INDUSTRIAL DE

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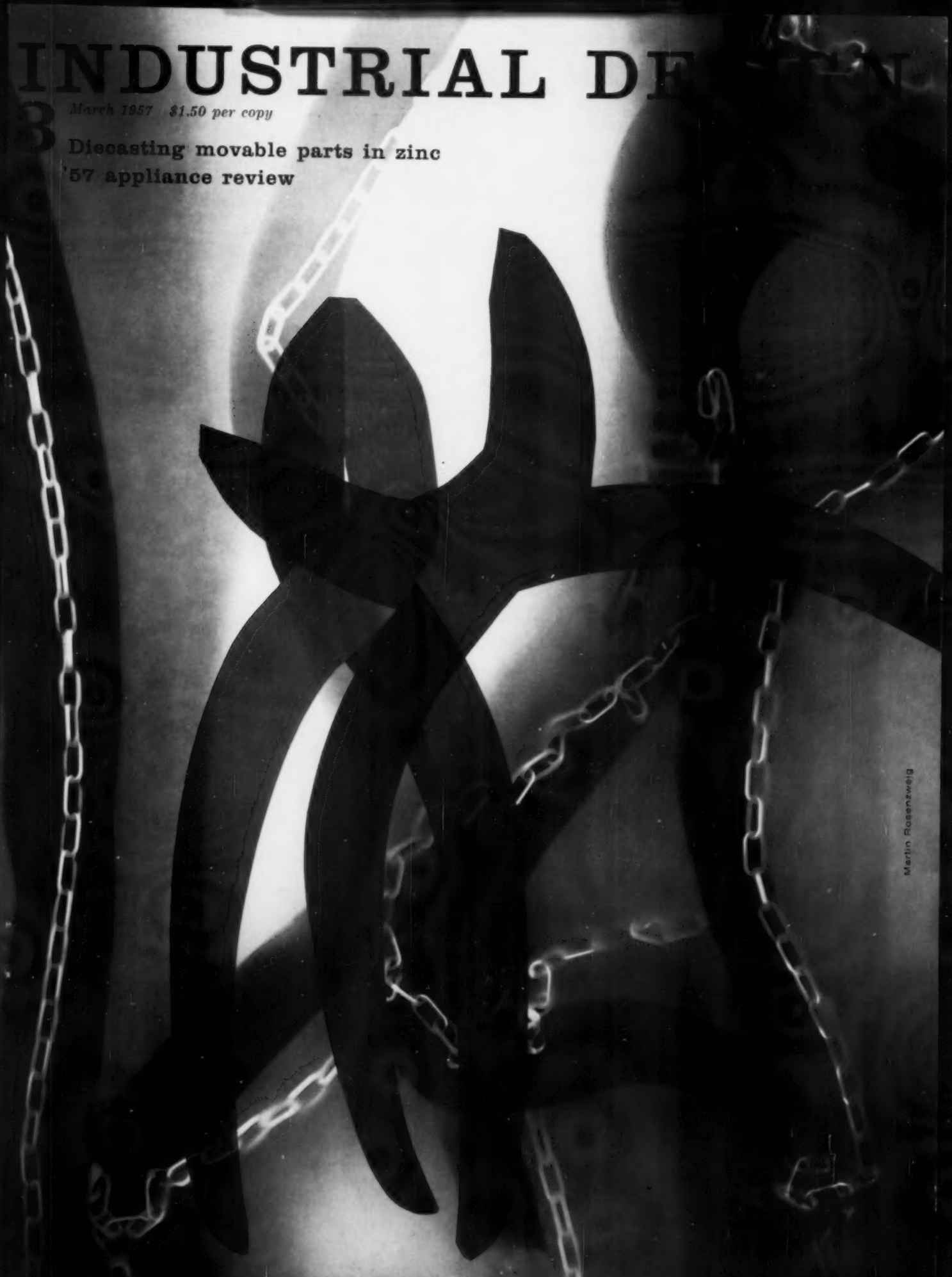
Diecasting movable parts in zinc

'57 appliance review



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MARCH, 1957 VOLUME 4, NUMBER 3

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 design, development and marketing.

CONTENTS

COVER: Martin Rosenzweig's photogram was made with small zinc parts produced at Gries Reproducer Corp. by a method known as the Intercast Process, which turns out movable parts in one die-casting operation. This and other new developments in zinc fabrication are reviewed on pp. 32-47.

FRONTISPIECE: Austenal Laboratories, Dover, New Jersey, takes about 7000 inspection radiographs a month, among them these harvesting machine pawls. The casting in the second row from top, second from left, will be discarded because it shows a gas pocket. How X-ray facilities have been made easier by an atomic projector is described on pp. 60-71.

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in this issue...

Noyes

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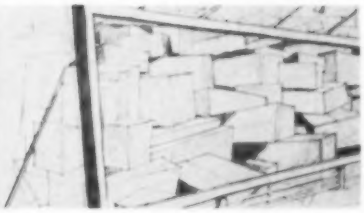

Leigh

Deskey

The man designated to oversee the design transition from the old IBM to the new (p. 48) is **Eliot Noyes**, ASID, new Consultant Director of Design. After 8 years as an IBM consultant, Noyes was offered this full-time job supervising graphics, exhibitions, interiors, architecture and the whole line of IBM machines. He took it only with the provision that he still be allowed to continue his private practice. Now 13 months into the program, he ruefully admits he isn't looking for more assignments. Projects for which he held out time include the concrete bubble house, one already in Florida, one in process for the Home Style Center in Grand Rapids, Michigan. He has also designed optical instruments for Perkin-Elmer, the plastic Model House for 1964 for General Electric. An architect by education (M. Arch. Harvard '38), Noyes directed the industrial design department at the Museum of Modern Art shortly after graduation, and has practiced with Norman Bel Geddes and Marcel Breuer.

William de Majo, designer of the award-winning Gilbey carton (p. 58), has said that Britain's position as an exporting nation is conducive to display, packaging and exhibition design. He has, nevertheless, tackled everything from a calling card to the interior of a 4-engine plane. He remembers happily the Festival of Britain ("A brilliant meteor in a rather dull sky"), where he was coordinating designer for the Farm and Factory exhibit. Designers were in their seventh heaven because for once they were able to design from a planned brief on a vast scale with little official interference. In practice as designer and merchandising consultant since 1939, de Majo has worked with British Overseas Airways Corp., Miles Aircraft Ltd., Biro-Swan Pen Co., Ronson Products Ltd. as well as with W. & A. Gilbey Ltd. He is a member of the Society of Industrial Artists.

Jules and **Nathanial Becker**, ASID, who went into the industrial design business as Becker and Becker in 1950, are now embarked on a field in which there are few precedents—design for nuclear energy. On page 60 is the story of their Kel-Ray atomic projector. In May, as part of the government's trade fair program, their exhibition "The Atom—Man's Servant" opens in Paris. With offices in New York, Dayton and London, Becker and Becker serve such clients as Singer Manufacturing Co., Budd Co., W. R. Grace, Colonial Williamsburg and Sheraton Corp. of America. **Frederick H. Leigh**, senior associate at Becker and Becker, carried the executive responsibility for the atomic projector. A member of IDI, he has been with the firm since its organization.

Donald Deskey, who copped the PDC Gold Medal for the Aqua Velva After Shave bottle and carton (p. 92), is a veteran designer, a co-founder and Fellow of ASID. For thirty years he has directed his own firm in product and interior design, packaging and architecture. He introduced tube steel in mass-produced furniture; suggested striated wood to U.S. Plywood; developed, with Ingersoll Div. of Borg-Warner, a pre-packaged unit holding all the necessary mechanical elements for pre-fabricated houses. Current clients include Procter & Gamble (packaging), General Electric, Westinghouse (Micarta), Sinclair Refining, Maiden Form Brassieres (packaging).

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LETTERS

Steady stream

Sirs:

. . . From a manufacturing standpoint, planned obsolescence (ID, December '56) is perhaps a nuisance, but from a marketing picture it is a large factor in what makes the wheels go around. Insofar as over-all company operations are concerned, the constant flux required to maintain the steady stream of new and modified products represents a powerful incentive for improvement which, of course, stimulates the market, methods and company growth.

On the whole, we think it is a very healthy thing. Of course, for many manufacturers it represents a greater load than they can bear, but for those who survive it's the royal road to growth.

Your article was excellent, I thought, particularly since it developed several points which have led us to do some very serious thinking on future plans.

V. H. Pomper
H. H. Scott, Inc.
Cambridge, Mass.

Man cannot think

Sirs:

I appreciated your report on "The Question of Creativity" (Jan. '57). You would have been spared this, if it were not for that word "Question" in the title.

Because we are pioneering new methods, we are plagued with having to create almost everything we need. In our search for creativity we have come to many of the same conclusions, but our concept is very different.

We come right out and say that man is completely incapable of thinking. Perhaps there is a thinking process but it suits our purpose not to accept it. This is more than a question of semantics because the act of thinking, if it can be interpreted at all, can be interpreted in far too many ways, and so much non-productivity hides behind this so-called process. When you tell someone to think about something, it seems to me to be the most vague and directionless assignment that can be given. But if you say to a group of people, search your memory, a definite procedure is called for and suggestions and experiences start a chain of reactions that amounts to controlled brainstorming. We prefer to believe that the brain is only capable of retention or memory. . . .

Our second step is to search our collective memories to find out if there is any person or written material in any other field that has dealt with a similar problem. If we are successful in uncovering a source, we are a step further in culminating this new-to-us creation. If unsuccessful, we say let's play with it. What we choose to call playing is actually the old trial and error method of discovery. We believe this is the only way of securing new knowledge.

When we are seeking creativity, we prefer to have an observant jack-of-all-trades rather than a couple of specialists sit in. At a seminar such as Mr. Arnold's, a group of varied specialists would make a terrific jack-of-all-trades. . . .

Contrary to Mr. Arnold, we use ourselves as tools. You cannot efficiently drive a spike with a tack hammer nor can you get out of me anything that has never been put in. . . .

It appears that Bill Gordon and others favor detachment from the subject now and then; this suggests that the very effort of trying to create hampers Creations; it also infers that by getting away from the subject, questions sometimes answer themselves. We do not hold with this.

I believe, with the proper study, the various disguises could be pulled off this elusive thing called creativity and with a standardized set of questions and procedure, creativity or whatever we are looking for may be reduced to a routine job of work.

I honestly believe that other than true genius, man cannot think. I make so many enemies with that statement!

Bud Friedman
Identification, Inc.
Chicago, Illinois

No single way

Sirs:

I enjoyed very much reading your comprehensive article on John Arnold's Creative Engineering Course at M.I.T.

I strongly feel that there is no one best way to approach creative design. The important thing is not the *method*, but the *results*. Anyone presenting a theory which is presumably conducive to creative activity will certainly sell that theory more effectively if they will present with it a creative end product or idea resulting from this approach.

After attending John Arnold's course and speaking with him personally, I feel that his greatest contribution to designers, engineers and people who are charged with the responsibility of being creative is the fact that he believes there is no one approach to creativity, and that the one thing that will determine the price tag is the demand for the *results*.

Jack K. Hockenberry
Wright Air Development Center
Dayton, Ohio

Act of courage

Sirs:

Speaking for myself and others in our office, I wish to congratulate you on an outstanding January issue. For you to venture into the somewhat mystical fields of creativity (to say nothing of psychiatry!) is in itself an act of courage and creativity. The technical articles equally interested us.

Stephen W. Osborn
Kelvinator Division
American Motors Corp.
Detroit, Mich.

An immediate answer

Sirs:

It is heartening to see the amount of interest being shown by industry as well as by scholars in creativity. Both Professor Arnold's seminar at M.I.T. and the Institute of Contemporary Art seminar at Columbia University's Arden House are representative of this mutual interest.

It has long been my belief that an immediate, but admittedly partial, answer to this country's shortage of trained technical people lies in better utilization of the potential of the presently trained people. I was pleased to learn from the article the quantity and quality of work going on in this field.

Jesse A. Sperling
General Precision Laboratory, Inc.
Pleasantville, N. Y.

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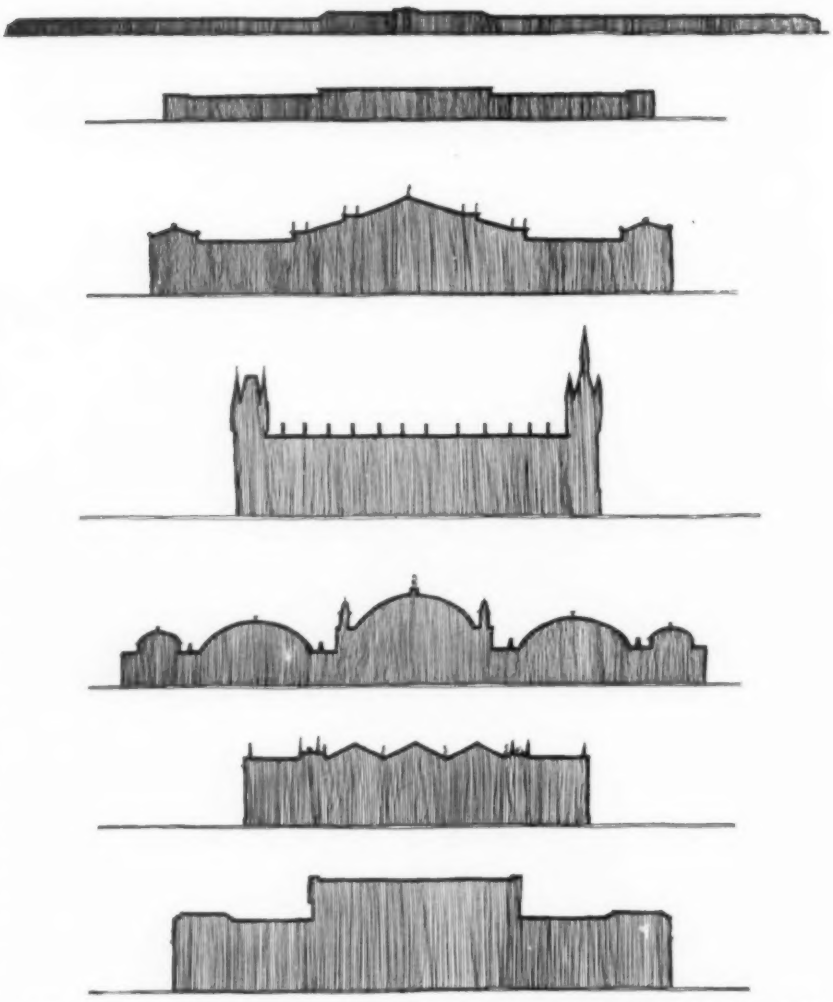

Silhouettes of a sequence of large railroad stations: Derby, Trijunct Station, 1839-41; Newcastle Central Station, 1846-55; Paris, Gare de Nord II, 1861-65; London, St. Pancras Station, 1863-76; Frankfurt am Main, 1879-88; Chicago World's Fair Terminal, 1893; Washington, D. C. Terminal, 1903-07.

