet planted in the clay of ten million readers, was the only one who could reach haltingly for the stars.

The question had come up over silverware. As chairman of the first panel, Carl Maas of Standard Oil of New Jersey had asked Miss Foley to talk about "the rosebuds," which she obligingly did. (He meant the motifs which increasingly appear in silverware designs.) Miss Foley pointed out that for "her" readers "choosing a pattern" is one of the first decisions of early maturity, and not one to be lightly made. It is arrived at by a young woman at a time, in Miss Foley's words, when she is the Princess in the Tower; and woe betide the designer who offers the Princess nothing but the severe, sterile purity of otherwise unobtainable upper-class sophistication. Miss Foley alone among us held out for the right of the consumer to impute romance to common goods.

Unfortunately, she did *not* allow for the right of the consumer to cease to be common and become something else, to rise on the taste ladder as well as the economic ladder. Here she deterred the conference from tackling its essential problem; for if we were concerned with discovering the secret of fluctuating cycles, and if these fashions represent so much to the consumer, then we should have gone on to analyze the levels of social achievement which different designs symbolize, and why. Why in Hollywood does a Hillman Minx rank a Jaguar, for example? What is the affinity between a Buick Roadmaster and the split level house, or why does Cadillac appeal so overtly to the rising members of ex-minorities? Yet these problems could not be faced frankly at Ann Arbor.

Many speakers at the conference were aware of them, and eloquently so — among them Mr. Robert Iglehart of New York University, Mr. James N. Morgan of the Michigan Survey Research Center, and Mr. G. Brown Zahniser of Shenango Pottery and Castleton China. However, in the absence of any agreed conception of stylistic mobility and ambition, we were left with the usual unanswerable questions about how "good" the public taste can be for "good" design — the sort of tail-chasing argument that can go on forever. It might have gone on forever at this conference but for the interjection of a merchandiser, Mr. Richard S. Burke of Sears, Roebuck & Company. When we finally arrived at the discussion of unitized kitchens, Mr. Burke talked about the usefulness of changeable cabinet fronts, and pointed one way for design to circumvent the permanently frozen definition of Miss Foley's class market. "Her lady," he said, "can buy white metal with Cadillac handles, and keep changing fronts, until she winds up buying her kitchen from Herman Miller."

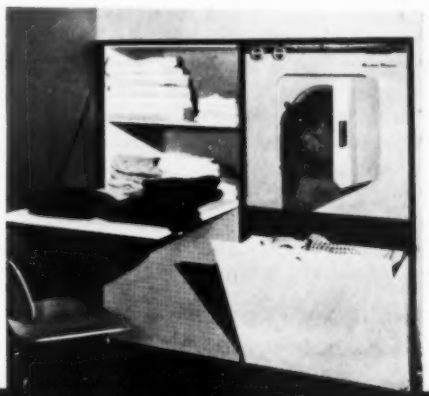
Certainly designs as social symbols have this tremendous potentiality for change, for adaptation, for re-definition within the sphere of daily life. If consumer research can increase the designer's sensitivity to these concerns, then it need not compel him to accept whole-hog Miss Foley's demand to let the housewife have her rosebuds. The designer need not deprive anyone of anything in order to provide something better. If he looks beneath the many mysterious cloaks of consumer research, he can find possibilities for designing symbols for the growing class of consumers whose craving for quality has yet to be satisfied.



1

Wall-hung refrigerator and freezer, shown in pink and blue on the wall above, and at the right, includes an 8.7 cu. ft. refrigerator in the left and center compartments, and a 2 cu. ft. freezer on the right. It hangs from an iron bracket fastened to studs. There are no handles; doors are pulled open by a groove along the bottom, and closed by magnets concealed in the rubber gasket inside door. For production, GE has substituted a high-efficiency fine Fiberglas insulation for the vacuum-wall insulation used in experimental models.

2



3 dream kitchens

currently being shown by three major appliance manufacturers promise to influence all appliance design of the future. Two of them were designed to dramatize the news in this year's production models. The third one explores new uses of the kitchen area that may dictate radical changes in the way appliances work. All of them demonstrate that the Dream Kitchen is both a good showpiece and a handy tool for measuring new ideas against practical demands.

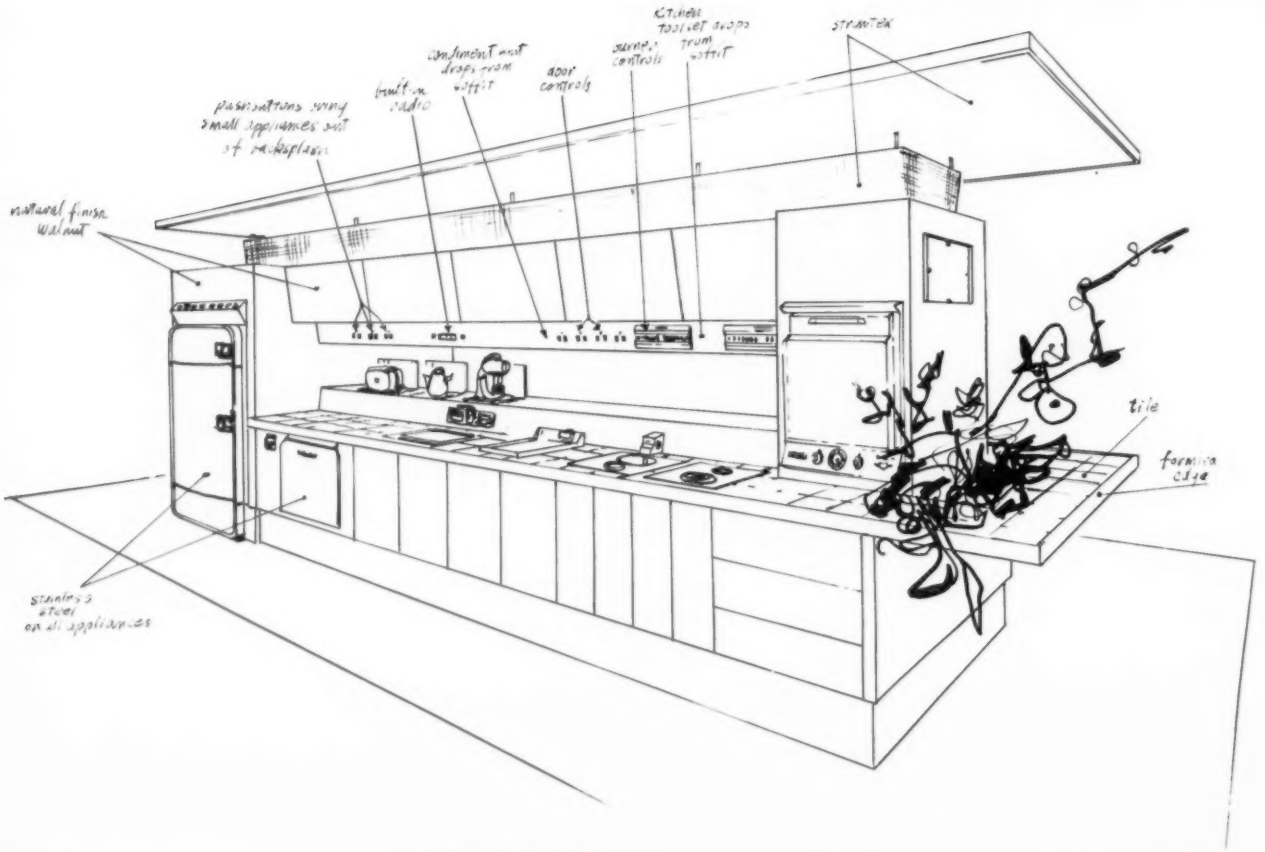
3

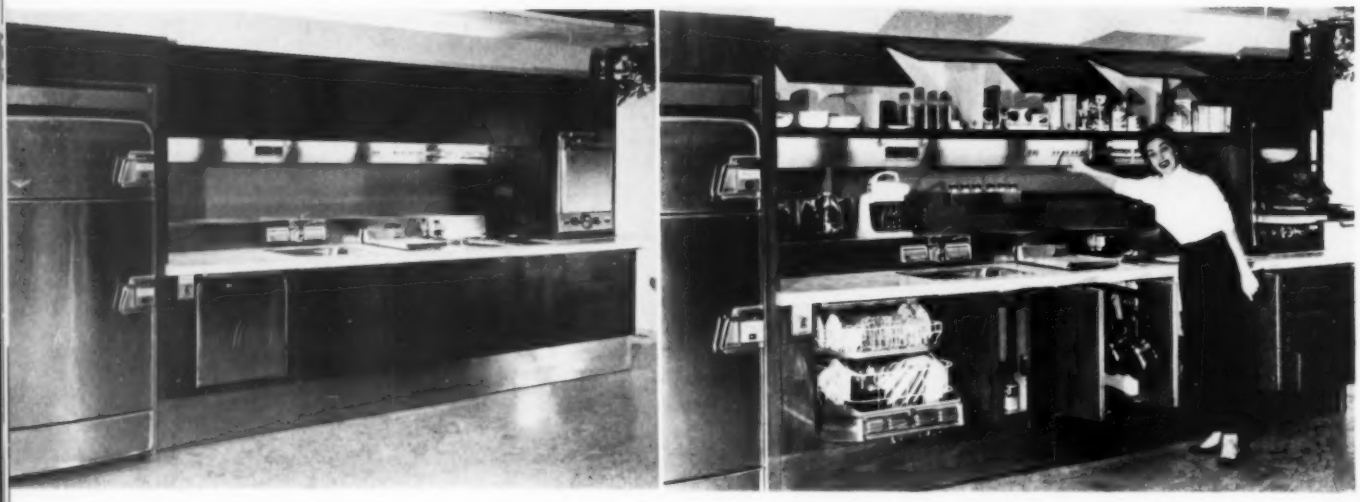
GE's Electric Kitchen Center

GE has startled the market this year with three innovations: the first kitchen package which puts everything but the refrigerator under a single counter top; a production model of its wall-hung refrigerator; and a full line of five colors for all its appliances.

How GE engineered its package with a minimum of tooling is shown in photo 1: they simply took this year's standard appliances — a new washer-dryer, dishwasher and Disposall, and 24″ range body — and put them together under an 8′ 6″ stainless steel top, which incorporates the range surface units, sink bowl and controls. One electrical connection does the job for the whole center, and since the units are also pre-plumbed, only three plumbing hook-ups are needed. The laundry may be installed elsewhere (see photo 2) and replaced with a 30″ cabinet. When space permits, a 12″ extension cabinet may be placed next to the range. It is accommodated by a 9′ 6″ counter top.

The package is shipped as components, and will sell for about $1500, or less than the total cost of the components purchased separately. To show homeowners as well as builders that the package and refrigerator makes building-in easy, the Major Appliance Division asked George Nelson and Associates to design a model kitchen (above) to show off the line amid mix-and-match colors.





Hotpoint's "Kitchen of Tomorrow — Today"

One of several major firms to introduce a full line of built-in appliances this winter was Hotpoint. Having decided the market was there, the company wanted to nudge it along by dramatizing the possibilities of the line. So Ray Sandin, Manager of Visual Design, worked out the display above to show how a fully built-in dream kitchen might be achieved today. Unveiled in Chicago, the kitchen is now on view on the West Coast.

Basically, the kitchen is a rectangular island. All food preparation equipment is placed along one long side, and laundry equipment is beneath the counter on the opposite side. At one end, probably near a dining area, there is an open counter which works as a serving center or breakfast bar. The other end is partially taken up by a recessed refrigerator, behind which there is a luxurious bar.

Though such an island scheme tends to become a simple one-wall kitchen of a size limited by practicality, it does offer a way to organize appliances into a compact unit which could fit neatly into an open living area. And though the cabinetwork which makes the island must be custom-made at the moment, the freestanding cabinet does solve another headache: putting built-ins into existing walls.

Frigidaire's "Kitchen of Tomorrow"

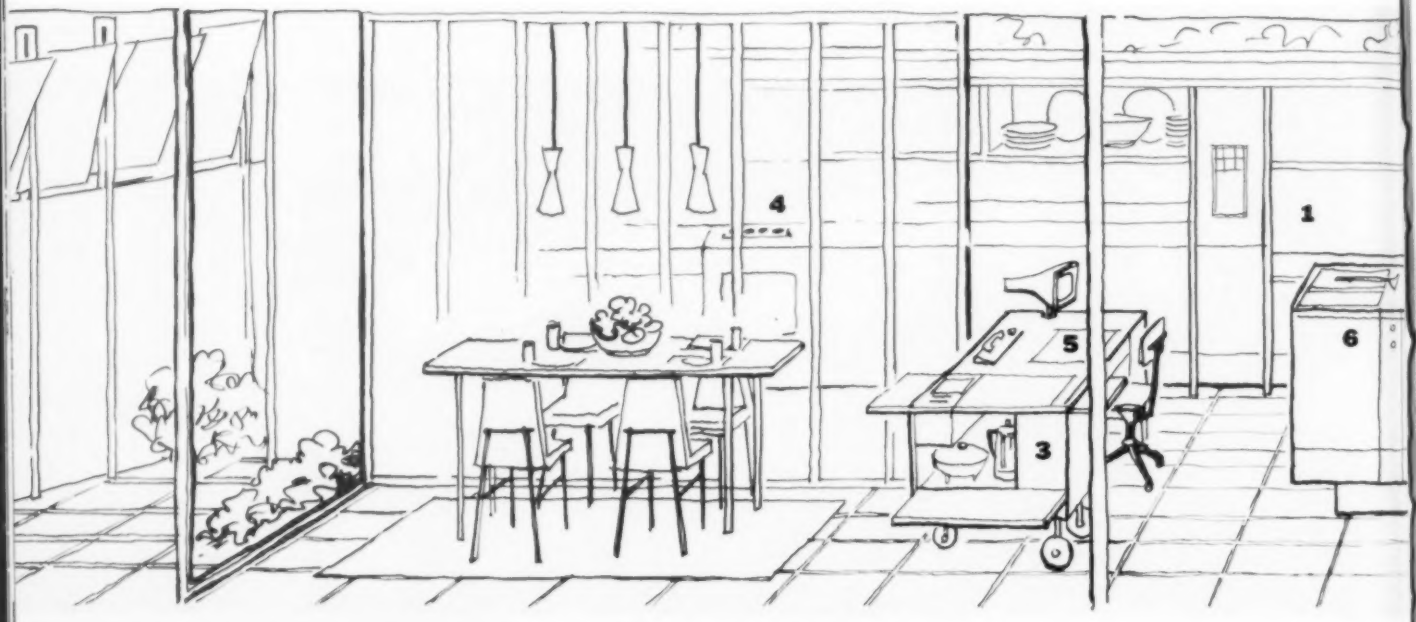
As a sequel to the 1954 display kitchen, Frigidaire is again treating the public to a power-driven dream kitchen in the GM Motorama. It has the necessary complement of magic — touch-bar doors, swiveling tv and no-hand telephone answering — but the theatricality does not conceal the designers' serious thinking about the functions of a work-a-day kitchen. It starts with planning — "indoor-outdoor living" is the theme — and then develops whatever props are needed to support this better life. Among many challenging innovations, these are a few highlights: 1) The cooking center is placed along an outside wall (see below). Glass partitions open on the adjacent patio, so that the cook may use the same oven-rotisserie for formal dinners or patio picnics. 2) Refrigeration is fractured into five appliances, which may be separately placed. 3) Food preparation equipment — mixers, blenders and the like — no longer have their own motors, but fit onto two universal motors set into the mixing counter. 4) Electric housewares are both stored and used on a motor-driven serving cart. 5) Meal planning desk and utility center are part of the kitchen, and the entire area is covered by a ceiling of light, diffused by aluminum strips.

The total effect is strictly high style; yet within the motorama's demand for effective overstatement, the designers made the most of elegant detailing, good proportions, and well-balanced materials and colors. The entire kitchen is a modular unit supported on stainless steel Unistrut frames; surfaces of aluminum, stainless steel, Iralite, and ebony contrast quietly with gray-purple and light pink on cabinet work. The design was inaugurated by General Motors Styling section in cooperation with Frigidaire. Some of the significant details are shown on the next page.

1

2

Refrigeration center features waist-high 10 cu. ft. cabinet with roll-out shelves; doors part at touch of control bar; freezer is below. Dispenser for cubed or crushed ice, or ice water, is at left. There is also beverage cooler and patio bar, and hydrator (right).



4

5

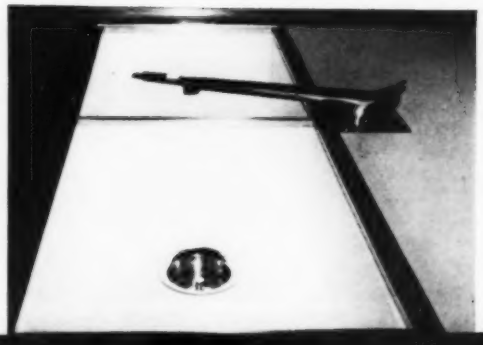
Planning desk (5) includes telephone which works without lifting receivers, and records incoming messages.

Laundry center (4) is behind dining room. Foot pedals open washer and dryer. Ironer closes like a spinet.

Washing center (6) is an island, with dishwasher, disposal, and chopping block. Self-rinsing sink has tiny flushing outlets around rim.

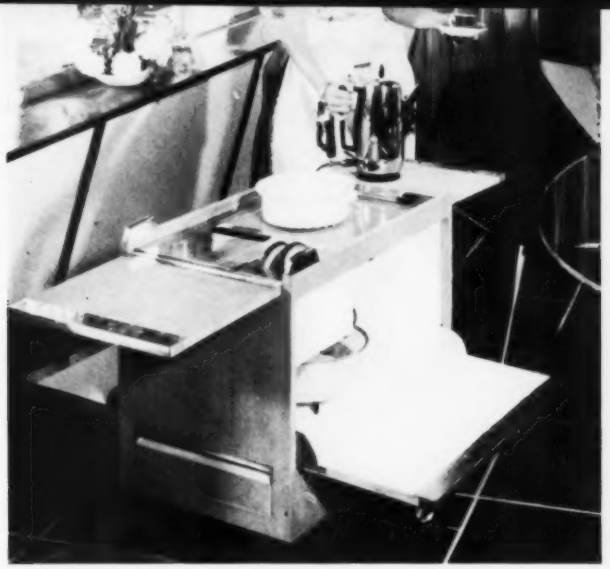
Plextone enamel on sun-vent playyard wall by Maas and Waldstein Co.; All points prepared by DuPont; Aluminum patio furniture designed by G. M. Styling Section for Alcoa; Aluminum extrusions by Alcoa; Plastic materials by Cadillac Plastics; Tempered glass windows on play area by Libbey-Owens-Ford Glass Co.; Armorply stainless steel laundry backsplash by U. S. Plywood Corp.; Travel tray ceiling tracks by Grant Pulley and Hardware Co.; Vinyl tile floor by American Biltrite Rubber Co.

6



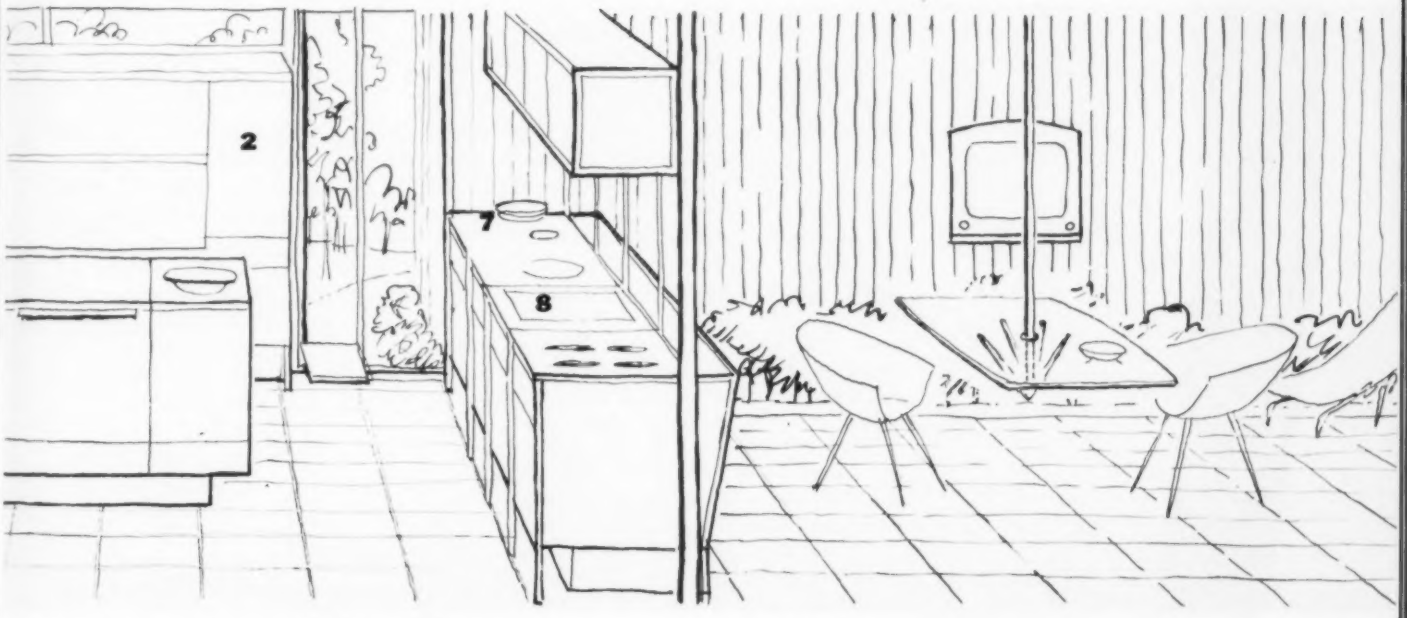
2

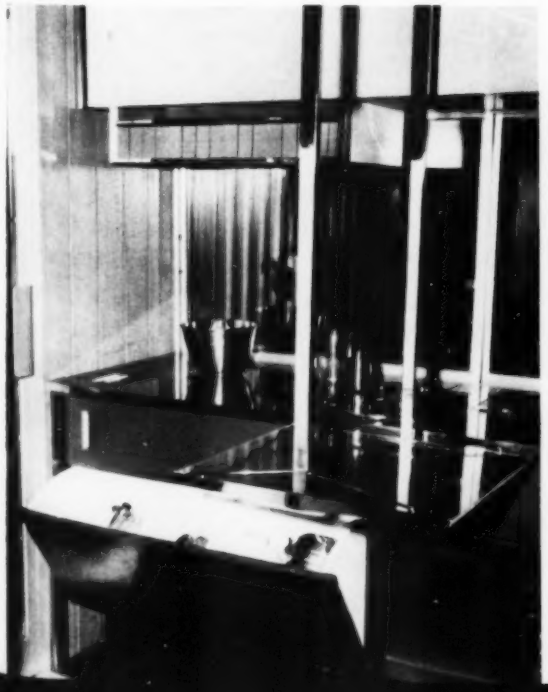
Hydrator, adjacent to refrigerator, rolls out like file drawer. Glass-front drawers for meat, vegetables open to either side.



