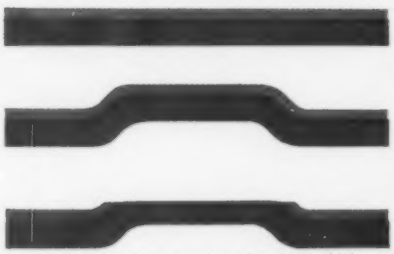
INDUSTRIAL DESIGN

February 1961 *$1.50 per copy*

Here's news about Butyrate plastic...

Duplex Butyrate sheet yields 2-color signs that by-pass usual decorating...the sheet itself provides the second color

Duplex sheet is formed in the same manner as regular Butyrate sheet for signs.



Duplex Butyrate sheet consists of a single thickness with thick and thin layers of Butyrate in two different colors.

The versatility of Tenite Butyrate as a plastic material for signs gains added recognition with the development of duplex sheet. By taking advantage of the ingenious construction of this new sheet, the creative sign designer and sign builder can produce 2-color effects without use of lacquers or inks.

In essence, duplex Butyrate plastic sheet consists of a heavy layer of one color under a thin layer of a second color. The sheet is produced by extruding and laminating one layer of colored plastic directly upon another layer of a different contrasting color. For example, a duplex sheet for forming a representative 4- by 8-foot sign panel might have a heavy layer 0.090-inch thick and a thin layer 0.010-inch thick.

After the sheet has been formed into a sign panel or element, with the thin layer on the appearance side, the color of the heavy layer may be quickly exposed by sanding away the thin layer from the raised surfaces of the sign face. The choice of color combinations will be determined by the effects desired, the specific application, the use (or the non-use) of backlighting, and the esthetic preference of the individual sign designer.

For information on availability of duplex Butyrate sheet, write to the Plastics Division, Eastman Chemical Products, Inc., Kingsport, Tennessee, or to the sales office nearest you.

After forming, the thin layer of color is sanded away from certain raised areas to expose the second color underneath.

TENITE®
BUTYRATE
an Eastman plastic

PACKAGING
in
INDUSTRIAL DESIGN

ID

MEMO TO ADVERTISERS

PACKAGING in I

Not only has t
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Packaging whic
categories:

1. Point of
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And industrial

1. Independe

2. Company

INDUSTRIAL DESIGN

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

in INDUSTRIAL DESIGN:

as the industrial designer become increasingly important in the
picture but particularly in the area of packaging which has
h an important factor in successful marketing.

which concerns the industrial designer breaks down into two
:

of Sale packaging. The packaging of products for display in
markets, drug stores, stationery stores etc., to prompt their
ase.

Duty Packaging. Packaging of products for safe delivery, not
consumer products packaged for delivery for retail outlets in
ity, but the packaging of products such as TV sets, aluminum
tmas trees and glassware.

rial designers break down into two categories:-

endent industrial design firms such as:

Lippincott & Margulies

Raymond Loewy Associates

Donald Deskey Associates

ny designers such as:

Frank W. Preiss, Bureau Head of Product
and Package Design - Montgomery Ward & Company

Maxwell B. Rogers, Director of Package
Design - Avon Products, Inc.

James Fogelman, Administrative Design
Director - CIBA Company, Inc.

PACKAGING in INDUSTRIAL DESIGN:

In its story on industrial designers Fortune li
firms and noted that packaging is a major inter

Raymond Loewy Associates	Archi
Cushing & Nevell	Engin
Lippincott & Margulies	PACKA
Walter Dorwin Teague Associates	Archi
Jim Nash Associates	PACKA
Donald Deskey Associates	PACKA
Henry Dreyfuss	Produ
Harley Earl	Produ
Dave Chapman	Produ
Peter Muller-Munk Associates	Produ
Sundberg-Ferar	Produ
Walter Landor & Associates	PACKA
Brooks Stevens Associates	Produ
Eliot Noyes	Archi
George Nelson	Archi
Smith, Scherr & McDermott	Produ
Becker & Becker Associates	Produ
Peter Schladermundt Associates	Produ
Latham, Tyler, Jensen	Produ
Russel Wright	Produ

Recognizing the great concern of industrial des
DESIGN has published a number of helpful storie

DESIGNING FOR THE SUPE

SPECIAL PACKAGING

CIGARETTE PACKAGES

FOOD PACKAGING DESIGN

PACKAGING AND THE CORP

FASTENING TECHNIQUES:

A.M.A. PACKAGING SHOWS

POLYETHELENE FITMENTS

ANNUAL DESIGN REVIEW C

(Complete List of Packaging Stories on Request)

listed 20 of the largest independent
terest of 10 of these firms.

chitecture & interiors, PACKAGES,
graphics
gineering services, exhibits
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designers with packaging, INDUSTRIAL
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SUPERMARKET

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CORPORATION

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PACKAGING in INDUSTRIAL DESIGN:

In 1961 INDUSTRIAL DESIGN will for the benefit of its subscribers (10,164 ABC at $10 yearly for 12 issues) delve into the subject of packaging to an even greater extent than heretofore.

Some major editorial features on Packaging include:

William de Majo's PACKAGING ..... January
Featuring de Majo's Packaging work for three of his clients:- Britain's W. & A. Gilbey Ltd., John Millar & Sons Ltd., and Clayton Brothers.

MATERIALS AND TECHNIQUES FOR PACKAGE DESIGN ..... May
A review of the latest materials (papers, boards, foils, films, inks, etc., and components (closures, spouts, labels, hinges, coatings, finishes, etc.) and processes (forming, filling, sealing, labeling, etc.) in creating packages for both industrial and consumer use. This article will include a report on the AMA's 30th packaging materials show.

FOILS AND FOIL SUBSTITUTES IN PACKAGING ..... August
Foils offer so many advantages in both structural and surface design, and they can be so eye-catchingly "elegant", that even the most prosaic contents are now sold in (and some experts believe by) aluminum foils. But, despite insured sales increases, the cost of using foil is very high, and competing materials suppliers are not sitting still. Metallized papers, as well as specialized inks, are already in wide use as foil substitutes. Recent trends and foreseeable developments in this field will be discussed, including ways in which designers have effectively used foils and foil substitutes as a weapon in the competitive battle.

PRODUCT GRAPHICS: ..... October
Every product carries its own identification, and the ways of affixing it to the product vary greatly. Trim parts or name plates can be made from metallized paper with adhesive backing from anodized metal sheets with embossed and/or etched markings applied by rivets. They can be part of a product's stamping, or can be separate parts used to take care of a product-function (the Royal typewriter label, for example, which also serves as a release mechanism for opening the machine's top). The methods for producing these trim parts also varies. This article will treat the production of nameplates and escutcheons as it relates to design.

ANNUAL DESIGN REVIEW: ..... December
In the 8th Annual Design Review December issue our editors will include a comprehensive section on significant packaging in 1961. In 1960 this section, titled "Selling" totalled some twelve pages.

INDUSTRIAL DESIGN:
Whitney Publications Inc.
18 East 50th Street
New York 22, New York

Also publishers of INTERIORS

FEBRUARY, 1961 VOLUME 8 NUMBER 2

INDUSTRIAL DESIGN

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

CONTENTS

COMING

IN MARCH—*Industrial design at General Electric's Light Military Electronics Department*

IN APRIL—*Gallery IV: The fourth in a series of profiles*

COVER: Art Director Peter Bradford's composition is a line drawing superimposed on a photograph of an electric furnace used in making steel ingots (see page 33). The photograph was taken by Yarnall Ritchie for Armco Steel.

FRONTISPIECE: Castings for the dials of Secticon clocks (see page 74) lie in trays on the assembly line of Universal Escapement Ltd. in La Chaux-de-Fonds, Switzerland.

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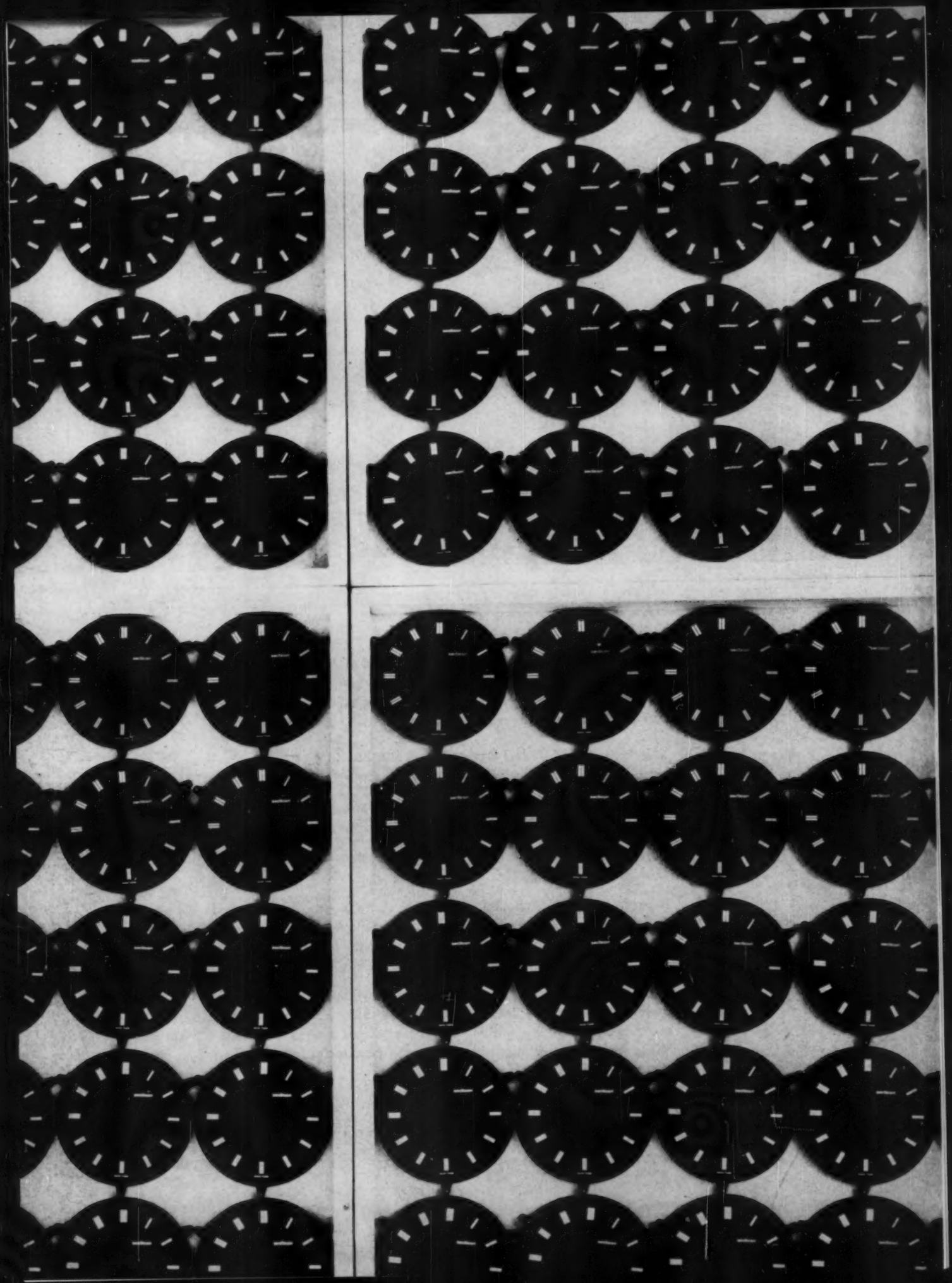
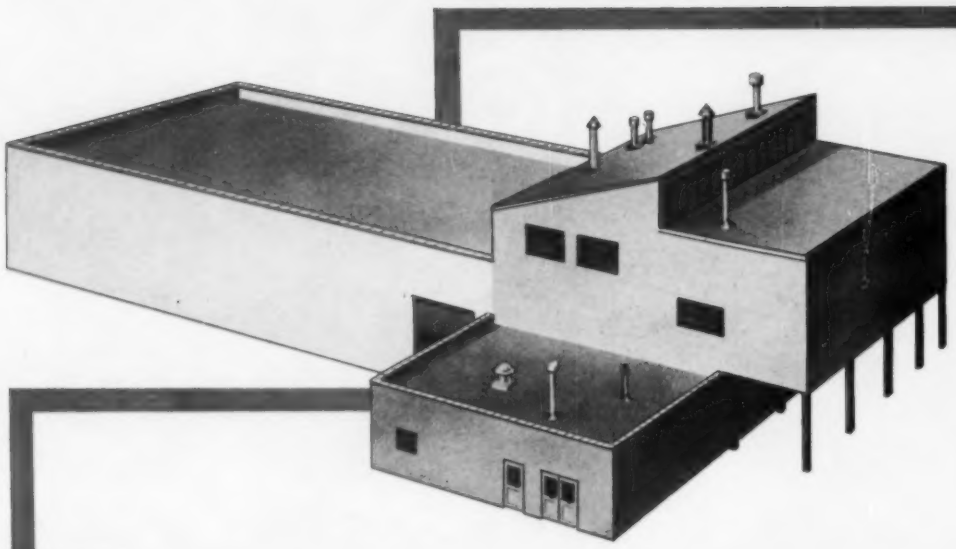
Member of the Associated Business Publications





How does this new resin plant benefit designers?

It produces *better* resins at lower costs . . . and better resins produce *better* MOLDED FIBER GLASS . . . and better and lower cost MOLDED FIBER GLASS offers designers far greater opportunities for creating new designs, and using MOLDED FIBER GLASS for applications where high cost had previously prevented its use.

This is the new Molded Fiber Glass Resin Plant . . . built to produce resins for the affiliated Molded Fiber Glass Companies.

Resins produced in this plant are far more uniform . . . thus, products made by the Molded Fiber Glass Companies are exceptionally uniform.

Resins made in this plant cost 20% less . . . thus MOLDED FIBER GLASS products cost less.

In addition, certain special qualities have been greatly improved in these resins: strength, impact resistance, chemical resistance, resistance to weathering, etc. Thus, designers can now specify MOLDED FIBER GLASS for uses where previously it was not practical.

Next time *you* have a job requiring a strong, lightweight, low-cost material . . . specify MOLDED FIBER GLASS . . . as matched-metal-die-molded by the Molded Fiber Glass Companies. Write today for technical brochure and detailed information on custom molding your designs.

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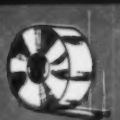
4607 Benefit Avenue, Ashtabula, Ohio

NICKELOID IS EVERYWHERE

IN THE LIVING ROOM

IN THE KITCHEN

ALL AROUND THE HOUSE



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.

Yes, wherever you go or whatever you do, there is an abundance of useful and prized products on which a Nickeloid Metal gleams, front and center, in full spotlight. Their use at once captures a smart, modern beauty that is durable, easy to keep looking new, and chic. But here is beauty that is more than skin deep . . . Nickeloid Metals are versatile, extremely economical in manufacture . . . deep-down in quality all the way. They are the shopkeeper's delight, the manufacturer's friend, and the designer's inspiration. You can *do so much* with Nickeloid! It's more than a Metal . . . it's a *Method!* Write for free Introductory Kit, including metal samples. Or, phone one of our sales offices (located in most principal cities).

AMERICAN NICKELOID COMPANY · PERU 13, ILLINOIS

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

IN THIS ISSUE

Candela

Felix Candela is the co-founder of Cubiertas Ala, a Mexico City firm which specializes in the design and construction of thin-shell concrete structures like those on page 69. The enterprise was created when Candela moved to Mexico from a Spanish concentration camp, where he was interned for Civil War activities. The Candela exhibit is now on view at Syracuse University and will be seen: Feb. 16-28, Virginia Polytechnic Institute; March 2-14, Duke; March 16-April 7, Clemson College; April 10-21, Georgia Institute of Technology; April 25-May 8, Auburn; May 11-21, Tulane. A duplicate show will tour the Midwest concurrently: Feb. 16-18, Cleveland Institute of Arts; Feb. 22-March 7, University of Iowa; March 13-25, Iowa State; March 27-April 1, University of Illinois (Navy Pier, Chicago); May 6-20, University of Illinois (Urbana).

Doggett

Jane Davis Doggett is the founder (1958) of Architectural Graphics Associates, which produced the traveling photographic exhibit of the works of Felix Candela (page 69). Her first project after Tulane's Newcomb Art School, a year of work in Europe, and a masters degree from Yale (where she and a fellow student conceived the idea for AGA) was organizing the graphic design program for a shopping center by architect Lathrop Douglass in Washington, D. C. During the summer of '58, on an assignment for *Architectural Record*, she returned to Europe as a reporter and photographer to cover new architecture abroad and to represent the magazine at the Fifth Congress of the International Union of Architects in Moscow.

Jackson

Dorothy Jackson's initial assignment with Architectural Graphics Associates was a trip to Mexico to do the complete photographic coverage of Felix Candela's works for the traveling Candela exhibit. Before joining AGA, she was on the editorial staffs of *Architectural Record*, *American Photography*, and *Modern Photography*. Miss Jackson has recently designed a set of ski trail safety symbols.

Mason

E. Gilbert Mason, whose airplane seat is discussed on page 52, bought Teco, Inc. last year in order to build the seat. At Douglas Aircraft, he organized the airplane interiors section and planned the appointments of many executive planes including President Roosevelt's "Sacred Cow" and President Truman's "Independence." He raises and breeds Palomino horses, Springer spaniels, Labrador retrievers, and cattle, and paints in oils to keep up with his wife, artist Rosemary Ball. Research for the aircraft seating article was initiated by Chet Miller.

CELANESE POLYMER COMPANY

Designed in Fortiflex... for PHILCO-Bendix

This blow-molded unit stores and dispenses detergents and bleaches in Philco-Bendix Duomatic® washer-dryer combinations. Molded of Celanese Fortiflex B-50-20, it is corrosion-free, light, strong, and easily cleaned with boiling water.

Fortiflex is an easily molded, tough, rigid material, which provides unusual freedom in design. It offers outstanding heat, chemical and stress-cracking resistance and can often replace metals and other materials in components, with product improvement and cost savings.

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LETTERS

Criticism stunted?

Sirs:

Speaking, I believe, for most of my compatriots in the automobile section of the practice of industrial design, I feel that your seven pages of criticism of this product (November, 1960) so important to the national economy is far too stunted.

I have no issue with the writer (having read most of his articles) and believe with more research on his part his articles of *this type* could improve.

We in Detroit welcome valid, logical criticism of our number-one product—especially we designers, because quite often our superiors, as well as those members of upper and top management of the companies in which we work, read INDUSTRIAL DESIGN. In many instances the criticism of the various cars is not qualified by any reason as to why they should not look as they do. What on earth value is the critique of the Rambler classic—"What's in a name?" Having been employed for several years with American Motors, I for one am well aware of its good *and* bad points, its strengths and weaknesses. But I see none of these mentioned. How do you plan to get your point across to management?

Why is "exaggerated rear overhang a penalty" to the Pontiac? Is this a penalty to the "looks" of the car or the rear bumper?

In most cases it is not the topic nor the quality of the review but the limited *quantity* of criticism and lack of qualifying reasons pro and con that leave this article wanting. Why not take the designs by groups and span them over the year's issues? Or just take the good ones, if any, or the worst of the bunch—perhaps do some research as to *why* they came off as good or bad as they are? There are many interesting, humorous stories along these lines, which would hurt no one.

W. D. S. Longwill
Detroit, Michigan

Author and Reviewer

Egregio Signore,
ho letto la recensione della sua rivista sul libro "Pinin Farina," scritto da me e da Ferruccio Bernabò.

La recensione non è firmata.

Vorrei chiarire alcuni punti fondamentali:

1. Gli autori *naturalmente* non sono responsabili nè delle traduzioni in lingua straniera, nè dei ritardi di pubblicazione da parte dell'editore.

2. Poichè sembra che le traduzioni fossero pessime, i casi sono due:

a) o il suo recensore leggeva il testo originale; oppure

b) non esprimeva un giudizio su un testo che dichiarava a priori illeggibile.

3. Il suo recensore, a parte tutto, deve avere le idee piuttosto confuse in fatto di automobili.

Comunque, caro signore, se io sono un "fan" di Pinin Farina, non lo sono tanto più della sua rivista, molto pregevole ma tanto scervellata.

Bruno Alfieri
Milan

We fear that Mr. Alfieri's letter, like his book, suffers in translation. It was translated variously, and with some difficulty, by Maude Dorr, Louis Botto, Vilma Botto, Giuseppe Botto, Terenia Katavolos, and Richard Moss, with the help of the Italian Consulate in New York. There was a good deal of scholarly disagreement on a number of points, but the translation below is generally acceptable to the translators.—Ed.

Sirs:

I have read the review of *Pinin Farina*, the book written by Ferruccio Bernabo and myself.

The review is not signed.

I should like to clarify some fundamental points:

1. The authors are, *naturally*, not responsible for either the foreign translation or for the late publication on the part of the editor.

2. There are two reasons why the translation may appear to be bad: Either your reviewer read the original text, or he is not passing judgment on a text which he declares a priori to be illegible.

3. Your reviewer, apart from this, must have a very confused idea about automobiles.

However, if I am a "fan" of Pinin Farina, I am not so much a fan of your magazine, valuable but scatterbrained.

Bruno Alfieri
Milan, Italy

Mr. Alfieri is wrong. The review was, of course, signed by James S. Ward. And Mr. Ward replies: "Nobody holds the authors responsible for the unclear translation or for the unexplained late publication. But these are faults—one minor, one so serious as to render the book nearly useless to most American readers. I do not understand Mr. Alfieri's explanations of why the translation may seem bad, but they are beside the point. I was not reviewing the authors, I was reviewing the book. If the English makes reading impossible (and it does) the suffering reader doesn't much care whose fault it is."

Who retained whom to do what?

Sirs:

REFERENCE: ID DECEMBER ISSUE. PAGE 102. DOMORE GP X.

CORRECTION: NO SUCH OPERATION TITLED COTY-WAGNER DESIGN ASSOCIATES. PERHAPS REFER TO COTY-WAGNER BONGOANDEXPRESSO PARLOR NUMBER 5 VIA MARCELLINO ROME.

THIS WRITER C-O-D-Y JUG EARS TALL WEAR R*W SILK PUTTEES. FORMER DESIGN DIRECTOR RLA INC. OTHER FELLOW W-A-G-N-E-R BIG WIDE MAN WITH SCOTCH GUARDS BRUSH UNDER NOSE. GOOD FRIEND OF C-O-D-Y NO MUTUAL BUSINESS INTERESTS.

CORRECTION. ALL GP X SEATING AND SPECIAL STORAGE UNITS DESIGNED BY DICK C-O-D-Y FOR DOMORE. ACKNOWLEDGE FACT SOM ESTABLISHED GENERAL DESIGN ATTITUDE. HOWEVER CONCEPT EXECUTION AND EXPANSION OF GP X PREPARED BY DC OFFICE. BELIEVE IT TIME WE ESTABLISHED FACT OF MATTER.

REFERENCE: UNDERSTATED PULLS ON CASE PG 102 NOT PULLS. PROJECTING BUSINESS END OF NICKLE PLATED .25 CAL. WEBLEY-VICKERS AUTOMATIC. SHOULD ESTABLISH HARDWARE TREND DON'T YOU THINK?

DICK CODY
CHICAGO

ID misspelled Mr. Cody's name, but the Domore Chair Company still insists:

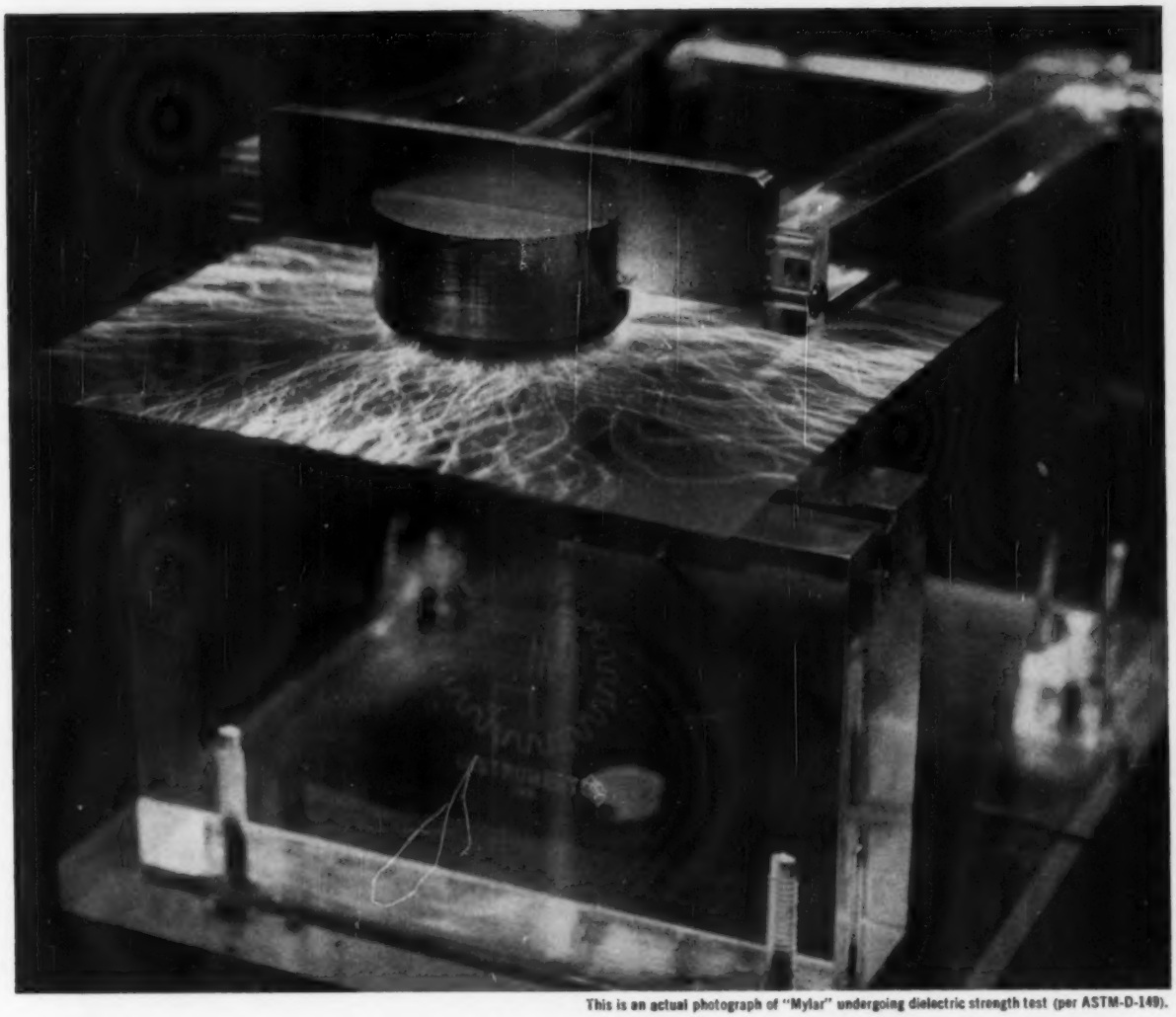
1. At the time the Group X was designed. Messrs. Cody and Wagner were associated (at least in regard to their design work for Domore Chair Company.)

2. Jane Johnson, of Skidmore, Owings & Merrill, was the originating designer on the #100 secretarial chair that you show under caption 3 on page 102; and Mr. Cody and Mr. Wagner (being retained by the Domore Chair Company) carried it from the point of Jane Johnson's original design to the finished product as it now appears on page 102.

3. Andrews and Robins, also retained by the Domore Chair Company, were responsible for the finished design on the wall unit.

These are the facts.

Domore Chair Company, Inc.
H. B. Williams, President



This is an actual photograph of "Mylar" undergoing dielectric strength test (per ASTM-D-149).

MYLAR® has a dielectric strength of 4,000 volts per mil

Can the unique combination of properties found in "Mylar" help you solve your design problems?

High dielectric strength helps cut capacitor size. Tough, thin "Mylar" with a dielectric strength of 4,000 volts per mil for 1 mil film (per ASTM-D-149) permits capacitor manufacturers to reduce size of finished unit . . . improve performance and reliability.

"Mylar"* polyester film is a tough, flexible engineering material. In addition to its outstanding dielectric strength, "Mylar" has an average tensile strength of 20,000 psi, withstands temperature extremes (-60° to 150° C.) . . . resists most chemicals and moisture.

On an area basis, tough, thin "Mylar" often *costs less* than heavier, conventional materials. "Mylar" can be laminated, embossed and metalized, punched or coated. The film won't embrittle with age. "Mylar" is available in roll or sheet form in a wide range of gauges.

Find out how the *combination of properties* in "Mylar" can help you solve knotty design problems, improve product performance or cut costs. Write for our booklet containing detailed information on properties and applications. E. I. du Pont de Nemours & Co. (Inc.), Film Dept., Room P-9, Wilmington 98, Del.

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

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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT MYLAR® POLYESTER FILM

REVIEW: BOOKS

Basic Human Factors Data

The Measure of Man: *By Henry Dreyfuss. 16 diagrams and an explanatory pamphlet. Whitney Library of Design, New York.* $4.95.

Reviewed by RENATO CONTINI

This latest publication in the field of human factors is essentially a compendium of anthropometric data accumulated by the Dreyfuss organization over a period of years and organized to be useful to the product designer. From time to time, reports covering similar material have appeared, but the present collection appears to be one of the best.

In the last two decades, designers have become much more cognizant of the need to relate man properly to his equipment. And in designing for him, they have found out much more about his physical dimensions and capacities, his physiological needs and limitations, and his response to psychological stimuli.

What has been attempted in this portfolio is the collection of those data which are available and less controversial, principally anthropometric information. This information is presented in a series of charts together with a pamphlet suggesting how the charts may be used and including a check list of other design criteria to be considered.

The presentation of anthropometric data has been well done. The charts showing the physical dimensions of the adult male and female population and those showing male and female operators in a variety of operational situations are more detailed than usual. The charts for children's dimensions, range of vision, hand and foot dimensions, and particularly for passageway clearances are not generally available in such compact form.

The text itself covers too much in too limited a space, but it does warn the designer that there are no absolute design criteria and that the charts are primarily guide lines. It also suggests other human factors considerations which enter into the design of equipment — particularly those associated with displays and controls. And it contains a bibliography of human factors publications.

There are a number of criticisms that may be made of this portfolio. For example, it may create the impression that what is described in it is all there is to human factors. In fact, this is only a part of the total. Also, although much material is presented, and a bibliography is included, the two are nowhere related except in one or two instances. The designer would be able to use the data with greater confidence if he had a reference to the source. Some information is too positively stated, as if there were no compromise possible .

The term human factors encompasses a vast area of human knowledge. It is not possible to prepare a proper handbook similar to other engineering handbooks until additional knowledge has been obtained, examined critically, and applied successfully in design situations. Until that time arrives, this portfolio will serve as a guide to human factors for the product designer.

RENATO CONTINI *is research coordinator at New York University, College of Engineering, and a former president of the New York chapter of the Human Factors Society.*

Plastics in Shelter Design

Plastics As Building Construction Materials. *By graduates of the Harvard Graduate School of Business Administration. Structural Plastics Associates, Box* 13, *Belmont* 78, *Massachusetts.* 129 *pages.* $18.50.

Reviewed by JAN SAND

No architectural designer can afford to overlook the potentialities, present and future, of plastics as a structural material. The fact of the matter is, however, that, to an overwhelming degree, they are overlooked. An investigation of why this is so and what can be done about it is presented in this book.

After surveying the most likely plastics available and comparing their structural properties with those of more conventional substances, the authors, a group of Harvard graduate students, investigate why their use is not more universal. The blame is apportioned among the raw plastic producers, the fabricators, the architects, the builders and the purchasers, leaving no one with totally clean hands. The producers are brought to task for the needless diversification of trade names to the confusion of the architects, builders and customers. Some of the confusion, it is admitted, is not the fault of the producers, but rather the result of the bubbling creativity in the field which tosses out newer and more remarkable plastics each year. This, plus the non-uniformity of testing standards, promulgates greater suspicion and reluctance on the part of the architects and builders to use these materials. On down the line, the fabricators contribute their share of chaos by additional trade names and sometimes by grossly misapplying the raw material. At the architectural and design level, the authors bring up the point that design with plastics requires an understanding and "feel" for the material which design people are reluctant to acquire. The authors indicate that the greatest potentialities of plastic in construction lie in design directly for plastic rather than the use of the material as a substitute for something else. This, alas, runs bluntly into the opposition of the building codes, the labor unions (whose members are rarely familiar with any but traditional means), and the prejudices of architects and builders. Nevertheless, since this appears the most rational approach to the problem, the report forges ahead into specific design considerations and direct suggestions as to the type of structure best suited to plastics.

The master bogey of cost is the final consideration. It appears that a plastic house, assembled with maximum economy, would still cost initially more than a conventional structure. It is in the upkeep that the plastics pay off. An annual saving in maintenance easily offsets the high original cost. In the future the cost of the plastic house may drop to equal that of other structures. This report indicates that the plastic house will be very much with us in the next decade.

JAN SAND *is an industrial designer, formerly with the Will Burtin office and now with James Valkus, Inc.*

Corbu Condensed

Le Corbusier: 1910-1960. *Edited by W. Boesiger. H. Girsberger, Zurich.* 329 *pages.* $15.00. *Imported by George Wittenborn, Inc., New York.*

Reviewed by PHYLLIS BIRKBY

All this has been said before by the same people, but this time they say it better. The team of Boesiger-Girsberger have been concerned with the cataloguing of Corbusier's work since 1910, producing six volumes of the *oeuvre complète.* This condensation of those volumes, with new text and color plates, is an intelligent rearrangement into such groups as private houses, large buildings, and city planning, which gives the reader a view of the architect's development of ideas on each subject. Although the three-language text and the 9-by-11-inch pages make for awkward reading, this is a handsome volume. It provides an excellent reference for the architecturally interested, and a full bibliography for the hungry.

PHYLLIS BIRKBY *majored in art at Women's College of the University of North Carolina and studies architecture at Cooper Union.*

richard latham: "second generation" designer

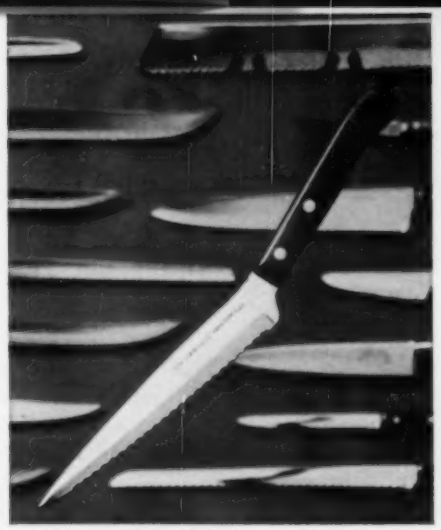
latham talks design

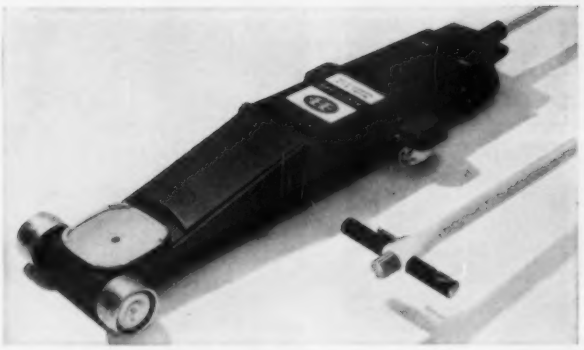
When you think of industrial design, you tend to recall the giants that gave birth to the profession in the late Twenties: Loewy, Teague, and Dreyfuss. But hot on their heels is another generation of designers. One of them is this year's Chairman of the Board of the American Society of Industrial Designers, Richard Latham, a man who as late as 1940 was a combination floor sweeper and designer at Montgomery Ward when it was one of only three Midwestern companies that had design departments.