Picturesque on the RR

THE RAILROAD STATION, *by Carroll L. V. Meeks, 203 pages, illustrated with 231 photographs and drawings. Yale University Press, New Haven. $7.50.*

In the beginning, in the days of the Tom Thumb trains, there were no railroad stations. A Philadelphia timetable of 1837 announces: "A through train for the accommodation of western passengers will leave the vicinity of Broad and Callowhill Streets . . ." With a profusion of new photographs and old tintypes, of sketches, details and etchings, and in an academic textpiece that actually invites the reading (as well as admiration for a scholarly job of documentation), Professor Meeks tells the tale of this come-lately among architectural problems. He relates how the first decades of railroad-station architecture produced scores of experimental solutions (What was the station to look like? What, indeed, was it meant to be? a shelter? a luxurious lounge? a shed? an imperial monument to a railroad company?). Meeks describes how, like forms in nature, some of the earliest railroad-station forms were not destined for survival. And he demonstrates how other forms were to establish patterns for ticket selling, passenger circulation and track layout that not only endure to this day but also, taken together, reflect in a curiously succinct way the total scheme of values that existed in the last century in Europe and America.

As one of the scholars gradually guiding us toward definitive perspectives on the 19th century, Meeks uses the whole of railroad-station architecture to define what he sees as the last century's predominant aesthetic—picturesque eclecticism. Rejecting classical and rational principles, this new aesthetic (Meeks avoids calling it "romanticism") obtained its effects through five primary means—variety, movement, irregularity, intricacy, roughness. "In its long life," says Meeks, "the picturesque devoured not only Gothic and Renaissance detail but with equal voracity the soberer Italian villa, Second Empire, and baroque styles as the means to creating a new style. The borrowed eclectic adjuncts were given new vitality by juxtaposition. Unprecedented combinations created new content."

Picturesque was the making of a picture, a visual thing. Meeks cites Alfred Waterhouse, an influential British architect, who advised in 1889 "to take care lest a design prove to be anything but a pleasure to the eye" and not to neglect "the outline seen against the sky." A series of silhouettes of six major stations (see cut) shows how that outline changed. At first the form is overwhelmingly horizontal. Verticals begin to appear, and then verticality, to use the author's simile, sweeps in like a great wave, breaking across the century, subsiding in the early 20th. The relative verticality, and the relative importance attached to the five qualities mentioned above, determine the phases of 19th century picturesque.

Meeks describes how railroad stations, like bridges, are one of the old battlefields of company engineers vs. architects. The architects were responsible for the so-called "head-houses," the engineers for the soaring, glassed-in train sheds. He laments the passing of the great arching sheds, for the protection and the appearance they provided (though too often hidden on the frontal aspect by the monumental "head-houses") were far superior to their modern replacement, the low-lying butterfly canopy.

After 1900, picturesque declined into Burnham Baroque, and in this century there have been pathetically few advances in railroad-station architecture. Meeks lingers lovingly on the marvelous new station in Rome, but when he returns to America, the best he can do is discuss a couple of student projects. There have been fairly recent mausoleum-stations in cities like Cincinnati and Buffalo, to be sure, and a mission-station in Los Angeles, but Professor Meeks' report leaves us all wondering when a plan truly new will come into the local depot—*h. b. j.*

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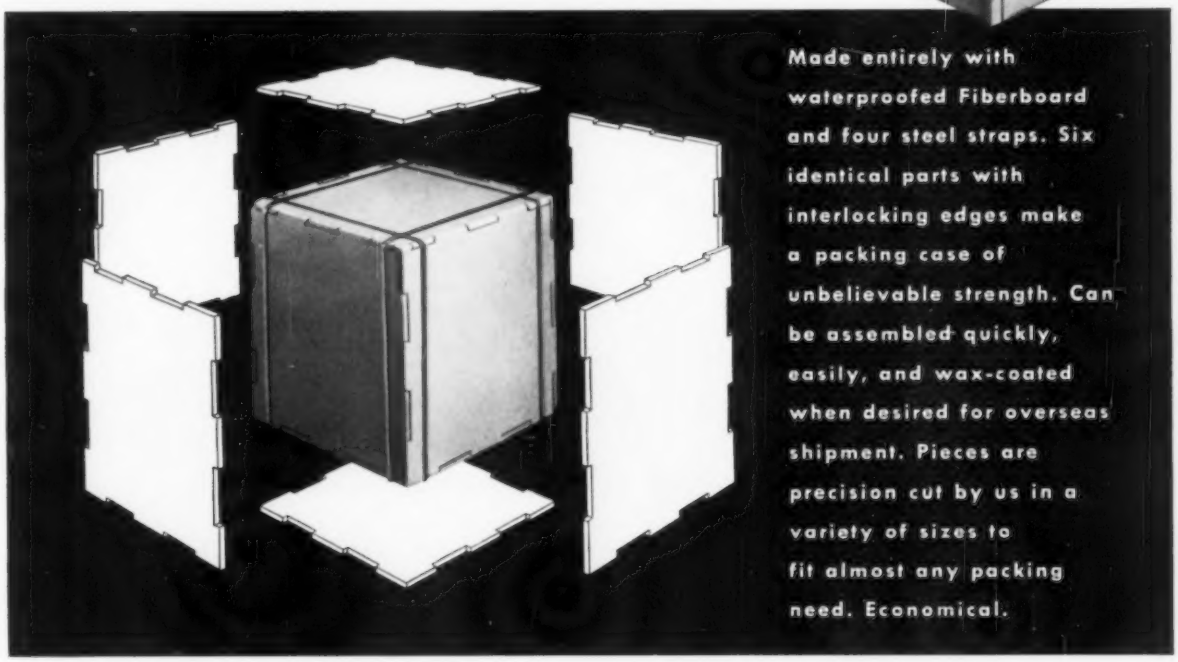

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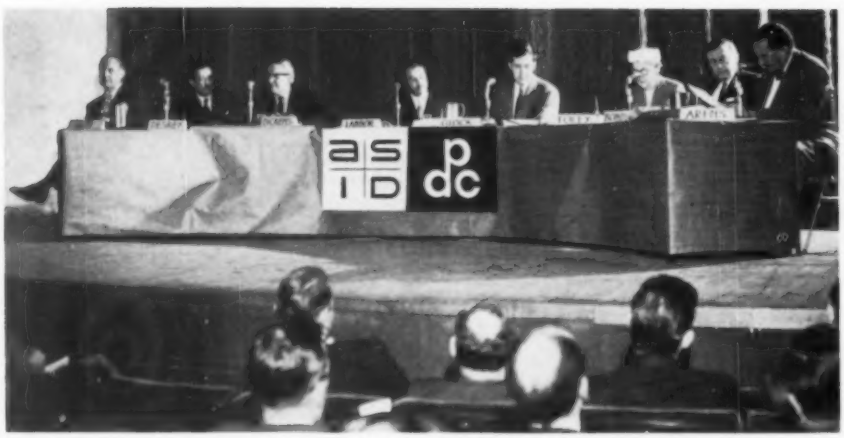

Time, price and change studied at packaging symposium

The answer to "What Price Packaging?" —the theme of the February 14th symposium sponsored by the American Society of Industrial Designers and the Package Designers Council—seemed to be high: $10 billion in 1956 and getting higher, but well worth the price.

Package designers on the panel, including Walter Landor, Donald Deskey, Robert Sidney Dickens, Francis Blod and Egmont Arens, explained why the price was necessarily high. Mr. Deskey approximated the designer's time on a long-term program: "37% on gathering market information, 40% on technological research on materials, processes, engineering and production, 13% on visual treatment, and the final 10% on convincing the client that the design is the correct solution to his problem." Although some of the panelists demurred from this time-breakdown, all agreed that long-term programs of this kind did a better selling job than crash programs.

"There is no one ideal package," continued Mr. Deskey. "It is not a static, permanent concept; it is a constantly changing response to changing conditions." Package designers, it was noted, are finding themselves commissioned to design a replacement as soon as a new package is launched.

Commenting on this factor of change, A. P. Bondurant, Vice President of Glenmore Distilleries, who represented the manufacturer's viewpoint on the panel, noted that industry, having discarded the notion of identification through a changeless label, will pay the price to get the customer's attention in ever-new ways. "Fickleness, impulse and the time element are three things that industry must keep in mind" in packaging programs.

The consumer, spoken for by Esther Foley, Home Service Director of Macfadden Publications, wants packages that appeal to her feelings about the contents and, in specific cases, that can be reused. "Reusable packages," suggested Walter Landor, "assuage the sense of guilt about waste that lies deep in our Puritan hearts." Miss Foley added a further thought: since some packages have to be thrown away, they should be designed so that this can be done without regrets.

In summing up the discussion, Dr. Charles Glock, Director of the Bureau of Applied Social Research, Columbia University, raised some provocative questions on market research: "How good is it and what have we learned about package design from it? It seems to me we don't know the simple answers to the questions Miss Foley raised on why people buy."

Dr. Glock agreed in principle with long-range planning, but failed to see how it could work. In a business where what a competitor does plays so large a role, planning, he implied, should be flexible and short-range.

The symposium was held in connection with the Package Designers Council's annual competition, awards of which were announced the following day (see p. 94).

Plans for Aspen design conference

The Seventh Annual International Design Conference in Aspen, Colorado, has been scheduled for June 23-29. Leading figures in the fields of design, science and communications — including philosophers and city planners, TV critics and advertising executives, editors, architects and market analysts—will be invited from all over the world to discuss the proposed subject, "Design and Human Values." As Saul Bass, Chairman of the Program Committee, explains it, "Every designer knows that, no matter who employs him, his real client is the individual. How are his values expressed in the things he buys or refuses to buy? What forces operate to change these attitudes towards his surroundings? What is the role of design in this process?" Detailed program will be announced in May INDUSTRIAL DESIGN.

Creativity seminar expands

The Institute of Contemporary Art in Boston will hold a six-week summer course from July 8th to August 16th, offering advanced studies for designers, design engineers and design educators. Joseph Carreiro of the Philadelphia Museum School of Art will be Academic Head of the program, which may be attended for two, three or the full six weeks. Processes for design problem-solving will be taught by R. Buckminster Fuller, William J. J. Gordon, Professor John Arnold and other leading industrial designers and creative engineering teachers. Information may be obtained by writing to Theodore S. Jones at the Institute, 230 The Fenway, Boston 15, Mass.

Design management forum planned

The Philadelphia Museum School of Art and INDUSTRIAL DESIGN will co-sponsor a forum on "Design in Management" to discuss the place of design decision-making on the management level, to determine the position, responsibilities, training requirements and function of the design executive in industry, and to explore the future of this position and improve educational preparation through better organizations and planning by institutions and industry. The conference sessions, tentatively scheduled for March 30, will not be open to the public, but INDUSTRIAL DESIGN will carry a full report in a future issue.

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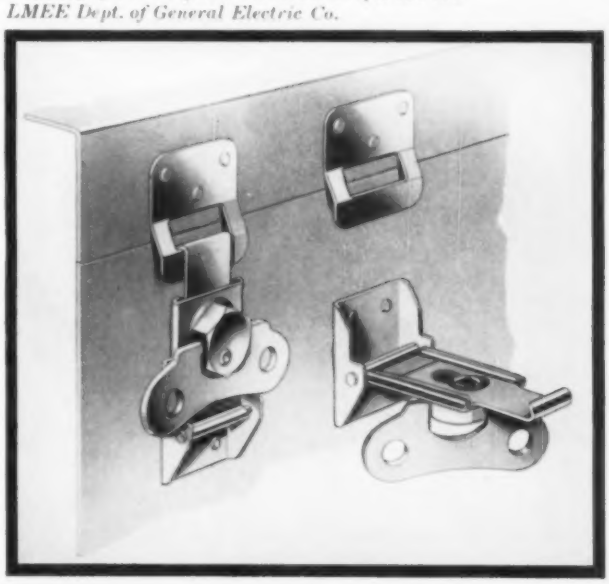

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QUICK-LOCK SPRING-LOCK ROTO-LOCK LINK-LOCK DUAL-LOCK

Harold Van Doren: pioneer designer

Harold Van Doren died on February 3rd at Bryn Mawr Hospital, Philadelphia, at the age of 56. In honor of this pioneer of his profession, INDUSTRIAL DESIGN *has asked Walter Dorwin Teague—who joined him among the founders of the American Society of Industrial Designers—to express the accomplishments of his colleague.*

"The profession of industrial design was fortunate in that Harold Van Doren joined its ranks in the very early days when it was feeling its way toward truly professional standards of ethics and aesthetics. Immediately, with his first efforts,

he stepped to a clear and brilliant level of classic achievement.

"He brought to the profession a richer background of education and culture than most men possess. A graduate of Williams College, Phi Beta Kappa, he studied art at America's foremost art school, the Art Students' League of New York, for several years at the Academie de la Grande Chaumiere and the Ecole de Louvre, Paris, and lectured at the Musée de Louvre. He found time to translate Vollard's source books on Cézanne and Renoir, and write penetratingly on modern art. In this country he continued to write and lecture, and became Assistant Director of the Minneapolis Institute of Art before the expanding profession of industrial design enlisted him in 1930.

"Thus he came equipped with a trained sense of aesthetic values and that ability to express himself both plastically and orally which are essential to the industrial designer. But also he possessed a practicality, a mechanical sense, which is much more unusual among men of his background. And, most important of all, he had that high, modest, unshakable integrity without which ability is a danger rather than a virtue.

"It was this combination of qualities that gave him from the beginning a place of leadership, justified the confidence of a list of distinguished clients—Toledo Scales, Westinghouse, Philco, Goodyear, Maytag, Libby-Owens-Ford, Cincinnati Milling, to name a few—and won him many high awards. Known as the author of the only textbook on industrial design; as a gifted writer of magazine articles on the subject; as one of that small nucleus around which the American Society of Industrial Designers was formed—he was one of its first Fellows and an early president.

"But most of all we knew him as one of those who gave dignity and direction to a young profession when it needed it most. He has bequeathed something of himself to all the fine work of the future."

World's Fair pavilion proposed

The 1958 World's Fair in Brussels, Belgium, will draw an expected 35,000,000 visitors to exhibits of about fifty nations and several international organizations. U. S. participation will center at a pavilion said to be the largest circular building in the world without interior columns. The $5,000,000 building, designed by Edward D. Stone—who designed the new American Embassy in New Delhi, India—will have a "bicycle wheel" construction in which the roof is attached to a rim connected with an inner metallic ring by high tension steel cables. The outer ring of the roof will rest on two rows of steel columns. Made of translucent plastic, metallic mesh and gold-colored steel, the structure will be 340 feet in diameter and 95 feet in height.

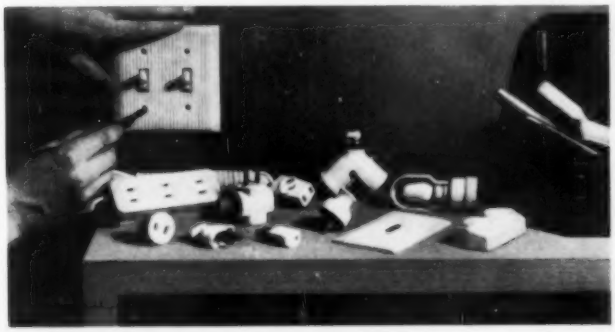
HOUSE OF THE FUTURE section is assembled at Springfield, Mass., for tests under high thermal and static loads which confirmed laboratory predictions. The experimental reinforced plastic house will be erected at Disneyland, Calif., in May for demonstration to the public. Monsanto Chemical Co. and Owens-Corning Fiberglas Corp. will make available data developed in tests on plastics for architecture.