3

Service cart, new all-in-one appliance, has built-in toaster, grill and warming plate, and outlets for appliances stored inside. It runs on batteries, plugs in with reel-out cord.





7

8

Cooking center's recessed hotplates flip over when not in use; underside of one is a griddle. Oven rises from counter and, like drop-down controls, works from kitchen or patio.

Mixing center's two universal power-driven shafts sunk in counter fit all motorless accessories (mixer, blender, extractor, shredder) which are stored in drawer below.

by William B. Donnelly *Industrial Design Department, Electronics Division, G.E.*

Calibrating a ship curve

In designing plastic housings, it is essential to arch the sides and top of the case, for flat or thin-walled thermoplastics are prone to warp. The problem also occurs in forming sheet metals. The sweeps employed are not solely a matter of style; they are needed for strength or rigidity and they must be exact. But they're a nuisance to produce. Designers arrive at these curves by tracing their sketches with a standardized ship curve. The designer selects a section of the given curve that matches the sweep he is trying for. But since the ship curve is unmarked, when the designer's sketch is turned over to the draftsman for the preparation of engineering drawings, these sweeps must be plotted mathematically. Generally, one sweep is made up of several blending radii. The process of establishing accurate measurements for the sweep may ultimately spoil the original freehand line.

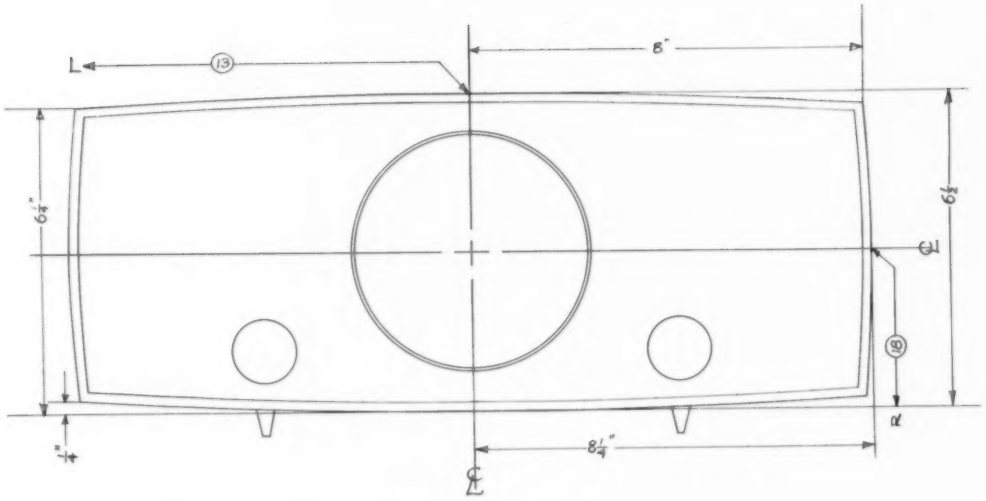
To get out of this difficulty, we devised a method of calibration for the ship curve used by the designer. It was marked off in ½" intervals, every other mark being lengthened and numbered. The ends of the curve are marked right and left to indicate the direction of reading.

A set of three calibrated curves, each with the same contour and catalogue number, is made up. The designer uses one of the curves in making and marking his original drawing, the draftsman uses the second curve in turning it into a working drawing, and the toolmaker uses the third curve as a template with which he can follow the indications of the working drawing.

On the working drawing, sweeps are indicated with a bent arrow whose tip points to the spot on the drawing where the curve is to be placed. The calibration is noted on the arrow, and encircled. The R or L indication is also noted (1, 2).

We found that there was some chance for confusion in this method, for the curve must be reversed to mark off the second half of the sweep. Instead of the *R* or *L* indication, we indicated placement of the curve by using two calibration numbers. The system of notation used on the drawing is arbitrary, the designer selecting the one that seems the appropriate one for the particular drawing. If both ends of the sweep indication are numbered it is impossible to reverse the curve by mistake, but one of the numbers is likely to be approximate (3).

Since the translation of the designer's sweeps, through the draftsman and the toolmaker to the finished form, can be a cause of confusion and delay, and because these sweeps are often corrupted in the process, this simple modification of the ship curve has made it into a doubly useful tool. Any degree of curve can, of course, be adapted to the system.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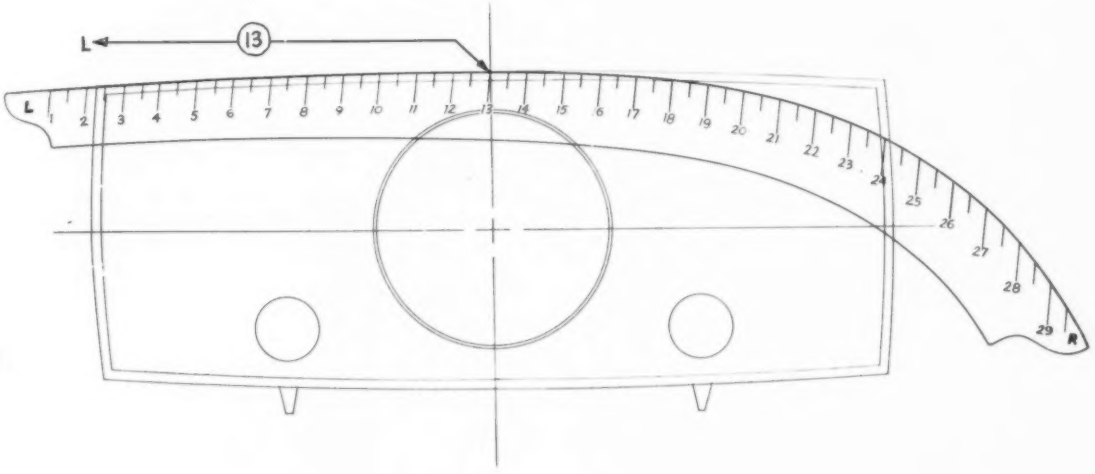
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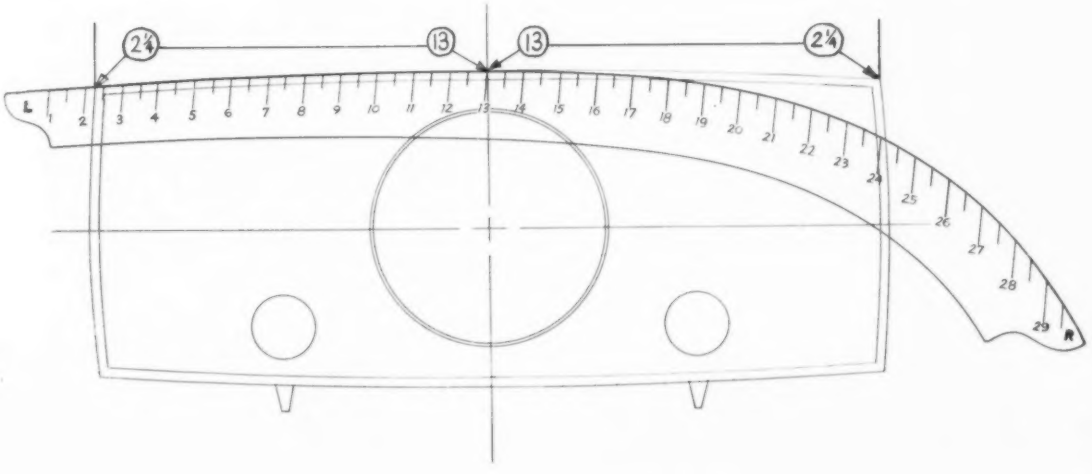
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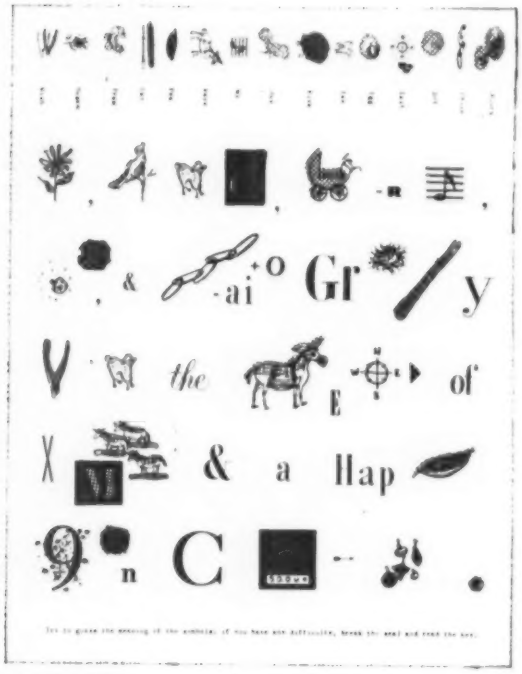
3

Greetings from designers

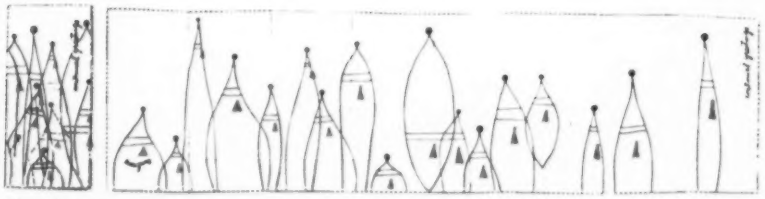
Here is a sampling of the many photos and etchings, puzzles and sketches which brightened our recent holidays. Most of the designers did it themselves, but a few left it to us to cut, fold, paste and assemble.



Chon Gregory

Paul Hassel

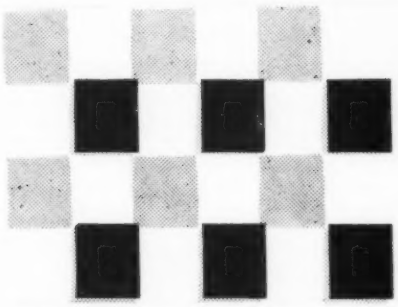
The Fashion Group



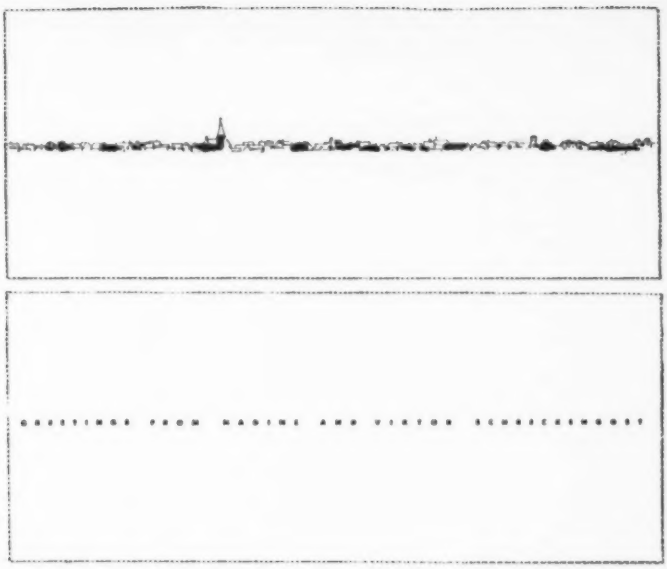
Martin Rosenzweig

Ben Shahn

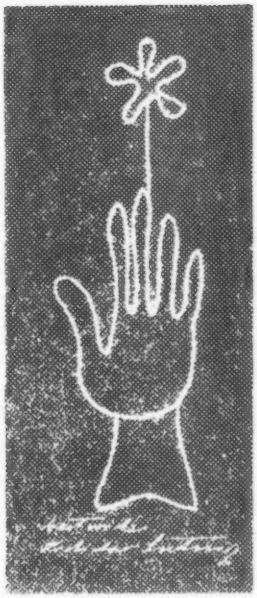
Dick DeNatale



I. M. Pei

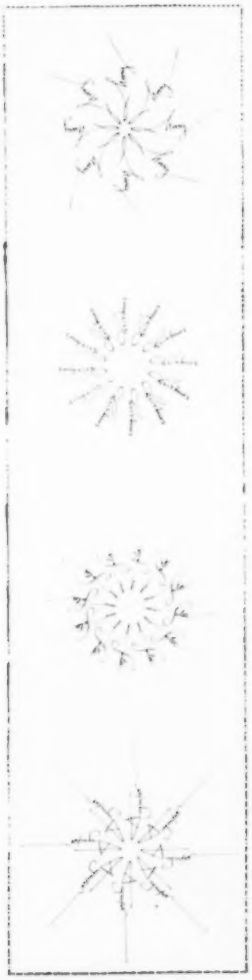


Viktor Schreckengost

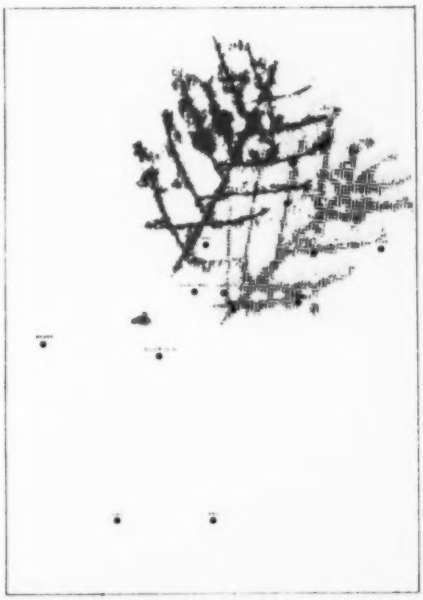


Ladislav Sutnar

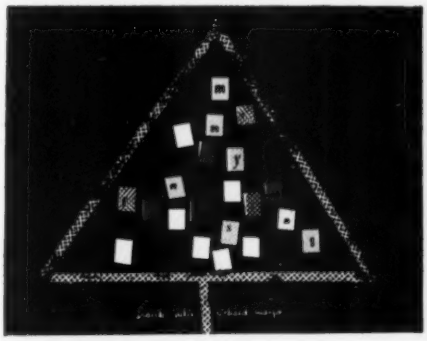
Anne Scotford



Felix Augenfeld



Louis Silverstein



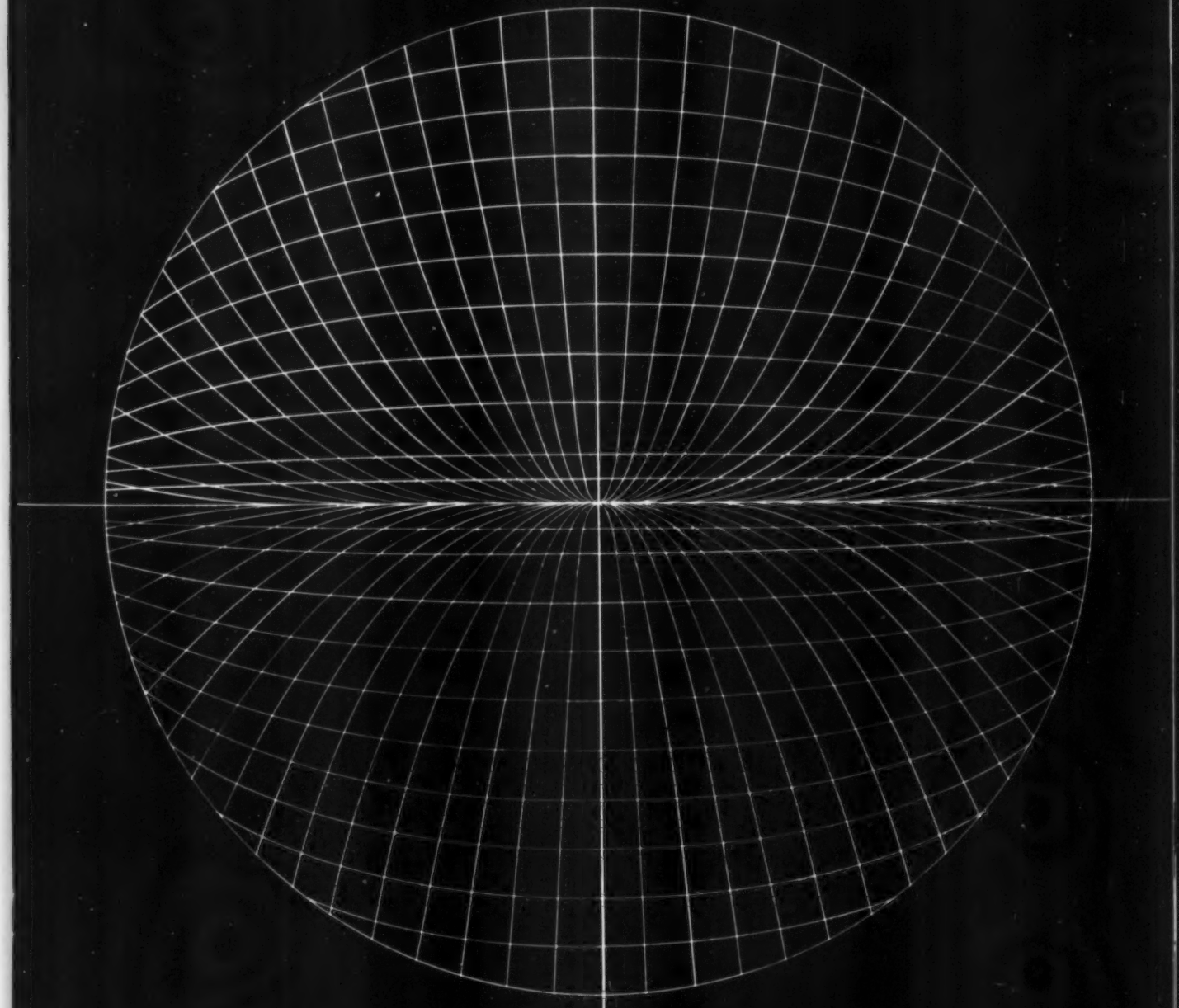
Frank Mayo

Ted Andresokes

We received many "cards" meant to dangle in the holiday eddies. Glancing from left to right, across top: Domoto's *flat scissored triangle opened into a mobile;* Sam Scherr's *6-sided ornament had to be cut out and assembled, unlike* Anne Harris' *ready-to-hang triangles.* Von der Lancken, Lundquist and Sorensen *honored us with a custom-made pyramid, with a handwritten note, beginning "We have no card lists . . . there are already too many lists of all kinds."* Hap Smith's *Bach excerpt,* Morton Goldsholl's *black disc pop-up, and* Elsa Kula's *rooster on shiny paper came neatly folded, but* Bruno Munari's *colored cellophane chips in a translucent envelope didn't need to be opened. On the shelf,* Egmont Arens' *ornament,* John Scotford's *snowflake, and* Peter Muller-Munk's *star took on new dimensions when opened.* Harry Zelenko's *bird full of sunflower seeds,* Seymour Robin's *painted wooden pyramid, and the grinning Santa Claus arrived boxed; Santa advocated Christmas thrice yearly and was attributed to Macy's, Gimbel's, Zsa Zsa Gabor, F. W. Woolworth, and* Jay Doblin.

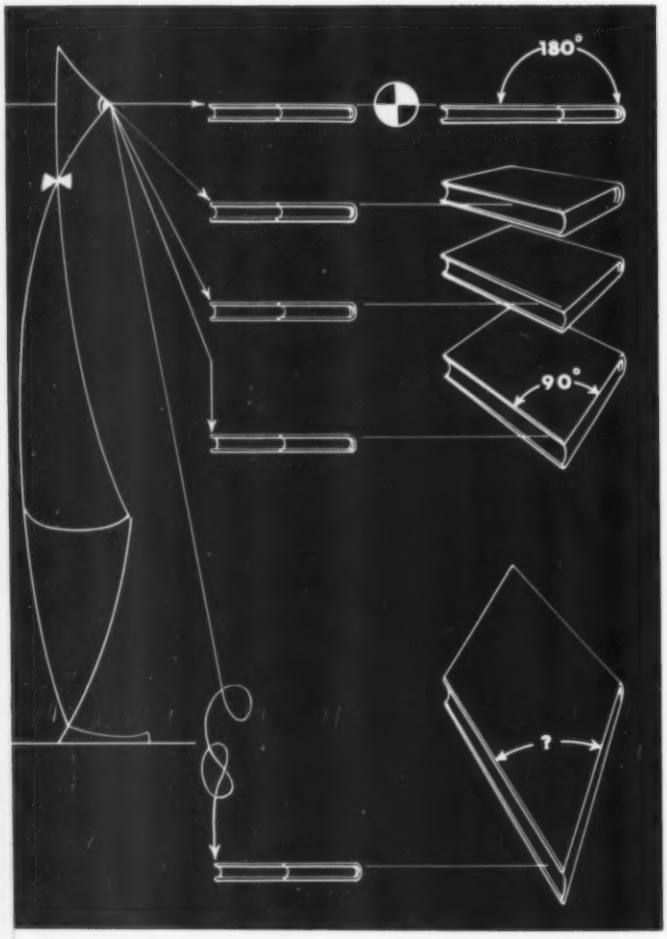
PERSPECTIVE

a new system for designers



by Jay Doblin

In the last chapter we discovered a simple method for erecting a cube in 45° oblique perspective. According to traditional theory, we should be able to multiply this cube in any direction and use it as a basis for constructing any figure. To see if this is true, draw a horizontal square in 45° oblique perspective (A1) and project it into a complete vista of horizontal squares. Now examine a few random squares and notice how many look distorted. These distortions result from two types of error, which we must learn to avoid if we want to make correct drawings. The first error is fairly simple, and most draftsmen know how to control it. The second is more complicated. To my knowledge it has never been described.



