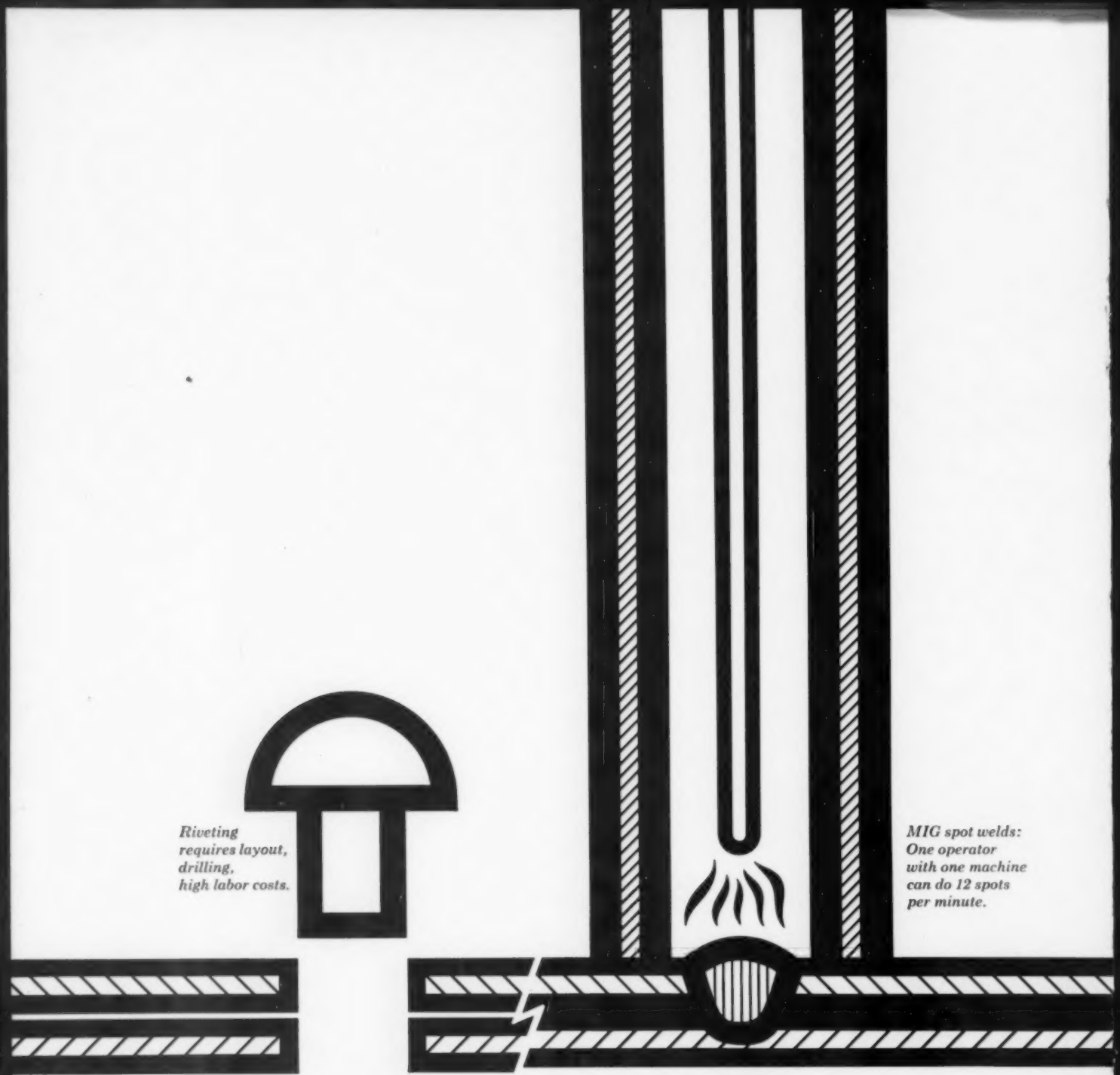
INDUSTRIAL DESIGN

4 *April 1961* *$1.50 per copy*

Package design by suppliers:

pro and con

How design mass-produces a chair



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APRIL, 1961 VOLUME 8 NUMBER 4

INDUSTRIAL DESIGN

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

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COMING

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IN JUNE—*Instrument panel design*

COVER: Art director Peter Bradford uses stacked cartons in two colors to suggest the different opinions in the supplier-consultant controversy discussed on page 53.

FRONTISPIECE: Unimate, an industrial robot (page 35) made by Consolidated Controls Corporation, wheels through a work cycle in this multiple-exposure photograph.

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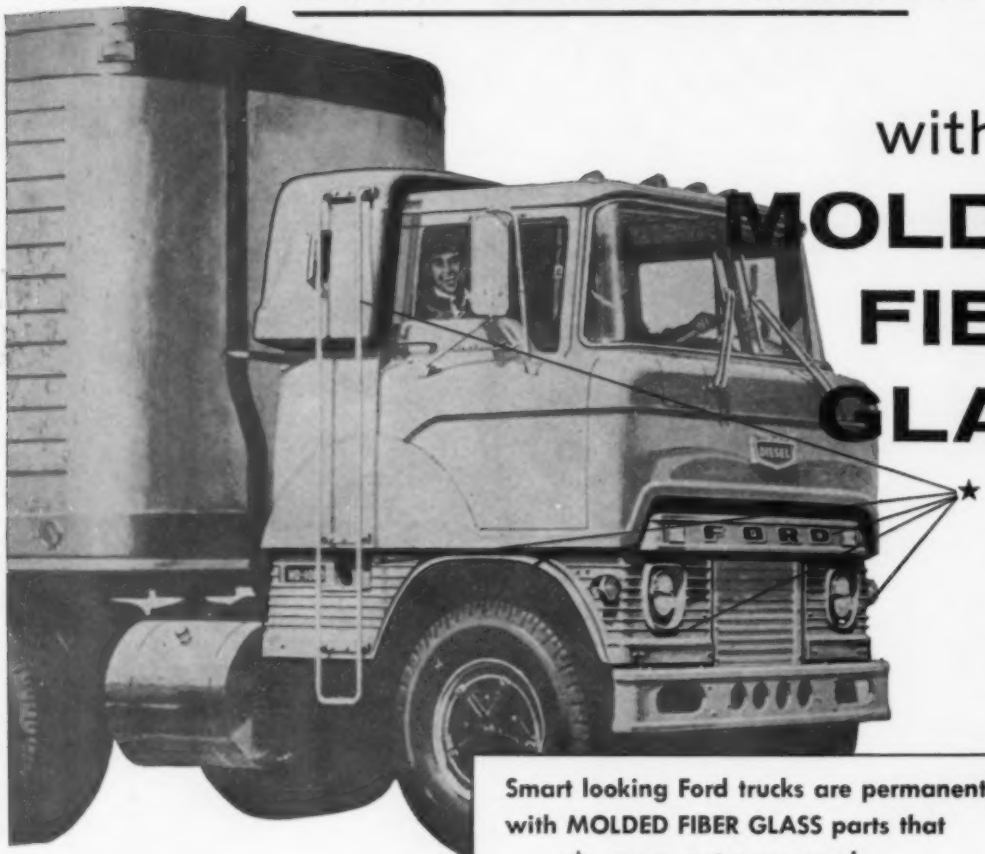

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IN THIS ISSUE

Dunn

Crawford Dunn, whose view of the wheel appears on page 50, practices in Dallas, Texas, as an independent consultant in "business esthetics," by which he means graphic, product, packaging, and interior design. An industrial design graduate of the Art Institute of Chicago, he also attended the University of Alabama, Texas A & M, Haverford College and Roosevelt College. Convinced that the esthetic "turpitude" of U. S. business cancels out millions of dollars' worth of public relations and advertising, Dunn feels that the role of the competent designer is to dispel "the dark at the top of the corporation." His own wheels carry a Volkswagen and a Mercedes 190-SL.

Baermann

Walter Baermann, who designed the mass-produced upholstered furniture shown on page 30, heads his own seven-man design firm in Waynesville, N. C., a location he picked in 1951 because he liked the country. He holds MS degrees in engineering and architecture, and a Ph.D. from the University of Munich. Formerly design director of Norman Bel Geddes' office, he has served as director and chairman of faculty at the California Institute of Technology Graduate School of Design, director of industrial design at Cranbrook Academy, and is at present ASID's consultant to the product design department of North Carolina State College. He chaired the first annual meeting of the Furniture Design Association in 1960.

Rome Jones is president of the Prestige Furniture Company of Newton, N. C., and instigator of the Baermann-designed furniture (page 30) which his firm now makes. Jones is a talented, self-trained mechanic who has built his concern, in 11 years, into a multi-million dollar business — largely by mechanizing everything from assembly line to cost accounting. After hours he is a Civil War buff, an interest rooted in his meeting, as a boy, some of its veterans (Confederate, naturally).

Jones

Fink

Albert Kner, whose views on supplier design are aired on page 53, is head of the Design Laboratory of Container Corporation of America. The laboratory, which he started as a one-man operation in 1942, now numbers 100 men and has offices in 9 cities here and three abroad. Before coming to the U. S., he was president of a printing firm in Budapest (continuing a family tradition of 7 generations). He has lectured on package design and the work of his Design Laboratory has been exhibited here and in Europe.

Kner

Karl Fink, as president of the Package Designers Council and head of his own design firm, represents one side of the controversy on supplier design (page 53). A graduate of Parsons, Fink has taught at the Workshop School of Advertising and Editorial Art, and has lectured at Pratt Institute. He has been art director of the Rahr Color Clinic and chief designer at Arthur S. Allen, design and color consultant.

ingenuity unlimited

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LETTERS

About "How to Kill People"

Sirs:

George Nelson's article "How to Kill People" (January) should have been titled "How to Confuse People." The confusion is about his motives in writing it.

The article was introduced editorially as an "ironic commentary . . . about design and about the extent to which society has sanctioned human destruction." The first seven pages of this eight page article bore no commentary at all except the cynical and questionable generalization that "money has always attracted creative people." ("Always"? "Creative"? Perhaps "sometimes"; perhaps "talented"; maybe "destructive"!)

Only after seven pages of loving detail about the "elegance" and "glorious craftsmanship" and "sleek deadliness" of these doggone weapons do we find some "commentary": much talk about the bigness of modern warfare. Alas, the personal element has gone out of "the activity that has been man's favorite throughout history!" Note again the broad and questionable generalization—Mr. Nelson has taken the liberty of including you and me as lovers of war.

If there is any "irony" in this article, it is buried too deeply to overshadow other possibilities for interpretation. The whole article might just as easily be interpreted as a glorification of war. Since the article was originally presented as a tv program, no doubt viewed by millions of impressionable young people, the responsibility is heavy.

Mr. Nelson's unquestionably serious picture of designers as a money-mad lot pouring their talents into mass destruction is one we ought to question. If true, this would stamp designers as the backward people of our time, indicating a serious lag—as compared, for example, to scientists, who have universally taken a stand against weapons of mass destruction in terms of their professional involvement.

Lili Port
New York, New York

Sirs:

George Nelson's pictorial article, "How to Kill People: A Problem of Design," is a very important contribution to our thinking on the prime problem of our time: the elimination of war.

I am glad that those who have blindly designed whatever their masters have told them are at long last beginning to question the complicity of their cooperation with the war system. No doubt some feel vested interest in continuing such designs for economic reasons, but as Nelson admits at the end of his essay, if peace ever does break out, the designers will have plenty else to do.

The only things I missed in this impressive essay were a photograph of devastated Hiroshima and recently released photographs of the Hiroshima and Nagasaki type bombs. But there are enough photographs accompanying the essay to validate the notion that human evolution is not all in one direction.

Homer A. Jack
Committee for a
Sane Nuclear Policy
New York, New York

Sirs:

I would like to extend my thanks to you for having published "How to Kill People," an article informative as well as interesting—my congratulations to the author, Mr. George Nelson, please.

With due respect to the author, I would like to bring to your notice the ascertained fact that the credit of discovering gunpowder and not the gun (as stated on page 50 in the January 1961 issue) goes to a German Franciscan monk, Berthold Schwarz, and not to Bernard Schwartz as reported. My statement will be found supported in the Konversations Lexikon from Brockhaus and the "Der Grosse Herder."

Ashok K. Mittal
Essen-Werden
West Germany

A System for Safety

Sirs:

Your article on aircraft seating is timely after the most disastrous winter in airline history. It is unfortunate that neither you nor Mr. Mason has attacked the real problem in aircraft seating design, that is, providing adequate safety.

Military tactical aircraft seats are stressed to 32 g's; military transport seats are stressed to 16 g's and rearward facing; commercial airlines' seats are stressed to 9 g's and forward facing. The human body is capable of sustaining 60 g decelerations and surviving, as Colonel Stapp proved in his famous rocket sled rides a few years ago.

The survival of the human upon experiencing impact is wholly dependent upon the protection afforded him by the support, and to some extent the energy absorption, of his seat. A support system which rips loose from its mounting, making a missile of the passenger, can hardly be said to protect him.

In 1958, as an Air Force officer in the Air Research and Development Command, I was the co-designer of a light weight nylon mesh support system designed for use as a crew seat for space vehicles. The system is presently completing tests prior to its operational acceptance. I firmly believe that this system could be adapted to commercial use; further, that the saving in the weight of the seat (about 50 per cent) could be applied in the beefing up of floor structure to provide a realistically stressed life support system.

It should be added that the passenger would lose none of the comfort he now enjoys, since the nylon mesh system "molds" to its occupant's contours, minimizes body organ distortion during high accelerations (or decelerations), and provides minimum body distortion during normal gravitational pull.

It would be hoped that the disasters of this winter would awaken the commercial carriers and the passengers to the importance of realistically designed seating systems.

William Elkins
Grand Rapids, Michigan

Glowing Words for Steel

Sirs:

By now you must be receiving accolades from virtually everyone connected with the steel industry for your excellently written and technically sound article, "Steel's Renewed Glow" in the February INDUSTRIAL DESIGN.

Without doubt, the industry will be quoting you loudly and repeatedly. That steel itself needed this article cannot be questioned. The importance of the industrial designer in affecting not only style but material is indisputable. It has taken the industry a long time to become aware of this fact, but after the appearance of your article it must become apparent to all that the industrial designer belongs with sales, sales promotion, technical services, advertising and public relations as an essential, integral part of the steel selling group.

Stuart D. Goulding
Arthur Schmidt & Assoc., Inc.
New York, New York

Erratum

Paul Specht's byline was inadvertently left off his reinforced plastics report in the March issue.

REVIEW: BOOKS

Going it alone

Professional Practice for Designers. *By Dorothy Goslett. B. T. Batsford, London.* 232 *pages.* $4.50.

Reviewed by Robert Hose

Without being facetious, this book could have been called "Soup to Nuts," for this is truly a complete do-it-yourself textbook for the young designer with a courageous heart and money in his pocket. As for the silver-haired designer, he can use it as a mirror, checking his own manner of doing business against the reflection. In short, there is not a practicing designer in America who could not learn something from this careful and analytical look at design practices in England. There has not been a book of this detail and scope since Harold Van Doren published his original *Industrial Design* in 1940.

Unfortunately, at least half of the text seems overly elementary for any designer qualified to open his own office — I would hope that many of these "pointers" would already be known and understood by any graduate designer. But the other half clearly makes up for it with ambitiously undertaken discussions of practice, procedures, budgets, contracts, etc., all of which are of definite interest to the professional designer. The book might well be used as a classroom text, since specific business courses are as necessary to the design student as they are to the student of business administration.

The author seems to understand thoroughly what the designer's problems and pitfalls are in the early stages of running his own office — her instructions about developing a letter-writing personality, keeping diary notes, fee estimating, and contract clauses can be followed faithfully and profitably. Perhaps the contract stipulations seem more stringent than our client arrangements here in the United States, but it is probably safer to be over-cautious than not cautious enough.

Many of the descriptions and discussions of business operations have a British inflection. One of the problems that the author encounters, for example, is the elaborate tea-time preparations that are essential in a British design office. I quote:

"A gas-ring or power point will boil your kettle for you. A dairy with an enterprising roundsman will deliver as well as milk, a regular order of coffee, tea, sugar, biscuits, to save you shopping. Your tea-towels can go to your own laundry, or your cleaner may be persuaded to do them for you, either way for a few pence a week.

"Be fussy about your cups and saucers, spoons and trays. Your visitors will be pleasantly surprised if your coffee or tea is not only good to drink but attractively served, instead of slopped weakly into cracked cream-coloured mugs with badly drawn marigolds on them."

But even so, the reader will find himself extracting "things to remember." The book is easy reading, logically organized, well presented, and obviously reflects the observations of a top-flight English designer. Such an ambitious and mammoth undertaking should not go unnoticed, and should prove to be a worthwhile reference book for the business side of industrial design.

ROBERT HOSE *is in charge of the New York office of Henry Dreyfuss, and was president of the ASID in* 1953-54.

Factories also have faces

Industrial Architecture. *By James F. Munce. F. W. Dodge, New York.* 232 *pages.* $14.75.

Reviewed by Brooks Stevens

This scholarly, technical treatise on industrial architecture is superbly done —if viewed from the vantage point of such things as structural innovation, and soundness and newness of materials. But if the book's purpose, as stated in the foreword, is to "capture the essence of the modern factory," then it needs to be bolstered.

What is the essence of the modern factory? Simply to produce equipment, merchandise? This is the view of some, including the author, who unfortunately has omitted any additional views. Perhaps he believed they were unnecessary in a technical study. But without seeing the other side of the factory's "face," the treatment is incomplete.

What is the other view of the modern factory? One good answer comes from the president of the Johnson Wax Company, who admitted that for years the company's products were sold chiefly because of the impetus of two main forces: the Fibber McGee and Molly radio show (which they sponsored), and the "fabulous" factory design by Frank Lloyd Wright, which has become a tourist shrine.

Today's industrialist uses the "front" of his plant (provided it is attractive) as he does the labels, packaging techniques and product design of his wares — to advertise and merchandise his products. The connotation, of course, is that good looking buildings produce worthwhile products. *Industrial Architecture* omits any account of how architectural appearance has played its part in product merchandising.

The administration building of the Miller Brewing Company in Milwaukee, for example, emphasizes ornamental metal work—symbolic of the firm's product, beer — in both the interior and exterior. The building utilizes brushed brass and satin-finish stainless steel to symbolize beer's amber color and foam. Throughout, the color schemes are borrowed from the packaging and the product.

The author asserts that the American factory of post-war construction is inadequate because it is "based upon the almost universal use of steel frame, flat roof, and panel wall; efficient, economical and dull." He further states that to show their awareness of the possibilities of advertising and good public relations, American factory owners "make the most of any factory wall facing a main thoroughfare by clothing it with all-wall glazing to expose the processes and machinery within." Not a bad idea, but is this the extent of advertising and public relations planning by our American industrialists?

An example to the contrary is the McCulloch Corporation plant in Los Angeles. Located adjacent to the airport, its front canopy shaped remarkably like the wide, reaching wings of an aircraft, it provides shelter and ingenuity which could never be matched by the simple transparency of glass walls, revealing grinding machinery within.

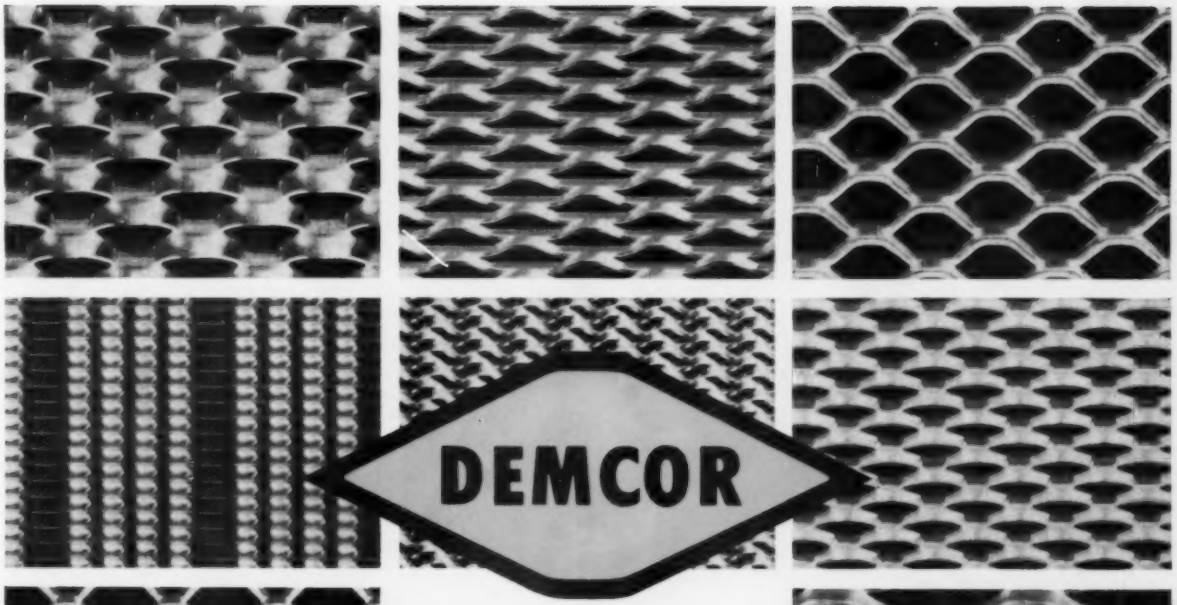
However, these points do not detract from the scholarly research and documentation between the covers of this book. (Unfortunately, budding young architects and students may balk at its price tag.)

BROOKS STEVENS *of Brooks Stevens Associates, occasionally designs "showcase" factories for his product-design accounts.*

Exhibition technique

Esposizioni Architetture-Allestimenti
By Roberto Aloi. Ulrico Hoepli Editore, Milan. 337 *pages.* $16.

Fully illustrated with both black and white and color photographs, this book, in English and Italian, undertakes a critical and historical survey of expositions and displays—mostly in Europe—from 1914 to the present.



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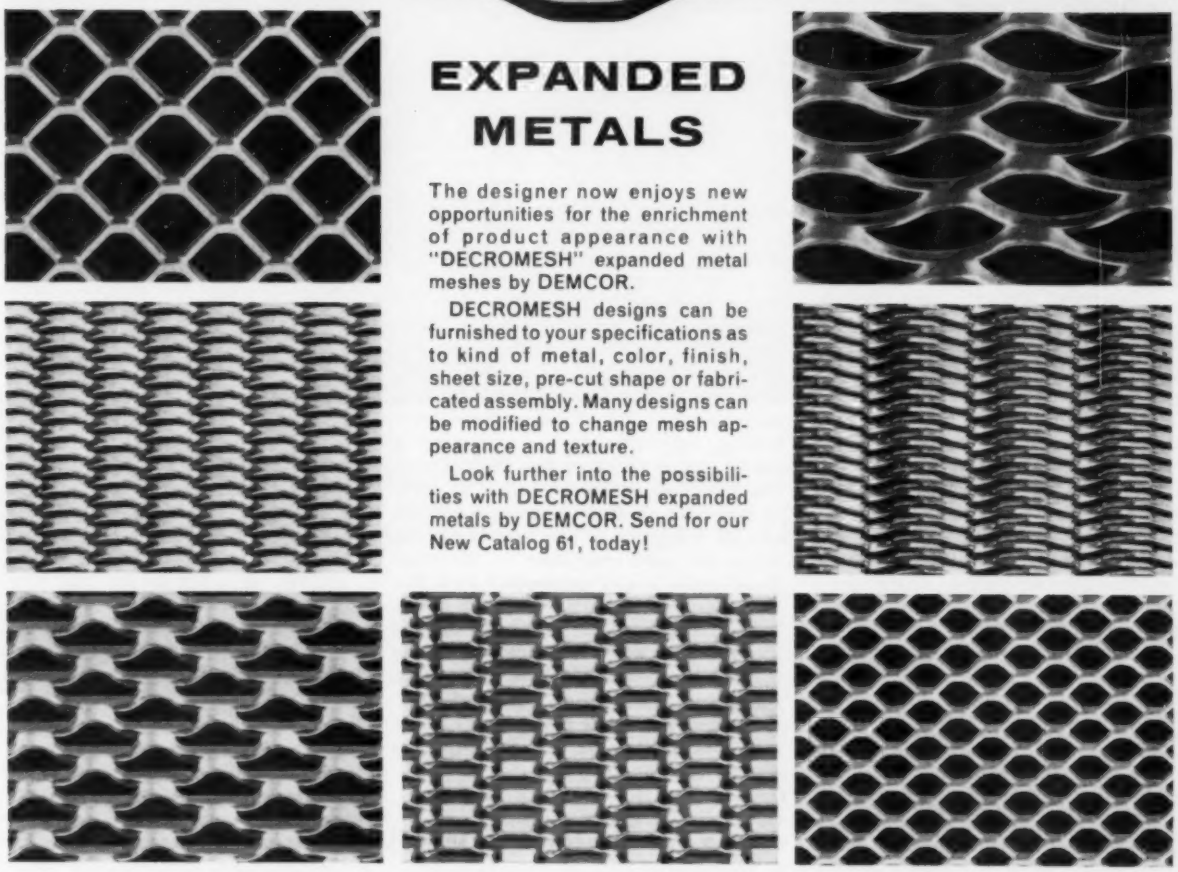

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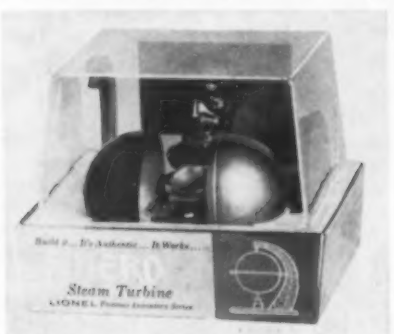
NEWS

Box serves as control panel for completed weather station

Lionel enters scientific toy market

Hard on the heels of General Electric (ID, March, 1961), the Lionel Corporation entered the scientific toy market with the introduction of four groups of science toys at last month's Toy Fair in New York. Electronics, plastics, meteorology, and a Famous Inventors series mark the divisions of the new line. Van Dyck Associates, Westport, Connecticut, are responsible for the appearance design, graphics, and packaging, and worked closely with Lionel's engineering staff from the inception of the project in an attempt to coordinate product design with new packaging. In the electronics and meteorology series (the weather station is shown above), the box is an integrated part of the toy, serving as control panel. In the Famous Inventors series, recreating one of six famous scientific advances—Gutenberg's printing press, Edison's electric light bulb, Hero's steam turbine (below), Galileo's telescope, Morse's telegraph, and Bell's telephone—the box is a display case for the assembled instrument; in all the groups, the high-impact, injection-molded clear polystyrene cover is designed to be a point-of-purchase showcase. This packaging method required the use of die-cuts in the box platforms, as well as standard elastic bands, to keep parts in place. Van Dyck achieved identifying differentiation by employing a varied group of colors and symbols: in the inventors group, a basic gold color is used with another color and a content symbol (a picture of the invention); the white and dark gray base on the other three series is also augmented by a distinguishing color, with the new shade carried through in the rest of the graphics. Boxes for the inventor series are cardboard, but the three engineering series are boxed in a plastic of .094" thickness, unusual in a toy. Harry Jones and Tom Downey were in charge of the project for Van Dyck.



Container also displays finished toy

Design engineers to meet in Detroit

The sixth annual Design Engineering Show, and its concurrent Conference, will open at Detroit's Cobo Hall on May 22nd for a four-day run that leaves no room for speculation about why the two events are being held in Detroit. Opening session at the Conference will be devoted entirely to the automotive field, and officials of Ford, Chrysler, General Motors, and American Motors will participate in a panel discussion of "Designing for Today's Competitive Market." In subsequent sessions, such topics as "Designing for Production," "Designing with Adhesives," "New Developments in Types of Fasteners," and "Designing with Powder Metallurgy to Improve Quality and Reduce Cost" will be covered by representatives of major companies, including GE, Corning Glass, Monsanto, du Pont, and Westinghouse. More than 400 companies will exhibit.

Chapman model classroom shown

This model classroom, designed by Dave Chapman, Inc., for the Brunswick Corp., is the direct result of Chapman's study of school needs and teaching-by-television techniques for the Ford Foundation's Educational Facilities Laboratories completed last summer (ID, June 1960). Most of the innovations in arrangement and component design are based upon the recommendations made in the study; Brunswick's new Trizoid desk, with an extension leaf that adds more work space when raised level and doubles as a partition when placed at a right angle to the surface, was suggested in the report. Among the other recommendations incorporated into the room are: a "corner oriented" arrangement that moves the teacher from his traditional front-and-center position to the corner; movable desks arranged in a correlating pie-shape lecture seating plan that corresponds to vision and sound paths; placement of components and controls for phonograph, television, projection screen and any electronic devices, in the teacher's corner; supplementary lighting over wall-hung objects; and carpeted floors for increased sound absorption. New York City's Board of Education is planning to adopt many of the innovations in a proposed teaching laboratory school at Queens College. The entire model room was featured in the American Association of School Administrators exhibition last month at Philadelphia's Trade and Convention Center.

Brunswick's experimental classroom

(*Continued on page* 16)

Nickel-Chrome Plating shines through the years of wear she'll give this bicycle

Nickel-Chrome Plating is more than a match for the hard wear that means bicycling fun for youngsters. It's beautiful, it's durable—*and stays that way*—despite rain, dust, bumps and scratches.

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NEWS *continued*

Eames, IBM, and the numbers game

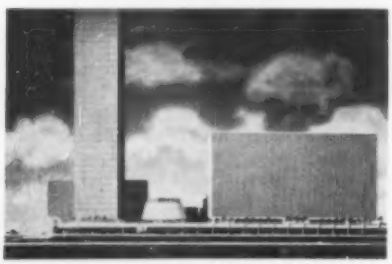
"The World of Numbers . . . And Beyond," a permanent exhibition designed by Charles and Ray Eames in consultation with UCLA mathematics professor Raymond Redheffer, was installed late last month in the new Science Wing of the California Museum of Science and Industry, Los Angeles. IBM sponsored the project to stimulate broader popular understanding of mathematics and math-based sciences. The exhibit is organized into five separate divisions: a group of nine giant working models, operated by visitors, illustrating such basic mathematical precepts as a probability curve; a "history wall" documenting in pictures and text the development of mathematics; a Mathematics Images Wall of visually pleasing and mathematically meaningful objects, both natural and man-made; a ceiling hung with quotations designed to create an image of the mathematician; and six two-minute movies explaining fundamental mathematical concepts. Later this year, the exhibit will also become a major part of the Chicago Museum of Science and Industry. The exhibit was built by three California firms, Displaymasters (San Gabriel), Scale Design Associates (Hawthorne), and Remanco, Inc. (Santa Monica).

Dutch packaging fair

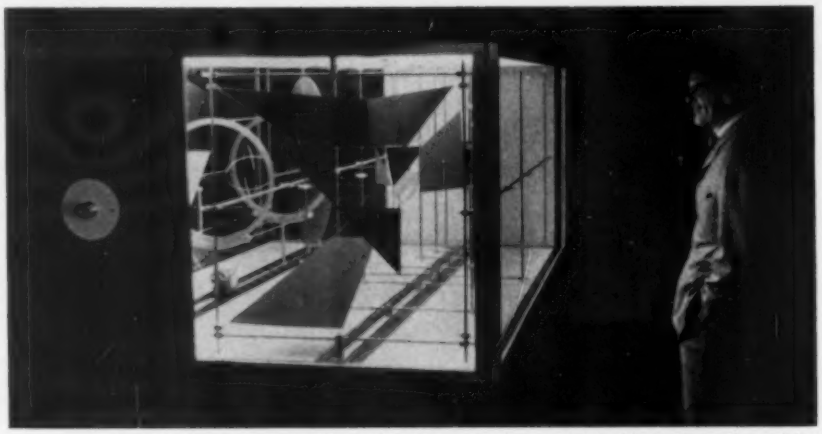
The Netherlands' sixth biennial international packaging trade fair will run May 2-9 at the new exhibition halls of the RAI in Amsterdam. For the first time, package handling equipment will be included along with packages, packaging material, and packaging machinery. N. V. 't Raedthuys of Amsterdam organized the event.

Face-lift for Wall Street

Construction of a World Trade Center in New York has been proposed for a 1962-1968 construction schedule by the Port of New York Authority. It would include a 72-story World Trade Mart, a circular 8-story Securities Exchange, a 30-story World Commerce Exchange, a 20-story Trade Center, and a multi-level concourse. The architectural rendering (below) was executed by Richard M. Adler of Brodsky, Hopf & Adler with the guidance of a board composed of architects Gordon Bunshaft (of Skidmore, Owings & Merrill), Wallace K. Harrison (of Harrison & Abramovitz), and Edward Durell Stone. The center would occupy a 16-acre site on the East River, and the estimated cost is $335 million.



Proposed World Trade Center



Charles Eames surveys "Projective Geometry," a model in his mathematics exhibit

New German Ford bows

Ford of Cologne's new Taunus 17-M, designed by styling division head Wesley Dahlberg, returns to the "tear-drop" body style, a move aimed, according to the designer, at achieving a continental character for the car and providing better fuel economy through more favorable air flow conditions. The oval design theme of the exterior—evidenced in the head lights, deck lid opening, locking equipment, license plate area, and tail lights — appears in the interior's instrument panel, ash tray, arm rest, and door latch. By using curved side glass, the designers increased passenger space without a corresponding increase in size.

The new "tear-drop" Taunus

IDI news

IDI's national organization recently leased a booth at New York's National Design Center, for the display of members' work. Each chapter will have the use of the booth for about six weeks. The Ohio Valley group opens its display on the 15th of April.

IDI's Central New York Chapter has established an annual scholarship award of not less than one hundred dollars to be given to a student of industrial design.

Exhibit of folding screens

William Keck's multi-wood screen with contoured louvers (below) was in a recent show of screens by Design Group, Inc. at the N. Y. Architectural League.

Keck's wood screen

SPE exhibition opens this month

The Society of Plastics Engineers' first educational and technical exhibit, centered about the theme, "Plastics—A New Dimension in Buildings," opens on the 15th of this month in Springfield, Mass. The exhibit is designed to provide technical information for architects, builders, contractors and interior designers, to call attention to the wide range of plastics applications, and to project ideas for future uses. A project of the SPE Plastics in Buildings Professional Activity Group, the exhibit will travel to some 16 major North American cities for a series of 30-day showings at museums and universities for the next two and a half years.

(*Continued on page* 18)

NICKELOID IS EVERYWHERE

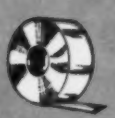
IN THE GAME ROOM

IN MOST ANY ROOM

IN THE KITCHEN

These eye-catching products use functionally a basic Nickeloid Metal. The finish of Chromium, Nickel, Brass or Copper is electroplated to a base metal, usually Steel (but often Zinc, Brass or Copper).

Mostly, Nickeloid Metals are supplied in continuous coils in widths up to 24" for modern, low cost fabrication. They're also available in sheets and strips. Optional: bright or satin finishes, plating one or both sides, a galaxy of stunning patterns and crimps.



Quality plating produces metals so durable they can be fabricated, even quite severely drawn or bent. Rejects minimized. For severe stamping, we offer Mar-Not protective coating that is easily peeled off after its job is done.

These handsome articles of daily use are striking indeed! Not a little of this is achieved by the functional use of bright plated Nickeloid Metals in Chrome, Brass or Copper finishes. But look again! These pictures carry a deeper, even more dramatic story . . . the story of a *new concept* of manufacture. Not always do artisans work with raw steel sheet. Not always is the final finish applied by the extra step of painting or plating. With Nickeloid Metals this finish is built-in, and it's done by a company which has dedicated itself to electroplating of sheets and coils for industry for over 60 years! The use of Nickeloid Metals as a pre-finished raw material proves the theorem that a straight line is the shortest distance between two points. Write for free Introductory Kit that unfolds the entire story and provides you with metal samples. Or, phone a Nickeloid sales office in one of the principal cities.

AMERICAN NICKELOID COMPANY • PERU 13, ILLINOIS

America's Pioneer Manufacturer of Pre-Finished Metals — Since 1898

NEWS *continued*

A one-day SPE Regional Technical Conference on the same subject will also be held in Springfield on April 20.

Whirlpool previews 'space kitchen'

How American astronauts will dine in space can be seen on the 24th of this month when the Whirlpool Corporation unveils its "space kitchen" at the Aerospace Medical Association Convention at Chicago's Palmer House. Whirlpool was retained by the Wright Air Development Division, Air Research and Development Command, USAF, to design, develop and build a unit which would store and dispense the food and beverages required by three men on a 14-day mission. In the picture above, William F. Saenger, Whirlpool manager of advanced industrial design, is checking a wood and cardboard mock-up of the kitchen.