CYANAMID

PLASTICS NEWSFRONT

CYMEL* IN ELECTROSURGERY

High-frequency current flows between two sharp electrode tips in the 789 Bi-Active Coagulation Set used by physicians for removal of cervical cysts, tonsils and surface growths. The Birtcher Corp. of Los Angeles encases the electrodes in mineral-filled CYMEL Melamine Molding Compound because of its excellent insulating properties and smooth flow into the mold which simplifies accurate spacing of the tips. Handles and cord tips are molded of alpha-cellulose-filled CYMEL, also an excellent insulator. All surfaces are exceptionally hard, chip resistant and can be sterilized easily. *Trademark



MODERN TOUCH IN WIRING DEVICES

Home styling today favors light, cheerful colors. This note is carried out perfectly with wiring devices molded of ivory-colored BEETLE® Urea Molding Compound. Its hard, smooth surface resists discoloration and scratching, and safe dependable service is insured by BEETLE's excellent insulating properties.

WOOD CHIPS BUILD A WALL

These attractive panels are made of wood particles bonded with MELURAC® Melamine-urea Resin. This low-cost particle board has good warp resistance, flexural strength, moisture resistance and easy working and finishing properties. In addition to structural uses—walls, sliding doors, partitions, ceilings, subflooring, parquet flooring—it is ideal for furniture core and underlayment of decorative melamine laminates. MELURAC 304, developed expressly for this use, imparts no color and improves strength of the particle board.

1907 1957

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edited by George Nelson. This big volume brings fresh answers from all over the world for one of today's most common problems—more storage space in contemporary living arrangements. Covers shelving, special purpose storage, unit cases, architectural storage . . . with practical new solutions and ideas that make imaginative use of space. The author's analysis of each piece is detailed and perspective. Bound in full cloth, 176 pages, 9 x 12 inches, 303 illustrations. $12.50

Display

edited by George Nelson. Here are the ingenious and remarkable displays that have set new patterns in interior design thinking and techniques . . . in shops, showrooms, museums, exhibitions—wherever creative designers have put ideas into three-dimensional designs to "show something." Display shows new systems created by more than 125 top designers and architects. Bound in full cloth, 192 pages, 9 x 12 inches, 312 illustrations. $12.50

Chairs

edited by George Nelson. In this book of design, the author traces the evolution of the chair and examines chairs produced today in bentwood, laminated wood, molded plastics, solid wood, metal and upholstery ... by 137 top designers. Lively reading, and an important reference source, Chairs takes up new application of materials . . . technical inventions in furniture. Bound in full cloth, 176 pages, 9 x 12 inches with 433 illustrations. $10.00

Living Spaces

edited by George Nelson. The only complete collection of interiors based on the new philosophy of *freedom to use space for living as one well pleases!* Presents contemporary interiors by 81 leading designers, including Finn Juhl, Le Courbusier, Mies van der Rohe, Richard J. Neutra, Frank Lloyd Wright. A great source of fresh ideas for interior designers, architects, manufacturers, retailers, home owners. Bound in full cloth, 148 pages, 9 x 12 inches, 232 photographs. $7.50

Package Design

by Ladislav Sutnar. This book makes package design come alive —outlines in pictures and commentaries the potentialities of package design for selling a product. Package Design clarifies the expressive power and drama of the visual elements of the package, especially with regard to changing selling conditions. The author, a designer of international repute, throws a spotlight on some 500 practical examples of package design from world-wide sources, from food to luxury products. 128 pages, 12 x 9 inches, 545 illustrations. $9.75

Anatomy for Interior Designers

by Francis de N. Schroeder. This important book gives you 1,321 essential measurements every designer needs . . . in clear, dimensional drawings that can save hours of research! Diagrams give measurements of the human body in terms of requirements for design of furniture, storage space, home products and equipment. Includes a significant section entitled: How To Talk To A Client! Bound in full cloth, 96 pages, 9 x 10½ inches, filled with sketches and diagrams. $4.00

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Cadillac plastic awards announced

The Cadillac Plastic & Chemical Company contest for thermoplastic rod and tube applications was dominated by designers in nylon and cast acrylic tubing. First prize of $1,000 went to William Gould of Keystone Plastics, Inc., for a nylon sleeve designed to cold flow into a seal between work, bolt and nut (2-3), which was cited by the judges "for turning to an advantage one of nylon's less desirable properties—its cold flow." The student first prize of $250 was awarded to Calvin Lee Payne, Jr., University of Cincinnati, for a sliding joint of nylon tubing cited as "simple and marketable, filling a need now present in any piece of collapsible furniture or machinery." Payne also won one of the two student second prizes for a decorative screen of acrylic half-tubes threaded on poles, which showed "good imagination, though cost would militate against mass production."

The $150 second prize for an industrial product in the open contest went to Alexander S. Kellner, Controlled Atmosphere Enclosures, Inc., for a square air lock with rounded corners (1) as a research enclosure. Formed from a cast acrylic cylinder, it was commended "for producing a shape necessary to the application which could hardly have been produced in any other way." Third open prize of $150 was won by Martin H. Pollack for an ion exchange purifying unit of acrylic tubing manufactured by Enley Products, Inc. (4), "for its wide range of possible applications." The $75 student second prize was presented to Carl Hall, State University of Iowa, for a transparent clock with dial and case made of two acrylic cylinders, which showed "high style at low cost."

The contest was judged by Professor John Arnold of Massachusetts Institute of Technology, George Beck, industrial design manager of the Light Military Electronic Equipment Division of General Electric Company, William T. Cruse, Executive Vice President of the Society of the Plastics Industry, Inc., Hiram McCann, editor of *Modern Plastics*, Jane Fiske Mitarachi, editor of INDUSTRIAL DESIGN, and Jean Reinecke of Reinecke & Associates.

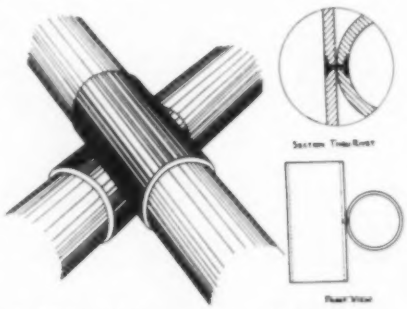
Prize winners were announced at the Industrial Designers Institute convention in Los Angeles, and winning entries were put on display there.

Godscholl

Awards

Charles H. Godscholl, Manager of Tooling and Tool Engineering for the Government and Industrial Division of Philco Corporation, was awarded the Distinguished Service Award by the U. S. Navy Department for his work in the development of a new anti-submarine weapon. The citation, the second Mr. Godscholl has received from the government, mentions the application of "extensive experience in industrial design" in translating research into production of complex underwater ordnance weapons.

The international competition for design of the official poster of the Eleventh Triennale was won by painter **Eugenio Carmi** of Genoa, Italy.



Cadillac plastic contest winners: above, sliding joint of nylon tubing; below: 1) air lock for research enclosure; 2-3) cold-flow nylon sleeves; 4) ion exchange purifying unit (right).

Donald Levy, University of Illinois art student, has been given a $500 Motorola Scholarship as the outstanding junior in industrial design. The award, based on high scholarship and artistic promise, is given at Illinois each semester by the Motorola Corporation.

Levy

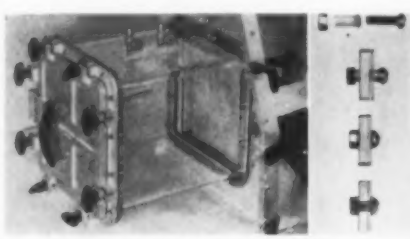
Contests

The **Industrial Designers Institute** has announced its **Seventh Annual Award Program** for mass-produced products submitted on behalf of an individual designer or design team. Awards of gold medals and citations will be made June 20, 1957, and entries may be submitted until May 5 on forms available from Walter C. Granville, 38 South Dearborn St., Chicago 3, Ill.

Cash prizes in the **Second Annual Allmetal Stainless Steel Awards** competition will be increased to $1,500 by the sponsor, Allmetal Screw Products Company. The awards will be presented for the best case histories describing the use of stainless steel fasteners as an ultimate cost-reducing or sales-increasing factor in product manufacturing. Entry blanks are available from Allmetal's Awards Committee Secretary, 821 Stewart Ave., Garden City, L. I., New York. Deadline for all entries is June 1, 1957.

Hess Brothers' annual **Versatility in Design and Use Contest** is open for the sixth time to manufacturers, designers and inventors of multi-purpose products. The competition categories include housewares, home furnishings, new products, clothing and general equipment. Deadlines have not yet been set, and entries may be submitted to the Hess Brothers Awards Committee, 152 West 42nd St., New York 36, N. Y.

The Second Exhibition of Award Furniture and International Furniture Competition of Cantu, Italy, is open for entry forms until April 15, 1957. Plans for furniture in six categories must be postmarked not later than April 30. Address: Seconda Mostra Selettiva e Concorso Internazionale del Mobile, Cantu, Italia.



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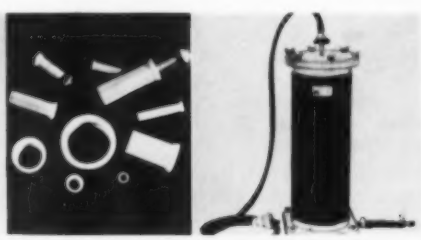
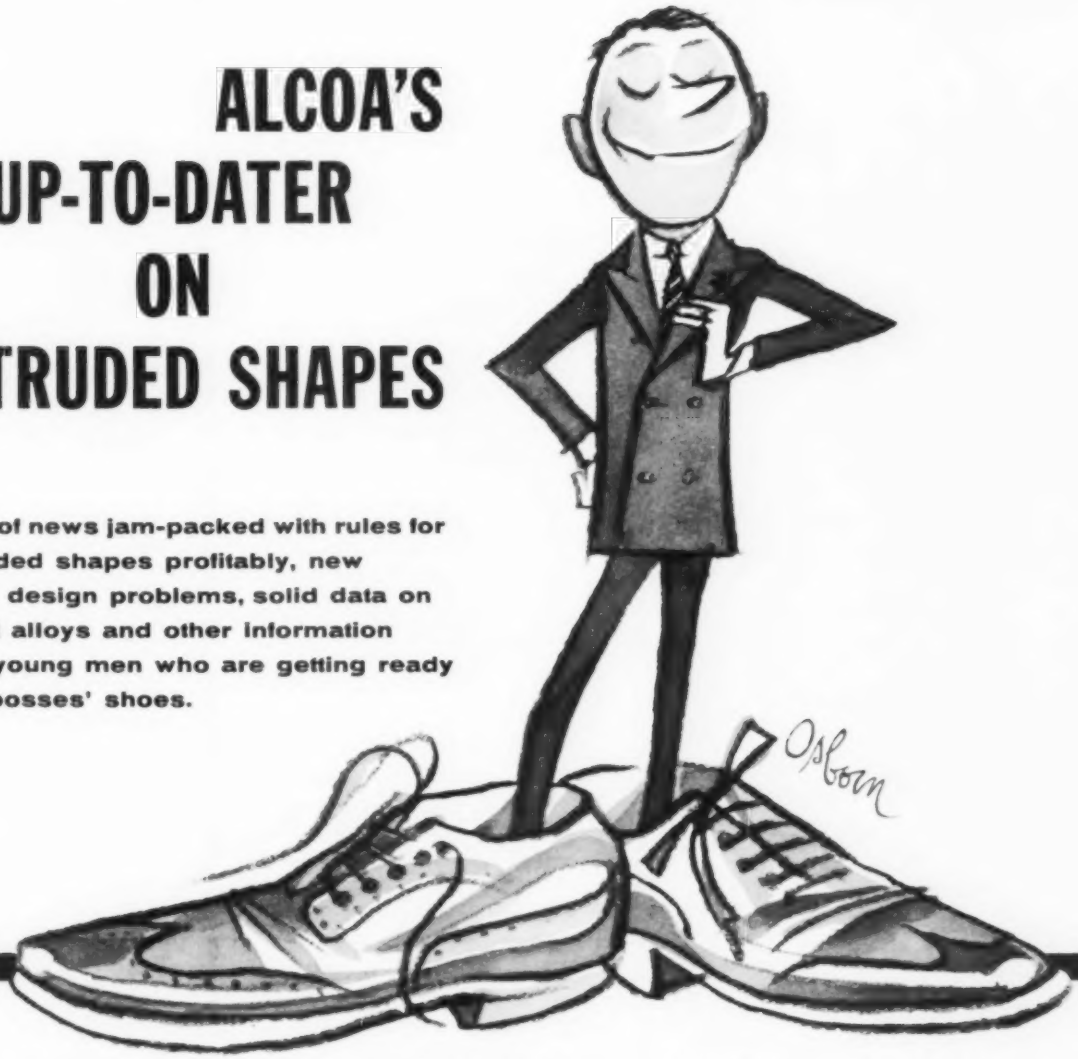


3 4

ALCOA'S UP-TO-DATER ON EXTRUDED SHAPES

Four pages of news jam-packed with rules for using extruded shapes profitably, new solutions to design problems, solid data on costs, latest alloys and other information for today's young men who are getting ready to fill their bosses' shoes.



here's the rule book for using extruded shapes to save time, trouble, money.

In a nutshell, the biggest rule is: when you have a complicated cross section, it can usually be made as an extruded shape—and much more economically. Then, too, an Alcoa® Extruded Shape adds strength without adding weight. It cuts out welding, roll forming, riveting and eliminates costly machining. Here's how:

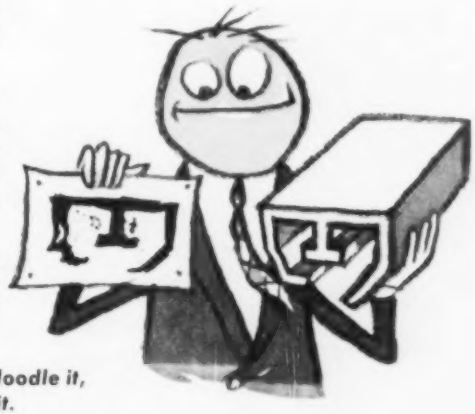
1. Instead of using standard rolled shapes such as angles or I beams, consider a made-to-your-design extruded shape. It allows you to put the metal right where you want it and need it. Take a long column, for instance. An extruded shape with a cross section like a capital **C** will support almost twice the load as will a standard channel of the same dimensions—and with less metal. Weighs less, too. Frees your imagination from standard shapes.

2. If you're building up sections using welded, riveted or crimped construction, take a hard, cost-reducing look at extruded shapes. Eliminate cost-increasing assembly work, cut out the chance for human error, save the money spent for jigs or crimpers.

3. If you're machining bars or rod into special angles, T beams, or other special long shapes, extrusions can be far less costly. Time-killing, costly machining is gone—so is scrap generation.

4. If you've got a small part with a cross section that can be drawn in one plane, it can be extruded even if it's complicated. Lots of them can be made at one time in the long length. Then, the pieces are just sawed off, like slicing bread.