Control of the nearest angle

If an observer looks at a book held horizontally at eye level, the nearest angle is 180°—a straight line. As he lowers the book the nearest angle becomes more acute until it finally reaches 90°. When this happens, the book is at right angles to his line of sight and he is seeing it in plan. It is impossible for a plan view to occur in a horizontal perspective view; thus it is impossible for any square in true perspective to have a nearest angle of 90°. Any square in a perspective vista whose nearest angle is 90° or less is distorted.

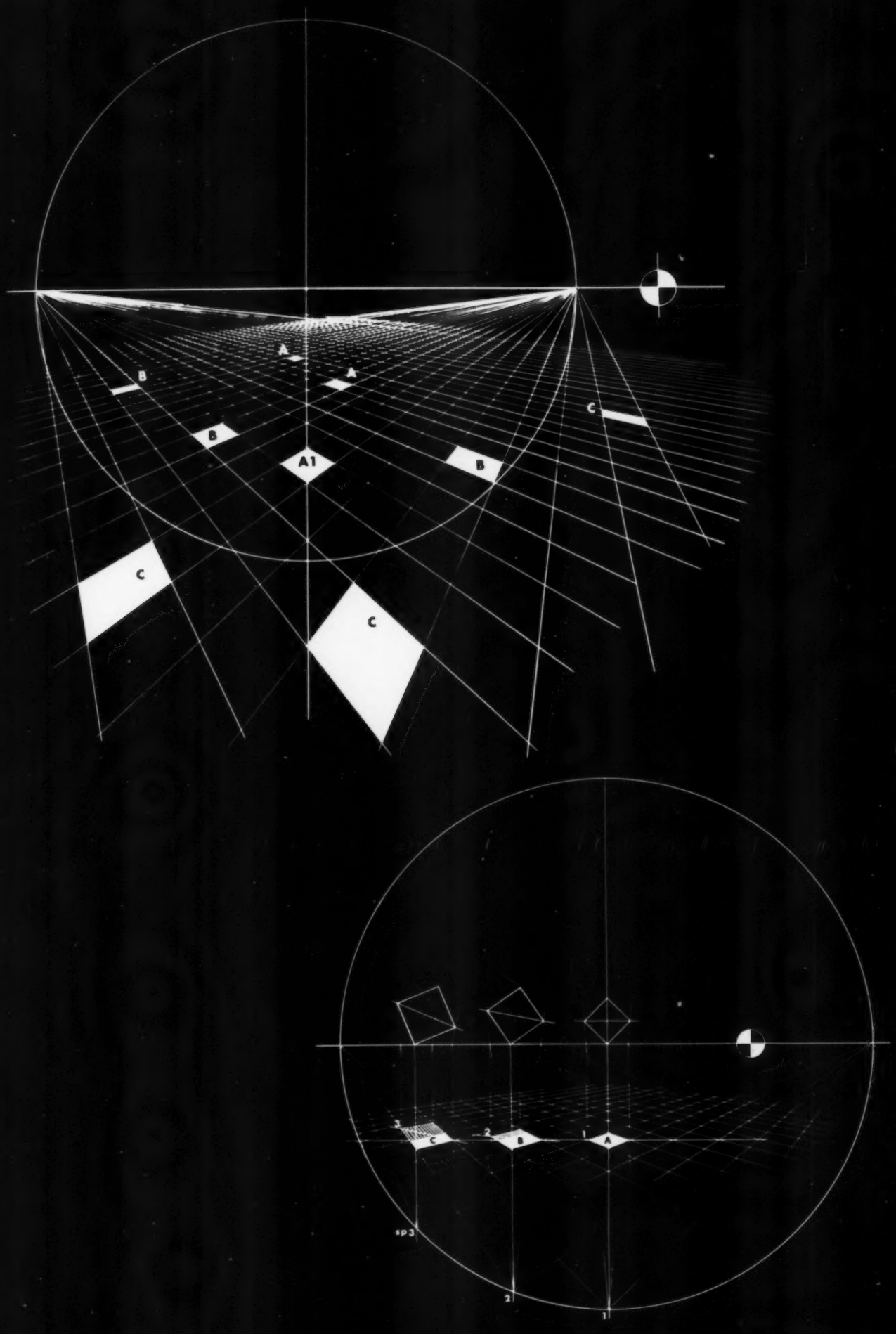
A simple way of imposing this limitation is to swing a circle from the horizon to intersect the vanishing points. We know from geometry that any angle formed on the perimeter of a circle by lines from the intersections of the circle and its diameter will be a right triangle. Thus any nearest angle that touches the circle will be distorted; any nearest angle within the circle will be greater than 90°.

Side to side error

We have now eliminated the kind of distortion found in squares C, but if we examine our vista again we find many squares inside the circle look distorted. Those marked A look all right, but those marked B look increasingly distorted as their horizontal distance from the original square increases. We can check the accuracy of some of these squares by comparing them with squares drawn individually by the top plan method.

To draw an accurate perspective square over a grid square: Draw a perpendicular through the nearest angle of the grid square and locate the station point where this perpendicular intersects the circle. Draw lines from the station point to the vanishing points. Place the nearest angle of the top plan at the horizon with its sides parallel to the angle at the station point. Project the next nearest angle of the grid square through the horizon to construct the width of the top plan. Now complete the top plan and project it by the top plan method (chapter 1) to make an accurate perspective square.

When we check squares A, B, and C against the corresponding top-plan squares we find that B and C accumulate error as they move away from the original, A. The nearest angles in each pair of squares coincide, and the sides are parallel; the significant difference is in the diagonals. Notice how diagonals 1, 2, and 3 change angle as they move between the vanishing points.


A
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B
C
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A1
C
C
3
2
1
C
B
A
SP3
2
1

Curved diagonals

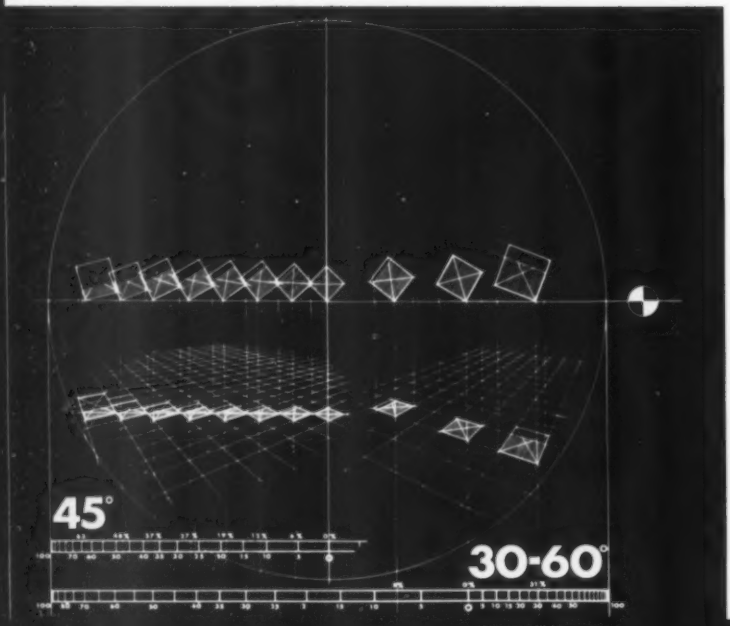
Using the top-plan method, let us construct a series of horizontal squares across the circle of correct drawing and line them up along their diagonals. We find that the diagonals generate a curve. If we draw hundreds of accurate horizontal squares and line up their diagonals, the diagonals will make a figure like that at the bottom of the opposite page. A perfectly accurate drawing of any horizontal square in two-point perspective can be made on this figure simply by connecting perspective lines from the vanishing points so that they intersect on the diagonals.

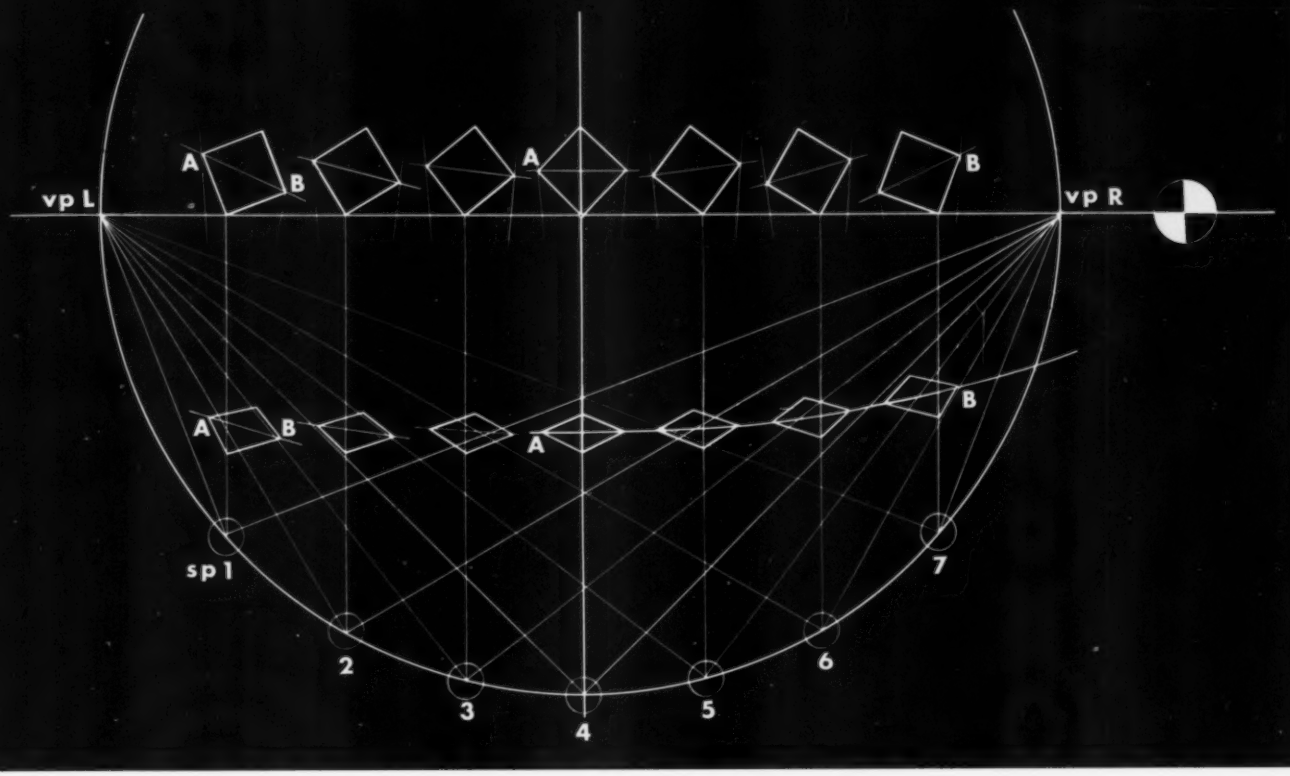
The implications of this figure are startling: In a perfectly accurate perspective drawing, the only straight lines will be those that cross the observer's line of sight. This may seem remarkable at first, but we can see it is so by the evidence of our eyes. Consider the case of an observer looking at a long low building at right angles to his line of sight. The building will appear largest where it crosses his line of sight. At the sides of the vista it is further from him and will therefore appear to diminish. The roof, if it is above his line of sight, will curve down toward the horizon; the bottom, if it is below his line of sight, will appear to curve upward. Only if one of these lines is directly at eye level will it appear to be straight.

Tolerable error

Of course it would be almost impossible to draw rectangular objects with curved lines, and our habits of seeing would make such a drawing look absurd. The grid we have developed is not useful in drawing; it is only valuable because it explains why distortion multiplies in an ordinary perspective drawing as the side-to-side vista is increased. Obviously, if we are not willing to introduce curved lines into our drawings we will have to tolerate some error.

By comparing correct squares with distorted ones, as we did on the last page, it is possible to determine the exact percentage of error that occurs at any point in a vista created by multiplying one square. The drawing below shows two scales, one showing how error accrues in a vista developed from the 45° oblique view of the cube, the other showing the error in a vista developed from the 30-60° view. On page 5 of this issue is a chart I prepared for a large perspective study, it was used to determine how much error the trained eye can tolerate. I discovered that visual accord is assured if errors do not exceed 25 percent in depth and 10 percent in height and width. The 45° scale below shows that an error of 25 percent occurs about half way to the vanishing points. In other words, the method of drawing the cube discussed in the last chapter will be satisfactory for any rotation from the center half way to the vanishing points; at this point we need a view that will be acceptable at the sides of the vista. Such a view is the 30-60° rotation.




vp L
vp R
A
B
A
B
A
B
A
B
sp 1
2
3
4
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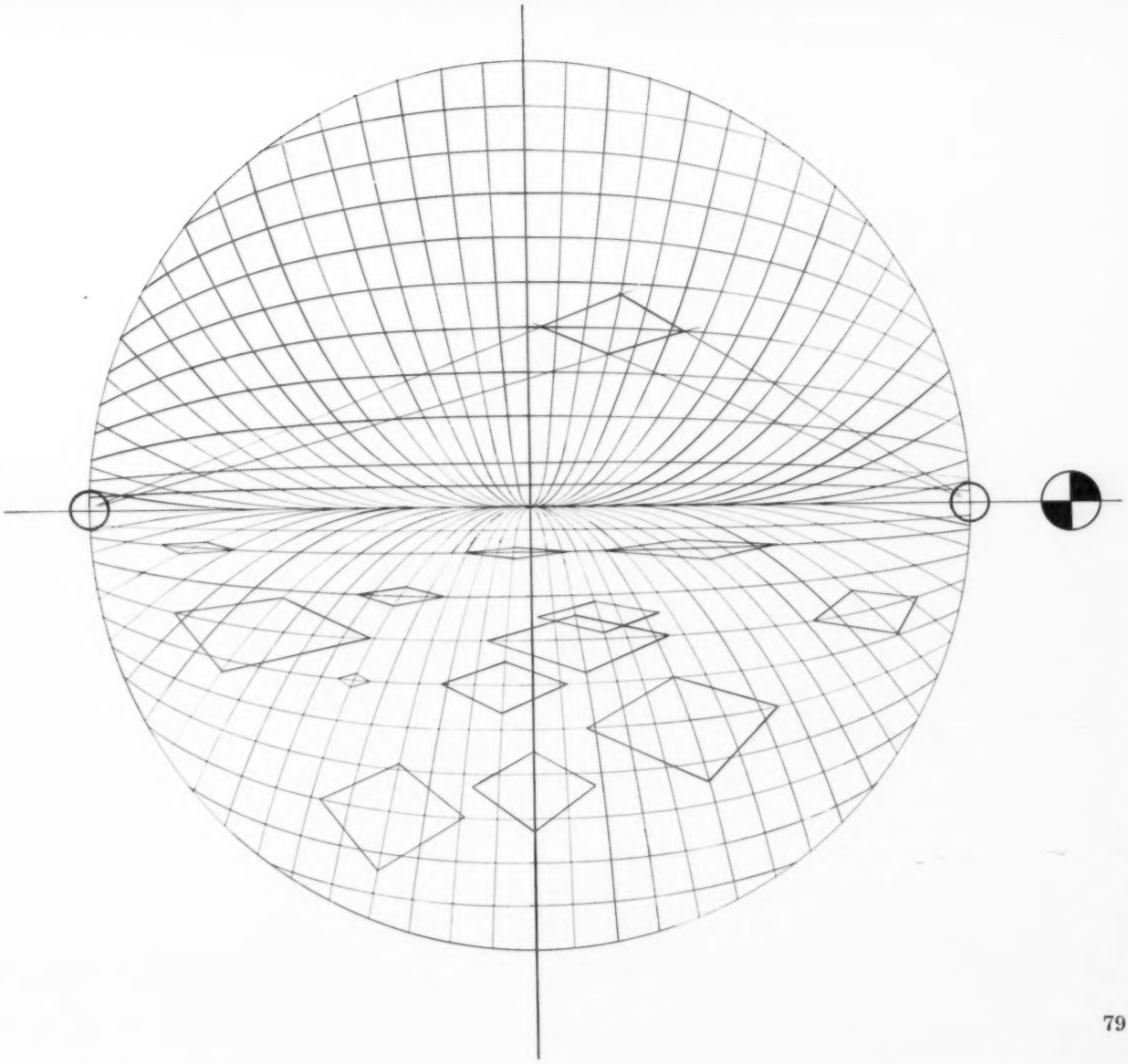
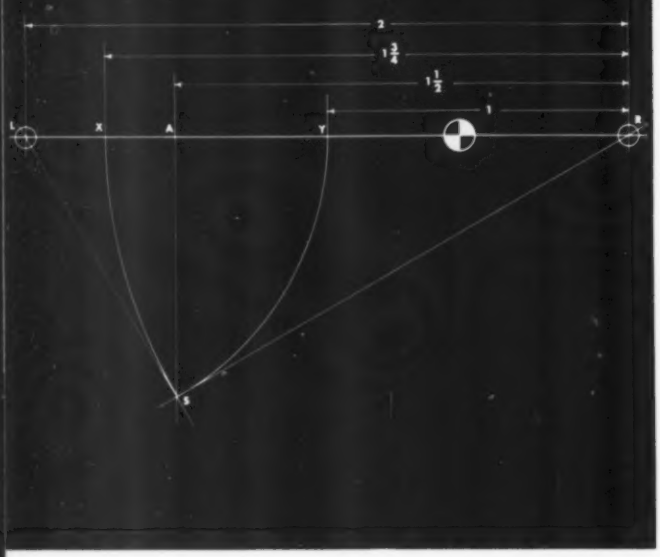
6
7





Special case of 30-60° measuring points

Ordinarily, drawing a 30-60° view of the cube by the measuring point system requires the following preliminary construction: Draw a horizon and place two vanishing points on it (*L* and *R*); using *L-R* as the hypotenuse, construct a 30-60° right triangle with the apex at *S*; draw a vertical from *S* intersecting the horizon at *A*; rotate *S* to the horizon from *L* and *R* to locate the measuring points *X* and *Y*. At the 30-60° rotation it happens that the vanishing points, the measuring points, and the vertical at *A* can be located without construction of a right angle, by simple division of the hypotenuse (*LR*).

We know that the short side of a 30-60° triangle equals half the hypotenuse; thus *LR* equals *2LS*, and since *LS* equals *LY*, then point *Y* is the midpoint of *LR*.

In the 30-60° triangle *LAS*, *LS* equals *2LA*, and since *LS* equals *LY*, *LY* equals *2LA*. If *LR* equals 2, *AR* equals 1½.

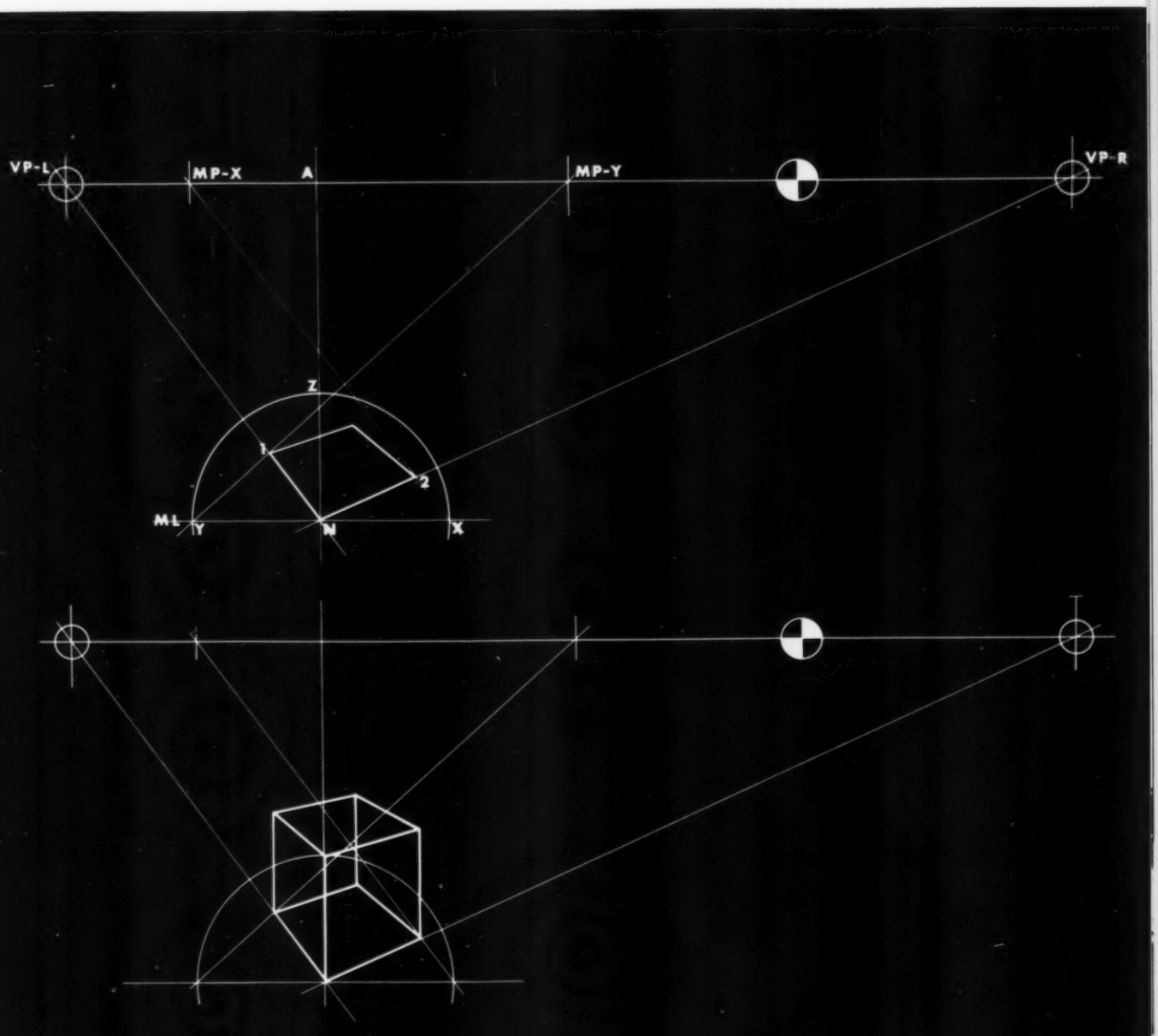
We also know that the sum of the squares of the two sides of a right triangle equals the square of the hypotenuse; thus LS^2 plus RS^2 equals LR^2; and if *LR* equals 2, then *LS* equals 1; so that 1 plus RS^2 equals 4 and *RS* equals 1.732, and since *RS* equals *RX*, *RX* equals 1.732. For practical purposes, 1.732 becomes 1.750. Thus, if *LR* equals 2, *RX* equals 1¾.