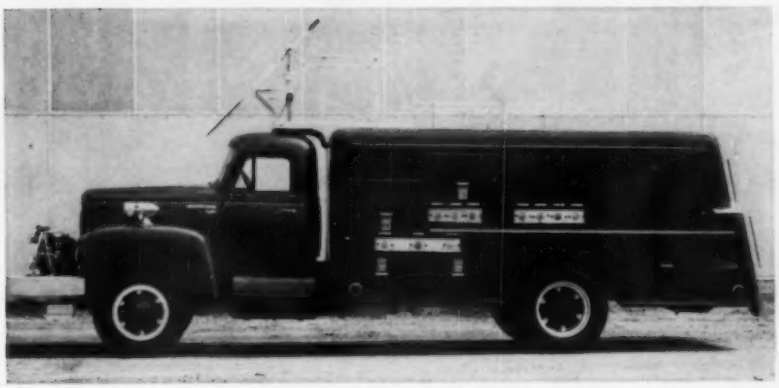
Those were the days when industry was just beginning to realize that good design represented a competitive advantage. They were the days of Montgomery Ward's "Good—Better—Best" policy in which they used design subtleties to distinguish between three different grades of the same item. "In those days," Latham says, "design was largely a matter of face lifting. Today, industrial design is becoming a true planning function for industry, and the designer is concerned as much with making a product work better as he is with appearance."

Latham is well qualified to tackle any problem of form or function. During World War II he worked in engineering research and development on aircraft, including the jet fighter, weapons systems and ballistics, and the first air-borne radar system. After the war he devoted five years abroad to the German porcelain industry. Since then his work has centered on "hard" product and transportation. Included in the latter are work on the new Greyhound Bus and the DC-6 and DC-7 aircraft series. Since early 1955, he has headed his own industrial design firm of *Latham, Tyler, Jensen* and worked on ceramic consumer products, corporate identity programs, the design and marketing of housewares, retail shop layouts, aircraft instrumentation and design of medical equipment. A number of striking exhibits have been designed by *Latham, Tyler, Jensen*, including the Cantigny War Memorial Museum at Wheaton, Illinois, and they're currently working on the Hall of Health for the California Museum of Science and Industry.

What is the designer's function today? "The real question," Latham says, "is what *should* it be? Industry is using industrial designers to create or redesign products for next year's markets, or at the most just a few years ahead. But the industrial designer's real talent lies in genuine innovation, in crystallizing the reality of not only what a product might be, but what it *can* be. He conceives of totally new products that aren't even







in existence today, and then gets down to the hard work of adapting them to the home, to the everyday business of living. The true industrial designer works years ahead. He dreams. Short term design and redesign, on the other hand, should be a staff function of industrial corporations where it can be integrated into the total marketing plan, including product development, sales, market development, merchandising. Then the true industrial designer can act as a pure consultant to industrial management." Is he needed? "Woefully. He's the only artist in business.

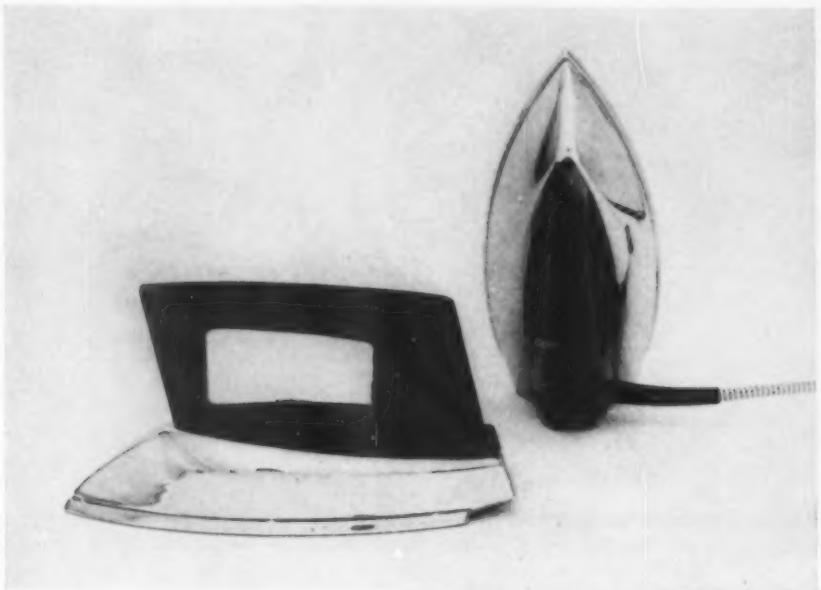
"But let's not confuse the artistic designer with the Left Bank," Latham says. "Industrial designers are—and have to be—hard-headed businessmen who must know what will sell and how well and easily the product can be manufactured. I haunt machine shops and production lines," Latham says. "I talk to workers and foremen and try to analyze production problems, as well as educate them about what we're striving for in the product design. Just as unrealistic design can make the production man lose his hair, a lack of understanding on the part of production people and insistence on long-standing production techniques can often ruin a design."

Selection of the right material for a design is another Latham trademark. The material must be capable of convenient fabrication, it must express the personality of the product that the designer is trying to achieve, and it must help move the product off shelves and showroom floors.

Latham has used dozens of different materials, and it is no coincidence that the majority of his firm's product designs have used steel in one way or another. He says, "Steel, after all, was the first metal available to man that could be stretched and pulled into form. Steel, to the designer, is form in tension. It has an inner strength that you feel. It was the first material that had enough ductility to be formed and drawn, yet at the same time enough strength to make a skeleton from which things could be hung, such as auto frames and certain types of architectural systems. And let's not overlook the fact," Latham says, "that this modern metal is the same one that made mass production possible."

The moral? Steel in its many forms has been with us for years, yet it continues to excite the imagination of people like Dick Latham and his associates who make a business of designing for the future.

NEWS



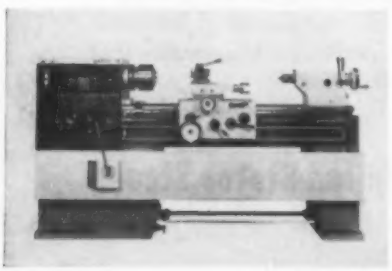
Iron, Compagnie de l'Esthétique Industrielle

Signe d'Or awards

The major yearly design event in Benelux — the Signe d'Or design competition — singled out 13 products of Benelux industries for the 1960 awards, just announced. The products range from lathes to laundry irons. Among those which the jury found especially notable were the laundry iron, lathe, and convertible sofa unit shown here. The laundry iron was cited for its "sobriety" and practical adaptation without affectation. It was designed by Raymond Loewy's Compagnie de l'Esthétique Industrielle in Paris and manufactured by Nova Electro-Ménager (Liège). The jury cited the lathe for its intelligent and logical simplification of a complex form. It was designed by M. Tallon of Technès, a Paris design firm, for manufacture by Mondiale (Vilvorde). The sofa, which converts into a double bed, was designed by Martin Visser, manufactured by N. V. 't Spectrum (Holland). The jury gave it an award because it offered an "elegant solution to a difficult problem."

The international jury, whose chairman this year was Count Sigvard Bernadotte and which included American designer Raymond Loewy, also awarded fourteen honorable mentions and eight "Diplômes de Création" in recognition of designers or inventors whose work is not yet in mass production. The Signe d'Or, founded in 1956, aims to guarantee the public high-quality products, publicize fine Belgian products both at home and to the rest of the world, and stimulate Belgian industry to produce designs of a quality which would make them competitive on the Common Market and the markets of the future.

Sofa, Martin Visser



Lathe, Technès

Armstrong-Jones to advise CID

Antony Armstrong-Jones, who has not held any regular post since his marriage to Princess Margaret, joined the British Council of Industrial Design last month as an unsalaried advisor working with Council director Paul Reilly. Long-range plans for his job have not been announced, but at present he is assisting in the preparation of a new Council publication and in the regular photographic work (he was once a professional photographer) of the Council's present publication, *Design* magazine.

In its announcement the Council said: "The idea that Mr. Armstrong-Jones should take an active part in the work of the Council was his own and arises out of his personal interest in matters of architecture and design."

Century 21 news

Five design teams, including one French, one Japanese, and three American, have been named finalists in the $250,000 Civic Center Fountain competition being held by the City of Seattle in connection with the Century 21 exposition.

The winning teams are: Paris architect Alain LeNormand and sculptor M. Adam; Tokyo architects Hideki Shimizu and Kazuyuki Matsushita; California landscape architect Richard A. Moore and sculptor George Hall; and, coincidentally, two teams from Birmingham, Michigan: architect Alan Hamilton Rider and sculptor Glen Michels, and architects W. Byron Ireland and Rostislav George Spacek.

Selected from among 260 teams from 11 different countries, these finalists will submit additional detail drawings, scale models and specifications for final judgment next month by a jury composed of California architect Nathaniel A. Owings, New York sculptor Bernard Rosenthal, California landscape architect Garrett Eckbo, and British Columbia architecture professor H. Peter Oberlander.

Century 21 also announces plans to erect a mile-long Swedish Alweg Monorail to connect downtown Seattle with the exposition site. The high-speed monorail will cost $4,200,000 and will carry up to 8,000 passengers per hour in two trains of four cars each, to be built in West Germany.

The trains will ride on rubber tires along parallel rails raised about 16 to 20 feet above street level and supported by "T"-shaped steel columns. Construction of the system, to commence this spring, will be directed by Alweg Rapid Transit Systems of Washington.

Century 21 also announces that it will create a memorial to Walter Dorwin Teague, who was responsible for planning the interior of the five-building Federal science pavilion. "The science pavilion represents one of Mr. Teague's

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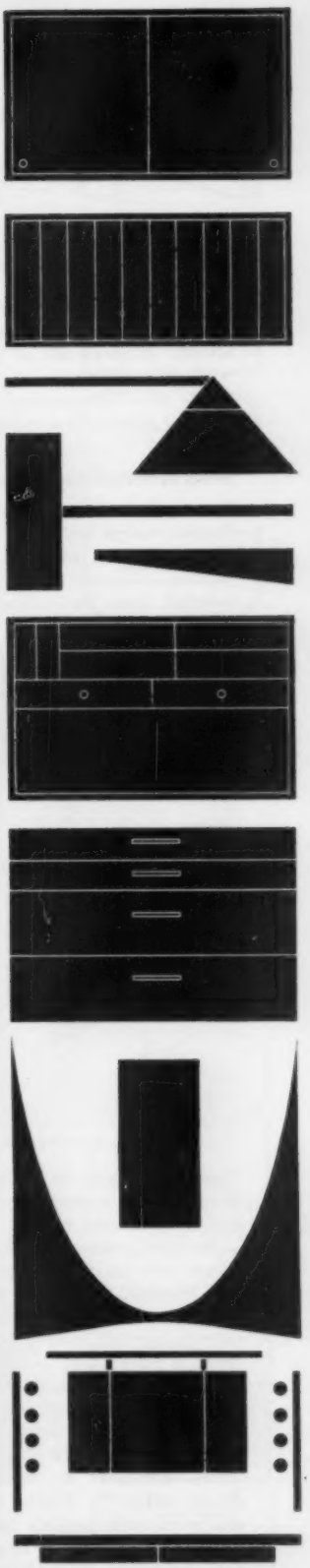
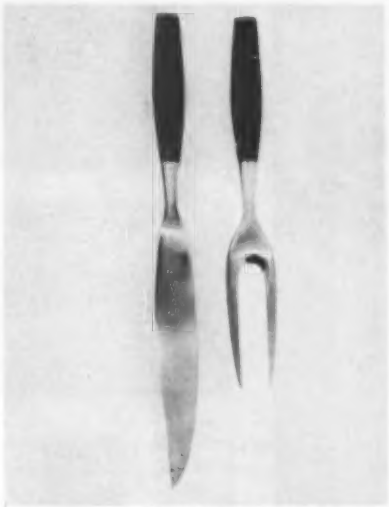


With the introduction of five new components, Herman Miller's Comprehensive Storage System now provides flexible storage spaces for the home.....in addition it offers some intriguing possibilities for very special contract applications.

final major projects," Century 21 president Joseph E. Gandy observed. "His dedicated interest in creating a showcase for the scientific achievements of free society inspired all of us who worked with him. Century 21 Exposition will salute this distinguished American artist with an appropriate memorial."

Metropolitan buys Danish design

Twenty-five examples of contemporary Danish design will soon join the permanent collection of New York's Metropolitan Museum of Art. They were selected from the exhibit "The Arts of



Carving set, Jens Quistgaard

Denmark: Viking to Modern," which was shown at the museum from October 14th through January 8th.

Included among the museum's acquisitions are furniture, ceramics, flatware, and jewelry, as well as a set of plastic bowls, the first all-plastic objects to be admitted to the Metropolitan's collection. Magnus Stephensen's stainless steel and copper casserole and Jens Quistgaard's stainless steel and teak carving set, (shown here), are among the selections. The purchases were chosen by the museum curators in consultation with design authority Edgar Kaufmann Jr., and were made possible by a fund set up for the acquisition of modern European and American decorative works. They will be kept in reserve for use as a reference library at the end of the exhibition's current tour of other U. S. museums.

In announcing the purchase, James J. Rorimer, director of the museum, stated, "The Danes are convinced that a chair, like a piece of sculpture, is an artistic achievement. [They] see no chasm between the fine and the applied arts."

Casserole, Magnus Stephensen

"The Metropolitan Museum," he continued, "has purchased the work of Danish designers and craftsmen in the belief that these objects have a significant place in the history of art."

Two design awards

The administrators of the Bachner Award for excellence in the industrial application of plastics announce that in addition to the $1,000 cash prize to be given company men responsible for the winning entry, a plaque will be awarded to the industrial designer of the product. "This award is intended as a formal tribute to the pervasive role of the industrial designer in today's product development complex," said John J. Bachner, president of Chicago Molded Products Corporation, sponsors of the award. Harley Earl is chairman of the Award Committee.

The competition closes March 10th, and the award will be announced during the National Plastics Exposition and Conference in New York, June 5-10.

The competition for the 1961 Copper and Brass Awards ($500 and a bronze trophy in two areas: industrial and architectural) closes March 31st. Sponsored by the Copper and Brass Research Association, the award is for: (1) product developments advancing the use of copper, brass, bronze or other copper alloys, and (2) for the year's outstanding architectural use of copper or its alloys. The awards will be presented May 17th at the association's annual meeting in Hot Springs, Virginia.

Redesign by Gestalt

Dr. Peter Schlumbohm, who discussed invention and design in the November issue of ID, has redesigned the logo for his Chemex Corp., manufacturers of the famous Chemex Coffee-maker.

Designers and manufacturers are generally proud to point to the "months of total integrated research and testing" that go into the redesign of their trademarks, but Dr. Schlumbohm, who based his new symbol on psychological studies pursued at the University of Berlin, says that "it pays to study ten years." He reports that the new trademark "is based on laws of psychology.—Helmholtz's classical concept of seeing as being a chemical reaction in the cells of the retina was mutated by the 'Gestalt'-theory, especially by W. Koehler, who formulated: 'To see is to group.'—I was his pupil while getting my Ph.D. in chemistry. In [the Chemex trademark], Helmholtz would only 'see 2 lines.'—Koehler would see much more: the eye is relating those 2 lines to the space between them and around them and to similar constellations of its memory.—In this case, the 'Gestalt' has a secondary meaning and is 'grouped' by the viewer with the 'image' of Chemex Corp. as source of products so marked. This is an excellent requisite for a Trademark, provided that the company's image has been widely established in the public mind. In this respect, a Consent Decree in a court Action in 1955 had decided, that 'the Chemex Corporation's hourglass coffeemaker has acquired a secondary meaning whereby its identity has been established.' "

New Chemex symbol

Games Wins Design Medal

British graphic designer Abram Games (below), recipient of many design honors in the past decade, was awarded the Society of Industrial Artists' Design Medal for 1960 at the Society's annual get-together in London in December. Games's work has been shown in the Museum of Modern Art ("Four Poster Artists," 1953), and in the British Trade Fair poster competition last year in New York he took first and second prizes. He has just published a book on his work: *Over My Shoulder.*

Archaeologist Jacquetta Hawkes delivered the Design Oration at the presentation ceremony. In conclusion to a long address on "Patterns and Cultures," Miss Hawkes urged her audience to "steady down a little," to establish a style.

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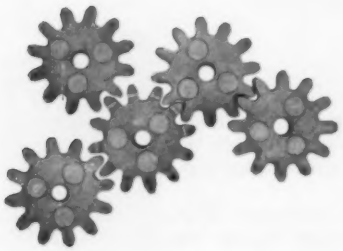
Games



Why zinc die casting?

To you, the designer, the answer to the question can be summed up as follows:

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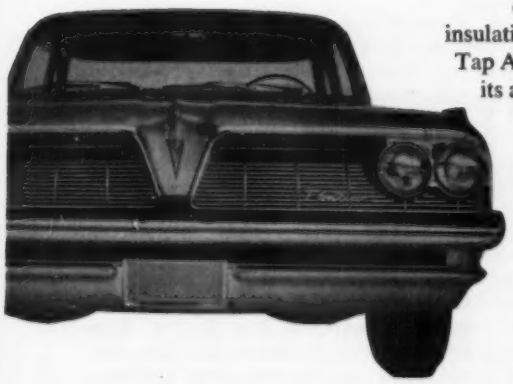
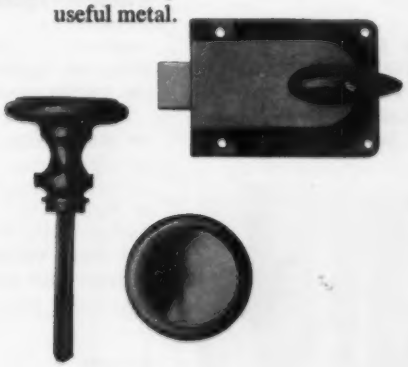
Asarco produces zinc in the following grades: Special High Grade, Prime Western, Brass Special, Intermediate and High Grade; Zinc anodes for cathodic protection of submerged steel structures and for electroplating; Zinc Foil for barrier wraps, insulation; Zinc Alloys for die-casting; Zinc Dust. Tap Asarco's knowledge about zinc's properties, its alloys and its many applications. If you are using, or contemplate using, zinc in your product, look to Asarco for technical information about this broadly useful metal.





ZINC DIE CAST METALS

ASARCO

American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

NEWS *continued*

Company news

RETAINED: **V-E-K Associates**, New York, to create the design concept, theme and programming for Power & Light Exhibit, Inc., a new corporation which will conduct the electric industry's participation in the New York World's Fair. . . . **D'Elia, Stolarz, Nishanian**, New York, by Walton Laboratories and the Smith-Lee Corporation. . . . **Bruce Kamp Associates**, Philadelphia, by the Beloit Eastern Corporation, as consultant for the design and styling of a corporate identity program for the company's processing equipment. . . . **Charles M. Huck—Industrial Design**, New York, by the W. L. Maxson Corporation, to implement the design and human engineering of their electronic equipment. . . . **James Valkus**, New York, by the U. S. Department of Commerce, to handle design for the Helsinki Trade Fair. . . . **Richard H. Jennings**, assistant professor of art at the University of Michigan, by the Office of International Trade Fairs of the Department of Commerce, to design a fountain for the International Agricultural Exhibition in Cairo, Egypt, which opens on March 15.

GOING PLACES: **Donald Henning Industrial Design** to 5915 North Lake Drive, Milwaukee, Wisconsin. . . . **Andrew Szoeke**, to 61 Spring Street, Metuchen, New Jersey. . . . **Olin Mathieson's** packaging laboratory, with product evaluation facilities, to 445 West 59th Street, New York. . . . **The National Guild of Mural Artists** to 225 East 54th Street, New York.

RE-CHRISTENED: Carreiro Design Associates, Philadelphia, to **Carreiro/Sklaroff Design Associates.** William B. Sklaroff (above) has been active partner and managing director of the firm since its establishment in 1956.

ESTABLISHED: **Van Houten, Baker and Associates**, New York, a marketing and design consultant firm, by Norbert Van Houten (formerly head of his own design firm) and Elias B. Baker (previously an account supervisor at Doyle, Dane, Bernbach, advertising), at 145 East 52nd Street, New York. . . . **Reynard Associates**, an industrial design service including product development, engineering, manufacturing methods, and testing, at 1413 North Hayford Street, Lansing, Michigan.

Daley ceramics

People

APPOINTED: **Edward M. Wallner** (below), studio director for Dickens, Inc., Chicago, as a vice president and member of the board of directors of that firm. . . . **Austin E. Cox** (below), **Pierre L. Crease** (below) and **Donald L. Nupp** (below) as associates of Scherr & McDermott, Akron, Ohio. . . . **Stanley E. Thorwaldsen** as a full associate with William M. Schmidt Associates, Harper Woods, Michigan. . . . **Morton Berard** (previously with Neal Goldman Associates, New York) to Remington Rand Univac's industrial design department. . . . **Paul d'Entremont** (of G. E.'s Defense Electronics Division) as chairman of the student chapters of the Industrial Designers Institute. . . . **John McLoughlin** as regional manager of a new Knoll Associates' sales territory with headquarters in Cleveland. . . . **V. Larry Porcelli** to the design staff of D'Elia, Stolarz, Nishanian, New York. . . . **Dr. Janet Travell**, consultant to Henry Dreyfuss on anthropometric matters, to the White House staff as personal physician to President Kennedy.

Wallner *Cox* *Crease* *Nupp* *Ewing* *Sklaroff*

ELECTED: **Gerald B. Ewing** (above) as chairman of the 1961 Industrial Designers Institute Symposium. Additional information concerning the symposium is forthcoming. . . . **Leslie E. Lewis** as president of the Exhibit Producers & Designers Association, New York Chapter, for the current year.

AWARDED: The tenth annual Frederik Lunning Prize (awarded yearly to designers of great promise to the future of Scandinavian design) to **Mrs. Torum Buelow-Hube**, Swedish jewelry designer, and **Miss Vibeke Klint**, Danish textile designer and weaver. Georg Jensen, Inc., New York, sponsors the competition.

Events

An exhibition of ceramics and sculpture created by industrial designer **William Daley** is currently on exhibition at the Pace Gallery in Boston, Massachusetts. The row of vases shown at left is part of the exhibit. Daley is a member of the Industrial Design Department faculty at the Philadelphia Museum College of Art.

The importance of qualified management in producing and effecting results from data processing equipment will be emphasized and explored at the American Management Association's 7th annual **Data Processing Conference and Exhibit** at the Statler-Hilton Hotel in New York, March 6-8. Detailed analyses of the effectiveness of data processing machines in production line systems, the establishment of such systems, techniques for collecting, processing, and distributing the information, and new methods of data output and input will be discussed in the various sessions.

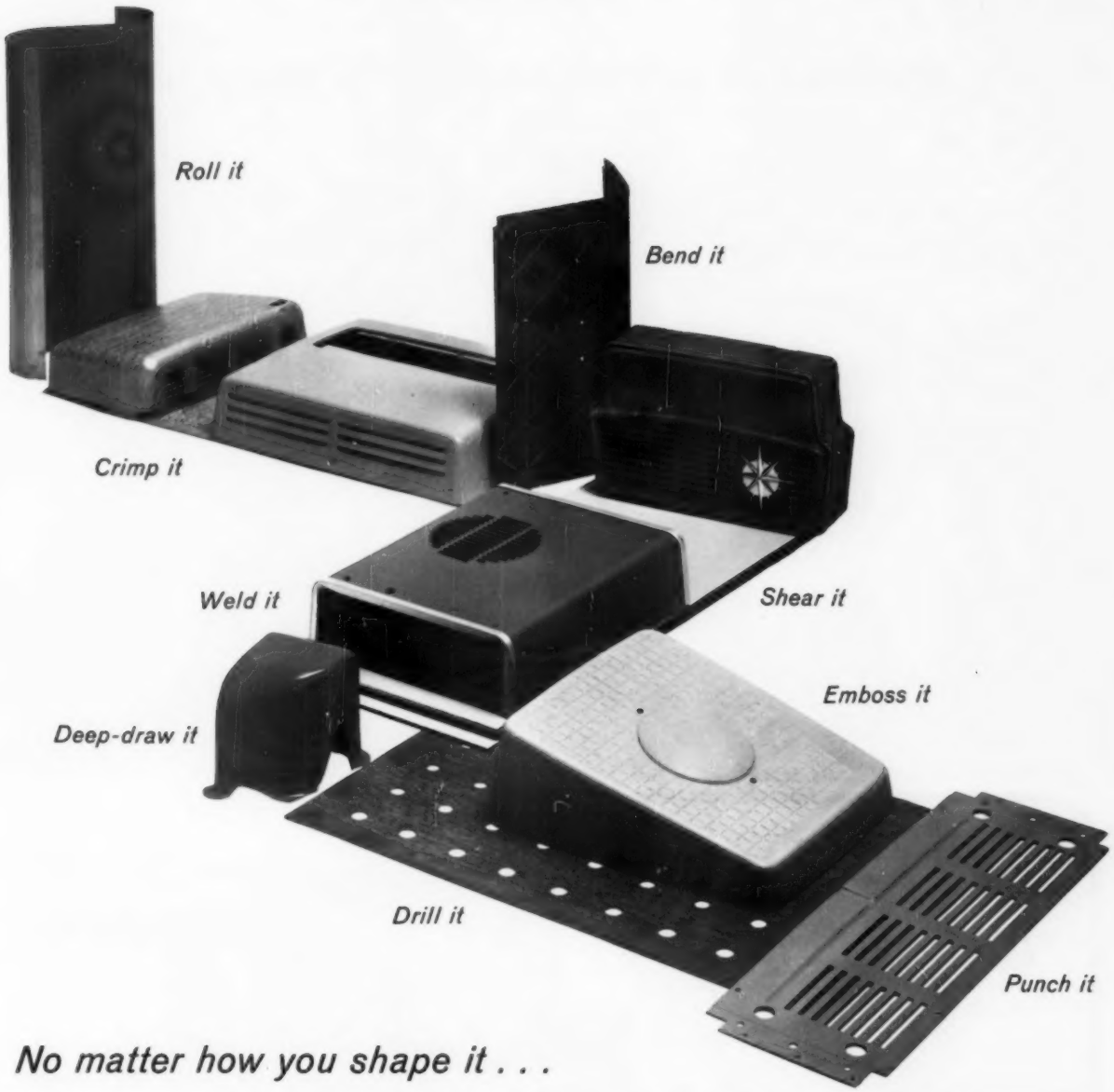
The World Lighting Forum, a series of nine symposiums, will highlight the third **National Lighting Exposition**, to be held at the New York Coliseum March 5-8.

Packaging for the Canadian domestic and export markets will be stressed at the **National Conference of the Packaging Association of Canada**, to be held in Toronto's King Edward Sheraton Hotel on March 7th and 8th. The program is specially directed to management and sales executives, production management, and technical personnel.

Materials and component parts for virtually every kind of manufactured product, from everyday household items to space ships, will be shown at the **Design Engineering Show** and its concurrent conference which will take place at Cobo Hall, Detroit, May 22-25. Both the show and the conference are devoted to the research and development aspect of all types of new products.

The first annual **Pacific Electronic Trade Show** will be held in the Great Western Exhibit Center, in Los Angles, from February 26th to March 1st. The show will bring together the latest products, materials, information, and services of the West's booming electronic components industry.

"Increasing the Effectiveness of Shows and Exhibits" is the subject of a workshop sponsored by the **Association of National Advertisers** to be held at the Plaza Hotel, New York, Wednesday, March 22nd. H. H. Howry, Jr., exhibit manager at American Can Company, is chairman of the workshop's program committee. END.



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For more information on COLOVIN VINYL METAL LAMINATE, write for your copy of "Colovin Meets Metal." It contains laminate samples, colors, textures, test specifications, industrial applications, and a list of laminators to whom we supply Colovin vinyl sheeting.

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1 Floor panels are locked to joists laid on permafrost ground.

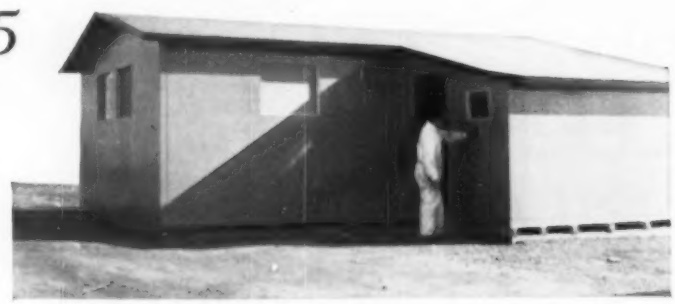
2 Doorway is first wall panel to go up. It locks to floor.

3 Walls and partitions lock to floor and to each other.

4 Roof panels go on last. This takes about three hours.

5 Complete in 7 hours! Floor, walls, roof panels—It's all done with Simmons Dual-Lock fasteners.

Standard Dual-Lock withstands 2500-lb. tension; may be modified for high-load applications to 4500 lbs.



■ This house is put up in a day—and can be taken down in half a day!

■ Key to quick assembly-disassembly is the Simmons Dual-Lock.

Dual-Lock is a high-load, positive-locking structural fastener perfectly adapted to panel fastening of demountable shelters, shipping containers, covers, cowlings... and to all butt-joint fastening jobs. It can be recess-mounted as in the application pictured, or surface-mounted on sheets or panels. Locks with heavy closing pressure, with very light pressure required on the key.

Arctic Units, Ltd., Toronto, Canada, is putting up 90 "Eskimo Houses" on the DEW Line. Panels, including roof, are plywood-covered styrofoam designed for insulation against Arctic cold.

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■ Samples and engineering service available upon request.

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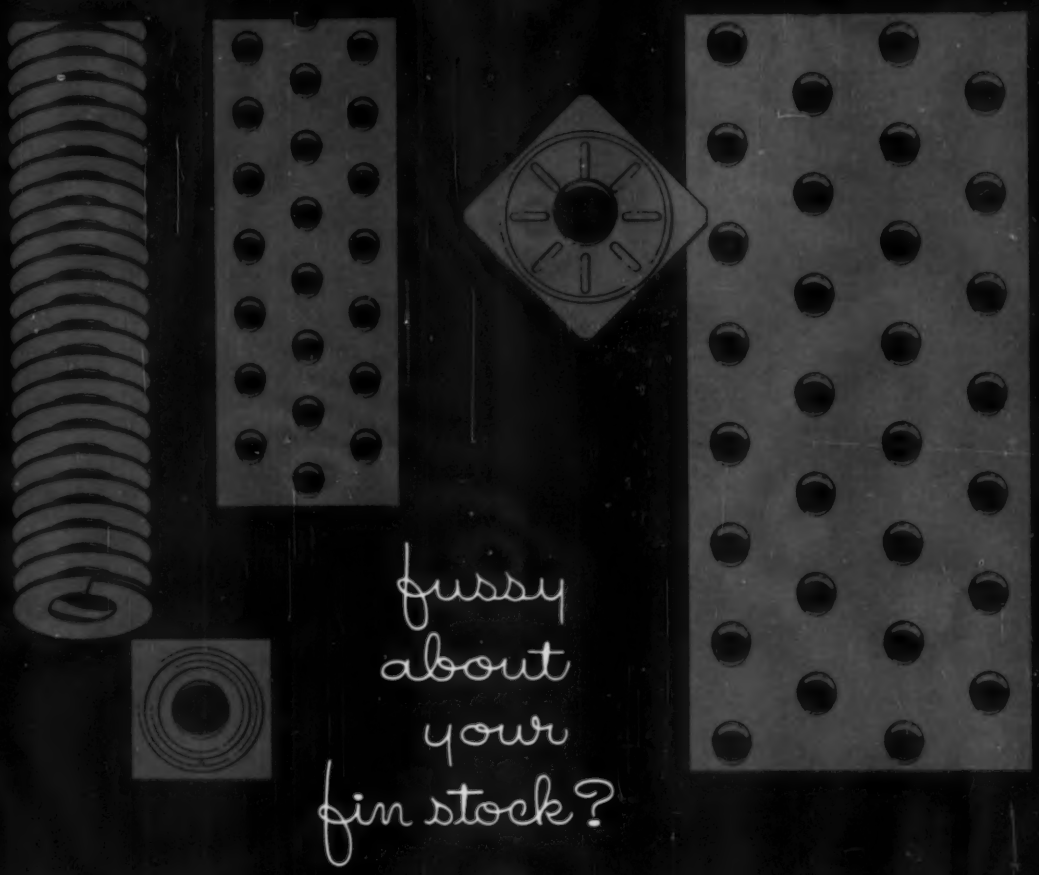

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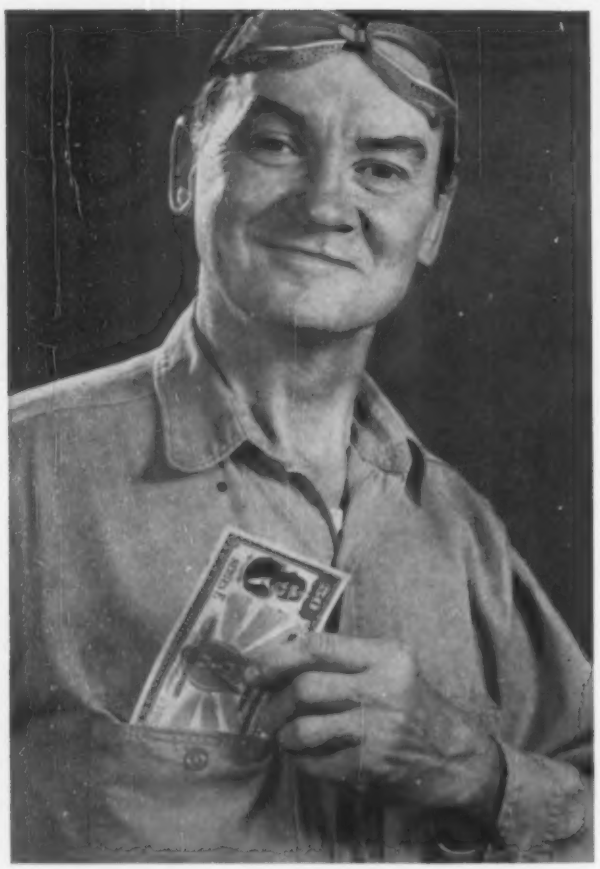

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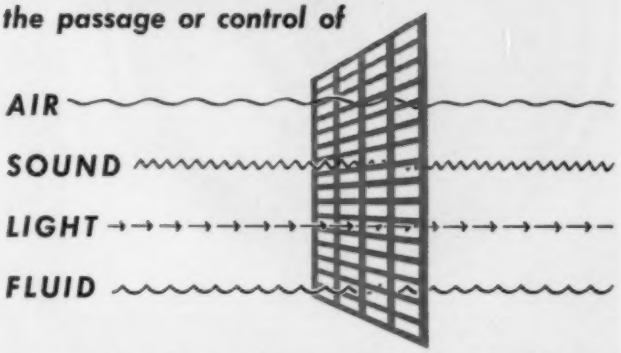

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COMING NEXT MONTH

GE and the toy market

At this month's National Hobby Show, General Electric launched a complete line of educational equipment which last spring was only a bright idea in a company contest. The items, all made from GE components, range from a transistor radio to an electronics laboratory, and introduce the company into an entirely new field. To make sure the debut would be a smooth one, GE asked Visual Marketing, a young design firm, to consult on packaging. Their unusual solution makes the GE line unique among its competition. ID will show the packages, and show how packaging helped GE get a new line of products on the market.