If you can doodle it, we can do it. If you can sketch the cross section, we can extrude it. All we need to start helping you is your sketch and invite.



if you can doodle it, we can do it.

advertisement

What's new in problem solving?

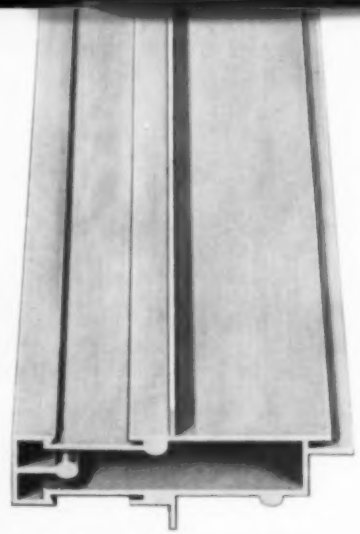
Virtually every shape extruded in our five extrusion plants is new—a problem solver to a designer and his company. Across the top of the page are a few recent examples that we think interesting. Use them as idea starters.

corkscrew extruded: spiral ribs

Here's an interesting extruded shape—a hollow tube with eight ribs spiraling down the outside. (We are making six- and 12-rib ones, too). It comes out in a long tube 20 feet long, six in. in dia. Alcoa's diemakers and extrusion experts worked it out so the extrusion actually spirals out of the die.

extruded sunshades

Here's another special architectural shape, used for louvers or sunshades that are electrically operated and clock controlled to follow the movement of the sun. They run vertically over window walls. Light weight, high reflectivity, beauty, natural resistance to weather, are reasons why aluminum is the metal. For economy, Alcoa extrudes in three pieces, which are dovetailed together during erection to make a louver 12 in. wide, 1½ in. thick. Walls are 0.063 in. thick.



complex extruded shape: special stool

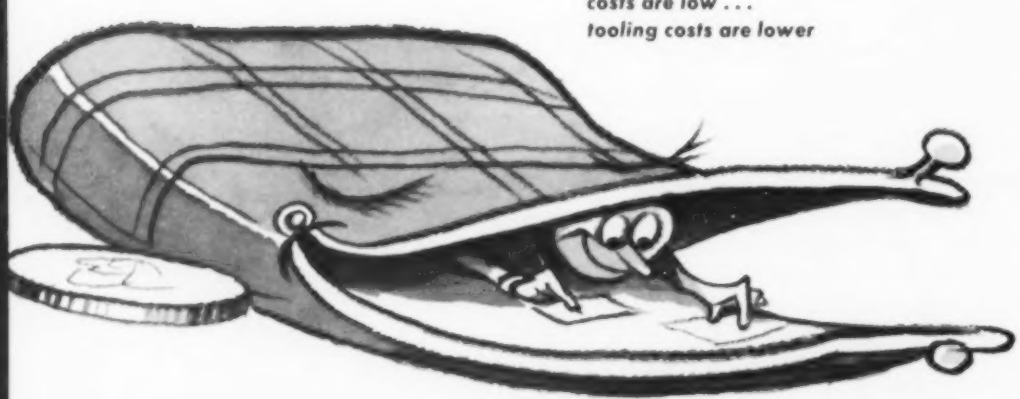
Typical of the many special architectural shapes is this special 5½-in.-wide "stool," a horizontal member used in a curtain wall building. Top slot takes the glass panel stop; bottom one, the aluminum panel stop. Inner key with knob is made with special tolerance of ± 0.005 in., takes fastener from vertical member. An extruded shape is the only practical way to make it. Bright, clean, rustproof Alcoa Extruded Shapes are universally used in building design. And color—an integral part of the metal surface—can be added. Maybe your shape isn't as complicated as this part, but we bet this example starts your imagination running.

Costs?.....

When a designer turns to extruded shapes for the first time, he's sure costs are going up. Usually, he's looking at extrusions because he thinks his part would be impossible to make any other way—or because its costs are great in fabrication assembly. It's always a big, pleasant surprise when he finds out that base costs are low. Tooling for an extruded shape is usually less than it is for other fabrication methods—casting, forging, stamping, special roll forming, or full machining.

Die charges for average solid shapes: one fitting inside a 3-in. dia. circumscribing circle—a

costs are low . . .
tooling costs are lower



advertisement

corner post: steel, 6¼ lbs/ft; aluminum, 2½ lbs/ft

Here's a special truck-body shape used as a vertical corner post. It replaces a formed steel post. In steel, it weighs 6¼ lbs / ft; rustproof Alcoa Aluminum Extruded Shape: 2½ lbs / ft. Cost and strength about the same. It's easier to handle during assembly. When used as roof rail, it is available in one long length. In steel, the forming tool limited the length, making welding necessary. Better check on the cost-reducing possibilities in your rolled steel forms. Many designers are turning to structurals extruded by Alcoa—reasons: rustproof, light, strong, available.

extruded 1,000 feet long

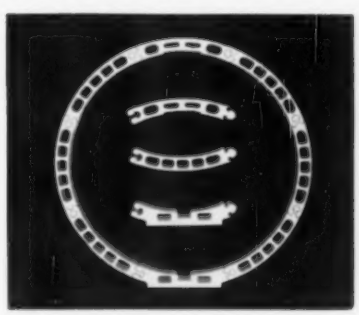
We're often asked how long and big an extrusion can be. 10-30 feet is usual, although that is often exceeded; 110 feet and more is possible.

Here's an extra-long one, 1,000 feet. It's 2-in. dia. cable sheathing, continuously extruded by Alcoa in a piece almost 1/5 of a mile long. Alcoa research and improved manufacturing methods made it possible. It's coiled on big reels, shipped to the cable plant where it is drawn over the conductor. Replaces a lead application because of price, weight, availability, strength.

other idea sparkers

Other unusual extrusions that may spark an idea: wide integrally stiffened, ribbed panels that are extruded as a "V" configuration, then flattened and processed to make a wider panel than the presses could make. The 14,000-ton press makes pieces 40 in. wide by this method. Another reason for "V" construction: costs are partly dependent on the size of the circumscribing circle. Also a "V" shape can be made on a smaller press than would be needed if it was extruded flat. Dovetail, tongue and groove, shiplap, offset couplings, snap-fit joints are ways to multiply width without multiplying costs.

Alcoa often extrudes ribbed panels in narrow width components to cut costs and obtain thinner panel cross sections. Then they are roll-locked (up to 24 in. wide) prior to delivery. Shapes, extruded in sections to interlock with each other, are commonplace cost cutters in our plants. Here's a "for instance." Eight special shapes, 1½ in. thick, dovetail together to make a complex 20-ft tube, 23½ in. in dia.



Previously, it was made by rolled plate riveted up into an assembly. Cost, when made as Alcoa Extruded Shapes, was slashed tremendously.

...here's the factual story

little over $100; inside a 6-in. dia. circle—less than $400. Semihollow and hollow shapes run higher.

Other cost factors: shapes cost more as they get thinner; the further you go from a symmetrical shape, the higher the cost. Sometimes, the higher cost per pound of a thin section makes sense economically since the real cost is per foot or piece.

standard stocked shapes and dies

So far, we've been talking about special shapes to your designs, but that's not the whole picture. Alcoa maintains stocks of many standard shapes at its distributors around the country—angles, bars, channels, H beams, I beams, tees, zees, etc. Hence, shapes, with high mechanical properties and smooth, bright finish obtained by extruding, can be had quickly—and without die charges. Certain architectural, truck-body and aircraft shapes are also stocked at distributors. Also standard (without charge) dies are maintained at the plants and available for mill production. Information on stocked shapes and available dies is as close as your phone. Use it to call your Alcoa sales engineer.

small parts...dozens at a time

Often, small parts with one-plane cross sections can be made cheaply by extruding long lengths and then wacking off the parts. They are just sliced off like bread. Torque converter blades are a good example. They have a special tolerance of ± .002 in. on the ordinates. Individual blades are cut off from long extrusions (they look like longitudinal slices of bent teardrops). Then they're tumbled, drilled and pin-installed on the stator or turbine. Previous method was milling from bar stock. Costs and scrap loss are cut.

what's new in alloys?

Biggest news is the availability of super-strength, hard alloys 7178 and X7079 for extruded shapes. Aircraft and missile designers are giving them their biggest play. Alloys 7178 and X7079 are a lot harder to extrude, a burden to the die designer . . . so costs are up. But so are the properties.

Here's a handy table of mechanical properties of the normal extrusion alloys in usual tempers. Where a range is given, properties depend on certain factors (thickness, area, etc.). To find out the properties possible with your design, check your Alcoa sales engineer. For any help on the proper alloy for your best balance between performance and costs, he is your great aid. Let him counsel with you.

Extrusion Alloys, Minimum Mechanical Properties

Alloy	Temper	Ultimate Strength psi	Yield Strength psi	Elongation % in 2"
3003	0	—	19,000	25
2014	0	18,000	30,000	12
	T4	35,000	50,000	12
	T6	53 to 58,000	60 to 68,000	6-7
2024	0	19,000	35,000	12
	T4	42 to 52,000	57 to 70,000	8-12
6061	0	16,000	22,000	16
	T4	16,000	26,000	16
	T6	35,000	38,000	10
6062	0	16,000	22,000	16
	T4	16,000	26,000	16
	T6	35,000	38,000	10
6063	T4	10,000 (1)	22,000 (1)	14 (1)
	T42	10,000 (1)	17,000 (1)	12 (1)
	T5	16,000 (1)	22,000 (1)	8 (1)
	T6	25,000 (1)	30,000 (1)	8-10 (1)
7075	0	24,000	40,000	10
	T6	68 at 72,000 (2)	78 to 80,000 (2)	6-7 (2)

(1) 0.500 in. and less, thickness
(2) 5.000 in. and less, thickness; maximum areas 32 sq in.

cry to the designer:
up performance,
down costs,
beat competition

straight talk

Today's big cry to the designer is: up performance, down costs, beat competition. Often, his answer lies in Alcoa Extruded Shapes. The way to start? Call your Alcoa sales engineer. He's listed under "Aluminum" in the Yellow Pages. He can contribute good, solid technical thinking at any stage of your project. The best time to call him in is at the "pre-drawing board" or "doodle" stage. Use him—that's his job.

He'll have a copy of the new booklet, *Alcoa Aluminum Extruded Shapes*, under his arm for you. It's packed full of technical data and tables to make your work lighter. If your work is in aircraft, involves really big extrusions, or extremely thin sections, he'll trot out your copy of Alcoa's new 36-page design book on the design horizons opened by the 14,000-ton press. Or write for your copy of either booklet; better yet, write for both. ALUMINUM COMPANY OF AMERICA, 1909-C Alcoa Building, Pittsburgh 19, Pa.

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Events

The Institute of Contemporary Art in Boston will hold a design conference on "Integrated Design for Company Identification" on March 27. Representatives of Ansul Chemical Company, Boston and Maine Railroad, Corning Glass Works, General Electric Company and Reynolds Metals Company will present case histories of their identification programs. The conference is open to all, and tickets are available from the Institute at 230 The Fenway, Boston 16, Mass.

The Midwest Chapter of the **American Society of Industrial Designers** will sponsor on March 25th a symposium on design in the home, in connection with the Modern Living Exhibition at Navy Pier, Chicago, March 23-31.

The Inter-Society Color Council's annual meeting will be held at the New York Statler on March 5 and 6. The program will center on the recent history of consumer color choice.

The American Management Association will hold its 26th Annual National Packaging Exposition and Conference in Chicago, April 8-11, to coincide with National Packaging Week.

The Second Design Engineering Show and Conference will be held at the New York Coliseum, May 20-23. The exhibition will be one of the five largest industrial expositions of the year, and discussion sessions will include "Procedures in Developing New Designs," mechanical, materials and electrical aspects of machine design, and Product Planning.

The Detroit Chapter of the **American Society of Industrial Designers** will turn the tables on the customary meeting of auto stylists and designers. A program on current design trends in architecture, product design, transportation, the home and packaging is scheduled for May 22. The meeting will be preceded by a question-and-answer period at General Motors Styling Center, with designer-panelists answering questions put by members of the GM Styling Division.

The first **U. S. World Trade Fair** to be held at the New York Coliseum from April 14th to 27th will display the wares of some 3,000 exhibitors from 41 nations to the American trade. One of the largest international expositions to be held in this country, it will enable an anticipated 100,000 buyers to shop the world market in nine product classifications.

The Survey Research Center of the **University of Michigan** will hold its annual summer Institute in Survey Research Techniques from July 22nd to August 17th, with an introductory session from June 24th to July 19th. For further information address the Survey Research Center at the University, Ann Arbor, Michigan.

Company news

The Copper and Brass Research Association has launched a program to extend the use of tape Solid Copper and Solid Brass labels used to distinguish these products from those that are plated.

The Air Conditioning Division of **Servel, Inc.**, is going into production with an oil-fired all-year residential air conditioner which heats and cools from a single unit.

Vauxhall Motors, Ltd. (the General Motors subsidiary in England) has a new car, the Victor, a 4-door, 4-cylinder model which is smaller than other Vauxhall models.

Stainless steel production reached an all-time high in 1956, according to the **Committee of Stainless Steel Producers, American Iron and Steel Institute.**

Servel, Inc. announced that three out of four of their family-size refrigerators sold in 1956 were equipped with automatic ice-cube makers.

General Motors production for 1956 was 3,699,144 passenger cars and trucks. This compares with 4,649,276 units for 1955.

A new product clearing house which arranges contacts between American and foreign manufacturers has been established by the **International Patent Exchange** of 594 Edgewood Ave., Elmhurst, Illinois.

The Brunswick-Balke-Collender Co. and the **Mengel Co.** are collaborating on the manufacture of pre-fabricated closets which form a wall for institutional applications.

General Motors plans a new foundry for the manufacture of aluminum castings for automotive parts near Massena, New York.

Reynolds Metals Company will construct an aluminum plant in the same area to supply it.

International Business Machines has established a scholarship program in memory of its late board chairman, Thomas J. Watson. Some 200 awards will be made each year.

Griffiths

Eilers

People

San Francisco's **Smith and Tepper Design Associates** have been retained by the Applied Electronics Company of South San Francisco and Rutherford, New Jersey, as general design consultants.

Four new trustees for the Detroit Chapter of the IDI have been announced by chairman Carl Reynolds: **H. Creston Doner**, Director of Design and Color at Libbey-Owens-Ford Glass Co.; **W. B. Ford, II**, President of the W. B. Ford Design Corp.; **Aarre K. Lahti**, Associate Professor of Design, University of Michigan; and **John Najjar**, chief Lincoln stylist, Ford Motor Company.

Nelson Rockefeller succeeds **John Hay Whitney** as Chairman of the Board of Trustees of New York's Museum of Modern Art. Mr. Whitney has been made U.S. ambassador to England.

Don Dailey has added **Fred Eilers**, former product manager of refrigeration at Servel Corp., to his design staff.

Belle Kogan Associates are newly located at 145 East 35th St., New York 16.

Peter Muller-Munk has been appointed planning consultant on the American exhibits at the Brussels World's Fair of 1958. Mr. Muller-Munk will advise on both the basic theme of the American exhibit and specific methods of presentation.

Larsen

Industrial designers **Lily Gruen** and **Jo Zepel** are publishing a series of articles in *Beauty Fashion* on "The Evolution of Cosmetic Packaging." The articles trace the history of art and technique in the great civilizations of the world, and will conclude their series this Spring with a study of modern packaging.