In short, we can find *LY* by bisecting *LR*, *LA* by bisecting *LY*, and *LX* by bisecting *LA*.

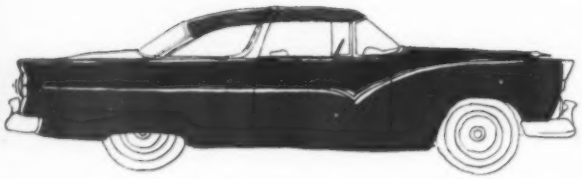
Construction of a 30-60° view of the cube

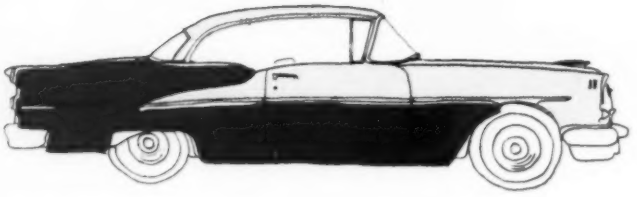
1. Draw a horizon and establish two vanishing points *VP-L* and *VP-R*.
2. Bisect the distance between the vanishing points to locate measuring point *MP-Y*.
3. Bisect the distance between *MP-Y* and *VP-L* to locate *A*.
4. Bisect the distance between *A* and *VP-L* to locate measuring point *MP-X*.
5. Draw a vertical at *A* perpendicular to the horizon and place nearest angle *N* at the desired distance above or below eye level, (limiting its angle less than 90°).
6. Draw a horizontal measuring line (*ML*) through *N*.
7. Lay off the height of the cube from *N* to *Z* and rotate *Z* to the measuring line, locating *X* and *Y*.
8. Draw perspective lines to *N* to construct the nearest angle.
9. Draw line from *MP-Y* to *Y* and note its intersection with the perspective line at 1. Repeat for *MP-Z* and *Z*, locating 2.
10. Draw perspective lines to the intersections at 1 and 2 to complete the horizontal square.
11. Erect verticals at all corners of the square.
12. Draw perspective lines to *Z*; complete the cube.

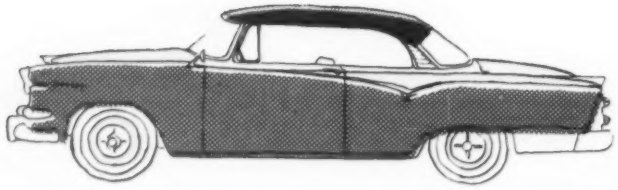
This cube is absolutely accurate and may be checked by any other system. It supplements the 45° oblique view, keeping error within the 25% limit when any cube is drawn between the vanishing points. The error exceeds 25% in the 30-60° cube after it crosses the center or reaches the vanishing points. When the latter happens, there is 100% error, so a vanishing point can never be included in a 2-point perspective. This will be covered in the next chapter.

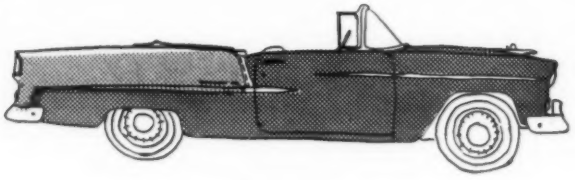

VP-L
MP-X
A
MP-Y
VP-R
Z
1
2
ML
Y
N
X

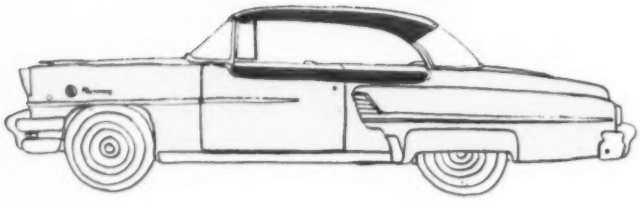
GUIDE FOR CARWATCHERS:











Cars '55

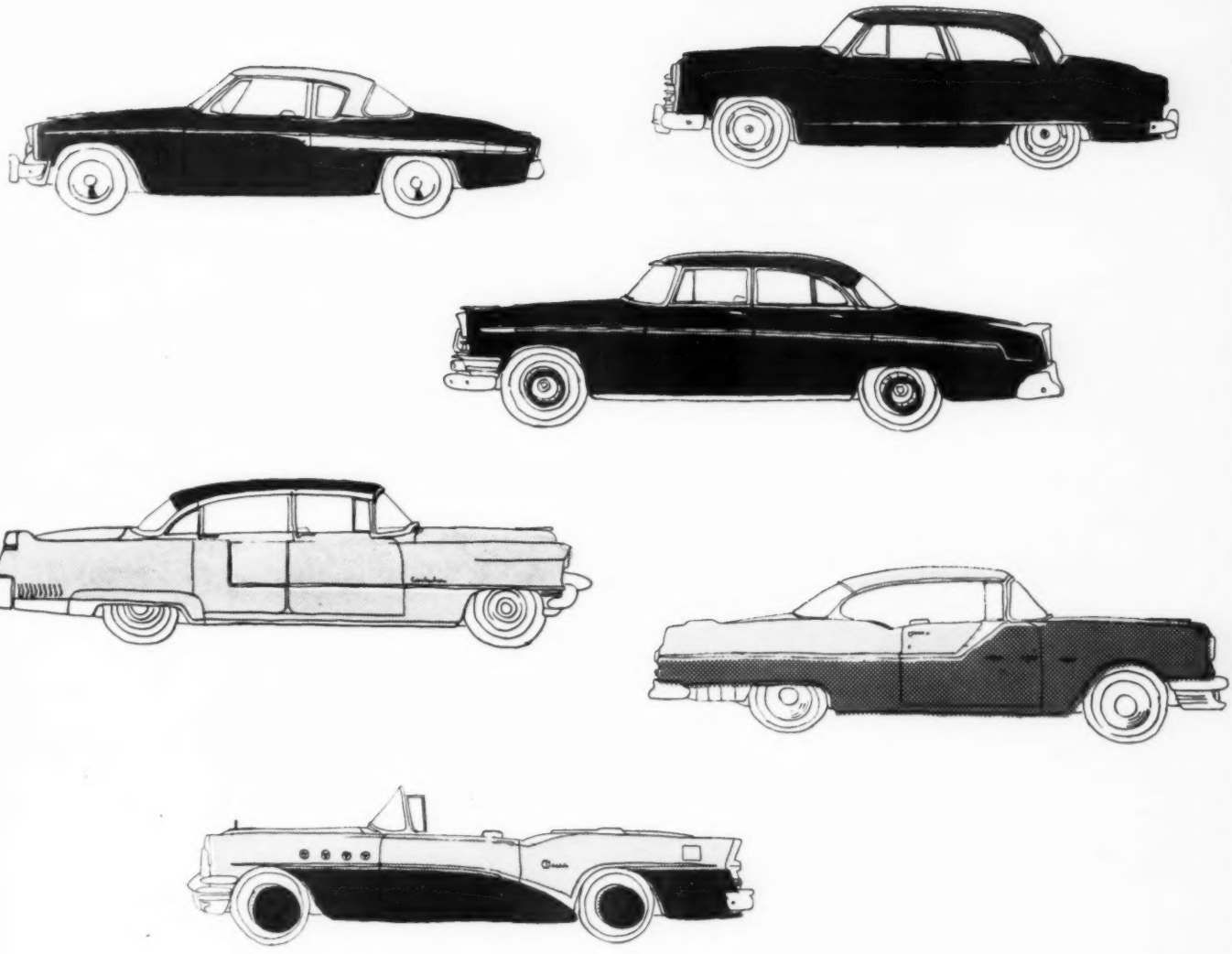
For carwatchers, 1955 is the year of brilliant plumage. Never has it been so easy to identify a make or model, and never has it been so hard to see the basic substance of a car.

In defense of this riot of color one can say that the '55 automobiles look very much like what they really are—not necessities of life but expensive toys. But one can also say that the playful decorations have not been applied well. The easiest proof is the fact that the '55 models *look* as outlandish as any of the postwar cars, yet in truth they are the opposite. Beneath the warpaint is the best collection of interesting and distinct body shapes to be seen in years.

Oddly enough, the paint is partly responsible for the improvement in body design. The worst postwar cars used bulbous curving planes of sheet metal to create an impression of speed; this year the more exaggerated effects of motion are described with paint —a far more fitting medium for such impressionism. The metal bodies are built around basic structural problems—where to begin, where to end, where to seat passengers, how to treat the wheels. Most have smooth sides, with barely a dent to recall the clumsy modeling of a few years ago; yet they are not silhouettes lifted straight from the drafting board, as American cars so often have been. The best of them are sculptured in the round: though the details are often bad, the bodies tend to hold together from any viewing angle.

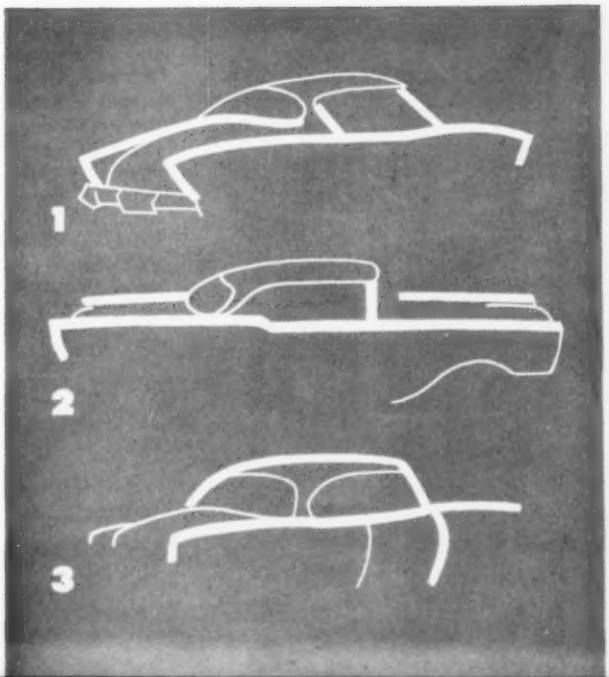
The first of the new basic body shapes was the rakish Studebaker (1). It is a stylish, Italianate combination of slow compound curves and sharply contrasting angles; the bowing of the body at the sides, its high curve under the back window, and the sharpness of the fenders are all of a piece, and effective. The disturbing elements are the parallel acute angles of the front and rear posts, which imply a similar acuteness in the position of the driver.

The second distinct shape was introduced by General Motors last year, and is seen at its best in the



Buick—a slab riding on waves (2). The boxy body is delineated by square slab fenders. The straight front post—regardless of its functional value, it is essential to the style—reiterates the squareness of the car and establishes its forward center of gravity. All other lines are waves embracing the box: the slab dips at the rear door, the rear post is a drape, and the chrome and wheel openings repeat the sensuous undulations. By comparison, the newest body shape is classic. It is found in the new Chrysler cars, which are built like coaches—a strong structure of curved ribs sheathed in a tight metal skin (3). The moderate curve of the fenders, the slope of the sides and the posts are balanced and easy to comprehend.

Studebaker's angularity has been an important influence, but it hasn't been notably successful in countering the big-car look. It seems probable that the big battle in '55 will be waged between the latter of these three distinct forms—GM's exaggerated, pioneering impressionism, whose appeal is proved, and Chrysler's new version of a classic approach.—*d.a.*



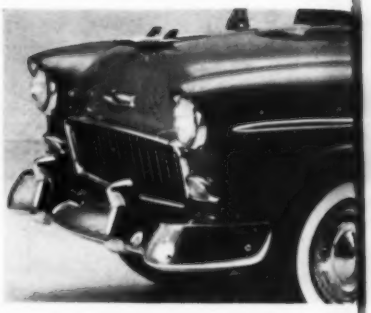
1

Fronts

There is little doubt that Detroit would like to make sports cars if they could. Each year the new cars are longer and lower, but aside from this annual taffy pull and a few wire wheels, the sports car look this year boils down mainly to the front end: 1) Grilles are lighter, and for the first time in years distinguished from the bumper; 2) Headlights have sharply canted profiles —one of the few discernible debts to the sporty Studebaker.

The most Americanized version of the light grille was developed by Packard (1) whose glittering side-swept grille manages to look a good deal like costume jewelry. Most GM cars try to combine a clearly outlined grille with a heavy American bumper, which isn't easy. Chevrolet's grille (2), tacked on its snub nose without reference to the bumper, looks like an afterthought. Buick (4), with a new expanded metal pattern on the grille, uses it like Cadillac (3) as a separate but essential element of the design. The Oldsmobile (5), like this year's new Pontiac, has stuck with the old formula — grille and bumper are an indistinguishable mass; only the lower lip is slightly thickened. Ford (6) has tried to fuse a light grille with the bumper; its lack of success is largely due to the insecure joining of the chromework to the painted side body: at the bottom the chromework seems to be a supporting member, while at the top headlight, the body shell is dominant. Lincoln (7), like Packard, has Americanized the light grille in a version which is not just glitter but a rich interpretation of the body's horizontal lines. Plymouth and Dodge (8, 9) continue to make the air scoop an incident in the design of the bumper. The results (reminiscent of past Studebaker designs) are generally good, though Plymouth has Ford's trouble in deciding whether the grille or the body came first. Meanwhile Studebaker (10), which pioneered with the sports-car look, has suddenly retrogressed with the discovery that the easiest way to make an existing car longer is to extend the bumper. Unfortunately, the new bumper adds little beside length.

3



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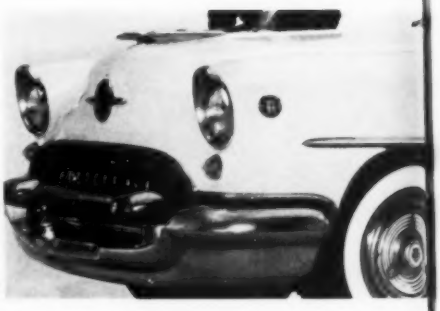

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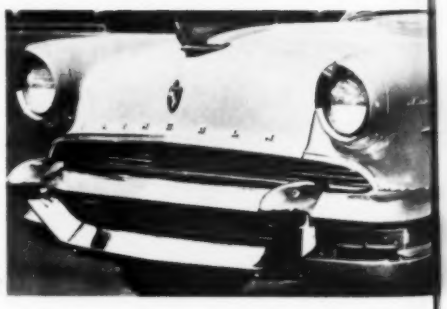

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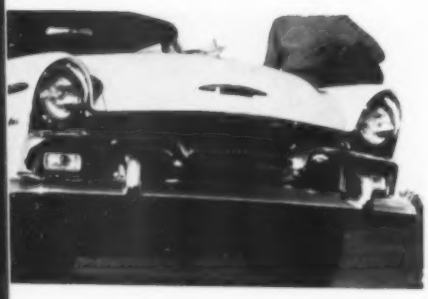

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Rears

The sharply canted profile which appears at the front of so many of this year's cars is even more pronounced at the rear. It is one answer to the problem which haunts car designers — how to end the car. This is not a problem to dismiss lightly, for the modern car is designed to look as though it were exploding into space. The visual center of gravity is no longer at the center of the car, but at the engine, which means that everything behind the front post must appear to trail off into space. The old streamlined rumps were a fairly literal translation of aerodynamics; today's cars do not try to withstand the effects of speed; they disintegrate, and the cant is a definitive expression of disintegration. Another literal sign of speed, like streamlining, is the jet exhaust, found on a number of cars this year. A third one is an older one — the raised wings.

Cadillac outlined its '55 rear profile in a sports car of '54 (1) — raised wings, jet exhaust, and a spray of little chrome shock lines. The idea of a totally bumperless rear was rejected, but this year's production model (2) represses it in favor of an impression of speed. The Cadillac Eldorado (3) takes the advice of another '54 sports car in wings which are not only raised but canted.

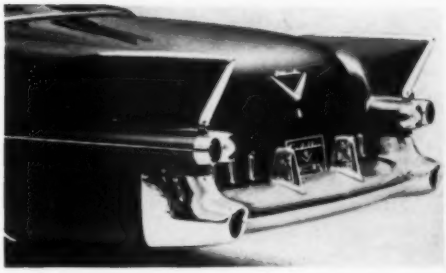
Plymouth and Lincoln (4, 7) have both given the cant a soft enough line so that it doesn't look absurd on a parked car. (Cadillac, like the Mobilgas horse, refuses to admit that it's sometimes immobile.)

Buick's rear (5) a two-pointed cant combined with a jet exhaust, strikes a false note in the over-all design because it is the one symmetrical line in an unsymmetrical car. Ford's Thunderbird (6) and the wasp-tailed Packard (8) show a similar fondness for the aircraft motif in their sculptural tightly sheathed rears.

The Chevrolet (9) seems least convinced about the value of the cant as a way of terminating the horizontal line of the car. Instead, it uses a jagged and indefinite profile; it is an admission that the car does not end abruptly at any point, yet a device which is sharp enough to be satisfactory.


1


2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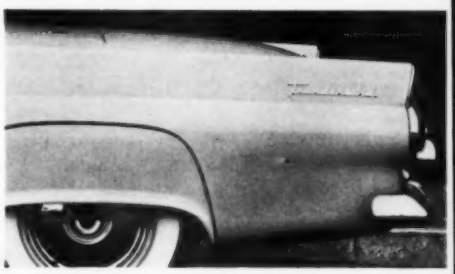
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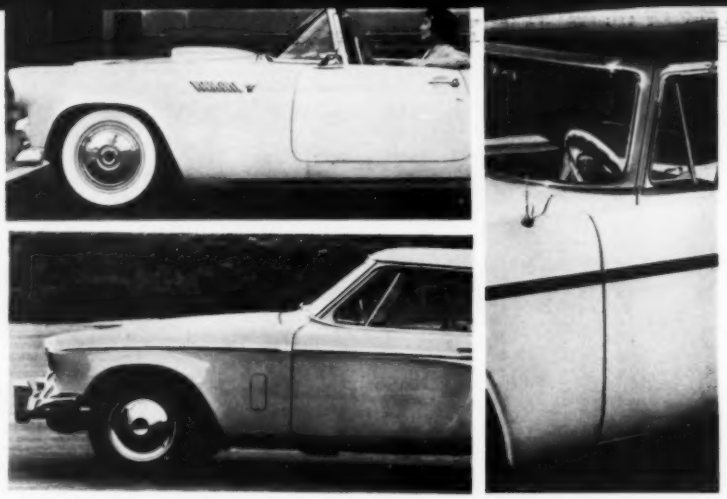
9

Posts

According to the car makers, the wrap-around windshield was developed to remove the corner post from the line of vision; its inevitable result was a larger, curvier area of glass which was not inherently a boon to vision. As the relative position of lady and steering wheel in Ford's Thunderbird shows (1), the problem is not to get the post around to the side of the car but to get it to the side of the driver; slant per se merely results in dust, glare, distortion and unnecessary distance between the driver and the windshield.

A post sloped in the opposite direction—a feature of last year's Studebaker (2)—is not better; the horizontal section of a sloped post is obviously larger than that of an upright post. The most practical, if not the most dramatic solution to the visibility problem is a moderately slanted windshield with a post as far back toward the driver as the structure of the car will allow. The company that has it is Chrysler. Plymouth's post, nearly straight and leaning slightly toward the roof, looks and is structural (3).