Full scale model of astronaut's kitchen

World's Fair news

Daily dispatches from the World's Fair Corporation record that firm's progress in assembling a fair in Flushing Meadows. High-ranking personages are added to the staff nearly every day. For instance, the fifth general to be added to the administration, Brigadier General Sheldon Seymour Brownton, has been appointed Chief Medical Officer of the fair, in charge of a 16-bed hospital and five first-aid stations. And the three living former U.S. Presidents have accepted Robert Moses' invitation to share the honorary chairmanship.

The list of participants grows more slowly, but on March 15th IBM signed a contract for 50,178 square feet. Although IBM is not yet willing to discuss its plans, reports are that its exhibit will be designed by a team of well-known industrial designers. The largest space yet assigned in the industrial zone—149,920 square feet—has been acquired by Edward H. Burdick Associates, for a "Better Living Pavilion." Burdick will rent space to individual exhibitors, each of whom will provide his own designer.

Rheingold Beer, which signed a lease some time ago, has retained Tex McCrary to design its exhibit. (Architects will be Kahn & Jacobs.) McCrary said recently that although the final plan for the exhibit has not yet been decided upon, a name (The Oasis) has been chosen, and tentative plans have been made for a restaurant on either a ferris wheel or a platform elevator—the aim being, in either case, to create a sensation of "slow rise." Miss Rheingold will visit a number of foreign countries to pave the way for the exhibit, and young ladies from various foreign lands will, in turn, represent the beers of their countries at the Rheingold exhibit.

Wescon 1961 to include design

An industrial design exhibit to encourage better design of electronic products will be a feature of the third annual WESCON (Western Electronic Show and Convention) at San Francisco's Cow Palace, August 22-25. As in past years, prizes for outstanding designs, selected from among the products of the exhibiting companies, will be awarded to both manufacturers and designers (see ID, September 1960).

Products displayed in Nashville

"Design for You and Profit," a month-long exhibition depicting the industrial designer's role in American industry, closed late last month at Peabody College Arts Museum in Nashville. Sponsored by the American Society of Industrial Designers and Peabody, the exhibit attempted to show the designer as a "key man in interpreting consumer acceptance trends . . . a professional in the combined fields of art, merchandising and engineering." More than 100 items, ranging from fountain pens to major appliances, in the form of sketches, development drawings, prototypes, and case histories, illustrated the evolution of consumer products. Participating firms included Henry Dreyfuss, Walter Dorwin Teague, and Raymond Spilman.

AMA holds packaging exposition

What's new in packaging machinery, materials, methods, and services, as well as a forecast of what will be new in the next twenty-five years, highlighted the American Management Association's National Packaging Exposition, which just closed at Chicago's Lakefront Exposition Hall. The concurrent National Packaging Conference treated both consumer and industrial goods packaging from design and engineering standpoints. ID will carry a full report on the show in May.

Olin 1

2

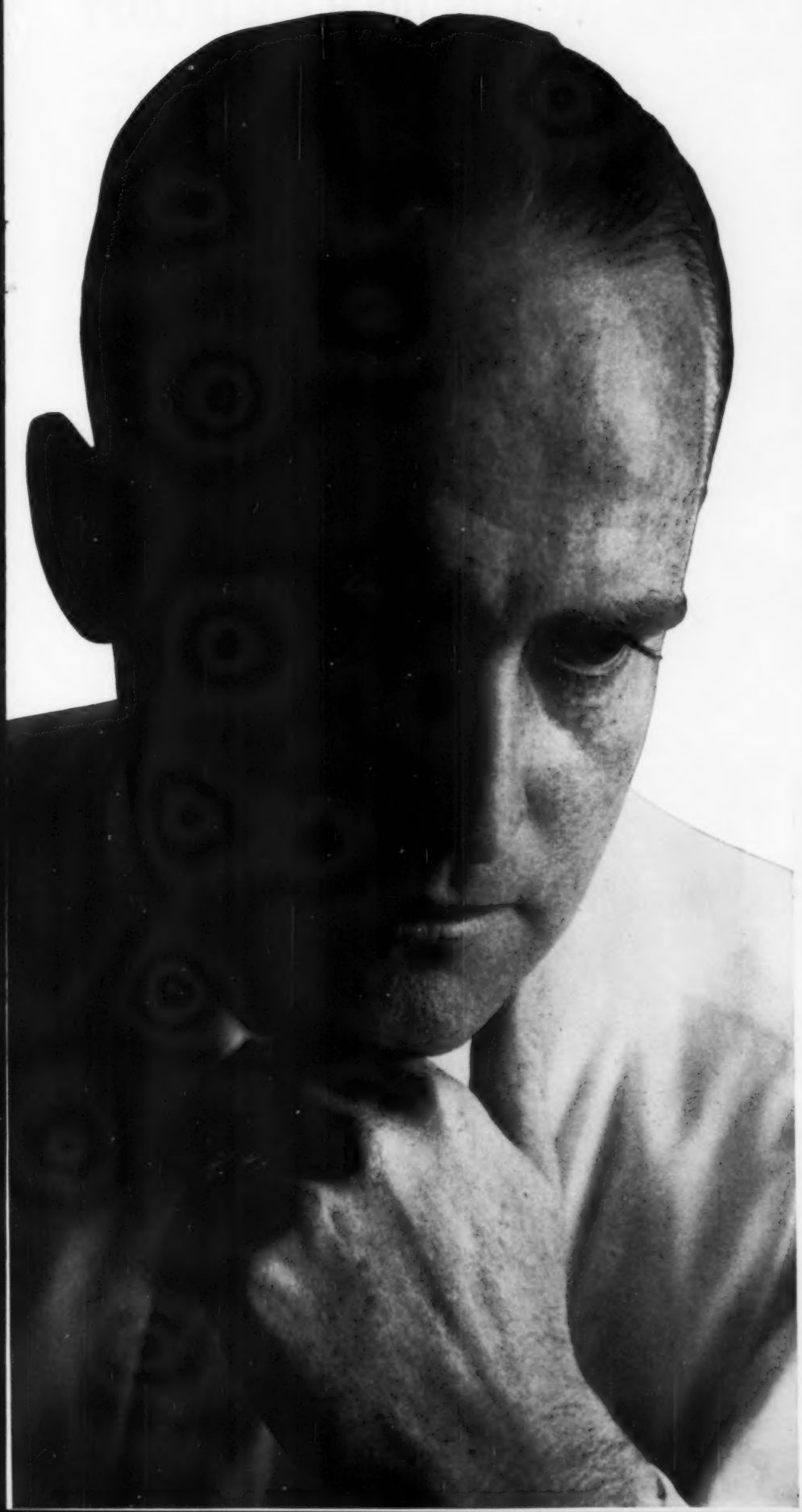
3

4

New symbols and packages

1. Olin Mathieson's new single-name symbol is heart of identity program extending even to division nomenclature changes. Designed by Lippincott & Margulies.
2. Symbol for U.S. Agricultural Exhibition in Cairo, Egypt, is part of larger identity program. Designed by Klein/Wassmann Design.
3. KVP Sutherland's egg carton has cell construction to hold eggs off flat bottom, straight sides.
4. Johnson & Johnson's glass Micrin bottle has frosted polypropylene closure. Removable labels set in debossed space use double gold and white borders. Oval label features stylized mortar-and-pestle and ingredient symbol. Designed by Donald Deskey Associates.

(*Continued on page* 23)



from new eyes, new ideas

You understand the industrial designer best when you know what he is not, as well as what he is. He is not a solitary genius who solves your problems single-handedly. He would never pretend to be. He is, instead, a skillful collaborator whose special values are his fresh, unfettered viewpoint and his willingness to break with tradition whenever that will serve your best interests.

Just such a man is Channing Wallace Gilson, whose course led him up from the ranks of U.S. Army privates to West Point, over Okinawa at the controls of a B-29, and through the classrooms of Pratt Institute and the Los Angeles Art Center School before he hung out his shingle.

Actually, "Chan" Gilson was training for his profession from that moment as a West Point plebe when he opened a little volume called *Missions of the Academy* and read these words: "To develop the powers of analysis so that the mind may reason to a logical conclusion."

This definition of the industrial designer's goal is still the best that he knows. It was with this attitude that he walked into the Industrial Products Division of International Telephone and Telegraph Corporation in San Fernando, Calif., to accept a new assignment—the design of a closed-circuit television camera. How he handled the job—how new eyes yielded new ideas—is told in the following pages.

THE ALCOA INDUSTRIAL DESIGN AWARD presented to Channing Wallace Gilson in recognition of notable achievements in design incorporating aluminum. Lester Beall, Robert Kolli, Just Lunning, Nanci Lyman and Jane McCullough comprise the distinguished jury of critics, editors and educators in the design field which chooses recipients of the award from the Alcoa collection of industrial design.

how to make a product wear its price tag proudly

Trimming cumbersome bulk, simplifying design to reduce manufacturing costs, providing easy access for servicing and, above all, making the product appear worthy of its high price. These were the multiple objectives in Channing Gilson's redesign of the ITT closed-circuit television camera and they had to be achieved in the face of a critical heat problem, since the vidicon picture tube loses clarity above 145°F. Sixty-four approaches were sketched before the solution was reached. Gilson and his associate, Jim McNary, are shown in the picture above.

Many a manufacturer has collided head on with this hard fact of marketing: It isn't enough that a product is functionally suited to its purpose; it has to reflect quality in its appearance to command an equitable price.

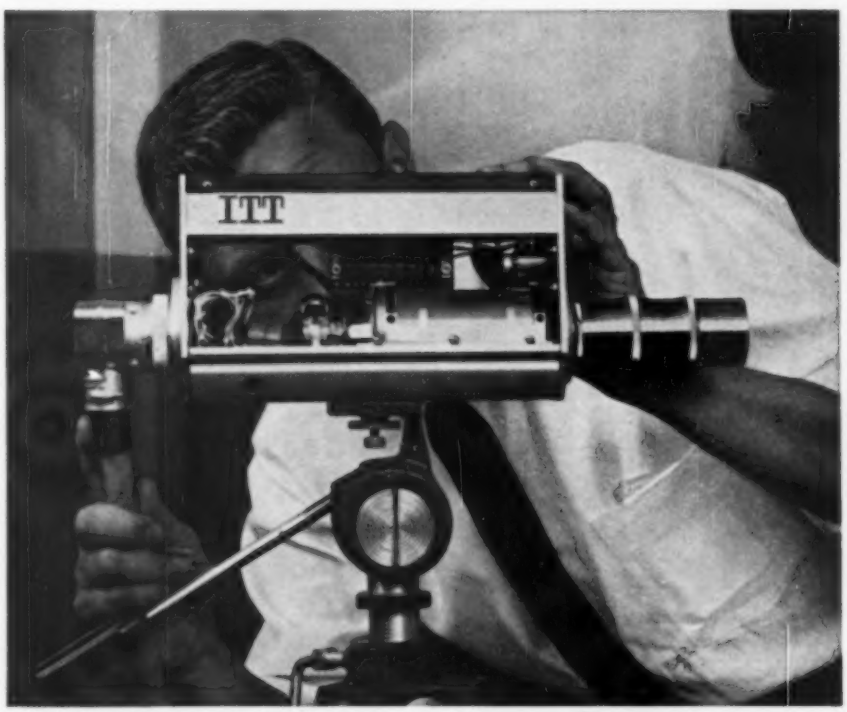
Just such a problem confronted Charles Aker, vice president and director of engineering for ITT's Industrial Products Division, in the closed-circuit television camera his company was planning to remarket in this highly selective commercial field. Its looks had to warrant a price of $3,200 per system. Aker's solution was one that many of his contemporaries have pursued; he called in a consultant industrial designer—Channing Gilson.

Sixty-four configuration sketches came off the drawing boards of Gilson's studio before his return to ITT's conference room. But the sixty-fifth showed what can come out of the partnership that typically develops between a skillful industrial designer and his client, even though refinements were still in order.

In Gilson's new design, the housing was as consistent with the image of quality as the elegant lens it carried. Marked reduction in size permitted installations in cramped spaces. A marriage of modern material and simplified design promised sharp cuts in production costs, along with easy access for servicing.

Working from the inside out, weighing the multiple factors of manufacturing, maintenance, human engineering and marketing, Gilson had given his client a rewarding competitive edge in a market where 38 manufacturers battle for business.

The design approach that Gilson finally presented to engineering, production and sales chiefs at ITT incorporated a genuinely novel breakthrough. It was built around an aluminum heat sink that guarded the sensitive vidicon tube from the high temperatures generated by other components and it utilized the high conductivity of the metal to dissipate heat through external surfaces. With the disappearance of old-fashioned fins and louvers, the camera took on trimmer lines. And now, with only seven structural parts providing both chassis and housing, manufacturing became simpler, faster and significantly less expensive.



It takes but 30 seconds to bare the innards of the new ITT camera for inspection or service, because Gilson nested one edge of the side panels in an integral groove in the bottom section of the housing, so that only two screws are needed to hold them in place. He also moved the cable connection from the bottom to the back for greater flexibility in installation.

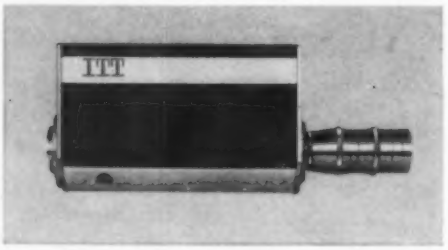
Advertisement by
Aluminum Company of America

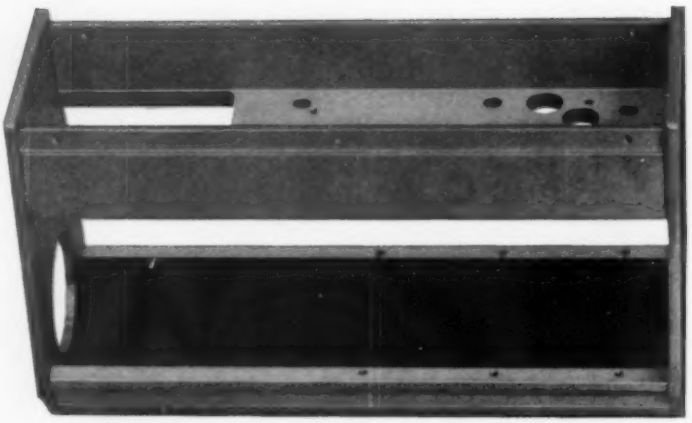
Aesthetic improvements that account for the look of quality are matched by functional gains in the new ITT closed-circuit TV camera designed by Channing Gilson. Reductions of 1¼ in. in height, 1⅜ in. in width and ⅝ in. in length permit increased flexibility for close-quarter installations. Efficient heat dissipation achieved with highly conductive aluminum removes a threat to sensitivity. Simplicity in design, characterized by economical extruded sections for key components, effects major savings in production. Only seven parts—bottom section, heat sink, two end plates and three sheet metal panels—are required for the combined chassis and housing.

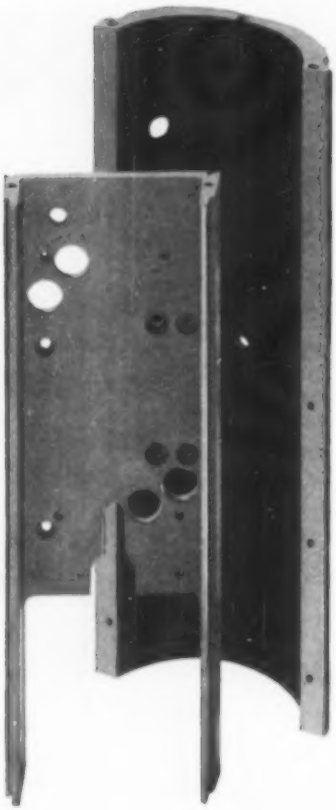
Banks need no longer take premium space for frequently consulted records. Instead, a closed-circuit TV system links the teller with the record files and she can check a signature or read a balance quickly and accurately from the monitor at her elbow. Safe observation of missile fueling and firing, traffic control, preventing pilferage in stores—these are but a few of the markets ITT serves with this product.

Aluminum is the designer's metal . . .

Channing Gilson's designs in aluminum range from the control unit of the famous Shopsmith all-purpose tool to the cast, blue-anodized drinking fountain he created for Haws and exhibited with distinction at the eleventh Triennale in Milan, Italy, and the Brussels World's Fair. They taught him that aluminum lends itself to more fabricating techniques than any other metal. So when die castings, first considered for the heat sink and bottom of the ITT camera, turned out to involve a $6,000 die cost plus $1 per unit for casting, Gilson and Aker switched quickly to extruded sections as far better suited to ITT's custom-quantity runs. Furnished by Alcoa in 20-ft lengths, they are cut to size, the web is drilled and tapped for screws to hold the end plates, and a final anodizing not only provides a handsome finish, but increases thermal emissivity to help heat transfer.







Alcoa is the designer's ally . . .

When the industrial designer approaches your product, he has an invaluable ally in Alcoa® Aluminum and in the technical resources Alcoa provides. No metal can be formed, joined, fabricated and finished by so many methods. No other metal affords, in every pound, access to such authoritative counsel on problems of application. This assistance is offered without obligation to you, your staff designers or the independent designer you retain. Call your local Alcoa sales office or write to: Aluminum Company of America, 841-D Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

NEWS *continued*

People

APPOINTED: **Gerry Preistley** (below) as an associate at Klein Wassmann/Design, Chicago. . . . **Charles MacMurray** (below) as manager of graphics and packaging, and **Ron Lane** (below) as manager of interior and space planning for Latham-Tyler-Jensen, Chicago. . . . **Roger C. Dart** (previously with Lawrence H. Wilson Associates) as staff designer at Dana Mox Associates, Glenview, Illinois. . . . **Morris Welch** as executive assistant to the president at Tom Lee Limited, New York. . . . **William I. Childs** and **Jimmy W. Hill** to the research and development staff of Hysol Corporation, Olean, New York.

AWARDED: To **Richard Franz Bach** formerly Dean of Education and Extension, and Consultant in Industrial Art at New York's Metropolitan Museum of Art and now Educational Advisor at the American Institute of Decorators, the first annual American Ceramic Society's Design Division Award. The Division established the award to recognize "major contribution to ceramic art and design in America."

HONORED: **Ray Engle** of Los Angeles, by the delegates to the regional planners conference held recently in Long Beach, California, for developing the symbol and graphics used at the event.

ACCEPTED: The chairmanship of England's new Council for Awards in Art and Design, by **Sir John Summerson.**

SELECTED: **Emily Malino,** New York interior designer, to create the 1962 "Room of Tomorrow." The purpose of the room, which is sponsored by a group of manufacturers, is to forecast the trend in hotel and motel guestroom interiors. It will debut on November 6th at the National Hotel Exposition in New York.

Company News

RETAINED: **McIntosh Design Associates,** Toronto, Canada, by Atomic Energy of Canada Limited, Commercial Products Division, for an extensive design and development program. . . . **Bruce Kamp Associates,** Philadelphia, by the Sheridan Machine Company for the design and development of a corporate identity program for all Sheridan units. . . . **Jon W. Hauser** (below), St. Charles, Illinois, as design consultant for Elkay Manufacturing Company. . . . **Mezey - Macowski Design Consultants,** Montclair, New Jersey, by B. T. Crump Company and Howell Company, Division of Acme Steel. . . . **Charles Butler Associates,** New York, by Riddle Airlines, to design the interiors of their DC-7C airplanes, and by Timmins Aviation, to serve as design consultants for the interiors of all executive, military and personal aircraft the company converts. . . . **D'Elia, Stolarz, Nishanian,** New York, by Renwal Products and Wolff Products. . . . Siegler Corporation's **Hallamore Electronics Division** (Los Angeles) by Convair Astronauts Division of General Dynamics, to design and manufacture a television instrumentation system for the Centaur Space Booster program of the National Aeronautics and Space Administration.

RE-CHRISTENED: R. Karl Ostrander Associates, Fort Worth, Texas, to **Lawrence Jones Design Associates,** with Ostrander moving to Texstar Plastics. Terrell Bridges, formerly with the Smithsonian Institution, will be design director at LJDA. . . . Stanley Electric Tools, division of Stanley Works, New Britain, Connecticut, to **Stanley Power Tools.**

ESTABLISHED: **Bowden-McRae Associates,** located at 832 Evanston Avenue, Muskegon, Michigan, by industrial designers **Benjamin Bowden** (above) and **Duncan McRae** (above). . . . **Warren A. Dillen Industrial Design,** at 4398 Poplar Level Road, Louisville, Kentucky. Dillen was formerly with Tarpey and Dillen.

GOING PLACES: **Dana Mox Associates,** formerly in Park Ridge, Illinois, to 238 Waukegan Road, Glenview, Illinois.

Events

Architectural Directions, an exhibition of the works of nine well-known architects, all residents of Fairfield County, Connecticut, is on display now through April 20th at Silvermine Guild of Artists, New Canaan, Connecticut. The show, which includes models, photographs, plan details and renderings, highlights the work of Eliot Noyes, Philip Johnson, Marcel Breuer, Victor Christ-Janer, John Johansen, Leon Levy, Joseph Salerno, and the firms of Sherwood, Mills & Smith; and Pedersen & Tilney. Carlus Dyer of Norwalk designed the catalog and was in charge of setting up the exhibits.

"The Creative Fire" is the theme of the **11th Annual Exhibition of the Baltimore Art Directors Club,** which will run from April 18-29 in the main gallery of the Maryland Institute of Art, Baltimore. An awards luncheon will be held at the Sheraton-Belvedere Hotel on April 17th.

The 1961 convention of the **American Society of Tool and Manufacturing Engineers,** scheduled for May 22-26 in New York City, will include a tool exposition at the Coliseum and an engineering conference at the Statler Hilton Hotel. There will also be a tour on May 24th of Grumman Aircraft's Bethpage plant.

The 63rd annual meeting of the **American Ceramic Society** will be held in Toronto at the Royal York Hotel, April 24-26. Speeches and panel discussions will cover such topics as the contribution of design to marketing success, design trends in Canada, and a reassessment of designer education.

The sixth **Visual Communications Conference,** conducted in conjunction with the Annual Exhibition of Advertising Art by the Art Directors Club of New York, was held at New York's Commodore Hotel, March 22 and 23. One of the subjects covered was "Current Trends in Typography," the theme of a panel discussion led by Ed Gottschall, editor of *Art Direction.*

A photographic **exhibit of interiors,** displayed last month at the Architectural League of New York, will begin a two year national tour in September under the direction of the American Federation of Arts. Among the participating firms were: Norman Cherner, Paul McCobb, Donald Deskey, Walter Dorwin Teague, Ketchum & Sharp, Alexander Girard, Raymond Loewy and Michael Saphier.

An exhibition of the **graphic design of Ladislav Sutnar** is currently on display at the Contemporary Arts Center of the Cincinnati Art Museum. The show will run until May 3rd.


Preistley


MacMurray


Lane


Hauser


Bowden


McRae

COMING NEXT MONTH

Packaging news

As in past years, the American Management Association is preparing a mammoth national packaging exposition (the thirtieth) which will be held next month in Chicago's new Exposition Center — alternately called McCormick Place or the Lake Front Exposition Center. Three hundred and fifty exhibitors will occupy nearly four acres of space on one floor. Packaging expert Walter Stern will serve as ID's guide to the most significant of the year's new materials, techniques, constructions and applications on display at the show.

New directions in exhibition design

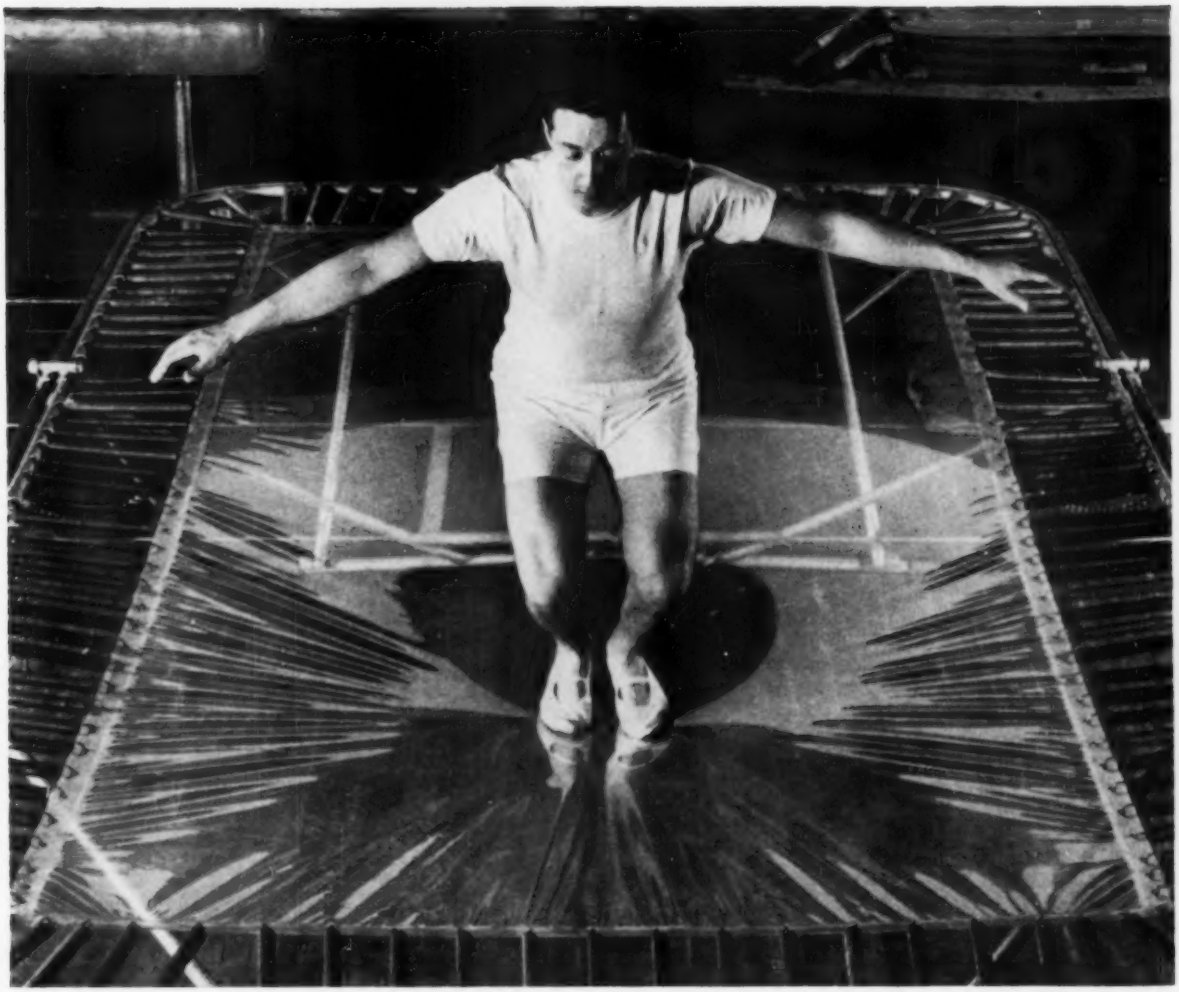
Charles Eames, Erik Nitsche, and the design department at New York's Museum of Natural History have all recently completed major exhibitions. Eames utilizes active participation machines, "peep shows" and animated films to describe the nature of mathematics and its history for the IBM-sponsored permanent exhibition at the new California Museum of Science and Industry in Los Angeles. At the Museum of Natural History's Hall of the Biology of Man, lucite laminated models, actual specimens, and colorful charts combine to interest and instruct the school child as well as the scholar. Erik Nitsche translates the material in Dynamic America*—a book combining the history of the General Dynamics Corporation with the technological history of America—into a tightly organized three-dimensional exhibition. The design techniques and approaches of all three shows will be described and evaluated in ID's report.*

Designers and the IRE

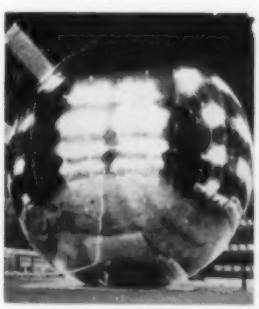
ID's review of the IRE (Institute of Radio Engineers) 36th annual exhibition at New York's Coliseum will evaluate this showcase of the electronic industry in terms of the designer's contribution. Some of the year's developments to be discussed include increasing use of color for components and new types of cabinet constructions.

Design review

The latest suburban tractors, power tools and other equipment for the garden, as well as the newest in electric shop tools, come up for review.



Tough, durable Mylar® cuts costs... improves product performance



1. Huge (100 ft. diam.) inflatable satellite of metalized "Mylar" stays strong and flexible in sub-zero outer space.

2. Permanent collar stays of "Mylar" last the life of the shirt . . . keep their shape even after hundreds of launderings.

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For example, "Mylar"* polyester film gives many products extra resistance to heat, cold and aging . . . lengthens their life. Today, "Mylar", with its resistance to chemicals and moisture, is improving the performance of products as different as surgical bandages and intercontinental ballistic missiles.

Can this unique plastic film and products made with it help you? For more information on "Mylar", write the Du Pont Co., Film Dept., Room S-8, Wilmington 98, Del.

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*"Mylar" is Du Pont's registered trademark for its brand of polyester film.

Better Things for Better Living . . . *through Chemistry*

DU PONT MYLAR® POLYESTER FILM

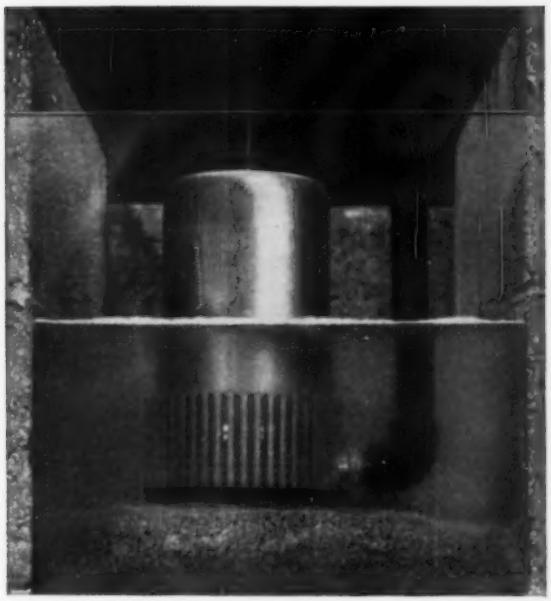
THE INDUSTRIAL DESIGNERS INSTITUTE ANNOUNCES THE 11TH ANNUAL DESIGN AWARDS PROGRAM

The IDI Design Award is a token of recognition bestowed on a designer or a team of designers for outstanding design of any product mass produced prior to May 14, 1961. The award is open to all designers, regardless of affiliation.

submissions Entries may be made either by the designer himself, or by anyone else on behalf of the designer. Copies of the submission form are obtainable from the address below. Forms must be returned postmarked not later than May 14, 1961.

presentation Announcement of the designers to be honored and presentation of the award medals will be made at a luncheon on June 22, 1961 at the Four Georges Room, Hotel Ambassador East, Chicago.

Request Forms From Jon W. Hauser, St. Charles Nat. Bank Bldg., St. Charles, Illinois



END CORROSION DAMAGE ...DESIGN WITH HIGH-DENSITY POLYETHYLENE

BAKELITE BRAND high-density polyethylene gives 100% corrosion resistance with strength and molding ease

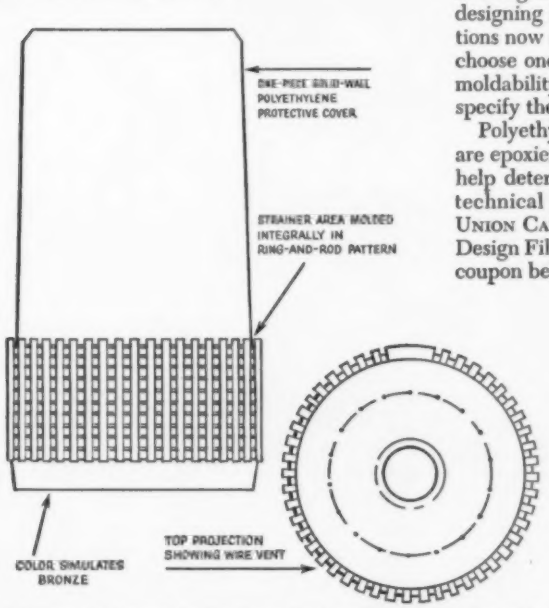
Strong Plastic Housing for Sump Pump—Fostoria Corporation's "Dynasumps," designed for rigorous underwater service, are housed in covers molded from BAKELITE Brand high-density polyethylene DMD-6001. The cover-strainers are deep-drawn molded in one piece by Haas Corporation.

Nothing to Corrode in This Cover—One-piece molding provides neat, tight-fitting cover with no screws, bolts, or nuts to vibrate, work loose or corrode. Drainage water and chemical detergents have no adverse effect on this completely corrosion-resistant component.

TYPICAL PROPERTIES OF DMD-6001

Properties	ASTM Test	Typical Value
Density, gm/cc	D 1505	0.950
Melt Index, gm/10 min.	D 1238	2.0
Tensile Strength, psi	D 638	3,400
Elongation, %	D 638	45
Secant Modulus (Stiffness), psi	D 638	100,000
Hardness, Durometer "D"	D 676	60

Easy to Mold, Tough in Service—Toughness and rigidity are characteristics of parts molded from BAKELITE Brand high-density polyethylene. Molding ease and flexibility go far in eliminating many common production problems. Result: a durable, smooth-functioning part that is resistant to water and most common chemicals.



Finding the right combination of properties needed in the product you're designing is made easier by the variety of BAKELITE polyethylene formulations now available. In addition to low, medium and high densities, you can choose one of the new polyethylene copolymers. Stress-cracking resistance, moldability, dimensional stability, toughness, flex life, rigidity—you can now specify the properties you require.

Polyethylenes are only one group of BAKELITE Brand plastics—the others are epoxies, phenolics, styrenes, and vinyls—from which you may select. To help determine the one you could use to your best advantage, call on the technical experience and know-how of UNION CARBIDE. Consult Sweet's Product Design File, section 2a/ui. Or just mail the coupon below.

UNION CARBIDE

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270 Park Avenue, New York 17, N. Y.

Please send me information about BAKELITE Brand Plastics for Design, with emphasis on these properties:

The type of application being considered is:

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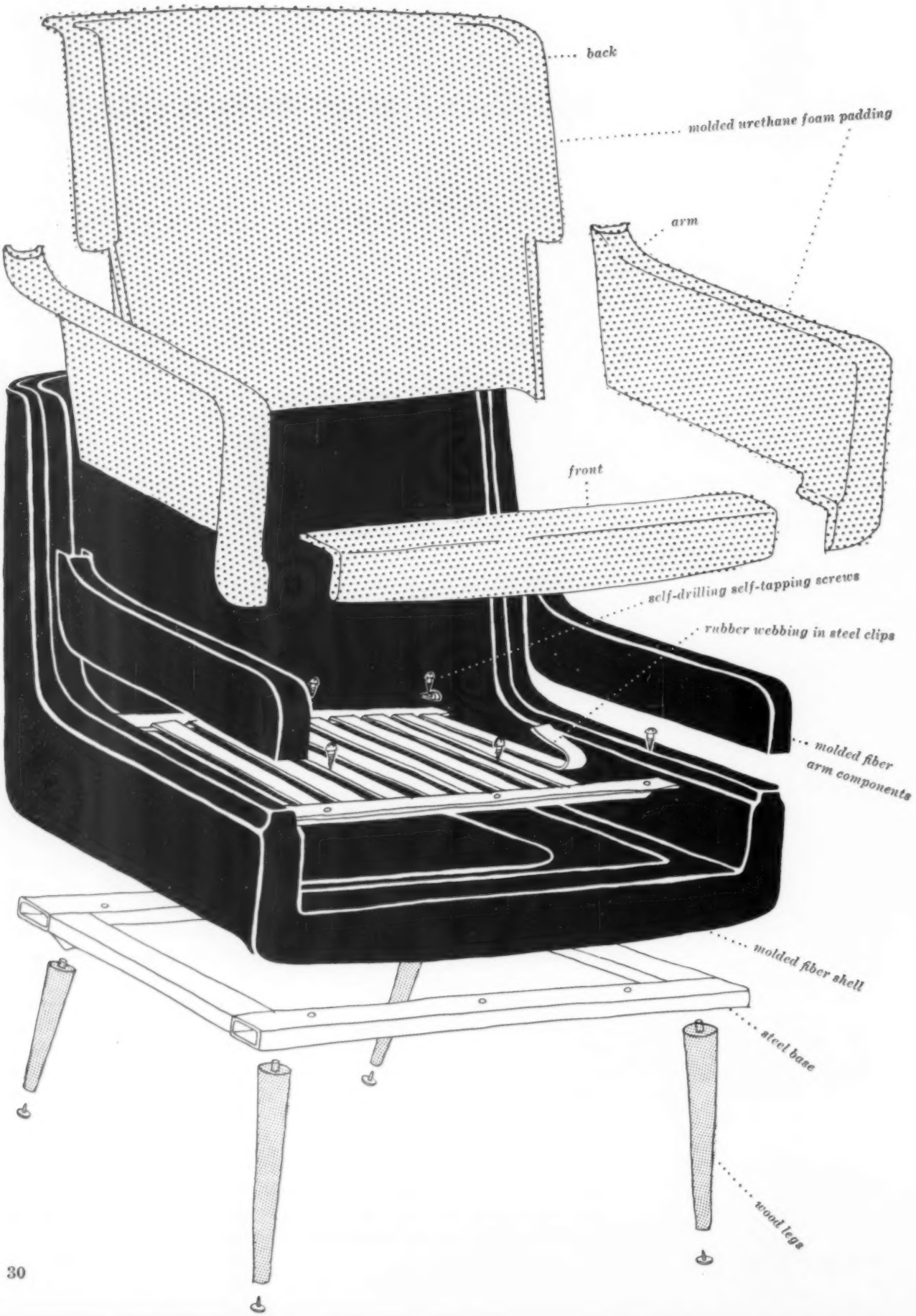
Don't look now but mama is everybody

No one with any compassion can help feeling sorry for the seven electrical industry executives who served prison sentences last month, but all the same it is hard to take much interest in them as men. Perhaps this is because their defense was that they were not guilty as men but as functions of corporate practice. The criminal conspiracy was not their conception; like Willy Loman's dream, it came with the territory. Even the judge declared that the real blame falls to the corporation, because the defendants "were torn between conscience and corporate policy." When you are torn that way, something has got to give; and it is easy to see what gave.