Whirlpool-Seeger Corporation has promoted **Otto Krauss** to the newly created position of Director of Manufacturing Research.

The Convair Division of General Dynamics Corporation has retained **Harley Earl, Inc.** and **Dorothy Draper, Inc.** for interior design and styling of the Convair 880 jet passenger airliners.

Designers for Industry, Inc., of Cleveland, have promoted the following to the position of Project Manager: **William Albertson, B. D. Fredrico, Walter Hood. Guilbert Hunt** was appointed a Project Manager and Director of Industrial Design.

Raymond Loewy Associates have made **Roy Larsen** (head of their Graphics and Package Design Division) a Vice President and partner.

Gary H. Griffiths, formerly of the Ford Styling Department, is the new head of the Industrial Design Department at Alabama Polytechnic Institute

Smooth, "warm" surface for metal chair, colorful wrinkle finish for car-trunk liner

New "finishing touch" for surfaces— spray 'em with vinyl

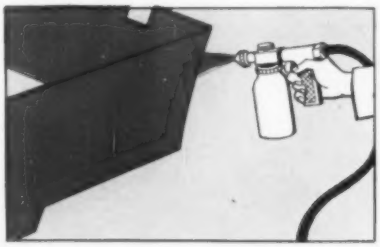
New vinyl dispersion finishes—sprayed on—give you entirely new ways to use plastic coatings in product design. You can use colorful vinyl spray coatings for metals, fabrics, paper or paperboard, foil, many other surfaces. Sprayed vinyl gives you every effect that "conventional" finishes can offer—wide color choice . . . high luster or dull sheen . . . matte . . . even wrinkle finishes. But vinyls give you much more.

Sprayed vinyls give you these unique features . . .

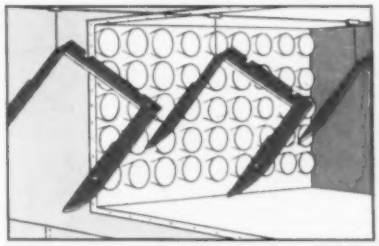
- *pleasing warmth to the touch*
- *sound- and vibration-muffling qualities*
- *unsually high abrasion resistance*
- *high resistance to acids, alkalis, solvents, cleaners*
- *insulation against electricity, heat, cold*

To build in the end-product qualities you want: Simple spray-coating process offers you various methods to control and modify the coating.

Consult your supplier for exact formulation—Your supplier can "tailor" the vinyl formulations to your exact requirements—speed of fusion; gloss, matte, wrinkle texture; resistance to soapy water; high scuff resistance; and many other features. You have wide latitude in choice of processing characteristics and product traits.



Excellent adhesion with simple process—Primers usually are not necessary unless you spray metals. For metals, just spray primer, let it dry. For even better adhesion, bake primer dry.



To control wear and finish—Simple *moderate* baking after spraying is sufficient to cure. Varying the time and temperature gives you still more opportunities to control characteristics of the coat.

Monsanto manufactures plasticizers and vinyl resins but does not produce or distribute the finished spray-coating formulations. For a list of manufacturers of plastisols or other solution and dispersion forms of vinyl, write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, Dept. ID-8, St. Louis 1, Missouri.

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The IDI Design Award is a token of recognition bestowed on a designer or a team of designers for outstanding design of any product mass produced prior to May 5, 1957. The award is open to all designers, regardless of affiliation.

submissions Entries may be made either by the designer himself, or by anyone else on behalf of the designer. Copies of the submission form are obtainable from the address below.

presentation Announcement of the designers to be honored and presentation of the award medals will be made at a luncheon on June 20, 1957, at the Sarah Siddons Walk, Hotel Ambassador East, Chicago.

deadline Forms must be returned postmarked not later than May 5, 1957.

PAST RECIPIENTS OF IDI DESIGN AWARDS

1956 William E. Clements
Jon W. Hauser, ASID
George W. Walker and Elwood P. Engel, IDI, and Joseph Oros, and Eugene Bordinat, jr. IDI, and Herbert Tod, IDI, and Rulo N. Conrad, IDI and John Najjar, IDI.

1955 James G. Balmer and Carl B. Denny and Frederick W. Hertzler of Harley Earl, Inc.
Randall D. Faurot,
Richard Montmeat, IDI

1954 Dave Chapman, ASID
Franz Wagner, ASID and Richard Latham, ASID and Don De Fano of Raymond Loewy Associates.

1953 Donald Dailey, ASID
Carl Otto, ASID, IDI

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

1951 George Cushing and Thomas Nevall, IDI
Charles Eames
Carl Otto, ASID

the Industrial Designers' Institute announces

the 7th annual design award program

Request forms from Walter C. Granville, Chairman, 1226 North Dearborn Parkway, Chicago 10, Ill.

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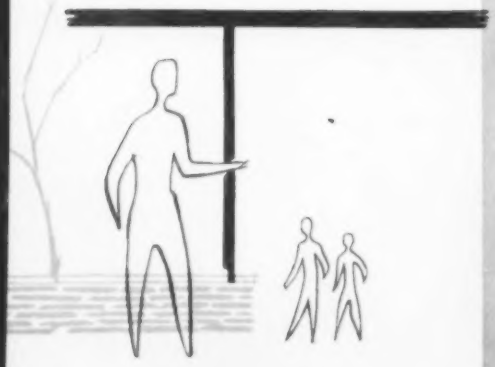


demand VERSUS supply

Is there a solution to the self-defeating pattern of industry's annual school search for design personnel?

Spring is the traditional Open Season on Seniors. Personnel scouts from all corners of industry pack up their glowing job opportunities and head for campuses, seeking scientists, engineers, business graduates and—more and more in the past few years—designers, too. In all these fields today, employers find themselves competing hotly for talent. But what is worse, most of them are stealing talent from themselves.

The good old law of supply and demand breaks down when the preoccupation with current demand starts to dry up the source of supply. And the scramble for design talent has begun to take this ironic twist: employers are not just competing among themselves; they are competing with the very schools they rely on to provide their annual quota of designers. The promising design graduate of 1957 will have his choice of jobs at starting salaries that often exceed what his instructors earn—or probably ever will earn, unless they abandon the classroom.

As the director of one school's design department put it recently, "Every time a student interviewer comes around, I'm terrified I'll lose an instructor. And viewing what they have to offer the boys," he added wistfully, "I'm half afraid I'll begin to be tempted myself."

Teaching, of course, has always attracted people with other than monetary incentives. Thus if the incentive to teach design is withering today, it can't be blamed on the salary situation alone. Nor can it be solved by the educators alone. There are fewer and fewer good teachers of design, in a period when more and more are critically needed, because design teaching has been made less glamorous than the practice toward which it aims. Employers' attempts to buy away teachers is both physically and psychologically self-defeating: it conveys the profession's low regard for the profession it depends on.

Almost every professional area has suffered from this exodus. Some of them—science and engineering most recently—have been forced to find ways to equalize the rewards of preaching and practicing. Such solutions are never easy or ready-made, but some of the steps taken in other fields suggest what might be done. These are only a few measures that are within the reach not only of industry but design offices that recognize the need to correct this trend—in their own interest as well as in the long-range interest of the design profession:

1) The teaching endowment—which means establishing a chair or professorship at a given salary—costs the endower no more than one extra man on the payroll; it allows the school to pay a top man the salary he might normally earn in the business world.

2) A corollary method of endowment—one with hazards but also possibilities—is for firms and offices to free selected designers on their payroll for a given number of teaching hours.

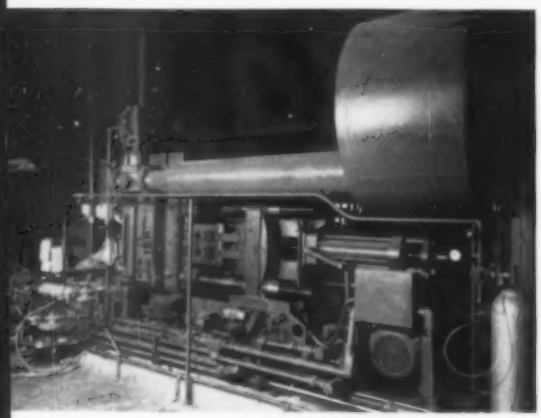
3) A method favored by schools that receive general endowment, from industry or from individuals and alumni, is to have donors earmark a specific part of such funds for instructors' salaries, to assure the improvement of teaching along with plant and equipment.

Whatever methods are devised to boost design teaching incentives, employers would do well to ponder their part in supporting them. Shouldn't it be possible for their personnel scouts to harvest the campuses this season without laying waste next year's crop?—*j. f. m.*

Method

1 **VACUUM DIE CASTING**

may lead to more versatile and less expensive castings



Method

2 **CONTINUOUS STRIP GALVANIZING**

is mass-production finishing that cuts fabrication time and costs, increases output and the application of galvanized steel

Method

INTERCAST PROCESS **3**

is a new one-shot method of producing movable parts already assembled

Second in a series on industrial techniques

Zinc: fabrication news

When one workhorse material is credited with three new developments, each hard on the heels of the others, it is time to look at that material, no matter how long it has been in use or how mundane its applications. The three methods illustrated on these pages are new and significant advancements in the fabrication and use of zinc. Individually they are noteworthy and combined they certainly prove that it *is* possible to teach an old metal new tricks.

1. VACUUM DIE CASTING is still under development but promises to improve the quality of zinc castings and eliminate some design limitations.

2. CONTINUOUS STRIP GALVANIZING is rapidly replacing other methods for mass-production of galvanized steel—a major contribution to faster and more economical production.

3. INTERCAST PROCESS, a challenge to the imagination, turns out in a single operation objects with movable parts, assembled and working, like the chain on the right whose links are mysteriously interlocked yet free to move.

Over a million tons of zinc are used every year in die castings, rolled into sheets, strips and plates, and as coatings for steel in its familiar galvanized form. Zinc's combination of characteristics makes it the most widely used die casting material, leading aluminum, magnesium and copper alloys: it has a low melting point which increases die life and casting speed, and lowers cost; it has high impact strength (higher than all other casting alloys except copper); it is readily finished with electroplating or organic coatings; and it is available—a vital consideration at this time when many materials are in short supply.

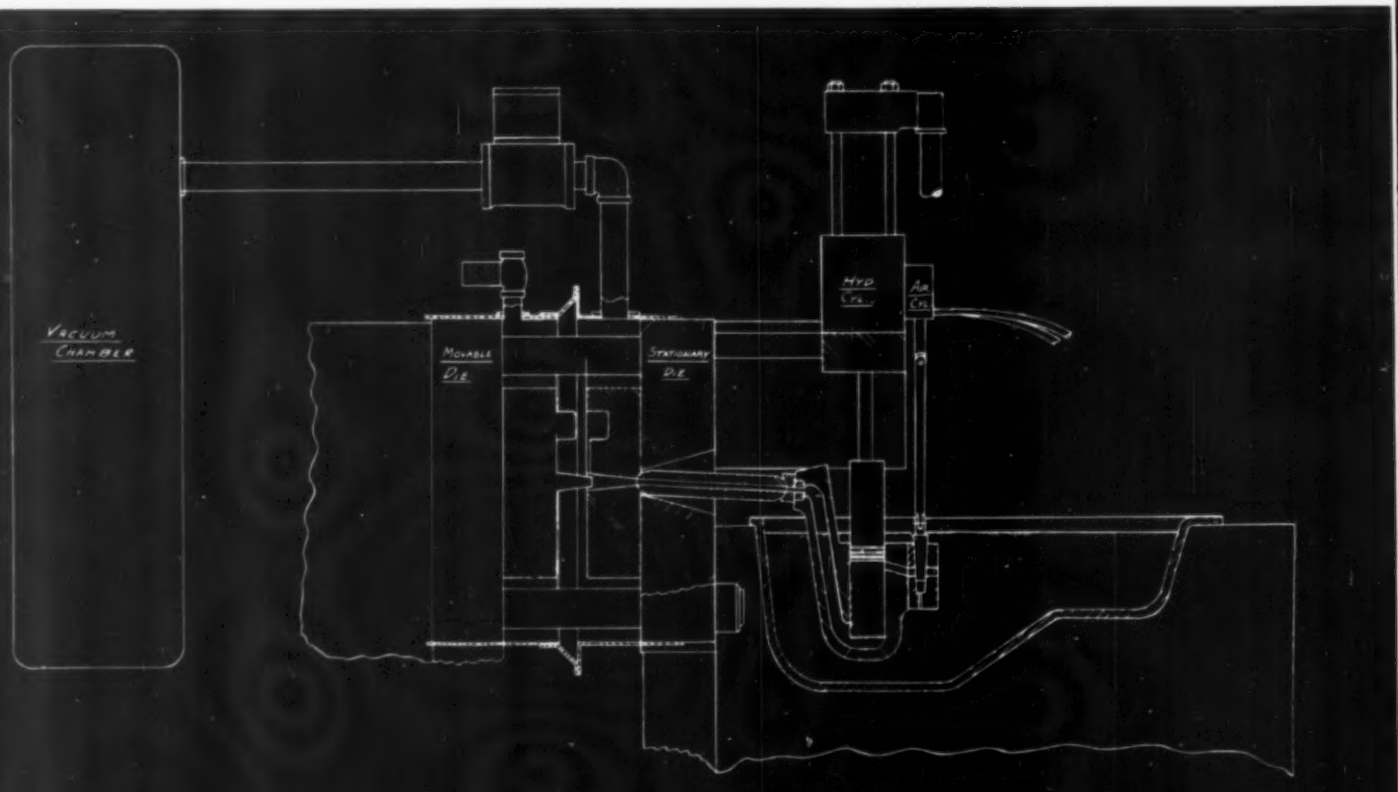
Details of the three new methods are presented on the following pages as part of a review of standard techniques used in the fabrication of zinc, showing how it may be better designed, in a variety of forms, into today's products.

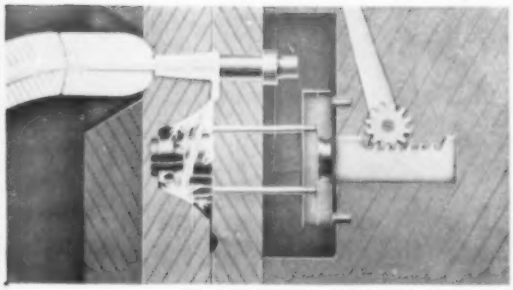
DOUGLAS G. MELDRUM

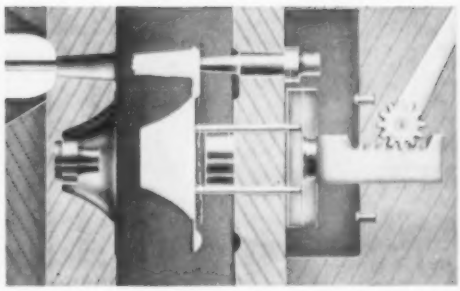
1 VACUUM DIE CASTING

Until recently even the experts hesitated to take a firm stand on the possibilities and limitations of vacuum die casting zinc. Recent runs, however, have increased the confidence of men connected with the development and, although they are aware that the ultimate has not been reached, they are convinced of the practicability of the new process.