But when the driver gets into the car, something else begins to operate. In the Buick (5) she is couched at just the right point among flattering curves, and her distance from the windshield gives her an air of command that may do more for her driving than a clear view of the road. By contrast, the sensible Plymouth (4) does little to flatter the driver. As elements in the design, the posts can considerably alter the whole effect of a car. In the Chevrolet (6) the four posts on each side are clearly built to be load-bearing, but the chrome tells another story—a picture window at the front, a graceful sweep toward the



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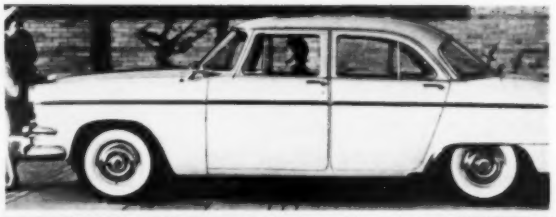

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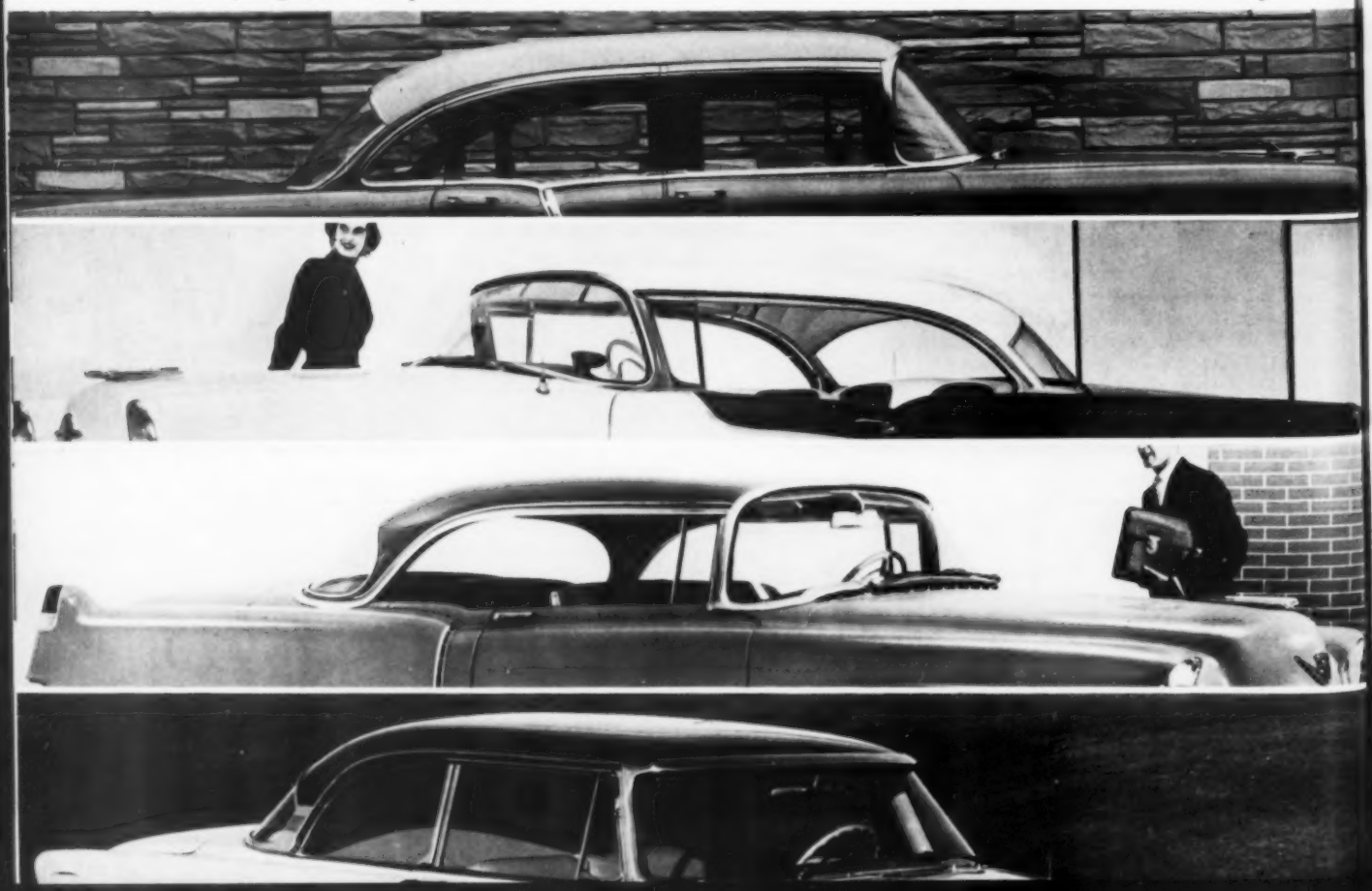


10 | 11
12 | 13

back, and no side posts at all. This disregard for structure is more honestly stated in the Oldsmobile (7), where the posts are bent to the designer's whim, and in the Cadillac (8), whose chrome window frames are draped over the body as if to prove that gravity is beneath consideration. The Plymouth (9), with its clearly outlined structure, reveals the flippancy of GM's attitude: at GM, a post isn't a post, it is a design on your emotions, and if it defies purist logic, it nonetheless succeeds in its real aim, which is purely psychological.

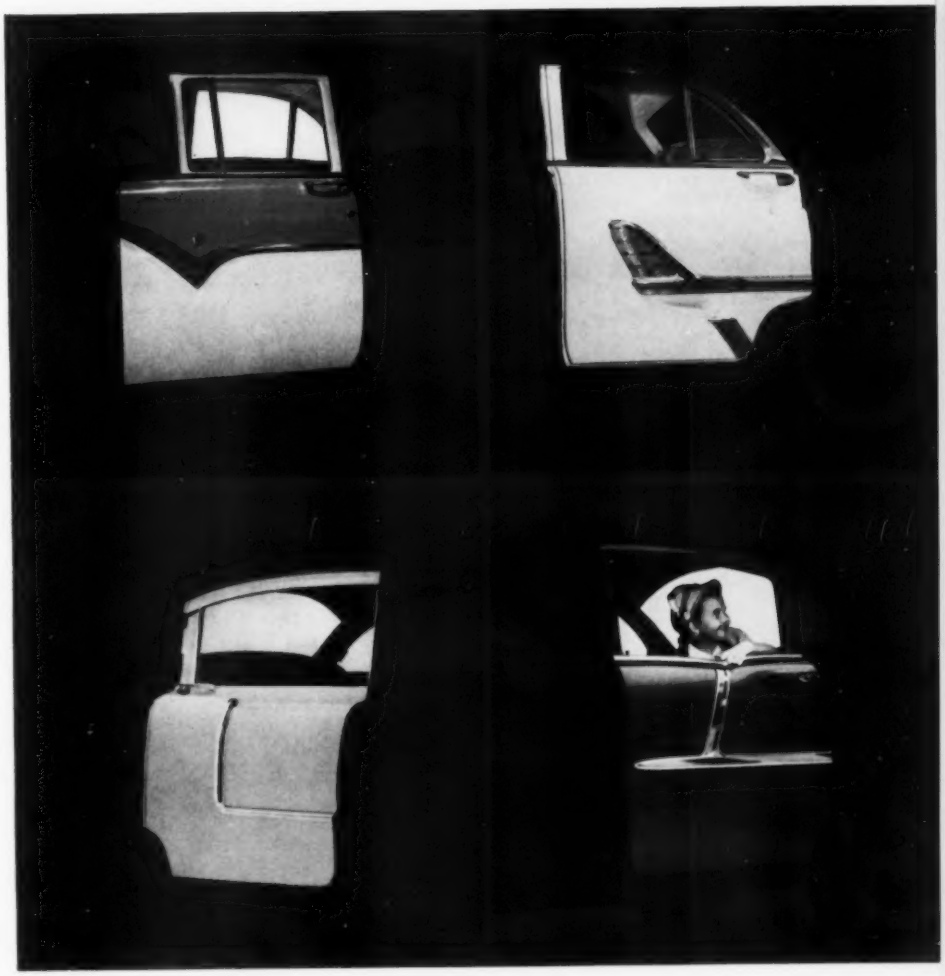
Ornament

As easily as a post can sum up the whole car, ornament can destroy a good body line. This year's frantic attempt at originality through ornamental lines may step up sales, but it is likely to blind a lot of customers to the quality of the design underneath. The trouble is not that the two-tone patterns and sweeps of chrome are purely ornamental, but that they are anti-structural, and in some cases destructive of other calculated effects. Mercury's assortment of bulges, spears and saddles (10) suggests that the bare body must be pretty disappointing. The arbitrary whiplash in the Buick Century's rear fender (11) is the final straw that makes one wonder what sense there is in any of these curves. Chrysler's roof (12), which is structurally conceived, is rudely contradicted in the body trim, which implies that the rear post is resting in mid-air. And Oldsmobile's skewed lines (13) apparently have no rhyme or reason.

Sometimes ornament is downright uncomfortable: the chrome dip on the door of the Ford (14), far forward of the center of thrust, breaks the motion at just the point it should be starting, and gives the sensation that the car is cracking just behind the front axle.

Doors

Doors, in fact, frequently accentuate the absurdities of chrome decoration by the way they are pitted against it. Since they are little more than practical aids to the enjoyment of a moving vehicle, doors should not demand undue attention. Still, it is hard for some people not to notice that what they are opening is not an element in the design, but a rather arbitrary cut-out left when the more urgent demands of style and function have been accommodated.



14 | 15
16 | 17

Cars '55

The editors feel that the three cars on this page are good cars. They are not great cars, but if we have succeeded in reading the minds of the designers, each one achieves a calculated effect and does it with consistency.

PLYMOUTH is not a pretentious car, but it has more elegance than any other small car. Although it has a clear sense of direction, it is designed to be appreciated as a self-contained piece of goods, without motion, without people. The center of the design is at the straight center post, and all other lines slope toward this center. Doors, windows, wheels, posts, are all taken into account, and there are no monstrous structural concessions to dramatic effect. Direction is implied with the familiar devices — higher wheel openings at the front than the rear, the sharp line of the front post, the curved line of the rear post, an emphatic line at the front fender, a slightly raised rear fender, a jagged line at the tail. By design school logic, the Plymouth is the best design of the three.

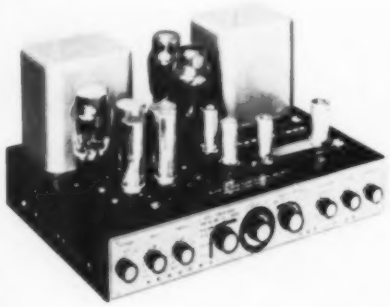
LINCOLN is one of the few cars that still uses sculptured metal as an ornamental indication of speed and direction. This application of clay-modeling techniques to sheet metal raises a problem that is rarely understood: it implies that the body is not merely a cover but something solid and substantial. Lincoln has found the answer — the thin edge of the metal must never show. Thus the back fender is curved way under the car; the front fender ends in a sturdy welt; at the rear, taillight and bumper are part of the sculpture rather than separate ornaments. Since even the glass areas are substantial, the flap at the back corner of the roof is not structural flippancy but a surface detail. Though the effect is rich, the over-all lines are simple.

BUICK, though it is a year old, is the most revolutionary car on this spread. It is logical, but only by its own standards. It was not designed to sit on the ground or even roll on the ground; it is perpetually floating on currents that are conveniently built into the design. This attempt to achieve buoyancy with masses of metal is bound to have the same awkward effect as the solid wooden clouds of a Baroque baldachino; unless you like to wince a purist's wince at every Buick or baldachino, the best recourse is to accept the romantic notion that materials have no more weight than the designer chooses to give them. (Admittedly, this is hard when you witness the effect of a bump in the road on the Buick's heavy rear cantilever, which pretends to be diaphanous.) The Buick's designers put the greatest weight over the front wheels, where the engine is, which is natural enough. The heavy bumper helps to pull the weight forward; the dip in the body and the chrome spear express how the thrust of the front wheels is dissipated in turbulence toward the rear. Just behind the strong shoulder of the car, a sturdy post lifts up the roof, which trails off like a banner in the air. The driver sits in the dead calm at the center of all this motion; hers is a lush situation.

DESIGN REVIEW *Audio Fair . . . Hi Style for Hi Fi*

↑ **Fairchild's** quick change points up the hi fi industry's fast-growing interest in glamour. The original version of their preamplifier, a simple sleek cabinet with Lucite knobs, was recently dressed up with a medallion of darker paint (left), finally replaced by a new Loewy version with horizontal emphasis (right).

↑ **Interelectronics** Coronation Consolette pre-amplifier-equalizer has "optical quality" Lucite panel backed with satin gold, wide white pointers, emphatically spaced calligraphy.

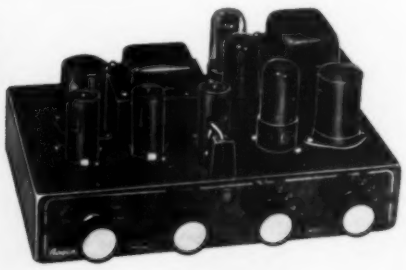


↑ **Newcomb** Classic 2500 amplifier has an anodized panel, an increasingly popular finish. Panel makes decorative use of official-looking lettering, and includes a "petite pilot light."

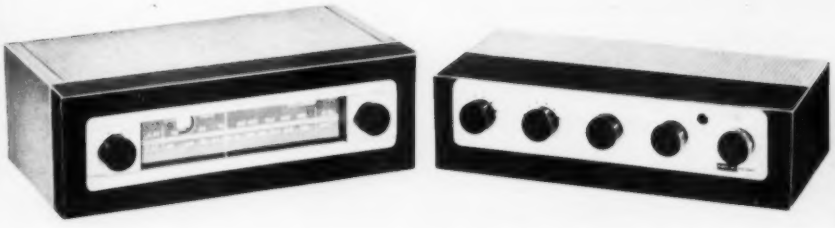
↑ **Sonex** ultra-linear pre-amplifier, designed by Raoul Ibarguen, uses simple plastic knobs and dotted line arcs for positioning. Lettering is on the back of the transparent plastic panel.

↑ **H. H. Scott** FM tuner has anodized knobs and panel, a Lucite sweep tuner that glows when power is turned on. The tuning meter is coupled with the signal strength indicator for tuning weak stations.

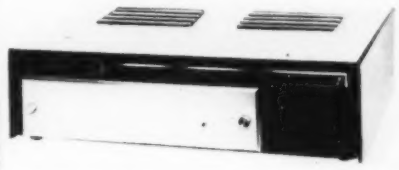
↓ **Bogen** DB amplifier comes in a self-contained gold and brown cage, or with a separate leatherette-covered front panel for built-in installations—presumably among handsomely bound books. Both are equipped with plastic knobs inset with anodized discs.



↑ **Altec Lansing** amplifier-loudspeaker has picture-frame enclosure in "rendered blond or mahogany." Metallic grille cloth and exposed tweeter are increasingly common. Anodized knobs, panel and tweeter.

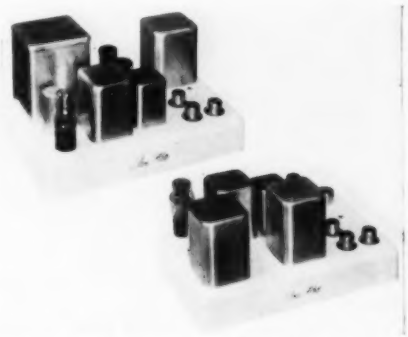


↑ **Harman-Kardon's** AM-FM tuner and its ultra-linear Williamson amplifier and pre-amplifier have black knobs and lettering on copper escutcheon, against the black front and brushed copper cage.

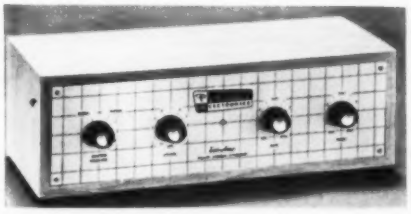


↑ **National** Horizon line has a crackle finish metal housing that projects beyond the black front panel, a Lucite nameplate. Carefully off-centered brushed chrome plate can be replaced with pre-amplifier unit.

↑ **Langevin** equalizer-pre-amplifier hangs in a chromed wire frame to sit on a table as a remote control unit. The case is black; the front panel is chrome with black knobs.



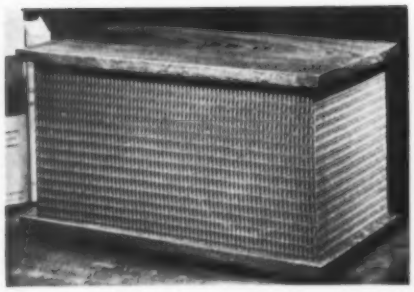
↑ **Stan White** Powrtron amplifiers have a one-piece white molded plastic base, for built-in installations only. Prominent signature is a design trend.



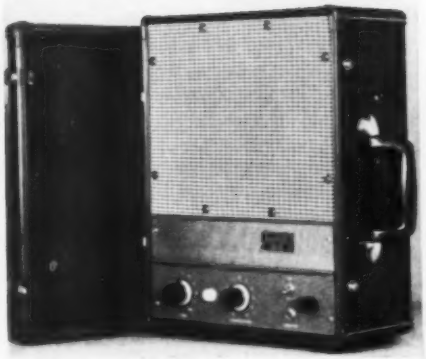
↑ **Pedersen** Triamp amplifier—pre-amplifier—control unit designed by Warren W. Fitzgerald is unusual for the over-all pattern on its anodized control panel. Cabinet is blond wood.

→ **Magnavox** changer and amplifier are parts of the company's "integrated design component system," all of which have speckled yellow composition cases with gold metal mesh. Like most we show, these were designed to be built-in or left as is.

↑ **Heath** amplifiers and tuners are kits to be assembled at home according to directions. This amplifier employs anodized knob discs and face panel; tuner has leatherette case.



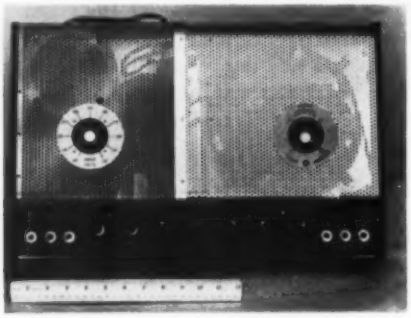
↑ **Lang** speaker uses a wrap-around grille cloth for the speaker housing and a natural wood finish for the top and bottom.



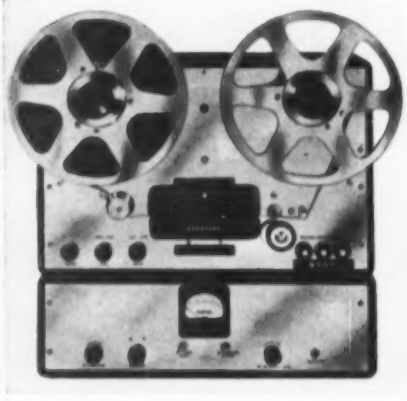
↑ **Ampex** amplifier-speaker weighs 25 pounds and its luggage case matches that of the portable tape recorder. Speaker is mounted in top half of case.

↑ **Columbia-Bell & Howell** 360K (for Kilosphere speakers) has a plywood case and a front grille with controls on a step so that the recorder can be operated with lid closed. Push button control of reels and thumb dials for volume and tone control simplify and speed up operation. Two pulse lights indicate normal recording level and peaks.

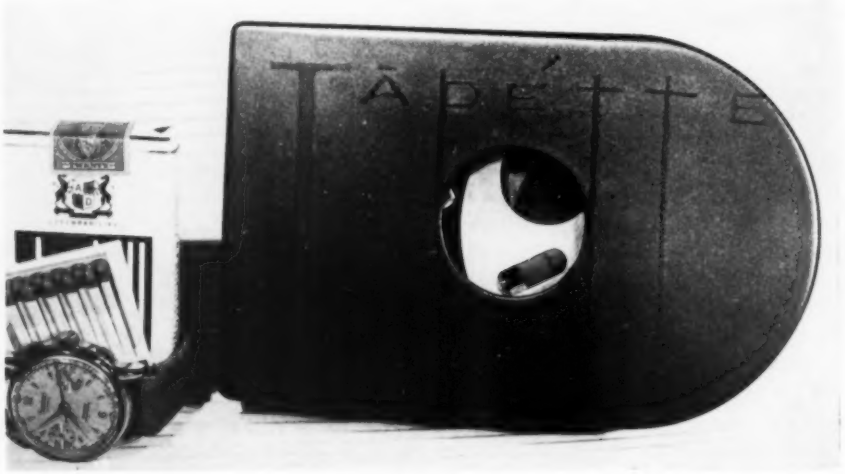
↑ **Magnemite** flyweight tape recorder weighs 8 pounds, and is battery operated. Aluminum case with plastic handles and switches.



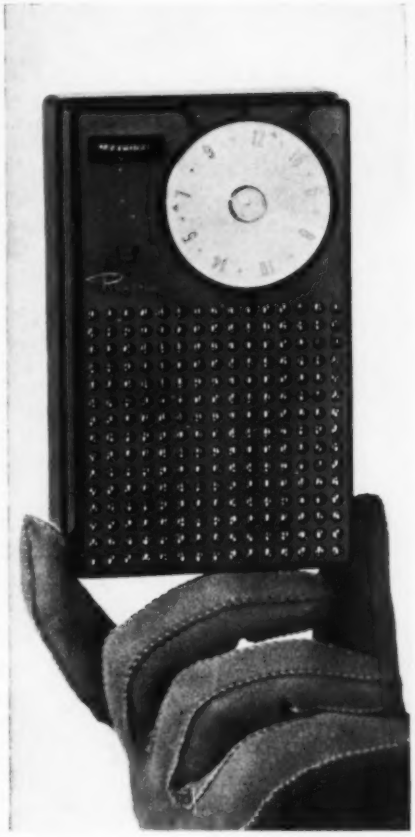
↑ **Warren** "MTEL" recorder, recently declassified, has 40 tracks, on a single loop of 35mm. magnetic sound tape, which can be selected by push-buttons, and will record for 8 hours. Aluminum mesh cage and frame. Weight, 30 lbs.



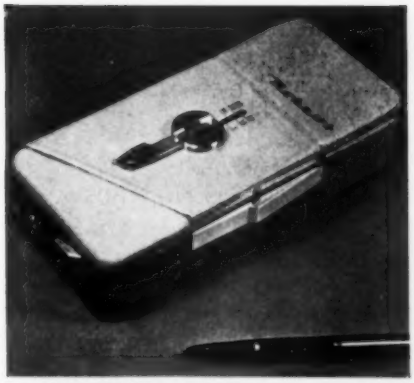
↑ **Pentron** Dynacord's push-button reel control system and a separate amplifier system are contained in plastic-covered plywood carrying cases.



↑ **Broadcast Equipment Specialties Corporation's** "Tapette" spy-sized tape recorder is battery operated, and uses tapes that fit standard recorders. A lapel microphone, or a microphone in a watch can be used. Thumb controls permit furtive operation.



↑ **Regency** transistor radio has a molded polystyrene plastic case, a brushed brass control knob, and gold metallic grille cloth. Designed by Painter, Teague and Petertil.