Despite the enormous amounts of money involved, the crime itself is not earthshaking. In a world crackling with hostility in Laos, the Congo, Algeria, Cuba, and the Jack Paar show, the effort of a few companies to dupe their customers and eliminate competition is petty enough. Normally it would be forgotten as fast as the last electrical industry scandal, in 1957, involving the movement of unregistered public relations personnel across the New Jersey border (who today even remembers the name of the blonde?). What lends a sobering significance to the present case is what the argument for the defense reveals about us all.

These were not, as we say, interesting men, and their defense was lodged in their very dullness. Since their guilt was a matter of record, none of them pleaded innocence; instead they pleaded Weakness (they could not buck the corporation)and Goodness (they served their churches, raised money for the Community Chest, sponsored the Little League). This is the classic plea of the burglar who couldn't help himself, Judge, but was always kind to his mother. But weakness is a weak argument to enlist in behalf of captains of industry; and the goodness they outlined is the sort of pulpy goodness one finds in commercially baked white sliced bread—artificially nourishing, standardized, and flavorless. Several attorneys said their clients were "pillars of the community," and went on to prove it by describing lives that, like the attorney's briefs, seem never to have risen to a higher pitch than that cliché. The Outlaw, the Pirate, the Robber Baron—all those gloriously iniquitous folk heroes who lived recklessly beyond the law — have been reduced to the civic-minded church vestryman obediently rigging prices in a committee meeting. Crime not only doesn't pay, it has been entrusted to men who haven't the imagination to enjoy it.

As a result of the scandal, one of the nation's business schools plans to institute a course in "business morality"—presumably it could be sandwiched into the curriculum somewhere between plant maintenance and cost accounting. That is not the answer. Business morality is what these companies were *already* practicing. What we need is not a business approach to morality, but a morality that can be applied to business, as well as to basketball and everything else that is important. In the meantime, if we have to make do with the old morality, we had at least better learn to state it more convincingly. The problem with these price riggers was not that Mama never told them, but that they never believed she really meant it. And they just may have been right about that.—*R. C.*


back
molded urethane foam padding
arm
front
self-drilling self-tapping screws
rubber webbing in steel clips
molded fiber arm components
molded fiber shell
steel base
wood legs

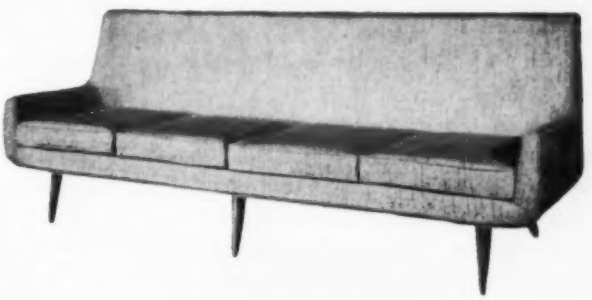
SEATING PRODUCED IN MATTER OF MINUTES

Walter P. Baermann Associates has designed a group of moderately-priced upholstered furniture pieces that can be assembled at the rate of 1000 a day

"I want living room pieces that can be punched out like covered upholstery buttons," said furniture manufacturer Rome Jones to industrial designer Walter Baermann in January, 1959, and he very nearly got what he asked for. At the furniture market in Chicago in January of this year, Jones' Prestige Furniture Company unveiled a new group of upholstered couches and chairs that look pretty much like a lot of other modern furniture, but that, in full production, will come off the Prestige assembly line at the rate of 1,000 chairs a day—a chair every two minutes. The line is called Image, and everything about it, from material to method, was determined by the Baermann office. "The problem was not one of furniture design," says Walter Baermann, "but rather of designing a system for the production of furniture." It was a problem

that led him into one of the most complete single product development assignments ever undertaken by an industrial designer.

When Jones came to Baermann with his emphatic request, there was some precedent for the wish, the willingness to back it up financially, and the expectation of success. Jones is a vanishing American type, the self-taught tinker-entrepreneur, and his factory—even before Image — was a testament to his talents. In nine years, the Prestige plant in Newton, North Carolina, had grown from nothing to a 300,000 square foot operation with an IBM control for processing materials, production steps, and costing. Everything that could be mechanized had been. The trouble was in the product. Prestige turned out a conventional wood-frame chair whose carpentry requirements thwarted total automation; and automation was what Jones wanted. He wanted it enough to consider building a whole new plant if it were needed (Prestige has added 40,000 square feet for the Image line). More important, he wanted it enough to give the Baermann office complete freedom to research in any direction they wanted to. ("For the first 18 months he didn't even see



what we were doing," says Baermann.) The only stipulation was that the result be acceptable in appearance and price to a mass-market, and that it match the competition in the latter, yet discourage competitive copying.

For almost a year the Baermann office spent all its Prestige time accumulating information. They catalogued all the current furniture manufacturing methods, and all the current types of furniture construction (see page 33). They investigated human factors research as it applied to seating design and to factory processes. They analyzed and compared costs of production, costs of packaging and shipping, costs of parts storage. And they investigated materials and forming techniques—an investigation that frequently took them to suppliers and fabricators never before associated with furniture. They talked to engineers, research chemists, aircraft seating people ("we thought it about time ordinary furniture took advantage of some of the comfort factors uncovered by research in dynamic seating").

Approached from this direction, a chair becomes less a finite object than a composite of working parts, and the Baermann office conceived of their goal as a structure containing (1) a seating element; (2)

springs; (3) padding and cushion; and (4) support or base. Naturally they hoped to double up as many of these as possible, but the ideal was not always feasible. Sometimes costs were prohibitive; sometimes the resulting form would have been too avant garde for a mass market. And sometimes the method or material was too new to have been checked out on long-range performance—although several of these are still under consideration and may be incorporated into future versions of Image (among them: a system for integral springing, and a method of molding upholstery fabrics into permanent shapes). In their search for a structural system, Baermann's staff considered a whole range of possibilities—skeletal framing of tubing and extrusions; integral skin and skeleton of thin panels bonded to an extremely light frame; rigidized, formed sheets of materials that could be stamped, vacuum-formed, and molded; thin shells with fill of various materials such as styrofoam or bonded wastewood; molded foams (urethane, styrofoam, foamed rubber) with or without molded-in reinforcing skeletons.

Out of this finally emerged a seating concept that begins with a two-piece molded fiber shell that is the basic unit for both chairs and couches. For the latter, it is sawed in half and a back insert section fits, telescope-fashion, between the halves. Several versions of arms (two already in production, five more on the boards), and a wing cap for wing-chair styles, fit onto the basic shell. All these are made by Hawley Products Company in St. Charles, Illinois (page 34). At the Prestige plant they are assembled with adhesive and staples (page 37), fitted over a steel base and fastened with six self-drilling, self-tapping screws. A steel clip, designed by Baermann, fastens onto the sides of the seating well and holds the Rotex rubber webbing springs. Over the assembled shell fit molded urethane back, arms, a front apron padding sections made by the Bostrom Corporation in Milwaukee (page 35); and over these goes a conventional fabric slipcover that attaches unconventionally with zippers and Velcro: half the zipper and Velcro tape is sewed to the fabric, the other half is bonded and stapled to the chair shell. The result is a cover that looks as taut and smooth as regular upholstery. Prestige makes two base styles that are shipped, knocked-down with the seating: one is tapered wood legs; the other is a wood cradle that snaps onto the shell by means of a special Baermann-designed fastener. At the end of the assembly line, the Image chair slides into a trapezoid-shaped cardboard carton that has been blown up by air pressure to receive it; the ends are capped automatically, sealed automatically, and Image is off to market.—*Betsy Darrach*

In the research stage, Baermann divided seating into five construction categories. (1) and (2) are subdivisions of a single category: skeletal framework. The first is of steel or aluminum tubing; the second, of cast aluminum side members with extruded stretchers and slats. (3) is a stressed skin of wire mesh, expanded metal, fiberglass, vulcanized fiber, or vacuum-formed plastic sheeting with a frame of metal rod or tubing. (4) is a molded shell, similar to stressed skin, but requiring no supporting frame. It could be made by draw-forming sheet or expanded metal, metal mesh, or vulcanized fiber; by die-casting aluminum, wood chips, or plastics; or by matched metal die molding of reinforced plastics. (5) is panel construction, using stamped metal panels or wood panels of laminated or sandwich construction. (6) achieves structure from sheer bulk of foams, microballoons, or shredded balsa with wood or metal inserts for strength.

The seating element, according to Baermann's anatomical breakdown, could be supported by either a structural or non-structural system of legs. In the former category is the "Barcelona" type of chair (7), in which the legs are also an element of the seat structure. Examples of non-structural support include screw-in tapered legs (8) or pedestal base (9).

Seating resiliency also breaks down into a few basic forms. For example, a flexible or rigid platform (10) can be suspended from the corners of a seat frame by spring mountings. But commonest form of all is probably compression or extension elements (11) used individually or fastened into a drop-in frame so that all lateral stress is taken by frame members. Newest concept is integral springing (12) which exploits the resilience of the shell material itself.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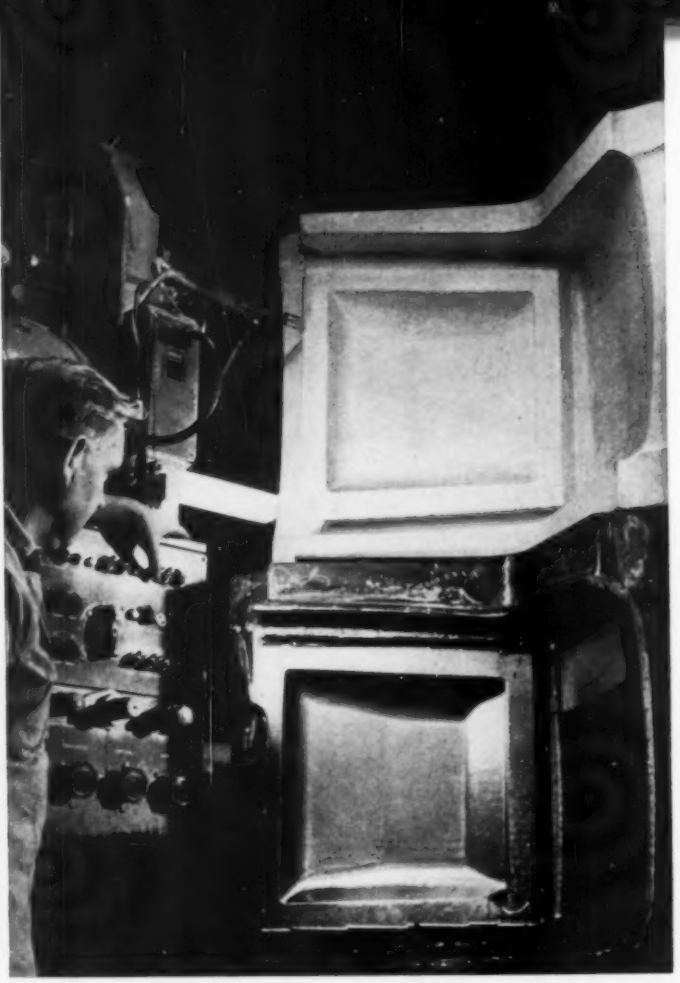
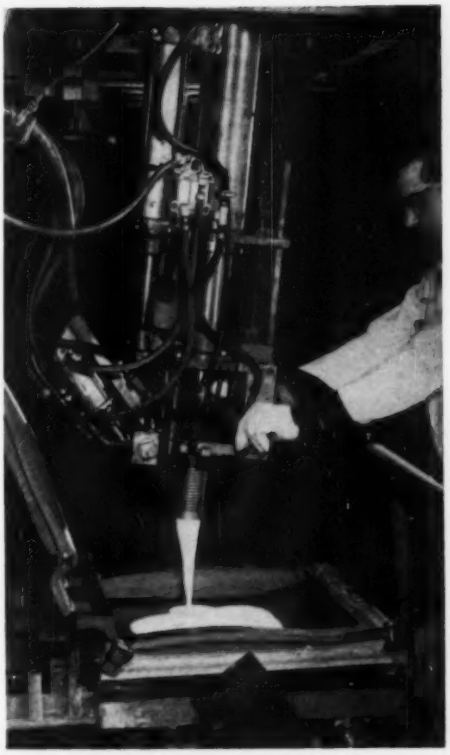
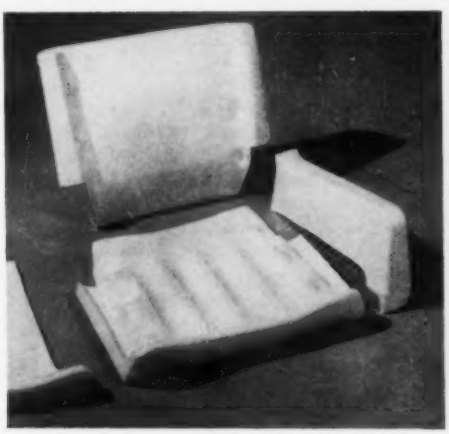


Basic shell is molded of fiber by Hawley Products Company of St. Charles, Illinois. Although Hawley had never before done anything associated with furniture, it had used its process for luggage frames and speaker housings, and its material had proved to be strong enough to use for hollow-form structures without additional internal bracing or fill. The process, which is similar to felting, combines wood, glass, and other fibers with various resins and with water. The resulting slurry is poured into preform dies where excess water is drawn off by vacuum; then the preform is transferred to match-mold dies where heat and pressure bond the ingredients into a stress-skin shell. At first Baermann and Hawley engineers tried a three-part shell, later simplified it to the two-part shell which now forms the basic unit of all Image pieces. The dies themselves, shown here, were molded first in epoxy (top left), then contours of each of the four models (two for top half of shell, two for bottom) were translated into cast iron match-mold dies (top right) by Keller tracer, an electrical version of pantograph. Drainage slots are cut into inside half of match-mold (bottom left) to carry off steam created by damp preform in heated dies. Surface of outside half of dies is hand-ground (bottom right) to remove ridged pattern left by Kellering.

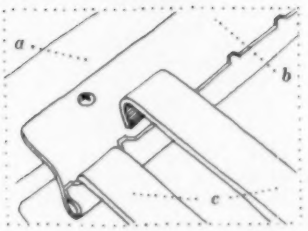
Foam padding is molded in contoured sections by Bostrom Corporation, Milwaukee; the material is urethane. Unlike Hawley, Bostrom had worked extensively in the seating field —particularly in dynamic seating for aircraft, tractors, and trucks—and its research staff, which included a psychologist and a physician as well as engineers and technicians, had amassed a considerable body of information on the comfort factors in seating. The Image padding benefits from this. In the Bostrom process the foam is metered into aluminum molds (top), cured in ovens, then stripped from the molds (center), and passed through crusher rolls to release trapped air or gas. Top and underside of back padding, and inside and outside of arm padding are shown (bottom); other padding elements include another arm style, a wing cap for wing chairs, back insert padding for couch styles, and apron padding for front of shell.





1. At the Prestige plant, assembly begins with the joining of the basic two-part molded fiber shells; this is done with staples and an adhesive bonding agent (no filler is needed because the shells are strong enough without it). The photographs that follow are facsimiles of the factory process, not actual production shots. In actual production, most of these operations are done mechanically.

2. Image has two types of base: tapered legs and a cradle. Both are designed to be assembled on showroom floor by dealer. To simplify cradle attachment, Baermann designed this snap-lock which engages simply by pressure.



3. Cut-away view shows assembly of shell to steel frame base. At the same time, a steel clip (b, above), designed by Baermann to hold Rotex rubber webbing springs (c), is also attached to shell (a).

4. Image has removable upholstery, but it fits as smoothly as permanent upholstery because of a unique method that Baerman's office devised for holding it in place. One-half of a zipper (or a Velcro tape) is attached to the upholstery, the other half is attached to the chair shell. There are two such fastenings: one runs completely around the base of the chair, an inch or so in from the edge; the other runs around the inside seat.

5. One of two pre-assembly operations handled by Prestige is the making of upholstery slipcovers (the other is the making of the two styles of wood bases). This is also one of the few hand operations in the whole process — seamstresses run the machines. In the photograph a zipper is being sewn into center back of a chair cover. Buttons for button-tufted versions of seating are also covered with upholstery fabric at this point.

6. Upholstery slips over padded chair and a conventional zipper arrangement closes it at the back. After this, the two Baermann-designed zipper arrangements fasten the upholstery to the shell. To make sure that this upholstery cover always fits as smoothly as the permanent type, differently sized cutting patterns are used for each type of upholstery fabric, since some fabrics have more "give" than others.

7. For couches, the basic shell is sawed in half and a back insert section is fitted between the two halves, sliding into their open ends to make a couch as long or as short as desired. The telescoped sections are glued and stapled together.

8. The two zippers (or Velcro tapes) that attach the upholstery to the shell are fastened to the couch shell, just as for the chair (see photograph 4). These tapes have previously been coated with an inactive adhesive. After they have been anchored in place with staples, the tapes are sprayed to reactivate the adhesive and bond them permanently to the shell. Normally, a jig simplifies positioning of the tapes (it appears in photograph 4).

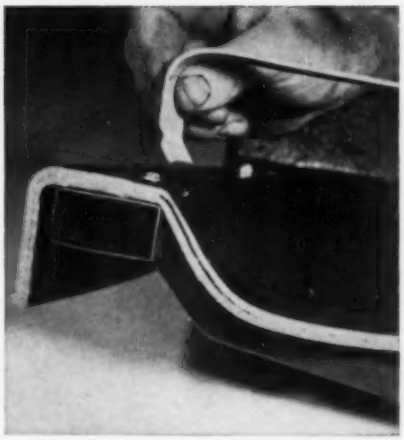
9. Adhesive-coated Velcro tape is applied to bottom of couch shell. Adhesive on both this tape, and that of zipper (step 8), will subsequently be reactivated to complete bond.

10. Molded urethane pad components are bonded to fiber shell of couch with adhesive. On some back sections there is another step: when button-tufting is to be used, a gripper post is attached to padding and the button, actually a gripper button, snaps over it after the upholstery fabric is in place. This means that even the upholstery of button-tufted models can be removed for cleaning.

11. There is a urethane padding form for every arm style (so far there are only two, but Baermann has at least five more in-work). Arm padding is also glued in place.

12. At the end of the production line, the Image chair or couch slides into an open-end trapezoid-shaped shipping carton which has been blown open by air pressure. The carton is capped automatically at both ends, and sealed automatically. This assembly line packaging concept was developed jointly by Baermann and engineers of Mead Carton; Baermann's office also designed the carton graphics, including the new Prestige symbol.






on Special







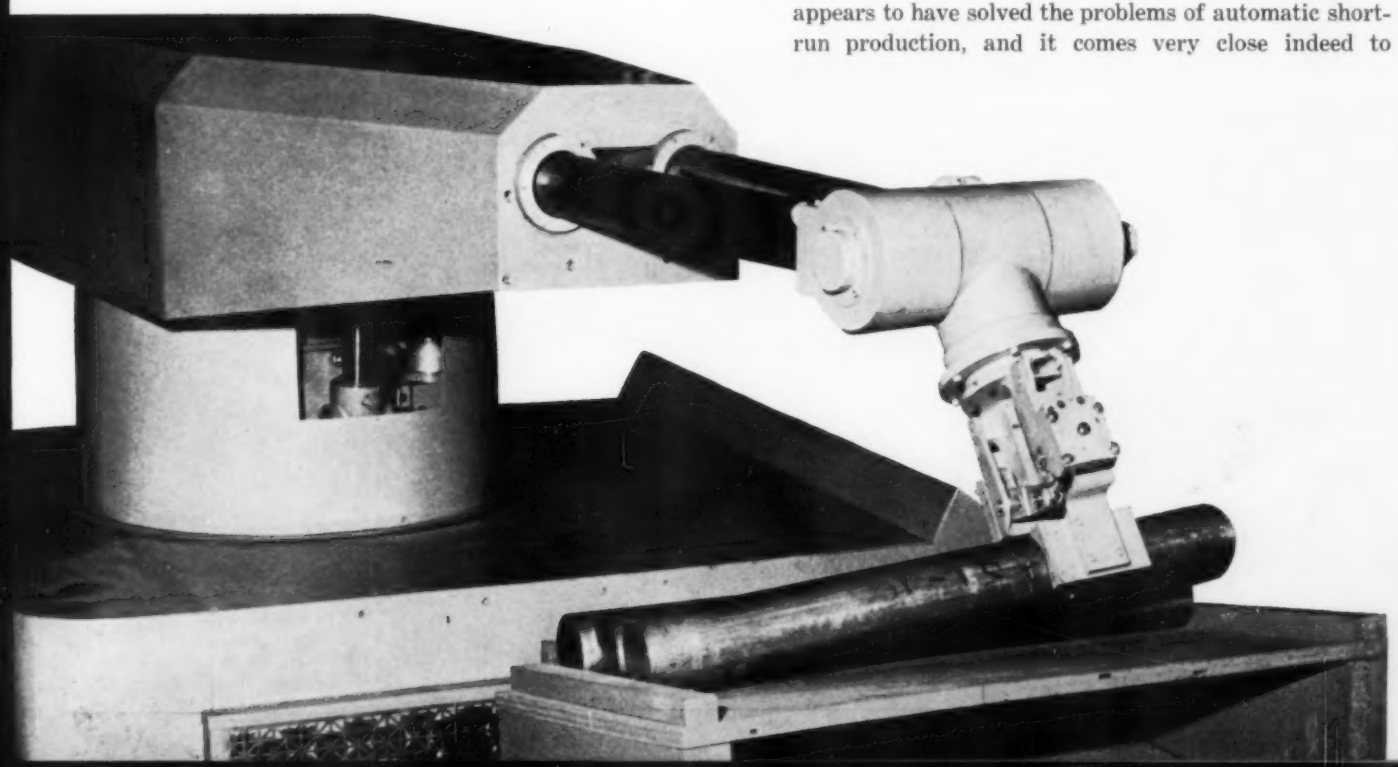
Image
ADVANCED FURNITURE BY PRESTIGE

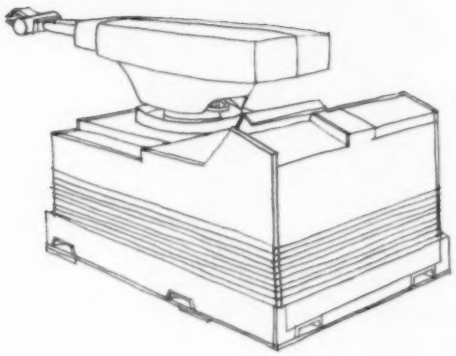
VERSATILE ROBOT MAY DEFY OBSOLESCENCE

Consolidated Controls Corporation delivers "Unimate," a robot which is taught on the job by being led through the motions, thus permitting short-run automation

For several years U. S. industrial management has been eyeing the prospect of wide-scale automation with its promise of greater plant and manpower productivity, reduced costs, lower prices, and higher profits. But the prospect is not all clear sailing, and if automation can be said to have developed a tradition, these are its traditional problems: the high initial cost of automation production equipment, the rapid rate of obsolescence for products and processes, and the expensive necessity of having a highly trained programmer to reinstruct the equipment every time the process needs an amendment. Now, however, an untraditional kind of automation is available that circumvents most of these. It is called Unimate, and it has been developed by Consolidated Controls Corporation of Bethel, Connecticut, under the guidance of the man who conceived it, CCC's president, Joseph Engelberger.

Unimate is a robot which can be taught a wide range of functions by simply being led (by the hand, as it were) through the motions once. Significantly, it is a true robot as opposed to the handling devices common today for use in hazardous operations—i.e., Unimate needs no operator. It therefore escapes from the "master-slave" relationship that is currently characteristic of automatic equipment. After Unimate has been taught a job, a unique memory drum allows the machine to continue its task until it is ordered to forget and is led through a new set of paces. Instructions given to a machine at one location may also be relayed electronically to the memory drums of other Unimates located at remote or hazardous areas. The robot can be moved from place to place. It can be taught by anyone who knows the job he wants it to do. It appears to have solved the problems of automatic short-run production, and it comes very close indeed to

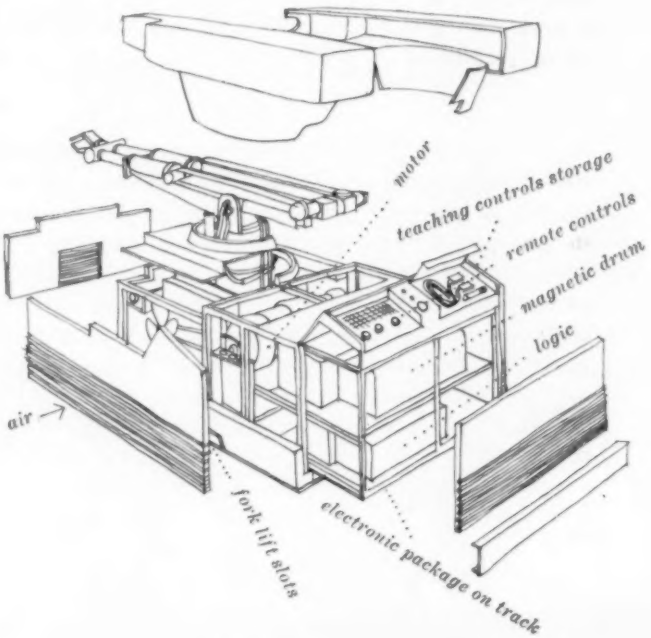


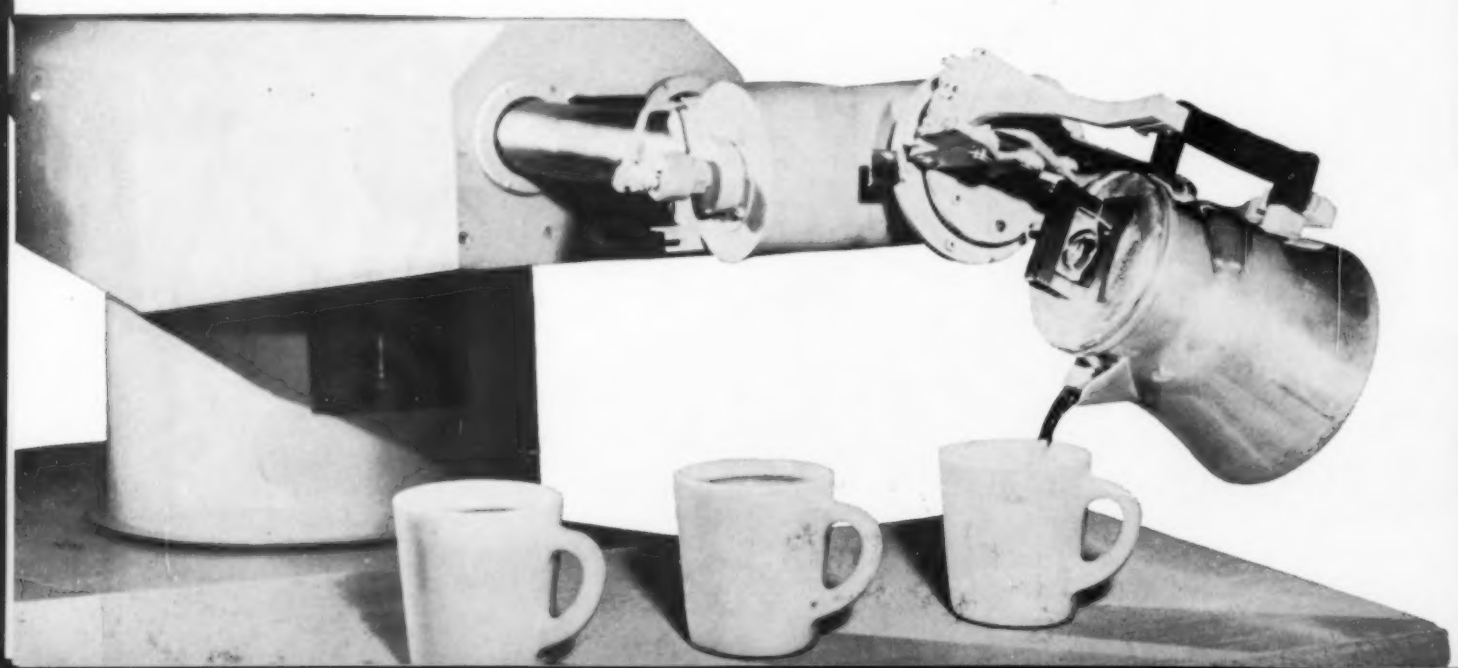


defying obsolescence by virtue of its almost unlimited willingness to learn new tasks.

Photographs of a prototype model at work are shown in these pages, with drawings of a proposed design for the ultimate production model.

In a manufacturing plant Unimate will presumably be regarded as a piece of general-purpose equipment with an obsolescence factor vastly superior to that of special-purpose automation. It has a collection of hands which adapt to various delicate or rugged operations. Its design permits five degrees of freedom,enabling it to grasp an object in any position within a swept volume of 350 cubic feet, and its memory drum has a capacity of 16,000 units of information. This flexibility permits, for example, assembling parts one month, feeding a lathe the next, operating a welding gun the third month, feeding a forging press the fourth, loading a conveyor belt the fifth, operating a punch press the sixth, and so forth. According to the manufacturer, any hazardous, hot, noisy or tedious job is a prime prospect for Unimate. Physically, Unimate bears little resemblance to a human or even to a conventional robot. A box-like base contains all of the control and operating mechanisms. A pedestal supports a column from which the arm extends. Its muscles are hydraulic and allow telescoping action from 3 to 7 feet; in a horizontal plane the arm sweeps in an arc of 220 degrees; vertically, 60 degrees. It can reach objects from 4 inches off the floor to 90 inches high. At the end of the arm, a wrist bends and rotates with a joint terminating in an interchangeable hand, pneumatically operated so that the pressure with which it grasps an object can be controlled by a varying air pressure supply. It handles 25-pound loads under full speed and can accommodate up to 75 pounds running at reduced rates.



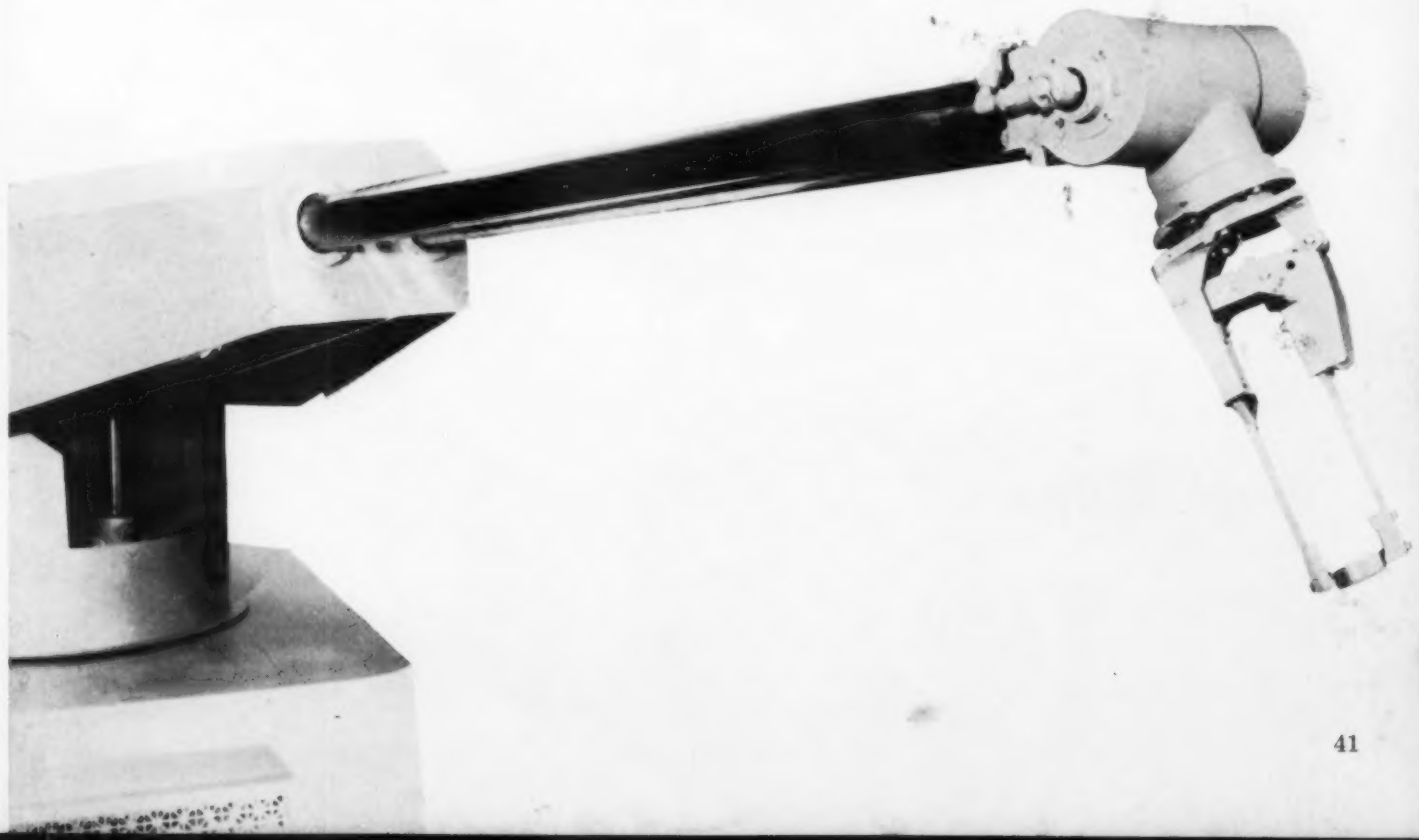


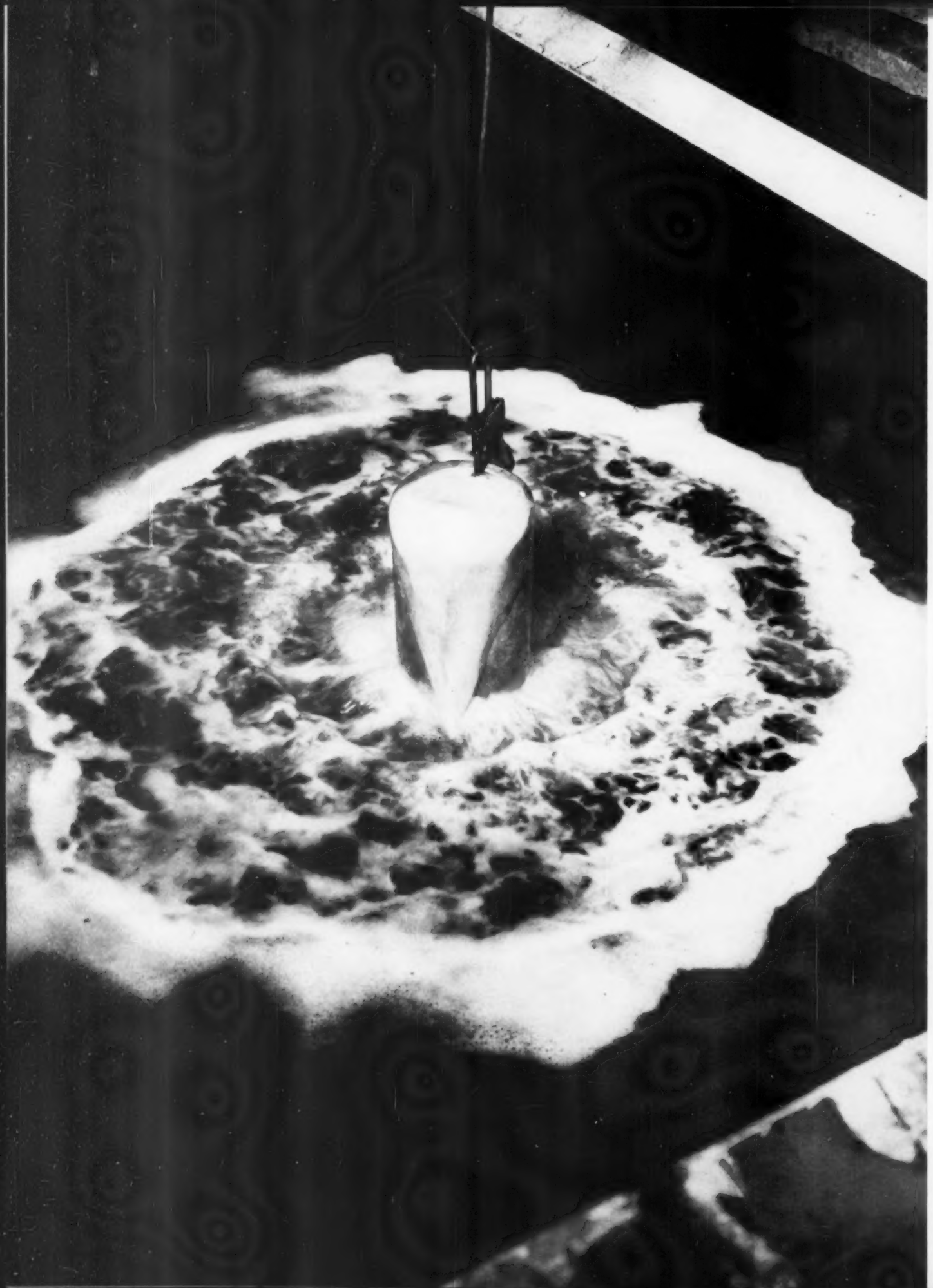
The brain is a patented memory drum, trademarked "Dynastat." Its surface can be either magnetized or erased in a pattern conforming to instructions recorded when the arm was led through its task for the first time. Thus the drum simply steps from one position to the next, waits for a signal that the arm has assumed the correct position, and then steps on to present the next set of positioning instructions. Furthermore, the memory drum can also control external devices. In feeding a punch press, for example, it can actuate the press after the work piece has been positioned and the hand withdrawn to a safe distance. Dynastat was largely developed by Engelberger; given a brain, the body was almost inevitable, and Maurice J. Dunn was assigned as project engineer to develop the prototype robot shown at work here.