Knit paper

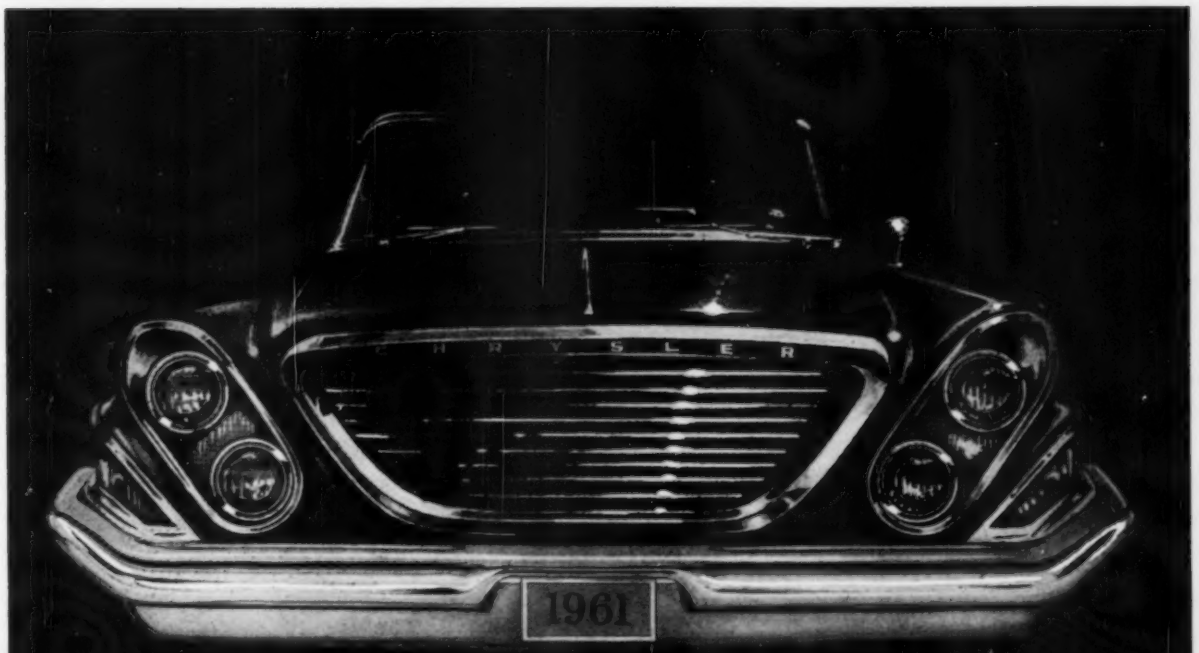
A Texas manufacturer of meat packing equipment has found a way to knit paper, making a surprisingly strong and inexpensive product which can be sewed, patched or re-formed. Developed as a packaging material for hams, the new paper may soon appear in industrial and consumer packaging, drapery fabrics, and disposable items. Next month ID will describe this new material and speculate on its possible future uses.

Industrial design for defense

How does a small staff of industrial designers fit into the many-sided defense operations of one of the U.S.'s biggest corporations? At General Electric's Light Military Electronics Department, the industrial design staff "sells" its services to other LMED departments (engineering, manufacturing, marketing), and its contributions are evident in everything from missile vehicles to readout gear. In March, ID will present a broad study of the department, the designers, the work they do, and why and how they do it.

Design review

Next month, ID will review the latest in electric and non-electric housewares, with a special selection of some of the products introduced at the Chicago exhibit of the National Housewares Manufacturers Association.



Double-Layer Nickel Plating is the difference between this and this

Both of these plated panels were exposed in a corrosive marine atmosphere for 18 months!

You can see how the panel on the left — plated with a Nickel-Chromium coating that is perfectly suitable for less rugged use — fared in this severe outdoor test.

But the panel on the right — *coated to the same 2.0 mil thickness* — retained its rich original luster!

Why? *Double-Layer* Nickel Plating — a good thick layer of sulfur-free, semi-bright Nickel beneath the lustrous bright Nickel layer and the thin chromium overlay.

Remarkably durable, this combination provides outstanding resistance to corrosion, abrasion and wear . . . helps assure the mirror-bright, *lasting* eye appeal that satisfies today's quality-conscious customers.

For more information on the durability of decorative Nickel-Chromium plating, write for your free copy of "*The Contribution of Nickel and of Chromium to the Durability of Decorative Plating.*"

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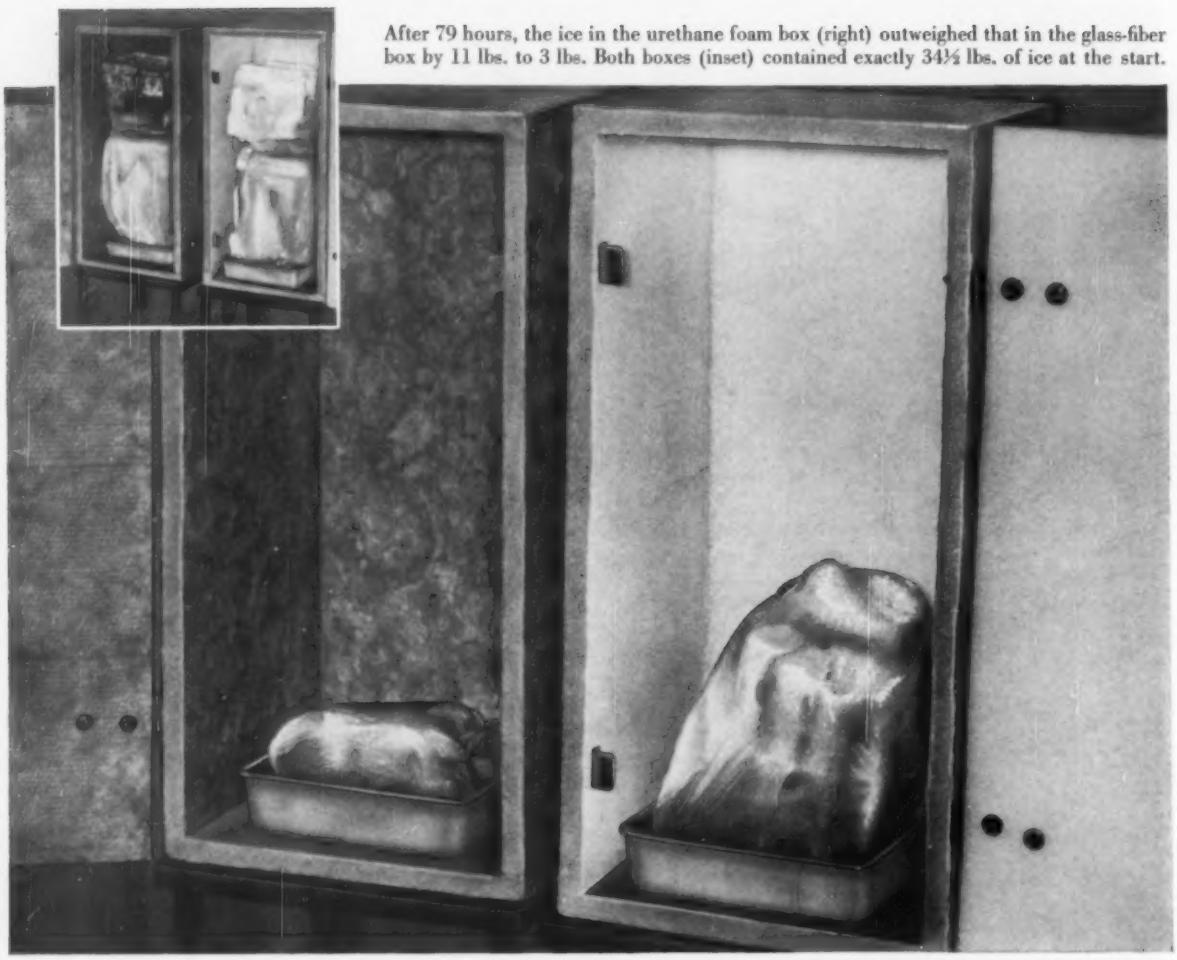

After 79 hours, the ice in the urethane foam box (right) outweighed that in the glass-fiber box by 11 lbs. to 3 lbs. Both boxes (inset) contained exactly 34½ lbs. of ice at the start.

The difference is superior insulation... from new, rigid urethanes foamed with FREON®

These two cakes of ice started out equal in size. The only difference?—improved urethane foam insulation in the box on the right, glass-fiber insulation in the other. Rigid urethane foams blown with "Freon"* blowing agents now have a K-factor of just 0.14—provide twice the insulation at the same thickness as other materials.

Urethane foamed with "Freon" will also match other insulating materials in efficiency with just half the volume . . . permitting more compact designs, greater interior space with the same outer dimensions.

Structural strength of urethane foams blown with "Freon" lets you combine insulation and lightweight, structural support in one material. High adhesive strength makes these foams ideal for bonding . . . and offers a built-in water-vapor barrier.

Greater design freedom. Foamed in place, these new foams will fill voids of almost any shape and size . . . can simplify production techniques. Foaming with "Freon" also permits closer control of density.

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Whodunit?

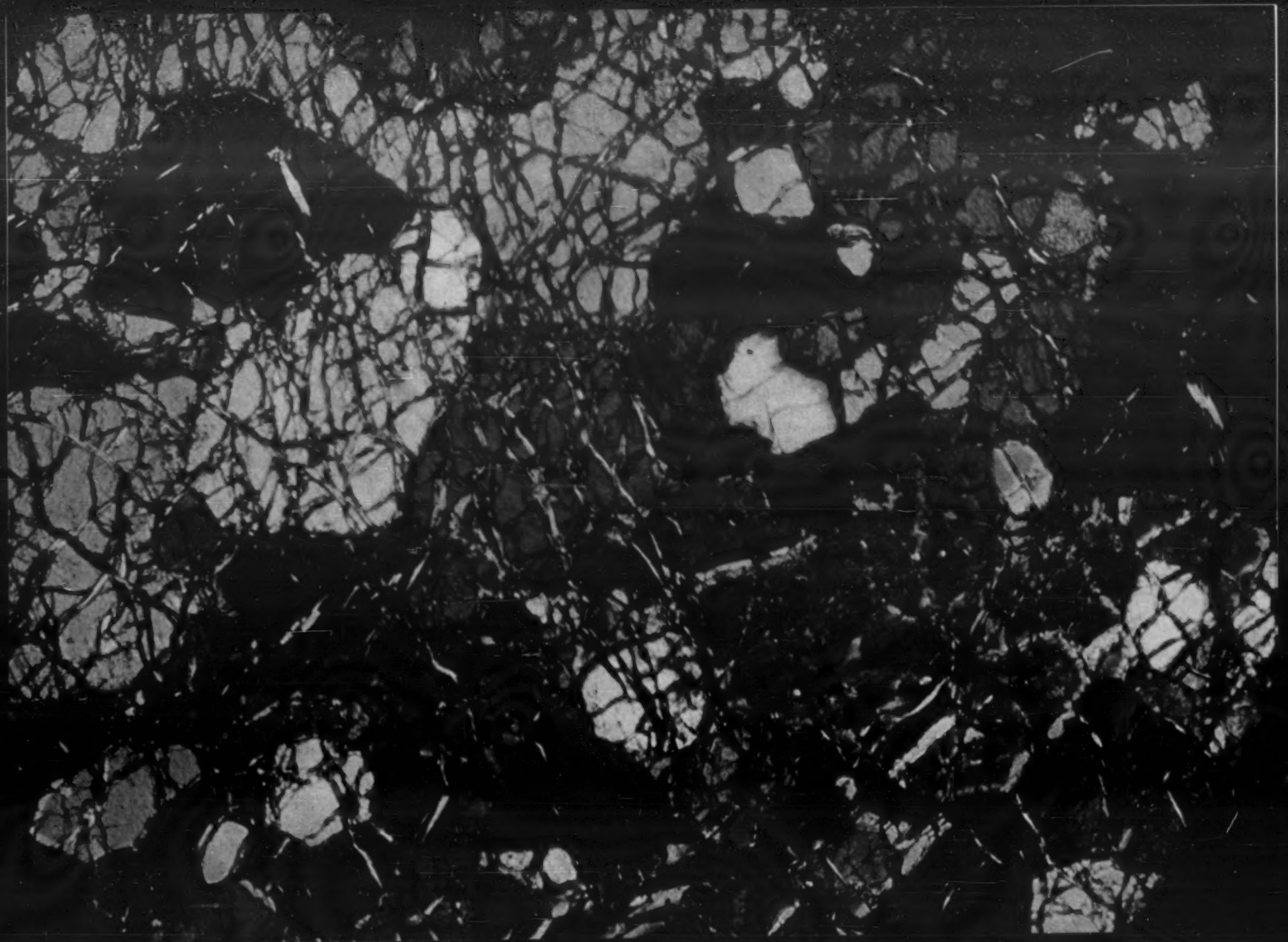
If there is one passage in Biblical literature that is universally loved and respected today, it is the admonition not to hide one's light under a bushel. In fact much of the energy of American business is regularly bent to the task of removing the bushels and magnifying the light. An occasional mother still deludes prospective suitors into thinking it was her *daughter* who baked the pie, but every other class of professional demands his just deserts, or more. It is an axiom of the reporter's craft that when someone says "I am not interested in personal publicity," the next sentence will begin with "But . . ."

Designers are as understandably anxious as anyone else to get credit for work they have done, but it isn't always easy. "Teamwork" often makes it difficult to pin down precisely who did what; also, the passion for decisive anonymity so pervades the business world that many companies are reluctant to admit—and sometimes unable to perceive—that anyone has actually *done* anything. Each year, in preparing the Annual Design Review, we learn all over again that many manufacturers either don't know or don't care who conceived the products they make and sell.

Even when they are actually talking about design, some firms reveal a curious indifference to designers. The Whirlpool Corporation in December sent out a bulletin heralding the creation of a new corporate identity symbol to be used on all the company's products, advertising and printed matter. According to the release, which mentions no designer, "many months of study and investigation produced" the new mark. By examining the language we can see the faulty thinking behind it. If the authors were to parse the sentence, country school style, they would discover that "months" is the subject and "produced" the predicate. It is easy to fall into the trap of believing that months actually produce designs, but the fact is that men do. It might be nice to acknowledge them.

Surprisingly, architects too are taken for granted. From the Massachusetts Institute of Technology comes a press release entitled "lead story" (for the benefit of editors who hate to make decisions). The item deals with MIT's new Center for the Earth Sciences, "a structure architecturally unique in the United States." One would suppose that if the architecture is all that important, the architect might be mentioned, but he isn't—not even by inference. There is a language problem, and therefore a thinking problem, here too: since the release, like most, is written largely in the passive voice, it carries the suggestion (or, as the authors would say, the suggestion is carried) that the building designed itself. It didn't pay for itself, though, and the Texan who put up the money for it *is* mentioned, as indeed he should be. In a supplementary release the Institute finds a sort of old-school-tie reason for naming the architect: he is finally identified as "an M.I.T. alumnus, I.M. Pei, founder of I.M. Pei and Associates, New York City, who received the Bachelor of Architecture degree in 1939."

Every day we see fresh evidence of the importance of choosing the right college: if Pei had gone to Purdue, MIT might never have remembered his name. But what truly matters is not the fact that he designed the building, but the idea—increasingly rare in a world increasingly impersonal—that someone did.—*R. C.*



STEEL'S RENEWED GLOW

When changing times threaten an industry that reigned imperious for half a century, some rallying of forces is called for. ID's ninth article on basic materials shows what steel is doing to find and win new markets and a new public image. BY ARTHUR GREGOR

For the past three years the steel industry has been surprising its customers in various ways. Large producers like United States Steel have redesigned their graphics on everything from trademarks and bank checks to the cement bags used in their plants. They have stressed design, the rich uses of the metal's slender "steel-strong" beauty, and designers are being used in their marketing and advertising programs. They have offered their customers some mill-products which are not only new but clearly different. And they have let it be known by means of recent, vigorous campaigns, that their material is indeed versatile, a fact not sufficiently realized.

The most popular concept of steel divides it into two categories: inexpensive, low carbon; expensive high-class stainless. But this common view takes no account of the fact that between these two extremes lies a variety of ten thousand or more types of steel whose metallurgical, structural and appearance properties greatly differ from each other. For decades now, whatever was new in the steel industry's product line was new mostly in terms of composition and of such basic design factors as cross-section, wall thickness, length and width of strip.

But this has not been so within the last three years. In that time, the august and conservative industry has put on the market such new and diverse items as steel

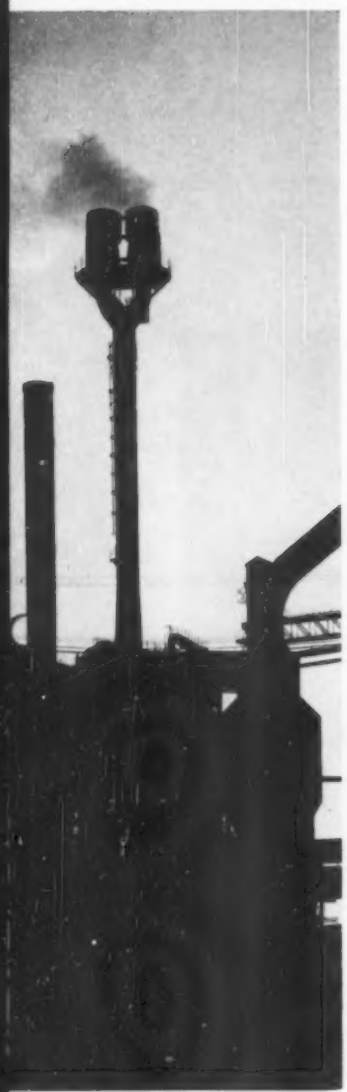
Photomicrograph of crushed firebrick in blast furnace lining; above, purified metal poured from ladle. Photos courtesy Steelways.

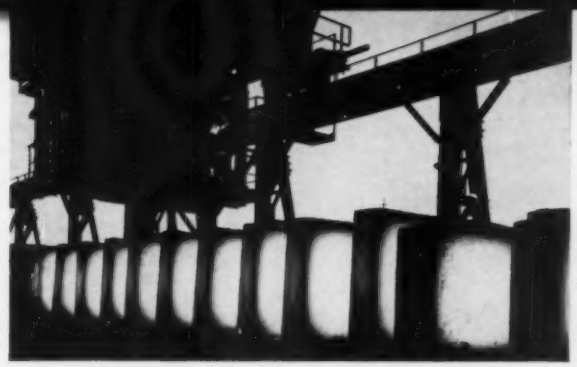
made to look like lace, steel strips shipped in coils and covered with colored vinyl, steel sheet corrugated like cardboard, steel angles on which a whole line of desks and chairs (page 41) is based, and steel brackets that are the core of a new building construction principle (page 46). Compared with standard mill products, the output of the new steel products is, of course, small; nevertheless they indicate the extent to which the most solid and solemn of American industries is aware that it's time for a change.

A fresh impulse in marketing

What is behind this change? Industry spokesmen tend to dwell on it as a zealot might on someone's conversion. They seem to want to get across the idea that the industry has been asleep, has been unwilling to look realistically at the new material markets and the decline in steel consumption, but that now *steel has awakened.* There is no denying the fact that the leaders in the industry — United States Steel, Bethlehem, Jones & Laughlin, Armco, Republic, as well as some of the smaller companies like Sharon Steel — are redefining their attitude toward their customers and their markets. But the claim that the change in the industry is a new emphasis, a shift from "being production-oriented to becoming market-oriented," and that the industry has now become interested in people — "people" in this context being "markets" — is oversimplified. However true it may be that the business situation for the steel industry today is not what it was some decades ago, when steel was not only the undisputed leader on the materials market (it didn't even have a challenger), it does not seem likely that any industry could have flourished so richly without being somewhat concerned about markets. If there is evidence within the industry today of a shift in emphasis, the shift is not the result of a conversion. Behind much inflated public relations talk is the plain fact that the whole materials market has undergone changes and continues to do so. Steel did better three or four years ago than it did last year (steel's profits have declined from 1.13 billion dollars in 1957 to about .8 billion last year). Some of its markets have been taken away from it by competitive industries, others are being threatened, and steel producers are attempting by very realistic means—and by no means as the result of a sudden awakening—to regain lost markets, to hold on to those they have, and to get new ones wherever possible. If this is not a new emphasis, it is at least a fresh impulse in a logical direction; and in surveying the new developments in the steel industry this impulse—more than fabrication methods and even products — is what stands out as significant and new. Nearly all the developments that are shown on the following pages—the recent activities of industrial designers retained by steel producers, the new shapes, alloys and finishes supplied by the pro-

Smoke stacks from Armco's blast furnaces





Glowing ingots are lined up for processing.

During production the metal smolders in soaking pit. Photographs this spread by Yarnall Richie for Armco.

ducers — are an outgrowth of it.

Steel's fresh impulse—its new glow from the furnaces and its newly charted market strategies—is an attempt to gather its own forces to meet the outside threats that challenge it. Chiefly, of course, these are the inroads made on its markets by materials either nonexistent or regarded as insignificant during steel's long (almost 50-year) heyday. The fact that these materials — aluminum, concrete, plastics and steel imports — were shrewdly planning out markets for themselves became suddenly evident to the steel magnates when parts of their most cherished markets were snatched away from under them. For example, about a year and a half ago, the steel industry had to swallow the distasteful news that the Southern Railway had purchased 1,205 railroad freight cars made of aluminum. Up to then, this market had belonged to steel exclusively, and this unanticipated loss and cut in consumption, however small on a percentage basis, shocked the steel giants. Nor was this the first sign of the falling away of traditional markets. Design changes in the automobile industry—unitized construction and the compact cars — were sharply cutting steel tonnage. Pre-stressed concrete and aluminum were doing damage to steel in perhaps the most important area of steel use: construction. Too many aluminum containers were beginning to appear; this and the use of plastics in garbage pails, furniture, and industrial parts such as bearings and gears, did not help to make things look any brighter.

These threats were not yet too harmful in terms of percentage cuts in consumption—only about 20 per cent of steel's total decline was due to competitive inroads—but they threatened to become so if not checked, and industry leaders knew, of course, that something had to be done effectively to revitalize industry's and the public's interest in steel. Broadly, the action that was needed was threefold: to communicate the vast versatility of the steel industry's own resources; to remind the public that a good majority of the products they use at home or in business had steel in them whether it showed or not; to show designers and engineers how to use steels correctly and imaginatively. Said R. C. Myers, U. S. Steel's Director of Market Development, in what may be considered the company's new market manifesto: ". . . We recognize that our customers owe no permanent loyalty to steel. . . . [But] as a steel producer, our basic loyalty *is* to steel, and we believe we can and should show our customers how *our* material can help them serve *their* markets better. . . ."

The marketing programs

The steel industry is now taking a more active interest than ever in the markets of its customers, and the major companies have implemented concrete programs to dramatize the potential of their materials. Companies like U. S. Steel, Armco, Republic and others have

Continuous annealing line for tin plated steels. Courtesy U. S. Steel.

Successive stages in the deoxidation of molten iron. Courtesy Steelways.

Scarfing of steel slab to insure quality for flat rolled steels. Courtesy U. S. Steel.

market development groups whose job it is to keep up an awareness of the materials needed by American industry, to instigate the development of new grades of steel for those product designs for which the proper steel does not exist, and to inform manufacturers of the steels that do exist and of their most effective uses. At Armco the group that evaluates the needs of its customers and furthers new applications for existing steels is the Application Engineering Section of its Market Development Department; at Republic Steel it is the Product Design Department — part of its new Research Center—which develops new applications and improved use of steel in products whose manufacturers are Republic's customers. At U. S. Steel, the Market Development Division is an elaborate network covering such steel-consuming industries as agriculture, automotive, building construction and architecture, highway construction, home building, industrial equipment, transportation, aircraft and missiles, electric utilities, and others. These market areas are headed by marketing specialists who work hand in hand with the company's department called Applications Research, with engineering and industrial design to fill the needs of the markets they survey and to expand the end uses of present steels. Rounding out this team effort is U.S. Steel's Product Development Division which carries out the actual development of new steels and steel products. Like talent scouts, the marketing specialists are everywhere where a "find" might turn up, and the needs and general condition of the fields they survey are as familiar to them as the resources of their own company.

The new old steels

A main objective of this stepped-up communications network is to break down outdated concepts and to promote material selection based primarily on properties. The industry is trying to make clear that steel is *not* heavy, *per se*. Because it is strong, products made of it can be thin and light, and there is a tendency to make the cross-section of a beam or furniture leg thicker than it needs to be simply because it looks *too* thin and fragile. The producers are offering a large variety of high-strength low-alloy steels; thin-gage coated steels, stainless steels flexible as cloth, a constructional steel which coats itself—any one of which should be used only in such applications in which their special properties are required. (The industry claims that for each use there is one steel, or combination, and it is that steel which must be selected for best results and none other.) It is impossible to point out the characteristics and appropriate applications of each of the myriad mill-products the industry offers (some of those recently in the news appear on pages 44-48), nor is it necessary. But the steel industry is both eager and prepared to work with designers in the earliest stages of product design in determining which steel to use for the best and most economical job.

Industrial design in the steel industry

In the attempt to convey its message with clarity and impact, the industry is, of course, making use of the available tools of communication. U. S. Steel claims to have an advertising program which reaches over 20,000,000 people a month, even more through its popular program on tv; it has made designers like Teague and Dreyfuss the subjects of its advertisements. Some of the producing companies employ industrial design services, but in spite of this, the industry has been slow to recognize industrial design as an effective means for dramatizing product information. Only two of the producers — U. S. Steel and Sharon Steel — retain industrial design offices for other than graphics services; Armco has recently had its trademark redesigned by Lippincott & Margulies. To many a steel executive, however, industrial design is still a meaningless or, at best, obscure designation. Many cannot conceive of design beyond design engineering, and the thought that a man also concerned with form and color might have a voice in their business programs sends shudders of reaction down their spines. Steel's number one giant—U. S. Steel—showed considerably more foresight and flexibility than other producers, and while the more astute competitive material suppliers were nibbling away at some of their markets, U. S. Steel began to nibble away at some of the inertia which was preventing its company from taking its place in the forefront of American industry. But even U. S. Steel's comprehension of design is still young and raw. At best they are just beginning to see that, to be most effective, design must be an attitude reflecting an approach practiced on all levels within the company. Many steel executives regard industrial design largely as a fringe activity, a play of the imagination (sometimes in comic-strip futuristic terms), and they do not yet seem to realize industrial design's value as the practical solution to a given problem. Steel companies who now use industrial design were not seeking the humanist's expression of technology, nor even a more profitable philosophy of business when they engaged it. They were seeking a proven method of promotion and company propaganda. It now remains up to the design firms retained by the two steel suppliers for other than graphic designs—Lippincott & Margulies and Peter Muller-Munk Associates by U.S. Steel, and Francis Blod Associates by Sharon Steel—to make the fuller meaning of design felt within these companies.

Graphic and product designs for steel

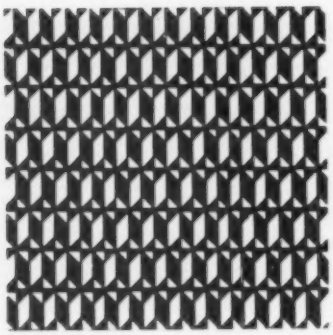
The first major industrial design assignment by a steel company was L & M's redesign of U.S. Steel's graphic

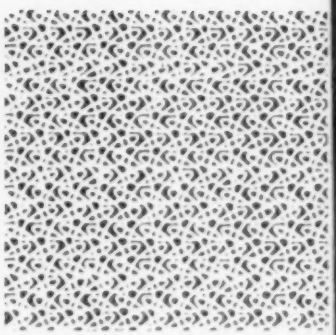
symbols and the creation of the "Steelmark" (see ID October 1958 for full coverage of trademark and Steelmark programs). An extensive investigation made for U.S.S. by Alfred Politz Research about four years ago revealed that the public's view of steel was as old fashioned as the industry's. The public thought of the metal as reliable but of restricted use, and one of the ways by which this error could be corrected, U.S. Steel thought, was to redesign steel's image. L&M redesigned all of U.S. Steel's graphic identification, and the company's new graphic look began to appear in its trademark, lettering on checks, forms, invoices, cement bags and myriad tags. To remind the public that steel products can be light, and that the material is not only not restricted but is in fact found in applications ranging from appliances to hairpins, L&M designed for U. S. Steel the now famous Steelmark (at right) which was to identify the presence of steel and was to convey its versatility and up-to-dateness. After U. S. Steel tested the Steelmark for a year with marked success, U. S. Steel presented it, and the results of its use, to representatives of the entire steel industry through the American Iron and Steel Institute. The industry was impressed, and U. S. Steel suggested that the Steelmark be adopted by all steel producers as a merchandising symbol for their products. After some urging, the industry's understandable reluctance was overcome and they accepted the mark as an industry-wide symbol.

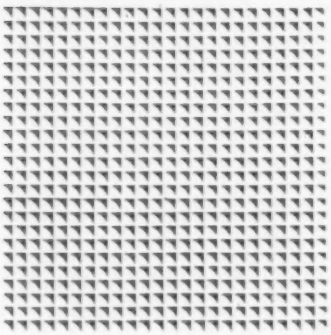
In order to create a clear and immediate family look for Armco and its divisions, L&M has just completed a corporate identity system which consists of a revision of all of Armco's visual and fixed verbal communications. The program includes a trademark redesign (at left) and a graphics control manual.

The function of industrial design in the overall market approach of the steel industry has been defined by U. S. Steel's director of market development in this way: ". . . As a basic materials supplier, it is not our function to engage in the design business, nor should we go so far as to complete production models of our design ideas. On the other hand, we accept as our responsibility the function of probing the capabilities of our raw material. . . . We hope to create 'thought starters' that will lead steel consumers into design and marketing opportunities for new products made of steel." To implement this policy, U. S. Steel engaged Peter Muller-Munk Associates about three years ago originally to identify potential markets for their new vinyl-clad steel (see ID, May 1959, for detailed account of this program) and more recently to function as design consultants to all of U. S. Steel's market divisions of the market development department. Asked to comment on the nature of his firm's liaison with market development, Muller-Munk states that he and his designers are not predominantly concerned with

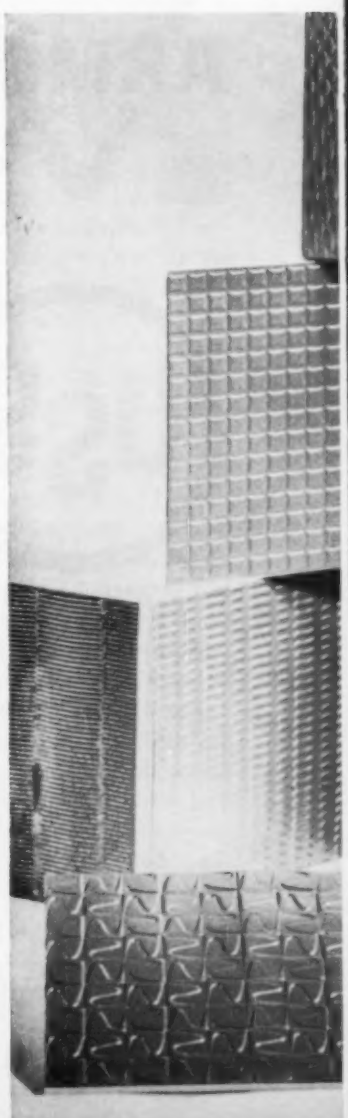
(text continued on page 44)

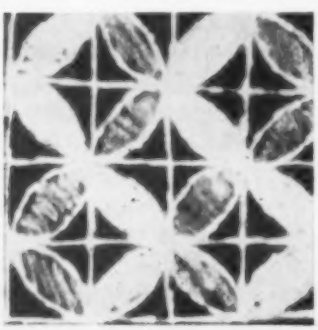






The steel industry is now actively at work in studying — often imaginatively — the markets of its customers. Their programs for developing end-uses for the basic products they supply are of course akin to those of other material suppliers, notably in the aluminum industry. To implement these programs steel producers have engaged the services of industrial designers, some of whose work appears here.





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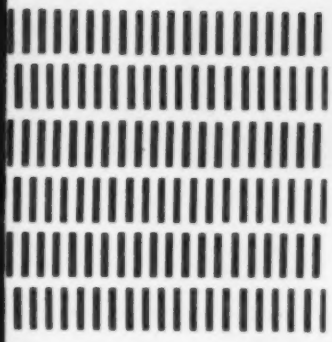

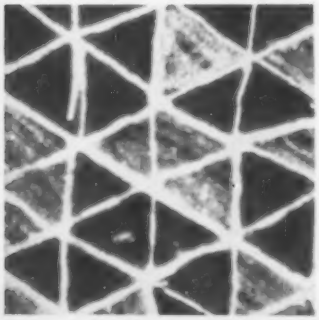

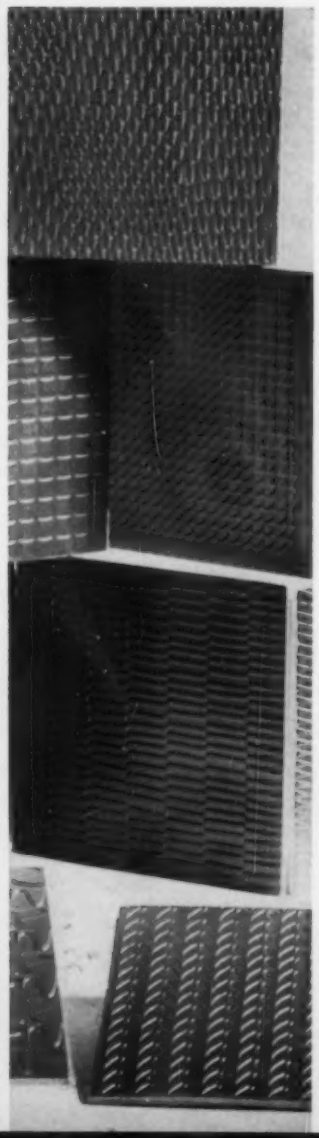

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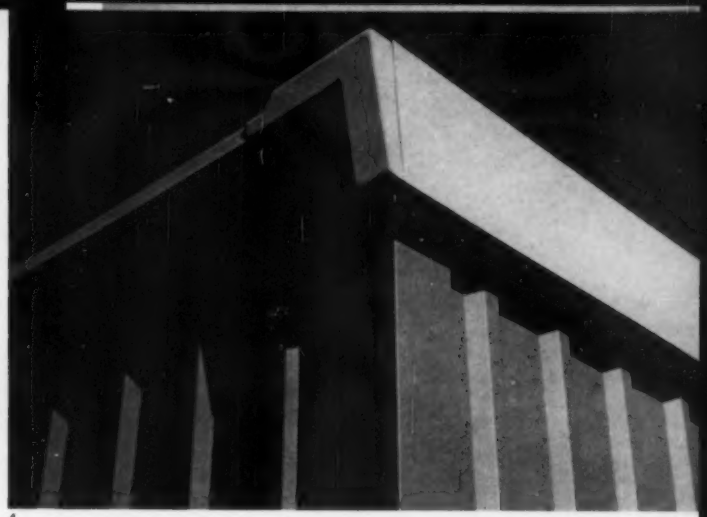


4

1. Sharonart by Sharon Steel has been used for decorative surfaces —particularly those requiring abrasion resistance — on automobiles, small appliances, furniture, hardware, housewares, etc. To increase its use and broaden its markets Sharon retains Francis Blod Associates, a sampling of whose suggested designs for textured metal are shown here. Among the source materials for these patterns are leaf structures, wood grains, or other random forms.

2. Some of the recent Sharonart patterns designed by FBA and now being manufactured by Sharon Steel.

3. McLouth Steel Corporation has included detailed drawings of suggested uses of stainless steel in automobile design in a booklet called "Stainless Steel For The Automotive Industry." The one-piece stamped bucket seat shell shown here is conceived as a pre-finished structural assembly.