↑ **Mohawk** Midgetape has a spotwelded sheet aluminum case and operates on hearing aid batteries with a life of 45 hours. External power amplifier has a 2" speaker, with anodized aluminum cover on a drawn steel case. Light grey wrinkle finish with silkscreen red lettering on both. Designed by Fred Bohm.

↑ **Sonic** Capri has a plastic fabric finish on a plywood frame, a marbleized plastic motorboard. White plastic knobs and gold anodized metal parts. Measures 9¼" x 12¼" x 4".

↑ **Raytheon** "8-transistor" portable radio uses 4 standard flashlight batteries for 500 hours of play. Leather covered hardwood case with gold aluminum mesh grille.

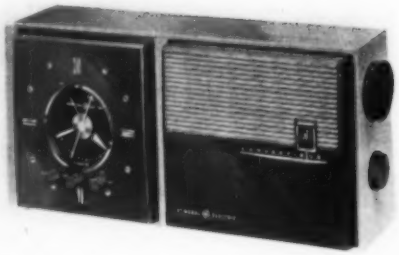
↑ **Rimenco** portable works on battery or ac/dc. Earphone plugs in to cut out loudspeaker when battery operated: reversing plug permits use of both earphone and speaker. Slightly smaller all-battery model measures 5" x 8" x 2".

↑ **RCA Victor** Slide-O-Matic record player has a slot into which records are slipped. Plays automatically when anodized gold "Play Bar" is raised. Molded plastic case.

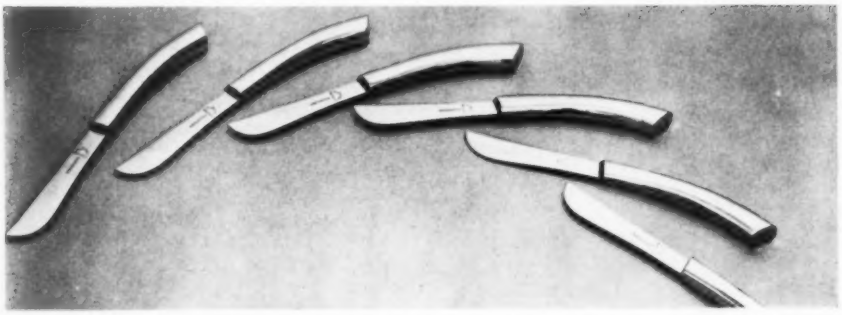
↑ **Motorola** portable record player comes in green and white leatherette case, employs two speakers. Designed under the direction of Herbert Zeller.

↑ **Carradan Associates** of Chicago have designed a bubble lamp made of Krene that blows up like a beach ball, and can be raised or lowered by pulling on its own lampcord. Translucent bubble is about 20" across, 10" deep. $14.95.

↑ **Hall-Mack Company** of Los Angeles had Hunt Lewis redesign their chrome-plated fixtures made of brass forgings and stampings.



↑ **GE's** clock-radio consists of a battery-run portable which can be plugged into an electric clock by prongs recessed into the radio's plastic case. Recessed handle. Red with white panels, grey with black panels. Weight, 4 pounds. $49.95.

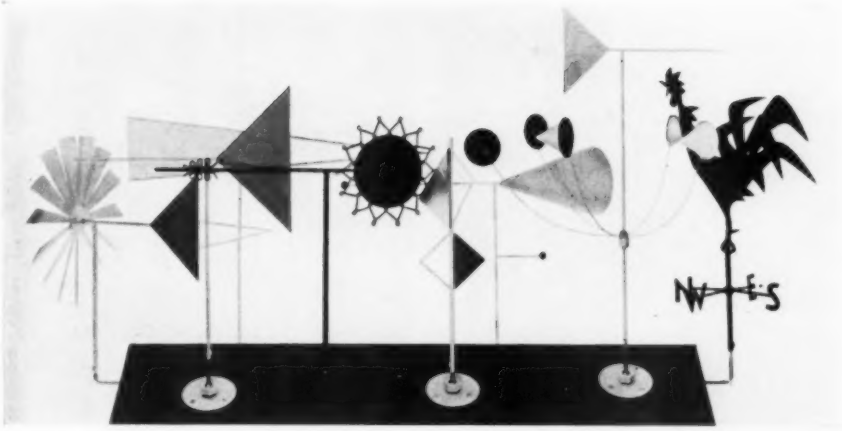


↑ **Raymor** imports German stainless steel steak knives with aluminum handles; designed by Sam Bordelon. Set of 6, $19.95.

↑ **Lakeside Manufacturing** of Milwaukee offers "Servit-Hot" warming tray designed by Waltman Associates. Satin finish stainless steel top. 15½" x 24", with raised edge, ebony handles, plastic feet. $24.95.

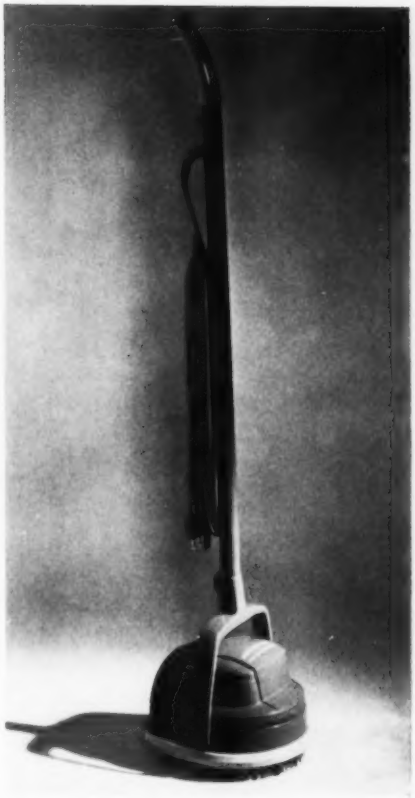
↑ **Enterprise Manufacturing** of Philadelphia presents a belt-driven knife and scissors sharpener, which can change from one gut to another in 30 seconds for different jobs. White and grey compression-molded housing by Harold Van Doren. $14.95.

← **Heller** Hostess-Ware presents a set of oval chromium-plated steel canisters with anodized aluminum covers, designed by Belle Kogan Associates. Small cans nest, while rings on cans and covers make for easier handling. $10.00.



↑ **Howard Miller Clock Company** produces weather vanes as gay as spring breezes, designed by George Nelson and Associates. Ball and socket mountings keep a variety of indicator shapes aloft, and metal surfaces are spray-painted in matt finish black, white, red, orange, and yellow. $4.50 to $17.50.

← Fanciful birdhouses, of weather-resistant thermoplastic, are productions of the same firm. They are made of two sections held together by a snap-on band so they can be cleaned easily. The houses are suspended with a plastic-coated cord, and come in a variety of colors. $5 to $20.

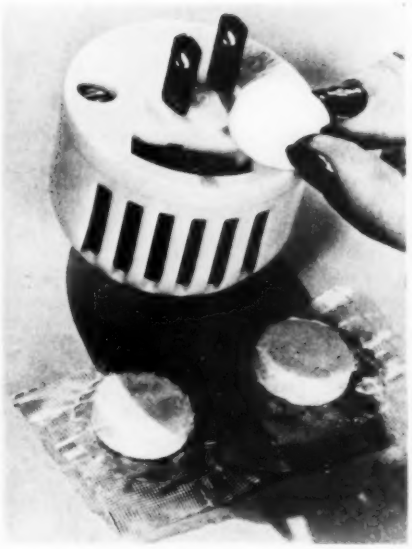


↑ **Johnson** polisher-scrubber, designed by William C. Harris, has a top housing of shock-proof butyrate and a bottom housing of aluminum, with a vinyl plastic bumper. Carefully balanced, it weighs only 11⅛ pounds. $69.50.

↓ **H. E. Lauffer Company** is bringing out its classic Arzberg china with black bodies, white handles and spout in a semi-gloss finish. Designed by Hermann Gretsch, the pieces can be mixed. Cup and saucer, $4.50.

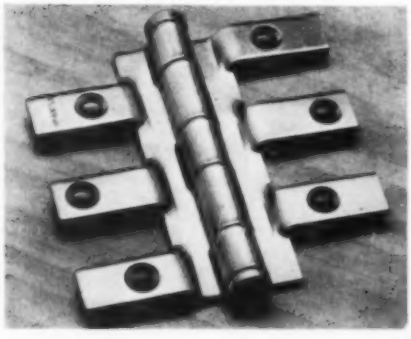
↑ **Revere** presents a 14-cup stainless steel percolator, deepdrawn and buffed. Swing and lock handle and pot-type handgrip facilitate pouring. Designed by W. A. Welden. $19.95.

↑ **Ebco Manufacturing** has a water cooler that also contains a brass hot water tank insulated with ground cork and mineral wool, and a heavy coat of hot hydrolene. Thermostat-controlled.



↑ **Odor-Ban** uses an extruded plastic resistor in a plastic shell and base, which is plugged into a socket. Enough heat is generated to vaporize an odor-eliminating chemical. Designed by Costello-Mausure, Inc. $1.69.

↑ **Minneapolis-Honeywell** presents a home fire alarm system designed by Henry Dreyfuss. It employs up to 30 button-like fused-link detection elements that ring a bell and turn on a control panel zone light when air temperatures reach 140°. Panel has a gold finish and measures 5⅝" by 8". $55.



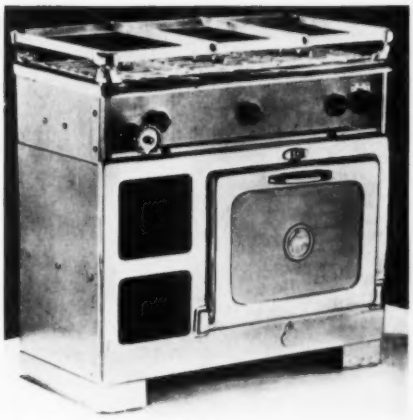
↑ **McKinney Manufacturing** of Pittsburgh has a non-mortise hinge of heavy gauge wrought steel, with leaves that telescope into a single ⅛" thickness when closed. Hinge can be used on doors up to 1⅜" thick. Finishes: bonderized prime coat, nickel plate or dull brass.

↑ **Raytheon** "Micronaire" room air cleaner is an electrostatic precipitator with cell and ionizer assemblies that can be removed as a unit for washing. Weighing 60 pounds, it is 15" square, 30" high. Designed by Leonard Emerson. $229.

→ **American Homecraft Company** of Chicago produces a car wind silencer that cuts down wind roar by directing turbulent air through holes in a stainless steel cylinder fastened to the door frame. $2.98 a pair.

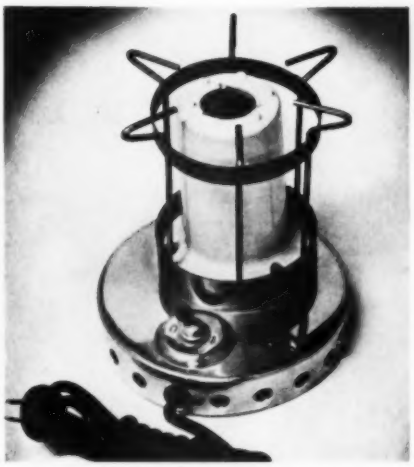
↑ **Kirschner Manufacturing** of Seattle produces the Edmonds Plastic Dog Cage. It is molded in one piece, of fiber glass reinforced with polyester. Barred gate is aluminum. Sizes to 3′ x 4′.

↑ **Hasty-Bake Manufacturing** of Tulsa has a portable grill of spot welded sheet steel designed by Allen and Hastings. Hinged hood permits it to be used as a roaster and heater. Weighs 25 pounds. $24.95.

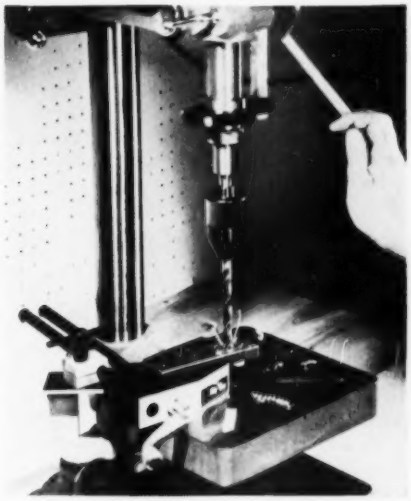


↑ **Marine Manufacturing** is producing a ship's galley stove of corrosion-resistant 26 gauge stainless steel "Rigid-Tex" with a textured satin finish to hide scratches.

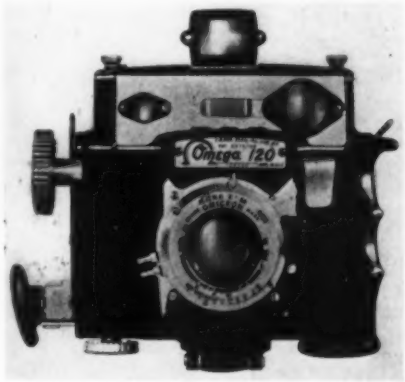
↑ **Ansul's** newest fire extinguisher designed by Raymond Loewy Associates weighs 22 pounds, and expels 10 pounds of dry chemicals. Bonderized drawn steel shell with red baked enamel finish, cadmium-plated brass hose couplings. $52.50.

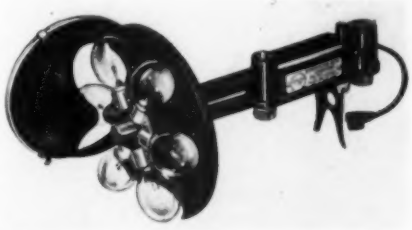


↑ **Modern Laboratory** Equipment Company is distributing the "Horo Electro-Bunsen-Burner," which can reach 850° when necessary. The heating element is housed in a porcelain chimney whose spiral interior acts as a radiator for the stream of hot air. Height, 7″, base diameter, 6″.



↑ **American Machine and Foundry** has modeled its "Mity 7" vise for home workshops after its industrial float-lock safety vises. Stainless steel throughout, with a 9″ opening when used as a "C" clamp, it can be used as a drill press, bench, or bandsaw vise. $9.98.



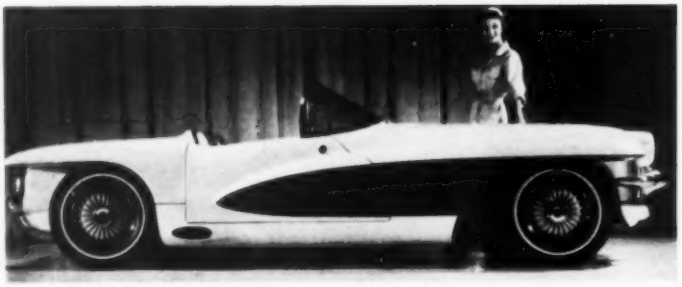


↑ **Simmon Brothers Inc.** have designed their "Omega 120" with large control knobs, a side pistol grip, an extra large range finder and a repeater flashbulb swivel mount in a die-cast magnesium body. Total weight is under 22 lbs. $258.50.

DESIGN REVIEW: *Dream cars play on established conventions, and create a few new ones.*

If "experimental" cars are meant to chart future directions, then more refined detailing and more bizarre body shapes are in the offing. Carved niches for bared wheels, integrated grilles, and low lines continue the sports-car trend; high-curved windshields, new entrance gimmicks, and rounded forms are added to solve some of the problems of a 6-passenger sports car.

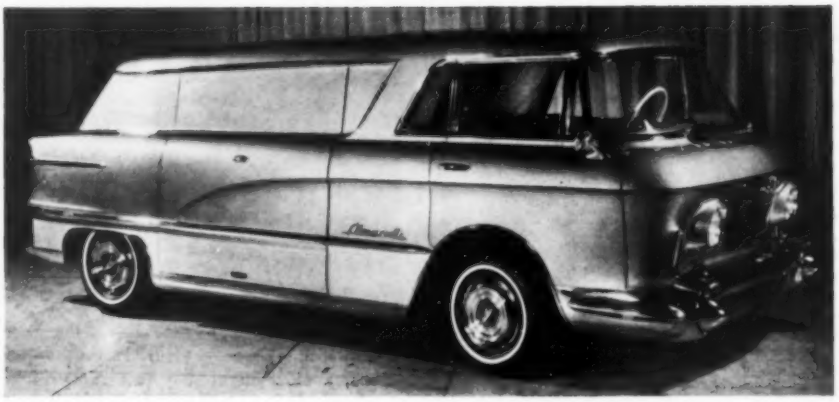
Buick Wildcat III has a sloping hood for increased forward vision, four bucket seats, a nipped-in-rear. "Bumper bombs" house parking and directional lights; zig-zag slash continues to be a trademark, and scooped-out wheel wells preserve the sculptured look. Racer-red paint, red leather upholstery. →

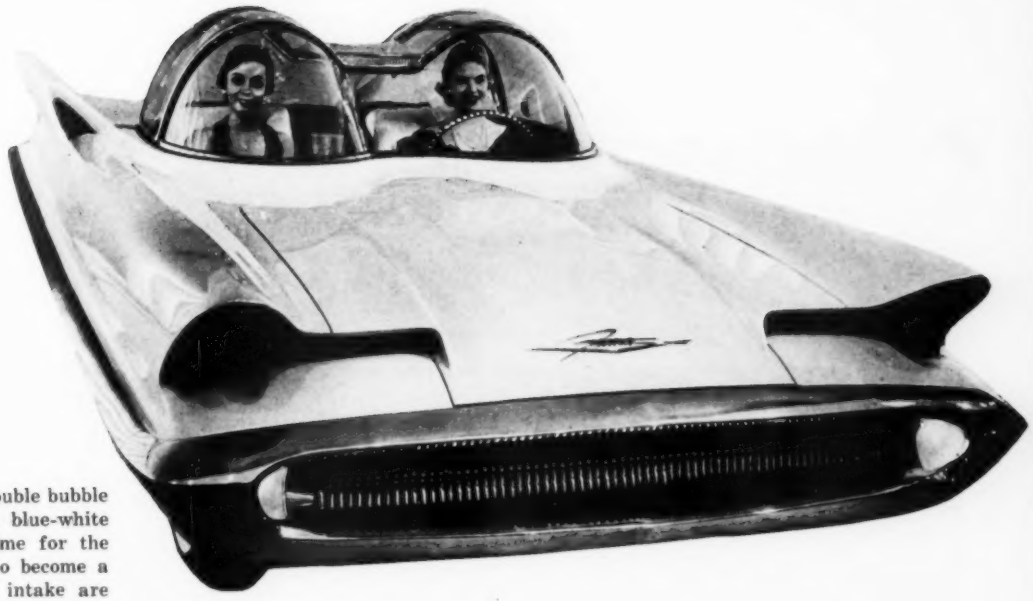


LaSalle II coupe has cast aluminum wheels with radiating spokes that dissipate heat from integral brake drums. Rear fender cuts straight back in a horizontal fin. Elliptical titanium ports are for exhaust gases. Like the LaSalle sedan opposite these are Harley Earl design specials. Pearlescent white with a deep-cut shark-tooth cove in blue. →

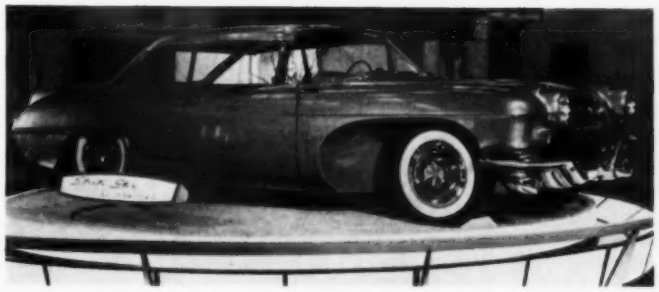
Oldsmobile 88 Delta has chrome ovals to combine headlights and brake-cooling air scoops, which extend into bulging bolster effect along the side of car. Horizontal rear bumper blade wraps around to the front fender. Dual exhaust stacks serve as rear bumper guards. Olds emblem is jeweled. →

GMC l'Universelle has front wheel drive. Motor is behind driver. Cab entrance over the wheels. Body is painted iridescent copper with chrome trim, with an extruded aluminum pane below the rub rail. Loading doors side and back; load floor height, 13". ↓

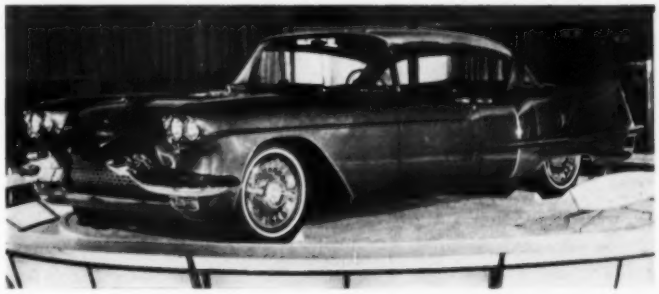




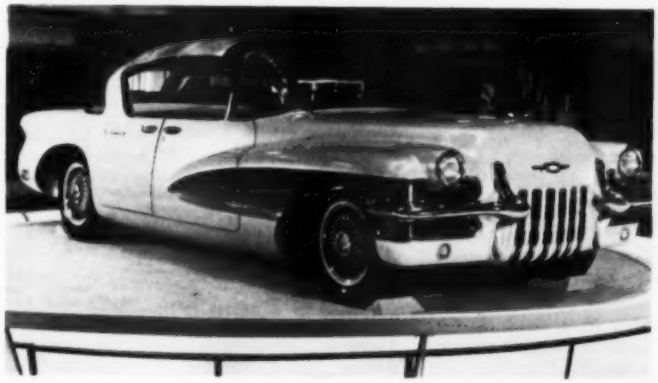
Lincoln-Mercury Futura has double bubble plastic domes above the low, blue-white pearlescent body. Bumper frame for the concave grille wraps around to become a rub rail. Headlights and air intake are housed in flaring nostrils; scooped-out rear fins stretch out side lines. Ghia Body Works in Turin fabricated the body from full-size plaster casts. ↑



Pontiac Strato-star in metallic silver with vermillion and brushed aluminum interior, has headlamp nacelles for heater and defroster, and "aircraft type" intake scoops to vent passenger area. Bumpers are "gull-wing" chromed sections. Hood and wing-type, scooped-out fenders are integral. →



Cadillac Eldorado Brougham has hooded headlights, shark-fin bumpers, duck-under grille, individual seats for four passengers. Front seats pivot for easy ingress. Metallic green with complementary interiors. →



LaSalle II sedan fuses floor, body sills, engine supports, and body shell into one integral structure, painted blue. Body sill also houses exhaust pipe and muffler. Six wrap-under chrome-edged slots form main front grille, augmented by outboard grilles that blend into wheel openings. Closed scoop for rear wheel. →

TECHNICS *a catalog of new products, materials, processes and finishes*

D. A. Cusano with the laboratory model of the phosphor cell he developed.

Phosphor cell

A young General Electric scientist, D. A. Cusano, has developed a way of directly amplifying light on a screen. He took an ordinary lantern slide projector and threw a photograph on a 4-inch phosphor screen, using ultraviolet light. The screen is coated with a zinc sulfide film, 10 microns thick. Current from a dry cell is passed through the screen, causing it to give off ten times more light than it receives from the lantern-slide projector. The phenomenon is being called electroluminescence, and the system can be used for all types of picture reproduction, including night-sight devices, photography, x-ray fluoroscopy and flat-screen television (see page 132, ID October.)