Walter Dorwin Teague Associates were retained to design a production model, and they were promptly confronted with the two horns of a dilemma. In order to sell the machine to management, its form should suggest its function and significance. But the function and significance of Unimate is that it replaces humans, and this could have both positive and negative results. Management is likely to welcome its contribution to the production process, but may shy away from its consequences in labor relations. Unimate must therefore look as versatile as a man, but should not look like an anthropomorphic rival.

At the Teague offices Milton Immermann and Danforth Cardozo set up design criteria to come to terms with the dilemma. Considerable emphasis was placed on the control area in order to strongly suggest the need for an operator. In the Teague proposals, controls are clearly defined on the machine and the panel is divided in terms of function. One side carries the buttons needed to teach the machine how to do its jobs. This section also accommodates various cables and control extensions which are carried by the operator while he is doing the teaching. The other section houses the operating buttons used while the machine is engaged in its work cycle. Between the two sections a wide strip divides working from teaching areas, and this space is occupied by various safety devices. Teague's recommendations include an injunction to cover the control buttons so as to minimize accidental or curious punching.

Environments are considered to the extent that Unimate is particularly useful in hot, noisy, dusty, uncomfortable areas. The machine will be functioning in conditions far from the usual spotless hospital-like atmosphere associated with automation. And the machine should look "rugged," so that it will suggest familiar associations to its operator—that is, so that it will look, however slightly, like just another piece of standard machine tool equipment.—*R. B.*





SHAPING METALS WITH SPARK AND FLUID

New metal forming techniques use the corrosive action of chemicals and electricity to shape ultra-hard materials into design configurations impossible with conventional tools. BY LESLIE D. GOTTLIEB

Spurred by missile and satellite requirements, recent aircraft industry developments in metal fabrication are opening up versatile and economical design possibilities for every manufacturer who has to shape metals intricately. The searing heat caused by projectiles leaping into space — plus the tremendously expensive energy needed to boost their weight — calls for ultra-hard, light-weight metal alloys. But machining these materials to shape is sometimes impossible with conventional tools. For one thing, the materials are harder than the tools; for another, their surfaces are so much distorted in the tooling operation that their physical characteristics are often changed. Add to this the fact that the metal must be shaped into unusually complex forms, and the task seems herculean. However, the aircraft industry has effectively solved some of these problems by spearheading research into entirely new fabrication techniques.

New forms of energy are the key to many of today's technological advances, and accordingly the new metal shaping techniques make use of energy sources never before considered relevant. Where conventional techniques use metal or abrasive carbide or diamond tools to gouge and cut metal to shape, the new techniques— chemical milling, electro-discharge machining, and electro-shaping — use, respectively, chemical etchants, electrical sparks, and combinations of the two.

That sparks and chemicals can corrode metal is no recent discovery, but only within the last 10 years have machines and processes been perfected that are capable of applying that fact to the controlled removal and shaping of metal to specification.

This report will discuss how and where the new techniques are used and will indicate both their advantages and limitations.

What looks (at left) like a surging, foaming vat of beer is actually a tank filled with chemical etchants being used, in this case, to reduce the wall thickness of an aluminum tube. The process, called chemical milling, is discussed overleaf.

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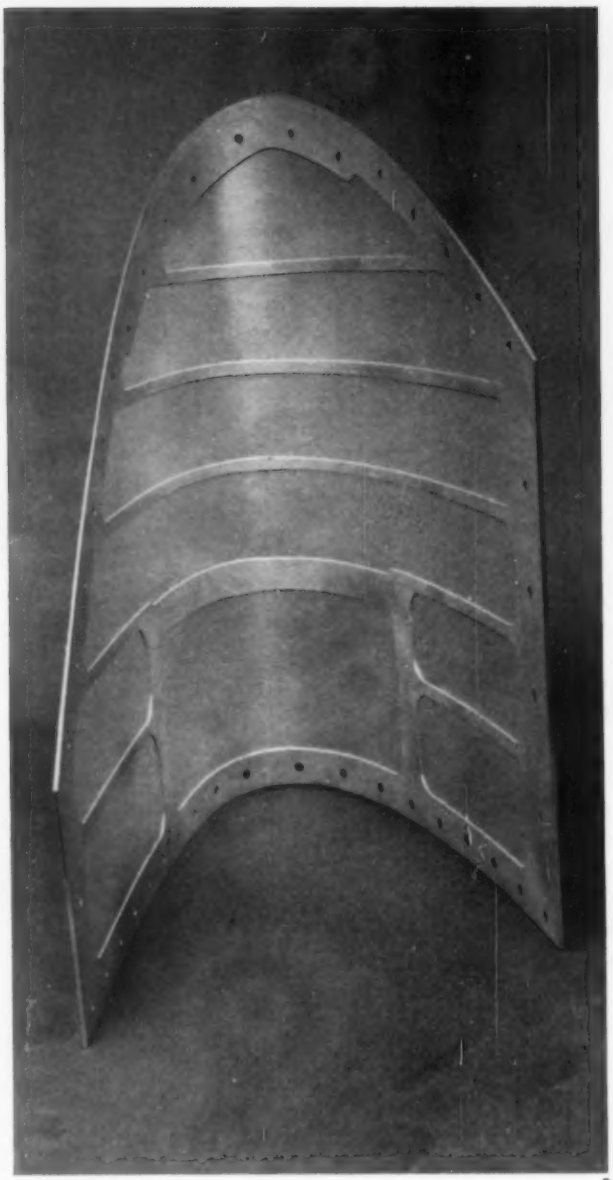


2

Chemical milling

Chemical milling is the controlled dissolution of metal by chemical etchants, and to date the process has been used primarily by airframe manufacturers.

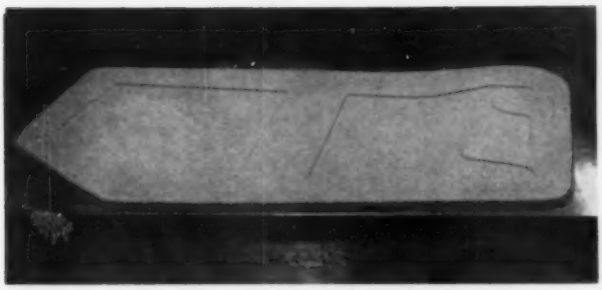
Its major advantages in airframe manufacture are clear. In each of the following applications the chemical milling process does a job that would be either too costly or wholly impossible with conventional machining techniques: reduction of body panel thickness by removing metal from large areas to shallow depths; reduction of overall weight and dimensions of framework members such as longerons and spars; and production of integral raised areas on body panels for stiffness, thus eliminating the need for riveting or welding ribs, or other stiffeners.

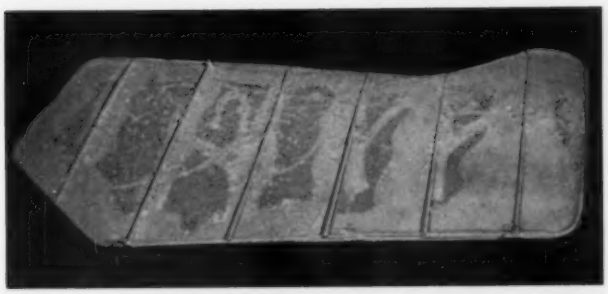
Unlike conventional processes, chemical milling does not limit the shape or direction of cut, does not impair physical properties of metal cut, requires no expensive holding fixtures associated with conventional machining, yields tolerances of plus or minus .002 inch, permits tapering of flat or contoured parts, and, in most cases, requires no such additional surface finishing as sanding or polishing. Perhaps most striking, the process permits weight reduction of contoured parts *after* forming operations have been completed.

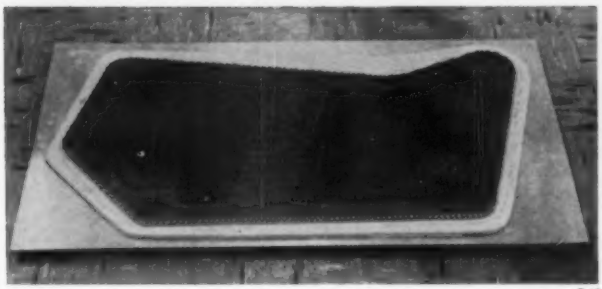
It was not until 1953, when the continued development of the missile program demanded renewed research efforts into every possible metal fabrication technique, that chemical milling was developed as an industrial process in the North American Aviation Company's laboratories. Ownership was turned over exclusively to Turco Products, Inc., Wilmington, California, and since 1954, more than 60 companies have been sublicensed. At first, the process was limited to a few alloys of aluminum. But now virtually all aluminum and magnesium alloys, titanium alloys, many steels, and the high-nickel, high-temperature alloys can be processed.

Briefly, the process consists of four basic steps: 1) Cleaning; 2) Masking the surface not to be exposed to the etchant; 3) Etching by immersing in the chemical etchant solution — the rate of metal removal is independent of the material's hardness and toughness but is keyed to composition of the etchant (which differs with each metal) and the length of immersion time; and 4) De-masking, by stripping off the rubber-like maskant by hand.

Of course, chemical milling, like all fabrication techniques, has limitations. The chief one is depth of cut







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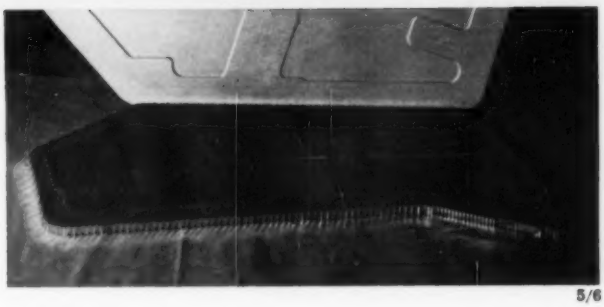

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when masking materials are used (for surfaces that are to be reduced only in specific areas). Cuts deeper than one-half inch cause gas to collect under the edge of the maskant. In addition, the process cannot be used to produce thin slots or cavities, because the etchant acts uniformly on all surfaces, and therefore would etch the walls of a cavity at the same rate as its base, yielding a hole with width equal to depth. For the same reason, all such surface irregularities as scratches, waviness and thickness variations are retained in the chemically milled part. Finally, the size of parts is limited to the size of the etching tanks available; the largest tanks in the industry are 50 feet long.

Despite these drawbacks the process has proved itself, and the industry's most recent significant development has been a method for low-cost production of contoured honeycomb, the strong, light-weight core material used between thin aluminum and steel skins for aircraft and missile body panels, floors, doors, etc., and also in such commercial materials as building wall panels, flooring for trailers, and truck panels. The new chemical milling achievement offers greater dimensional accuracy, and also permits production of complex inside double curvatures and fine-tapered, thin sections impossible with the expensive and time-consuming conventional methods—machining and crushing.

The production of honeycomb core section for a Northrup T-38 Talon landing gear strut illustrates its cost-saving capabilities. The part was milled from a pre-production thickness of ¾ inch to a final thickness varying from 30 to 670 mils, with some areas feathered to zero mils. One thousand parts machined and crushed would cost $120 per unit; chemically milled they would cost $88 each—a saving of $32,000.

Some applications of chemical milling in the aircraft industry are illustrated on these two pages: (1) A casting, compared before and after (left) chemical milling, is reduced in weight and wall thickness to a degree impossible with present casting techniques. (2) Wing skin section lightened by removing material not necessary for strength requirements. On this page, the sequence shows chemical milling applied to the shaping of a honeycomb sandwich core for a landing gear strut door: (3) plaster negative, representing the reverse face of the desired honeycomb core contour, is cast from a master pattern; (4) block of honeycomb is pressed into the negative to controlled depth; (5) exposed portion of honeycomb is filled with hot-melt sealing compound to protect it from chemical etchants, and the area of surface to be milled is then scribed away; (6) after the milling or etching process has been completed, the contoured honeycomb block will be mounted between matching aluminum skins to form the sandwich structure.

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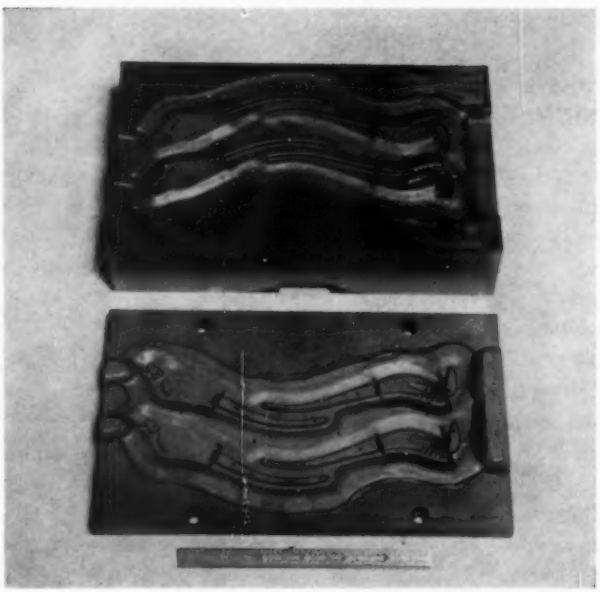

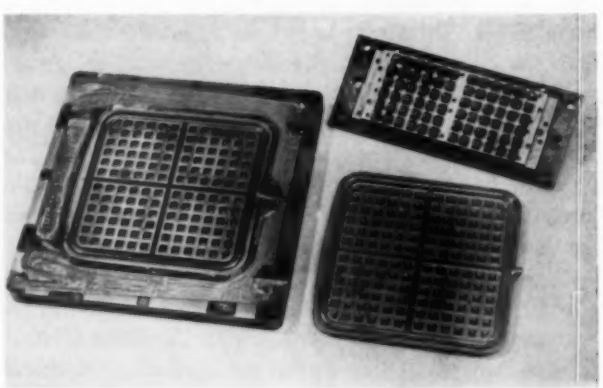

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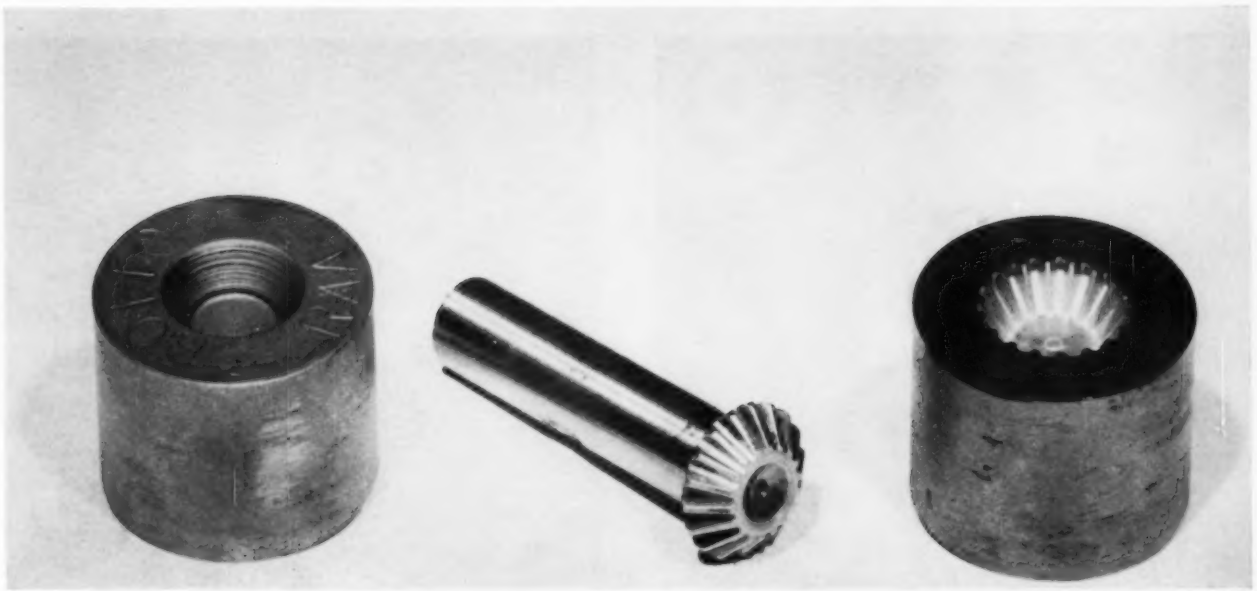
Shaping metals with electricity

The lightning bolt jabbing a metal roof, the rapid firing of an automobile spark plug, the spark hopping across an electrical relay — each of these common electrical sparks corrodes metal. Several years ago, this unwanted corrosion effect was harnessed in a technique called electrical-discharge machining, which uses sparks to perform cavity-sinking operations in die and mold making.

The idea of using electricity directly to cut metal, instead of converting it into the mechanical motion of a drill or other cutting tool, fascinated metallurgists at Battelle Memorial Institute, who were doing research for the Steel Improvement & Forge Company, Cleveland. Toward the end of 1960, they perfected a second electro-chemical process that can actually shape metal —and without the disadvantages of arcs and sparks. Their newest method, termed electro-shaping, uses a rapidly flowing chemical solution to maintain and direct the electric current.

Electricity has even made its debut in explosive forming techniques (by General Electric) to create shock waves that literally blow intricate contours into sheet forms of many hard-to-shape metals. Dynamite is conventionally used for this purpose but its handling and storing is often tricky and dangerous. The use of easily-controlled electrical jolts eliminates these hazards, and permits the work to be done in the manufacturing area.

The first of these new processes—electrical-discharge machining and electro-shaping—are particularly worthwhile to the designer because they make possible configurations and materials unfeasible or even unthinkable only a short while ago.



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Dies and molds on these two pages are representative of the type of work done on electrical-discharge machines. (1) To cut the die casting mold (center) nine electrodes, like the one shown at the left, were required. They did the job in only 70 hours whereas estimates for conventional machining averaged 1200 hours. A die casting produced from the mold is shown on the right. (2) The blank-and-pierce die (left) was machined by the electrode beside it. (3) Only 38 hours were needed to produce this finished forging die (above) in tool steel for a pair of channel lock pliers; the electrode, made from zinc tin, is shown beneath it. (4) A waffle iron mold, shown on the left, with the electrode (upper right) and a finished waffle iron. This cutting job required only 40 hours. (5) An electrode used to produce a cotton picker spindle die is flanked on the left by the die blank and on the right by the finished die. This job took only 2½ hours.

Electrical-discharge machining

Electrical-discharge machining (EDM) is a specialized tool primarily used for sinking cavities in very hard materials like carbides, stainless and fully hardened steels. It will machine holes of intricate shapes (without distortion or burrs) so close together that the web between them would not support conventional drilling, milling, or other mechanical operations; and it will machine very deep holes impossible with conventional drills—such as a hole of 3/16 inch diameter, 28 inches deep in stainless steel, absolutely straight, and to a tolerance of .005 inch. In EDM, all jobs are done without any mechanical cutting forces.

An EDM machine causes high voltage electrical discharges to flow between a metal blank, the workpiece, and a tool shaped to the same size and configuration of the hole to be cut. The tool is advanced directly into the workpiece, where it forms a cavity duplicating its own shape. The electrical discharges are fired at rates of 20,000 to 300,000 times per second, and each of them dislodges an exceedingly minute particle of the workpiece by turning it into a superheated metallic vapor. Most of the vapor particles wash away in a dielectric oil circulated between the tool and the workpiece; however, some of them strike the tool and corrode it—necessitating periodic replacement.

The equipment is manufactured, in this country, by three companies: Matson Company, Detroit, Michigan; Elox Corporation of Michigan, Troy, Michigan; and Cincinnati Milling Machine Company, Cincinnati, Ohio.

The major drawback of EDM is the need to continually replace the tool as it wears away. This means that instead of simply hobbing out a single male tool from a solid block, it is necessary to make a cavity—a

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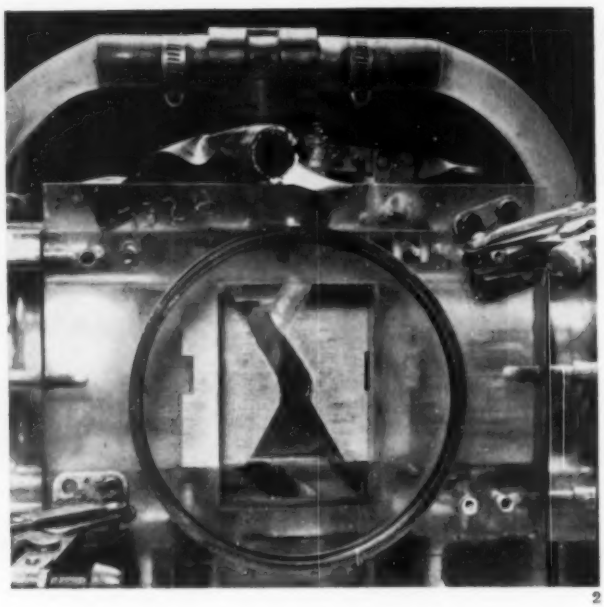

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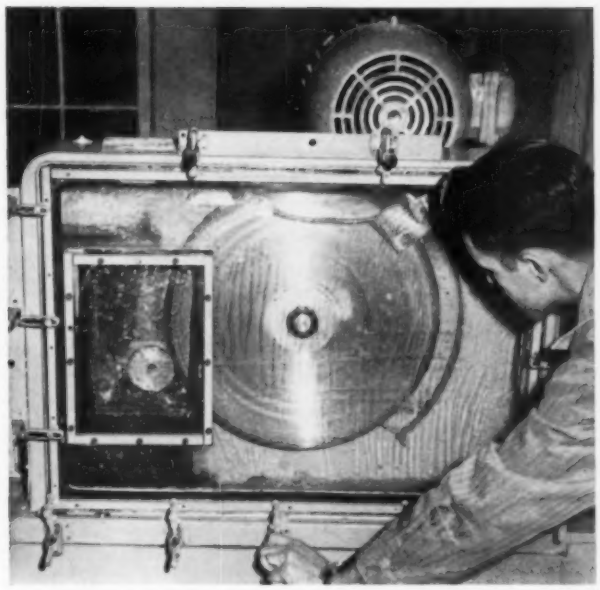
more difficult process—and cast the required number of tools from it. Second, the use of EDM for a complex job necessitates a different tool shape to produce each different cavity configuration—and there might be 10 to 30 of these — in a single complex die. Third, the machining operation is slow, generally only .003 to .010 cubic inch per minute for precision work. Finally, the initial cost of the equipment is high, ranging from $15,000 to $25,000 or more for each machine, depending on the accessories desired.

Determining what is a good EDM application requires a solid knowledge of comparative tooling costs and capabilities. The following is an easy example: To put a round hole in a piece of tool steel prior to hardening is not a job for EDM, since it can be done more quickly by other methods. To put a square hole in the same steel may or may not be an EDM job, depending on size, depth, and tolerances required. However, to put a small, star-shaped hole in the tool steel would doubtless prove a good EDM application. In most cases, though, a complete die is not made by EDM because it is usually more economical to employ mechanical methods for those parts which are easily done mechanically, and to specify EDM only for the intricate tasks at which it excels.

Three different kinds of electro-shaping are shown above. (1) Turbine blade, precision machined by electro-shaping, is shown between the two electrodes used to produce it. (2) Close-up of electro-shaping machine shows how the same two electrodes are arranged for finishing the blade. During the operation, a rapidly flowing chemical solution fills the space between the electrodes, electrochemically removing metal in the specified areas. (3) To cut a tungsten rod, a rapidly rotating electrode wheel directs chemical solution, by centrifugal force, against the rod. An electric current passing between the two does the cutting; the wheel itself does not touch the rod. (4) Close-up of machine used for drilling small diameter holes. The slender line in the center of the photo is actually a fine tube for directing the chemical solution, which does the cutting, to the work area.

Electro-shaping

Electro-shaping—the newest method for removing metal with electricity—promises more to the designer than the other methods cited here. In addition to sinking cavities, it can produce completely shaped parts. In fact, the developer claims that the process is potentially capable of duplicating all of the common metal-shaping operations: 1) Forming surfaces of revolution, i.e. per-



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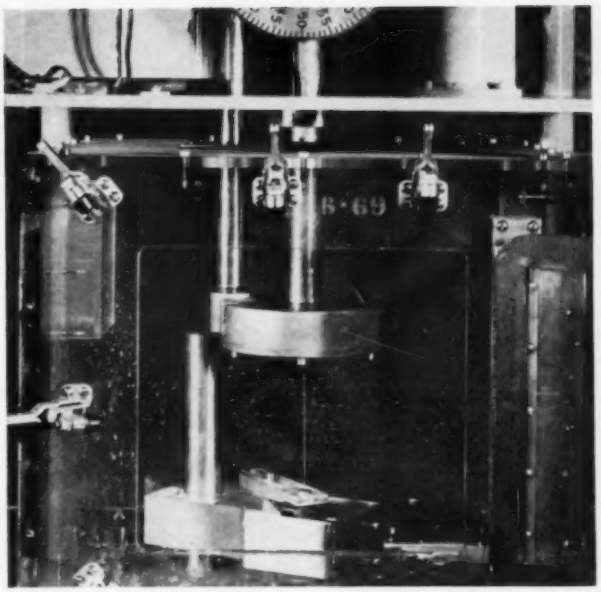

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forming operations ordinarily associated with lathe turning or form grinding; 2) Forming slots, grooves, and other cavities, as in milling and grinding; 3) Shaping internal areas, the counterpart of internal grinding or turning; 4) Slicing large billets of fully hardened steel or other metals without surface damage or overheating; 5) Broaching internal helical splines; 6) Drilling deep holes of round, square, fluted, or other complex shapes, and as small as .013 inch diameter; 7) Drilling holes and saving the cores, important with expensive metals or alloys; and 8) Sinking complex die cavities, particularly advantageous when a number of dies of the same pattern are required because the same tool can be used to produce them all.

The electro-shaping method combines electric energy with a chemical solution that sweeps away surface molecules of metal. It does this by simply ridding them of the negative electric charges binding them to their substrate associates, and attracting them into the rapidly flowing chemical solution.

There are no arcs, sparks, or high temperatures as in EDM, and no chatter, crunch, and dust as in conventional mechanical machining. Metal is actually removed molecule by molecule, without the gouging and cutting familiar in mechanical methods, and without the necessity for replacing the tool, the main limitation of EDM.

The conditions for electro-shaping metal are met by simply submerging the metal workpiece and another conductor in the chemical solution, connecting the workpiece to the positive terminal of a straightforward dc rectifier (in contrast to the complex circuitry common in EDM), and the other conductor to the negative terminal. The set-up is practically the opposite of the familiar electro-plating process. Metal is removed at rates of .05 to .10 inch (much faster than with EDM), and the speed of removal is directly proportional to the current supplied.

So far, the first big job turned out by electro-shaping has been the mass production of jet turbine blades from super-hard alloys. In this application, a rough forging of the blade is fed into the electro-shaping machine, and in five to ten minutes, the airfoil sections of the blade have been shaped to within .003 inch tolerances. Pockets are also hewn in the holding end. These operations conventionally take from one to two hours of heavy grinding or machining.

What all this adds up to is that the designer will be able to make parts of any metal in intricate and unusual contours that would otherwise have been prohibitively expensive or even impossible. Marketing plans for electro-shaping have just been completed by Steel Improvement & Forge Company with the granting of exclusive rights (in the United States and Canada) to build and market electro-shaping equipment to Ex-Cell-O Corporation of Detroit. Steel Improvement & Forge will continue all experimental work and will supply the chemical solutions.

DESIGNERS TAKE THE WHEEL

The wheel in motion automatically corrects any design injury done to it. But once it stops spinning, it's at your mercy

BY CRAWFORD DUNN

It has become a favorite indoor sport to sit around on dull afternoons and take pot-shots at American automobile design. Outsiders have no way of knowing how this is received by management and "stylists" in Detroit, although it is easy to conclude that both have begun to suffer a persecution complex. We do know, however, that the dollar-grinning radiator grilles are just about gone, that the confidently convex tonneaus have almost run their course, that several million pounds of chromium-plated festoonery of the kind that Britishers like to call "catch-penny trash" have been melted away, and that those tail fins that were once so necessary to stabilize Detroit iron at higher speeds (and bolster the arguments of critics) have lately been, like tadpoles' tails, disappearing a little at a time.

It is altogether possible that management and stylists alike have failed to understand some of the criticisms. Every now and then there seems to be evidence to support this argument. Item: almost everybody outside Detroit knew as soon as they laid eyes on it that there was no excuse — much less a *raison d'être* — for the Edsel *or* its appearance. It may be that Detroit, traveling backwards, can only see where it has *been*; it may be that it must depend upon hindsight

and the market to tell whether it is going in the right direction. Item: the Edsel, as a mistake, was corrected in this expensive manner. Item: the bigger-every-year trend, that began with Harlow Curtice's 1936 Buick and that was based on the premise that it makes good sense for an automobile to *displace* a lot more volume than it *utilizes*, has now been halted and even set back momentarily.

Perhaps, in all fairness to Detroit, we should all admit that most of the points of recent criticism—the Yankee smile, the pneumatic look, the catch-penny opera, the exhibitionistic derriere—are *relative* matters, subjective matters, matters of taste, unimpeachable on rational and objective grounds. After all, European automobile designers, who used to get straight-A's in deportment from the critics, are proving right now that they were not so much purists as laggards. Some of their current mannerisms are suspiciously like some of the only recently discarded ones of you-know-who. With the import market for European cars in some categories falling to U.S. compacts, this plagiarism may get even worse. *Then*, who are we going to point out for Detroit to emulate?

Again, in all fairness, Detroit has not yet been given credit for helping kick the U.S. Protestant Ethic in the teeth. Yet this is what it did, and the P. E. had it coming. This was the ethic, usually taken far more seriously by the "poor" than the "rich," that implied that the lower-income chap, as he tooled around town in his well-behaved, asexual Ford, Chevy or Plymouth, was not *supposed* to look as if life were fun. The difference between a *bon vivant* and a plain rounder was mostly a matter of tax bracket. With the help of Detroit (and, admittedly, a few others), this whole business was shot to pieces.

There is, however, one point on which Detroit *can* be indicted, and on the first ballot. It is a trig sort of point that does not range all over the place and does not get too involved in philosophical subtleties. This is the matter of wheel design or, more accurately, wheel *cover* design.

Now, just about everybody who has studied design is agreed that, while the designer in giving final form to any object has many choices, he should direct all those choices toward an expression of the central function of the object. The designer, in sum, must make apparent from the appearance of an object what the most characteristic function of that object is. (This could hardly be put more concisely or with greater authority than an editorial in the December 1960 issue of INDUSTRIAL DESIGN: "... appearance must support, rather than belie, reality.")

Similarly, in designing major parts of a larger whole, the designer has an obligation to give a form to those parts which will contribute to, rather than detract from, the expression of the function of the whole. Thus, the appearance of an automobile wheel must be considered not only in relation to the function of the wheel itself but also to the function of the whole automobile. (*Continued overleaf*)

A wheel has two main functions, the static one of supporting the automobile *from* the wheel's centerpoint and the dynamic one of rolling *about* that centerpoint. Now, of these two functions, the one that comes closer to being the essence of the automobile is that of rolling. How can a designer best express this "essence" through his design of the wheel?

Spin an automobile wheel, and what happens visually? All radial elements immediately disappear in a smear of motion, and only the circular elements remain. Of the two visual aspects of the wheel, "spokiness" cannot exist at high speed; only "circleness" can do this.

It is not often that an object *helps* design itself, especially with such unequivocal, though mute, finality. The modern automobile wheel *wants* to be designed as a thing essentially circular, a thing all of whose visual elements contribute to that circularity. The wheel in motion cannot be perverted visually; the motion itself corrects the designer's errors. This is true of no other visual element of the automobile. Unfortunately, the appearance of the wheel at rest—the only state in which its appearance can be studied—is completely at the mercy of the designer.

Every other visual element in the sheath-design of the automobile is designed to express the esthetics of its dynamic functions, to enhance the *mobile* quality of the automobile. Of two cars standing at a curb, one can *look* fast and the other slow, according to how successfully this quality has been articulated by the designers. Detroit designers have most assuredly taken this dynamic esthetic into account elsewhere throughout the body exterior and even, with varying degrees of success, in the interior. Why have the designers chosen to impose a counter-will on the basic proclivities of the wheel? Why have they elected to express motion in the body and—on the same automobiles—emphasize dead standstill staticity in the wheels?

It is this approach to design that has alienated the Detroit school of "styling" today among designers everywhere, an approach whose immaturity is permitted, in the name of merchandising, to contravene good design sense. This approach is embarrassingly similar to that of fashion design, in which basic anatomical considerations are often ridiculously subordinated in favor of such merchandising gimmicks as "hanger appeal."

Back when the automobile manufacturers were producing wheel covers that looked capable of rolling, the auto accessory stores were selling wheel covers with great, obscene radial globs of chrome that cut athwart the circle of motion. Worse, as often as not, there were *four* of these globs. An *even* number, yet! And people bought them to go with those Angora dice for the rear windows.