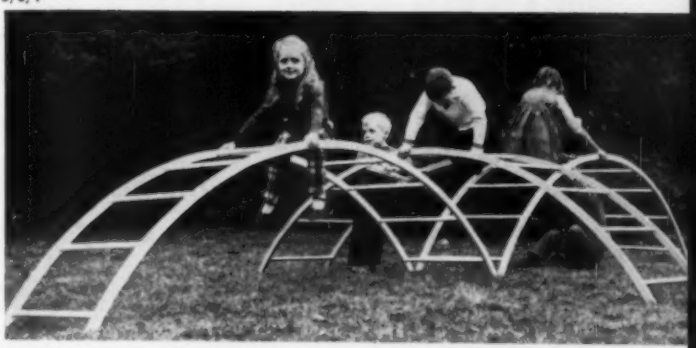
4. Harley Earl Associates designed this flashing and gutter for Stran-Steel's line of pre - engineered buildings. Design detail is to enhance appearance of commercial structures.

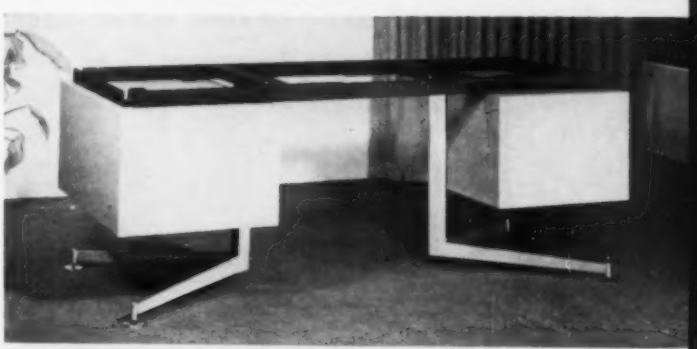
5. United States Steel engaged Peter Muller-Munk Associates to "take a long and hard look at some of the mechanical principles involved in steel construction and fabrication." Shown here are some of the product models PMMA designed for USS's program "A Study In Steel." These curved ladders—steel under compression and tension—can be used as playground equipment.

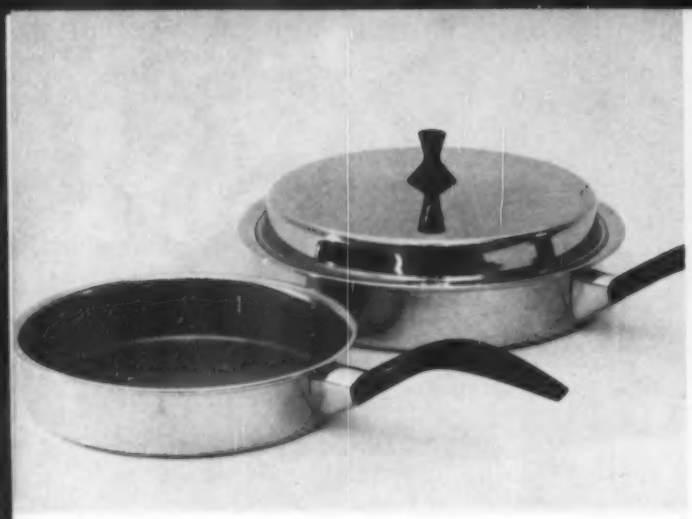
6. "V" leg is a variation of "C" leg—a new basic structural support unit for furniture. PMMA added connecting members to produce this desk frame; pedestals are hung from the frame.

7. PMMA developed a variation of "V" leg to function as base for this lounge chair whose shell is also made of stainless steel.

5/6/7







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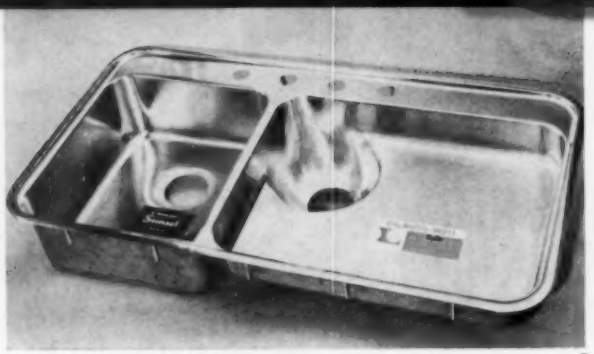
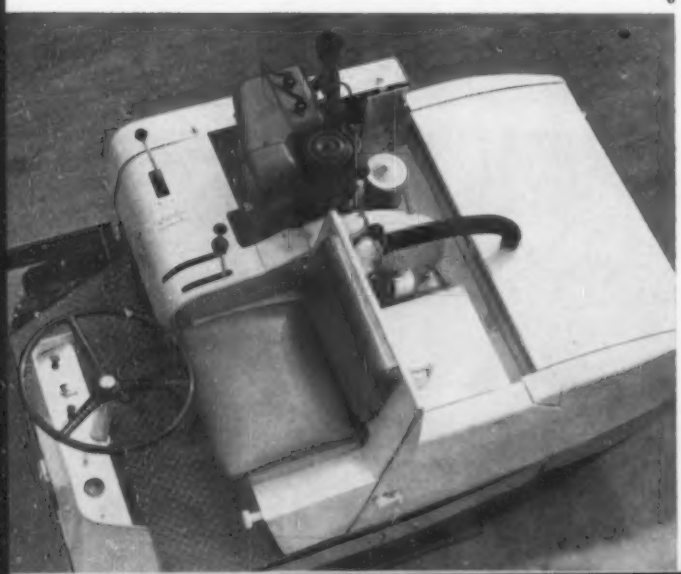


2

The popular attributes of steel are reliability, strength, low cost, and formability. But there are other qualities inherent in it — luster, sleekness, delicacy of structural silhouette, protection against corrosive atmospheres — which permit designers to let steel's own natural surface and form be the accented factor in product designs. An early expression of this was Mies van der Rohe's Barcelona chair (at right). A selection of more recent designs that make outstanding use of steel appear here.

6



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5

1. Stainless steel pots and pans are prized items in housewares due to bright finish and scuff resistance. The metal's affinity for crisp contours, and its high gloss are exploited in sauce pan and fry pan designed for Federal Enameling and Stamping Company (Pittsburg) by Raymond Loewy/William Snaith, Inc.
2. Double sink was one of designs recently selected in an international stainless steel competition by the National Industrial Design Council for exhibition in Canada. Sink has deep Disposo-Well area for easier draining and cleaning. Designed by Harley Earl for Lyon, Inc. (Detroit).
3. Sea water- and abrasion-resistance of a special stainless steel alloy make these marine hardware items impervious to salt corrosion. "Seaprufe" line designed by Raymond Loewy/William Snaith, Inc. for Special Products Division, Cooper Alloy Corporation (Hillside, N.J.).
4. Pittsburgh's new "#4 Gateway Center" building is a curtain-wall tower of stainless steel and tinted glass. Steel fabricated by Limbach Company (Pittsburgh); architects: Harrison and Abramovitz.
5. Stainless steel sheathing in the form of movable leaves covers the roof of Pittsburgh's new Civic Auditorium. Architects: Mitchell and Ritchey; Steel by International Nickel Co.
6. Die-formed steel parts make up most of the body of this rider-driven industrial sweeper. Designed for Wayne Manufacturing Company (Pomona, Cal.) by Henry Keck Associates.
7. Famed Barcelona Chair is classic example of steel's slender elegance. Strength of steel eliminates additional braces at welding points. Designed 25 years ago by Mies van der Rohe; manufactured by Knoll Associates (New York).
8. In this Waste King Corporation electronic oven, stainless face and grills are combined with aluminum extrusions. Designed by Henry Dreyfuss.

7

8

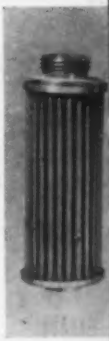
appearance when digging for new concepts in steel usage. "As we come up with new ideas, we know very well that these can be interpreted in many different ways. All of our work is focused toward industries, not to any given customer, and the members of such industries are at liberty to copy, to adapt, or to improve upon our design principles in any way they see fit. We at PMMA want to broaden the horizon of designers, of fabricators and of end-users by doing some of the fundamental research for them."

The first thorough execution of these objectives was steel in furniture (page 41), playground equipment, cranes and tents, sculpture, etc. The designs aim to indicate that steel used as a designer's material adds an elegance not commonly attributed to steel products, and that the slender grace of steel is inevitably combined with its most famous attribute—strength. Part of the exhibit was PMMA's designs of office and home furniture constructed around a new type of steel bracket—"C" shaped legs made of separate steel bars welded together under tension (page 41). The PMMA group also serves U. S. Steel in a broader capacity: "to provide design guidance and consultation in matters concerning the physical exposure of U. S. Steel to the public and to its customers." In this function the group has concerned itself with the design of executive and other offices and other types of company installations—they have, for example, redesigned the strapping machines produced by United States Steel Supply, a division of U. S. Steel. In its drive to suggest the correct uses of steel in imaginative designs, the market development division of U. S. Steel also retains as design consultants, George Danforth—head of the School of Architecture at IIT—in architecture, and Wilbur Smith & Associates—highway engineering experts—in highway design.

A smaller producer of sheet steel — Sharon Steel — has retained the industrial design firm of Francis Blod Associates in a similar capacity. Sharon produces a textured steel called Sharonart, and for the past two years or so FBA has been part of what the company calls "a market symposium" which meets with clients' purchasing groups, sees to it that the client gets the right metal for the job, and also suggests the pattern of the texture which will be the best one for the intended markets. Blod has developed many types of patterns, some of which appear on page 40, and as part of their advertising program, the Sharon market group employed a number of designers (Wright, Deskey, Dreyfuss, Teague among them) whose suggested uses of Sharonart in appliances and other products appeared in the company's extensive advertising programs.

ALLOYS

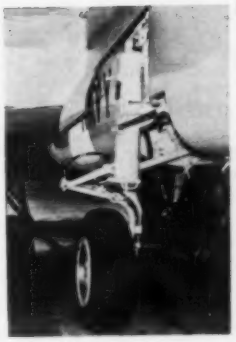
The steel industry is no longer strictly a supplier of such basic mill products as rods, bars and strips. To meet the design demands of current products, steel suppliers have developed new mill processes for a large variety of metal finishes, new enamel and plastic coatings, and new textures with subtle or elaborate patterns. And they continue to develop alloys with special properties for special applications.



8. Stainless and alloy steel powders. A high-degree metal consistency is obtained by a pre-alloyed steel powder in a newly developed patented process. Parts made from pre-alloyed metal powders are homogenous, and material is suitable for long runs of complex parts. The extruded and sintered filters (right), fabricated by Puralator Products, were made from Vasco 347 pre-alloyed stainless steel powder. *By Vanadium-Alloys Steel Co., Latrobe, Pa.*

1. Jalloy-S has high yield strength. Available in three grades—90, 100, 110—in both sheet and plate, metal has a high yield strength which permits reduction in section size. Suitable for missiles, hoists, cranes and other heavy-duty defense and industrial equipment. Metals are weldable with low hydrogen electrodes. Bend radius should be at least twice the metal thickness. *By Jones & Laughlin Steel Corp., Pittsburgh* 30.

2. Jalloy-AR is abrasion resistant. Similar to the Jalloy-S series in fabrication and welding characteristics, these new steels—available in grades 360 and 400—combine high yield strength with abrasion resistance. AR-360 can be sheared and punched in thicknesses up to 3/8", should be flame cut in heavier thicknesses; AR-400 should be flame cut only. Suitable for components in mining, transportation and construction equipment. *By Jones & Laughlin Steel Corp., Pittsburgh* 30.

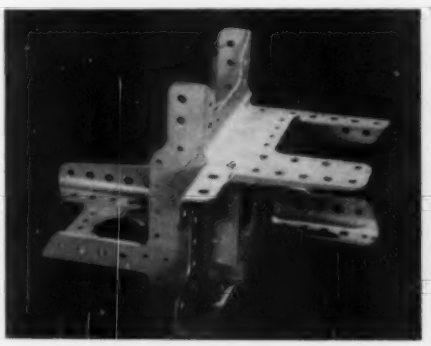


3. Strux has ultra strength. This alloy can be forged, machined, and heat-treated to develop tensile strengths up to 300,000 psi. Developed primarily for use in aircraft landing gears, Strux has about 7 per cent more strength than steels previously used in this application, and therefore yields a weight reduction of about the same percentage. Material is available in bars, billets or blooms and is suitable for a variety of forged or machined aircraft and missile parts. *By United States Steel Corp. Pittsburgh* 30.

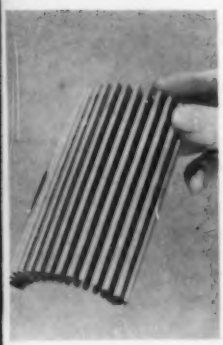
4. New "T-1" grade is light, tough. A new steel has been added to the "T-1" steels — low carbon constructional alloys with good weldability, high strength. Type A is available in plates and bars from 3/16 to 1 inch. "T-1" has a yield strength of 100,000 psi, thin sections are easily formed and welded; suitable for transportation, industrial, and military equipment. Structural members of transport trailer (left) of Army's "Sergeant" weapon system are made of "T-1". *By United States Steel Corp., Pittsburgh* 30.

5. Cor-Ten forms own protective coating. Introduced in 1933, high-strength low-alloy Cor-Ten is now being marketed for its excellent corrosion resistance, which has now been determined by checking Cor-Ten structures that were erected 24 years ago. A non-porous, tight-adhering oxide "skin" forms on Cor-Ten during the first year; from then on the skin preserves the steel's original strength and thickness. Marked structural member (right) shows skin on uncoated Cor-Ten. *By U. S. Steel Corp., Pittsburgh* 30.

6. Man-Ten for moderate forming. A high-strength steel suitable for construction equipment, earth-moving machinery and other material handling applications which require only moderate forming. Steel has 50,000 psi yield point, reduces weight, cost and is available in plates and such structural shapes as wide flange beams, bars, bar shapes, hot rolled sheets and strip. More than two-thirds of steel used in Pittsburgh's new Fort Pitt bridge is Man-Ten steel. *By United States Steel Corp., Pittsburgh* 30.



7. VascoJet 1000 retains high strength at high temperature. A high-strength, heat-resistant steel for structural applications where a high strength-to-weight ratio at temperatures up to 1000 degrees F is essential. The steel's ultimate strength at room temperature is in the range of 200-310,000 psi. Easily welded and fabricated. Arresting gear for Navy's multi-mach carrier plane is machined from VascoJet 1000. *By Vanadium-Alloys Steel Co., Latrobe, Pa.*



9. Stainless steel of special hardness. A new grade of stainless steel is being used for bearing assemblies in the Boeing 720 and 707; the assemblies act as thrust reversers during the planes' landings. The new steel has a molybdenum content of 4.00 and is produced by the vacuum consumable electrode process. The steel, designated Lesco BG 41 Varc Arc, can stand a compressive strength of 600,000 psi and temperatures above 800°F. *By Latrobe Steel Co., Latrobe, Pa.*

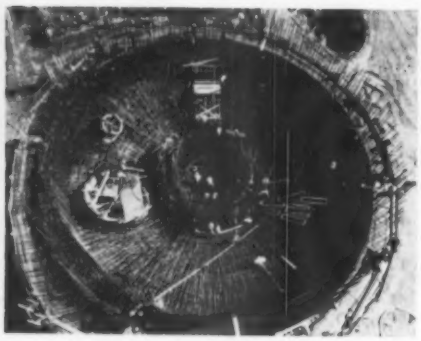
10. Stainless steel for car mufflers. MF-1 is a new, ductile, weldable stainless with 11 per cent chrome content to give it the corrosion resistance and other properties needed for automobile mufflers. This is one of the few non-decorative applications of stainless for cars. *By Allegheny Ludlum Steel Corp., Pittsburgh* 22.

11. New alloy resists attack by chemicals. Armco's 21-6-9 (21 per cent chromium, 6 per cent nickel, 9 per cent manganese) was developed specifically for smog-resistant automobile devices. It is unaffected by lead salts in exhaust gases and has the high-strength, heat and corrosion resistance needed for these automobile components. Available in sheet and strip. *By Armco Steel Corp., Middletown, O.*

NEW PROCESSES AND STEEL COMPONENTS

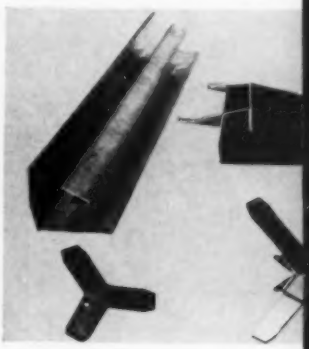
1. Electrolytic Machining. A new process makes it possible to machine tough alloys in as little as one-tenth the time of conventional machines. Jet turbine blades have been machined with this process in five to ten minutes, as compared to one to two hours by grinding. The process in which the metal stock is placed between electrodes in an electrolyte—electric current dissolves the work piece to the desired shape—is well suited to thin section parts. *By Battelle Memorial Institute, Columbus, O.*

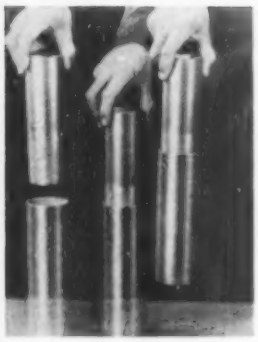
2. Accuracy by freezing. A new method called *cryoforming* produces parts to high accuracy. Part is first heated to a high temperature to harden it. To eliminate distortions the part is next cooled and forced into a sizing die. Part and die are cooled in a solution of dry ice and trichloroethylene; a metallurgical transformation takes place during which the metal is momentarily pliable and the steel reforms in the precise dimensions to which it is then being held. Process used *by Boeing Airplane Co., Seattle, Wash.*



4. Reinforcing bars. Use of new bars for concrete reinforcement made of high-strength steels means reduction of concrete or steel or both. When used as reinforcements in buildings or industrial constructions, the high-strength material makes for considerable reduction of beam depth. The new reinforcing bars were used in the support and shielding structure for this atomic reactor (left). *By Bethlehem Steel Company, Bethlehem, Pa.*

5. Rapid dry wall installation. The Research Institute of the National Association of Home Builders and US Steel's Research Center have developed a new system for installing dry wall that cuts construction time and costs. The system, called "SteelFast," uses cold-formed steel members (right) at all corner and ceiling joints. The members hold the dry wall sheet along their edges. *By United States Steel, Pittsburgh* 30.





7. Threads engage .without twist. This buttress-thread steel tubing locks into coupling without having to twist tubing to engage threads. This permits faster assembly of parts in which these threads are used and also lessens the chances for cross threading and thread damage. Tubing was developed to serve as joint between tubing and casing in oil wells. *By National Tube Division, of United States Steel, Pittsburgh* 30.

8. Large seamless cylinders. Large tubes in the shape of sausages have been made of seamless steel for use as high pressure cylinders in submarines. The cylinders vary in length from 3 to 80 feet, have wall thicknesses up to 3 inches and can contain pressures up to 10,000 psi. *By National Tube Division, United States Steel, Pittsburgh* 30.

FINISHES AND TEXTURES

1. Thin stainless steel cover. A newly developed process for laminating steel to a variety of back-up materials makes use of a stainless steel layer claimed to be thinner than hitherto possible. The process uses a plastic adhesive bonding agent which moves with thermal expansion and contraction. The new stainless-to-board (wood, metal, plastic) panels are suitable for decorative and structural uses in buildings. *By Mirawal Division of Birdsboro Corp., Birdsboro, Pa., and Allegheny Ludlum, Pittsburgh.*

2. New tin plate. The consumption of steel in the container industry is likely to increase as a result of a new tin plate called "Ferrolite." The new plate is thin, light, strong, and less expensive than the conventional tin plate. The picture right indicates that cans made from Ferrolite are almost 50 per cent lighter than those made from standard tin plates. Another development in the same field has resulted in increased tin plate production — the application of tin to steel by electrolytic means. *By U. S. Steel, Pittsburgh* 30.

3. Prefabricated buildings. The steel industry's drive to enlarge the markets for its product is clearly expressed in its activity in the prefabricated building field. In this area the industry is not only the material supplier but also the product manufacturer. US Steel has recently introduced two series of homes — the "Beacon" and the "Steelstyle" — ranging in price from $10,000 to $25,000. US Steel is also manufacturing the prefabricated components for modular steel schools.

National Steel's Stran-Steel division, originator of the Quonset Hut, is now manufacturing preengineered components in color for commercial building construction (left). Unique feature is system's new Harley Earl-designed window (left) which is stamped out of a single sheet of metal with the glass inserted like a windshield. Supplied with the glass, the window is erected in a few minutes just like any of the other prefabricated panels. Harley Earl also designed four store-fronts for the Stran-Steel system.

Granco has put on the market a low-cost series of prefabricated steel homes called "Holiday House," whose panels, walls and roof are galvanized and coated with an enamel primer to permit owner's application of desired colors. *By American Bridge Division of United States Steel, Pittsburgh* 30; *Stran-Steel Division of National Steel, Pittsburgh* 19; *Granco Steel Products Company, St. Louis* 15.

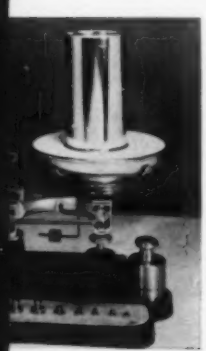
6. Corrugated sheet steel building components. A number of steel producers are now supplying corrugated steel plates in prefabricated forms for various types of building and other constructions. The automobile underpass (right) is a pipe-arch structure made from corrugated steel units measuring about 5 feet by 8 feet and shipped to the construction site in specified prefabricated form. Units are bolted together in the field.

Slabform is one of Bethlehem's corrugated steel sheets used both as permanent forms for poured concrete, and in roofs as the permanent supporting member for insulating concrete fills. High-strength steel is used.

Tufcor is Granco's deep-corrugated steel used in buildings as the structural roof deck. Tufcor is also made from high-strength steels. Another Granco corrugated sheet, Cofar, can be used for both reinforcement of floor slabs and as ceiling. *By American Bridge Division of United States Steel, Pittsburgh* 30; *Bethlehem Steel, Bethlehem, Pa.; Granco Steel Products, St. Louis* 15.

9. Vinyl-covered corrugated sheets. Granco is offering a line of vinyl-covered corrugated sheets for use in industrial building construction. The material has good protection against corrosion and bad weather conditions. Vin-Cor, the material's trade name, is supplied in sheets up to 12 feet long, in nine standard colors plus metallic green and metallic blue; other shades are available to meet customer's needs. *By Granco Steel Products Company, St. Louis* 15.

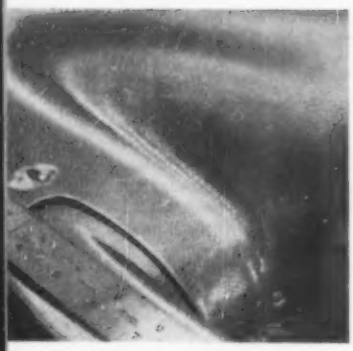
10. Stainless steel cloth. This flexible sheet of stainless steel has 160,000 tiny openings per square inch. It was developed to solve material problems in the missile and rocket field. For the recovery of space vehicles, wires made from a metallic textile like the stainless "cloth" will be able to withstand high friction heat and atmosphere contamination. *By American Steel and Wire Division of US Steel, Pittsburgh* 30.



3. Vinyl-coated steel coils. US Steel has developed a process of applying colored vinyl in liquid form and "baking" it into the steel (see ID May 1959). The process eliminates the laminating steps necessary for bonding vinyl sheets to steel and enables the producers to supply the vinyl clad materials as a mill product. The combination material can be embossed with a pattern by rolling the pattern onto the vinyl before cooling. Integral vinyl clad steels have good fabrication characteristics. *By US Steel, Pittsburgh* 30.

4. Zinc-coated sheet has decorative surface. A new zinc-coated sheet uses each surface for special operations: the hot-dip zinc coating is corrosion-resistant and suitable for welding; the other surface is a smooth finish suitable for painting. Called Zincgrip DC, the new sheets are well suited to truck and auto construction. *By Armco Steel Corporation, Middletown, O.*

4a. Zinc galvanized steel. To protect unitized bodies against corrosion, the Ford Motor Company specified galvanized steel after extensive evaluation tests. The basic framing members of new unitized car bodies are made of zinc galvanized steel, which provides longer life than conventional low carbon steel. *By Armco Steel Corporation, Middletown, O.*



5. Patterns rolled into strip of sheet. A variety of finishes and textures on steel strip and sheet is supplied by the Thomas Strip Division of the Pittsburgh Steel Company. The coating processes used are: electroplating, hot dipping, painting, and plastic laminating. The electro process includes zinc, copper, brass or nickel coating; hot dip is used for tin or lead alloy coatings suitable to retard corrosion, tarnishing and staining. *By Thomas Strip Division, Pittsburgh Steel Company, Warren, O.*

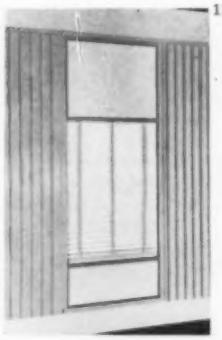
6. New galvanized sheets and coils. A galvanized sheet with good painting qualities has been developed by Inland Steel after long research on the problem of spangle show-through after painting. With the aid of three paint producers, Inland developed the new material, called Paint-Tite. It is available in sheets and coils, has a grey matte surface which takes a smooth coat of paint. *By Inland Steel Company, Chicago* 3.

7. Steel "lace." The decorative variety obtainable with steel was indicated in a product put on the market about three years ago. The embossed strip shown here has patterns as delicate as lace; the patterns can vary widely according to design specifications. The decorative strips are used in furniture, home appliances, hardware and other applications. *By American Steel and Wire Division, U. S. Steel, Cleveland* 13.

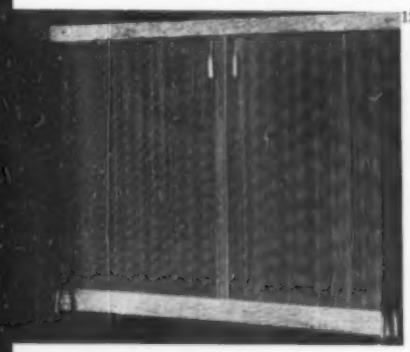
8. Color on stainless. Washington Steel is now offering 11 standard colors on stainless steel sheet and strip. Called ColorRold, the new decorative metals have a thermosetting acrylic coating which can be repaired on site if damaged in shipment. Putting color over a stainless finish is intended to broaden use of steel in decorative applications where a corrosion-resistant coating is needed. The building market is an obvious area of use. *By Washington Steel Corp., Washington, Pa.*

9. Mirror-like stainless. Steel strips in widths up to 27 inches are now available with high surface luster and improved corrosion resistance. New electric furnaces are producing the bright-annealed stainless strip in large quantities and in various sizes. The mirror-like product is being used in automobiles, appliances and other products subject to corrosion and in which the material's high luster is required for decorative purposes. *By Allegheny Ludlum Steel Corp., Pittsburgh* 22.

10. Diversity in texture and patterns. Sharonart is a line of textured steel sheets available in color or metal finish in a wide variety of patterns. Sharonart was originally used in automotive designs, but recent patterns have been developed by Francis Blod Associates for designs of appliances, furniture, hardware, housewares, office and electronic equipment. Sharonart is textured or coined on strips of varying width and thickness; the textured surfaces have improved abrasion resistance. *By Sharon Steel Corp., Sharon, Pa.*



11. Porcelain enamel on low-carbon steel. The need for a ground coat when enameling steel—to prevent fish-scaling—has been eliminated in a new porcelain-enamel steel called Bethnamel. Its low carbon content makes possible use at relatively high temperature (1600°F). The new material is available in various flange and beam sizes for architectural applications, and in sheets for appliances. *By Bethlehem Steel, Bethlehem, Pa.*



12. Rigidized steel sheets. Among the oldest and largest manufacturers of textured steel are the producers of Rigidtex material, who continue to add elaborate patterns on complex textures (left). Some of these are perforated, others have rough texture which offers good abrasion resistance. The metals are available in various finishes, colors and sizes; fabrication characteristics are good but depend somewhat on depth of texture. *By Rigidized Metals Corp., Buffalo.*

13. Bright annealed finish on stainless. Sharon Steel also has a new facility for producing bright annealed stainless steel with high corrosion resistance. The new finish eliminates the need for buffing and pickling operations, and is said to be more durable than conventional stainless finishes. The bright annealed steel is manufactured in strip from .010 to .100 in thickness and in widths up to 23-15/16 inches. It lends itself to stamping, and roll and break forming without deformation of finish. *By Sharon Steel Corp., Sharon, Pa.*

REPORT TO EUROPE: II

BY PETER MULLER-MUNK

More excerpts from lectures sponsored by the European Productivity Agency show businessmen abroad how our designers work with marketing and sales

One of the most significant changes in the attitude of American industry has been its recent shift of emphasis from production to marketing, and I believe that the growing acceptance of the marketing philosophy is one of the most revolutionary changes in American management and one of the most promising signs of its inherent vitality. I understand, furthermore, that a great deal of attention is also being given to marketing by the sophisticated industries of Europe. I hope this is true, because I believe that the basic problems of the European economy are marketing problems, and in many cases very complicated ones. They must be solved, however, if Europe is to prosper as a total marketing area, and this is certainly one of the most exciting prospects of our century.

The interest in marketing as the dominating factor for healthy and profitable industrial development is major problem for us. Or, to put it more accurately, due to the fact that production has ceased to be a the problems of production in Europe and the United States are no longer concerned with manufacturing, but with finding enough people to absorb the ever-more competitive quantities of mass production. In industrially underdeveloped countries—the USSR, China, Asia, and Africa—statistics on production have not only economic, but political, impact. In Europe and the United States, however, consumption —not production—has become the real index of stability and growth.

Now, just how does industrial design connect with marketing, and on what level or levels does it operate and become effective? In its simplest terms, industrial design controls and is responsible for the appearance of industrial products and for their presentation to the public. When the consumer reacts favorably to his impression of a product, when he wants to buy it, when he derives satisfaction from owning it or working with it, then the designers have succeeded. By producing satisfied customers, we designers create recognition for our clients and expand their markets.

In talking about industrial design, I usually find that my audience has a tendency to take my ideas as applying to consumer goods only, to the acceptance

of design as a necessary part of appliances, ballpoint pens, chinaware, and of all the paraphernalia in our department and specialty stores. To go beyond that and to accept design as a significant quality in machine tools, capital goods, and specialized instruments and equipment, many of which are produced in quite limited quantities and often almost made to order—that still seems to require a special effort.

As a matter of record, many of the finest achievements of industrial design are to be found in just this area—in the intelligent shape and orientation of controls, in the rugged architecture of printing presses, of milling machines and oil well equipment, in the refinement of X-ray machines and data-handling equipment, and in many thousands of other undramatic but essential products of science and of engineering.

Since both the time necessary for development and the life span of products such as these are usually measured by principles quite different from those of the average short-lived consumer product, design as an enduring quality is absolutely essential. In dealing with the construction of—and investment in—a new power plant, a new production line, or a new type of passenger plane or farm combine, style and product quality are measured very carefully because they must endure for a long time.

This, precisely, is what we designers know how to do best. To combine usefulness and precision into their most economical architecture, and to make the final product structure the most characteristic expression of corporate personality—that is our job, and I think that by and large we designers have acquitted ourselves well.

It is only one step from the realization that industrial design must be a collaborator in the capital-goods and specialized-equipment industry to the consideration of design as a vehicle for the projection of the entire corporate image. Now, just what do I mean by that?

I submit that management and the corporation are intrinsically abstract and impersonal concepts. The name of a corporation, the composite character of its management and personnel, its finances and business methods, all of these very essential factors are only the vehicles for the production of goods and services, and it is precisely the goods and services through which management becomes tangible. However, communication between management and the public does not stop with the product. There are the other endless big and little devices and trappings of production and of doing business, every one of which reaches out to us in some specific tangible form and either reinforces or confuses our impressions of the personality of the corporation as a whole.

To start with, let me mention two media with which we are all familiar: trademarks and printed matter. For better or for worse, we seem to require an immense amount of paper to communicate with each other, with our customers, our bankers, our stockholders, our suppliers, and our public in general. So, every time we mail a letter, send an invoice, present a calling card, stick a label on an envelope or print a report, we reveal a little bit of our true face. To me as a designer it seems reasonable that a corporation which manufactures ball bearings and one which sells whiskey represent quite different business postures and should indicate their different personalities in a coherent way with every device through which they address us.

The re-evaluation and design of trademarks has, therefore, become of major importance to design policy, more so today than at almost any time in the past decade. Export to new markets, the need to cross language barriers with easily assimilable symbols, diversification and mergers, television and international travel—they all combine to force a serious and unbiased analysis of trademarks as a major tool of competitive marketing.

In an excellent issue on the subject, the magazine *Printer's Ink* defined marketing not as a new method or a new technique, but as a point of view—"A way of looking at business from the point of view of creating and satisfying customers." While it is the responsibility of marketing to organize this process and to create the proper managerial climate for its execution, its ultimate success or failure will still, of course, be measured at the marketplace and by the acceptance or rejection of the tangible products and services for industry. And it is the special function of industrial design to provide the marketing recipe with what appears to me as a pretty essential ingredient—marketable products. Unless the marketing concept, therefore, includes a mature awareness of its interrelation with industrial design and an intelligent use of the total resources of industrial design services, the common objective of both design and marketing, sales and profits, will continue to elude us.

Sales, of course, are the specific responsibility of the sales department, and it is particularly important that the designer establish the proper relationship with this department. In my long and friendly associations with the sales managers of many different companies and industries, I have detected one common thread. At the start, the average sales department has a tendency to want to tell the designer pretty specifically just what to design, because it is quite honestly convinced that it knows best. As a matter of fact, more often than not, sales managers regard the industrial designer as the fellow who, at long last, will help them to make the product look the way *they* know it *should* look.

It takes a fair amount of experience, of tact, and of persuasion to resist the pressure of a sales manager on his first encounter with an industrial designer. To alienate his faith in the power of design would be suicidal. Somewhere among his requirements are some which should be considered very seriously. But sales, fundamentally, deals with immediacies, with today's sales problems and today's products, and with their reception. Designing, on the other hand, deals with the future, and this tends to create conflict. We have found that it takes an average of 12 to 18 months from the start of a design to finished product ready for sale. In far too many instances, the attempt to cut down on the necessary time for design development and testing has led to operational and structural weaknesses and to a downgrading of product quality with disastrous effects on sales. I, therefore, consider it an error to involve sales with design at too frequent intervals. If a good sales manager gets enthusiastic too early about a design of a new product, he will only lose confidence in the product which he will still have to sell for another two seasons.

In my experience. the relations of designs to sales should follow this general pattern, allowing for modifications due to special conditions. At the beginning of a project, sales, along with research, engineering, and production, should present its specifications, rated in order of priority. In a camera, for example, sales might ask for easier film threading, faster shutter speed, automatic exposure setting,

smaller size, and lighter weight. This is the time for sales to bring all its experience to bear on the product-planning process. Its recommendations should be evaluated in relation to their effects on ultimate selling price, on engineering complexity, and on necessary development time. At this early stage, the limits of allowable compromises should be defined, and, of course, the budget for engineering, design, and tooling must be set. This is the time when the total product line should be analyzed with a view toward arriving at an overall program, stretched out over a number of years. It is at this stage that the influence of sales is most important, because, once the program gets under way, it will become increasingly difficult and eventually impossible to effect any major changes.

As the product program progresses, certain regular checkpoints should be established at perhaps four- to six-month intervals. At these occasions, all of the parties involved — management, engineering, production, design, and sales—should review what has been accomplished as against the original objectives. Up to a certain point, changes and revisions can and should be considered. Eventually, however, the moment will come when the new design must be accepted as is, when it must be "frozen," as we say, and everybody must be aware of this.

I should like to stress the need to set a definite date for this decision-making meeting in the product-planning process because, without a definite breaking-off point, development will never stop; and the manufacture and introduction of new products will be delayed indefinitely. The great danger in such lack of resolution is not alone vital loss of time and money, but, more importantly, the likelihood that the new product will become out of date before it has even been offered for sale.