Lee de Forest's vacuum tube amplified radio waves in 1907, but twenty years passed before it was adopted by the public —in the form of radio. The phosphor cell amplifies light, and may be quickly adopted for on-the-wall TV, but its importance lies in the scientific development involved and not in its immediate application. Like the man who looked at a drop of water and was able to imagine the existence of the seas, there are some who may be able to imagine devices of the future made possible by the phosphor cell. Most of us must wait a decade or so to see what they will be.
General Electric Research Laboratory Schenectady, N. Y.

Flood lamp

A 200-watt all-glass sealed beam flood lamp with a two-pronged plug-in base for both indoor and outdoor floodlight applications, makes set-up of single and multi-source arrangements easy and simple. The lamp is built like an automobile headlight.
Lamp Division, General Electric Company Nela Park, Cleveland 12, *Ohio*

Flexible casting epoxy

An epoxy that provides exceptional impact strength has been developed for use with drop hammer punches, draw dies, pressure pads, and clamping cushions. Its compressive ability eliminates the need for skin clearance between the punch and die in many cases. A surface of ¼" to 2" thick is cast on a clean metal core. This combination is subsequently used as a metal forming punch, utilizing a rigid epoxy for the die. The degree of flexibility can be controlled. The material can be mixed cold and cast without pressure into simple molds, and is available in cans with enough extra space to allow for mixing of all ingredients. Additional Flexicizer is supplied when softer formulations are desired.
L—940 Flexible Epoxy; *Rezolin, Inc.*, 5736 *W. 96th St., Los Angeles* 45, *Cal.*

Pressure-sensitive tape

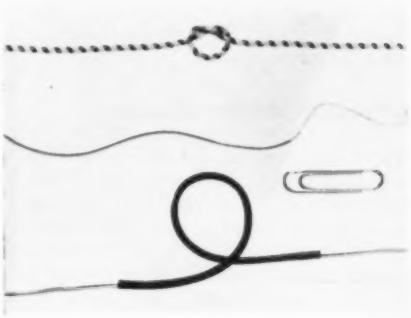
An insulating tape of Teflon coated with a silicone polymer has a useful temperature range of — 80°F. to 400°F. Can be used as a facing material on forming dies.
Tem-R-Tape T, *Conn. Hard Rubber Company, New Haven, Conn.*

Aluminum finishes

Easy plating and buffing of aluminum die castings direct from the mold is resulting from recent production and processing improvements. Castings no longer need to go through costly finishing operations before being chrome-plated, and designers can

now take advantage of the lightness and strength of cast aluminum. Mechanical, painted, and Alumilite finishes can now be applied to as-cast pieces as easily as finishes can be applied to other casting metals, such as zinc.
Aluminum Company of America
1501 *Alcoa Building, Pittsburgh* 16, *Pa.*

Non-rigid Teflon tubing



Thin wall Teflon tubing, so flexible it can be wrapped around its own diameter without cracking, comes in striped and solid colors for color coding uses. It can withstand temperatures from —90°C. to 260°C. The tubing has high resistance to acids and other corrosive materials, and absorbs no water. Available in 10′ lengths for wire sizes from No. 26 to No. 10.
Teflon tubing; *Hitemp Wires, Inc.*, 26 *Windsor Ave., Mineola, L. I., N. Y.*

Miniature lamp

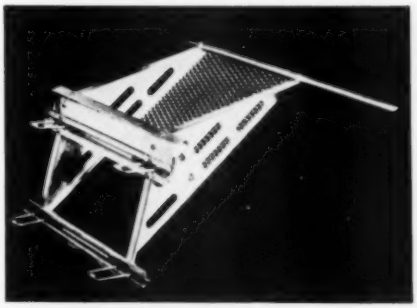
A lamp half as big as a stamp for use on waffle irons, toasters and appliances where on-off indicators are needed, has a life of 3,000 hours and can withstand temperatures twice as high as conventional miniatures can stand. Its terminals are two bare wire pins designed to plug into sockets that are the same size as those for miniature electronic components. It is 7/16″ in diameter, and 15/16″ long. The new lamp will withstand temperatures of 600°F., compared to 350°F. of conventional miniatures.
Lamp Division, General Electric Co.
Nela Park, Cleveland, Ohio

Saran

To make Saran even better, a new formulation improves light stability, offers better control of shrinkage, reduces static, and makes it easier to extrude. The base color is lighter to permit broader color ranges, including pastels, and the original qualities of Saran resin for monofilaments remain—toughness, easy cleaning, and resistance to stain and mildew.
Dow Chemical, Midland, Michigan

Aluminum ladder offset

A ladder offset with a long spreader that spans the average window, can speed up window installation, gutter repair, roofing, painting and glazing, by making it possible for a workman to be at eye level with his work without danger. The device can be fastened to an ordinary ladder in a couple of minutes. A mesh tray for holding tools and materials is built into the brace.
Ladder Products, Inc., 31 *Smith Place, Cambridge, Mass.*

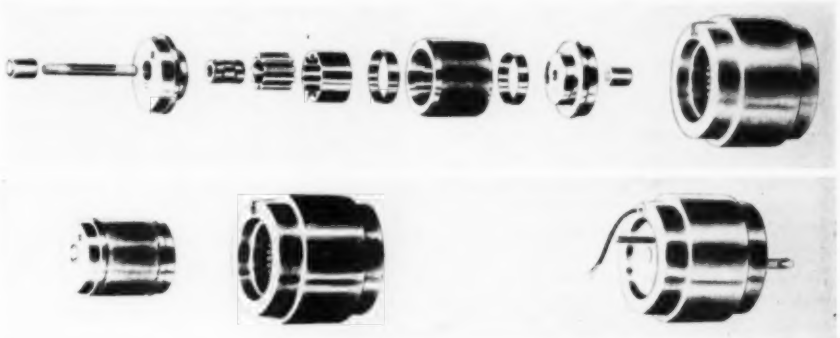


Nitrogen-filled sponge rubber

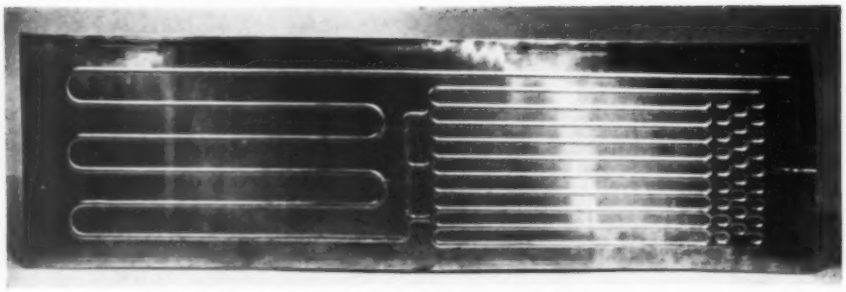
Millions of nitrogen-filled balloons are contained in a new closed-cell sponge rubber. Nitrogen for air prevents water absorption, so the material is useful for seals and gaskets. No skin coatings are needed for die-cut or molded parts because of the minute cell structure, and even cut edges are impervious to moisture. Extra softness, resilience, and insulation values are claimed for this cellular rubber, which is produced in a range of sizes, thicknesses and densities, and in soft, medium or fine grades.
ARco-CEL, *Automatic Rubber Co.*, 12550 *Beech Road, Detroit 28, Michigan.*

Epoxy impregnated compressor

By placing a compressor mechanism inside an electric motor, Wetmore Hodges has come up with a refrigeration motor-compressor that eliminates 58 per cent of dead weight, and replaces 110 parts with only 12. The compressor has only two moving parts. It has no valves, yet is a positive displacement compressor with a true compression stroke. The inventor is H. H. McAdam, who realized that the trick was to design a stator so that it could be a pressure vessel; for this, he impregnated the stator windings with epoxy resin, then mounted a gear-type compressor inside the stator bore. Two Hill Rotoid gears, one inside the other, maintain multiple tooth contact through a 220-degree rotational arc, forming several individual pressure chambers. The outer gear, in transmitting the work of compression to the inner gear, creates a force between tooth contacts during the entire work stroke. The impregnated stator is leak-tight up to 350 psi at temperatures between —20°F. and 250°F. The compressor can also be used as a submerged fuel pump for aircraft, a liquid pump in guided missiles, and as a submerged well pump.
Wetmore Hodges and Associates, Redwood City, California.



Compressor mechanism mounted inside stator in new compressor-motor, employs only two moving parts. Outer Hill Rotoid gear (sixth part from left in top photo) transmits work of compression to inner gear (fifth part from left) which revolves on its own true axis to form pressure chambers. Bottom photo shows how compressor mechanism is mounted in epoxy impregnated stator.



Roll bonding of metal sheet materials provides integral passages.

Roll bonding

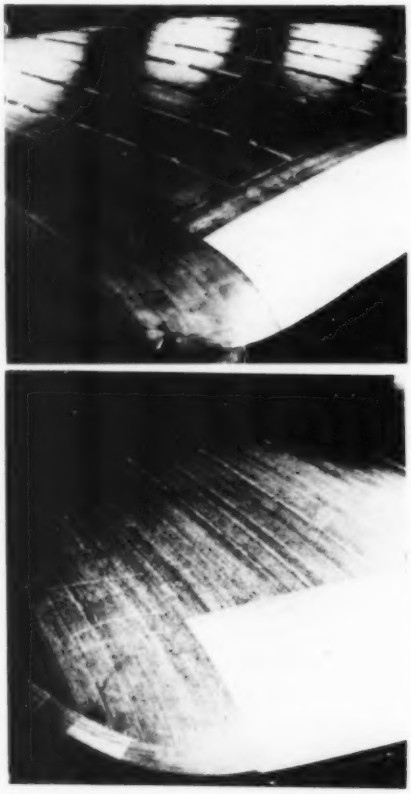
Roll bonding is a new process by which integral passages for liquid or gas can be produced in aluminum sheet. A stop-weld pattern is "printed" on an aluminum sheet and placed on an unprinted sheet. The two are rolled out together under high temperatures and high rolling pressures, so that they are metallurgically bonded together over the areas not covered by the printed pattern. Passageways are opened up in unsealed areas by hydraulic pressure. Increased design flexibility results, for the integral passageways can be routed without regard to tube-bending radii or other limitations of the tube-bonded-to-sheet process. The passageways may be flat, oval, or round in cross section; they can be smaller and closer together than is possible with conventional construction, since longer passages do not add to cost; and they act as stiffener ribs. The principal application is in the refrigeration industry, for refrigerator evaporators, freezer liner-panels, and vertical freezer plates.
Reynolds Metals Co., 2500 S. Third St. Louisville, Ky.

Room temperature curing

A flexible coating that cures at room temperatures, for waterproofing wiring systems and electronic components and protecting them against wear, has excellent dielectric properties. It may be applied by brushing, spraying, or dipping. It was originally developed as a rain erosion-resistant material. Its ability to cure at room temperatures means that it can be used with components unable to withstand high curing temperatures. There is no cracking or breaking under flexing at —65°F., and a fully cured film may be intermittently subjected to 400°F. without deformation. Shelf life of the material is six months. Complete polymerization requires two weeks, but the material will cure enough for handling in four hours. Supplied in sizes up to a quart, with a small can of the necessary catalyst, the material should be used within 48 hours after addition of the catalyst.
Micro Lite ML 88, *Radar Relay Inc.*
2260 Westwood Blvd., Los Angeles 64, Cal.

Impregnated wood

A new impregnated wood for die models and patterns, which is being called Hasko-Preg, reduces warping and shrinking as much as 70 per cent, and eliminates uneven swelling. Solid mahogany veneers 1/10" and 1/16" thick are impregnated with phenolic resins, then permanently bonded together in ¾", 1", and 1½" thicknesses. Such dimensional stability is needed when months are consumed in making die models, and more months are needed to complete the dies. Dimensional changes in dies for automobile bodies have been so great, for instance, that entire patterns have had to be reworked. The material is unaffected by exposure to dampness, for the impregnating treatment permanently reduces the moisture content. Resistance to heat, acid, and decay is also increased. It can be had in lengths up to 8' and in random widths from 4" to 20". Sections can be bonded with resorcinol and epoxy adhesives. Developed by the Forest Products Laboratory of the Department of Agriculture through a Ford Motor Company grant, it is also being used for housing electrical equipment and for construction of acid tanks.
Hasko-Preg, *Haskelite Manufacturing Co. Grand Rapids, Mich.*



Hasko-Preg die pattern of mahogany laminates (below) and conventional solid mahogany die pattern after being subjected to high relative humidity for 30 days.

Ultrasonic thickness tester

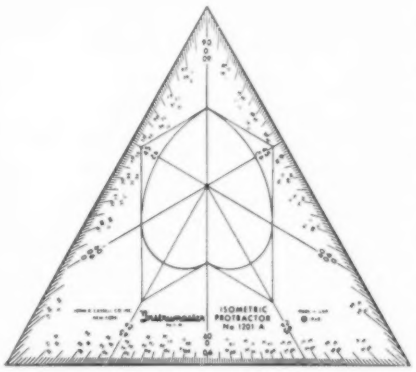
Thickness of metal can be measured with great accuracy from one side with a simple portable instrument called an "Audigage." In situations where metal cannot be drilled and where its location makes it impossible to have access to an edge for simple micrometer measurement, this device is a great aid to inspection. Typical uses are in the inspection of ship hulls, tanks, piping or boilers. The basic principle used by the Audigage is the fact that the natural fundamental frequency of vibration of a material in the thickness direction is independent of all other dimensions. In use, a vibrating quartz crystal is applied to the surface to be tested so that an ultrasonic wave is transmitted to the material. The wave is reflected back by the opposite surface of the material. When the instrument is tuned to a certain frequency, the returning wave is in phase with the applied wave and a resonant condition occurs. Frequencies from .65 Mc to 2.0 Mc can be generated corresponding (through a simple conversion scale) to thicknesses of .06" to 12.0" of steel. The instrument is tuned either by observing a panel meter or listening through headphones for a maximum signal. The device weighs only 18 lbs. and sells for less than $1000. A related instrument called a "Vidigage" uses a 21" cathode-ray tube to provide a visual indication that can be calibrated and read directly.
Audigage, *Branson Instruments, Inc., Stamford, Conn.*

Fitted pipe cover

A zip-on cover for pipes that needs no cutting or fitting, is furnished in exact sizes for protecting insulation from weather, abrasion, mildew, and chemicals. A polyvinyl closure is an integral part of the polyvinyl chloride acetate cover, which insures a watertight, airtight longitudinal seal. Joints are covered with a 2" vinyl tape, which is then painted with a vinyl sealer. The covering needs no painting, and comes in several colors; oil, rust, or dirt can be removed with a damp cloth.
Protektinsul, *Miracle Adhesives Corp.*
241 E. 53rd St., New York 22, N. Y.

Isometric protractor

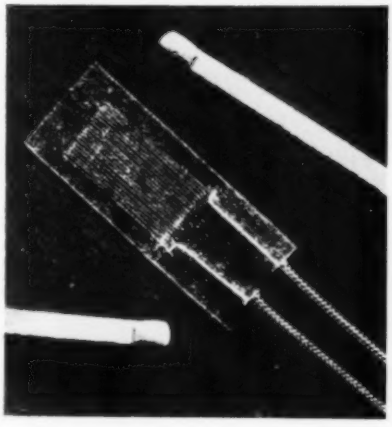
Without resorting to "boxing" or to the use of coordinates, any angle in any plane of an isometric drawing can be plotted or measured directly with this new protractor, so that lines not parallel with one of the axes may be drawn. A geometrical figure around the center of the protractor helps in orienting the instrument within a



particular plane. The protractor's triangular outline permits automatic orientation when one of its edges is placed against the T-square or straight-edge. There are two sets of 180° graduations, so that either half of the instrument can be used for any one of the three isometric planes. It is calibrated on both sides, so that figures can be read easily.
Isometric protractor, *John R. Cassell Co., Inc., 110 West 42nd St., New York 36, New York.*

Flexible thermometer

A new flexible thermometer for high-temperature applications up to 500°F., is only .0001 of an inch thick by 9/16" by 1-7/16", scarcely longer than a paper match, and weighs about as much as two postage stamps (2 grains). Of flat, thin, flexible construction, it can be cemented to almost any surface. It is unaffected by shock or vibration, will indicate temperature and temperature changes with great speed, and may be used to actuate direct-reading indicators, recorders or controllers. At 70°F. the resistance is 100 ohms. Manufacturing tolerance is ±2 ohms and each element is marked to the nearest .5 ohm.
Flexible thermometer element, *Ruge-de Forest, Inc., 50 Moulton St., Cambridge 38, Mass.*



Fluorescent lighting

Predicting the life of fluorescent lamps has always been possible only by burning sample tubes out, a test requiring an average of 7500 hours or about a year. General Electric's lamp development department is now using a new principle that makes it possible to predict the life of a lamp immediately without lighting, or even opening the tubes. The technique depends on the discovery that the life of the lamp is proportionate to the amount of a chemical called "emission coating" present in the lamp's cathode. This material serves as the source of the electrons that carry current through the lamp. It can be weighed and the life of the lamp estimated from this. In order to make it unnecessary to open the tube, the lamp under test is compared with a lamp having an uncoated cathode in an electronic circuit. When current is applied the coated cathode increases in temperature more slowly than the uncoated, and this resistance to heating is proportionate to the amount of emission coating present, and to the life of the lamp. This data can be read directly from a meter in the new method. Use of the technique includes both the laboratory development of better types of tube and also the testing of production tubes in order to detect short-life lamps.
Another development in fluorescent lighting just announced by G.E. is a new dimmer system. A simple dimmer is now available that will control the light output of as many as twenty 40 watt tubes. Electronic control of large numbers of tubes has been available in the past, but the new system uses simple resistance dimming with a special new ballast similar to present rapid-start units except for a simple wiring change. The new method is expected to be suitable for home and smaller commercial installations.
General Electric Lamp Division, Nela Park, Cleveland 12, Ohio.

Vinyl foam

A gas absorption process is used to produce a vinyl foam which can be cured rapidly with radio high-frequency equipment. Uniformity of cell structure and heat resistance are exceptional.
GAI-FOAM, *Rubatex Division, Great American Industries, Inc., Beford, Va.*

Maxaw 757 is a 7" industrial saw with a die-cast aluminum frame that weighs 10¾ lbs. and will cut a full 2⅛" at 95°, and 1⅞" at 45°. Source: Cummins of the John Oster Mfg. Co., Milwaukee, Wis.

Silicone Lubricant, developed for aircraft uses, will withstand 400° F. temperatures and is effective in "steel-on-steel" use. Source: Silicone Products Department, General Electric, Pittsfield, Mass.

Metallic Yarn in gold, silver and two-tone combinations, which can be dyed at the boil, will not cut on itself, and can be used without support, is made of a lamination of Mylar polyester film and aluminum foil. Source: Metlon Corporation, 432 Fourth Ave., New York 16, N. Y.

Color Photo Prints from transparencies in small lots are now being made by a new dye transfer process that ensures fidelity and greatly reduces their cost. Source: US Color Company, 1618 N. Vancouver Ave., Portland 12, Oregon.

Translucent Photocopy Papers with pure rag content in a lightweight 55 gram stock for airmailing, and in a transparentized tracing vellum that can be run at high speeds through diazo or blueprint machines, have high wet strength and will take erasures. Source: Peerless Photo Products, Inc., Shoreham, L. I., N. Y.

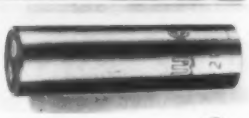
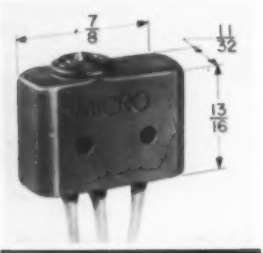
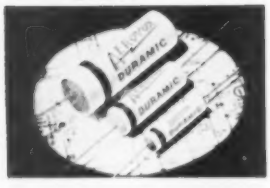
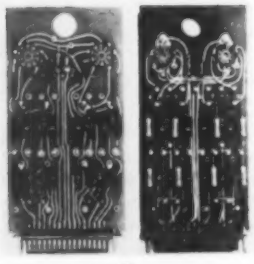
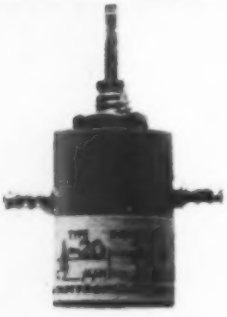
Screw-Lubes is a 3" can of heavy lubricant with holes punched in the lid for simple lubrication of screws used in wood, metal, and plastic assemblies. Source: Screw-Lubes, Box 307, Stamford, Conn.