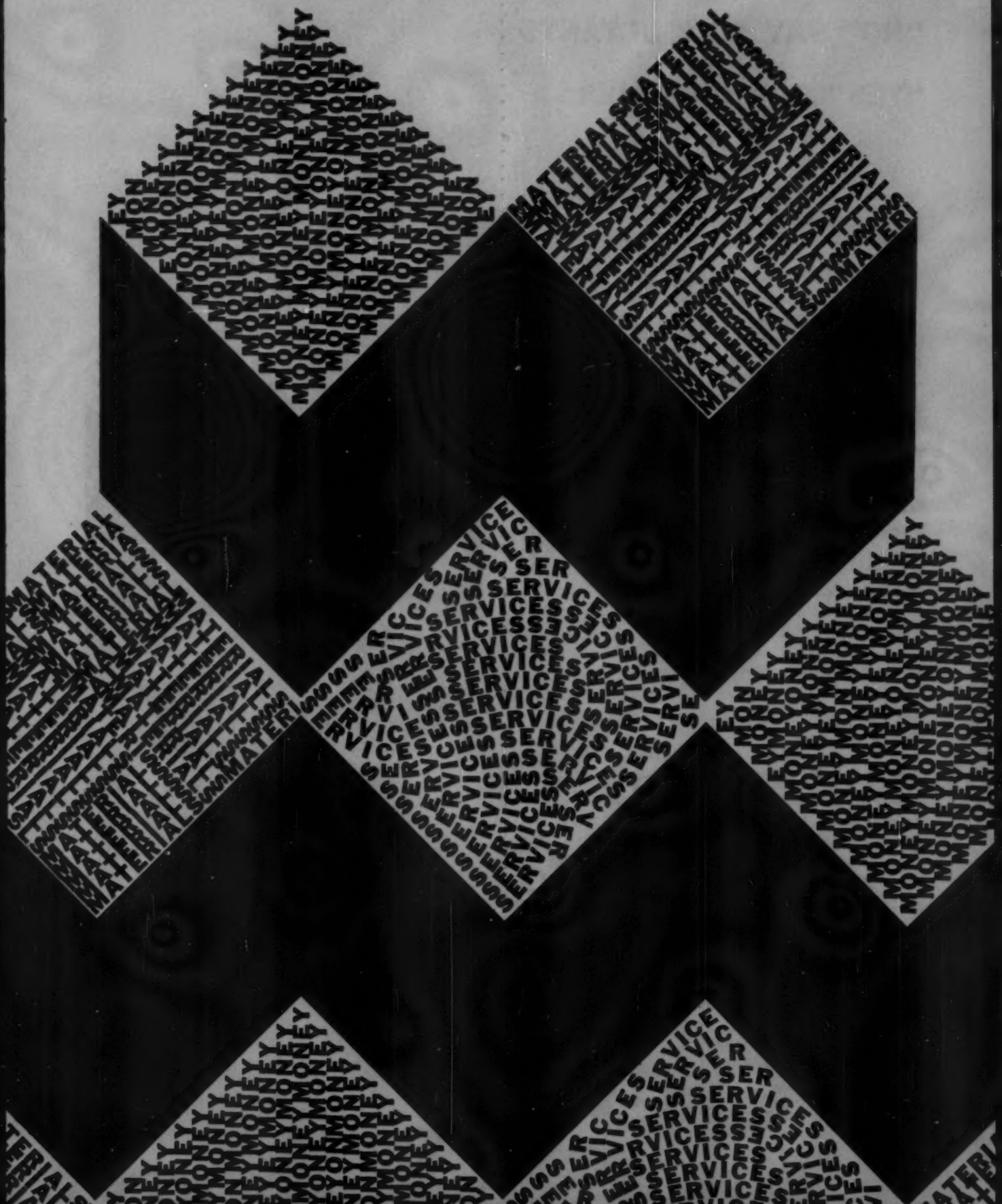
So now the auto manufacturers have put these abominations on almost all their products, opulent disks that remind one of nothing so much as those close-ups of wheels in the chariot-race sequence in *Ben-Hur*.

I know those blade-like spokes are supposed to express the ultra-high-rpm look of jet engine compressor-section turbines. (That *is* where they were lifted from.) But the view of the turbine that corresponds to that of the wheel covers is the one you get looking forward or aft, not inboard. A wheel on an automobile is first, last and always a *profile* element, the retired spare wheel, to the contrary, notwithstanding. The concept of the automobile wheel as a turbine, with spoke-like blades to cool the braking surface, can be justified on special, competition vehicles. But such wheels on ordinary cars cannot be; it is merely another example of the kind of fantasy enactment that characterizes too much of Detroit's fascination with aviation-cadetism.

I have a modest proposal: somebody should design and produce some good soft-spoken wheel covers to be sold either by the auto accessory stores themselves or by the automobile dealers as optional equipment.

Wheels should not rock, but *roll*.

PACKAGING *Should suppliers offer design services?*



"NO" SAY CONSULTANTS

"YES" SAY SUPPLIERS

"Why is it that package designers who work for suppliers are usually undertalented and underpaid?" Walter Margulies, consultant

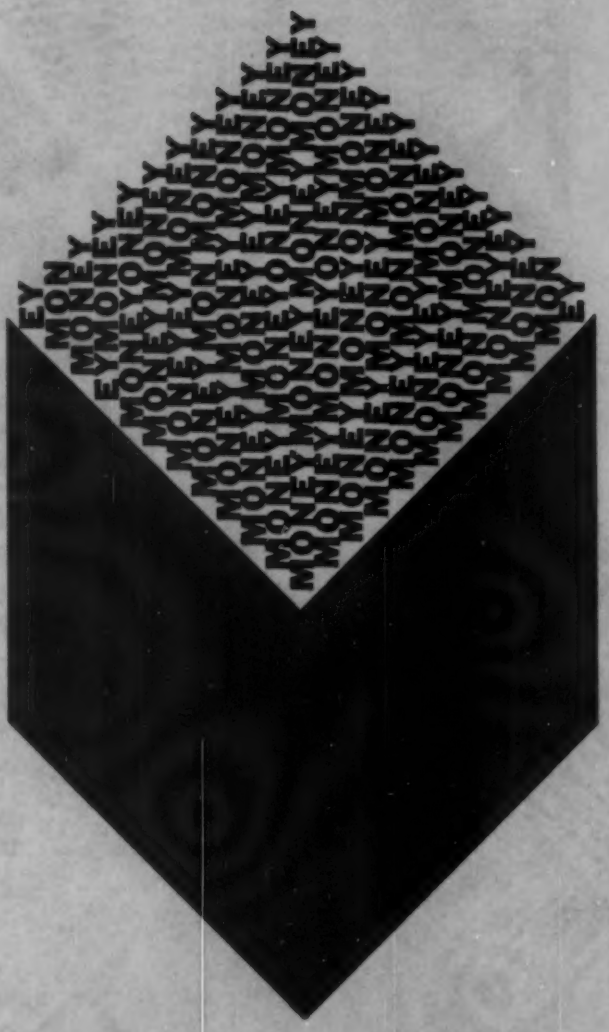
"It's none of the consultant's business if suppliers give design away." Charles Luckman, architect, speaking to the ASID

These, and even stronger, words have occasionally been exchanged in the sniping war between consultant package designers and designers who work for suppliers of packaging materials. There are no easy truce terms, and hostilities will probably continue as long as clients can choose between them. The Container Corporation's Albert Kner believes that "while this problem can never be solved, it can be softened." Perhaps. But then, it will have to deal with some prickly contentions. A prominent New York consultant recalls the time his client, an appliance manufacturer, was approached by a sketch-laden aluminum company salesman with an invitation to "Look at these designs. With our service you don't need your consultant any more."

What started the war and what is it about? Each side claims to offer better and broader services, put materials to better use, but the heart of the matter is that consultants charge for a service which suppliers give away free (or do they?).

To compound the headache, consultants now fret about "free" competition from new sources. "The consultant is not only squeezed by supplier package design," observes Mead Packaging art director Herbert Meyers, "but by ad agency design—even by architects who now design the shopping bags to go with their shopping centers."

Although without such new competition, as much as 90 per cent of all package design business may be controlled by suppliers, consultants like Karl Fink take pride in observing that when people talk about package designers they usually mean independent consultants. But answering for the supplier designers, Ernest Pioppo, art director for Lassiter (a division of Riegal Paper Corp.) says, "We're here to stay. The independents are here to stay. Why fight?" Some of the reasons why appear on the following pages, while portents of peace are scanned on page 59.



"There is evidence that the heart of the dedicated professional—when confronted with a stranger working his side of the street—beats with the same pure indignation as the heart of the oldest professional."
George Nelson, consultant

"It is no longer true that suppliers do not charge for their services. The trend now is to charge."
Albert Kner, supplier design director

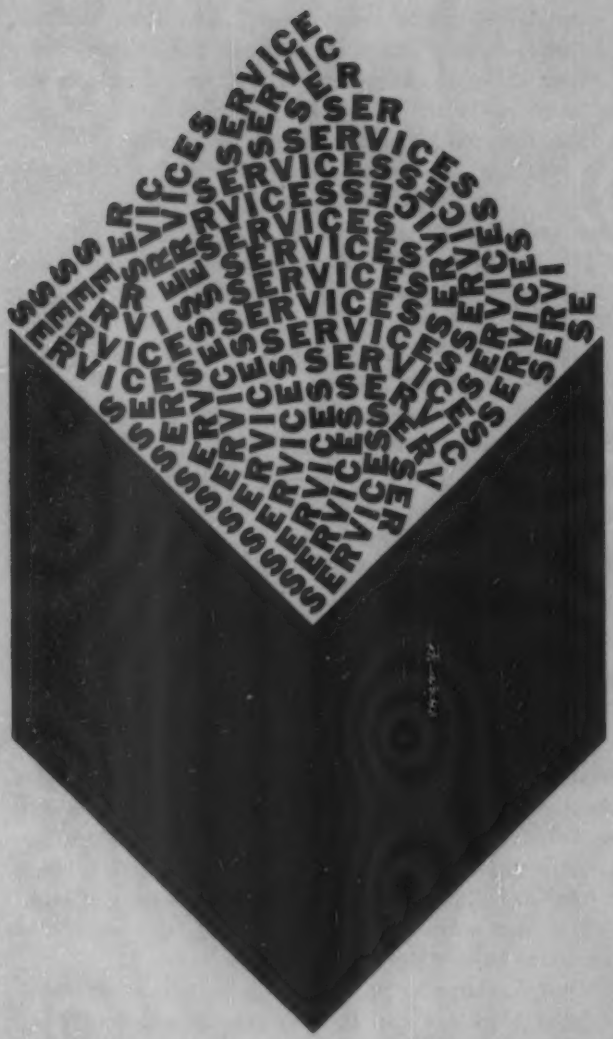
Free design continues to annoy, if not frighten, some consultant package designers, but certain suppliers contend it isn't free. However, KVP Sutherland is typical of most of the suppliers in looking on design as a customer "service," and in not charging for it. Robert O'Hara, sales manager for Mead Packaging, makes this approach sound like reasonable business practice. He says that Mead offers a design service to its customers because many of them either can't afford, or don't want to pay for, package design. For such customers "free design" becomes an important incentive for buying Mead's paper products. As O'Hara explains, Mead doesn't charge for its design service because it doesn't have to. According to O'Hara, Mead can amortize its $100,000 yearly design costs over $26,000,000 worth of sales. (But from another supplier came the admission that those who charge little or nothing for their design services can also afford to pay very little for studio work. "We can offer only $150 on a studio job for which a consultant might pay $500," he says.)

Contrary to Mead's "no charge" approach, some suppliers try to make their design departments at least break even, charging customers for their design time. Albert Kner calls this a trend among suppliers today, although his own Design Laboratory operates at a loss. "When customers come to one of Container's Design Laboratories, they are charged for it," says Ben Yoshioka, business manager for all the laboratories. "But package design work for Container's fabricating plants is charged directly to them; they decide whether or not to absorb these charges themselves," Yoshioka adds.

Lassiter, according to Ernest Pioppo, is among the suppliers who favor charging for their design services. "We charge where we can;" says Pioppo, "good design should not be given away." And John V. Shea, Lassiter's sales manager, believes the customer for whom the package design is prepared should pay a fair price for it. "We do not feel that all of our customers should be penalized by charging design costs to overhead, and consequently increasing our packaging prices," he says. "As it is, we don't break even on design, although that is our objective. For one thing, we charge less for it than consultants do since we're more concerned about selling the materials than the design." The official Lassiter position is to charge "for designs that are accepted, and for mechanicals. As a company, we feel we are selling design as well as printed packaging." And Pioppo adds that design is a top selling tool for Lassiter. Pointing to new packaging for W. T. Grant's Isis stocking line, Pioppo explains that it has already brought at least six other customers into Lassiter.

Flexographic printer Samuel Rivman says that his firm, Wrapture, Inc., charges $8 an hour for design service, but doesn't list the service as a separate charge to the customer. "We simply make an overall charge for the plate," says Rivman. "As we see it," he adds, "we're selling reprints of an idea, not just printing." The Wrapture operation is unusual in that Pratt-educated Rivman, who is president of the firm, also acts as director of his three-man design staff. "We seldom solicit design actively," explains Rivman. "More frequently a client will ask us to redesign his packages *after* he comes to us. Only when the prospects of landing a new customer look promising, do we extend ourselves beyond thumbnail sketches."

Only one supplier wins virtually unanimous approval from consultants for its charging practices: Alcoa. Design manager Samuel Fahnestock has said, "We aren't interested in giving anything away free," and Alcoa doesn't. In fact, it doesn't even offer customers a design service—at least in the conventional sense. Although it has a new graphic design section under Robert P. Eganhouse and laboratories for package evaluation, materials research, and printing techniques, Alcoa's services do not include the actual execution of customer designs. When manufacturers ask for design, Alcoa will assist them in locating a qualified consultant, then work with him on the project.



"The supplier's design staff has neither the time, the talent in depth, nor the freedom of choice in materials and production techniques to create a first-rate design program." Walter Landor

"Independents have at least one selling point lacking to many suppliers: research." Design director of a major printing and paper supplier

The design operation at Lassiter Division is typical of many supplier design efforts. It is also similar to the consultant's operation, but with significant differences. Like the director of many an independent graphic design studio, Ernest Pioppo was graduated from the old New York School of Design and today four design school educated men, all under 30 but experienced, work for him. Here the similarity to the consultant's operation disappears because Pioppo learns about a new design problem through his own Lassiter salesman as well as through the client himself. After the salesman has discovered — and discussed — the customer's packaging problem, he brings it to Pioppo. If the complexity of the problem and the size of the customer's purchase warrant it, Lassiter may then launch into a full-scale design study. Using a Request-for-Design form, the salesman outlines all vital information about the prospective re-design: where the package will be used, for what type of market, how it will be displayed, what material it could be made of, and who will buy it. All the questions with which any package designer might begin his research are included on the Request-for-Design form. After Pioppo has studied this and discussed the client's ideas, he reviews the entire problem with his own staff. A production man probably sits in on the discussion too, "so that we don't create a production problem which would have to be ironed out of the design later." Pioppo may also consult the carton design engineer retained to help with packaging structure and machinery problems. "And when the job gets big," says Pioppo, "I augment my staff with outside studios and free lance designers." If the problem can't be solved in conventional ways, Pioppo can also turn to Lassiter's Research and Development Department for help on printing techniques, new applications for materials, and packaging machinery design. But any solution

will involve flexographic, lithographic, rotogravure, or letterpress printing on paper, board, foil, or film since these are the materials and processes which Lassiter sells. ("Someone interested in metal cans or glass bottles just doesn't come to us," says Pioppo.)

"After the initial review of the problem, we frequently go into stores to check the lighting and display situation," continues Pioppo. "On the basis of this information, we make a preliminary comprehensive, further check it for mass display qualities and for in-store reaction. Then we pass it on to the salesman and client. Usually revisions on the package are minor, but when the client wants to market-test the package, Pioppo, like most package consultants, suggests he hire an outside firm.

Of 30 major packaging supply houses, at least half win customers with elaborate testing and research facilities as well as graphic design such as Lassiter's. Among the best known is Container Corporation's Design Laboratory. With spectrophotometers, visibility meters, and simulated shopping areas, Albert Kner's laboratory helped pioneer a "scientific approach" to testing packaging designs. Kner emphasizes that while two-thirds of his assignments come in through Container's sales force, the other third are experimental. "We simply take a problem which interests us," says Kner, "and work at it till we get a solution. In presenting our solutions to prospective clients we are, of course, operating on speculation, but often the results are good both for ourselves and for the client who buys the solution."

To get ahead of the trend toward expanding design services, Mead Paper Company this year opened an entire New Products Division in Cincinnati, to "analyze customer packaging problems from manufacturing to merchandising." In the same new building, the Technical Services Department tests packages for strength, resistance to abrasion and puncture, and the effects of heat, cold, moisture or rough handling. At Mead's pilot plant, prototype packaging machines are made and tested, and at the research center in Chillicothe, Ohio some 200 scientists and engineers develop improved papers and find ways for cutting manufacturing costs. For graphic design Mead maintains art staffs in New York, Atlanta, and Cincinnati.

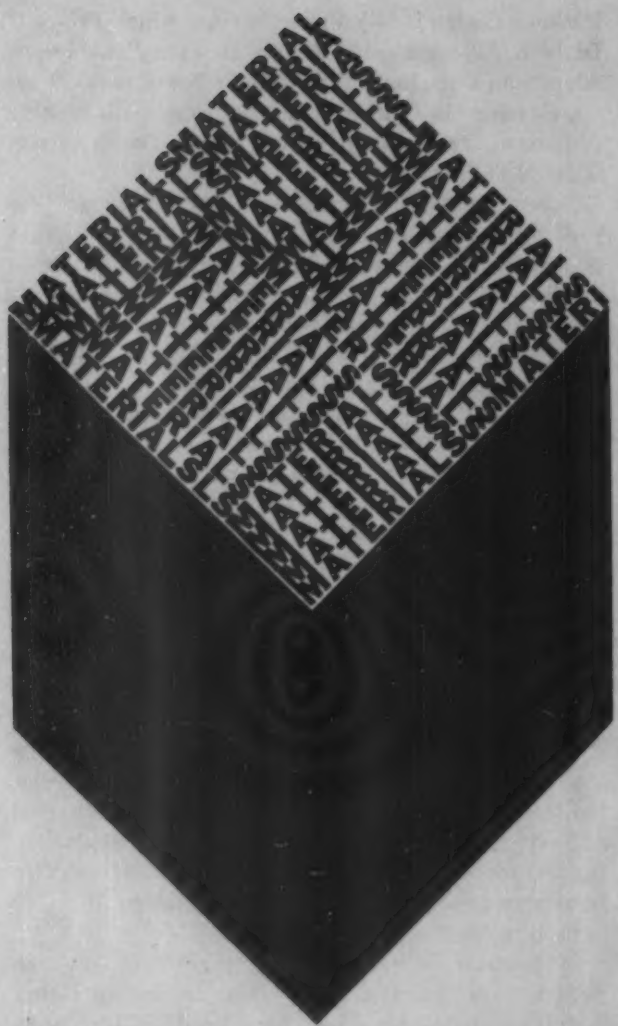
Package design is billed as a "service which Products Division salesmen can offer as an extra," at Kaiser Aluminum Company. The company has a package research center in Chicago, and also presses, die making equipment, and testing devices. Grabe Smith directs Kaiser's design program.

Several hundred thousand dollars a year go into packaging research at the San Leandro, California laboratory of Crown Zellerbach's Western-Waxide division. With four major printing processes to offer its customers, Western-Waxide keeps art directors busy in San Leandro, Los Angeles, St. Louis and North Portland.

At Dow Chemical's Dobeckmun Division, Richard M. Seigle established the design department in 1930, now has studios in both Cleveland and Berkeley, California. KVP Sutherland, the Kalamazoo paper company, used to limit design to copy and color changes suggested by the client. Today, under Roy H. Johnson, the department stands—with Edward Koslowski's design group at Warner Brothers Packaging Division—at the top in imaginative supplier-originated graphic design.

While the consultant can't—and doesn't want to—match the big suppliers' technical facilities, there are those who insist he is still more effective in achieving the major design breakthroughs because he is not under the thumb of a production department with a vested interest in packages causing few production headaches. But free-wheeling innovation has its limits, too, for customers also want to curtail the problems in order to keep the final bill down.

In contrast to the suppliers, consultant research facilities fall almost entirely in the marketing rather than the materials area. But only a handful—Lippincott & Margulies, Loewy/Snaith, Walter Landor — include even this type of research within their own organization (although a great many others take pride in their ability to do the kind of solid informal research they feel yields useful results). The rest consider it to their client's advantage to check their design against findings of an independent research organization. For information on materials and processes, the consultant must depend on his sometime competitor, the supplier; and it is his spotty background in this area for which he is most often criticized (page 58).



"Why do we have to pay high fees to packaging consultants whose knowledge is generally limited to what information they can 'chisel' from package and container manufacturers?" America's Textile Reporter, February 27, 1958

"We are free to specify materials. They are not. We are interested only in our clients." Karl Fink, past president, Package Designers Council

Insufficient knowledge of materials sometimes lands even the best consultants in trouble, and it is for this that materials suppliers most often indict them. Samuel Rivman, president of Wrapture, Inc., the Flushing, New York flexographic house, uses his own firm's experience to state the prosecution's case: "Most consultant package designers are woefully uninformed about flexography," says Rivman. "Many times the consultant presents a package design with no forethought as to the process which will reproduce it. Not long ago a package design came to us in which the consultant had placed a fine Spencerian script next to a large solid block. What he didn't know is that in heavily inking the block area to make it opaque, the fine line of script would fill in. Had he understood our process, he would never have placed a fine script next to a big solid area. Package designers don't realize that our rubber plates shrink and stretch, and don't allow for this in their working drawings. When circles stretch into ovals, it usually falls to us to make the compensations for this which should have been made in the original art work."

Rivman finds designers especially weak in the new processes "that have come on the market since many of these men left design school." Instead, he claims: "Consultants gravitate toward the processes they understand best—often ignoring newer ones."

Walter Stern, who is technical director at the Loewy/Snaith office, points out that most suppliers have only one materials group to learn about, while the consultant designer must familiarize himself with all materials and processes. "The designer with total knowledge hasn't been born yet," says Stern, adding: "If a consultant ever becomes as immersed in techniques as the supplier, he will lose some of his creativity. By working freely in a variety of materials and processes, the con-

sultant has the opportunity to establish new design and production frontiers." Furthermore, while the supplier's familiarity with his own materials and processes may impress the prospective customer, he must remember an important point: the amount of design service he gets is in direct proportion to the size of his materials purchase. When his request for service runs beyond what is profitable for the supplier to offer him free, the customer must either begin to pay directly for it or seek help from a consultant. And, since the salesman is king of the materials supplier's domain, the customer's package may incorporate many of his amateur design ideas along with those of the supplier's "design director."

If consultants don't know enough about materials, it can also be said that occasionally suppliers don't know enough about consultants—not even what they do. Designer James Stuart Ward tells of calling a top paper and box manufacturer to find out if the corrugated stock he wanted to use for Science Materials Center's new line of toys could be formed in a particular way. Instead of giving Ward the information he wanted, the salesman urged Ward to "let our own staff artists work out the design for you."

When the supplier-consultant debate comes around to materials, consultants do make up in freedom what they lack in knowledge. The consultant offers his client what the supplier doesn't: choice. "The independent designer can choose paper, film, foil, glass, tin, aluminum, plastic — whichever is the ideal solution," Walter Landor remarked recently. The supplier designer usually must restrict himself to the material which his company sells. According to Walter Stern, the supplier designer is further restricted by the production limitations of his company, which understandably wants to keep production costs down. Even clients, especially the more sophisticated ones, realize that a supplier pushes package designs in the material he sells — sometimes to the detriment of the product. F. W. Priess, manager of product and package design for Montgomery Ward, says: "When we use outside design, we go to a consultant's office where judgment is not subject to the limitations of specific materials or techniques, as it is in the case of a materials supplier."

Samuel Rivman believes there are frequent exceptions to the supplier's materials limitation, mentioning the time he advised Jantzen not to package their girdles in flexible film because they wouldn't look right. And recently he advised a liquor manufacturer that the requested removable band on his Christmas packages could not be properly printed flexographically.

CONCLUSION

"Design, like technology, politics, and war, is becoming an open game, and open games demand far more in personnel resources than closed games. We could be a lot worse off, for there are more road blocks behind us than ahead." George Nelson, consultant

Since George Nelson made that statement five years ago (in the article, " 'Captive' designer (?) vs. 'independent' (!) designer,' " ID, August, 1956), the coldness between suppliers and consultants has continued to thaw. And one of the most hopeful peace portents in packaging's civil war is the astonishingly agile fence hopping of the troops.

On the side of the suppliers' staff designers, one discovers frank admiration for the competence of the consultants and a desire to work with them—indeed, to be considered one of them. (Professional status, especially membership in the Package Designers Council, is something many supplier package designers really want.) Mead's Herbert Meyers lists Frank Gianninoto, Royal Dadmun and Jim Nash among consultants he has recommended to Mead clients. Furthermore — as Walter Margulies points out — consultants favor the suppliers who work with *them* best.

Most important, various professional organizations are now moving firmly toward improving relations between suppliers and consultants. Walter Margulies recalls consultant criticism a dozen years ago of the Folding Paper Box Association when it failed to credit some consultants for their winning designs in the Association's contest. Today, the Association credits consultants as part of its official policy. Recent action by the two industrial design societies will brighten rela-

tions also. Only last year the ASID initiated an industrial liaison committee, under Robert Hose, specifically to "promote cooperation between material suppliers and industrial designers." In exchange for giving suppliers access to their members, the societies obtain special design-material guidance from supplier members. So far, ten suppliers have joined the committee: Alcoa, Armco Steel, Celanese Plastics, Corning Glass, du Pont, Owens-Corning Fiberglas, Porcelain Enamel Institute, Rohm & Haas, U. S. Gypsum, and Claremont Pigment Dispersion Corporation. "This past year," says Hose, "supplier members especially worked with us in bringing information on new materials and processes to such design schools as Pratt, IIT, Syracuse, and the Philadelphia Museum College. None of these companies offer a free design service, and we hope that, in working with us, they will slowly set a pattern for designer-supplier relations which other companies will follow."

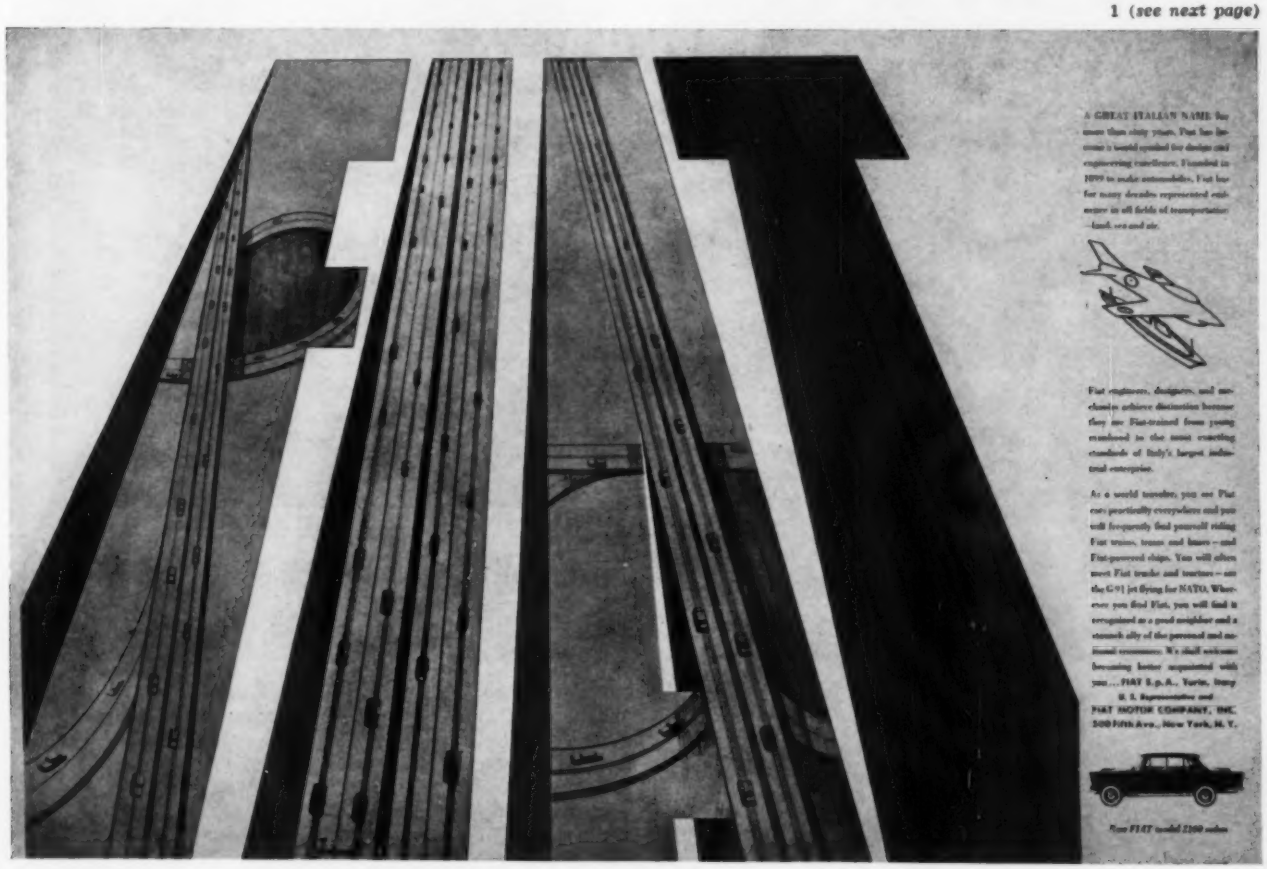
The Package Designers Council also wants to ease relations between materials suppliers and its members. This month, during the American Management Association's packaging show in Chicago, PDC will hold an informal conference with supplier design directors to try to agree on areas of cooperation.

In spite of liaison committees and good intentions, will the conflict between suppliers and consultant package designers persist? To some degree, conflict—or at least competition — appears inevitable. Undoubtedly, suppliers will offer design services as long as they remain potent selling tools. On the other hand, the consultant certainly has some consolations. For one thing, the supplier's "free," or at least low-price, service helps clients who would otherwise have none, thus raises overall quality of package design. And the design education which some customers receive from their suppliers helps them to "graduate" eventually to consultant package design. In this sense supplier design contributes to the entire packaging community. As for competing, Charles Luckman's stand on free design at the ASID's conference three years ago still seems to point to the best and most profitable direction. "Our job is to develop our own ABC's of success so that it is *unnecessary* to promote restrictive clauses against competition." The consultant's best weapons against supplier design services are still competence and talent.—*Ann Ferebee*

IS IT ART? IF IT IS, WILL IT SELL SOAP?

The 40th annual exhibition of the Art Directors Club of New York opened last month and hung there, somehow evocative of a man talking to himself and earnestly providing affirmative answers to the questions: "Is it art?" and "If it is, will it sell soap?" Too many pieces were displayed and the Pepsi-Cola building's lobby space was simply inadequate. Automobile advertising generated some interest—Doyle, Dane, Bernbach, Inc. earned a special citation for its work on the Volkswagen campaign and also produced for VW's Karmann Ghia a television commercial notable for its hard, sinister masculinity. But following close on the heels of this tight, urgent film strip came a Ford tv commercial of a pomposity better imagined than described: it is enough to point out that the exhibit catalog lists the film designers as "Architects of Ancient Rome." Curiously, two overworked fields produced stunning pieces: these were book and record jacket designs.

1 (*see next page*)



We've gone places!

Ten years ago, the first Volkswagens were registered into the U.S.A.

Those strange little cars with their beetle shape were almost unknown.

All they had to recommend them was 32 miles to the gallon (regular pump reg), no antifreeze (air-cooled rear engine that could go 70 mph all day long without strain), sensible size for a family, and a sensible price tag too.

Beetles multiply, so do Volkswagens. By 1954, VW was the best-selling imported car in America. It has been that mark each year since. In 1958, Volkswagen was once again first, with more than 150,000 VWs sold, including 30,000 station wagons and trucks.

Millionaires buy them, so do working people and college kids. Their stub noses are familiar in every state of the Union, as American as apple strudel.

Volkswagen is an honest car. We get as much as we can into it, and we think it the best car in the world for your money.

2

Around the world, the same standard of excellence you have learned to expect from IBM. 250 branch offices, 14 manufacturing plants, 33,000 employees in more than 80 countries. IBM.

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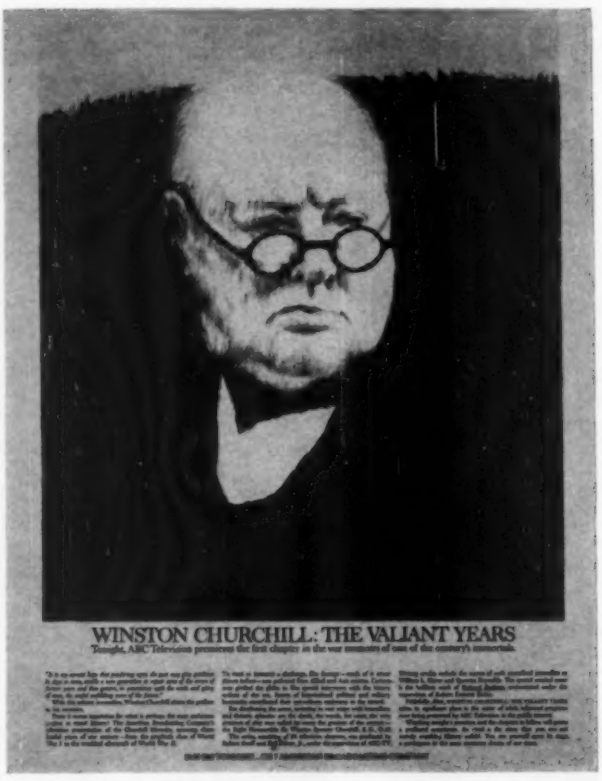

WINSTON CHURCHILL: THE VALIANT YEARS

Tonight, ABC Television premieres the first chapter in the war memoirs of one of the century's immortals.

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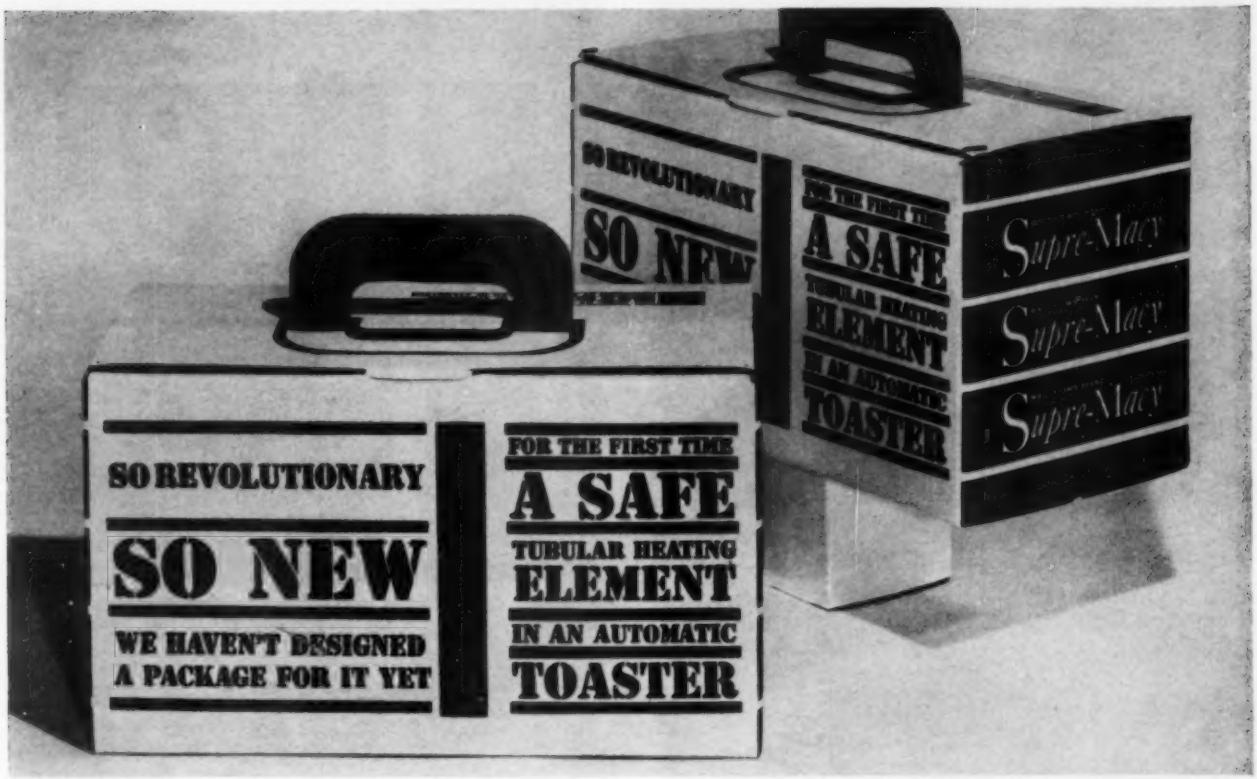

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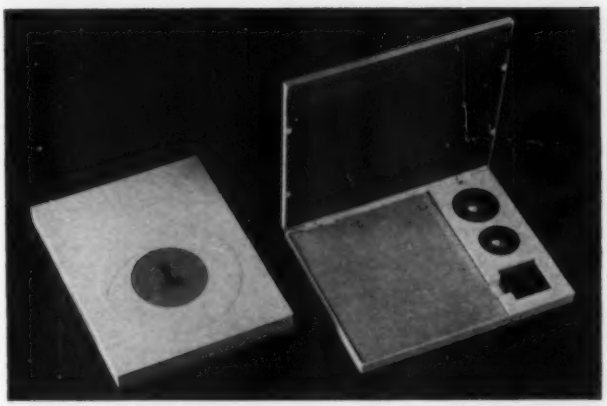
1—(Preceding page) magazine ad: Art director, George Trevelini; designer/artist, George Giusti; copywriter, Earl C. Donegan; agency, Wood, Donegan & Company, Inc.; client, Fiat (Award of distinctive merit).
2—Magazine ad: Art director, Helmut Krone; photographer, Harry Hamburg; copywriters, Bill Bernbach/Dave Reider; agency, Doyle, Dane, Bernbach, Inc.; client, Volkswagen.
3—Magazine ad: Art director, Robert H. Brooks; artist, Robert Weaver; copywriter, Arch Nadler; agency, Benton & Bowles; client, I.B.M. World Trade Corporation (Award of distinctive merit).
4—Magazine cover: Art director, Frank Zachary; artist, George Giusti; publisher, Curtis Publishing Company/Holiday Magazine (Award of distinctive merit).
5—Newspaper advertising art: Art directors, Sidney Myers/Len Sirowitz; artist, Saul Lambert; designer, Sidney Myers; copywriter, Leon Meadow; agency, Doyle, Dane, Bernbach, Inc.; client, ABC-TV (Award of distinctive merit).