In calling for the use of judgment and the assumption of responsibility in arriving at design and product decisions, I am well aware of my opposition from the field of consumer research. In the United States we are at present suffering from what amounts to almost a disease of consumer research, motivation research, market research, any kind of research, to anticipate the behavior of the future. Without in any way meaning to belittle the serious professional efforts which analyze the trends and forces which we must consider in our planning, I cannot escape the suspicion that, more often than not, consumer surveys are only crutches to support the growing fear of independent decision-making. It is of course essential that decisions involving new products be supported with all relevant data. The search for information with a direct bearing on product planning and design, however, should occupy itself with the compilation of facts—be they statistical, financial, economic, or sociological.

Any honest designer will tell you when he needs such information; and when he does, I consider it highly desirable that he and his staff conduct such surveys themselves as part of their total service to industry. Very often, however, no survey is necessary to tell an experienced designer that a given product is suffering from old age, or simply from out-and-out ugliness.

And that brings us to that most controversial of all subjects—who is to say what is ugly and what is beautiful? In my capacity as an industrial designer, I am almost constantly involved in the argument about good and bad design and about the economic futility of spending money to make our products not only better but better looking. A corollary to this attitude is the pessimistic statement that the consumers, our public, have such hopelessly low taste that, in order for us to stay in business, we have no choice but to cater to the low standard of the marketplace.

The position of an American industrial designer in Europe is particularly vulnerable in a discussion of this nature, because he almost inevitably finds himself taken as a symbol of the poor-design-equals-good-business philosophy, on the basis of the admittedly vulgar products of some of our industries. Permit me to add that my most vehement European accusers have usually never been in the States themselves, or if they have, they were condemned to spend most of their time in either Detroit or Hollywood. Well, I do not claim a really thorough knowledge of today's Europe, but I have looked around quite a bit, and it does seem to me that we are not the only ones who know how to produce trash in quantities and that the German word *kitsch*, for instance, must have been invented to describe something of native origin. So let's call it quits and get on with the business at hand.

I do not believe that we need to get lost in the philosophical arguments of what constitutes beauty in order to accept good design as an economic asset. The question of good and bad is a question for the designer to solve. It is part of his professional and personal integrity. What good design does when it appears as a part of corporate policy is to introduce the elements of order and of character into the total output of a corporation. Economy of means, logic of composition, of structure, of assembly, and of performance — these are the elements of design, and they deal with tangibles and not with abstractions. The arrangement of the controls on a machine, the serviceability of a piece of furniture, the visibility from the cab of a bulldozer—the solution of such problems leads to good design and to good products. When continuous attention of this kind is reflected in all of the products of a corporation, it will acquire the recognition that builds acceptance, not just for one season or one product, but permanently and for all of its product lines.

The public might be slow, and it is often fickle, but it never fails to gravitate eventually to the most convincing answers to its needs. The question, therefore, is not how gaudy and cheaply a product can be made, in order to sell it once, but how well and how harmoniously function, performance and appearance can be combined to create a lasting image of the honesty, the pride, and the self-respect of the producer.

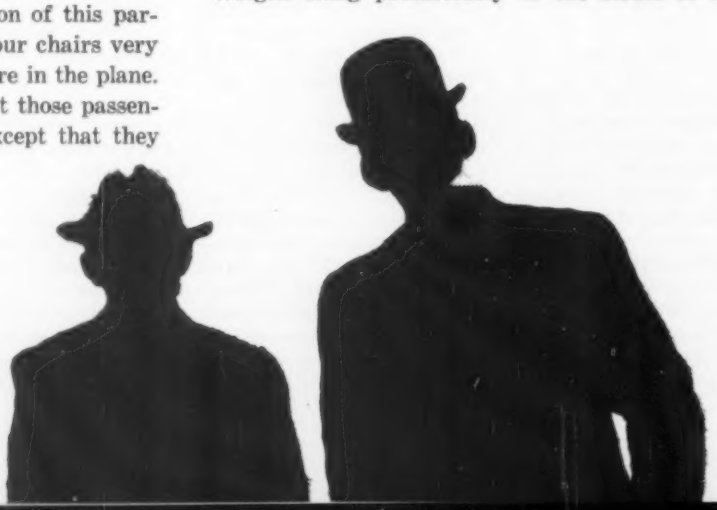
Therefore, let me suggest to you that you consider design as an integral part of a planned sales policy. Do not confuse fashion with style. The first comes and goes, while style is a matter of breeding and matures with the times. If the world we live in and which we bequeath to our children is not to become an intolerable inferno of uncontrolled noise and tawdriness, we must rekindle the principles of order, of reason, and of beauty in the purpose of our daily activities. END

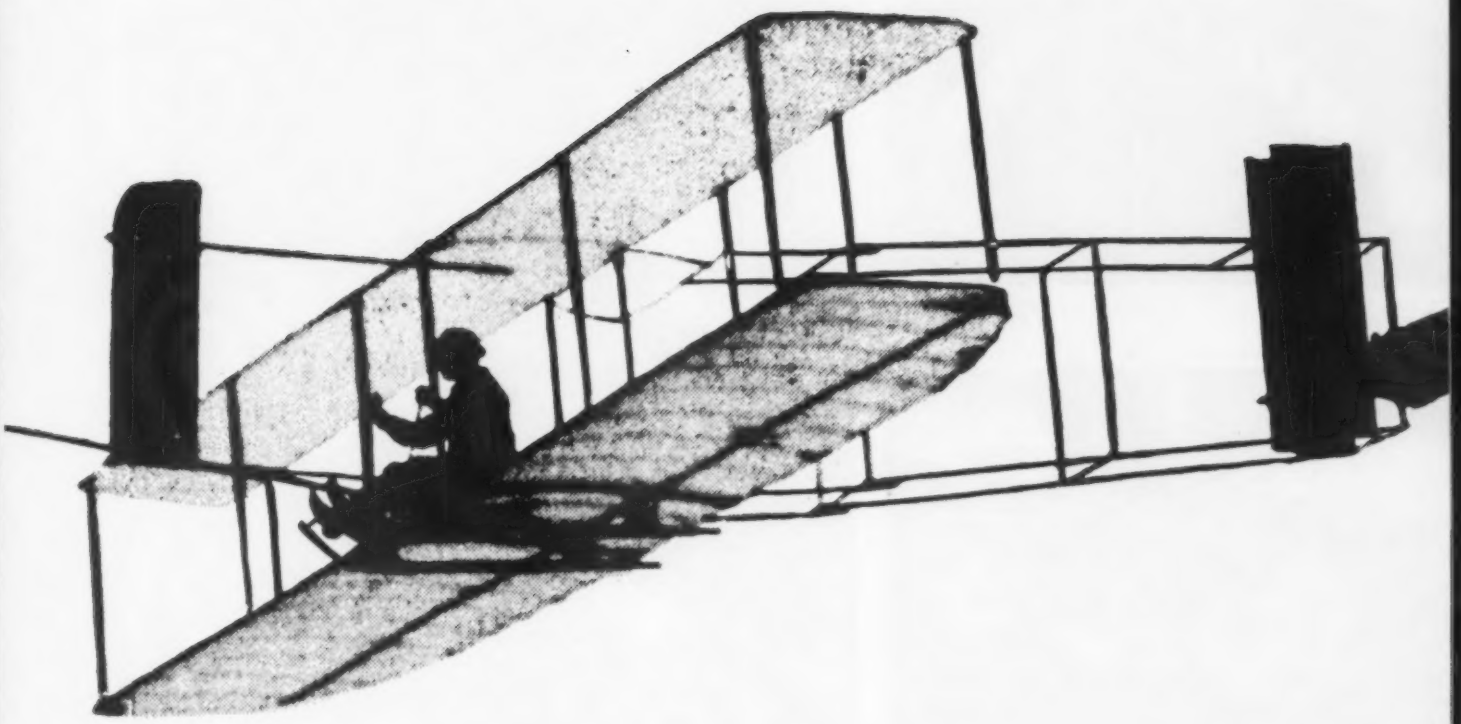
HIGH CHAIRS

For 35 years the airlines have solved the seating problem with bigger and softer armchairs. Now one designer asks them to switch from upholstered frames to padded shells.

Among the travelers who will board TWA's Flight 45 at New York one morning later this month will be nine anonymous VIP's who don't know yet how very important they are. There is nothing special about Flight 45, which hops nonstop to Los Angeles every day, except that nine of the seats in the coach section of this particular flight will be padded plastic contour chairs very unlike the plush upholstery used elsewhere in the plane. Nor will there be anything special about those passengers (just plain folks, presumably), except that they will occupy those seats. TWA is showing them to those seats in an effort to determine whether or not its regular customers will find this new "Mason seat" (named for designer/manufacturer E. Gilbert Mason) as comfortable as some airline company big-wigs found it when Mason invited them to try out mock-up models at his Burbank factory last November. The TWA study will continue through May, and if it shows that passengers like the seat, both the look and "feel" of airplane interiors may be in for some drastic changes.

Certainly, there has been nothing drastic about the evolution of airplane seats so far. While seating design has advanced considerably since the days when Orville Wright clung precariously to the struts of his 1903

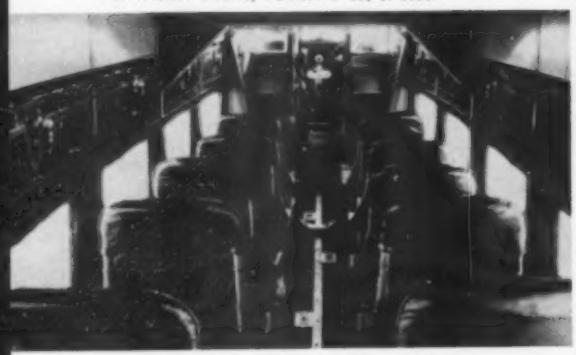




glider (above), or when Admiral "Putty" Read mounted the quaintly padded chair of his Curtiss "Pusher" a dozen years later (inset), the plush pots of luxury we sink into these days did not result from startling "breakthroughs" but from the gradual sophistication of design and engineering, and from the development of new materials like foam rubber, the thermoplastics, and synthetic fabrics.

Airplane seats have to meet severe structural requirements dictated by the Federal Aeronautics Administration. But possibly the most problematic requirement dictated by the razor-sharp competition among airlines (honed even finer now by the news that the industry's net profits sank from a fair-weather $61.7 million in 1959 to a low-visibility $4 million last year), is that the aircraft seat should fill two conflicting requirements. On the one hand, it has to be very efficient—lightweight, of minimum dimensions, and adaptable to different cabin shapes and arrangements. But it also has to provide "the ultimate" in comfort because the airlines long ago decided to turn the business of transporting people into the profession of pampering the traveling public, and they can't back down now.—*R.M.*

1. *Wicker chairs, Fokker F-32, c. 1930.*



2. *Airborne luxury c. 1928.*

6. *Later version of DC-3 seat introduced 1936.*

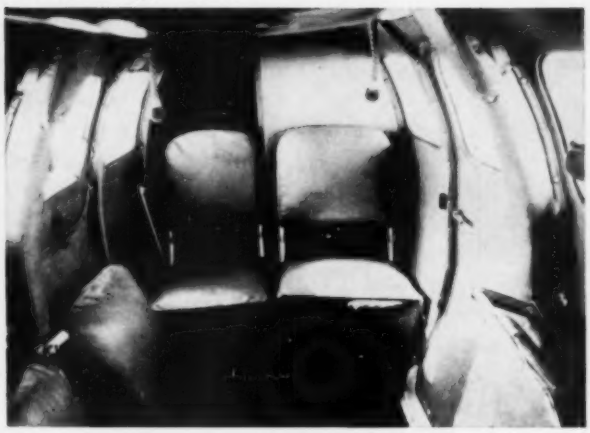
Aircraft seating design didn't get off the ground until long after the planes did. The padded wicker chairs (1) which were used to furnish the Ford tri-motors and Fokker F-32's of the mid-1920's—for example—look to us now like something borrowed from the front porch of a provincial Mexican hotel. Wicker, along with other primitive furnishings like leather-covered bent-tube frames (5), lasted till the early 1930's. The seat designed for the DC-2 (Fig. 1) featured a reversible back, was built on an aluminum-alloy A-frame casting and upholstered with coil springs and hair pads. Seats for the DC-3 (Fig. 2) brought marked improvements in structure and comfort. The 1944 version of this seat (6, and Fig. 3) made first use of latex foam rubber to replace the heavy coil-spring cushions used till then. The seat specially designed for FDR's "Sacred Cow" (7) pointed the way to post-war style, and the DC-6 seats of 1946 (8/9) established it.

Figs. 1, 2, & 3 courtesy Stanley Lippert, Douglas Aircraft Co.

3. *VIP accommodations, F-32, c. 1930.*

4. *Boeing 80-A, 1930; the First Stewardess.*

5. *Stinson aircraft, early 1930's.*



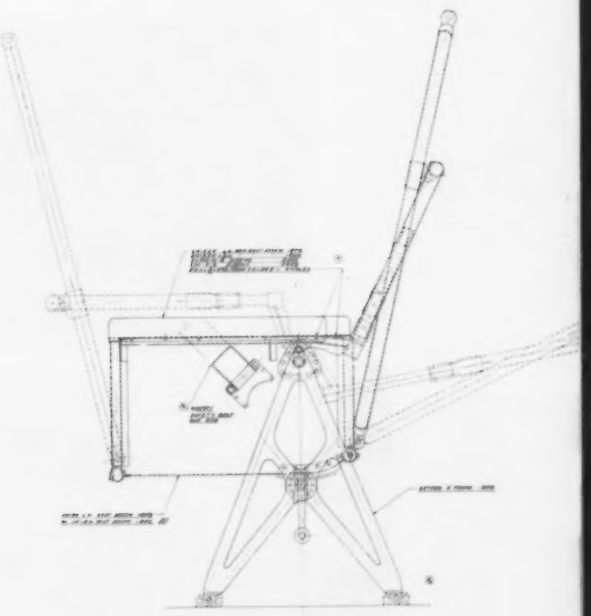


Fig. 1. DC-2, 1933.

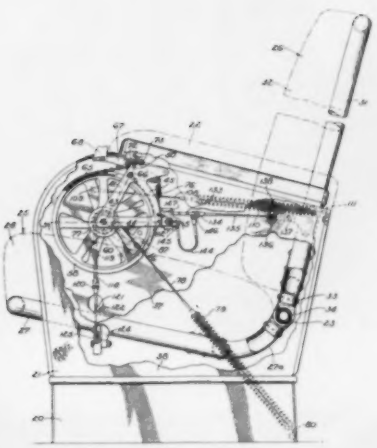
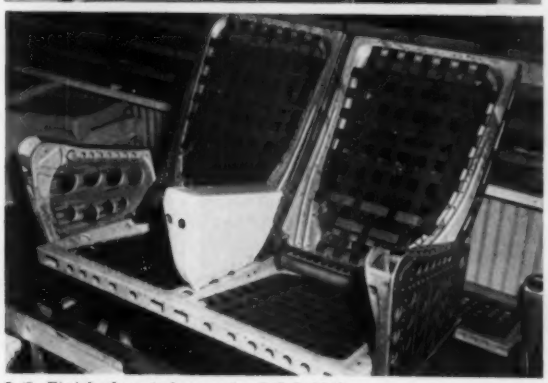


Fig. 2. DC-3, 1936.

7. *Seat for FDR's plane, 1944.*



8./9. *Finished seat, frame, for DC-6, 1946.*

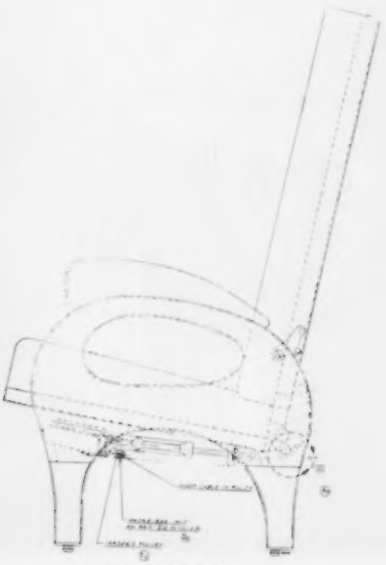


Fig. 3. DC-3,1944.

Within the structural limits set by the FAA, and after considering the airlines' demands for lightness, compactness, flexibility, etc., the airplane seat designer's chief task is to make everybody comfortable. This would be easy if passengers were as much alike as hostesses, but while there is much talk about "the average passenger," he has never appeared. The problem is compounded by the fact that airline executives have to approve the seats, and they can be crotchety. As one management-weary designer has put it: "Everyone has a rear end, and everyone has an opinion."

Seat designs of the past few years attempt to accommodate all shapes and sizes of both ends and opinions. Here is a collection. 1) Lockheed Constellation seat designed by the manufacturer's (Teco, Inc.) engineers and styled by Henry Dreyfuss. 2) Electra seat designed by Henry Dreyfuss, manufactured by Aerotherm Corporation, and used by National Airlines. 3) Dreyfuss's cushioned plastic chair designed for Lockheed "Jetstar" executive plane in 1959, but not yet produced. 4) and 5) Two versions of the Boeing 707 seat, a joint design effort by Boeing, American Airlines, and Walter Dorwin Teague Associates. 6) DC-8 designed by Douglas's own engineers incorporates utilities (e.g., reading lights, cold-air outlets, call button) formerly housed in overhead baggage rack. 7) DC-8 lounge designed and manufactured for Eastern Airlines by Burns Aero Seat Company. 8) Seats for the Convair 880, staff designed and first put into use last May. 9) Another example of private executive plane seating, this one designed and manufactured by Burns.

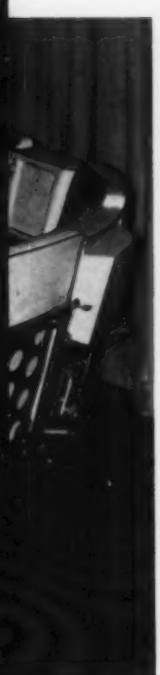
1. *Lockheed Constellation*

6. *Douglas DC-8*

7. *Eastern Airlines' DC-8 lounge*

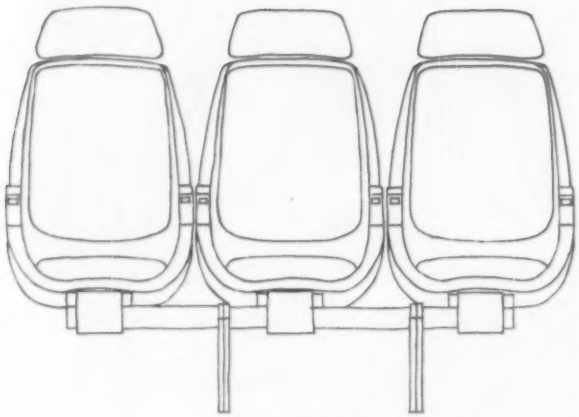
4/5. *Boeing 707*

2/3. *Lockheed Electra (National Airlines) and "Jetstar" seats*

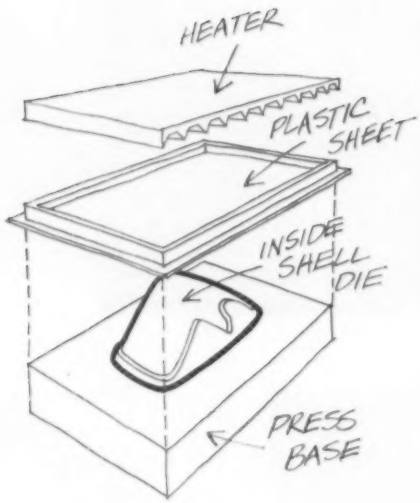


8. *Convair 880*

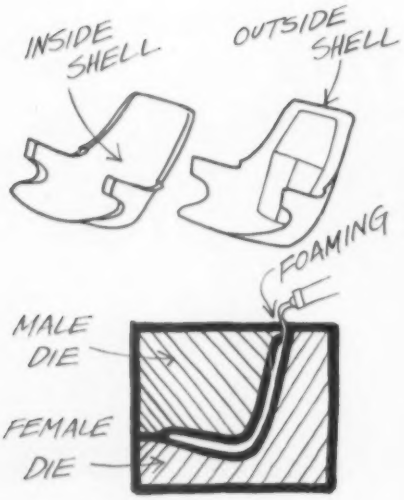
9. *Burns Executive seat*



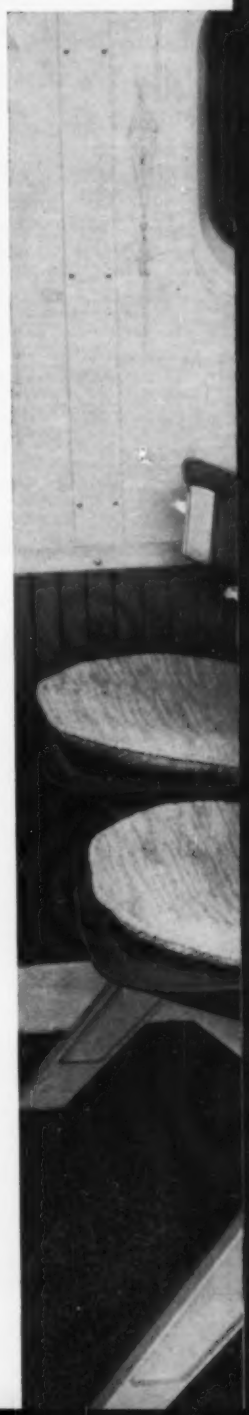
There is nothing new about the idea of a plastic airplane seat. Several designs have been proposed during the past decade, one of which was Henry Dreyfuss's chair for Lockheed's "Jetstar" executive plane (ID November 1959) shown on page 57. What is novel about the Mason seat, shown here, is that its designer intends to put it over commercially and is well on his way to doing so. (Production of the Dreyfuss seat is being held up until Lockheed is sure there is a market for it.) Long-time airlines design consultant E. Gilbert Mason, certain that he had a market, last summer purchased one of the U. S.'s largest aircraft seat manufacturers (Teco, Inc.) in order to put the seat into production. Then, after a group of assorted airline executives tried the chair on for size (they all said it fit), TWA decided to put the seat into the three-month service trial which begins later this month.



The design of the Mason seat is simplicity itself. Two Royalite shells are vacuum-formed (left), indexed, and bonded together. The cavity between them is filled with urethane foam (left) enclosing an aluminum mesh for reinforcement. This contour chair is bolted to the aluminum and steel base mechanism, which in turn is clamped to the vinyl- or epoxy-covered aluminum leg structure. Cushion and head-rest components are fabric-covered foams, while the arm-rest is a foam pad covered with Naugahyde. Cushions are attached to the chair by Velcro fastening surfaces (far right, top).



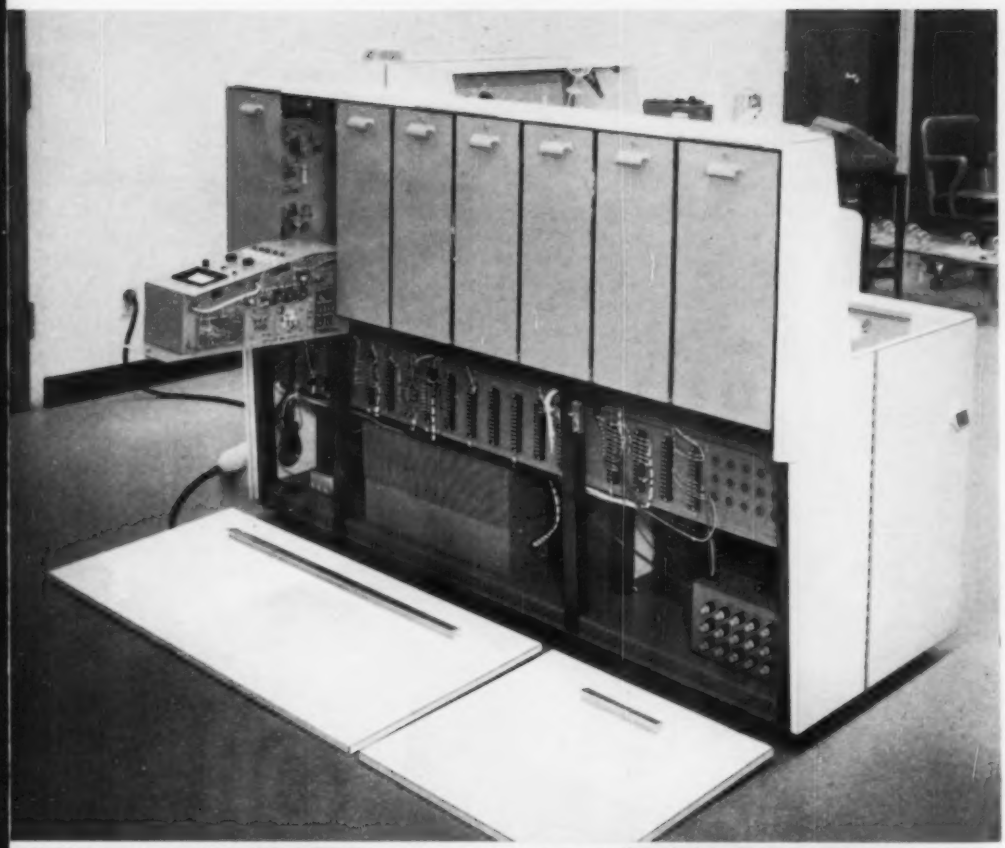
To the increasingly profit-worried airlines, the economies of the seat are probably nothing less than awe-inspiring. Initial cost of the seat is way down (it uses only 70 parts where conventional seats use over 500), and it is practically maintenance-free. And because it is much lighter (by a third) than conventional seats, and can be installed at 34-inch (instead of 39-inch) intervals, planes that can now carry only about 120 passengers could carry upwards of 200. The real question is: will the public accept it? On this point almost everyone of importance is still skeptical, but Gil Mason, who is gambling on what he regards as no gamble at all, thinks he knows the answer. END



INSTRUMENTS MADE EASY TO USE

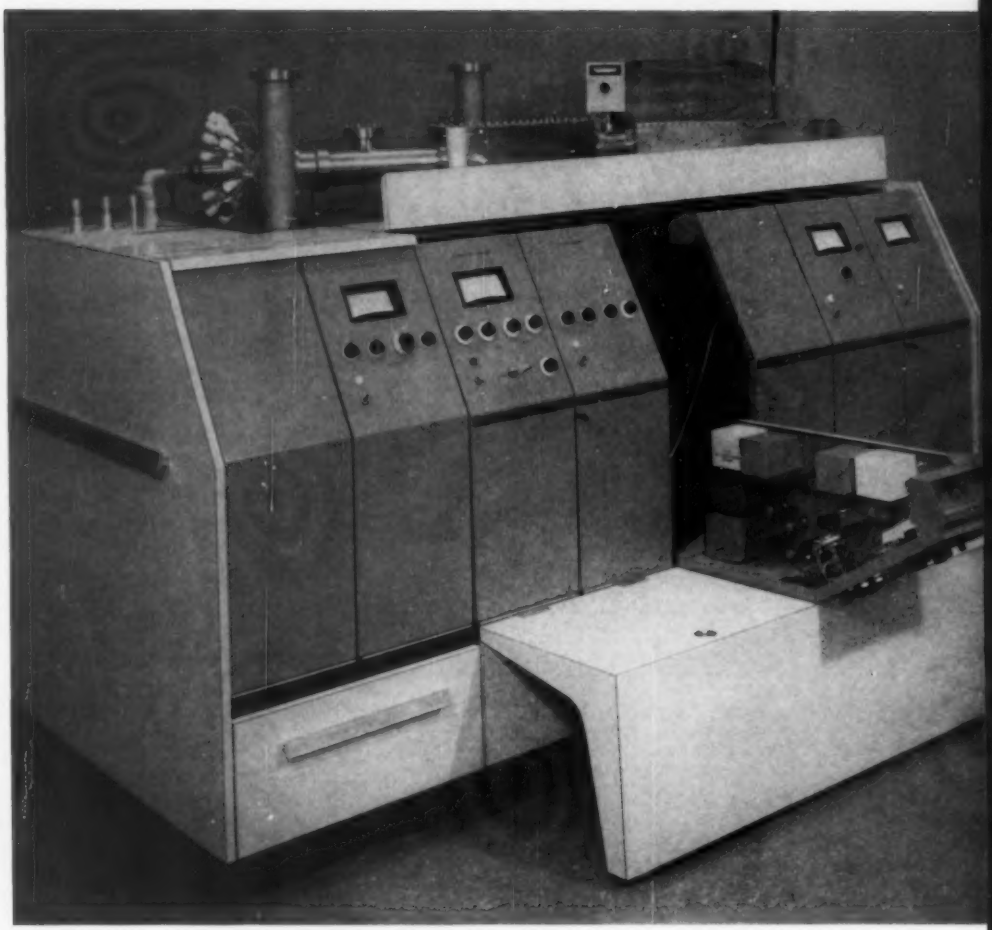
Consolidated Electrodynamics puts a line of analytical and control instruments into sensible packages

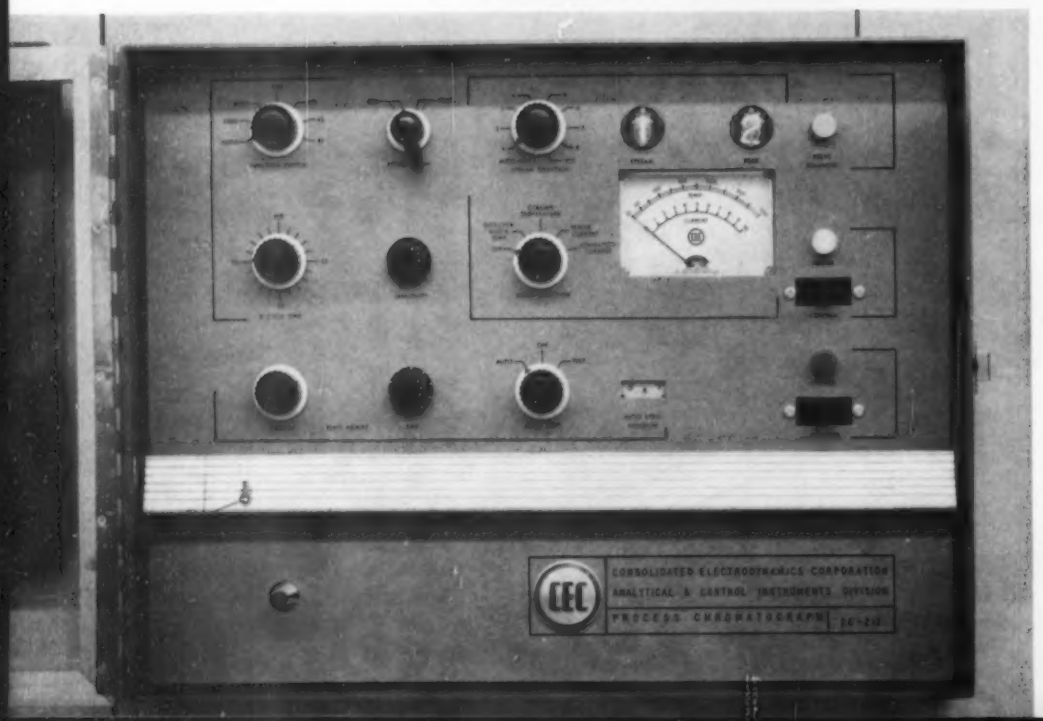
The designer seated tailor-style at right, Polish-born Andrew Nowina-Sapinski, has designed an electronic packaging system which allows customers to tailor to their own requirements some of the instruments they buy from the Consolidated Electrodynamics Corp. Since these complex instruments often must serve in makeshift labs or even in the oil fields, they are tough. And since an error on a mass spectrometer, for instance, may cause the loss of valuable quantities of crude oil, the operator demands accuracy. But he also needs an instrument that is convenient to use and service, and, frequently, to adapt to his own requirements. In developing a series of instruments which would meet these needs, Nowina-Sapinski took into account the fact that the "buyer seldom uses it in the form in which it comes to him. And even after he tailors the instrument, he is always going into it for inspection or replacement of parts." It was with this human factors orientation that Nowina-Sapinski designed three major innovations into the line. He organized electronic functions into modules so that users can easily incorporate accessories. The 21-100 mass spectrometer (page 62), for instance, offers a selection of ion detector and ion source modules which may be installed by users in any appropriate combination for the type of study they are conducting. His second innovation was to substitute a tip-out chassis for the usual, more expensive slideout drawers and awkward power cables. Finally, he rejected traditional sheet steel for lack of rigidity and in its place selected new materials: tough Formica panels over a honeycomb core, and an extruded aluminum frame from which interior mechanisms are suspended. The ultimate result of Nowina-Sapinski's tailoring job is a line of instruments which not only work sensibly, but are smart-looking too.



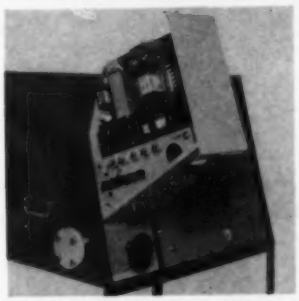
21-130 laboratory mass spectrometer, a medium-priced (about $32,000) unit for quantitative analysis of liquids and gases, is designed on a modular basis which permits purchasers to tailor it to their own needs. Each electronic circuit pulls out from the rear of the unit for servicing, and blank chassis allow the customer to add his own accessories as he needs them. A flexible cable connects the electronics console to the analyzer cabinet, and the operator can stand them at right angles so that all controls are within his reach. Panels at the base of each unit unclip for easy access, and by unhinging the cover at the top of the control panel, the operator can reach less frequently used adjustments.

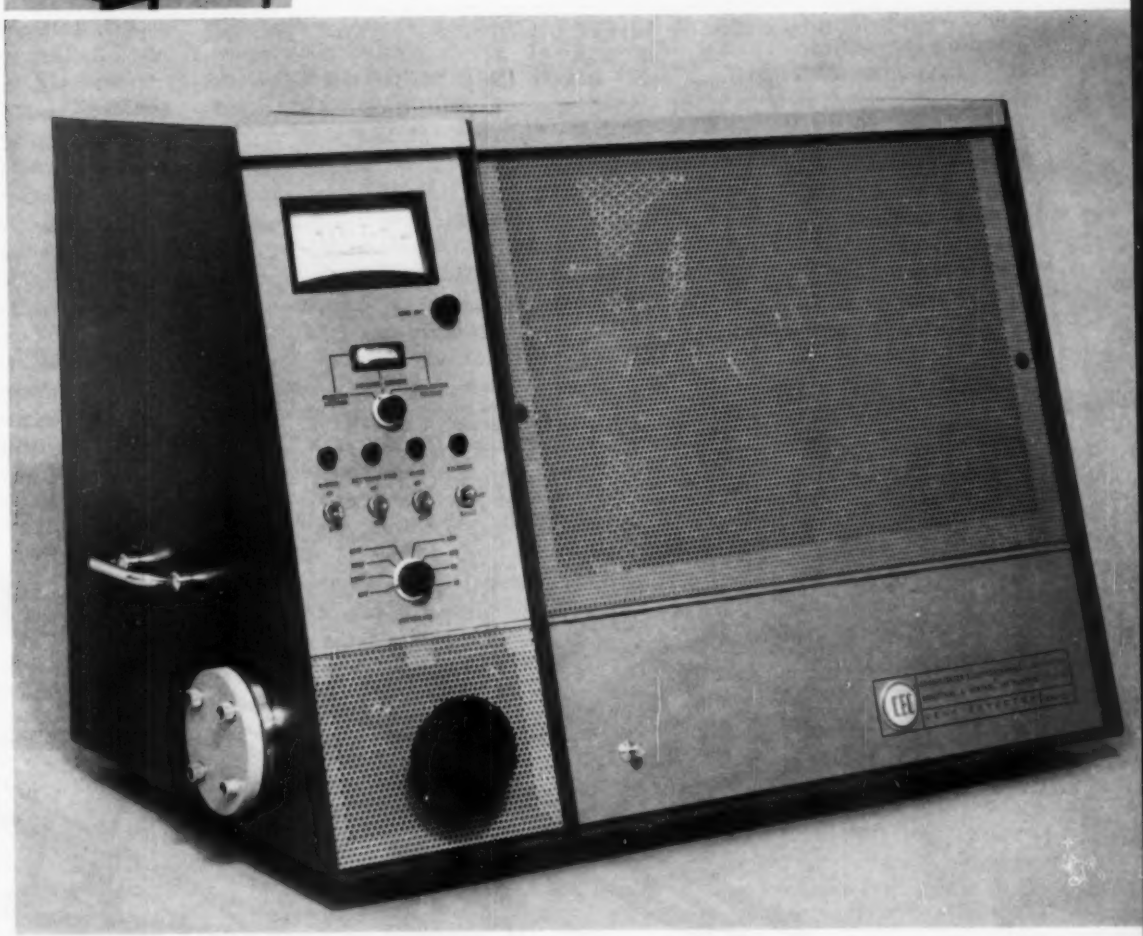
21-110 mass spectrometer, like the laboratory model (page 60), is designed on a modular basis with electronic circuits for each function mounted on tilt-down chassis. To gain access to the interior, the operator unlatches the hinged desk and folds it down, making it a support for the electronic chassis which then tilts down to rest on it. Mounted side by side, the electronic modules give the control panel a horizontal format, comfortable for the seated operator. By opening a hinged strip across the top of the console, he can reach secondary controls. Since all interior mechanisms are suspended on an extruded aluminum frame, the entire unit is several hundred pounds lighter than conventional sheet steel models. Cabinet panels are surfaced with Formica over a honeycomb core.