In the development of the Vacucast Process, as it is known, mechanical difficulties included designing a system with a vacuum box to contain the die that could be opened and closed with each cycle. It also had to permit molten metal to flow into the die without breaking the vacuum. Credit for the invention goes to David Morgenstern, a colorful engineer who plays the cello professionally as a contrast to his responsibilities as vice president of Nelmor Manufacturing Corp., Euclid, Ohio. Last year, Reed-Prentice Corp., a machinery manufacturer in Worcester, Mass., became interested and obtained the exclusive right to equip die casting machines with the Vacucast attachment. A few units were put into the field to be used under production conditions, and experienced die casters like Lee Radke at Lee Silver Service in Detroit nursed them through some painful mechanical changes until satisfactory results were obtained. Castings made under vacuum show improved tensile strength, lower porosity, better detail, and finer surfaces than castings without vacuum. Other benefits include higher production (minimum increase 25%), fewer rejects (reduced from 50% to 2% in some cases), and less metal required for castings as gates, vents and overflows can be cut down. Full advantage of casting zinc under vacuum will not be realized until products—and consequently dies—are designed specifically for the process, incorporating the thinner wall sections, deeper bosses, lighter weights with comparable strength that the process makes possible. This will necessarily be a gradual process, but greater flexibility for zinc die casting is definitely in the future.





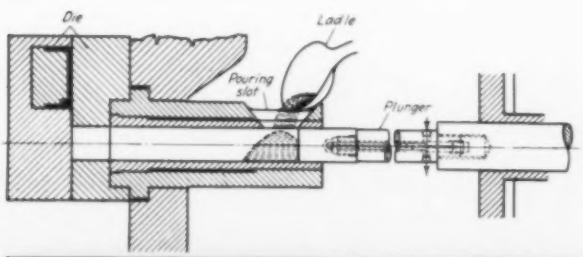


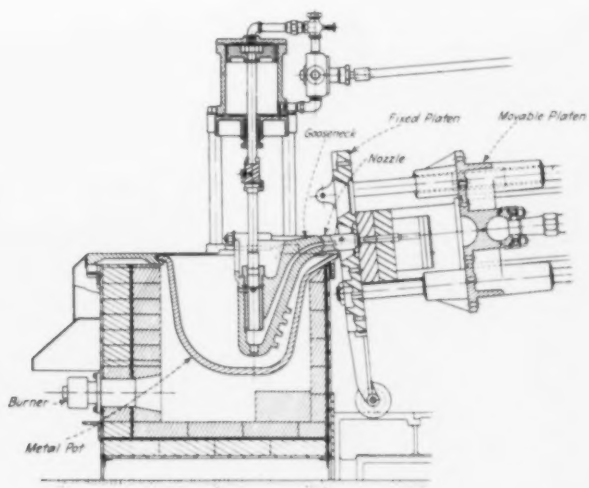
The die is, of course, the heart of the die casting process. Its precision determines the detail of the thousands of identical parts that will be formed in its cavity. As a rule, single cavity dies are used for large parts, but for smaller castings, dies with several identical cavities known as "multiple cavity" dies, or "combination" dies with two or more differently shaped cavities can be used to cast more than one piece at a "shot."

The cross-sectional drawings above show molten metal flowing into a closed die and the die opened with the casting freed by ejector pins. In the photograph on the right, the male side of a die for an automobile grille has its ejector pins extended. Some dies, for castings that have undercuts or other design features that make them impossible to remove from the die in solid form, must have movable parts, which is expensive but sometimes necessary.

Die casting today is almost completely automatic, particularly when zinc is used. As zinc alloys have lower melting temperatures than other die casting alloys like aluminum, magnesium and copper, a method known as "hot chamber" casting can be used. Machines for this process have a supply of molten metal in a pot at one end with a plunger submerged and ready to drive automatically the required amount of metal into the cavity. This method is faster than "cold chamber" casting, which is used for alloys with higher melting temperatures. With a "cold chamber" machine, molten metal is ladled by hand into the pressure chamber for each shot because, if these metals are in constant contact with an iron melting pot or plunger, they become contaminated and cause the plunger to freeze in its chamber, producing inferior castings.

As molten metal is forced into the die under enormous pressure (sometimes as high as 20,000 psi) strong and heavy parts are required to lock the dies securely. Larger die castings, of course, demand higher metal injection and die locking pressures, making the machines larger and more cumbersome. One of the great potentialities of the vacuum process arises from the fact that there is no air inside the die to retard metal flow; as the vacuum serves to hold the two halves of the die together, lower locking tonnage and injection presures are needed. This means that for a given size casting, the machine can be smaller, or conversely, larger castings can be produced on smaller machines.

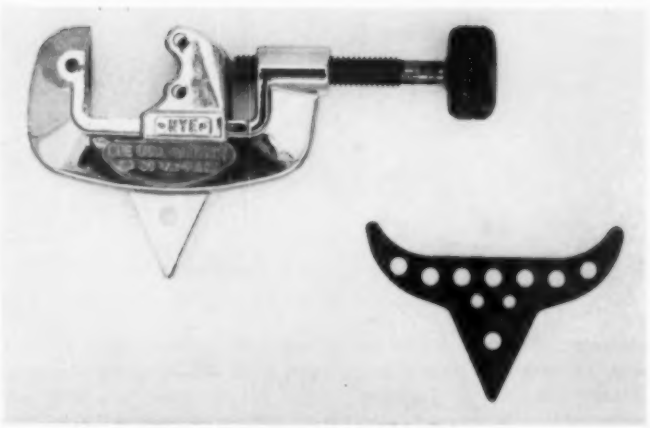




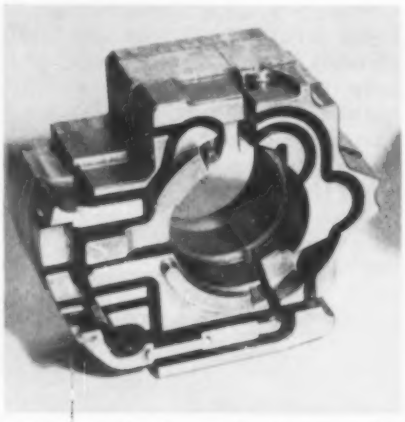
Three types of die casting machines. The vacuum attachment can be seen on the opposite page. The operation of the die is coordinated with the opening and closing of a vacuum box for each cycle. Hot chamber die casting (left) requires hand ladling of the molten metal. A cold chamber machine is shown above.

Structure and strength

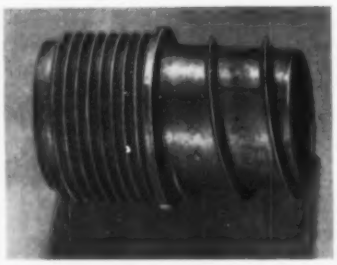
Zinc, whether it is cast under vacuum or by ordinary methods, has certain qualities that lend it to structural parts ranging from the minute to the massive, from watch parts to automobile components. But there are also restrictions that affect the way parts should be designed and, to take full advantage of zinc as a structural material, careful consideration must be given to both the possibilities and the limitations of the metal and the fabrication processes. Insufficient attention to restrictions can make die casting economically impractical and give poor results. The photographs on this page are examples of some advantages that can be designed into die castings, and opposite are desirable and undesirable design features.



Strength is given to this pipe cutter by casting a steel insert into the zinc alloy. The triangular projection serves as a pipe reamer, adding an extra function to the tool. Parts are chrome plated for appearance and sales appeal.



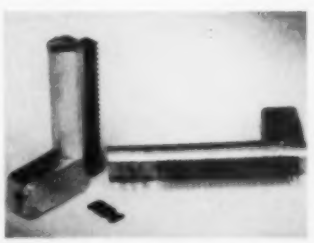
Intricate coring is possible but expensive. This die for an automobile valve made by Precision Castings has 31 separate machined and polished sections.



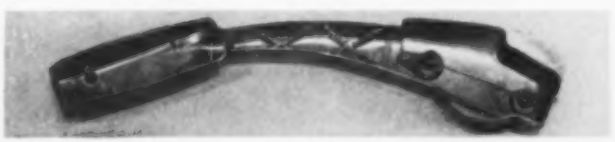
Cast threads save machining costs and time, but as a general rule cannot exceed 24 threads an inch.

Thin walls are obtained in this automotive air conditioning vent by Precision. Minimum wall thicknesses vary from .050 inch in large castings to .015 inch in small castings.

Bayonet slots are cast into the two parts shown above. On the left, the slots do not pierce the wall, while on the right they do and consequently contain "flash" which must be removed.

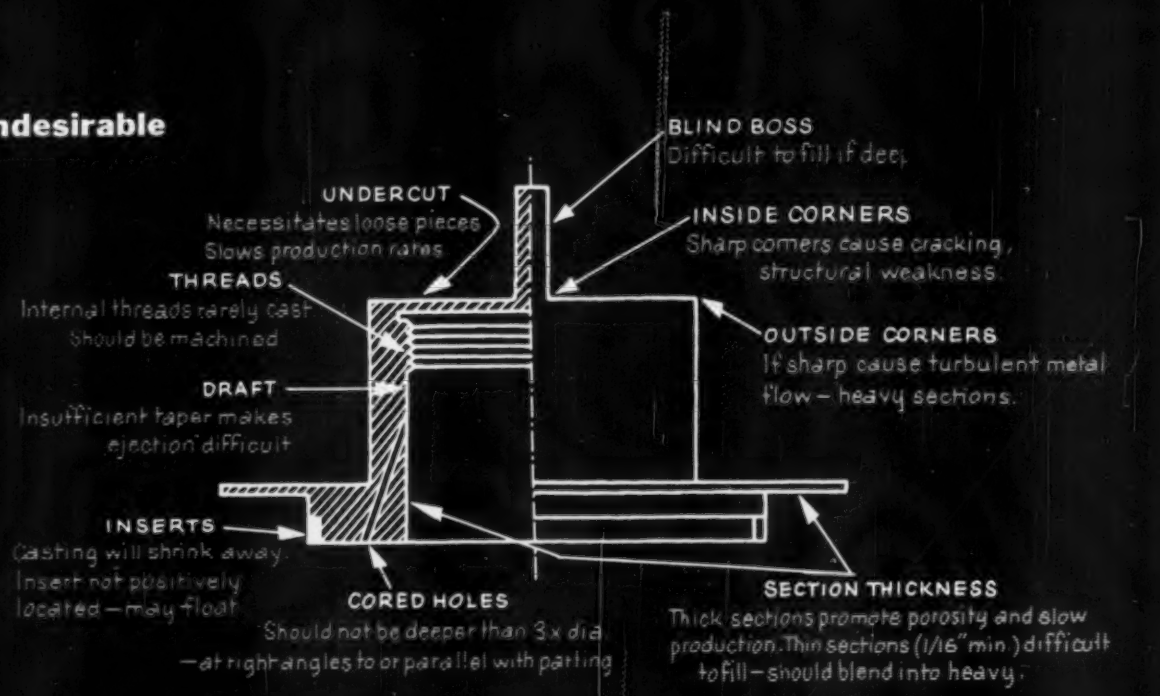


Steel inserts are cast into wool combs used on textile machines, saving assembly and adding strength.



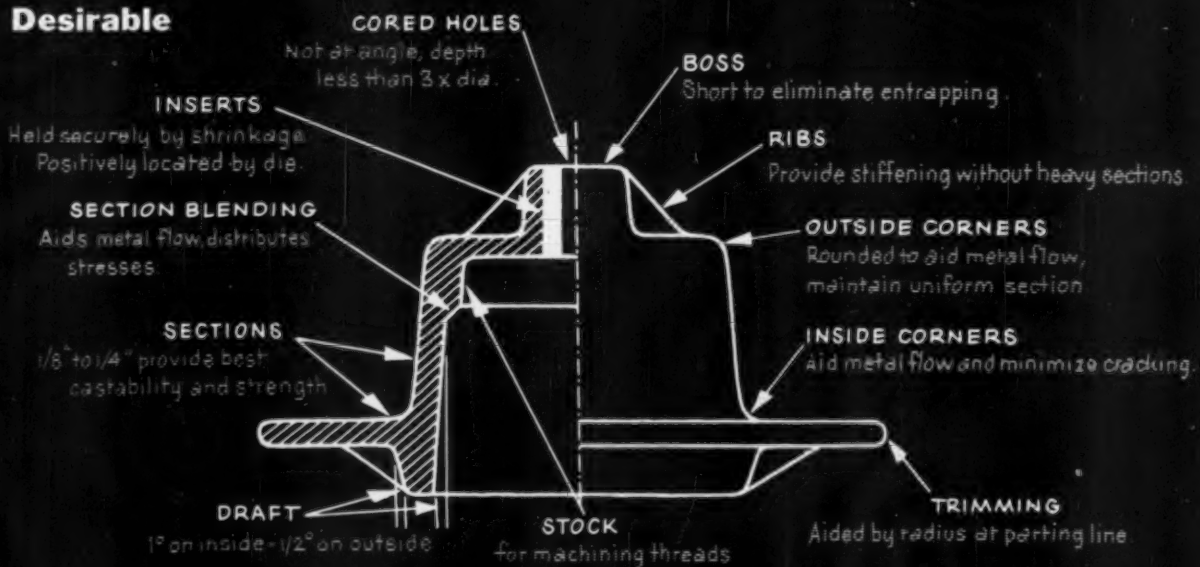
Ribs are located properly to give this phonograph arm sufficient strength despite the thin walls which save weight.

Undesirable



Desirable (below) and undesirable (above) design features limit the shape that zinc die castings can take. As new developments like vacuum die casting are removing some of these restrictions, more flexible forms should be possible in the future.

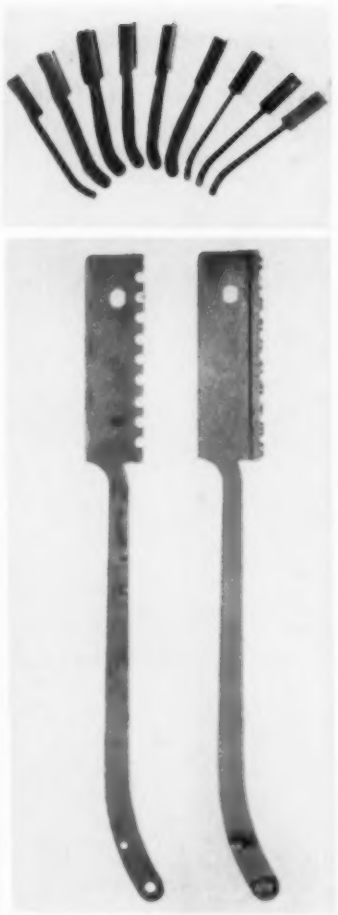
Desirable



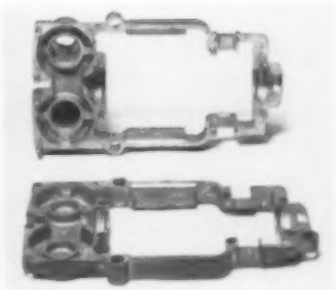
Assembly

Because zinc can be easily and quickly cast into complex shapes with high dimensional accuracy, it has long been a shortcut to economy in assembly. Parts that are complex enough to involve expensive machining and assembly if produced by other methods can be cast in one piece and with built-in features like rivets and studs that keep assembly operations at a minimum. Precision with zinc die castings can be held within closer limits than normal gear cutting, but not equal to high-precision machining.