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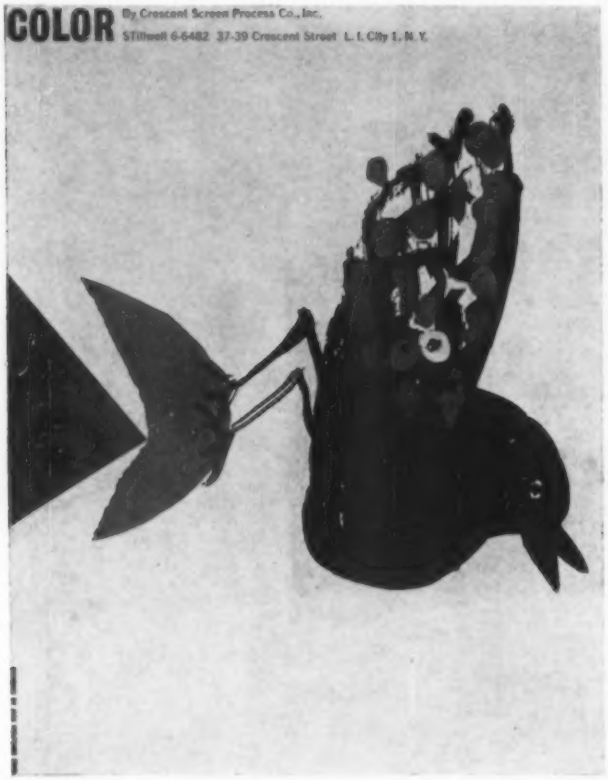
6—Point of sale package: Art directors, Randolph Damico/Aristides Kambanis; creative director, Morris L. Rosenblum; publisher, Macy's; client, Macy's.
7—Promotion kit: Art director, Louis Dorfman; publisher, CBS Television Network (Award of distinctive merit).
8—Point of sale package: Art director/artist, Ed Blas; agency, Doyle, Dane, Bernbach, Inc.; client, Eversweet.



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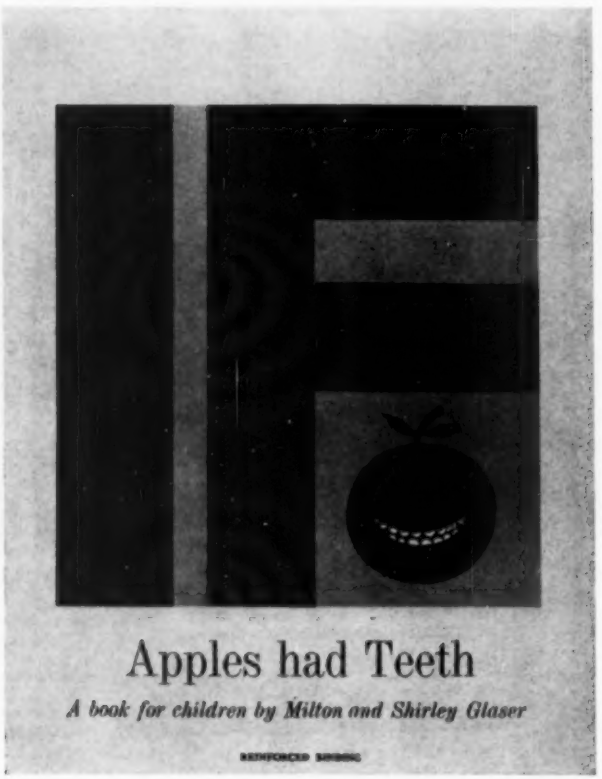

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1—Book jacket: Art director/designer, Jack Wolfgang Beck; client, Crescent Screen Process.
2—Book jacket: Art director, Milton Glaser; artist, Milton Glaser/Pushpin Studios; publisher, Alfred A. Knopf, Inc.
3—Book jacket: Designer/artist, George Tscherny; client, Dunetz and Lovett (Award of distinctive merit).

4—Record jacket: Designer, Rudolph deHarak; client, Westminster Recording Sales Corporation.
5—Record jacket: Designer, Rudolph deHarak; client, Westminster Recording Sales Corporation.
6—Record jacket: Designer, Rudolph deHarak; client, Westminster Recording Sales Corporation. (Award of distinctive merit).
7—Record jacket: Art director, John Murello; artist, Jerome Martin; client, RCA Camden Records (Award of distinctive merit).
8—Record jacket: Art director, Marvin Israel; artist, Abidine Dino; copywriter, Nesuhi Ertegun; publisher, Atlantic Recording Corporation; client, Atlantic Recording Corporation.
9—Record jacket: Art director/designer, David Chasman; artist, David Chasman; client, Monitor Records.


WESTMINSTER
High fidelity
Brass/Ancient
&Modern

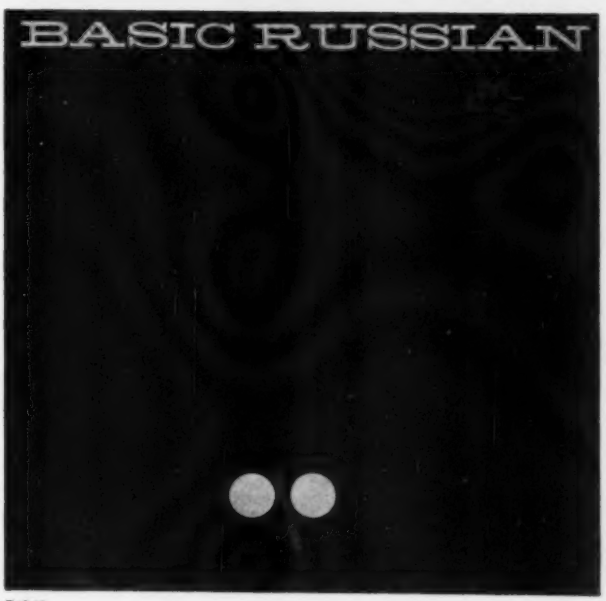

CAMDEN
SINGIN' THE BLUES


Franz Liszt:
The Two Piano Concerti
Sir Adrian Boult, Conductor
Vienna State Opera Orchestra
Edith Farnadi, Pianist
WESTMINSTER


THE MODERN JAZZ QUARTET
& GUESTS


WESTMINSTER
Sounds from the Alps

4/5/6


BASIC RUSSIAN

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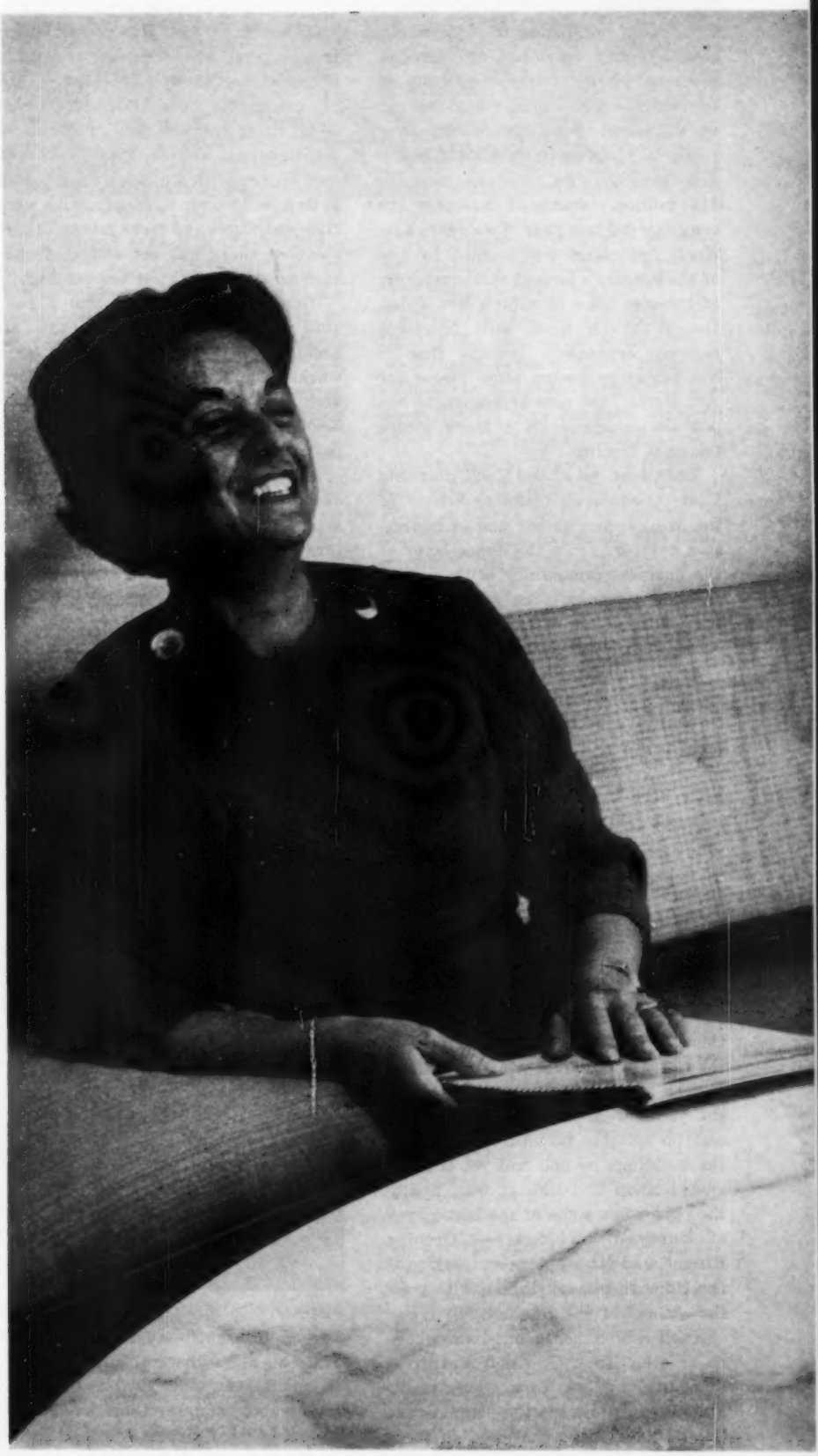
Gallery 4:

Florence Knoll

As background and support to the bright stars of modern design, her tranquil designs and less tranquil person have helped transform the places in which Americans live and work

BY URSULA CLIFF

"The greatest patron of design today" a distinguished architect recently called Florence Knoll, and if this is a strange characterization for a full-time designer, it is a role that Shu (for Schust, her maiden name) Knoll has chosen for herself. "I try to design the background pieces that make a room quiet and peaceful," she says. "You can't have a whole room full of spectacular pieces." The spectacular pieces are designed by the Associates with whom she shares her name: Breuer, Pierre Jeanneret, Saarinen, Bertoia, and, of course, Mies. Without Knoll, however, many of their designs would never have taken form and others would never have reached the production line. For Knoll Associates is a singular enterprise. It produces and sells many of the classics of modern furniture design, completes the line with creations of its own design staff, and frequently designs the interiors in which this furniture will be placed, down to the ash trays and picture frames, and even the textiles which cover the furniture. It is singular, finally, because it is run by a woman, one of the very few to have achieved such eminence in business, and the only one to have achieved such eminence in design. (The latest indication of this eminence is the Industrial Arts Medal awarded her by the AIA this month.)



Knoll does not foster its famous designs in any spirit of museum-like reverence; quite simply, they are good business. Just how good a business can be estimated from the Knoll showrooms in 11 cities in the United States and in 18 foreign countries, and the $15 million volume of business the company did last year. Two years ago, Knoll Associates was bought by one of the country's largest manufacturers of low-cost office furniture, Art Metal, Inc. Although Knoll still functions entirely separately (except that it has begun to design some pieces for Art Metal), the new arrangement has put the company on a more secure financial footing.

The client list of the Knoll Planning Unit (the interior-planning branch of the firm) comes chiefly and in impressive numbers from the upper layer of the business community, with, for occasional glamour, such glittering entries as the Shah of Iran's sister, who commissioned a palace.

Knoll Associates has not always been so prosperous, nor has modern furniture always been so widely accepted, and the story of one is, in a sense, the story of the other. When Hans Knoll came here from Germany in 1937, he brought with him considerable familiarity with furniture design in Europe (his father, in Stuttgart, manufactured modern furniture) and a few designs. He found almost no modern furniture in this country and almost no demand for it. The Museum of Modern Art's Organic Design competition, about this time (1939), revealed that there were no known ways of producing many of the prize-winning designs. It was an era of restlessness among the younger architects because there was no suitable furniture to put into the buildings no one had yet commissioned them to build. It was, finally, the time when some of the best-known of European architects — Gropius, Breuer, and Mies—were emigrating to the United States, bringing with them the axioms of the Bauhaus.

Knoll established a one-room showroom (the Hans G. Knoll Furniture Company) in New York, where he exhibited, at first, mostly some Grand Rapids lines, since that was all there was. Later he met Jens Risom, then free-lancing, who designed a number of pieces for him. Here and there, concentrating his sales efforts on architects, Knoll began to pick up contracts for interiors, and in 1941, when the war broke out, his business had begun to find its footing. Suddenly, with wartime shortages and more money in circulation, there was not enough furniture anywhere to meet the demand.

Then, in 1943, Knoll hired a full-time designer, Florence Schust, an architect by training, who had been working in a number of New York architecture offices. Three years later Knoll Associates was formed and the partners were married.

Florence Knoll was educated to be a designer of modern furniture (insofar as such an education was possible before modern furniture existed). She was born in Saginaw, Michigan, in 1917, and after her parents' early death, was sent to boarding school, the Kingswood School, in Cranbrook. Reticent and lonely, a skinny little girl with straight black hair, she took little interest in the parties and clothes that absorbed her classmates. An art teacher took her under her wing, and set her to work on a project which shortly absorbed all the child's fierce concentration. The project—designing the house she would like to live in when she grew up—was originally a two-year assignment, but has, in spirit, turned into a life work.

After Kingswood, she went on to Cranbrook Academy, whose resident artists and designers were beginning to create an atmosphere of almost feverish excitement. She lived at the Art Club, where many of them lived, and absorbed their conversations and opinions. Here, in addition to her other courses, she designed furniture for the house she had planned in high school, and made it herself, full scale, even to weaving the rugs and curtains. The single-minded effort which she put into these efforts—working in studio or weaving room until they closed at night—won her the respect of the senior members of the community, and, in particular, the affection of the Saarinen family. She was informally taken into the family and spent summers with them in Finland. It was at this time that she met many of the architects and designers who later worked with Knoll Associates, and it was by listening to the conversations of men like Eero Saarinen and Harry Bertoia that she received her only real training in furniture design.

1

2

After Cranbrook, she studied "the fine arts generally" in Italy, Germany and France, and "architecture seriously" for several years at the Architectural Association in London. Then, largely because Mies was there, she went to IIT for an architectural degree, and worked briefly in the Chicago architectural firm of Richard Bennett before setting out for New York. People who knew her then say she was a highly competent, rather prickly young woman, intensely dedicated to her profession and with decided opinions about it. "Lord, she was brash," one architect says, remembering their initial encounters, "I swore I'd never speak to her again."

Brash or not, she won his respect and that of enough other New York architects so that by the time she

joined Knoll she had, potentially, a sizable following. The only problem was that this was wartime, and the architects themselves had little work. Only the Government was building, and Knoll Associates' first substantial job was, consequently, a series of USOs. They would be told only whether it was to be North or South, hot or cold climate, and would produce their package job accordingly. One unit was the redecoration of the USO in Times Square, which presented unusually difficult maintenance problems. Mrs. Knoll went over to look at the existing carpet, which was filthy with the Times Square dirt tracked in by the servicemen. She cut out a square from the dirtiest part and brought it to her rug dyer, with orders to dye the new rug that exact shade of grey, which she christened "New York Dirt." (Knoll's color sense is now world famous—from such humble beginnings does fame grow.)

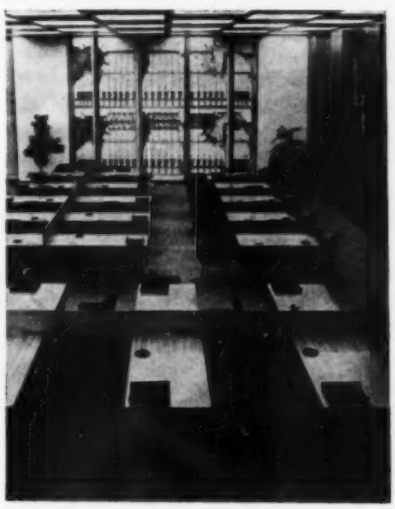
From the beginning of their association, Hans Knoll functioned as the administrator and salesman, and Florence acted as design director. Knoll, who died in 1955, is described by acquaintances as a man of great exuberance and charm, immense ambition, and all the attributes of a super-salesman. Although he was in no sense a designer himself, he had excellent taste in modern design, as well as an eager facility for learning more about it from those whose judgment he respected. Photographs show a large blond Wagnerian hero, and people at the Knoll factory remember that he used to walk down the assembly line shaking hands and making every worker feel like a vice president of the company.

Early in their association, Mrs. Knoll persuaded Eero Saarinen to design a line of chairs using non-critical materials: canvas webbing and laminated wood. Then, slowly, she began to add other pieces to the firm's line, including its most famous object: Mies's Barcelona chair. Until then, it had been impossible to buy one on the market; it could be obtained only if Mies specified it for a particular job, and then it was practically handmade.

Toward the end of the war, Hans Knoll visited a section of the Pennsylvania Dutch country just west of Bucks County and took a liking to the people and the countryside. In 1945, he and Shu transferred their furniture factory there from New York, to a building that had been an old cigar factory. Although the firm has since bought other buildings in the neighborhood, this one is still the main Knoll factory.

3

Meanwhile the Knoll Planning Unit (which had been formed almost as soon as Mrs. Knoll walked in the door) was gradually adding a number of impressive clients to its list. Wallace Harrison, who had admired her work ever since she had first come to New York, began to use Mrs. Knoll consistently for his interiors, and through him and Howard Meyers, then editor of *Architectural Forum*, she met the Rockefeller brothers, for whom she has done a number of projects: a floor of private offices for them in Radio City, a number of interiors at the Institute of Behavioral Sciences, and some of Nelson Rockefeller's own house. For Philip Johnson, she did a number of private houses. (Asked why he chose her, Johnson explains in surprise, "But she's the only one!")



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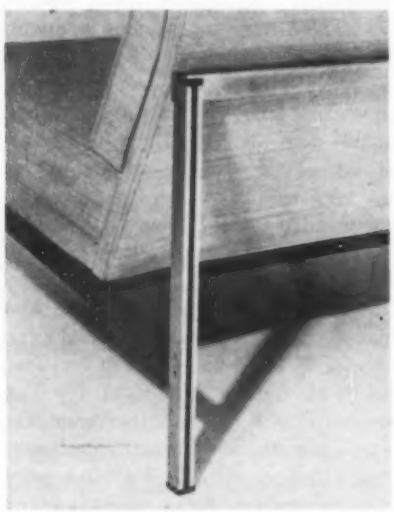
Knoll International began in 1951. Hans Knoll was after some government contracts for buildings connected with our technical aid program in Europe. His bid was accepted when he added to it the proposal that the furniture be made in France and Germany and paid for with their currency. These ventures proved so successful that Knoll began to expand into other countries, and it was while Hans Knoll was in Cuba, making the arrangements for a subsidiary there, that he was killed in an automobile accident.

Up to this point neither Hans nor Florence Knoll had ever delegated much authority—by temperament they could not—and Hans's widow now found herself with the ownership and the responsibility of an extensive and complicated business enterprise. Although Shu Knoll does not consider herself, and in fact is not, an administrator or a businesswoman, she had many of the attributes which make for success in business: she was decisive, practical, fiercely ambitious for the success of the firm; furthermore, she was a talented and versatile designer. And although Hans had always been the company's salesman, over the years the prickly and determined adolescent had learned how to make people listen to her ideas: she had become a super-salesman in her own right, specializing in persuading solid American busi-

Interiors by Knoll display (1) *use of round table to replace executive desk in office for CBS;* (2) *Knoll sofa designed to harmonize with Barcelona chairs, shown here in the First National Bank of Miami, but originally designed for Connecticut General building;* (3) *Knoll showroom in Los Angeles; and* (4) *sales area at Deering Milliken Co., with photomurals by Herbert Matter.*

nessmen that it was sound common sense to give up their Georgian desks and Hepplewhite chairs; that contemporary furnishings were in the American spirit: progressive, economically advantageous, and visual proof of the owner's success and vision. And she had learned to accomplish this without an inch of compromise, without the least deviation from the course she had made up her mind to.

Today, at 43, Florence Knoll has begun to relax some of the drive that helped carry Knoll Associates to its present eminence. Although she is universally accounted extremely attractive, her charm is largely in her coloring and her famous vitality, and photographs have never done her justice. Small, with black hair and brown eyes, she is deeply tanned from the Florida sun. (Since her remarriage, in 1958, to Miami banker Harry Hood Bassett,



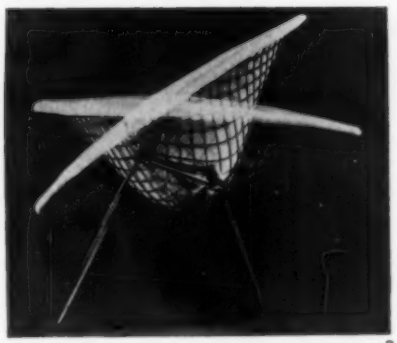
1

she spends most of her time in Florida.) Her clothes tend, like her own designs, to be well-cut and chic but essentially quiet background pieces to the rest of her personality. (She has, nevertheless, just been elected the best-dressed woman in Miami.)

The business which she has brought to maturity has itself begun to relax after the tensions and the jolts of its younger days. Essentially, Knoll Associates is composed of three divisions. The first, and senior, branch is the furniture manufacturing division, now distributed among seven factories in and around East Greenville, Pennsylvania. Some of these structures are little more than enclosed sheds, and all of the work is soon to be consolidated in a new plant Knoll hopes to complete this summer. The factory started as a woodworking mill, but as the emphasis in the 1950's shifted away from wood to plastic and metal, Knoll gradually began to concentrate on these. Because so much of the Knoll furniture involves techniques that have never been tried before, much of the factory work is necessarily experimental. The Bertoia wire chairs, for example, were in the beginning a design without any known means of realization: Knoll had first to develop the equipment to make the wire framework, and then figure out a way of fastening the upholstery to it. Because so much of their work is with the unknown, a testing laboratory occupies a good portion of one factory building. Knoll defends itself heatedly against occasional charges that its furniture is not tested enough, pointing out that to do more would keep it off the market indefinitely.

In 1944, Knoll organized, and in 1952 incorporated, a textile division because, according to Mrs. Knoll, she couldn't find any well designed textiles on the market at the time. Knoll does not have textile mills, but it does commission material to be woven exclusively for it, and fabric sales now average about 20 per cent of Knoll's total billing.

The Knoll Planning Unit accounts for the smallest volume of sales, but its functions are the most varied. It is responsible for the sumptuous interiors which earn Knoll regular space in the interior designers' and architects' magazines, for the sometimes spectacular Knoll showrooms, and for some of the designs in the Knoll line. Although company officials don't make a point of saying so, it is probably safe to say that the Planning Unit exists principally as a means of publicizing, promoting, and illustrating the uses of Knoll furniture. A Planning Unit client is never asked to sign a contract to buy Knoll furniture, but there is an unspoken agreement that he will do so. And Planning Unit designers (there are 11 of them) rarely specify furniture that is not Knoll; when they need a piece that is not in the Knoll catalog, they usually design it themselves. In that case, the client may be the first to possess that particular piece, but he is never given an exclusive on it, and it is added to the regular Knoll catalog. This was the origin, for example, of the chairs designed for the Connecticut General job, which have now become a popular part of the line.



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Knoll International is an almost completely separate organization. Furniture sold abroad is almost invariably manufactured where it is sold, although there may be an exchange of components among countries. The 18 countries in which Knoll is represented are divided between wholly owned subsidiaries and licensees. The parent company in the United States supplies them with all specifications, trademarks, and patents, and maintains a number of technical assistants abroad, who also see that Knoll standards are kept to. There is a Planning Unit attached to each foreign branch, and these occasionally refer problems to Mrs. Knoll. She worked on the palace for Princess Fatima, for instance. (Queen Elizabeth is due at the palace this month—"We don't know yet what we'll get out of that," a Knoll official said thoughtfully, perhaps with a private vision of Buckingham Palace filled with Saarinen womb chairs.)

Except for the Harry Bertoia wire-basket chair (2), *here demonstrating its flexible mounting, furniture on these two pages is designed by Florence Knoll. The detail above* (1) *shows the parallel bar system used in the construction of a whole line of tables, sofas, and chairs. Bench* (3) *and desk* (4) *are "structures to hold things," reduced to their simplest forms.*

The basis for this whole complex operation is the Knoll furniture, and designs for this come from a number of sources. Outside sources include the greatest of contemporary designers, who have been invited or persuaded to contribute pieces, and others who are practically unknown, who walk in off the street one day with portfolios under their arm. In either case, Mrs. Knoll is the person who passes final judgment on the design, and the sketch must first go through a long process of evaluation at the factory, to see if it is practicable. The designer may be asked to introduce modifications and in any case he is expected to work closely with the factory in the development of his design. Outside designers usually work on a royalty basis. Inside sources include first Mrs. Knoll, whose work, the firm estimates, accounts for more than half the pieces in the catalog. There are the occasional pieces that result from Planning Unit jobs. And there is, recently, the Experimental Group, which is currently absorbing much of her enthusiasm. The group started when Bertoia moved into the factory to work on the problem of getting his wire chairs into production. Although he is no longer there, six other designers now are, and there are a couple of Experimental Group members-at-large. Their job is to develop designs from the sketch form in which they are usually presented, and also to develop original designs. They are also expected to investigate new techniques and materials in preparation for the day when someone comes up with a design that demands a new method.

Knoll's search for new designs is not at all motivated by a desire for novelty. It follows no policy of obsolescence, but it is plagued by one problem that has made it almost neurotically secretive. By now it has become a routine for Knoll to develop a design, often at great expense, and put it on sale (admittedly in a rather expensive version) only to see the market flooded with inexpensive, not to say cheap, versions. The most famous victim of this was the Hardoy chair, which Knoll no longer makes (although it might be said that this was just naturally born to be the victim of a lighter, cheaper copy). Another piece which Knoll had to remove from its catalog was the Nakashima captain's chair.

Since her remarriage, the time Shu Knoll wishes to devote to all these problems is, necessarily, more limited. But she does maintain a regular working schedule in Florida and communicates with New York by daily telephone calls and frequent trips. The control that she exerts over every aspect of her firm is legendary, and although that control is relaxing, it is not loosening. For example, she has always acted as the firm's art director, designing the brochures and catalogs, and no Knoll advertising appears anywhere in the world without her OK. Among her staff, she tends to generate a kind of awe—"She's a great inspiration to us all," one of them reverently said; "They're all afraid of her," an outsider less reverently put it.

3

Until now, she has had time for almost no interests outside her work, but her present husband has a great many of his own, and she has begun to share these: a 25,000-acre ranch in the middle of Florida, an airplane with which to island-hop in the Caribbean, and two new houses still in the planning stage.

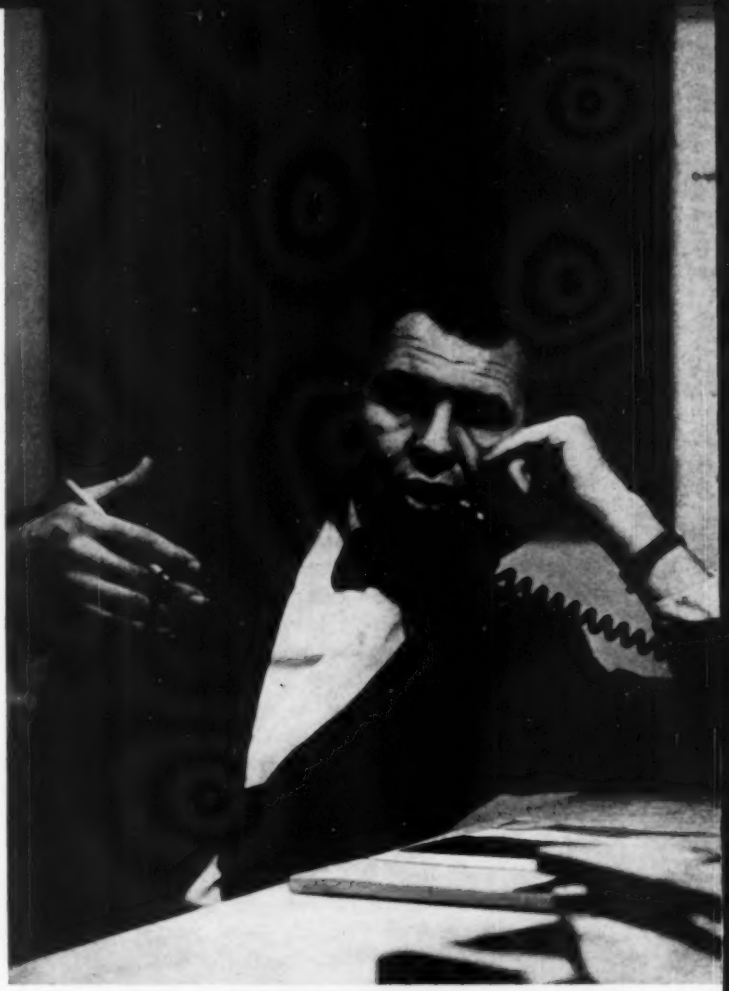
To all appearances, the firm has assumed its mature, if not its final, form. Certainly it is no longer infected with either the breathless excitement or the instability of its early days, and Florence Knoll herself speaks of the generative period for furniture design which produced the firm and which has now run its course. Her own contribution to design is so bound up with Knoll Associates that it is difficult to speak of her individual accomplishments, and her own definition emphasizes this. She speaks not of single pieces, but of a process: "An everlasting striving to get furniture related—to provide people with simple, straightforward, unaffected interiors that emphasize space rather than furniture." She refuses even to claim any development in her designs, saying, "I'm the least changeable designer of anybody."

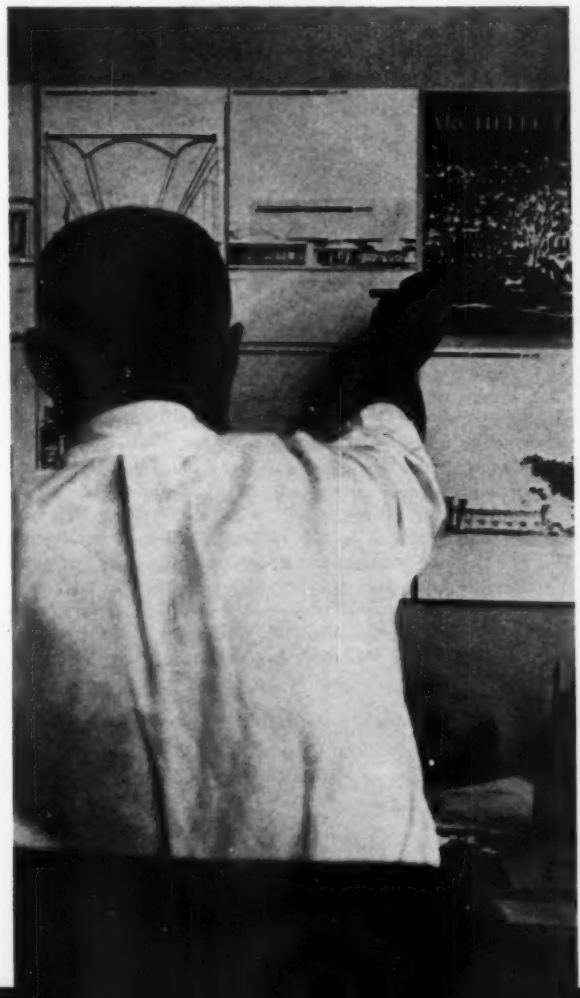
This quality of stability, of dependability, is what many of her clients come to her for. Wallace Harrison says, "When you hire Knoll to do an interior you know what you're going to get, and that's rare in a creative person—I've never been able to commission a painting, for example." This uniformity, down to the standard flower arrangement of tightly-packed pom-poms that is almost a Knoll symbol, is as true of her furniture as it is of her interiors. One critic pointed out that she has never deviated from the triangle and T-square of her student days, and it is true that of all her designs the boat-shaped conference table is almost the only curve. Her own sofas, chairs, and tables are all simple rectangles, as bare and direct as a child's drawing of a room. Perhaps the final judgment of her as a designer will be, "She knew her place and she kept it well." END

4

DESIGNING THE MESSAGE

John Peter exploits his background as an art director and editor to offer a communication and design service aimed at getting messages across

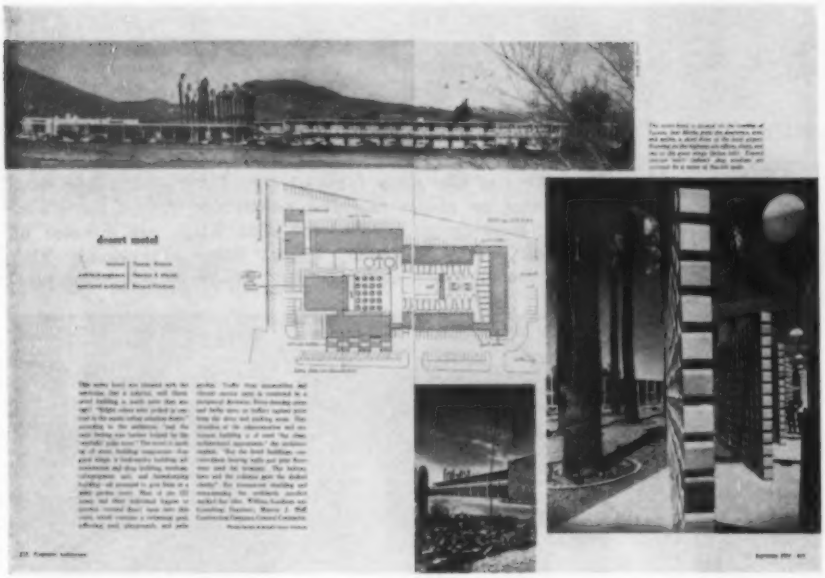


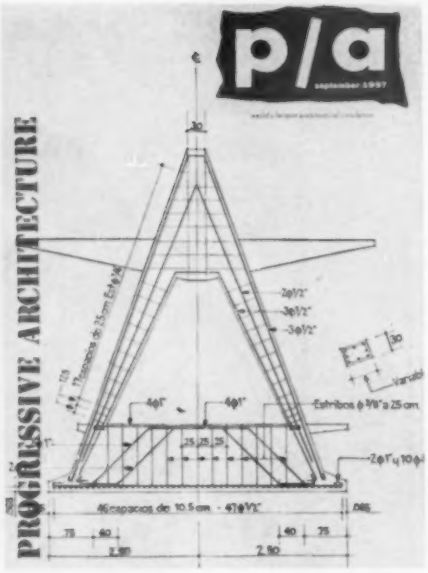


Top: three of the many faces of John Peter: discussing book assignment on phone, choosing panels for Oregon centennial exhibit, working on layout with Ron King, art director of *Canadian Homes*. **Bottom:** Robert Riley experiments with exhibit model, works on redesign of *Progressive Architecture*.

One of the most common of occupational fantasies is the one in which young writers imagine that they can support themselves by hanging a shingle on the door and waiting for clients who need some writing done. This fantasy, or something unnervingly close to it, has been fashioned into reality by an art director, writer, and editor who has forged his unusual combination of skills into John Peter Associates, Inc.—a unique small organization that will initiate, write, edit, and produce a book; develop and design a new magazine or redesign an existing one; design an exhibit. What these activities have in common is the one thing that sets the firm apart, in its own mind, from other consultant services: "the editorial approach."