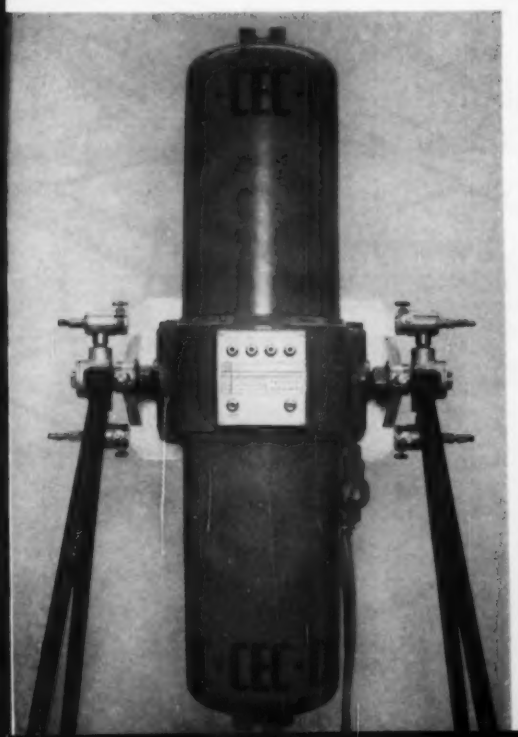




26-212 process chromatograph is used for the analysis of gases, especially in the petroleum industry. The analyzer unit (right) comes in an explosion-proof housing so that it can be set up in rugged locations without additional shelter. The control unit (left) may be set as far as 500 feet from it, allowing installation in a closed room where information may be received in comfort. Customers can fit the instrument to their own needs by purchasing accessories for additional tests, packaged as separate modules.







24-120 leak detector incorporates the easy maintenance concept of the mass spectrometers in its tilt-down electronic chassis (top). When closed, the chassis exposes a clearly arranged electronics control panel. The unit can be used as either a bench-top test station or, when mounted on its accessory rubber-tired workstand, as a mobile test unit.

FULLER'S LATEST DOME ARISES

To solve low-cost shelter problems for the Orient, R. Buckminster Fuller leads a seminar and builds a bamboo geodesic dome BY JUDITH RANSOM MILLER

R. Buckminster Fuller's latest project is, characteristically, an admixture of teaching, learning, doing, and social concern. The problem he posed was to design and build a practical, low-cost shelter for the dense population areas of the Orient. The solution, shown at left, was demonstrated with the help of 37 professionals and students at Long Beach (California) State College, where a unique seminar and construction crash program were held. The new shelter was constructed entirely of two materials plentiful in the Orient: bamboo and fishing twine.

The astonishing strength of bamboo is no secret; the Japanese use it in-

stead of steel as reinforcing rods in concrete. But according to Fuller, despite this, and despite the sophisticated intuitive design sense of Oriental nations, and their common hand skills, nothing like the new shelter was possible until someone had developed a mathematics for arranging bamboo in a pattern to take full advantage of its strength under both tension and compression. Now that Fuller has done this, the structure—which encloses 2800 square feet—can be built by people anywhere by means of a color code.

Fuller intends to make the "Bambassador" (so called because of its intended application and the materials of which it is made) available everywhere, but particularly in heavily populated Burma, China, Japan, and India. He has good reason for calling it "the most economical shelter that can be built": even with materials purchased at California retail prices, the structure shown here cost only 3½¢ per square foot to build. It might be covered with any of a variety of materials—thatch, leaves, paper, or plastic film. In regard to the last, Fuller predicts that Oriental producers will soon make high-quality plastic film for world-wide distribution.

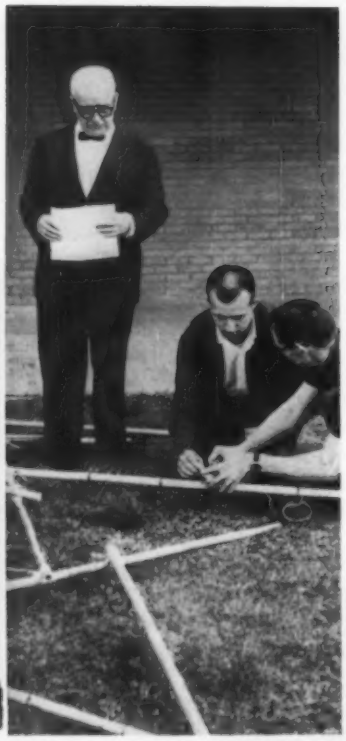
On Monday, December 12, the members of the seminar met at Long Beach State College for the first time. That evening they, along with several hundred others, listened to one of Fuller's classic lectures, during which he asks listeners to ride off with him in all directions and ultimately converge on a point common to them all—not impossible, if global equators with a common hub are used.

Like a child on demand feeding, the seminar members listened to Mr. Fuller at random points in time during the week—the occasion and need, rather than the schedule, setting the time and subject. Fuller's immense capacity for giving and receiving information, respect, and love, plus his working premise that everyone is better than he thinks he is, infected us all.

The age range of the participants in the seminar was at least 30 years. The group included industrial designers, architects, engineers, businessmen, writers, former students of Fuller's and students from Long Beach State College *and* other colleges in the area. As a result of the diversity of age and background there was a kind of deliberation which Fuller described as "coordination at a non-frantic level" in contrast to that of university students, who "have a tendency to choose cheer leaders."

All unproductive annoyances and time-consumers had been eliminated before the seminar started. Through year-long correspondence, clearances, and other arrangements, Fuller, with

As the photographs on this spread indicate, Fuller was always actively on hand as teacher, coach, guiding force. Blackboard at far left shows structural diagram and breakdown of individual seminar member's special work responsibilities. Bernard Judge, seen talking with Fuller in lower left hand corner picture, owns his own dome in Hollywood, where it just barely holds its own against zoning regulations and indignant neighbors. Allen Kinkel, bearded young man in bottom picture, will build a dome on the Palos Verdes Peninsula with leftover bamboo and cord from the Long Beach project. Across from Kinkel, wearing white sweatshirt, is Professor Ken Glenn of Long Beach State College. At far right Fuller demonstrates lashing to seminar coordinator Alfred Musso, while CBS news cameraman gets story. Photos at immediate left and right and on page 64 are by Richard Gross. All other photos by Wes Wendland, Long Beach State College Audio Visual Center.



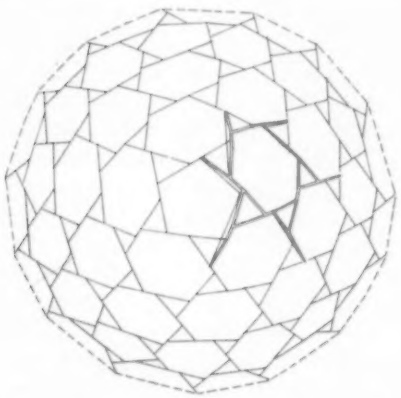
the aid of Ken Glenn, sculptor-professor at the college, had designed an atmosphere that mixed welcome with comfortable privacy and carried with it access to equipment, supplies, communications, tools, research facilities and a private dining room. The research project, of course, was concerned with social needs and dealt with society as it is organized. It was *not* an exercise in learning; the students were up against the realities of a crash program. What they did in five days never had been done before. Moreover, until they were actually at work no one could have said precisely what there was to be done. Fuller arrived with a backlog of investigation ready for a many-handed high-speed project. In advance, Professor Glenn had cleared the decks and provided for amenities. (Fuller's own formula for cutting red tape was simply to by-pass it—for example, to separate the project's budget from that of the institution, he paid expenses himself, thus eliminating the diversionary delays of having to "get permission.")

By Tuesday evening bamboo was on the site and one of the students had managed to locate a bamboo specialist —Charles Hallberg—and an extensive bamboo bibliography at the Los Angeles County Arboreta. Although at no time did anyone seem hurried or harassed, blue prints, color codes, and a step-by-step sample of an appropriate lashing somehow emerged. (Frank Nishimoto, an LBSC art student, knew a lot about knots and lashings, and this was a big help; and some members of the seminar provided the Navy Manual and the Graumont and Hensel *Encyclopedia of Knots*.) Models grew; trial runs took place; and, finally, on Thursday the dome started mushrooming.

By Friday evening a clear-span, spherical-ended bamboo cone with a diameter of 50′ rested lightly on the northwest corner of the Long Beach State College campus. (Weight: about 600 pounds; number of struts, *all of equal length*: 270.) The "Bambassador" depends on lashings to hold it

together, and, says Fuller, "is so far the only Geodesic Dome made without hubs . . . its by-product a hubless sphere . . . simple, but requiring a whole lot of hand work."

Referring to the week's work Fuller said, "I'm truly excited. It's hard to believe that it is only five days since we were all strangers." He pointed out that the usual student group comes together already acquainted. "We're not patting ourselves on the back about this dome as being something nifty," Fuller added, "but it is not necessary to re-build it in this instance . . . We know what is necessary to produce a satisfactory structure—overcome inadvertent torque, reduce axial displacement, permit rotational displacement . . . Where structural members failed it was simply a matter of adjustment, for example, thinner replacements fortified with stronger . . . On a conic surface simple curvature can dimple in; if spherical, the surface is extremely stiff. Any failure is due to geometry, not to weakness of the structural member."



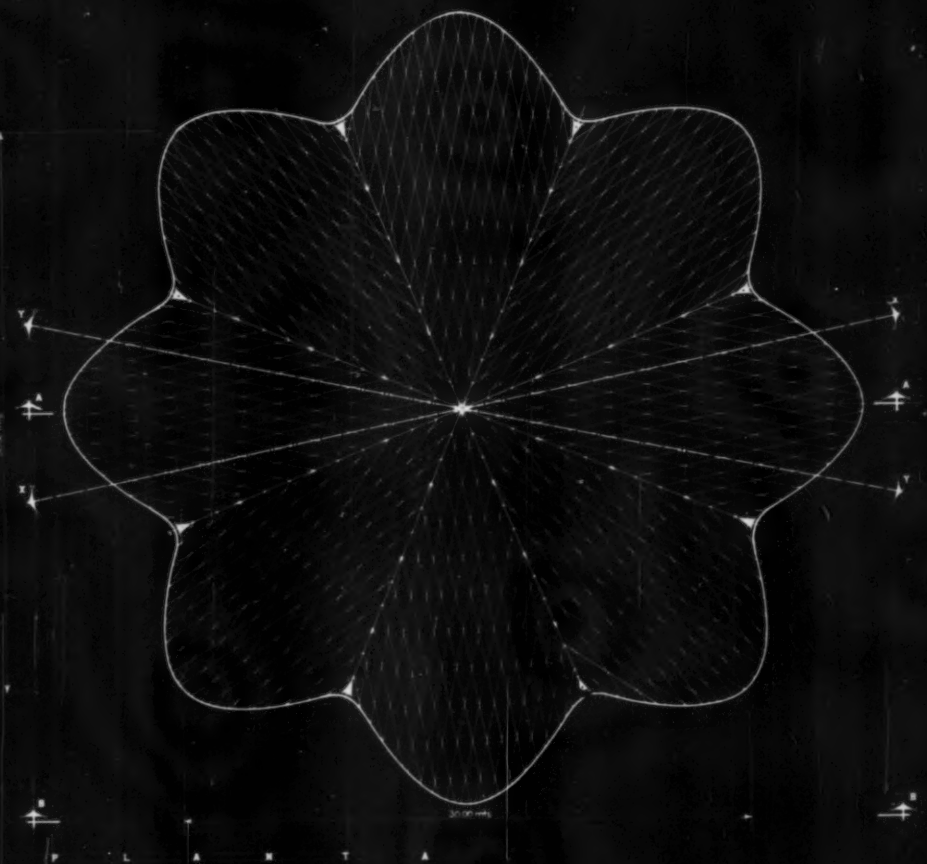
The seminar used mimeographed diagrams, like this one of a 270-strut tensegrity geodesic.

Speaking of the cultural and economic implications of the dome, he said, "We know that it is possible to turn geometry to the technical advantage of the Orient" where, as he had pointed out earlier, there is an economic situation which demands light-weight, simply constructed, inexpensive shelter for storage, schools, auditoriums, barns, etc., built by native skill with indigenous materials. By making all of the tensegrity members the same length Mr. Fuller had modified the shape of the dome from hemisphere to conical sections and, in so doing, had vastly simplified its erection. The use of bamboo and lashing brought practicality in Oriental terms to this modification. Additionally, there is vast technological potential in countries of the Orient in the field of industrially produced plastics, by which waterproof "skins" for "Bambassadors" could be produced.

Incidentally, the shape of the dome could have been further modified in two ways: (1) by using some sort of flag pole support for raising the growing structure (rather than the peripheral trestles) and (2) by drawing inward the terminal or base members, using either a girding cord or tethering stakes.

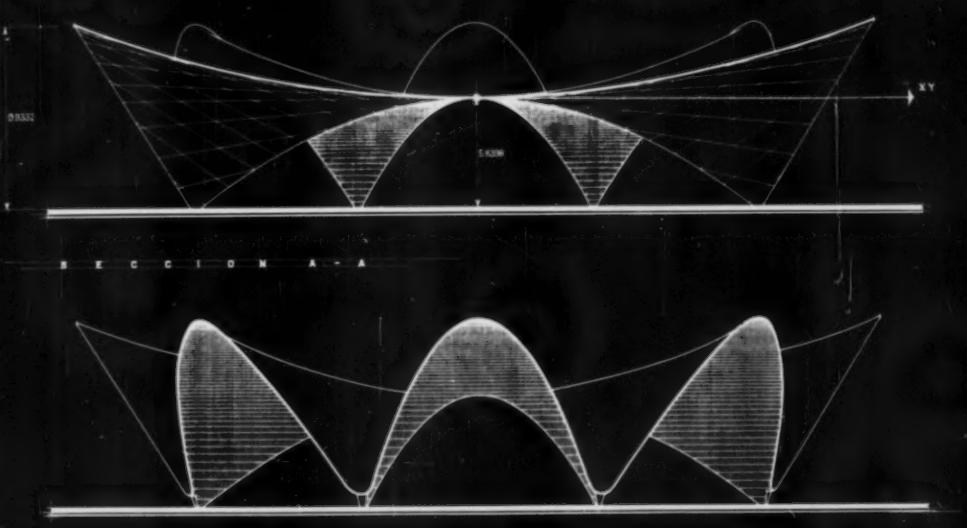
Every difficulty encountered during the week was fully exploited to enhance the probability of future successes, since identifying and dealing with obstacles put them to positive use and reduced the number of unanticipated future difficulties. There was, to quote Mr. Fuller, "a steady harvest of all things being found out" —both positive and negative. "If we had found out that what we were attempting couldn't be done, then that is what we were looking for." Such a minor observation as that of the coincidence of breakdowns of compressive strength with points of defective curing of the bamboo became major in importance.

Quite obviously the finished dome will beget others. In fact, one more is already in the making. Spurred by the need to test the cooperative strength of bamboo and geodesic mathematics further, Alan Kinkel—a Long Beach State College sociology student with some mathematics background (two years at Rensselaer Polytechnic)—will construct a dome on the Palos Verdes Peninsula, using Mr. Fuller's gift of the left-over bamboo.



P L A N T A

CANDELA: FLIGHTS OF CONCRETE



S E C C I O N A - A

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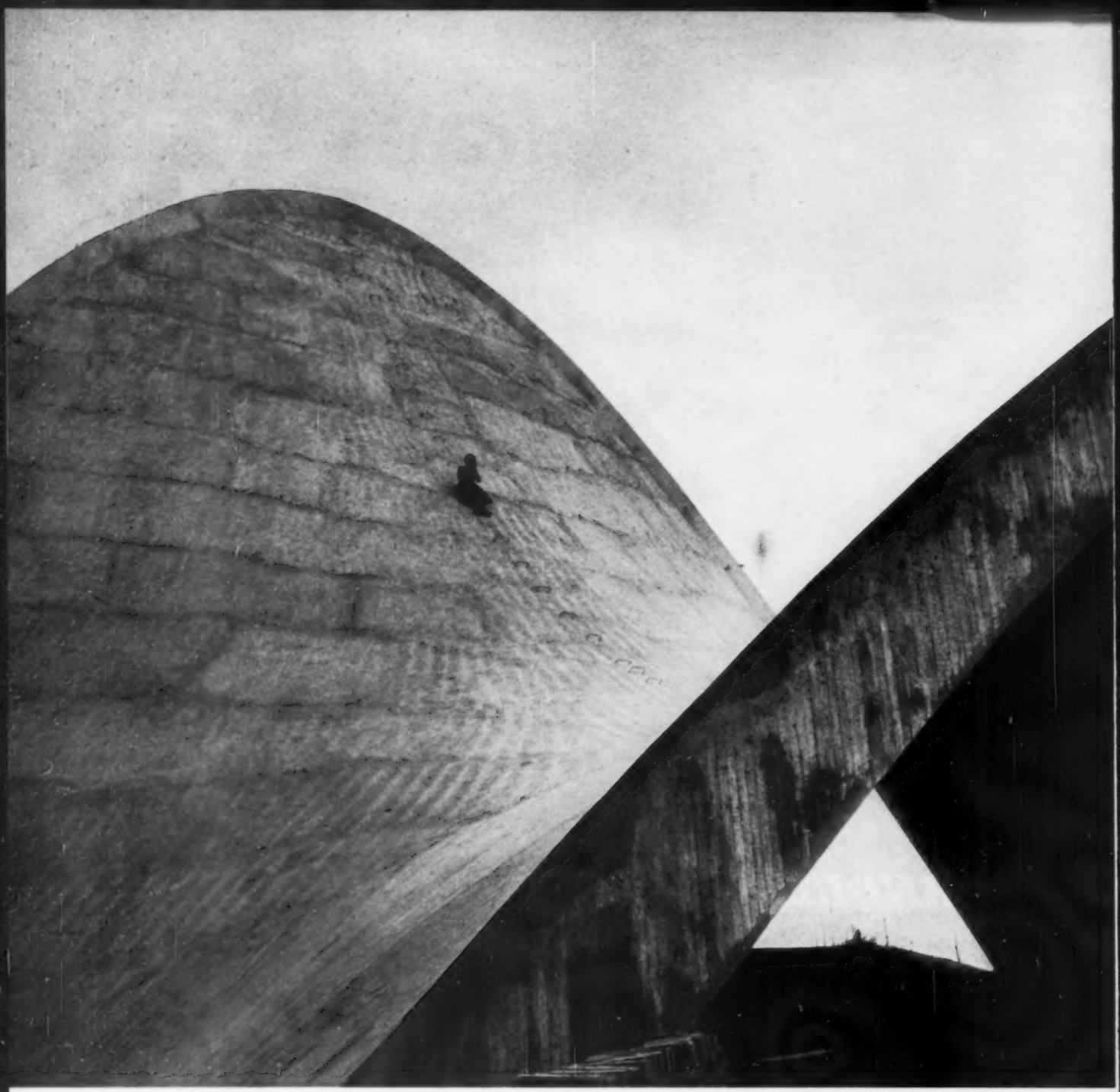
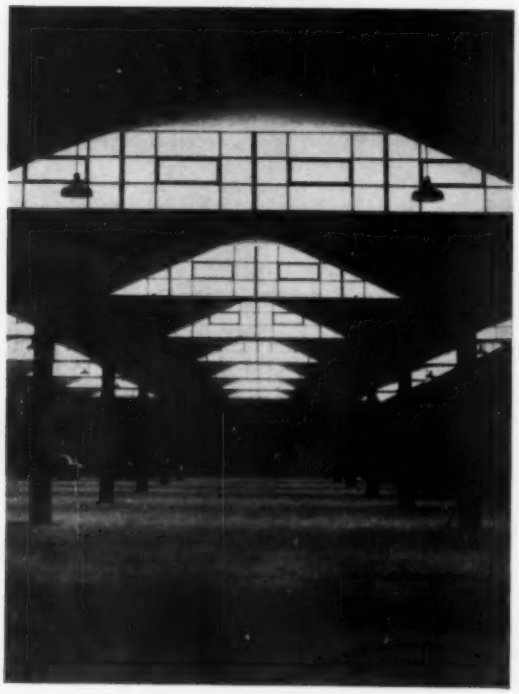


Felix Candela's concrete shapes are like no one else's. The Spanish-Mexican engineer puts his masterful control of the medium at the disposal of a poetic architectural imagination to create pyramidal umbrella roofs for markets and paraboloid vaults for churches that seem to lift off the Mexican landscape like a flock of birds. Future scholars will probably wonder whether to call Candela's work "sensualistic rationalism," or "rationalistic sensualism," but for the present we can gladly note that it escapes all categories. These pictures are from a remarkable traveling exhibition of Candela's recent work, produced by Architectural Graphics Associates (a Connecticut graphic design firm), and currently on view at Syracuse University. Later this month it will start a tour of Southern universities with a showing at the Virginia Polytechnic Institute.

CHAPEL: *Las Lomas, Cuernavaca, 1958*

CHURCH: *San Antonio de las Huertas, Mexico City, 1956*

MONUMENT: *Tequesquitengo resort, Cuernavaca,* 1958



WAREHOUSE: *Bacardi Works, near Mexico City,* 1959

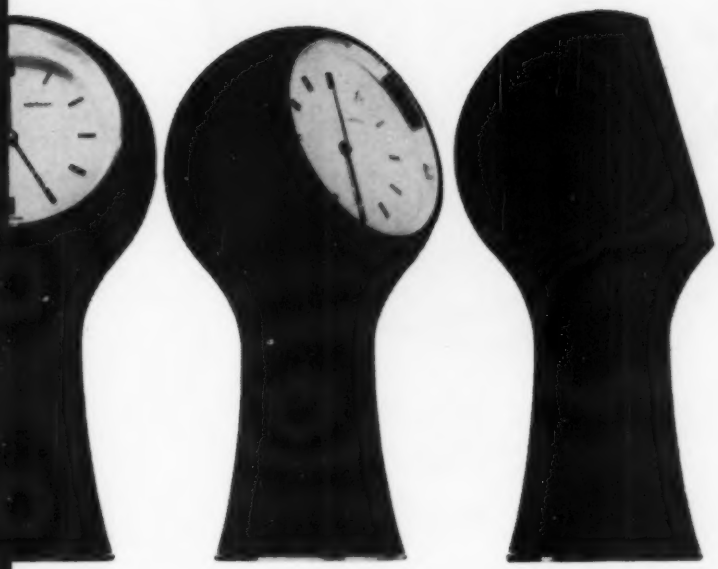
CHAPEL: *San Vincente de Paul, Coyoacan,* 1958

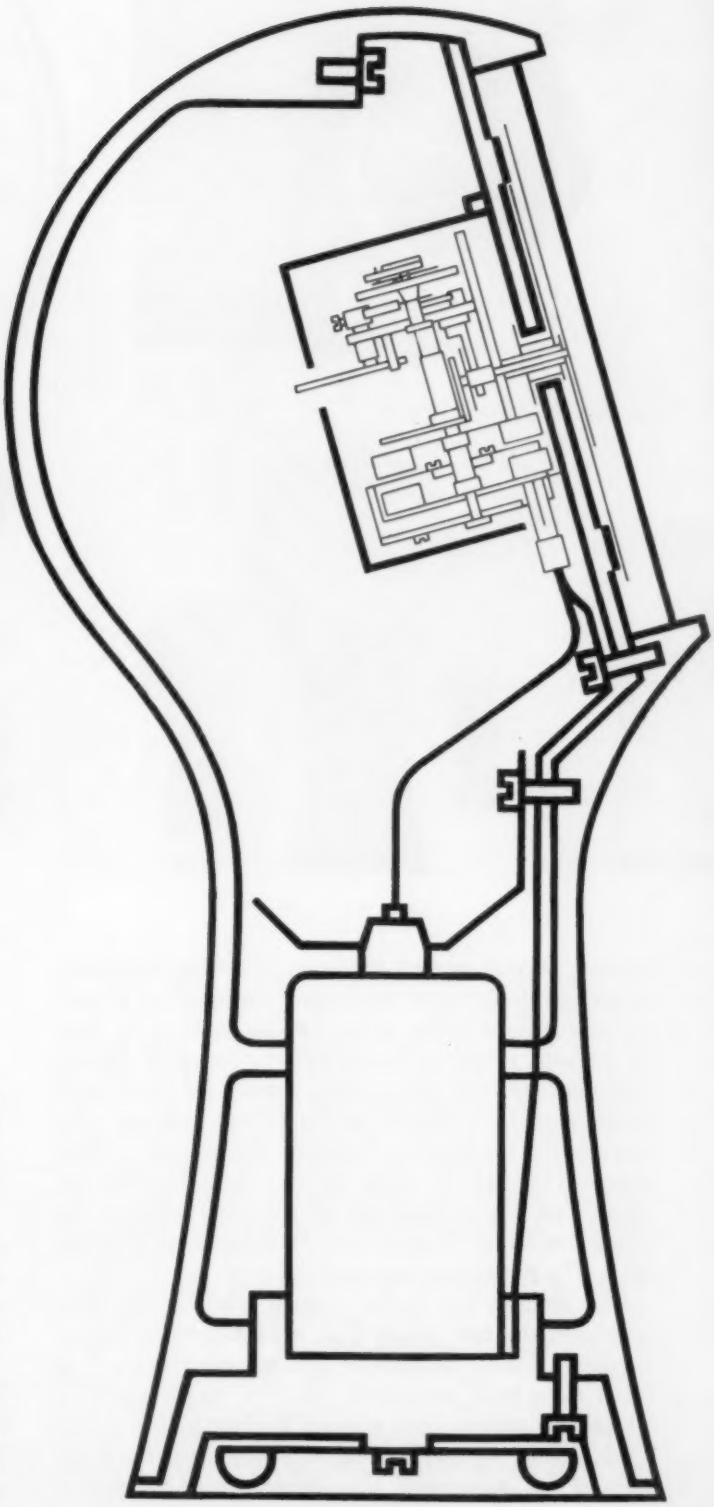
NEW SLANT ON TIME

Three clocks express the superiority of a new mechanism that runs without cords or keys and never needs re-setting

There are four ways to tell time—mechanically, electronically, atomically, and by the stars. The last, in their courses, are more accurate than anything man has yet devised, and the first is the most primitive. Nevertheless timekeeping devices at the top of the mechanical range are precise enough to meet some fairly exacting standards, and the clock on this page, although mechanical, rivals the accuracy of the lower echelons of electronic time. Its name is Secticon, and it will run for more than a year, without adjustment, on the power from an ordinary flashlight battery.

The economy is unusual, but even more unusual is an internal mechanism that adjusts to the variable output of the battery (high when the battery is fresh, low when it runs down) so that as long as Secticon is ticking, it ticks on time. Its case, in three versions, is designed to convey this new order of precision. All

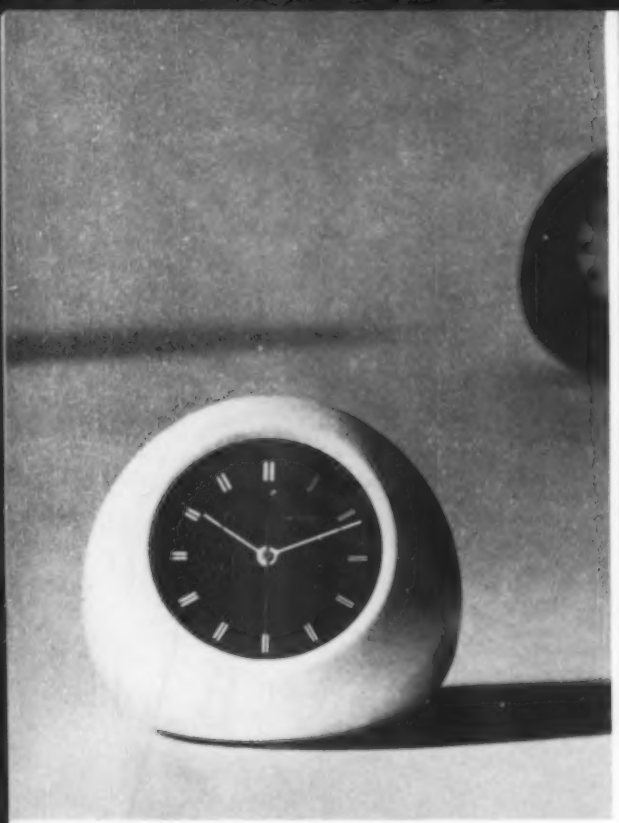




three—two table models and a wall clock—are by the Italian architectural team of Angelo Mangiarotti and Bruno Morassutti. Secticon itself is Swiss, and is made by Universal Escapement Ltd. (escapement is a watchmaker's term for the action of controlling the energy from the watch spring).

The firm is young (30 years old) by the standards of the watchmaking industry, and much respected; but this is only the second time it has produced a complete timepiece. Its reputation rests chiefly upon Incabloc, a tiny component which protects the pivots of the balance wheel by absorbing shocks, and which is now used in most fine watches. In the inner circles of the industry it is also known for its chronometric testing devices, one of which, the Vibrograph VS 500, won the 1960 Good Design Award at the Basle Trade Fair.

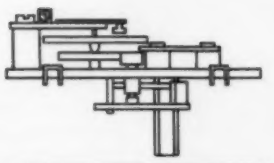
Secticon's predecessor was a clock "especially designed for the American market" in a catch-all style that flopped so completely that the firm's U. S. agent threw the entire inventory overboard into New York

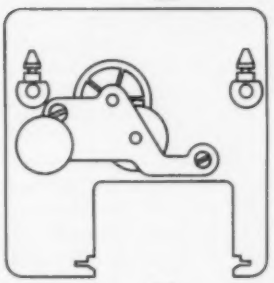


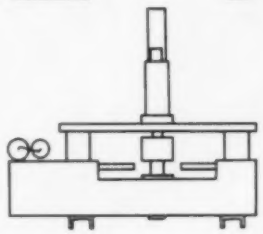
harbor. Having learned its lesson, the firm determined to enclose its Secticon movement in a case that pleased its own private tastes, as typified particularly by those of company president George Braunschweig. M. Braunschweig lives in a famous villa, a much-published early example of Le Corbusier at La Chaux-de-Fonds (the town is also the home of Universal Escapement). When several years ago the villa required some architectural alterations, the delicate job of changing without violating was handed to architects Mangiarotti and Morassutti. The Secticon assignment followed.

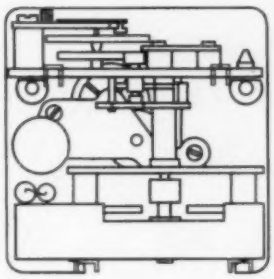
The designer's intention was to create a case that expressed the new things that were happening inside. Secticon's heart, technically and metaphorically, is a small three-part movement, the two major parts of which are integral units encased in clear plastic cubes. They attach, top and bottom, to a base plate, the third part of the movement. The bottom cube contains a miniature transistorized motor, run by the battery; the upper cube contains the escapement, including the complex mechanism that compensates for and corrects the variable character of the current. If the mechanism within either of the cubes becomes defective, the entire cube is slipped off the base plate and a new cube is substituted either permanently or temporarily, while the original cube is repaired.

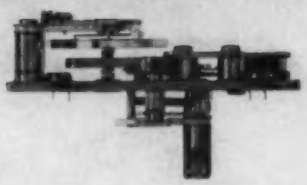
To express all this in esthetic terms, Mangiarotti and Morassutti departed from the usual forms associated with fine clocks—Federal to nautical—and chose a material far removed from the jeweler's or woodworker's crafts. The three cases of Secticon are molded from melamine plastic — not because it is cheaper, lighter, or easier to care for, but because it is completely identified with modern technology. In fact the practical values of the material are outweighed by its capacity to assume a form and a finish indicative of

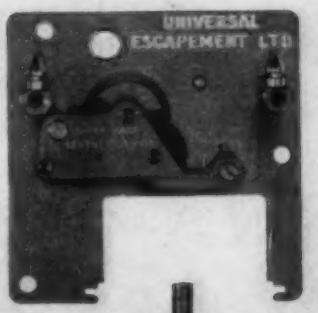


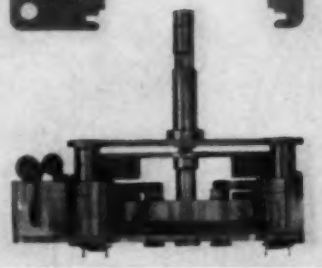


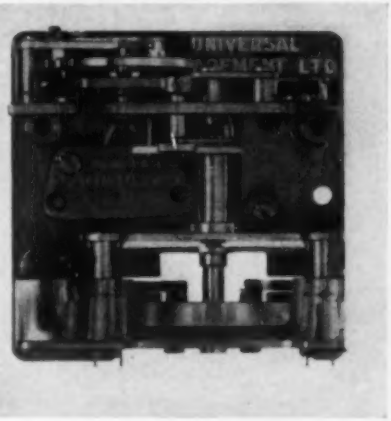












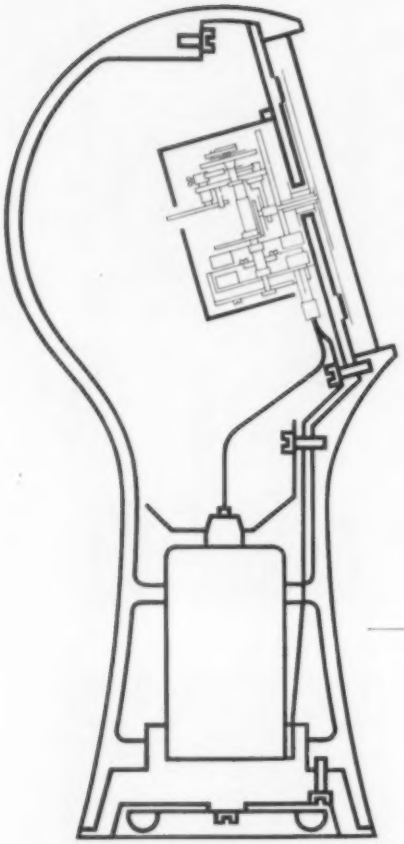
Secticon's large table model is designated t1, the small table model is t2, and the wall clock is m1. Both table models (far left, facing page) are designed to be pleasant in the hand since, being cordless, they will presumably be carried from place to place. The smaller one is intended for bedroom use, and it will soon have a companion version with an invisible alarm (no buttons — a wave of the hand will turn it off). Because it was created for more formal settings, the larger table model rises from a columnar base that gives it more presence. Both of these models come in black or red with gold dials, or in ivory or turquoise with black dials; the wall model comes in charcoal with a gold dial or dark blue with a silver dial. Secticon's unique mechanism is shown in the sequence of exploded drawings and photographs at right. Escapement unit is at top, base plate is next, motor unit is below it; the final drawing and photograph show the movement assembled. In actual clock, escapement and motor unit are encased in clear plastic cubes which can be detached from base plate—as complete modules—for repair or replacement.

the highly refined engineering concept of the Secticon movement.