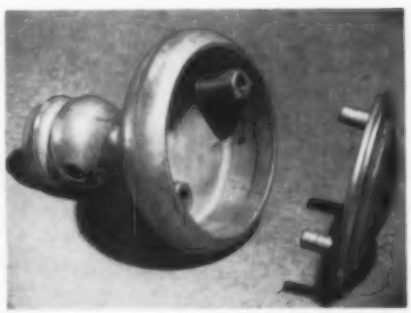
Gears are integrally cast in the hand wheel for a breast drill. Gears, cams, hubs and shafts can all be cast in one piece, eliminating assembly operations.



Simplified production was attained for a Burroughs type bar by changing to zinc die casting methods. Previously, nine steps were needed (top) to knead type on a steel bar. Now the type bar is made by casting type around a steel blank.



Rivets are cast into the housing of an electric food mixer. They mesh with the cored holes on the opposite casting.

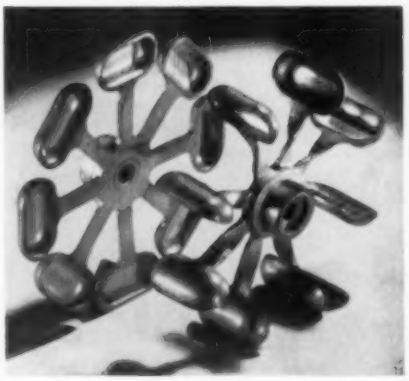


Integral studs are cast on the cover of this door knob. For assembly they are pressed into the cored boss holes in the opposite piece. The knob is made hollow to save metal and keep the sections thin.

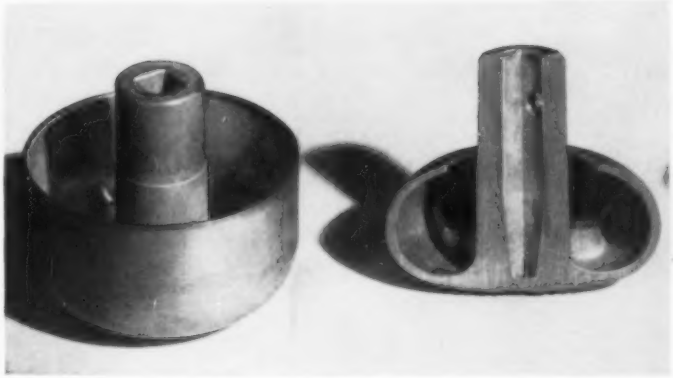
Cast to wood, the zinc hub of this roller skate wheel is permanently attached, as the metal fits into every crevice, cools fast and does not burn wood.

Forming after casting

The ductility of zinc makes it possible to shape, form, bend, or twist castings after they have cooled. Simple secondary operations are frequently economical when they permit the use of simpler and less expensive dies, or make die casting feasible for a part whose final shape demands another more expensive method of production.



Twisting the buckets of this impeller wheel 90 degrees makes them radial, a position which would be difficult to cast.

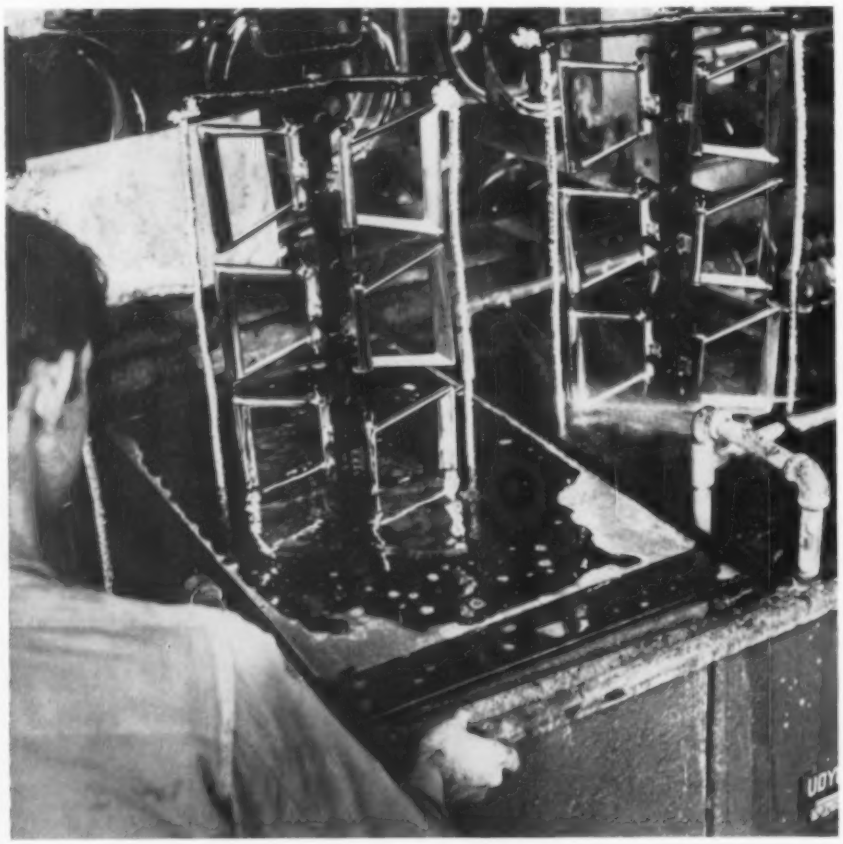


Inward forming of the tubular skirt of a knob produces a symmetrical hollow knob with walls of uniform thickness, saving metal and avoiding porosity characteristic of thick sections.

Forming the end of this tube is accomplished with a forming die. The short side tubes are spun over to fasten the die casting to a jar cover.

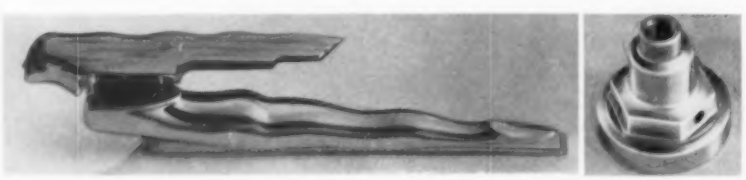
Finishing problems are usually design problems

Zinc die castings, if they are used as decorative components, must be finished. Although zinc readily receives many kinds of finishes from electroplating to paint, the shape of the casting frequently determines the appearance or cost of the finishing operation. And, unless finishing is considered during initial design stages, severe difficulties can arise. Surfaces that must be polished, for instance, should be accessible so they can be reached by the polishing, buffing, or grinding wheel. Small radii and recesses are difficult to reach and will result in poor polishing. Deep and narrow recesses are difficult to clean. In electroplating, because raised faces absorb most of the current, recesses receive inadequate plating. For the same reasons, deep concave areas are a plating hazard. New and automatic methods of polishing and finishing are overcoming some of these problems in keeping with the designer's frequent desire to abandon soft shapes in favor of crisp lines.



Automatic plating is done by dipping zinc castings into a series of baths. After polishing, an acid bath etches the surface of the zinc. A series of copper baths build up a copper coating, which is covered with a layer of nickel to provide corrosion resistance. The nickel coating, which would tarnish, is covered with chromium for permanent luster.

Surfaces on the top and bottom of this housing are slightly crowned to make minor surface blemishes less noticeable.



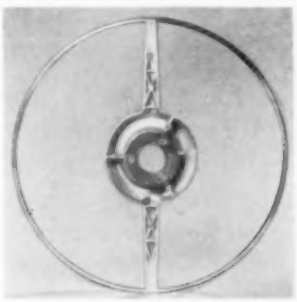
Polishing problems are minimized by the flowing lines of the hood ornament on the left. This casting was made in two parts to make the area between the head and flowing hair more accessible for polishing and plating. The flat surfaces on the casting on the right were hard to polish. Well rounded corners would have been easier, but not necessarily more desirable visually.

The automobile demonstrates versatility of castings

The automotive industry, the largest consumer of zinc die castings, absorbs 60 per cent of the industry's output. The average car contains over 65 pounds of zinc, mostly in the form of die castings, and personifies the versatility of zinc die-cast parts for structural as well as decorative and finished parts.

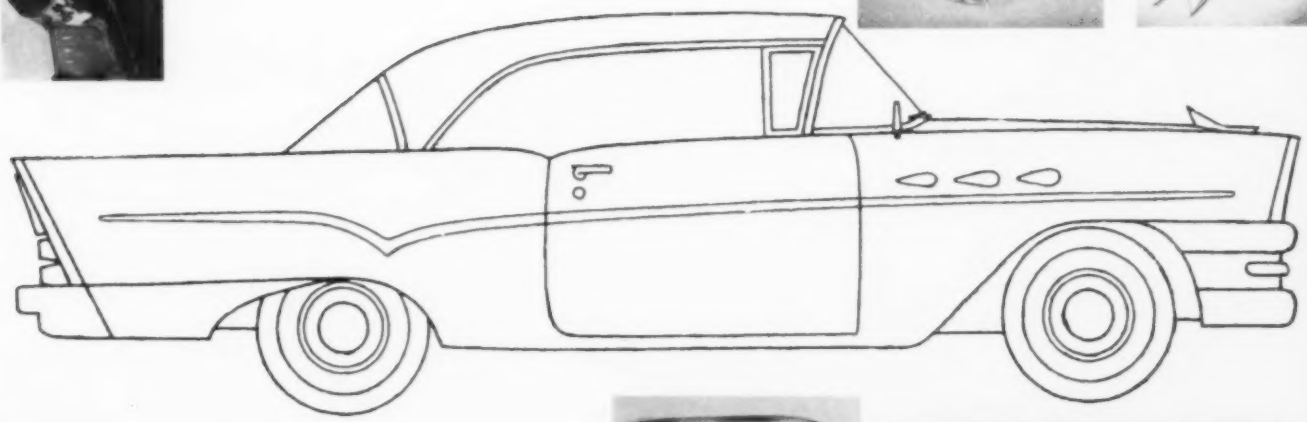
Fuel pump is economical when cast in zinc

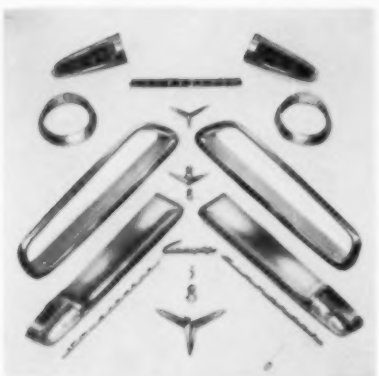
Steering wheel is cored to remove excess metal



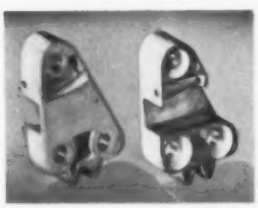
Hood ornaments have rounded contours for easy polishing

Taillight assembly incorporates decorative trim



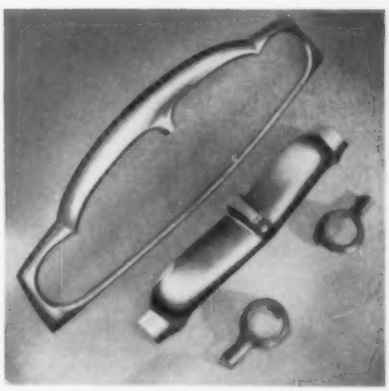


Trim finished with chrome resists corrosion from outside exposure



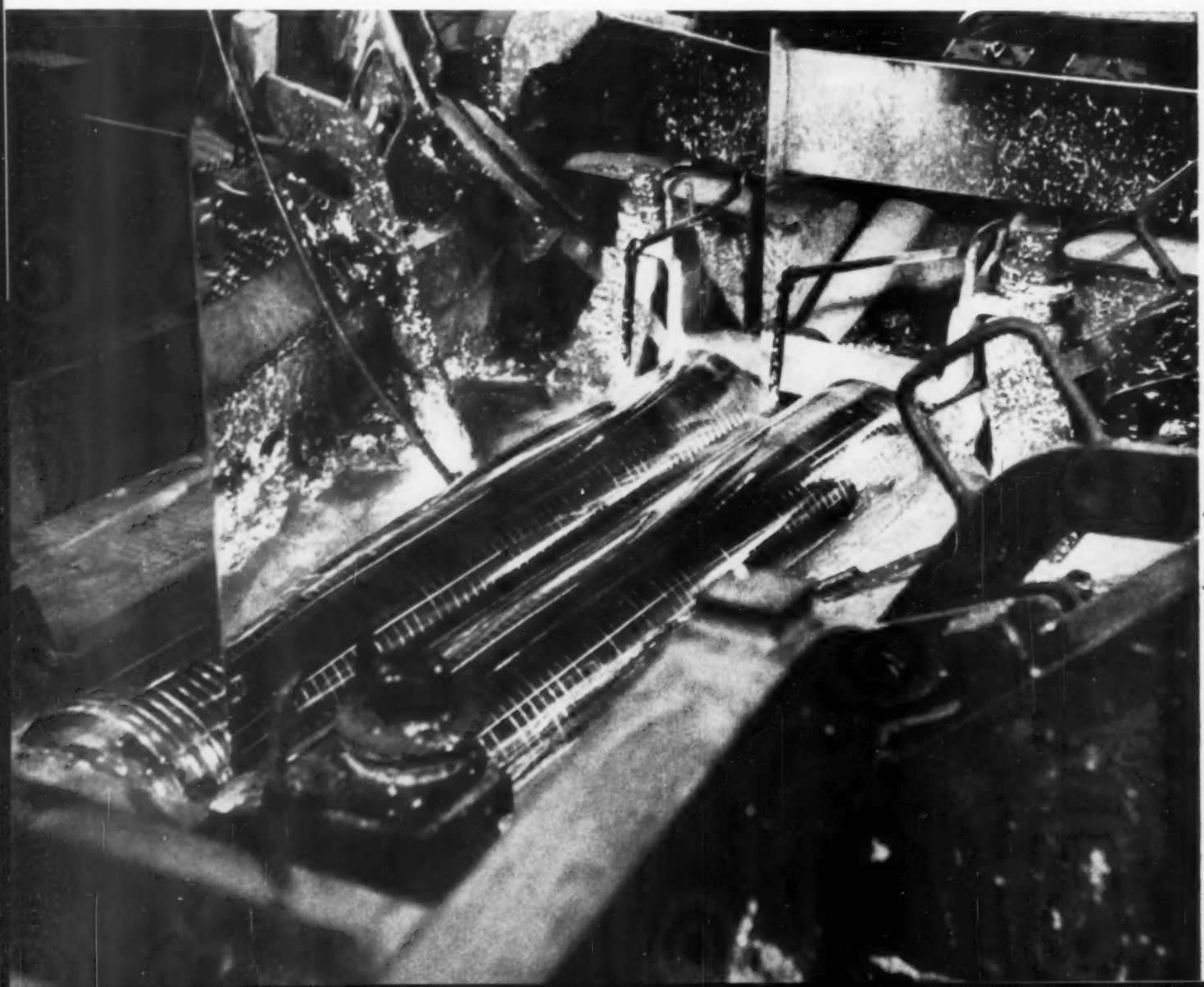
Door latches cast with minimum of parts

Door handles are strong and durable

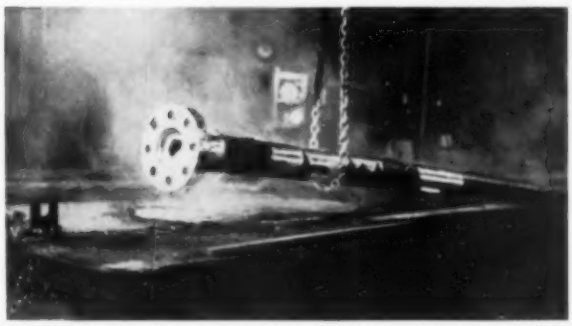


Grille is exceptionally large casting

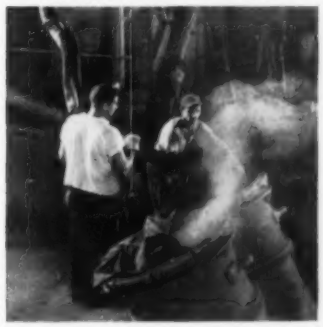
2 CONTINUOUS STRIP GALVANIZING is the most recent development in methods of coating steel with zinc. It is important because it speeds up and simplifies production and provides a superior protective coating. In the past, sheet metal parts were first formed from uncoated steel and then hot dip galvanized to give them their rust-resisting zinc coating. The development of continuous line galvanizing provides a zinc-coated steel product with sufficient ductility and adherence to withstand severe drawing and forming operations without peeling, breaking or flaking. Fabricators who have used steel galvanized by the continuous process have found that the coating is unimpaired after forming and working by any familiar methods of metal fabrication, including rolling, seaming, braking, folding, hemming, lancing, deep drawing, slitting, expanding, stamping, spinning, lock forming, fringing, and crimping. The photograph below shows steel being galvanized by the new method, and on the right is an example of galvanized steel fighting corrosion. The buildings, in an arctic military installation near the North Pole, are designed to sink slowly into the icecap. Hot dip galvanizing and sherardizing are shown opposite.