JPA comes by that approach through Peter himself. An energetic man in his early forties, with close cropped gray hair and the restlessly persuasive gestures of a salesman, Peter has spent all of his adult life in editorial work. After World War II (during which he art-directed 12 foreign language magazines for the OWI and SHAEF), he became Art Director of the Visual Research Department of Cowles Publications. Because the research didn't seem to be leading anywhere, he left in 1946 to become art director of *McCall's*, and in the process realized that he wanted more control over editorial ingredients than an art director normally





Top layout and cover from *Progressive Architecture*, September, 1957, are typical of magazine's look before Peter redesigned format. Lower spread and cover of August, 1960, typify present look. Earlier approach tended to use photographs of roughly the same size, cover featured "P/A" prominently, with logo running vertically in stencil type. New covers carry only name and date, no "sell line" (since magazine is not sold on newsstands), are usually black and white, with color on spine for identification when stacked. White space is scaled to try to compete with larger page of a competitive magazine. Picture sizes play for contrast, layouts seek to balance solidity with openness. Typography was chosen for dignified "book look;" book concept was also applied to editorial organization and style, in an effort to emphasize strongly the reference aspect of the magazine.

had. So he became a writer, and in 1948 joined *Life* as an assistant editor.

Eleven years ago John Peter left *Life* to go on his own. He wanted not to be a free-lance, but really to be in business for himself. But what business? After taking stock of his assets, he decided that they were most impressive in combination: he was an experienced art director, writer, and editor, with a special interest in industrial design, which he had studied at Pratt under Donald Dohner and Will Burtin. He calculated that, by combining his talents, he could provide what would be, in effect, an editorial staff unattached to any single magazine. That such a service was salable seemed clear to him, but difficult to establish. So he set out to establish it; and his first job was the redesign of *Barron's Weekly* for Dow Jones, a client that wanted

"something like a cross between the House of Morgan and the Bill of Rights."

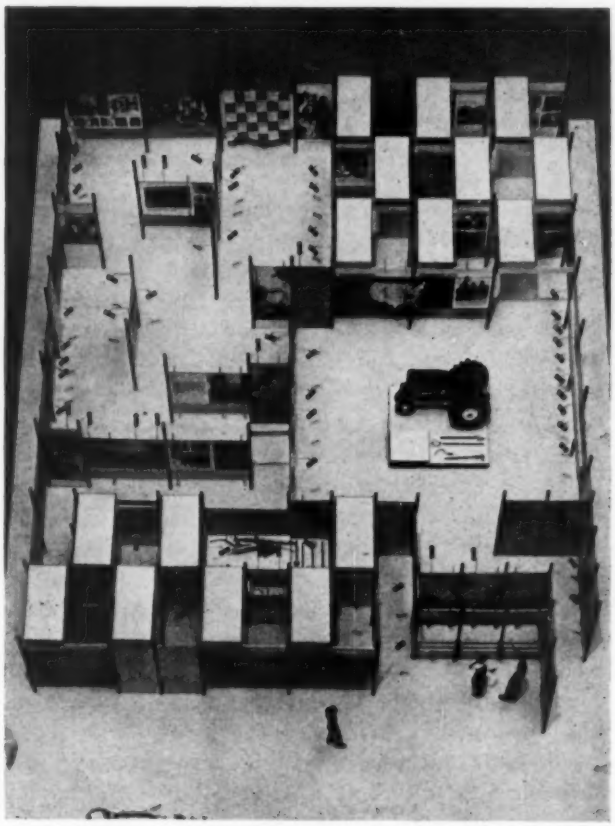
Peter's principal associate at present is Robert Riley, who functions as designer, illustrator, and model maker. Other staff members are Karen Hartnick, researcher and writer; and Judy Raff, who serves as general assistant and also does research.

In its early years John Peter Associates did everything from write children's books to prepare the tv script for Peter's appearance as home living editor of CBS's "The Morning Show." But although Peter himself serves as home living and architecture editor of *Look*, the firm now sticks to a last that it describes as "editorial consultants to management." Among their best-known jobs in that capacity were the award-winning two books, *Aluminum in Modern Architecture*, published by Reynolds Metals, but researched, written, and illustrated by the Peter organization. One of the books' more interesting features came from a special interest of Peter's. Since most of the masters who had created modern architecture were alive and active, Peter, like a design-oriented Alan Lomax, traveled the country with a Wollensak tape recorder, talking to Wright, Saarinen, Mies, Gropius, etc., and convinced Reynolds that the conversations ought to be included in the books. (The Ford Foundation has just given Peter a grant to complete his "oral history of architecture.")

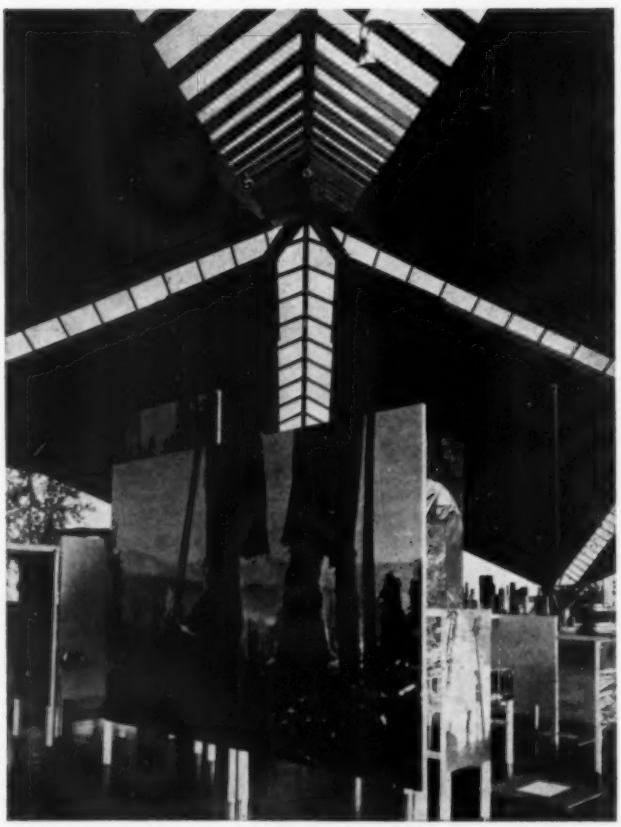
There are seven other books in the works now, but John Peter Associates' design activities are chiefly in magazines and exhibits. They approach magazine design pretty much as consultants normally approach industrial design, and face some of the same problems in the process. Retained by management (publisher = manufacturer) to do a job that is not always easy to distinguish from the job that the staff is already there to do, Peter's firm is to the magazine's art director and editors what the consultant designer is to staff designers and engineers. Often, at first, they resent his being called in, Peter admits, and his initial job is to prove that he can make a working contribution, rather than merely pontificate. Just as he has to convince the publisher that his approach is grounded in production realities, he has to convince art directors and editors that his approach is not grounded *by* production realities. He begins each magazine assignment by asking everyone on the editorial, advertising, sales, and circulation staffs to fill out a detailed confidential questionnaire designed to find out what individual members of each department regard as the magazine's strengths and weaknesses. Typical questions are: What do you think of the body type face in your magazine? — easy to read? hard to read? too big? too small? too light? too dark? too tricky? too dull? too inflexible? too tight? too loose? How would you describe the relationship between words and pictures or graphics in your magazine? — coordinated? uncoordinated? carefully planned? last minute? satisfactory? impossible? By the time all 30 questions have been answered by everyone from the publisher to the editorial assistants, Peter has a pretty good idea of what the magazine looks like to the staff that produces it, and they have a pretty good idea of what he is up to.

After research into what readers want from the magazine, and research into where his client stands in relation to competitive publications, Peter works with the staff to produce a redesign. This usually includes specimen covers and pages, new typefaces, copy and editing changes. When this is approved, JPA checks layouts and makes up style sheets and art control manuals, and they may continue the program with monthly critiques and planning meetings. They are now doing this with the staffs of *Maclean's*, *Chatelaine*, and *Canadian Homes*—three consumer magazines published by Maclean-Hunter in Toronto. For *Canadian Homes* they not only redesigned cover and layouts, but introduced a string of regular columnists into the magazine. In designing a logo, Peter tries to see it as a trademark: more than the identity tag on the front of a magazine, it is also the graphic staple on letterheads, invoices, truck banners, tv advertising, etc. Once he even got into personnel selection. Part of his design recommendation to *Progressive Architecture* (see left) was that they get a full-time art director. He not only got them one, but convinced them that she ought to start in Peter's office for the first week, so she could be integrated into his kind of design.

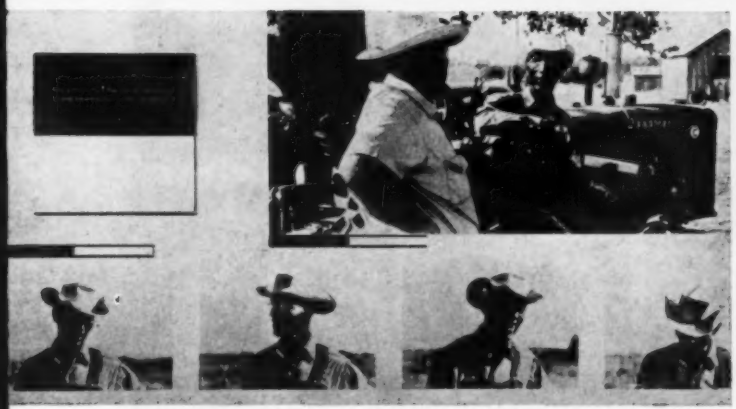
Peter's approach to exhibits is the same as his approach to magazines: reportorial rather than esthetic, striving for clarity rather than effect. They got into exhibit design when the USIA invited them to do "The County Agent" (see page 76), and they found that it was another kind of journalism. JPA's exhibits are characterized by strong pictures, simple words — like a large picture magazine story unfolding. In its conservative straightforwardness, their work runs counter to much modern exhibit design. But Peter believes that a lot of designs more imaginative than his fail to solve the problem of how best to present basic product information, believes that his approach could help solve it. "The reason most of our exhibit work is in propaganda," he says, "is that in propaganda you can't afford to rely on inference, you can't risk misunderstanding. The journalistic way is one way to make sure the idea comes across. A photograph is an explosion. Our job in an exhibit—as in anything else we do—is to make sure that the explosion is directed."—*R. C.*



Peter got into exhibit design four years ago when the USIA commissioned his firm to prepare an exhibit of "The County Agent" (right) for display in southeast Asia. First job was to find typical agent; Peter and George Zimbel chose one from Johnston County, Oklahoma, made him center of picture story showing how county agent concept helps American farmers. Revolutionary period tools are similar to some now used by Asian farmers. Model at right was designed for 3500 to 4000 square feet, but six arrangement plans, all retaining same traffic pattern for continuity, were made to allow for varying space plans. Chrome strips on panels were developed to receive translations of script into each country's language. Carrier system is tubular aluminum, panels are of plywood on styrofoam. Photographs for exhibit are by George Zimbel.



"Man in the Forest" — the exhibit at right — was prepared by John Peter Associates for the Oregon Centennial held in Portland in 1959. It was housed in the wood products pavilion, a parabolic structure designed by architect John Storrs. The 400-square-foot exhibit structure was made of wood for thematic reasons, and the photo-essay form was chosen by the Peter organization as the most logical way to dramatize Oregon's forest industries. Photos by James Karales.



DESIGN REVIEW *Major Appliances*

Underneath such verbal confetti as Sensi-Temp, Frost-Free, Filter-Flo, Magic-Flame, and Burner-with-a-Brain lurk one or two real advances in major appliances. The first commercial thermoelectric refrigerator is on the market, albeit in diminutive form (just large enough for one ice tray); and two newly developed gas-range burners cook with a smoother, more efficient heat. It is a rare 1961 appliance that does not bill itself as built-in, or as looking built-in. In addition to fitting between cabinets, or under them, appliances are now designed to stack on top of them (or on top of each other), or to hang on the wall. Consequently there is now a wall-hung dishwasher, and at least two of the new cabinet-style ranges are available without bases, for this kind of installation. In contrast to this general trend toward compactness, there is a localized counter-trend toward huge refrigerators with French doors that open on a VistaVision of food.

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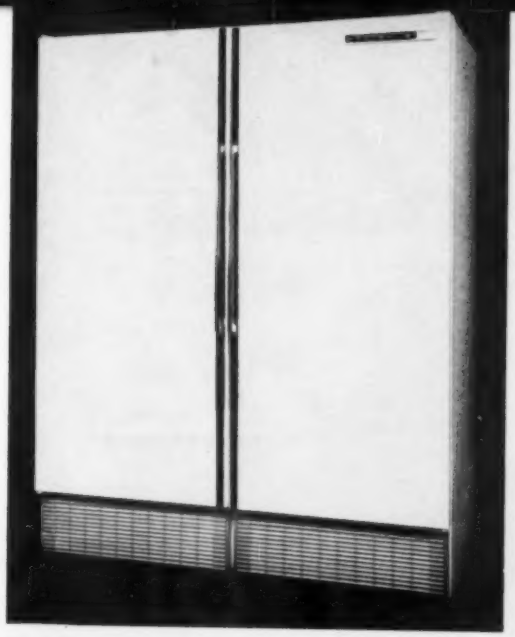

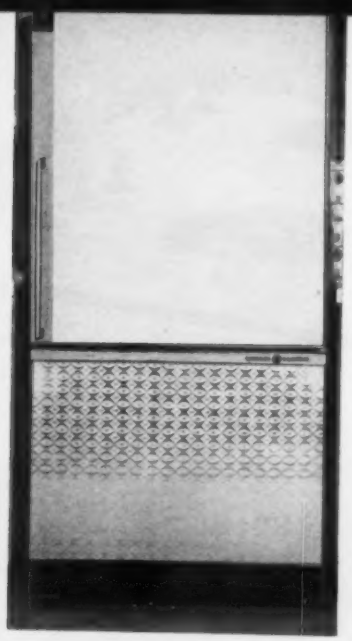

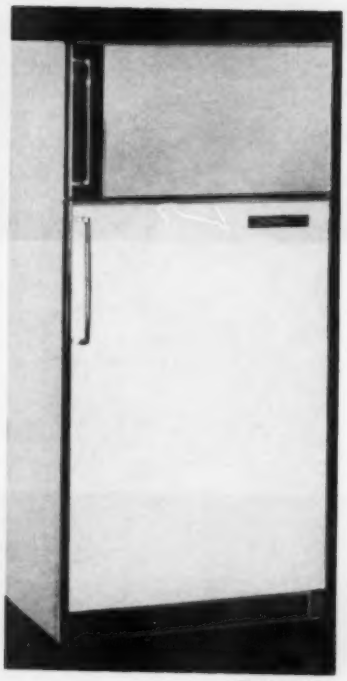

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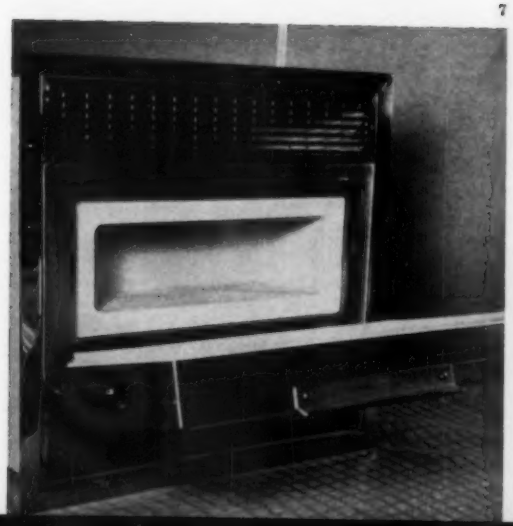

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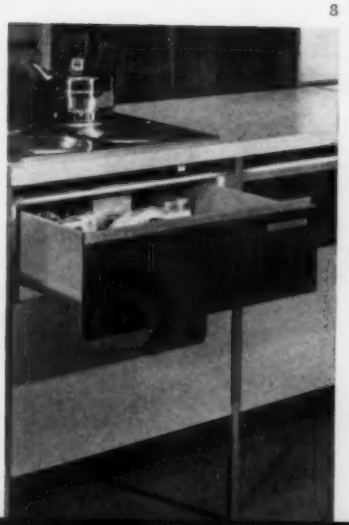


Refrigerators-freezers

1/2. Kelvinator prototype pass-through refrigerator is set into outside wall, opens from both inside and outside. Developed for dairy delivery and storage, it may be adapted for kitchen-to-patio use. Refrigeration element is in base. Prototype's exterior door is stainless steel, interior door is paneled in wood.
Designers: D. H. Carter, manager, commercial department; W. E. Reddig, director of styling; H. F. Powell, director, engineering; H. E. Anderson, staff designer.

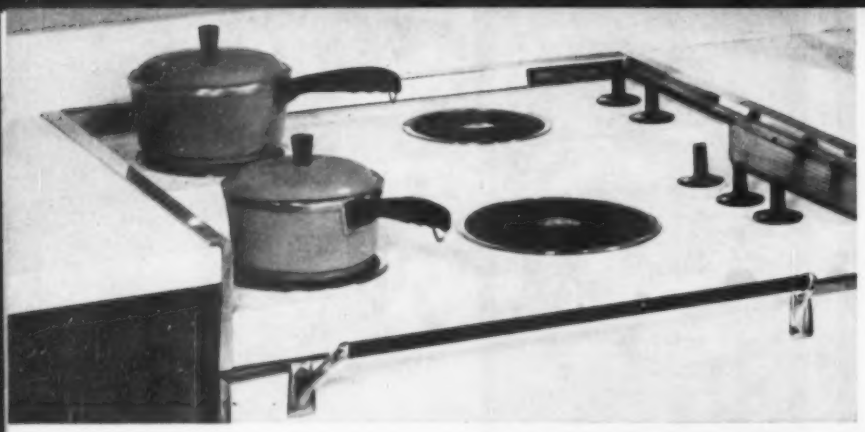
3. Admiral duplex refrigerator-freezer is symptomatic of trend to big, French-door units that fling open upon a cornucopia of food. This one can be built-in or used freestanding.
Designers: Lawrence H. Wilson Associates.

4. GE thin-wall refrigerator takes up same amount of space as 1950 model with half the capacity. Insulation is freon-filled polyurethane. Straight-line back allows it to be used in kitchen island or room divider installations.
Designers: GE design staff, Arthur BecVar, manager.

5/6. Montgomery Ward refrigerator-freezer has family-look scroll panel and special handle adopted for use on all the firm's 1961 appliances. Interior planning and graphics are unusually good.
Designers: F. W. Preiss, manager, Product & Package Design; G. F. Mendenhall, manager, Product Design; F. J. Greb, staff designer.

7. Norge thermoelectric refrigerator-freezer, just large enough for one ice tray, is progenitor of larger thermoelectric freezing units. This one will be installed in hotel rooms as a built-in.
Designers: Norge and Borg Warner engineering staffs.

8. Westinghouse under-counter freezer drawers are experimental installations in company's Kitchen-of-the-Future. Individual drawers are cooled to temperatures suitable to their contents.
Designers: Peter Muller-Munk Associates.



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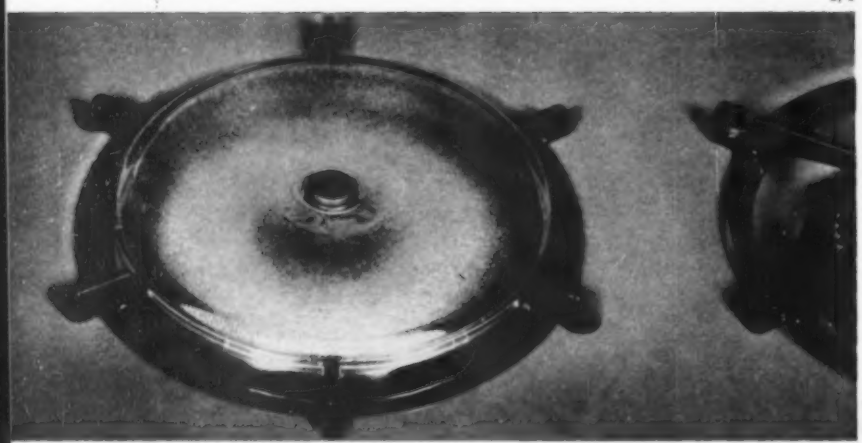

Ovens and ranges

1. Westinghouse split-level electric range has burners on two tiers for convenience in stirring pots at the back, and also to make room for handles. Absence of backguard makes it look built-in, but it isn't.
Designers: Westinghouse staff

2. RCA Whirlpool freestanding range lines up controls along right side; flip-up burner knobs fold down when not in use. "Gourmet Shelf" along backguard is for cooks who haven't heard that heat spoils spices and herbs.
Designers: Sundberg-Ferar

3. Hardwick Stove has a new kind of burner. A honeycomb ceramic disc is placed over the flame, and a Microglas cover goes on top. It emits infra-red rays, provides faster, more efficient cooking.
Designers: Hardwick staff

4. Whirlpool drop-in range unit has a new burner, too. A jet of air from center of burner spreads between flame and bottom of pot to provide more even heat. Top of unit (shown with grids off) has rounded corners, sealed burner bases, for easier cleaning.
Designers: Sundberg-Ferar, with Whirlpool engineering staff

5/6. O'Keefe & Merritt "Contempo" (5) and Tappan "400" (6) were jointly engineered by two firms, but individually designed for East and West Coast markets. They can be hung on wall, mounted on cabinet base, or built-in. Burners are concealed in drawer. Oven venting on Contempo is incorporated into top of oven doors.
Designers: For O'Keefe & Merritt, Lewis & Tweedy; for Tappan, Smith, Scherr & McDermott

7. Frigidaire wall oven has a door that swings out and up for loading —especially useful in compact kitchens.
Designers: Frigidaire engineering staff with GM Styling

8. Whirlpool modular oven is meant for stacking, hanging, or mounting on counter top.
Designers: Sundberg-Ferar

9. Tappan electronic range uses Litton Industries Microtron unit; microwave action stops when door is opened. It will be available in 6 colors.
Designers: Tappan staff

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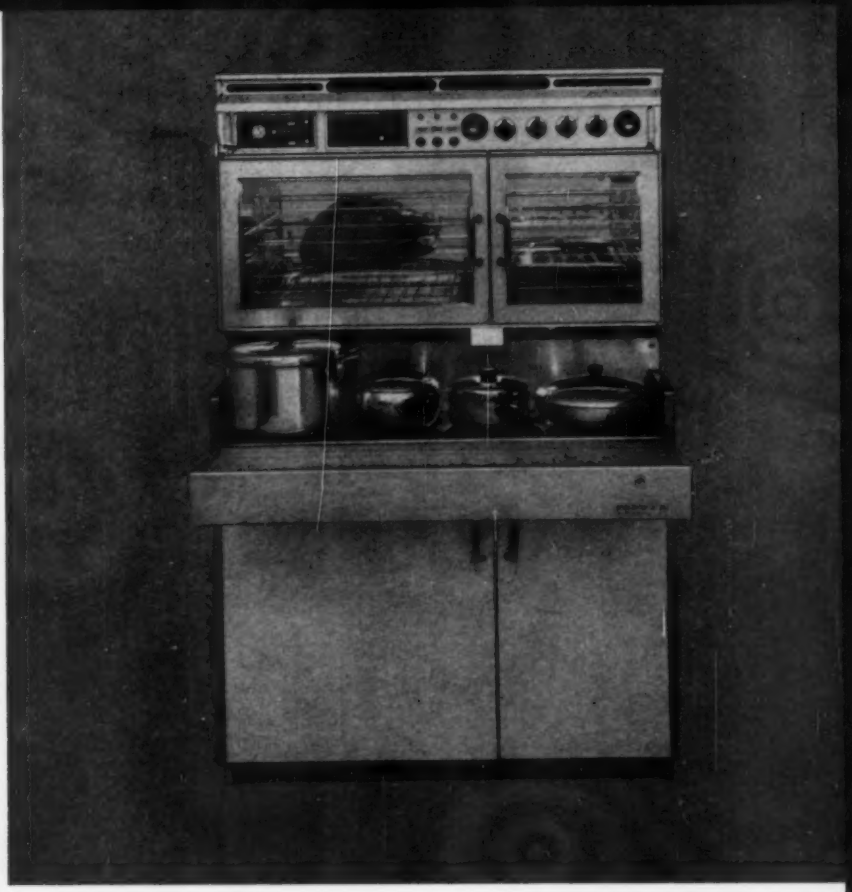

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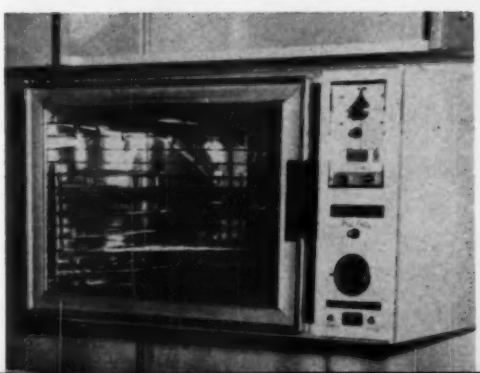

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Laundries and dishwashers

1. Ling-Temco compact dishwasher is a longitudinal box that can be installed on the wall at eye level. It comes in three sizes, the smallest of which, holding service for six, is 30" by 15" by 13". Washing action is waves of water followed by steam sterilization. Door and handle design shown are presently being modified.
   Designers: Ling-Temco staff

2. GE combination washer-dryer is newly engineered to fit depth of standard storage cabinets. It also matches them in height. Dispenser doors for bleach and rinse agent are on front, rather than on top.
   Designers: GE design staff, Arthur BecVar, manager

3. Sears, Roebuck washer-dryer unit is only 29" wide, is suggested for installation in a spare closet. It holds 10 lbs., comes in gas or electric versions.
   Designers: Sundberg-Ferar

4. Tappan dishwasher has the usual new operating advantages, but the big bonus is in appearance. Snap-latch closing is hidden beneath long pull-bar, and graphics, start button, dial control, and venting are also visual understatements.
   Designers: Tappan staff

5. RCA Whirlpool undercounter dishwasher has telephone-dial-type control, a two-color control panel that looks like an almanac phase-of-the-moon drawing—curious but not offensive.
   Designers: Sundberg-Ferar

6. Preway gas dishwasher is new product for a small appliance manufacturer. It has changeable front paneling, aluminum frame and grid. Concave stainless steel trim on control panel exploits depth of necessarily thick door.
   Designers: Don Doman Associates

7. Westinghouse companion washer and dryer units are only 28½" high, so can be installed stacked as well as side by side.
   Designers: Westinghouse staff

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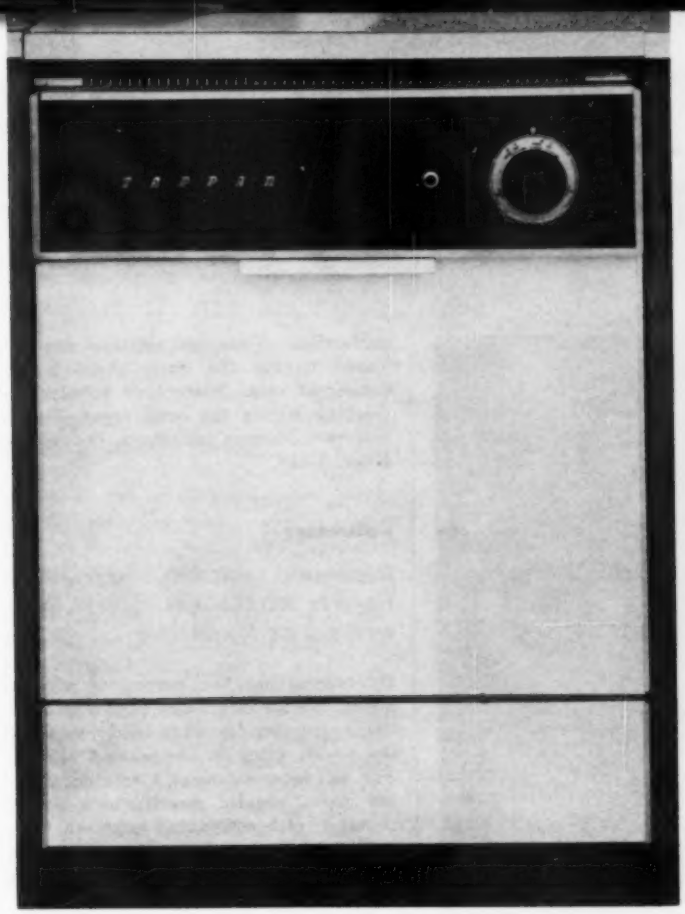

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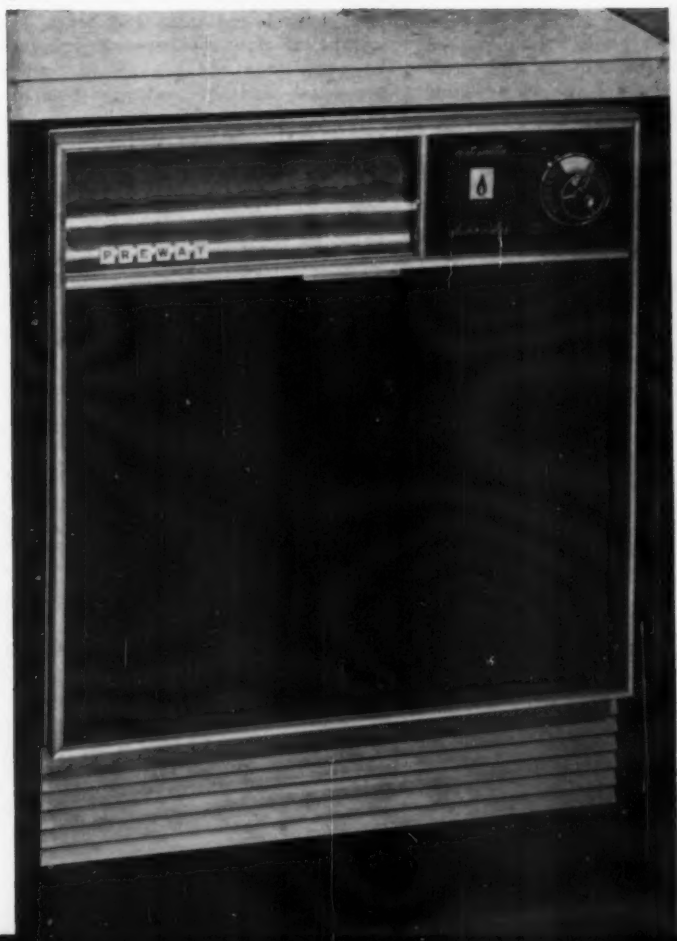
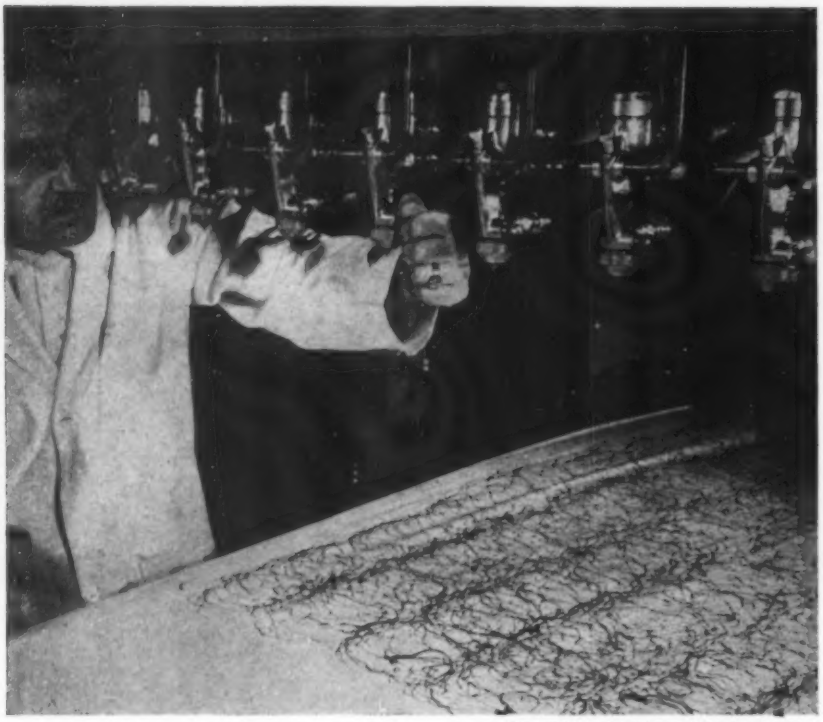


7

TECHNICS *new products, materials, processes and finishes*



Decorating textiles with vinyl sprays

Decorating textiles

Vinyl spray technique for textiles yields immense range of pattern and color; eliminates engraving, printing equipment

A novel approach to textile decoration—spraying liquid vinyl plastics in abstract swirls, random line or spatter designs—offers designers a practically unlimited choice of color, pattern, and texture for a wide range of fabrics. Because the same spatter and swirl patterns are repeated in the new process, they have the regularity of printed designs—but do not require costly engraving rolls or heavy fabric printing equipment. A great variety of fabrics, wovens, nonwovens, and knitted materials of tight and loose construction, can be decorated by the method.

After being sprayed on the fabric, the vinyl is fused to it by oven-curing and forms permanent patterns that are said to withstand washing and dry cleaning. If desired, the vinyls can also provide a three-dimensional or raised pattern surface. The range of patterns is achieved by adjusting the spray guns, altering the flow properties of the plastic, and by changing the number of spray heads, their position, or the speed of the material through the equipment. Either hand or automatic spray guns may be used. *Manufacturer: The equipment is made by Binks Manufacturing Company, Chicago; the process was developed by B. F. Goodrich Chemical Company, Cleveland, Ohio.*

Metal bonding adhesive

Dry adhesive for metal-to-metal bonding cures in oven, contains no cloth carrier, no solvents

For high-strength, metal-to-metal bonding, a new, dry adhesive has been introduced. The new material is supplied in continuous rolls, 18 inches wide, comprising 125 square feet. It is a dry, 100 per cent solid, modified epoxy resin system, and contains no solvent or cloth carrier.

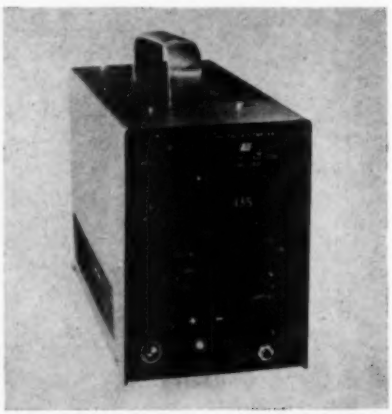
A sheet of the dry film is simply cut to shape and interposed directly between the metal surfaces to be bonded. It is cured in an oven by heating at 350 degrees F. for approximately one hour. As the adhesive, known as Metlbond 408, softens, it flows and wets the metal surfaces, filling in small voids and imperfections. Since no volatiles are released during the cure, there is no danger of voids, blisters, or bubbles developing within the bond areas. *Manufacturer: Narmco Industries, Inc., Costa Mesa, Calif.*

Voltmeter

Redesigned voltmeter mechanism features stroboscopic readout, high accuracy at lowest cost

By redesigning the insides of a voltmeter, the manufacturer is able to offer the instrument for what he claims to be the lowest price on the market ($295). The voltmeter combines a rotating number drum, coupled directly to a potentiometer (for comparing unknown voltage with given known voltage), and a stroboscopic readout of the unknown voltages.

This is how it works: On the surface of the drum is a transparent film strip with numbers 0 to 250, which correspond to unknown voltages. The potentiometer is mounted on the same shaft as the drum and both are rotated continuously at very high speeds. A strobe lamp is located inside the drum, and it fires the instant the right number—when the unknown voltage and the known voltage are equal—and the projection lens are properly aligned. The number is projected onto a ground glass screen on the panel face, where it flashes 24 times a second. Since this number is flashed once for each drum revolution, the strobe lamp, in effect, "stops" the number which corresponds to the unknown voltage. By projecting 24 images per second, the eye sees an essentially continuous image.



Voltmeter

The voltmeter is reported to have an accuracy of 0.5 per cent, ample for use in most laboratory and industrial production work. *Manufacturer: Electro-Logic Corporation, Venice, Calif.*

Acrylic-overlaid plywood

Acrylic-bonded plywood overlay eliminates on-the-job finishing for low-maintenance projects

Plywood with a permanently colored acrylic overlay is said to cost less and last longer than metal for low-maintenance building exteriors.