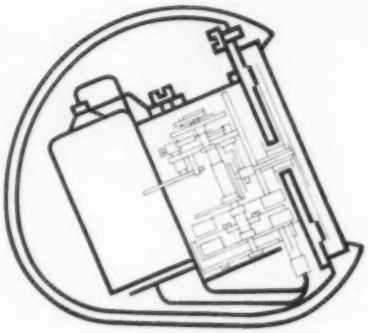
The molds for the larger of the two table models, for instance, went through several minor modifications before the designers and clients were satisfied with the tightness and evenness of the seam between the two halves (there is now so little variation in the level of the joining surfaces and in the width of the joint that it could be mistaken for simply a scribed line). And the surface of the plastic, which in earlier models was minutely marred by occasional cloudy patches, has been subjected to a finishing process that produces a flawless sheen—immaculate enough to withstand the scrutiny of a watchmaker's eyepiece.

The clock dial is worked out with similar care. Re-studying its relation to the viewer in various use situations, the designers scaled its proportions to suit the distances from which it is most commonly viewed, and then added a new dimension—all three versions have tilted faces. The two table models tilt slightly upward since they are frequently viewed from above; the wall model slants downward since it is always viewed from below. The hour markings are also unique. Compromising between classic Arabic numerals and contemporary dots or strokes, the Secticon marks the hours with raised parallel lines graduating in size from narrow to wide in concordance with the value of the number.

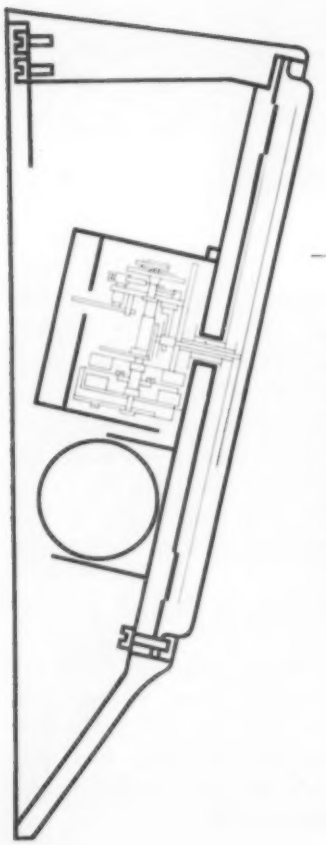
Although Secticon mirrors the well-defined tastes of its designers and their clients, it is also very much intended to appeal to a world-wide clientele. Sometime this spring, Universal Escapement hopes to introduce it on the American Market. The smallest model will cost about $65, the two larger ones, about $70. The company does not expect *this* venture to end up at the bottom of New York harbor.—*B. D.*



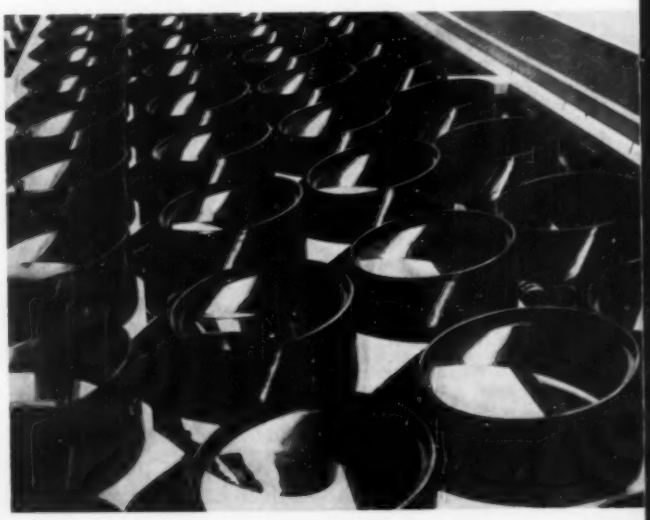
In model "t1," battery is mounted upright at base of column. Two halves of case are held together by a wing catch recessed in metal base. (In both "t1" and "t1," below, the seam line at the joining of the two halves is so undeviating in width that it could easily be mistaken for a decorative raking.) "T1" is assembled (near photograph, facing page) in half of the foam container that eventually becomes its packaging and also serves as a point-of-sale display case.

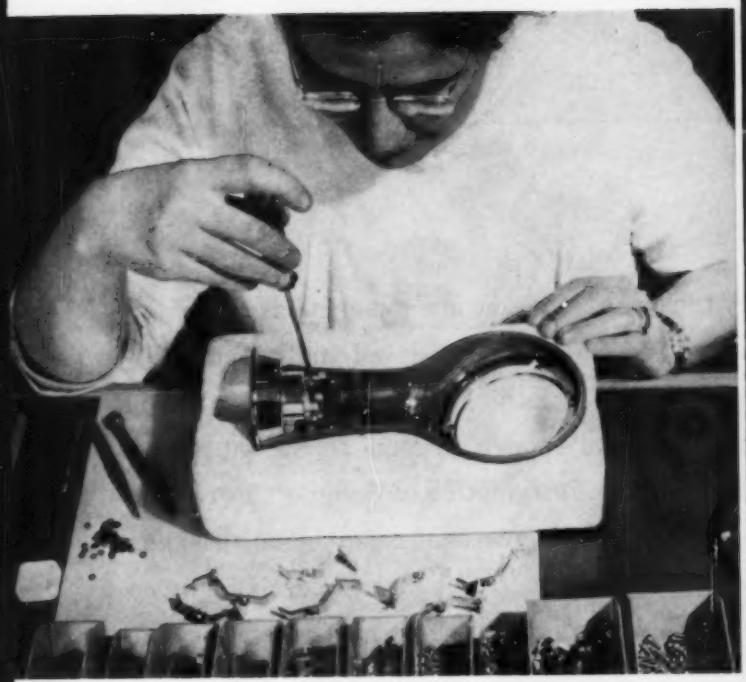


Battery for "t2" rides piggyback behind clock movement. Tilt of dial is greater than that of "t1" because the clock in most cases will sit lower and be seen at a sharper angle. The two halves of "t2" fasten together with a gripper-type closure (see right).



Wall clock, "m1," is an asymetric truncated cone with a dial tilted sharply downward since it will always be seen from below. Production photographs show "m1" case (near right), a close-up of the graduated stacking bins (center) that hold parts for assembly, and (far right) trays of cast zinc dials. At top right of facing page, a worker assembles one part of the Secticon's three-part movement.



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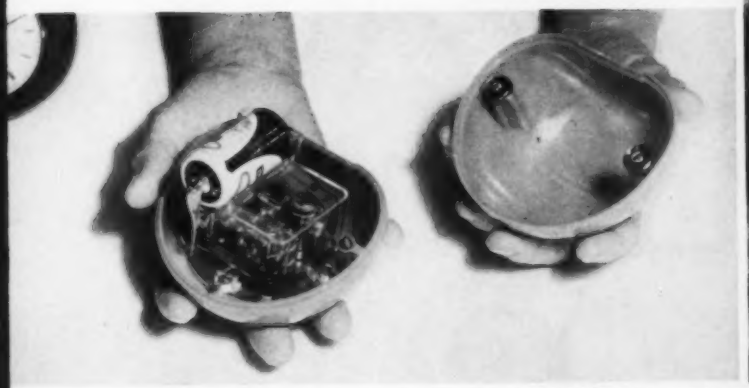
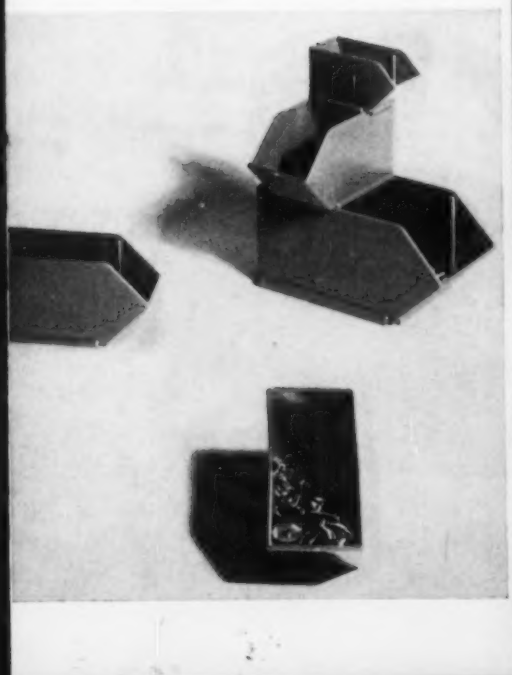
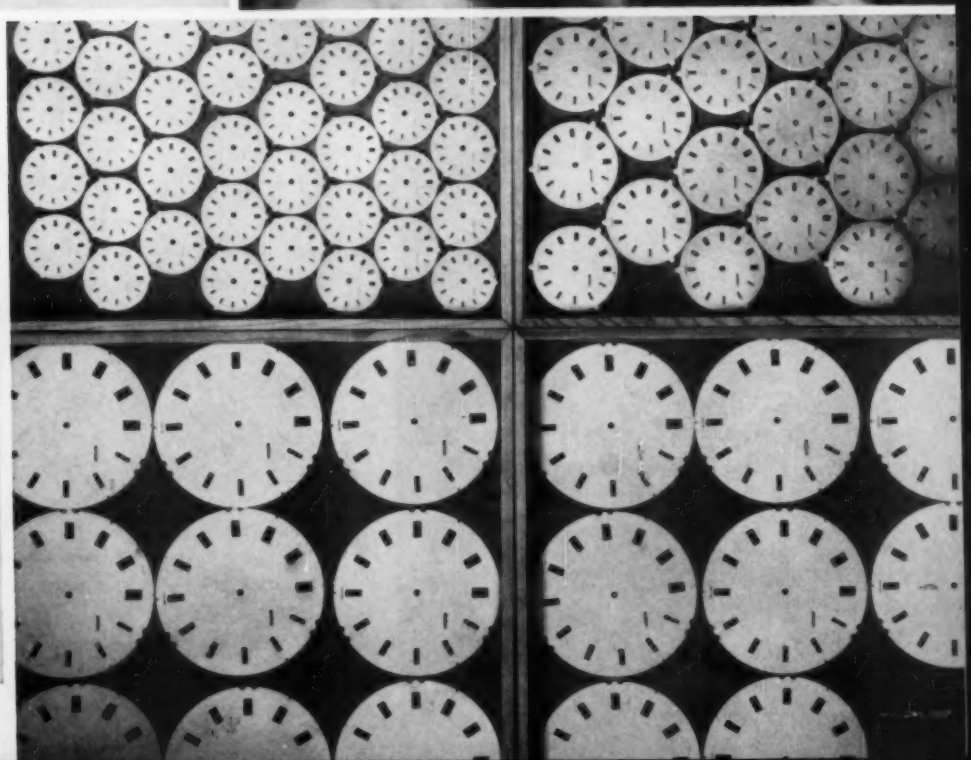






DESIGN REVIEW *Tablewares*

The commonest design observations on the U. S. tablewares market are the same as they have been for the past few years—the most impressive objects are not U. S.-produced and/or not U. S.-designed, and the most impressive trend is cook-and-serve. A lot is being done to shape sturdy cookware materials into pieces that are clever and attractive enough to come to the table even when there are guests. Apparently accessory pieces fire the imagination of designers more than the basic table settings do: there is more good design among casseroles and condiment dishes than in cups, saucers and plates, which run to "classic" shapes with design changes occurring only on the surface—in pattern, not in tone or quality. Since silver flatware has gone modern (to compete with stainless) there is now little difference between them. However designers can still exploit silver's ability to lend itself to flowing lines—and some do.

1. Porcelain demi-tasse cup, *Raymor*

2. Porcelain tea set, *Merrill Ames*

3. Staved teak salad bowl, *Dansk Designs Inc.*

4. Ceramic cook-and-serve ware, *Heath Ceramics*

5. Earthenware casseroles, *Arabia of Finland*

Cooking and serving

1. Raymor exaggeratedly tall, thin porcelain demitasse cup, imported from Japan, may enhance the espresso one drinks from it. But if the espresso is good to the last drop, a woman risks losing her hat trying to get it.
   Designer: LaGardo Tackett.

2. In Merrill Ames imported porcelain tea pot, spout appears to be pulled from body, rather than attached to it. Thick lid puts right finishing touch on this handsome piece which was test-marketed in a matte tan but now comes in a shiny black glaze.
   Designer: M. Mori, Good Design Center, Japan.

3. Dansk staved teak salad bowl, made by laminating solid strips of wood together, is notable for its extreme but graceful curve and display of wood graining. It is 16½ inches in diameter, ⅞ of an inch thick, and the wood is left unfinished.
   Designer: Jens Quistgaard.

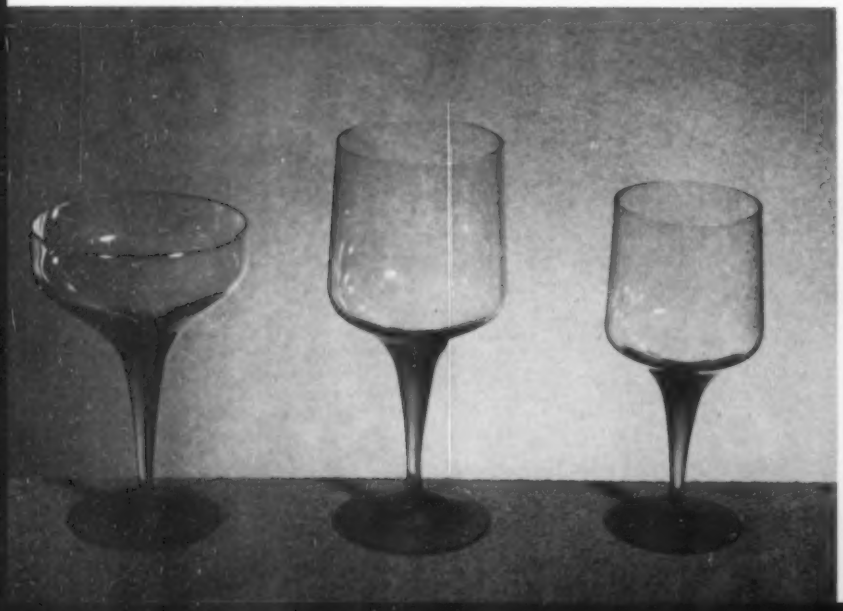
4. Heath "Gourmet Line" of ceramic cook-and-serve ware offers a variety of practical possibilities. Shallow plates function as dinnerware, lids for the casserole bases, or shallow baking dishes. All the bottoms are unglazed to prevent slipping and flat to permit stacking; the flange edge makes them easier to handle when hot. The cup's handle is placed low, for balance, and elongated to clear the saucer rim.
   Designer: Edith Heath.

5. Arabia "Liekki" casseroles of heavy earthenware are cooking pieces graceful enough to satisfy their serving function. All three sizes (2½ quart, pint, ½ pint) come in a deep brown matte finish and their relatively light weight makes them doubly fit for double duty.
   Designer: Arabia staff.

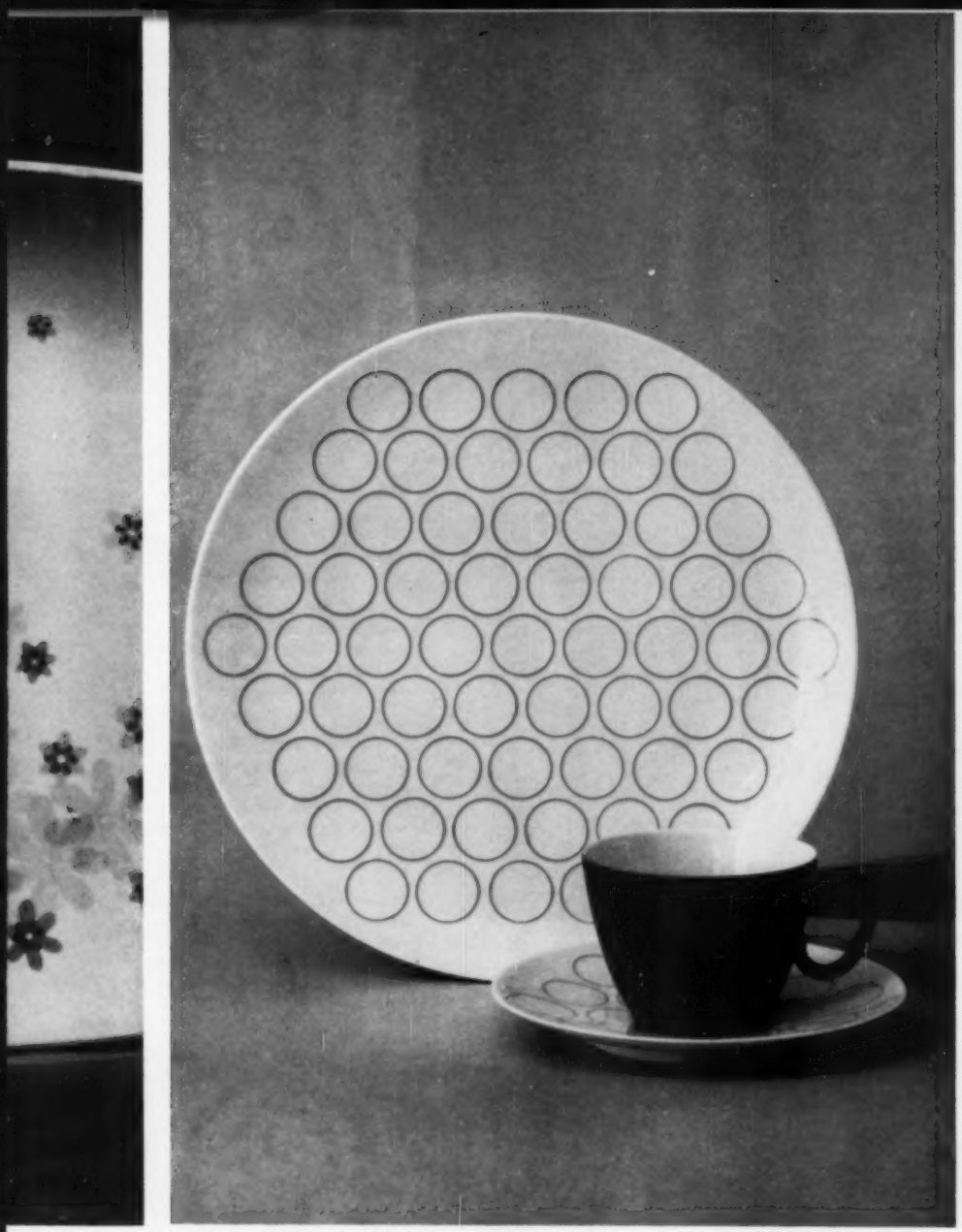
1. Earthenware, *Metlox Mfg. Co.*

2. Melamine, *Brookpark, Inc.*

4. Stemware, *Orrefors*



5. Stoneware, *Marshall Studios, Inc.*



3. Chinaware, *Rosenthal-Block China Corp.*

6. Melamine *Plastics Mfg. Co.*

Dinnerware and Glass

1. Metlox California "Tempo" earthenware—an example of the "back to earthiness" movement in American dinnerware—comes in satin matte finish of dark brown walnut with beige, blue, gold, terra cotta, or olive applied on inside surfaces. *Designer: Allen-Shaw Associates.*

2. Brookpart "Blue Crystals" melamine dinnerware makes use of the squared shape, carrying it out in the cup and its asymmetrical handle. The new pattern is just whimsical enough not to be cute. *Designer: Joan Lutz.*

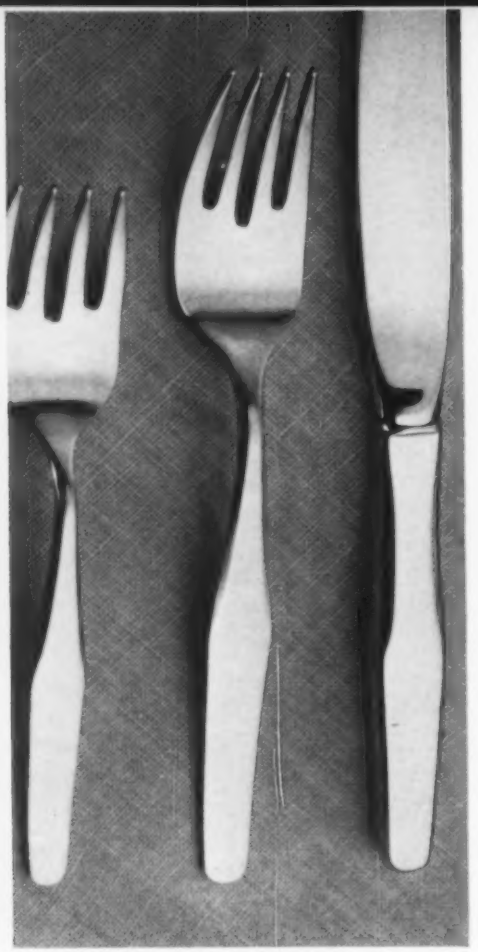
3. Rosenthal-Block "Circles" dinnerware of feldspathic china—high fired, more break-resistant than fine china but still in the same category. The new pattern's thin-line black circles on white go with charcoal matte exteriors of existing cups. Blunt, loopy quality of handles complements the circles. *Designer: Raymond Loewy/William Snaith, Inc.*

4. Orrefors "Rhapsody" stemware, notable for the grace and restraint of its straight-sided tulip shape, comes in smoky grey as well as clear crystal. *Staff design: Sven Palmqvist.*

5. Marshall Studios hand-finished stoneware comes in a variety of glazes, retains the pleasing look of pottery, and is not much thicker than fine china. New pattern swirls glaze into glaze; no two pieces match, but they make a family. *Staff design: Jane and Gordon Martz.*

6. Texas-Ware "Viva" made by Plastics Manufacturing Company of melamine has color on the inside of bowls and cups while the outsides and flat pieces are tint white. Shapes are good and simple (particularly the bowl), and colors are strong and clear—royal blue, burnt orange, ochre yellow, kelly green. *Staff design: W. Lloyd Cone, Jr.*

1. Stainless, *Dansk Designs Inc.*

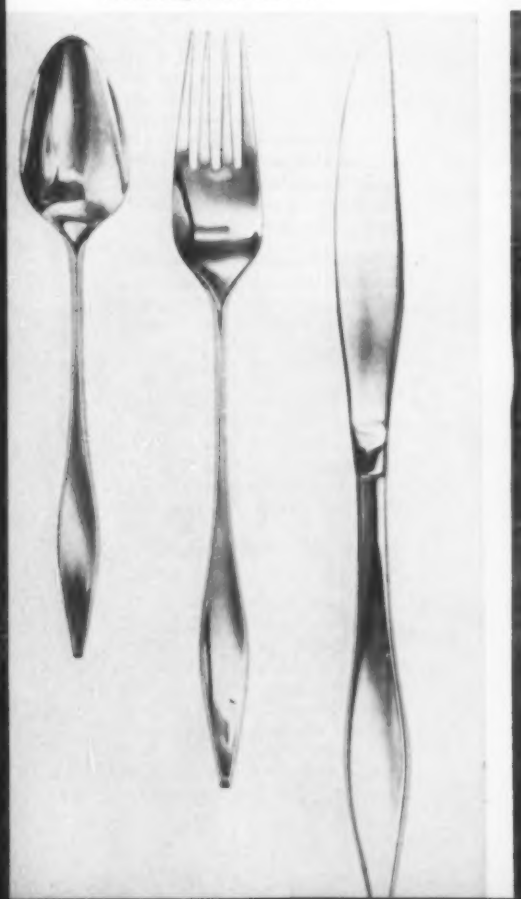


2. Stainless, *Wallace Silversmiths*

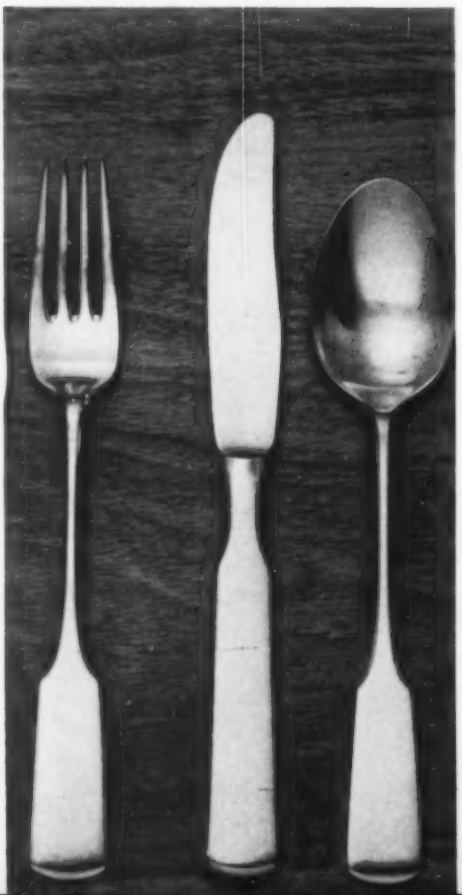
Flatware

1. Dansk "Odin" stainless wide-blade knife and bowled, curved 3-tined fork blur distinction between implements. The very slight variation in the line of each piece makes for design economy.
Staff design: Jens Quistgaard
2. Wallace "North Shore" stainless flatware has handles with a pronounced profile curve that tapers into thin shanks.
Staff design: William Toth.
3. In Reed & Barton's "Lark" sterling silver, the abruptly convex shanks of spoon and fork are sharply differentiated from the working end, and flare out into a concave surface at the base; the knife handle matches them.
Staff design: John Prip.
4. Fraser "Pilgrim" imported stainless flatware is reminiscent of early American, but the curves are more attenuated; shanks are thinner.
Designer: Gordon Fraser and K. Mayer.

3. Sterling, *Reed & Barton*



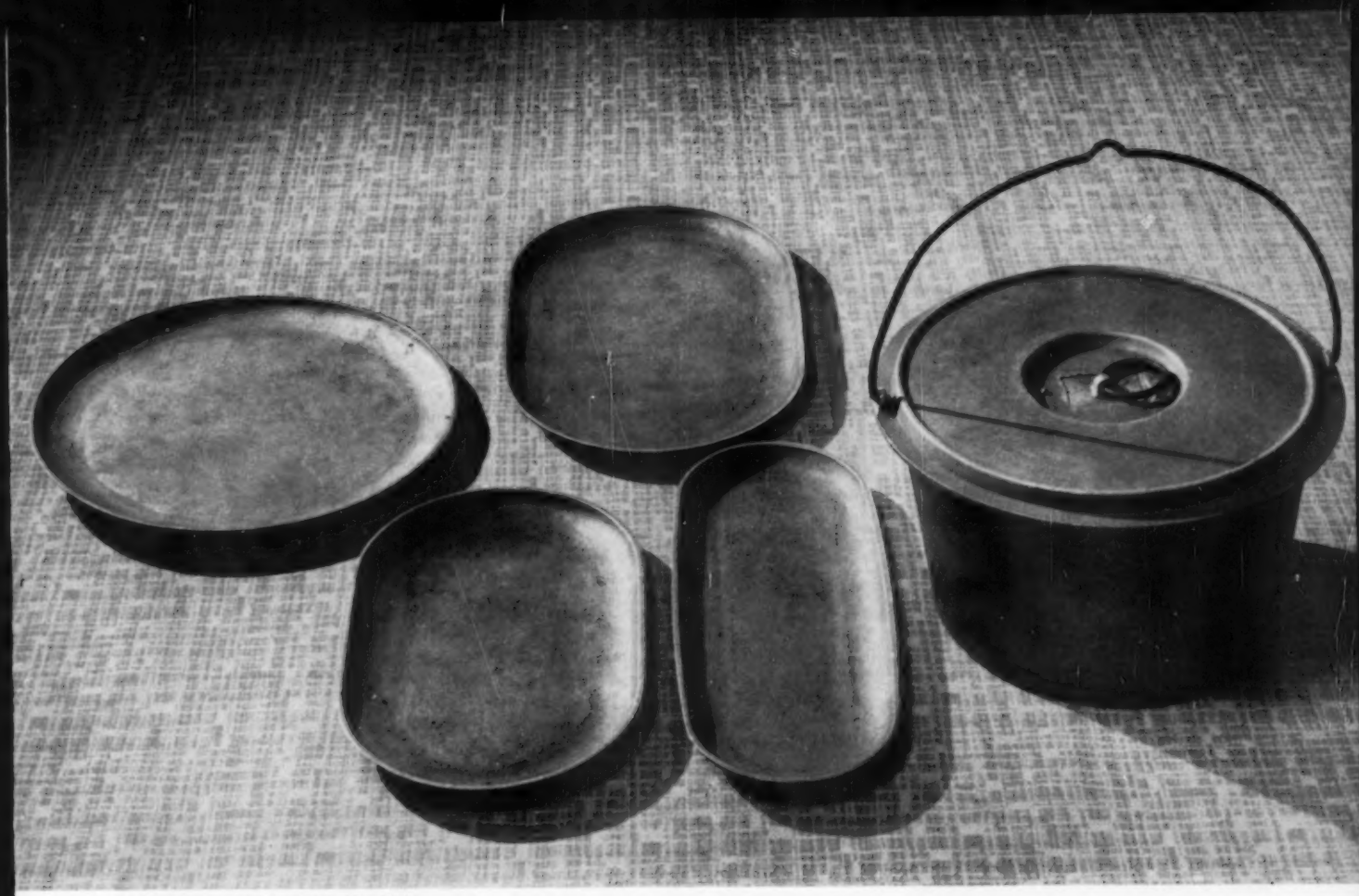
4. Stainless, *Fraser's Inc.*



La Fonda del Sol

The objects on the opposite page are all to be found at La Fonda del Sol, the Latin American restaurant in New York's Time-Life Building, and some will soon be found, modified, on the market. A few are stock items, and a few were designed by Garth and Ada Louise Huxtable, but most were designed for the restaurant by Alexander Girard.

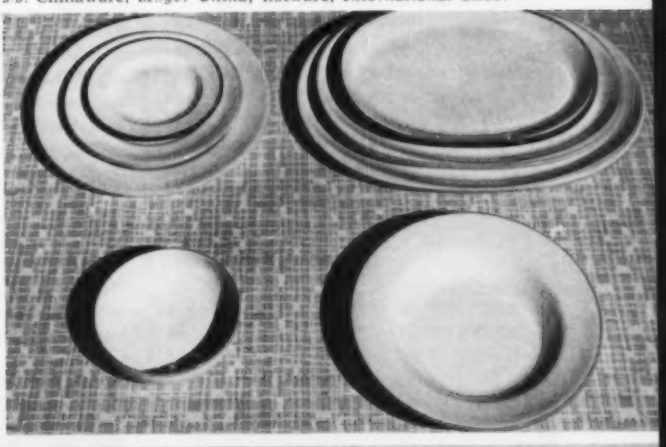
5. Cast aluminum serving pieces, designed by the Huxtables and made by Ben Yuter, have a pleasantly hardy look and a fine shape.
6. Bowls designed by Girard and made by Mayer China (as is most of other china), are used for butter and sauces. Wire forms used to carry fish and steak are Huxtable designed, made by Ben Yuter.
7. Girard's fanciful glasses have brightly colored bases, made by Louie Glass.
8. Non-stock items here are oval plates. Like others they are white with color on outside rim only.
9. Silver-plated nickel alloy flatware is a stock shape from International Silver. Incised pattern was specifically designed by Girard to outsmart scratches by getting there first.



5. Aluminum serving pieces, *Ben Yuter*

6/7. Bowls, *Meyer China;* wire carriers, *Ben Yuter;* glasses, *Louie Glass*

8/9. Chinaware, *Meyer China;* flatware, *International Silver*



TECHNICS *new products, materials, processes and finishes*

Superconducted electrons

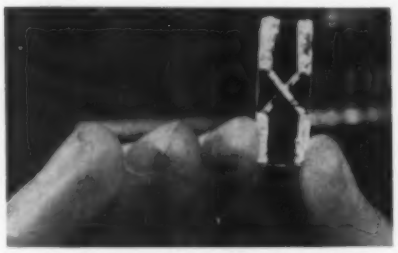
A recent discovery in electronics has yielded new scientific concepts and may make possible an entire new family of simple electronic devices of extremely small size, low power requirements, great reliability, and inexpensive fabrication. Besides these outstanding advantages, a single one of the devices will be able to function equally well as a switch, resistor, or capacitor.

The discovery involves a combination of two physical phenomena—the "tunneling" effect of electrons, and the "superconductivity" of certain metals. Tunneling occurs when electrons are able to pass through what is normally a barrier, or insulator. For this to happen, certain conditions must prevail. Primarily, the barrier must be extremely thin, from 10 to 100 atoms thick (one-millionth of an inch). When this condition is met, a small part of the current induced on one side of the barrier will "tunnel" through it in sufficient quantities to yield a measurable flow. The current is proportional to the voltage, just as if the insulator were an ordinary resistance element.

Superconductivity is achieved when certain metals are brought down to very low temperatures near absolute zero (minus 450 degrees F.). At these temperatures, they become perfect conductors—current induced in them will flow forever. An additional relevant fact is that a magnetic field fundamentally influences the superconductive state; no metal is known to be super-conductive in a high magnetic field.

The unexpected discovery of the new electronic concepts occurred when scientists were experimenting with tunneling through ultra-thin insulating films where one of the conducting films was a superconductor. They found that the current does not steadily increase proportionally with the voltage, as normally happens. Instead, there is an area in which the current actually decreases with increasing voltage. This effect, they decided, occurs because certain energy levels in a superconductor are forbidden to electrons.

From the practical standpoint, this unpredicted finding opens up the possibility of a new family of extraordinarily versatile electronic components. By simply varying the magnetic field of a superconductive, thin-film tunneling device, it becomes possible to change its operating characteristics to permit widely different functions: as a switch, resistor, or capacitor.



Forerunner of new electronic devices

Commercially significant is the fact that the devices are very cheap to fabricate. They are made by simply depositing alternate metal and insulating layers on a suitable foundation. Thus, in a single operation, it would be possible to deposit complicated circuits involving hundreds of components. Not only are costs reduced substantially, but size also, and because the devices generate only a tiny amount of heat, they may be packed at a density many times greater than that possible with present solid-state components. However, it must be noted that much continued applied research is required before the devices will be commercially available.

The photograph shows a laboratory sample of one of them. Its functioning portion is located at the point where the two strips cross. The strips are vapor deposited, superconductive metal and are separated by an extremely thin insulating layer. *Manufacturer: General Electric Research Lab., Schenectady, N. Y.*

Talking through touch

Because jet pilots are frequently deluged with more visual and auditory data than they can absorb, the Air Force is experimenting with a new "touch" method of communicating information to the brain. The method involves transposing vocal frequencies into mechanical vibrations which are felt by placing the fingertips against a small vibrating plate. After a limited amount of training, the participants in the experiment were able to identify words through the vibrator with 85 to 90 per cent accuracy. Although the Air Force is particularly concerned with developing the touch system for channeling information to a pilot when his hearing or sight has been impaired by injury or weather, it might also be used as a reserve channel when jet noise or other technical difficulties disrupt normal communications. In addition, the new method might provide a new form of hearing for the deaf.

There has been research in this area since the 1920s, but the original attempts failed because the researchers did not realize that the skin does not respond to the same frequencies as the ear. The psychologist in charge of the present experiments has found that the skin is most sensitive to a frequency range about ⅛ that of speech frequencies. In order to achieve this frequency range, sounds are tape recorded and then played back through the vibrator at the slower rate.