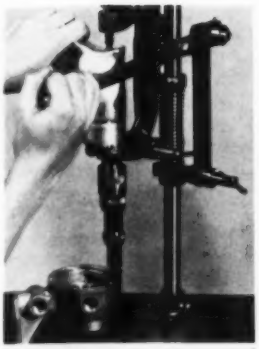
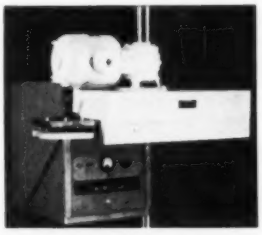
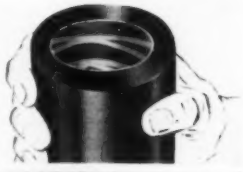
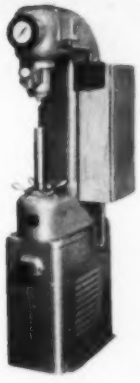
Fluoroflex-T is a light duty pipe for use in low pressure and gravity-feed systems for working pressures up to 50 psi, made of laminated fluorocarbon resins and glass fabric. Will handle corrosive liquids at elevated temperatures to 500°F. Source: Resistoflex Corp., 39 Plansoen St., Belleville 9, New Jersey.

Super-Symphony FM-AM Radio incorporates an automatic frequency control circuit that simplifies FM tuning, and allows a leeway of several degrees on either side of the FM channel in setting the dial indicator. Source: Zenith Radio Corporation, 6001 W. Dickens Ave., Chicago 39, Ill.

Oildag Dispersions consist of colloidal graphite mixed with petrolatum, and the product provides a lubricant for office machines in motor shafts and other moving parts where there is a tendency to throw off pre-thinned lubricants. Source: Acheson Colloids Co., Port Huron, Mich.

Technics: a quick guide to specialized products and components

	Name	Purpose	Manufacturer
	Small double-purpose generator	For use where a small generator is needed, this 19 oz. generator with an over-all length of 4" produces a two-phase indicating sine-wave, and two 10-degree pips 180 degrees apart, coordinated to one of the phases. Current rating is .015 amps per phase with a substantial overload factor. Peak current rating of pip-generating switch is 300 ma. It delivers a 13-volt, 20 cps output at 1200 rpm, having a normal voltage tolerance in production of plus or minus .15.	Dalmotor Company, 1380 Clay Street, Santa Clara, Cal.
	Miniature DC solenoids	For use where size and weight must be kept down. Solenoid shown (one of a new line) has push-pull capacity from 9 oz. with 1/16" stroke to 5 oz. with ¼" stroke.	West Coast Electrical 233 West 116th Place, AC Div. 216, Los Angeles 61, Cal.
	Miniature high-power motors	For use where ratings up to 1/6 HP are adequate, these small motors in a baked enamel frame measure only 4⅜" OD by 5½" long, and give a very low temperature rise. Available as either hysteresis or AC induction units. Shafts of different lengths, diameters and materials are available. Motors are specially designed for easy modification.	Instrument Motors, Box 5, Acosta Street, Stamford, Conn.
	Miniature sealed snap-acting switch	For mobile, marine and aircraft applications where small size and light weight are needed. Completely sealed with a silicone rubber plunger seal, bonded to both the pin plunger and metal housing, and embedded in an epoxy resin casting inside the housing. Temperature range is from —65°F to 180°F. Treated aluminum case is ⅞" wide, 21/64" high, 11/32" thick.	Micro Switch, Freeport, Ill. (Division of Minneapolis-Honeywell)
	Ceramic-cased paper tubulars	For use where exceptional protection against humidity is needed, these cardboard tubulars have a dense steatite casing. Operating temperatures from —55°C to 85°C. Life test is 1½ times rated voltage at 85°C for 250 hours.	Aerovox Corporation, New Bedford, Mass.
	Sensitive relay with complete wiping action	Complete wiping action formerly unavailable on high sensitivity relays. Low wattage consumption is 25 milliwatts per contact. Designed for DC.	Hedin Tele Technical Corporation, 640 W. Mt. Pleasant Ave., Livingston, N. J.
	Etched circuits using epoxy laminates	To minimize weight and space, to save time and eliminate human errors in wiring electronic circuits, etched circuits made from Epon epoxy-impregnated glass fiber are used in dual flip-flops. New circuit is at left.	Logistics Research, Inc., Redondo Beach, Calif.
	Miniature variable inductors	For use where resistance against shock or large amplitude vibrations are needed, these variable inductors have the entire powdered carbonyl-iron cup core and coil assembly imbedded in epoxy resin. Supplied in ten standard values from .058 mh to 1.8 mh and up to a maximum of 25 mh in special units, they feature an inductance range of 2:1; operating temperature range from —50°C to 100°C; temperature coefficients of inductance less than 50 ppm/°C. The units are 1⅛" long and ¾" in diameter. They weigh about an ounce.	Levinthal Electronic Products, Inc., 2789 Fair Oaks Avenue, Redwood City, Cal.

	Name	Purpose	Manufacturer
	Thread insert tool	For users who install 5,000 threads a month. Tool drives inserts to provide internal threads ranging from No. 6 to ¼″, National Coarse and Fine, and can be powered by air or electricity. It provides strong permanent threads in aluminum, magnesium, plastics, copper and wood, as well as steel. Depth of drive or placement of the insert in the hole can be controlled to within .008″ by quarter turns of the adjusting sleeve. Automatic clutch disengages driving mandrel when correct depth is reached.	Heli-Coil Corp., Danbury, Conn.
	Adjustable air regulator	Drift-free air source for instrument service or air-regulated equipment. Cast aluminum body chemically treated for corrosion. Regulator measures 3⅜″ in diameter, and is 7⅛″ tall.	Kendall Controls Corp., 114 Moody St., Waltham, Mass.
	Flapper valve with inertia latch	To prevent fuel movement in aircraft fuel tanks, this flapper valve locks open under conditions of normal flight, and closes automatically by means of a pendulum action when the plane is maneuvering. Valves are very light, one designed for a 1.875″ port diameter in a horizontal bulkhead weighs only 1/3 of a pound, including a standard 8-bolt flange.	Aero Supply Mfg. Co., Inc. Corry, Pa.
	Electronic bag-top welder for high speed closure	Can be fed automatically or by hand with uniform seal of any width. An over-riding buffer prevents contact between plastic bag and electrodes, preventing sticking and eliminating wrinkling. Speeds range from 30 to 60 feet per minute. The welder weighs 220 pounds, stands five feet tall, is 35 inches long and 33 inches wide.	Electronic Processes Corp. 1125 San Antonio Road, Los Altos, Cal.
	Internal collet for accurate internal holding	Applications include lathe spindles, grinder spindles and collet indexing fixtures; fits most of the popular machines and collet attachments.	Velocity Engineering Div. Morris & Batchelder, Inc., 555 West Arden, Glendale 3, Calif.
	Nylon-lined sleeve type bearing	For use where tolerances must be held to plus or minus .0002″ for bore, length, outside diameter and concentricity. Thin .005″ nylon lining allows rapid heat dissipation but resists plastic deformation.	Nylacore Corporation, 305 East Shore Road, Great Neck, L. I., N. Y.
	Rotary wire stripper	Strips to within 1/32″ of the component, handling sizes from 20 to 29 AWG.	The Eraser Co., Inc., 1068 S. Clinton St., Syracuse 4, N. Y.
	Brinell hardness tester	Rapid testing of metal hardness is made possible with this machine, which uses three signal lights to indicate hardness range (yellow means too hard, green indicates proper hardness and red shows the metal is too soft.) Limits are easily adjustable, and the machine can be used to sort work after testing with addition of other devices.	Steel City Testing Machines, Inc., 8817 Lyndon Avenue, Detroit 38, Michigan

Manufacturers' Literature

Abrasives. The Carborundum Company, Niagara Falls, N. Y. 42 pp., ill., charts. *Abrasive Grain and Powders for use in Metal Finishing* devotes a chapter each to metal buffing, metal tumbling and pressure blasting.

Beryllium Copper. Manco Products, Inc., 2401 Schaefer Road, Melvindale, Mich. 48 pp., ill. Information about beryllium copper, and a guide to the use of beryllium copper mold components.

Building Products. National Gypsum Co., Buffalo 2, N. Y. 8 pp., tech. National Gypsum's new directory catalogues products along with the various Federal and A.S.T.M. specifications to which they comply.

Castings. Atlantic Casting and Engineering Corp., 810 Bloomfield Ave., Clifton, N. J. 12 pp., ill. Step by step illustrations and description of the Atlantalloy plaster mold casting process.

Chemicals. Technical Service and Development, The Dow Chemical Co., Midland, Michigan. A newly revised catalog, *Products of the Dow Chemical Co.*, provides an alphabetical listing of Dow chemicals.

Construction. A new monthly publication will be available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C., for $3.00 per year. *Construction Review* will cover construction statistics which are compiled by the Federal government.

Electronic Dictionary. Allied Radio Corp., 100 N. Western Ave., Chicago, Ill. 72 pp., ill. A revised edition of *A Dictionary of Electronic Terms*, containing over 3,500 terms used in television, radio and industrial electronics. Send 25c to Allied Radio, for stock no. 37 K 756.

Electronic gluing. Monsanto Chemical Co., Springfield, Massachusetts. 16 pp. Supplier of a 4 synthetic adhesives for electronic gluing operations, Monsanto offers this technical bulletin covering gluing operations in which radio-frequency heating is used for curing.

Epoxy Resins. Marblette Corp., 37-21 Thirtieth St., Long Island City 1, N. Y. This new permanent reference folder on the properties and applications of Marblette epoxy resins is a companion item to the Marblette phenolic data folder still being circulated.

Fasteners. John Hassall, Inc., Westbury, L. I., New York. 12 pp., ill. Complete information on special rivets, nails, screws and small parts manufactured by the cold forging process.

Formed Wire. Peerless Wire Goods Co., Inc., 2702 Ferry Street, Lafayette, Indiana. (Write Dept. P476). 8 pp., ill. This brochure shows plant facilities and wire manufacturing operations.

Neoprene. Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware. The November 8 pp., ill. issue of du Pont's *Neoprene Notebook* concerns the electrical properties of this material.

Parts and Components. PIC Design Corp., Lynbrook, L. I. 64 pp., ill., charts. A catalog of precision instrument components and parts that can be ordered from stock.

Plastic Laminates. Polyplastex International, Inc., 441 Madison Ave., New York 22, N. Y. Polyplastex laminates Fiberglas, fabrics, feathers and leaves between rigid Vinylite sheets or between flexible sheets of plastic. Available literature includes a catalog of uses, a technical bulletin, and several folders.

Manufacturers' Literature *(Continued)*

Silicones. Dow Corning Corp., Midland, Michigan. 8 pp., ill., charts. The 1955 Reference Guide to Dow Corning Silicone Products lists 23 new products besides the 100-odd listed in the previous issue. The method of listing the products enables engineers to locate a product by what it does rather than by what it is.

Steel. Firth Sterling Inc., 3113 Forbes Street, Pittsburgh, Pa. Two catalog sections give analysis, characteristics applications, etc., on two Firth Sterling metals. Catalog 10-280 describes CYW Choice hot work steel; Catalog 25-150 describes Type 420 stainless steel.

Vacuum metallizing. F. J. Stokes Machine Co., 5500 Tabor Road, Philadelphia, Pa. Catalog No. 780, 22 pp., ill., charts. A description of Stokes' vacuum metallizing equipment for metal finishing by a process of evaporation and condensation under high vacuum conditions.

Wood Framing. Small Homes Council, University of Illinois, Urbana, Illinois. 8 pp., ill. No. F3.0. A non-technical primer on wood framing systems has been prepared to help homeowners recognize the various approved methods of building construction.

Films. Westinghouse Electric Corp., Pittsburgh 30, Pa. Westinghouse has published a film guide providing complete information on the motion pictures and slide films they offer on loan without charge. Ask for Catalog B-6505.

Film. Cyril Bath Co., 32318 Aurora Road, Solon, Ohio. Precision Metal Forming is the title of a color film now available to interested groups. The film shows the Radial Draw Former machine produce multi-plane parts in stainless steels and other metals.

Index to Advertisers In This Issue

Classified Advertisements

10c A WORD PER INSERTION, $3.00 MINIMUM, PAYABLE IN ADVANCE. BOX ADDRESS COUNTS FIVE WORDS

Positions Wanted

INDUSTRIAL DESIGNER *with versatile background, thoroughly experienced in development of commercial and household products, desires position with manufacturer or studio located in Chicago area. Box ID-32,* INDUSTRIAL DESIGN, *18 E. 50th St., N. Y. 22.*

INDUSTRIAL DESIGNER *with original ideas offers comprehensive product design service. Highly suited to assignments calling for unique creative or inventive solutions. Excellent production, material and merchandising background — special familiarity in plastics. Individual assignments or retainer basis. Box ID-35,* INDUSTRIAL DESIGN, *18 E. 50th St., N. Y. 22.*

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Help Wanted

HELEN HUTCHINS PERSONNEL AGENCY. *Specialist Industrial, Architectural, Interior Design; Decorative Arts, Trades, Home Furnishings. Helen Hutchins' long association with a leading industrial design organization insures intelligent and individualized screening of all types of personnel for industrial designers. 767 Lexington Ave., New York 21, TE 8-3070. Interviews by appointment.*

ARCHITECTURAL AND DESIGN PERSONNEL AGENCY — MURIEL FEDER — *A personalized placement service for top level architects, designers, engineers, draftsmen, interior decorators, and home furnishing personnel. Selective contacts arranged in a confidential and professional manner. Interviews by appointment. 58 Park Ave., N. Y. MU 3-2523.*

NEW ENGLAND MANUFACTURER OF METAL FURNITURE *desires product designer on permanent basis. Please state complete details, background, and previous experience. Box ID-33,* INDUSTRIAL DESIGN, *18 E. 50th St., N. Y. 22.*

WE NEED CAPABLE DESIGNER WITH EXPERIENCE AND ABILITY *to manage studio. Work consists of all phases of product with some furniture and showroom. This firm has an excellent reputation and growth. Reply fully giving experience and training also salary requirements. Box ID-37,* INDUSTRIAL DESIGN, *18 E. 50th St., N. Y. 22.*

Miscellaneous

MODELS — *industrial — complete facilities for modelmaking in all materials. Executed to your specifications. Prompt delivery at reasonable prices.* ARNKURT ASSOCIATE ENGINEERS, *31 East 27th Street, N. Y., LExington 2-4286.*

HUMAN AND EFFICIENCY ENGINEERING RESEARCH ASSISTANCE. *Expert field analyses for determination of product requirements. Human body size psychological, physiological data. Simplification—automation aid. Evaluation of proposed designs for efficiency, safety and comfort of human use. Training of designers in human engineering technique. Project, per diem or retainer basis. Box ID-34,* INDUSTRIAL DESIGN, *18 E. 50th St., N. Y. 22.*

IDEA MAN — FREE LANCE — PHENOMENAL ORIGINALITY — *Intellectual catalyst; Science liaisons; ultimate pen; wet ink, spherical/conical point, leak proof; $25,000. Ultimate razor; guardless 36" slashing edge, self honing, $100,000. Torch, burning solid carbon; 16,322°F. (Vaporizes creation) $200,000. Tugboats eliminated; $100,000. Atmospheric separation; $250,000. Triflers abhorred. Want revolution, your line? Laboratory; Box 2, Brooklyn 17.*

FOR YOUR CALENDAR

February 2—March 20. 100 Museum Selections from Good Design 1950-54 and forecasts of home furnishings design trends prepared by seven leading design schools in this country. Also a survey of GD popular sellers, prepared by *Retailing Daily*. Museum of Modern Art, New York.

February 17—March 18. Joint Faculty Exhibit. The Institute of Design, Chicago.

March 1—3. Society of Automotive Engineers' passenger car, body and materials meeting. Sheraton-Cadillac Hotel, Detroit.

March 4—April 3. American Industrial Design Show of the 10th Triennale of Milan. Auto-Motives, an exhibition of automobiles designed for specific purposes. To show concurrently at Contemporary Arts Museum, Houston, Texas.

March 14—16. Society of Automotive Engineers' Production Meeting and Forum. Cincinnati.

March 14—18. American Society of Tool Engineers' 23rd Annual Meeting. Shrine Auditorium and Exposition Hall, Los Angeles. (See page 20)

March 27—30. Philadelphia Gift Show. Hotel Benjamin Franklin.

March 28—April 1. 9th Western Metal Exposition, Pan-Pacific Auditorium and 9th Western Metal Congress, Ambassador Hotel, Los Angeles.

April 6. National Machine Design Conference. New York University College of Engineering.

April 6—10. World Plastics Fair and Trade Exposition, National Guard Armory, Los Angeles. (See page 22)

April 10—May 1. For Your Home, an exhibition of furniture and articles for the home selected for their good design by the Dept. of Architecture of the University of Illinois, Urbana.

April 13—15. Society of the Plastics Industry, Inc. Pacific Coast Section Conference Palm Springs, Calif.

April 13—June 5. Textiles and Jewelry from India, Museum of Modern Art, New York.

April 14—May 31. Product Design Exhibit. The Institute of Design, Chicago.

April 18—20. 24th National Packing Exposition of the American Management Association. International Amphitheatre, Chicago. Packaging Conference will be held in conjunction with Exposition, at Palmer House, Chicago. (See page 20)

April 18—21. Society of Automotive Engineers' aeronautic production forum and aircraft engineering display. April 18-20 Hotel Statler, April 21 Hotel McAlpin, New York.

April 23—May 8. Seventh International Metals, Materials and Industrial Fair of Liege, Belgium.

May 5—31. Open House Exhibit. The Institute of Design, Chicago.

May 7—15. Society of the Plastics Industry Annual Meeting and Conference—cruise on the Queen of Bermuda.

May 16—20. National Materials Handling Exposition. International Amphitheatre, Chicago. (See page 18)

May 31—June 3. Basic Materials Exposition. Convention Hall, Philadelphia. (See page 20)

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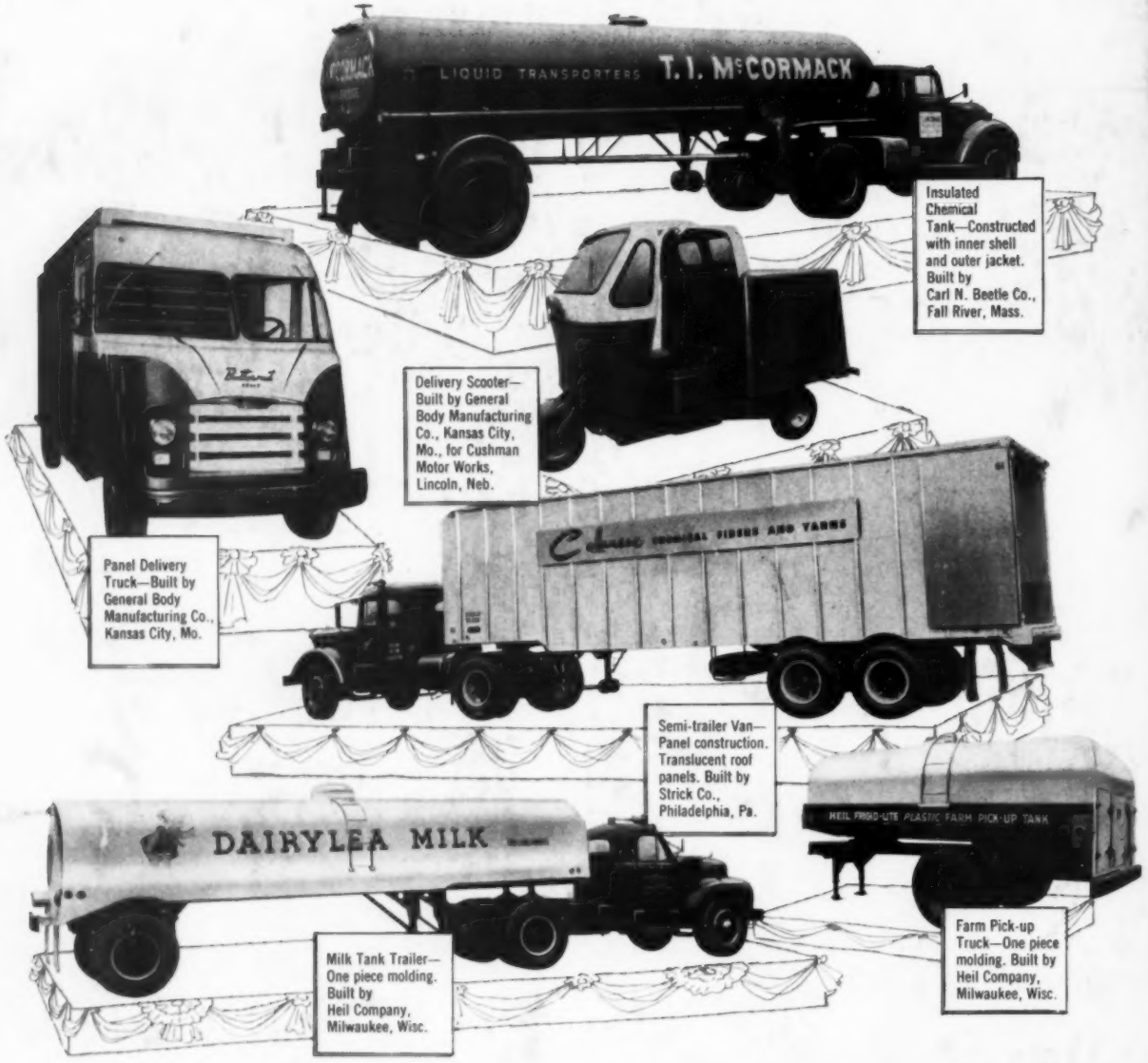

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The trucking industry was quick to recognize reinforced plastic construction as the fastest way to greater payloads. These six truck-bodies tell the story:

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