Designed for fascias, feature walls, or entire buildings, the tough, double-overlaid panels are being marketed in initial heat-bonded acrylic colors of white, red, blue, and green, with other colors to follow. They require no on-the-job painting or other surface treatment, and are available in standard widths, lengths, and thicknesses. *Manufacturer: Georgia-Pacific Corp., Portland, Ore.*

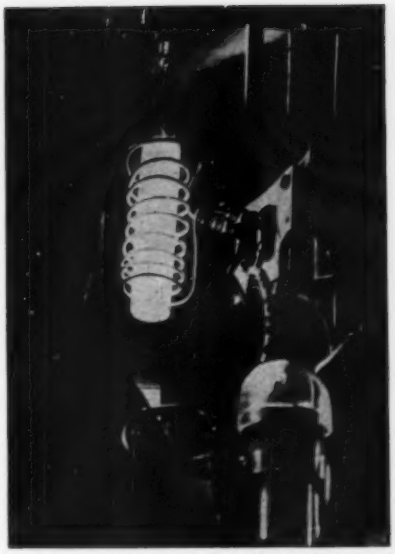
Ultra-strong magnets

Research in superconductivity yields tiny hyper-magnets able to run on modest power source

The latest offspring from research in superconductivity (see ID, February 1961, page 86) is the creation of ultra-strong magnetic fields from only small amounts of electric power. Conventionally, millions of watts of power, supplied by special power plants, are required for strong electromagnets, and the equipment weighs many tons. In addition, most of the power is wasted in the form of heat generated by the vast electrical resistance inherent in the equipment. The new power equipment will be small, weighing only a few hundred pounds, and inexpensive.

The development will have important applications wherever large volumes of magnetic fields are required. In many electronic devices, the availability of large magnetic fields can extend operation to higher frequencies providing broadband communication systems for use in radio relays and space communications. In the area of thermonuclear physics, large-volume magnetic fields permit containment of high speed atomic particles at low cost. And the development will be welcomed in the experimental physics laboratory where the present cost of producing high magnetic fields has greatly limited certain kinds of research.

The new magnet, the result of fundamental research in physics and metallurgy, is a combination of three parts of niobium metal and one part tin. This compound is an especially good super-



Low-watt electromagnet

conductor: when maintained at very low temperatures, near absolute zero, current introduced in it will continue to flow without the addition of more power.

Special techniques had to be developed in order to form niobium-tin into wire because the material is very brittle. (An electromagnet is made when current is introduced into wire wound around a metal core.) The difficulty was overcome by forming the niobium into a slender tube and filling it with powered niobium and tin. The tube was then hammered and stretched into wire which was wound around a coil and baked. Heat fused the powders inside the tube into the desired solid wire. *Manufacturer: Bell Telephone Laboratories, New York, N. Y.*

Mass-produced furniture

One-step urethane molding promises production economies in furniture upholstery technique

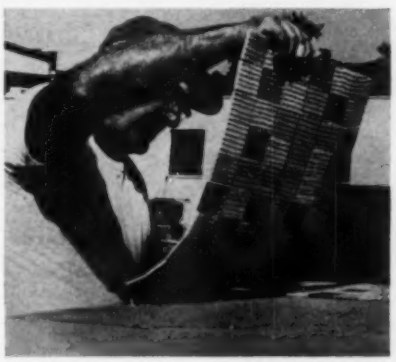
Upholstered furniture is now being produced by a technique that molds polyurethane foam directly over a steel frame in a single quick step. In the process, the steel frame—of any design —is simply positioned in a mold cavity and the urethane chemicals poured around it. After the foaming action has occurred, and the foam has set, the whole casting is removed from the cavity, and all that's left to do is to glue fabric on the foam body and screw in the set of legs. Because foam surrounds the entire chair, it is light weight, durable, and flame resistant.

The process does away with costly and slow hand craftsmanship, and will eventually mean lower retail prices for upholstered furniture. So far a line of five chairs produced by the new technique have gone on sale. *Manufacturer: Karpen Furniture, division of Schnadig Corporation, Chicago, Ill. The process was developed by General Tire and Rubber Company.*

Exterior tile adhesive

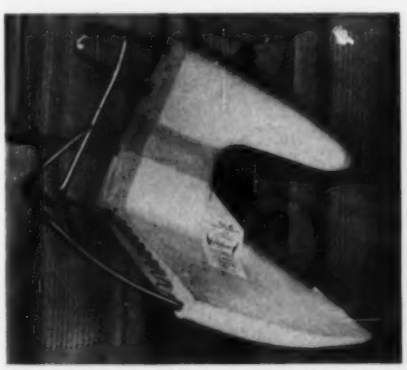
New adhesive eases installation of exterior ceramic wall tiles, reduces weight of curtain walls

A specialized adhesive has been developed for installing ceramic tile on exteriors of all descriptions. Designated MA-450, the product is a high-strength



Adhesive for tiles

waterproof rubber base adhesive with non-oxidizing resins. It has already been used in the construction of the tile facade of the Philco Research Center in Philadelphia. In this application, prefabricated curtain wall panels were faced with 45,000 square feet of ceramic



Foam-in-place seating, cut-away (left) and production model

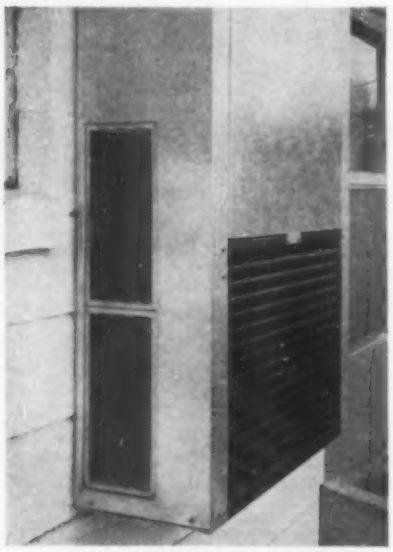
mosaic tile. Use of the adhesive made the ceramic tile more competitive with other facing materials by reducing the installation cost of the tile and by permitting a reduction in the overall thickness and weight of the panel.

MA-450 is said to be bondable to any rigid, dry, hard, clean surface such as concrete, metal, cement asbestos board, etc. Coverage is approximately 50 square feet per gallon. *Manufacturer: Miracle Adhesives Corp., Bellmore, N. Y.*

Air conditioning

Externally-mounted heat pump cuts installation time and cost for new air-conditioning unit

Central-system cooling and mild weather heating for residential and commercial structures, is promised through a heat pump that attaches directly to the outside of a house, greatly reducing installation time and cost. Trademarked the WhispAir, the unit costs approximately $500 for a ranch style house of concrete block construction. Each unit serves an



Heat pump mounted on outside wall

area up to 1000 square feet; for larger houses, two units may be used with one supplying the living-dining area, and the other the bedroom-bathroom area.

The WhispAir is approximately 6 feet high, 2 feet wide, and 1 foot deep. Rated at 18,000 BTUs of cooling and 17,000 BTUs of heating, it is equipped with two squirrel-cage blowers, driven by a ⅛ horsepower motor. The outside panel is removable, exposing all major components and providing easy access for maintenance. The cabinet is aluminum. *Manufacturer: Westinghouse Electric Company, Air Conditioning Division, Staunton, Va.*

Redesigned gantry

Adjustable gantry handles 4-ton load; comes to terms with awkward spaces, tight restrictions

A gantry (a pulley system on a framework) is now available that can be set up on the end of loading platforms, as well as on truck beds, in pits, and other cramped areas.

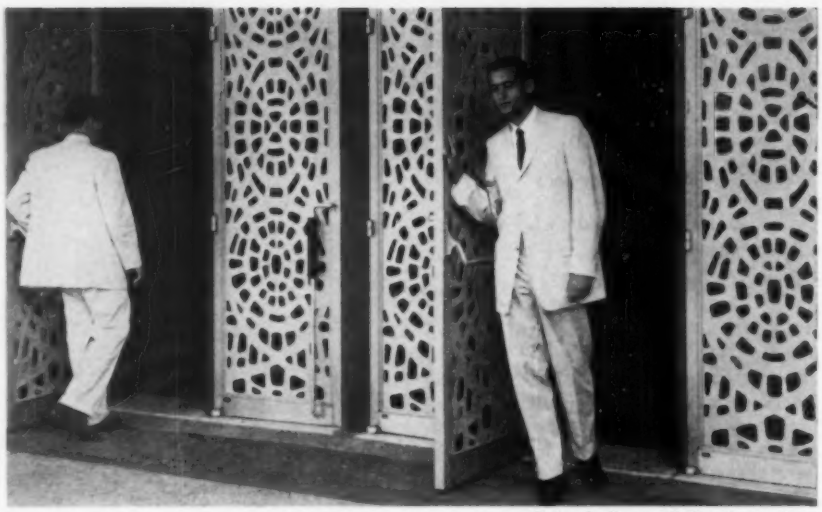
Unlike conventional fixed-height gantries, the unit has telescoping legs with 6 feet of height adjustment, and a self-leveling I-beam for off-center loads. It can be lowered and narrowed when rolling through tight aisles, under fire doors, and into elevators. Available in five different models, the gantries come in steel or aluminum alloy I-beams in spans to 30 feet, heights to 17 feet, and capacities to 4 tons. *Manufacturer: B. E. Wallace Products, Inc., Exton, Pa.*

Stained glass and aluminum

Aluminum mountings widen potential for stained glass applications, offer varying planes and densities in rigid, stable form

Stained glass, one of the oldest decorations, may now be mounted in aluminum. The innovation, which affords designers and architects broad possibilities for treating door and window openings sandwiches the stained glass between two thin sheets of aluminum into which a selected design has been cut. The glass then appears through the openings.

The aluminum sheets are first cut into the proper design, after which pieces of mouth-blown glass are sandwiched between the layers of metal. The sections of glass are then surrounded by epoxy resin. The entire structure is rigid and structurally stable, and is said to have no interior voids; the seals between glass, epoxy, and aluminum are air tight.



Stained glass and aluminum doors

Multiple light planes and degrees of color density are achieved by canting of the individual pieces of glass and by variations in glass thickness. When light deflects from the panel, the glass areas appear dark, while the aluminum assumes a sheen, providing a surface pattern. *Manufacturer: Baut Studios, Inc., Forty Fort, Pa.*

Feeding Computers

Optical scanner translates full pages of engineering and design data at sight, thus eases computer tape-punching bottleneck

A commercial reader scans whole pages of ordinary business documents and instantaneously translates the information it reads into punched tape at the rate of 240 characters—letters of the alphabet, numbers and punctuation marks—per second. It is the world's first such device to handle entire pages of copy; its predecessors accommodate single lines of type.

The device is designed to close the

Commercial page reader

information feeding gap in data processing. It incorporates alpha-numeric principles and is transistorized. Its use is said to eliminate the laborious manual translations of raw data into business machines suitable for high-speed computers.

The Optical Scanner has already been ordered by several insurance and utility companies for use in billing. The unit weighs 1200 pounds and is 68 inches wide, 30 inches deep and 62 inches high. *Manufacturer: Farrington Manufacturing Company, Needham Heights, Mass.*

Decorative hardboard

Grainless wood product contains colored particles scattered throughout in mosaic patterns

A decorative hardboard—the first of its kind—consisting of colored particles on a light blond background has been introduced for interior applications such as wall paneling, partitions, cabinets, table tops, sliding doors, etc.

Trademarked Sandalite, it is a grainless wood product with a scatter mosaic design. Its factory-sealed surface can normally be used without any further finishing. Wax finishes may be used for added protection or where a more glossy finish is desired. Easily worked and fabricated with ordinary hand woodworking tools or power equipment, Sandalite is available in standard thicknesses and sizes. *Manufacturer: Forest Fiber Products Co., Forest Grove, Ore.*

Heated conversations

Communications system, based on infra-red signals, offers maximum secrecy for user, total frustration for eavesdroppers

Heat waves—invisible infra-red beams—transmit voices silently, secretly for distances up to three miles with a new gun-shaped device called MAXSECOM (Maximum Secrecy Communications). Words spoken into the hand-held unit are electronically converted into infra-red beams, transmitted to a receiver and reconverted back into sound waves. Larger systems have also been developed with ranges up to 20 miles.

MAXSECOM is said to be immune to interference, detection or jamming. It was developed primarily for military, police, and civil defense applications requiring secrecy and complete security from interception or jamming.

The device is powered by a 12-volt storage battery and requires no wires or cables between transmitting and receiving units. The infrared signal is confined by optical control to a narrow

Taking aim for heat wave conversation

beam between sender and receiver. It can be received only in this zone, and then only by another MAXSECOM unit containing the necessary specialized infrared sensor apparatus and decoding devices. It weighs less than 10 pounds. *Manufacturer: Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.*

Seagoing radar

Marine-electronic design team develops 10-ton seaborne radar system for air attack warning

One of the largest seagoing radar installations ever developed will soon join the Navy to give early warning against air attack.

Faced with the twin problems of electronic complexity and seaworthiness, the Navy called on widely divergent design talents to produce a radar system which could operate with equal success on picket boats and cruisers. The 10-ton system has a 40-foot aluminum antenna and an ensemble of 150 horns that beam and collect signals to pinpoint objects hundreds of miles away. Inside the antenna mast is a maze of transmission lines to carry the radar impulses to and from the complex of horns. *Manufacturer: Raytheon Company, Waltham, Massachusetts.*

High-speed x-ray photography

Pulsed x-ray movie camera inspects high-speed phenomenon in sealed or obscure environments

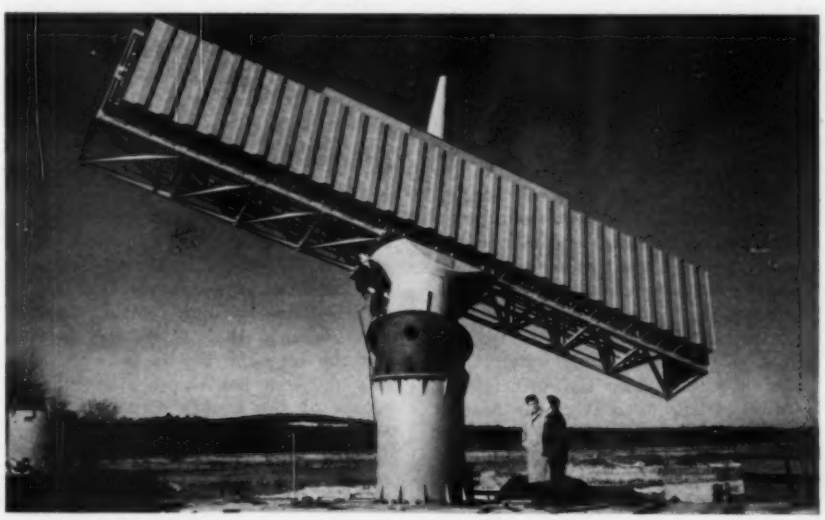
The development of a new pulsed system capable of making x-ray motion pictures with exposure times of one millionth of a second or less, and only 1/4000th of a second apart has been announced. This will make possible, for the first time, high-speed x-ray movies of rapidly moving components sealed inside metal cases, or of the burning pattern of solid fuels used in missiles and rockets.

Other applications will be in the fields of shock, vibration, and radiation effects studies, medical radiology, ballistics, and crystallography. Previously, such high-speed pictures could only be taken individually several minutes apart so that cinema studies were not possible.

The device, for example, delivers stop-motion capabilities which make it possible to show a rifle bullet, traveling 4000 feet per second, entering an aluminum salt shaker filled with water, and the same bullet an instant later (inside the shaker) as the nose is flattened and mushrooming begins.

The x-ray device will also make possible studies of the action of ultra-high-speed machining where observation by conventional methods is impossible because of the obscuring effects of smoke and vapor.

The x-ray pulse of the unit may also be used to study diffraction patterns of crystals. It will enable the investigator to analyze the molecular and crystalline



New navy radar system

structure of crystals under dynamic conditions, and to record transient crystal formulations formerly unknown.

The x-ray system consists of two units: the x-ray console with the flash x-ray generator tube, power supply and control circuits; and an image intensifier console. In operation, the x-rays pass through the object under test, and strike the x-ray-sensitive screen of the image intensifier tube, where they are amplified and converted into visible light. The system costs about $40,000. *Manufacturer: Zenith Radio Corporation, Chicago, Ill.*

Laboratory table surfacing

Table top material for laboratories said to resist prolonged exposure to corrosive chemicals

For laboratory table tops, a new material has been developed which is said to have superior chemical and stain resistance. Trademarked Colorceran, it has a completely inorganic surface and an asbestos-cement base.

The material is similar to Colorith, the chalkboard product, in such properties as durability, corrosion resistance, and product uniformity. It is said to be unaffected by almost all reagents used in school, industrial and hospital laboratories, and is specifically intended for service where continuous exposure to strong acids, powerful solvents, and chemical staining agents is encountered. *Manufacturer: Johns-Manville, New York, N. Y.*

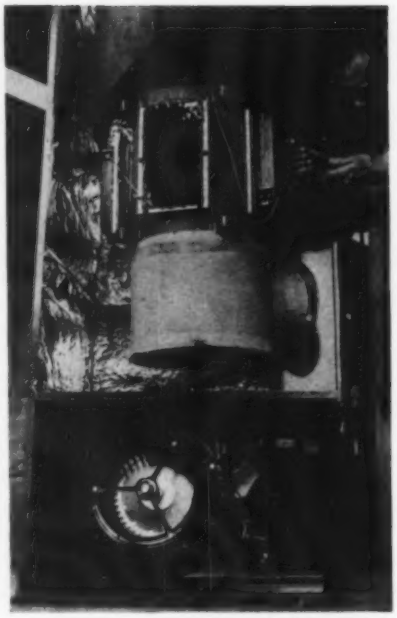
Self-powered furnace

Thermoelectric heating eliminates need for external power, permits new design flexibility

The first commercial application of thermoelectricity to residential heating may soon appear on the market in the form of a gas-fired, forced-air furnace. Totally free of any external power source, the furnace will be more reliable, simpler to install and cheaper to operate. What's more, emancipation from external power supplies suggests a new flexibility in location and design of residential or commercial heating units.

The new unit uses the principle of thermoelectricity to convert the heat of its own burning gases into electricity to power its blower.

The thermoelectric elements are built into openings in the furnace walls so



Thermoelectric furnace

that the portions inside the furnace heat up more than the portions outside—electricity is released at their junctions. The heating capacity of the furnace is 80,000 BTUs, or more than enough for most residential applications. *Manufacturer: C. A. Olsen Manufacturing Company, Elyria, Ohio.*

Very lightweight bolts

Metal technology overcomes inherent weakness in beryllium to permit manufacture of featherweight, super-strong fasteners

The strongest metal fasteners for their weight are now being made of beryllium metal, which is one-fourth the weight of steel. The development is expected to open up immediate weight-savings possibilities in space and missile craft where bolts are used. Pound for pound, the new beryllium bolts are nearly twice as strong as the best comparable steel bolts; thus, where two pounds of steel bolting have been used, little more than one pound of the new beryllium bolts will do the same job. This weight saving is of vital importance in satellite work—the manufacturer estimates that it costs as much as $1,000,000 to put each pound of satellite into orbit.

Until now, investigators have passed up beryllium for high strength applications because they attributed to it a general inherent brittleness. However, new research has shown that the real source of the metal's structural weakness is a sensitivity to notches or surface discontinuities. By getting rid of microscopic surface scratches and by beefing up the other necessary notches such as the head and threads, these weaknesses were eliminated.

On a strength-to-weight basis, the shear strength of the beryllium bolts is 150 per cent of titanium bolts and more than 200 per cent of steel bolts. For fatigue strength, the beryllium bolts are better than nine times stronger than steel bolts and two times stronger than titanium (again on a strength-to-weight ratio). *Manufacturer: Standard Pressed Steel Company, Jenkintown, Pa.*

Beltless attic fan

Re-positioning drive mechanism eliminates belt and pulleys in attic-exhaust fan; allows equal power, lower cost, less bulk

A new line of attic and exhaust fans features a drive mechanism which completely eliminates the drive belt and pulleys of conventional systems.

This new concept in fan design means that the units cost less to install, less to maintain, and less to run. The driving system consists of an all-angle electric motor which, by means of a drive wheel, powers the steel hub of the fan blades. The motor is located right in the airstream where it runs cooler for greater efficiency.

The overall size of the fan is smaller than conventional units, and the weight is lower. (A 24-inch unit weighs 48 pounds as against 68 pounds for a comparable belt-driven unit). *Manufacturer: Consolidated General Products, Inc., Houston, Texas.*

New aluminum finish

High reflective luster now possible on painted aluminum, suggests use in wide design range

A technique for applying paint to aluminum sheet permits retention of most of the metal's reflective luster.

A line of decorative trim, embodying the new technique is now available. Developed especially for interior applications, the line is trademarked Reflective Colorweld and is available in widths of one to 18 inches, 10 colors, and three finishes: bright, embossed, and brushed.

The material offers wide design potential as wall paneling, in appliances, the auto industry, and in the costume jewelry trade. On bright sheet, its mirror-like quality is said to be superior to color anodizing, the present technique for producing bright, colored finishes on aluminum. On all other surfaces it is as bright as anodizing and it can be manufactured with less danger of damaging the surface. *Manufacturer: Reynolds Metals Company, Richmond, Va.*

FREE LITERATURE *available from manufacturers, on materials, components, processes, machines*

Materials—Plastics

Reusable plastic packaging. Pac-Tron, Inc., Willow St., Mystic, Conn. 12 pp. Ill. Catalog describes Pac-Trim, an expanded foam plastic in various reusable shapes employed for packaging, cushioning, and protection of delicate or sensitive equipment.

ABS plastics. Naugatuck Chemical Division, United States Rubber Company, Naugatuck, Conn. 28 pp. Ill. Booklet describes properties and applications of Kralastic ABS plastics. Also included is design information on more than a score of products currently molded from the material.

Thermoplastics. Cadillac Plastic & Chemical Company, 15111 Second Ave., Detroit 3, Mich. Table shows significant physical, chemical, and electrical properties of acrylics, acetate, butyrate, Teflon, nylon, polyethylene, and vinyl.

Vinyl coatings. B. F. Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio. 26 pp. Ill. Brochure gives description of properties, preparation, and applications of various Geon vinyl formulations used as protective and decorative coatings.

Silicones. Silicones Division, Union Carbide Corporation, 270 Park Ave., New York 17, N. Y. 16 pp. Ill. Booklet presents latest information on silicones, tells what they are, and describes ways in which they can be utilized in a variety of consumer and industrial products.

Silicones and space. General Electric Company, Silicone Products Department, Waterford, N. Y. 16 pp. Ill. Brochure discusses properties of silicones in relation to aerospace applications. Applications include insulation, potting and encapsulating, varnishes, paint additives, etc.

Laminates. General Electric Company, Laminated Products Department, Coshocton, Ohio. 16 pp. Ill. Brochure describes properties and applications of complete line of Textolite industrial laminates, including copper-clad, sheets, tubes and rods.

Nylon. The Polymer Corporation, 2120 Fairmont Ave., Reading, Pa. 4 pp. Ill. Bulletin describes properties and applications of a new nylon formulation that permits production of larger shapes at lower costs.

Styrene-based materials. Monsanto Chemical Company, Dept. AI, Springfield 2, Mass. 12 pp. Ill. Booklet gives typical performance and property data on new family of abuse- and chemical-resistant styrene-based molding and extrusion materials, Lustran A and Lustran I.

Comparison chart. Marbon Chemical Division, Borg-Warner Corporation, Dept. C-2, Box 68, Washington, W. Va. 12 pp. Report offers comparisons of the major properties of nine industrial plastics: Cycolac GS, nylon, acetal, cellulose acetate butyrate, cellulose acetate, modified acrylic, polypropylene, linear polyethylene, and high-impact styrene. Graphs compare the plastics in over-all performance in following areas: cost in cubic inches per dollar; heat deflection at 264 psi; impact strength at room temperature; impact at low temperature; tensile modulus; and hardness.

Methods

Non-destructive testing of small tubing. Superior Tube Company, 1712 Germantown Ave., Norristown, Pa. 8 pp. Ill. Reprint is said to be the first complete article on non-destructive testing of small diameter tubing. A short description of each test is given along with its advantages and limitations.

Machining laminated plastics. National Vulcanized Fibre Company, 1601 Beech St., Wilmington 99, Del. 4 pp. Ill. Reprint describes ways of matching laminated plastics. Methods are: sawing, punching, drilling, tapping, planning and shaping, gear cutting, lathe and screw machining, milling, finishing, marking, reaming and shearing.

Arc welding stainless steel. Lincoln Electric Company, Cleveland 17, Ohio. 12 pp. Ill. Bulletin 7300.2 gives physical properties, structure, and welding characteristics of the different types of stainless steels.

Blow molding. Dewitt Plastics, Auburn, N. Y. Bulletin discusses methods of blow molding and offers a list of do's and don'ts in design.

Belt finishing. Carborundum Company, P. O. Box 337, Niagara Falls, N. Y. 4 pp. Ill. Folder gives results of case study on production efficiency of wide belts and wide-belt machines for both wood and metal working.

Components and Machines

Automatic testing system. Audiotronics Company, P. O. Box 2187, Dayton 29, Ohio. 8 pp. Ill. Bulletin describes features of Speed-Tronik automatic check-out system for testing the performance of any characteristic that is convertible to an electrical equivalent. It checks ordinary current and voltage, modulated and unmodulated frequencies up to the 3000 megacycle range, and pulses with very low rise time and duration. Complex wave form analysis is also possible from a minimum amplitude of 30 microvolts.

Timing belts. T. B. Wood's Sons Company, Chambersburg, Pa. 80 pp. Ill. Catalog describes features of a line of timing belt drives for mechanical power transmission, with load capacities from fractions to 600 horsepower and belt speeds up to 16,000 feet per minute.

Metal bolts and nuts. H. M. Harper Company, 8200 Lehigh Ave., Morton Grove, Ill. 14 pp. Ill. Brochure explains the different kinds of strengths in metal bolts and nuts, and how these strengths are achieved. The meaning of terms such as shear strength, tensile strength, yield strength, elongation, etc., are defined.

Motors. General Electric Company, Schenectady 5, N. Y. 8 pp. Ill. Bulletin GEA-6927-B lists advantages of Thinline motors

FREE LITERATURE *continued*

for limited space applications. The motors are rated one through five horsepower.

Motorized wheel. General Electric Company, Schenectady 5, N. Y. 12 pp. Ill. Bulletin GED-4261 describes the motorized wheel drive developed for operators of off-highway equipment. Discussed in detail is an earth-hauling vehicle using the drive.

Glass drainlines. Corning Glass Works, Plant Equipment Dept., Corning, N. Y. 16 pp. Ill. Bulletin PE-30 gives detailed information on the Pyrex brand drainlines for disposal of chemical wastes.

Conveyor belts for foods. B. F. Goodrich Industrial Products Company, Akron, Ohio. 12 pp. Ill. Brochure is a guide to the selection of conveyor belts for food and package handling applications. Belts are rated for characteristics such as resistance to abrasion, high temperatures, and oil and grease resistance.

Mechanical arms. General Mills, Nuclear Equipment Dept., 419 N. Fifth St., Minneapolis 1, Minn. 20 pp. Ill. Booklet describes manipulator-equipped vehicle systems for remote-handling operations, and discusses existing manned and unmanned systems, and proposed vehicles for use in explosive, radioactive, or other hostile environments.

Pushbuttons. General Electric Company, Schenectady 5, N. Y. 8 pp. Ill. Bulletin GEA-6544-A discusses applications of a line of pushbutton units for standard and heavy-duty applications.

Metal bellows. Metal Bellows Corporation, 3030 Mica Lane, Wellesley Hills 82, Mass. 8 pp. Ill. Brochure presents design and application data on welded diaphragm bellows, used primarily to convert pressure into force.

Fasteners. Standard Pressed Steel Company, Box 883, Jenkintown, Pa. 8 pp. Ill. Bulletin 2449 describes a standard line of precision industrial fasteners, including socket screw products, pressure plugs, locknuts, spring pins, dowel pins, and steel collars.

Ventilating fans. Modine Manufacturing Company, 1500 De Koven Ave., Racine, Wis. 4 pp. Ill. Booklet describes line of packaged ventilating fans for installation in the walls of commercial, industrial, and institutional buildings.

Miscellaneous

Thermal insulation. Johns-Manville, 22 East 40 St., New York 16, N. Y. 64 pp. Ill. Catalog IN-244-A describes insulation materials for all types of commercial and industrial requirements ranging from minus 400 degrees F. to 3000 degrees F.

Sections covered are industrial and high temperature; plumbing, heating, and air conditioning; refrigeration; insulating firebrick and refractories; finishes and weatherproofing materials; and miscellaneous insulations such as asbestos papers, millboard, felts, etc.

Nameplates. Meyercord Company, 5323 West Lake St., Chicago 44, Ill. Bulletin explains differences between different kinds of Meyercord decal transfers, and also deals with other problems relevant to nameplate selection.

Curtain wall panels. Erie Enameling Company, Erie, Pa. 8 pp. Ill. Brochure provides architects, builders and designers with specific porcelain enamel curtain wall information, and includes a chart that outlines a variety of skin and core materials, thicknesses, and assemblies.

Static power conversion equipment. Hamilton Standard Division, United Aircraft Corporation, Broad Brook, Conn. 16 pp. Ill. Guide explains the field of static power controlled equipment, used to convert electrical power from one form to another without the use of moving parts such as rotors or vibrators. The booklet provides comparisons between static and rotating devices.

Paper tapes. Minnesota Mining and Manufacturing Company, Dept. JO-99, 900 Bush Ave., St. Paul 6, Minn. 5 pp. Ill. Bulletin describes properties and applications of paper pressure-sensitive tapes for industry. Illustrations are taken from in-use applications and show how paper tapes solve masking or sealing problems, and how colored and printed tapes can be used to instruct, inform or identify products.

Metal furniture finish. Bradley & Vrooman Company, 2629 S. Dearborn St., Chicago 16, Ill. 6 pp. Folder describes a new series of organosol coatings for metal furniture that require only one application and no primer. The new coatings are said to provide greater metal adhesion and abrasion resistance than conventional organosols requiring two applications and priming.

Free technical films. Modern Talking Picture Service, Inc., 3 East 54 St., New York 22, N. Y. Guide to free technical films includes list of more than 130 films with topics ranging from the pure sciences to practical industrial problems.

Technical capabilities. Singer-Bridgeport, Division of Singer Manufacturing Company, 915 Pembroke St., Bridgeport 8, Conn. 20 pp. Ill. Brochure describes company's facilities for research, development and production for prototype fabrication, as well as limited and mass production of mechanical, electro-mechanical, and electronics components.

Prestressed concrete. Master Builders Company, Cleveland 18, Ohio. 20 pp. Ill. Bulletin MBR-P-13 presents 16 studies of prestressed concrete projects including a prestressed lift slab, 120-foot-long prestressed bridge girders, and a 2-million-gallon prestressed water tank.

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CALENDAR

Through April 23. Fourth exhibition of architectural photography sponsored by the Architectural Photographers Association and traveling under the auspices of the Smithsonian Institution. The Octagon, Washington, D. C.

Through May 8. A retrospective exhibition of the works of Max Ernst. Museum of Modern Art, New York.

Through May 14. "Modern Mosaics from Ravenna." An exhibition traveling under the auspices of the American Federation of Arts. Museum of Contemporary Crafts, N. Y.

Through April 20. "The Splendid Century." An exhibition of French painting, sculpture, drawing and tapestries from the 17th century. Metropolitan Museum of Art, New York.

April 10-21. Annual convention and welding exposition of the American Welding Society. Sheraton-Atlantic Hotel, Commodore Hotel, and the Coliseum, New York.

April 13-15. National biennial convention of American Federation of Arts; convention theme, "Art is Opinion." Art Institute of Chicago.

April 15-May 14. "Plastics — A New Dimension in Buildings." First installation of a traveling exhibit of the Society of Plastic Engineers that will visit 16 North American cities during the next two years. Springfield Museum of Art, Springfield, Massachusetts.

April 18-19. Process planning seminar sponsored by the American Society of Tool and Manufacturing Engineers. Statler-Hilton Hotel, Cleveland, Ohio.

April 23-26. 1961 metals engineering conference sponsored by the American Society of Mechanical Engineers. Penn Sheraton Hotel, Pittsburgh, Pennsylvania.

April 24-28. National convention of the American Institute of Architects. Bellevue-Stratford Hotel, Philadelphia.

April 26-28. Eighteenth annual western section conference of the Society of the Plastics Industry. Hotel del Coronado, Coronado, California.

April 30-May 4. Seventh national aero-space instrumentation symposium sponsored by the Instrument Society of America. Adolphus Hotel, Dallas, Texas.

April 30 - May 9. German Industries Fair, notable for its offering of porcelain and glass. Hanover, Germany.

May 1-3. Home furnishings market. Merchandise Mart, Atlanta.

May 3-13. Annual U. S. World Trade Fair. New York Coliseum.

May 8-9. Lubrication symposium sponsored by the American Society of Mechanical Engineers. Deauville Hotel, Miami Beach, Florida.

May 8-10. Fourth national power instrumentation symposium sponsored by the Instrument Society of America. La Salle Hotel, Chicago.

May 10-12. Production engineering conference of the American Society of Mechanical Engineers. Royal York Hotel, Toronto, Canada.

May 15. Packaging industry technical conference of the American Institute of Electrical Engineers. New Ocean House, Swampscott, Massachusetts.

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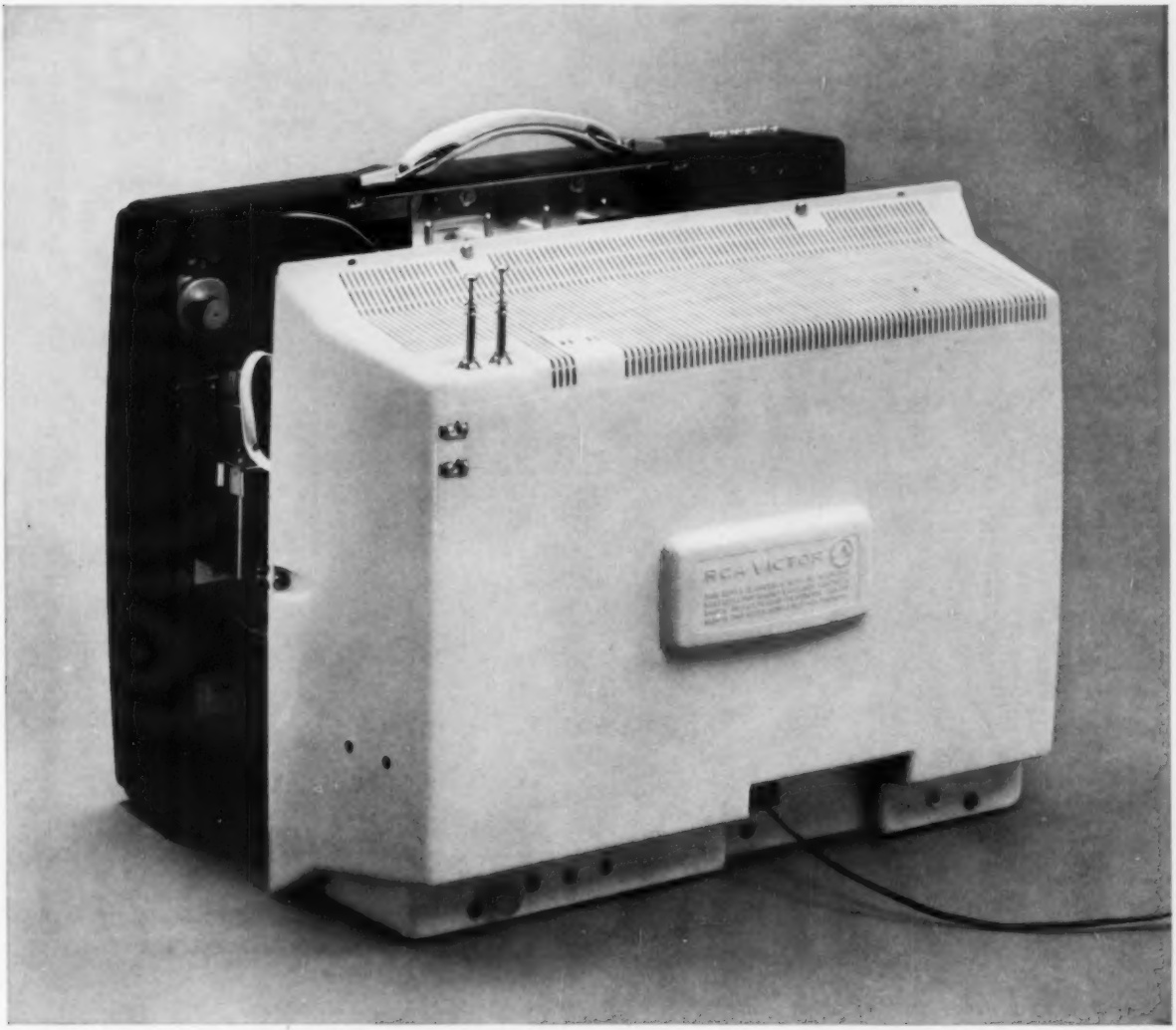

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