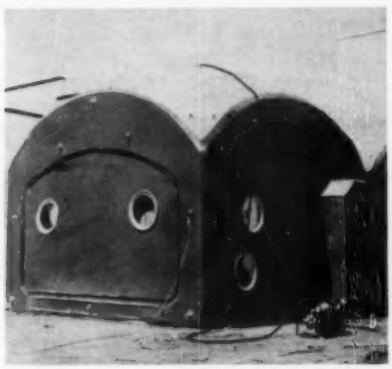
The technique offers promise, but extensive research is still required before it can be considered fully operable. Some of the areas that require further investigation are the slight differences in speech which change the rate of mechanical vibrations, and the slowness of message transmission resulting from the fact that the tape recordings are played eight times slower than normal. New areas to be considered include the effects of transitionals and other distortions that occur in connecting phonemes to form words. *Source: Rome Air Development Center, Air Research and Development Command, Griffiss AFB, New York.*

Psychologist demonstrates communication by touch

Inflatable structures

Portable, inflatable structures can now be constructed without pressurizing the entire interior for support. Structural rigidity is obtained by confining air pressure within the minimal space provided by double-wall construction, and reinforcing the ceiling and walls with inflated corner posts, floor beams, and triangular ceiling supports. The walls and ceiling are made from Du Pont Hypalon-Neoprene coated nylon fabric for strength, light weight, and weatherability.

The first structure made with this process is a 14-foot cube, which, deflated, folds into a compact 650-pound package for easy transportation. For multiple-



Portable inflated structure

room structures, the cubes can be attached to each other. The removable wall panels are fastened to the unit with a coil spring fastening system. The shelter is stabilized by guy wires attached to fixed positions on the exterior walls and staked firmly into the ground. The manufacturer claims the inflated unit will withstand 100-mile-per-hour winds.

Access is by means of a double-wall inflated doorway equipped with center opening double doors. The door panels are constructed of lightweight urethane foam, sealed top to bottom with a nylon Velcro fastener on the overlapping flaps of the fabric door opening.

The flooring consists of inflated, peripheral floor beams, about one foot wide, covered with sheets of aluminum. Beneath this, there is a sub-flooring of expanded honeycomb paper impregnated with Hypalon synthetic rubber for water resistance.

The windows are double-paned, and clinched into the inflated wall panels by

Triangular inflated ceiling supports

means of tire-rim-shaped aluminum frames, with Neoprene gasketing.

The entire unit can be assembled in less than a half hour. *Manufacturer: Berger Brothers Company, Inflatables Division, New Haven, Conn.*

Third-generation computer

The application of thin magnetic-film memory to computers heralds the beginning of the third generation of data processing systems; the first two generations were the vacuum tube and the transistorized models. The breakthrough has been scored by Remington Rand's new Univac 1107, which operates in speeds of billionths of a second as compared to the millionths of a second for second generation systems. Consequent to this thousand-fold increase in speed are greater memory capacity, smaller size (a typical system occupies 150 square feet of space, exclusive of passageways, work areas, etc.), and lower cost. The 1107 is suitable for both scientific computation and data analysis as well as business inventory control and scheduling systems.

The thin-film memory is made by depositing vapors of iron, nickel, cobalt, or other ferro-magnetic metals on a suitable foundation such as thin glass plate (see ID, February 1960, pages 80-81). The memory can be interrogated millions of times without being destroyed or adversely affected by use; in addition, it requires less electric power for energization than other memories.

Eventually, Remington Rand believes that thin-film techniques will be applied to logic performing tasks as well as memory functions. When this is accomplished, computers will be well on their way to being able to program themselves. *Manufacturer: Remington Rand, Division of Sperry Rand, New York, N.Y.*

Stepped-up transformer

What look like the gigantic antennae of some space-age insect are actually the 18-feet-high bushings of what is claimed to be the world's highest voltage power transformer—used to transmit electricity at 460,000 to 750,000 volts. Customarily, electric power in the United States is transmitted at 115,000 to 345,000 volts. The highest operating voltage transmission in Russia is 500,000 volts.

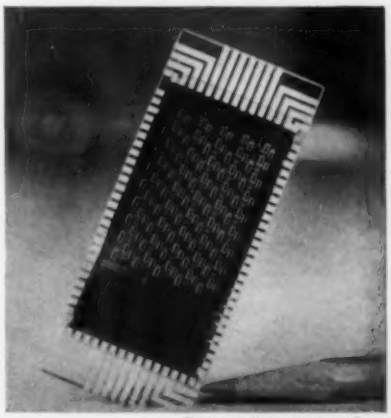
The transformer is part of a recent prototype system constructed by General Electric to test the feasibility and transmission techniques of extra-high voltage lines. The company is betting that EHV is the most sensible and economical way to transmit power. They explain that one 750,000 volt line will transmit over 36 times as much power as one 115,000 volt line, thus yielding enormous savings in construction costs, rights-of-way, towers, conductors, and apparatus expenses. The

Giant transformer

techniques used for the project were all predetermined by extensive analytical studies, including computer and model investigations. The test transmission line will serve to verify the preliminary results. Instrumentation for the project includes the automatic gathering, every twenty minutes, of 158 different measurements of electrical, mechanical, and meteorological effects. *Manufacturer: General Electric Co., Schenectady, N.Y.*

Computer memory fabrication

Automatic control techniques can now be used, for the first time, to fabricate cryogenic thin-film memory planes for use in cryogenic computers. Cryogenics, a branch of solid state physics, is concerned with what happens in materials and devices at temperatures of about



Cryogenic memory plane

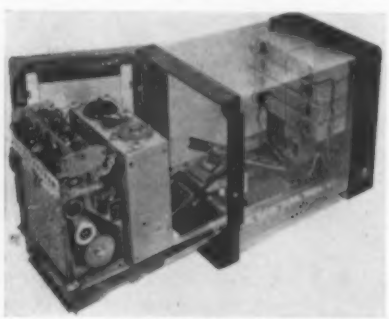
minus 450 degrees F. At these temperatures, certain metals become superconducting, i.e., they permit electric current to flow endlessly, without additional power (see "Superconducted electrons," above). In a cryogenic computer, superconducting materials are used to perform logic and to store information.

Because of this combination of functions (not possible with conventional computers) sophisticated operations may be realized. For example, scientists expect that cryogenic devices can be used in an "associative memory", which simultaneously searches all memory compartments and thereby speeds access to any stored information. Since extremely large numbers of these devices are used in cryogenic computers, automatic fabrication of them is an extremely significant step forward in their use and development.

Key to this advance is a special technique which permits accurate automatic duplication of devices. By means of the technique, microscopically thin layers of metals and insulating materials are automatically deposited on a glass foundation. The equipment used for this allows each layer of material to be sequentially deposited through 17 microscopically adjusted masks, or perforated metal sheets. The masks are changed automatically, like records in a juke box, and are held in a large metal cylinder operating in a high vacuum. Once the masks have been properly aligned, the process automatically produces 135 tiny devices—each of which functions as a logic and memory bit—on one unit (the memory plane) the size of a postage stamp. *Manufacturer: IBM, Federal Systems Division, Kingston, N.Y.*

Potentiometer redesigned

The potentiometer, an instrument that controls industrial process variables by measuring and balancing unknown voltages against known voltages, has been redesigned with a new type of balancing mechanism. Called the ElectroniK 17, the new version incorporates an extremely accurate strain gage as the rebalancing element, eliminating the conventional slide-wire with its problems of mechanical wear, and limited number of points at which the instrument can come to balance. In the new unit, the strain gage device, known as the Strandducer, does away with the mechanical problems, and, most important, makes possible an infinite number of balance points.



Open view of potentiometer

Dreyfuss-designed potentiometer

The potentiometer is constructed so that the front, or display, module can be easily removed and replaced with a strip or circular chart recorder (depending on the model), or a circular scale indicator. The unit, medium grey in color, with an aluminum frame around the front, was designed by Henry Dreyfuss. *Manufacturer: Brown Instruments division, Minneapolis-Honeywell Regulator Company, Philadelphia, Pa.*

Collapsible container

A collapsible container with a disposable liner for transporting and storing all kinds of bulk liquid and flowable dry commodities has recently been marketed. Use of the disposable liners, made from thin plastic film, makes it possible to use the same basic container interchangeably for such diverse products as oils, chemicals, dairy products, cement, beverages, etc. without extensive cleaning or danger of contamination—yielding substantial cost savings.

Container partly collapsed

The container, known as Flexi-Drum, is made from a molded polyester top and bottom, with a sleeve casing of synthetic fabric impregnated and coated on both sides with polyvinyl chloride. It measures 49 inches in diameter; different lengths of 40, 69, and 98 inches are available. All lengths collapse to 12 inches in height, and the maximum payload is 11,000 pounds. When collapsed, the fabric sidewalls fold accordion-like between the top and bottom shells, and are protected by them. The containers are filled through quick-opening orifices in the top and bottom, which are airtight when closed. In the larger sizes, Flexi-Drum can carry 90 pounds of payload to one pound of its own weight. *Manufacturer: Highway Trailer Industries, Inc., New York, N. Y.*

Self-adhesive Teslar

Du Pont's new Teslar polyvinyl chloride film (ID, September 1960, page 84) is now available in self-adhesive form. The plastic has exceptional characteristics of toughness, weatherability, and chemical resistance, and its new form will ease weather-proofing applications. It is offered, both transparent and metallized, in pigmented colors. *Manufacturer: Fasson Products, Painesville, Ohio.*

Protection from heat

An aluminized silicone rubber-coated glass cloth is providing an extremely high degree of protection against radiated heat. The fabric reflects more than 90 per cent of the infra-red rays generated by a heat source, and absorbs much of the rest. It can be used as a protective curtain to shield complex electronic gear, personnel, heavy equipment, and sensitive circuits. The fabric itself does not function over temperatures above 700 degrees F., but because of the high reflectance of its aluminum coating, it does not reach this limit even when exposed to body temperatures of 6,000 degrees F.

The fabric is constructed by coating vaporized aluminum over one face of a silicone rubber-coated glass cloth base. The specially woven and treated glass base cloth provides sturdiness and dimensional stability, as well as resistance to tearing, bursting, and creasing. *Manufacturer: Irvington Division, Minnesota Mining and Mfg. Co., St. Paul, Minn.*

More accurate weather maps

The U. S. Weather Bureau recently put into operation an electronic computer-plotter that mechanically draws a complete weather map of the northern hemisphere in less than three minutes, as opposed to the 20 minutes required for the less accurate hand-drawn method. The new system is said to be an important step forward in the Weather Bureau's program to employ automatic weather data processing, analysis, and forecasting.

Known as the Weather Plotter, the new unit reads weather information supplied in numerical form on magnetic tape, and presents the information to a digital-to-analog converter. The converter instructs the mechanical hand of the plotter to automatically draw contours or isobars, the lines representing barometric pressure, on a 30 by 30 inch map.

Information fed into the system is gathered from more than 500 weather

observation stations. The forecasts are then programmed on a computer, recorded on magnetic tape, and fed into the unit. During the course of a day, 64 weather maps are produced, each of which is distributed throughout the United States for use in local and regional weather forecasting.

Weather Plotter

The Weather Plotter is also being introduced for industrial applications such as automatic drafting, highway planning, map construction, and data reduction. *Manufacturer: Electronic Associates, Inc., Long Branch, N. J.*

Simulating atomic radiation

A device capable of bombarding objects with a gamma radiation pulse similar to that produced by an atomic explosion has been built for a variety of testing purposes. It can produce a single high-intensity pulse, or burst, of about ten million volts of gamma radiation. Known as the "Linac," for linear electron accelerator, the machine will be useful in the following fields: medicine—electron bombardment of cancers; pharmaceutical—sterilization of antibiotics, hormones, proteins, etc.; plastics—cross-linking of molecules to improve various physical

Bombarding objects with gamma rays

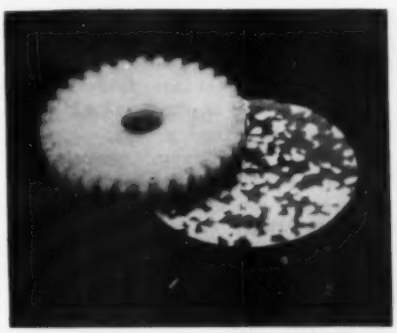
properties; chemistry—initiating and accelerating reactions, rearranging molecules, and oxidation; physics—study of nuclear properties, artificial production of radioisotopes; and a host of other applications.

Compared to the enormous nuclear reactor it imitates, the Linac is quite small, and it does not have the science fiction look of the reactor. The device appears merely as three or four electronic cabinets, with little laboratory plumbing extending out from under glass.

The photograph shows a scientist examining a flower-like pattern in a lucite disc, which is produced by the high intensity burst of electrons flowing around the crystal structure of the plastic. *Manufacturer: Hughes Aircraft Company, Culver City, Calif.*

New fluorocarbon resin

A new fluorine-containing thermoplastic resin, known as Kynar, is now offered on a semi-commercial production basis. Its properties, strongly determined by the stability and inertness characteristic of highly fluorinated molecules, include high resistance to the attack of corrosive chemicals, non-combustibility, great resistance to extreme weather conditions and ultra-violet radiation, and good mechanical strength and toughness. The manufacturer predicts that the new resin

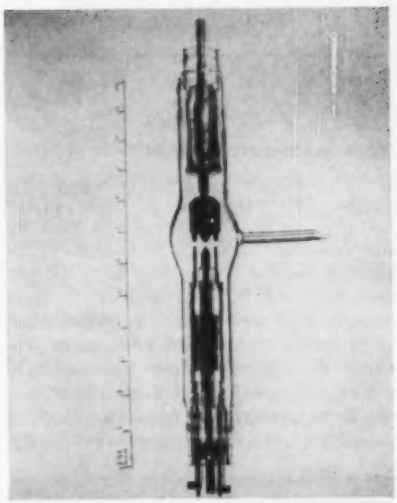


Kynar plastic gear

will find applications in the following fields: pipe and tubing, valve and pump parts, seals and linings for tanks and reaction vessels, packaging for chemicals, lubricants, food, pharmaceuticals, etc., as well as sleeving for wire and cable terminals, and protective coatings over various electrical components. Kynar is presently available as molding powder and pelletized resin. It may be fabricated by both injection and compression molding and extrusion. *Manufacturer: Pennsalt Chemicals Corporation, Philadelphia, Pa.*

Long-range illumination

An electric lamp, said to project light rays 50 miles, has recently been developed for various military and space applications. The bulb has three arc-discharge locations, spaced approximately one-quarter inch apart, surrounded by xenon gas under pressure, which is responsible for the extreme brilliance of the light. Conventional high brightness lamps have only one arc made of carbon. The advantages of the xenon bulb over carbon lamps are clean, maintenance-free operation; no open flame and no carbon fumes; perfect daylight color of light, and a life expectancy of up to 1,000 hours. In carbon arc lamps, carbons must be replaced at much shorter intervals. The shells of the bulbs are made of fused quartz, said to be the only suitable transparent material with a softening point as high as 3,500 degrees F. *Manufacturer: Duro-Test Corporation, North Bergen, N. J.*



Xenon light bulb

Extruded corrugated vinyl

Corrugated, translucent sheet vinyl is now available in continuous extrusion. Because of vinyl's self-extinguishing characteristics, structural strength and good weather resistance, the material will probably find its first applications as a building material for structural glazing and internal partitions. The 1/16-inch sheeting is extruded in 52-inch widths. Varied profiles will be offered. *Source: The process was developed by National Rubber Machinery Company of Akron, Ohio, and the material is supplied by B. F. Goodrich Chemical Company of Cleveland, Ohio.*

Man-made diamonds

For the first time, diamonds over a carat in size have been made in the laboratories; the first diamonds synthesized, in 1955, were only thousandths of a carat in size, about the size of fine grains of sand. The new diamonds are dark in color, and not yet of sufficient mechanical strength for industrial applications. But when these limitations are met, they will find wide application as grinding surfaces for drills, dies, and single point cutting tools. The achievement is also significant because it eliminates reliance on natural, and politically undependable, sources. Presently, industrial quality diamonds of 1/10 carat can be made. *Manufacturer: General Electric Research Lab., Schenectady, N. Y.*

New foam-cutting method

A new foam-cutting method is now producing urethane foam products faster and cheaper than they could be made by conventional molding techniques. The process reduces costs from 30 to 50 per cent because it uses relatively inexpensive wood and metal dies rather than more costly molds, and because it produces more products per time unit. It works with pre-foamed flexible urethane blocks or sheets, and forms products in a matter of seconds; conventionally,

Cheaper urethane foam packages

foamed-in-place urethane requires 20 to 30 minutes to set.

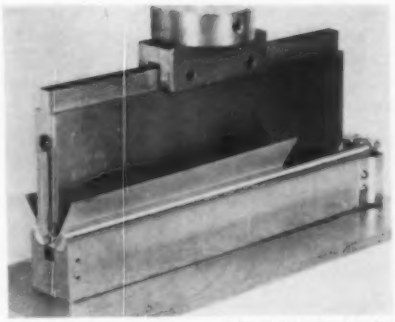
In the process, a die compresses the foam and pushes it up through a cut-out in a steel plate; the foam material that extends above the plate is then sawed off. When the die is lowered, the foam resumes its original shape minus the cut-out section. In this way, an unlimited number of shapes with female cavities or unbroken contoured shapes (the cut-outs) can be produced.

The urethane foam retains its physical properties, cell structure, and cushioning characteristics throughout the process. In addition, hard skin surfaces, inherent in conventional molding processes, are eliminated.

The shapes with female cavities are particularly suitable for packaging and cushioning needs. The cut-outs can be used for a variety of decorative objects; the manufacturer already uses them to make soap dishes, brake and gas pedal covers, pin cushions, trays, etc. *Manufacturer: Air-O-Plastik Corporation, Union City, N. J.*

Adjustable brake die for presses

For short production runs and experimental forming operations in sheet metal, a new upper-press brake die with changeable radius inserts is now available. Known as the Di-Acro Snap Form die, the device can make 13 different radius bends from zero to ⅜ inch, simply by changing the radius insert. This is accomplished by unloosening a spring that holds it in place—a 10 second op-



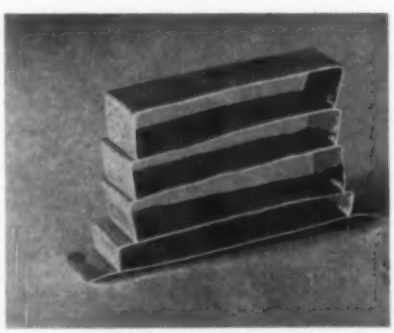
Adjustable brake die

eration. Advantages of the die include reduction of setup and press downtime as well as lower investment because it is not necessary to maintain a large number of dies in individual sizes. The Di-Acro dies are offered in lengths of from 6 inches to 12 feet. *Manufacturer: O'Neil-Irwin Manufacturing Company, Lake City, Minn.*

Copper joining process

A recent process for joining copper to copper is said to offer lower costs, improved bonds, and simplified production methods. The process employs a special coating on the metal surface which actually diffuses into the parts to be joined and produces a bond without an interface. Joints made in this manner are said to retain all of the high electrical and thermal conductivity of copper, and to be as strong or stronger than the base metal. In addition, they are superior to soft soldered joints in tensile, shear, and fatigue properties. Besides its use for bonding copper in electric motors, generators, transformers, and other electrical equipment, the diffusion-bonding process will prove particularly valuable in micro-wave applications where joints must be vacuum tight, free of high vapor pressure constituents, and capable of operating at elevated temperatures.

Production economies are achieved because the coating can be applied to copper strip before it is rolled to finished gage. The coated strip can be annealed in a non-oxidizing atmosphere at moderate temperatures, and fabricated by many of the usual techniques such as blanking, deep drawing, bending, or stamping without adversely affecting the



Diffusion-bonded copper assembly

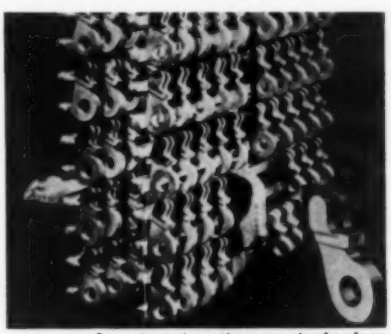
coating. The parts are bonded by heating them at 1700 to 1800 degrees F. in an inert atmosphere for 15 minutes or less.

There are three possible methods for making the diffusion-bonded joints: application of the coating to the mill product or fabricated part prior to joining; use of coated copper strip for at least one of the two components (the coating need be applied to only one surface); and use of an insert made of thin gage, pre-coated strip, coated on both sides, to join any two components made of uncoated copper strip or other mill form.

At present, the process is limited because, after exposure to the high diffusion-bonding temperature, the copper is in a fully annealed condition. However, in some applications, mechanical working, such as coining, can be used to increase hardness and tensile properties. Elsewhere, this limitation is not relevant because the essential physical properties are not changed by the joining process. *Manufacturer: Chase Brass & Copper Company, Waterbury, Conn.*

Investment casting innovation

A new investment casting setup procedure has brought about piece cost reductions of as much as 50 per cent. Unlike conventional investment casting, the process, called Planar investment casting, arranges the disposable patterns



Investment castings on single plane

along runners located on a single plane. This procedure permits easy removal of the castings from the runners, a time-consuming problem with conventional castings which are set up on risers on many different planes, similar in shape to a Christmas tree. The procedure also allows semi-automatic production techniques to be used instead of costly all-hand labor. In addition, for many jobs, one-plane arrangement of patterns eliminates the need for expensive stainless steel flasks to hold the mold material, with consequent savings in flask removal time and replacement of damaged flasks. Surface finishes and tolerances are said to be comparable to conventional investment castings. While most configurations are producible by the process, some more complex castings are not yet practical. *Manufacturer: Atlantic Casting & Engineering Corporation, Clifton, N. J.*

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

Materials—Metals

Nickel plating. Hanson-Van Winkle-Munning Company, Church Street, Matawan, N. J. 16 pp. Ill. Technical instruction booklet describes the Nickel Sulfamate process for coating nickel on metal for re-sizing, electroplating, electroforming, and other functional uses. Subjects covered are solution preparation, effects of changes in proportions of solution constituents, effective temperatures, voltage requirements, equipment needed, etc.

New permanent magnet material. Leyman Corporation, 5178 Crookshank Road, Cincinnati 38, Ohio. 12 pp. Brochure tells of low cost, lightweight permanent magnet material said to have excellent magnetic qualities, which can be cut with ordinary tools. Called Plastiform 1, the new material, a rubber-bonded barium ferrite, has already been used in such applications as magnetic cabinet latches, holding devices, and toys and novelties.

Steel-bonded carbide tools. Sintercast Division, Chromalloy Corporation, West Nyack, N. Y. 5 pp. Ill. Reprint describes properties and preparation of new powder metallurgy material said to form an entirely new class of cemented carbides. Blanks of the material can be sawed, tapped, drilled, turned or milled with standard machine tools before heat treatment.

Custom alloy steel castings. Esco Corporation, 2141 N. W. 25 Ave., Portland 10, Ore. 24 pp. Ill. Brochure 175 DS gives technical data on more than 100 cast alloys, and includes illustrations and descriptions of a number of typical applications.

Tool steel identifier. Universal - Cyclops Steel Corporation, Bridgeville, Pa. An identifier of tool steel, in the form of a compact slide rule, is said to reveal the brand name, producer, AISI number, and Universal-Cyclops equivalent brand at a glance. Over 600 brand names are listed.

Metal mill products. Chase Brass & Copper Company, Waterbury 20, Conn. 16 pp. Ill. Buyers' directory of products and services includes information on aluminum, brass, bronze, copper, nickel, silver, rhenium, stainless steel, and zirconium mill products and specialties.

Materials—Plastics

Plastic lenses. Fostoria Corporation, Applied Products Division, Dept. 90, Huntingdon Valley, Pa. 4 pp. Ill. Bulletin 100 describes specifications and applications of lightweight optically ground and polished solid plastic lenses.

Shell mold bonding resin. Schenectady Varnish Company, Schenectady 1, N. Y. 4 pp. Ill. Folder presents latest data on SP-7412, a pulverized, thermosetting phenolic resin developed specifically as a high-bonding resin for shell mold assembly.

ABS resins. B. F. Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio. 10 pp. Ill. Service Bulletin G-22 offers property tables and suggested applications for Abson ABS thermoplastic resins and compounds.

Nylon shapes. Cadillac Plastic & Chemical Company, 15111 Second Ave., Detroit 3, Mich. 8 pp. Ill. Brochure gives range of shapes, sizes and properties of nylon stock shapes. Available sizes range up to 8 feet by 8 inch rods, 4 feet by 12 inch by 2 inch plate, and 8 feet by 8 inch outside diameter tubes. Also offered are massive shapes up to 25 pounds in weight.

Polycarbonate and other resins. General Electric Company, Chemical Materials Dept., Pittsfield, Mass. 12 pp. Ill. Brochure CDC-381 describes technical data, product features and applications of General Electric's 1961 line of polycarbonate resins, phenolic resins, varnishes and molding powders, and fused magnesium oxide.

Polyethylene. U. S. Industrial Chemicals Company, 99 Park Ave., New York 16, N. Y. 4 pp. Data folder lists the most commonly used Petrothene polyethylene resins, their main characteristics, and their predominant applications.

Fiberglass reinforced plastics. Allied Resin Products Corporation, Hingham Industrial Center, Hingham, Mass. 32 pp. Ill. Brochure outlines properties and handling procedures for polyester, epoxy and foam-in-place resins, and fiberglass reinforcements for use in laminating and coating. It also contains a 24-plate chart of color paste dispersions and a list of technical reference books.

Polystyrene. Rexall Chemical Company, P.O. Box 37, Paramus, N. J. 4 pp. Folder describes properties of Elrex polystyrene resins.

Injection molding polyethylene. Phillips Chemical Company, Bartlesville, Okla. 6 pp. Ill. Bulletin 27 presents technical information on quality control techniques for producing high-density polyethylene injection molded items.

Polypropylene. AviSun Corporation, 1345 Chestnut St., Philadelphia 7, Pa. Illustrated brochure describes the characteristics and applications of Olefane polypropylene packaging film. Charts detail the properties of the film, such as water vapor transmission rate, gas transmission, chemical resistance, electrical characteristics, haze and gloss, heat sealing, machinability, etc. Two printed inserts of polypropylene film are included.

Nylon molding compound. Molding Resins Division, Polymer Corporation, Reading, Pa. 4 pp. Ill. Product bulletin gives features and application case histories of Nylatron GS, a molding compound of nylon and molybdenum disulphide. The material is said to have better properties of wear resistance, crystallinity, tensile strength, dimensional stability and heat resistance than ordinary nylon.

Silicone rubber. Silicone Products Dept., General Electric Company, Waterford, N. Y. 4 pp. Ill. Four-color selector chart, CDS-1450, assists designers in selecting the proper type of silicone rubber for particular requirements. The chart contains data on applications, typical properties, primary classes, and standard industry and military specifications.

FREE LITERATURE *continued*

Methods

Plasma spraying process. Plasma Systems Division, Schori Process Corporation, P.O. Box 712, Port Washington, N. Y. 6 pp. Ill. Brochure describes the process and applications of plasma spraying, which uses exceptionally high temperatures (up to 30,000 degrees F.), high velocities, and controlled atmospheres to melt and deposit materials as coatings.

Metallizing of ceramics. Centralab, Electronics Division of Globe-Union, Inc., 900 East Keefe Ave., Milwaukee 1, Wis. 1 p. Ill. Engineering bulletin CB-1030 describes the techniques of metallizing ceramic parts to increase their versatility and extend their applications into fields where expensive metal alloys were formerly required.

Materials handling. Rapids-Standard Company, 342 Rapistan Bldg., Grand Rapids 2, Mich. 4 pp. Ill. Bulletin gives specific methods for reducing costs in materials handling in the areas of storage, transfer and control. It lists 18 ways to cut costs, and includes a photograph of an actual application of conveyor equipment to solve each problem.

Buying high alloy castings. Alloy Casting Institute, 1001 Franklin Ave., Garden City, N. Y. 4 pp. Ill. Reprint is a guide to the most economical ways of purchasing high alloy castings.

Zinc alloy die casting. Henning Bros. & Smith, Inc., 91-127 Scott Ave., Brooklyn, N. Y. 36 pp. Ill. Booklet contains latest pointers for producing sound zinc alloy die castings. Such topics as alloy composition, alloy and die temperatures, gating and venting, injection pressure, and surface finish are covered.

Machining aluminum with automatic screw machines. Kaiser Aluminum and Chemical Corporation, 300 Lakeside Drive, Oakland 12, Cal. 104 pp. Ill. A comprehensive presentation of technical data and tooling information applicable to the production of aluminum automatic screw machine parts.

Materials handling trucks. Automatic Transportation Company, 149 East 87 St., Chicago 20, Ill. 80 pp. Ill. Handbook discusses material handling trucks, and gives the pros and cons on such subjects as narrow versus wide aisles, pusher versus rider-type trucks, and pallet versus palletless handling. Also included are sections on how to analyze materials handling in a plant and how to select the right truck for the job.

Components and Machines

Metal stampings. Dayton Rogers Manufacturing Company, Minneapolis 7, Minn. 8 pp. Ill. Brochure gives basic design ideas on short-run stamped parts, and includes a section on how to economize by converting machined or cast parts into stampings.

Control panels. General Electric Company, Schenectady 5, N. Y. 8 pp. Ill. Bulletin GEA-6334A describes Pan-A-Trol panels for use with machine tools, textile machinery, pumps, presses, air conditioning equipment, and similar equipment. These panels are arranged into coordinated units combining circuit design and device selection; they are built to specification.

Numerical control. General Electric Company, Schenectady 5, N. Y. 4 pp. Ill. Bulletin GEA-7209 describes new transistorized machine tool control capable of performing positioning and/or contouring from standard punched tape program.

Power supply modules. Valor Instruments, Inc., 13214 Crenshaw Blvd., Gardena, Cal. 18 pp. Ill. Brochure describes new types of power supply modules and explains the dangers inherent in faulty and poorly regulated supplies.

Ball bearing screw and spline operation. Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Mich. 24 pp. Ill. Engineering bulletin discusses ball bearing screws and splines, used for actuating and positioning functions, in terms of basic principles and applications.

Rolling diaphragm seals. Bellofram Corporation, Burlington, Mass. 28 pp. Design manual covers the selection and application of rolling diaphragm seals for hydraulic and pneumatic actuators, controls, and other specialized devices.

Plastic stock parts. Cosmo Plastics Company, 3239 West 14 St., Cleveland 9, Ohio. 24 pp. Ill. Catalog outlines bobbin, washer, and precision-made stock parts of nylon, Teflon, and epoxy materials.

Position-indicating instruments. General Electric Company, Schenectady 5, N. Y. 24 pp. Ill. Bulletin GEA-6596 describes features and capabilities of a complete line of position-indicating instruments for the aviation industry.

Industrial heating. Edwin L. Wiegand Company, 7500 Thomas Blvd., Pittsburgh 8, Pa. 20 pp. Ill. Catalog supplement CS-600 contains specifications and product illustrations of Chromalox electric heat bands, air heating elements, blower-type heaters, engine heaters, and other similar equipment.

Electronic products. Walsco Electronics Mfg. Company, Rockford, Ill. 68 pp. Ill. Catalog FR-61-W contains descriptions on phono drives, replacement transformers, tools, chemicals, and electronic hardware.

Automatic electric stapler. Staplex Company, 777 Fifth Ave., Brooklyn 32, N. Y. 2 pp. Ill. Bulletin describes operation and features of a new model electric stapler which can handle up to 32 sheets of 20-pound bond or mimeograph paper.

Infra-red ovens. Cleveland Process Company, 1773 East 21 St., Cleveland 14, Ohio. 8 pp. Ill. Brochure gives specifications and applications of line of fused quartz radiant ovens.

Hydraulic power units. Hannifin Company, Dept. 280, 501 S. Wolf Road, Des Plaines, Ill. 6 pp. Ill. Catalog shows 37 hydraulic power units including 1000 and 2000 psi single and double pump models.

Press brake dies. Press Brake Division, Valeron Corporation, 56 Factory Road, Addison, Ill. 28 pp. Ill. Catalog contains over 360 drawings of standard and special press brake dies, used for bending and forming sheet metal. The drawings are outlined in black, with solid steel surfaces printed in metallic inks.

Cam locks. Independent Lock Company, Fitchburg, Mass. Catalog features a new line of universal cam locks in a range of sizes and with various optional features.

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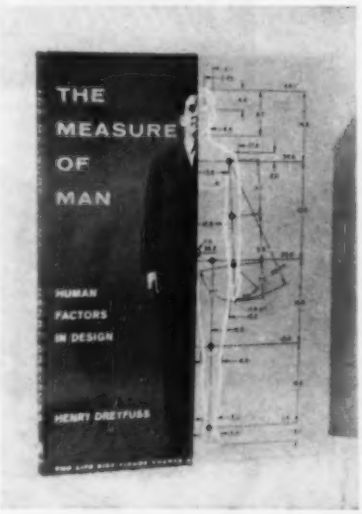

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CALENDAR

Through February 18. An exhibit sponsored by the Artist-Craftsmen of New York featuring articles made by members, including examples of ceramics, metalwork, textiles, jewelry and small sculpture. Cooper Union, New York.

Through February 29. "Japanese Ceramics from Ancient to Modern Times." Oakland Art Museum, Oakland, California.

Through March 12. An exhibition of over 50 paintings by Mark Rothko, done from 1945 to the present. Museum of Modern Art, New York.

Through March 26. "Festival of Italy" sponsored by the Italian Government and the Philadelphia Board of Trade and Conventions. Commercial Museum, Philadelphia.

February 13-16. The 15th international heating and air-conditioning exposition. International Amphitheatre, Chicago.

February 22-24. National industrial packaging and handling exposition sponsored by the Society of Packaging and Handling Engineers. Cow Palace, San Francisco.

February 26-March 1. Pacific electronic trade show. Great Western Exhibit Center, Los Angeles.

March 1-2. The 4th annual technical conference of the Society of Vacuum Coaters. Conrad Hilton Hotel, Chicago.

March 2-April 9. An exhibition of Italian drawings of the 15th through the 18th centuries lent by Italian museums. Metropolitan Museum of Art, New York.

March 5-8. The 3rd national lighting exposition and world lighting forum. New York Coliseum.

March 5-9. The 6th annual gas turbine conference and products show sponsored by the American Society of Mechanical Engineers and the U. S. Department of Defense, Shoreham Hotel, Washington, D. C.

March 7-8. The national conference of the Packaging Association of Canada. King Edward Sheraton Hotel, Toronto.

March 8-10. The 11th annual Instrument Society of America conference on instrumentation for the iron and steel industry. Roosevelt Hotel, Pittsburgh, Pennsylvania.

March 8-April 20. "The Splendid Century." An exhibition of French painting, sculpture, drawing and tapestries from the 17th century. Metropolitan Museum of Art, New York.

March 11-14. Annual meeting of the Steel Founders' Society of America. Drake Hotel, Chicago.

March 14. "Plastics Finishing Seminar" sponsored by the Society of Plastics Engineers. Roger Young Auditorium, Los Angeles.

March 15-16. A seminar on the economics of plastic tooling co-sponsored by the American Society of Tool and Manufacturing Engineers and the Society of Plastics Engineers. Statler Hilton Hotel, Detroit.

March 20-24. The 12th western metal congress and exposition sponsored by the American Society for Metals. Pan-Pacific Auditorium and the Ambassador Hotel, Los Angeles.

March 20-31. Industrial packaging short course sponsored by the Purdue University division of adult education. Purdue University Campus, Lafayette, Indiana.

March 22. A workshop on increasing the effectiveness of shows and exhibits sponsored by the Association of National Advertisers. The Plaza Hotel, New York.

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