Hot dip galvanizing is used to coat large structural steel members like those for this television tower, which must have lasting rust resistance.

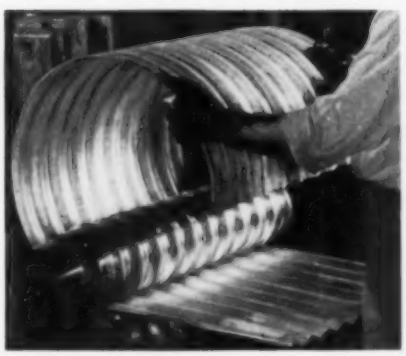


Sherardizing is a zinc coating method in which retorts are loaded with parts, charged with zinc dust and then rolled into a furnace. Under heat some of the zinc enters the pores of the steel and more adheres to the surface to form a durable coating.



Galvanized zinc parts can now be formed after they are coated

The forming that galvanized steel will withstand without injuring the protective coating is shown in this group of four pictures. In all of these examples, the steel is coated before fabrication.



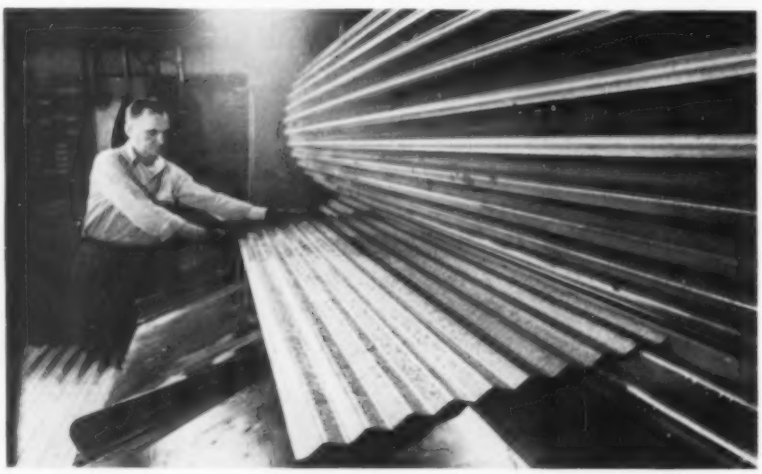
Corrugating and shaping a sheet of galvanized steel does not affect the zinc coating applied by the continuous process.

Crimping, part of the fabrication operation for an elbow, must not make the coating peel or flake.

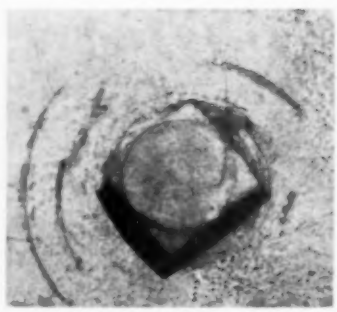
Severe bending and forming of this galvanized strip demonstrates the extreme strain that the new continuous strip galvanized steel will take.

Deep drawing a blank to a part 8 inches high by 13½ inches in diameter on a 750 ton press leaves the coating intact.

Zinc fights corrosion in two ways: as a surface barrier and by acting electrochemically. Two different metals connected and immersed in an electrolyte cause an electric current to flow from one metal to the other. This electrical activity is always accompanied by the corrosion of the more reactive metal and the subsequent protection of the less reactive. Electrochemically, zinc is one of the more active metals and consequently protects steel or copper or the less active metals at its own expense. This kind of protection, known as Galvanic Action, is illustrated on this page.



Galvanized steel in its familiar corrugated form gets double protection from its zinc coating, which serves as a barrier against invasion from moisture and also acts electrochemically to protect it against rust.

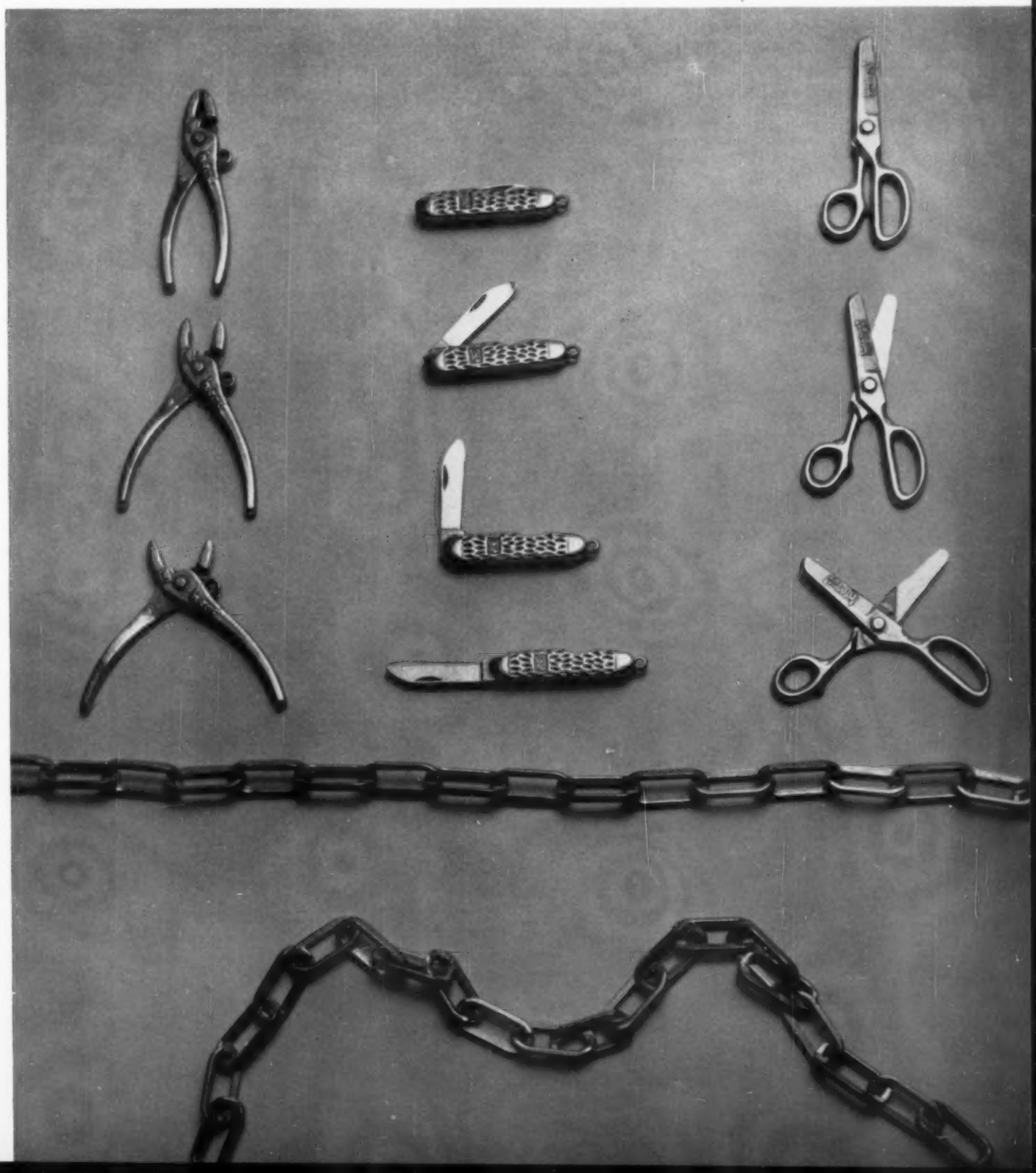


Scratches where the steel is exposed around a bolt do not rust because of zinc's galvanic action. The electrolyte in this case is the moisture in the air.

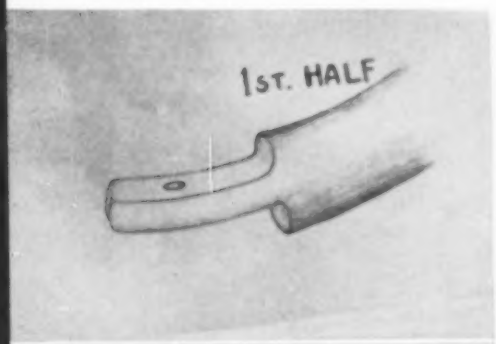
The Galvanic Table lists metals in their order of activity. Zinc's high activity makes it an effective sacrificial anode.

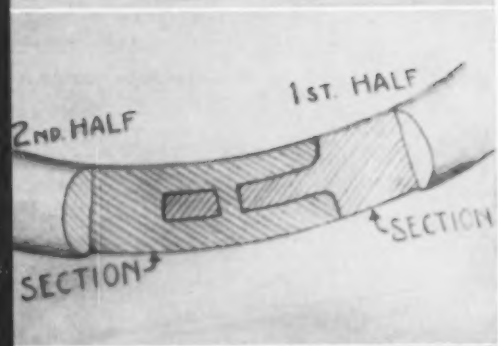
Zinc anodes are welded to the hull of a ship to protect the steel hull and bronze propeller. Sea water acts as the electrolyte. Zinc anodes are often used to protect piers, pipelines, and other submerged and buried structures.

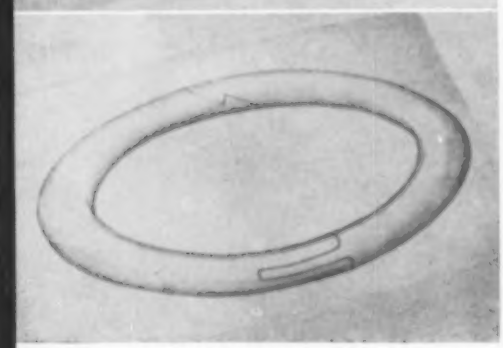
3 **INTERCAST PROCESS** produces in one operation the tiny pliers, jack knives, scissors and chains shown one and a half times their actual size on this page. Developed by Gries Reproducer Corporation of New Rochelle, New York, Intercast Process is limited to small objects. But no matter how limited, the ability to produce objects with movable parts in one die casting should make any designer sit up and take notice.

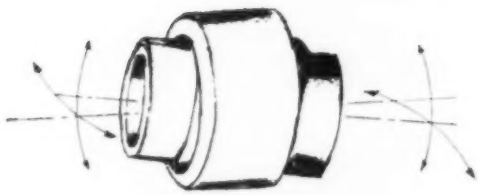


Details of the Intercast Process are still secret, but the diagrams below of a binder ring show the general principle. The two-piece ring was cast complete with hinge, ready to work. What happened is this: as the first half of the ring was cast, the zinc hardened very quickly and its ends became part of the die for the second half. The metal for the second half entered a fraction of a second later, flowing around the tongue and through the pivot hole of the chilled and hardened first half, forming an integral assembly. The drawings on the opposite page show a few product ideas that are being worked out at Gries; they demonstrate the obvious advantages the Intercast Process presents. The savings in assembly time and costs Intercast parts will contribute is anybody's guess.

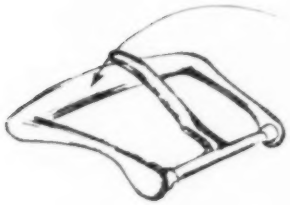








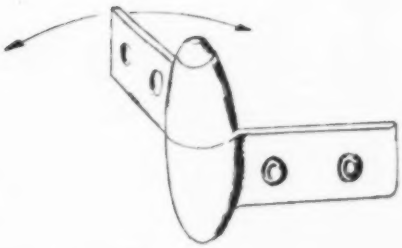
SELF-ALIGNING BEARING



BUCKLE

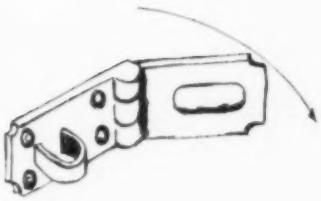
PULLEY WITH SWIVEL

BALL JOINT

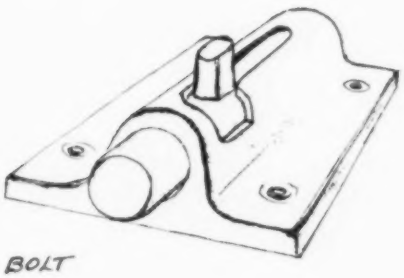


HINGE

BROOM HANDLE CAP



HASP



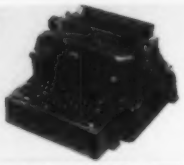
BOLT

The three new developments that punctuate this review of zinc and its fabrication serve as a reminder that answers to new fabrication problems frequently turn up in materials that have been available for a long time. Zinc's usefulness and flexibility are obvious, but like any other material, it must be used properly if its advantages are to be exploited and its limitations minimized. On the surface, it may seem that zinc die castings are fraught with design restrictions. Certainly, the considerations of flow and radii described earlier have considerably influenced the form of today's products, giving soft shapes instead of crisp radii and flat surfaces that many designers now prefer. But these limitations, real as they are, must be viewed as relative. Stampings inspire their own limitations on shape for instance—and die castings frequently require fewer parts and assembly operations, their dimensional limits are usually closer and section thicknesses can be more varied; they involve less scrap, and they can be made in many forms not attainable by stamping. On the other hand, stampings can be made in steel and alloys not suitable for die casting, have the properties of wrought metals, and in simple forms are produced more rapidly and with less weight than castings.

Compared with screw machine products, die castings can usually be produced more rapidly with less waste and in shapes difficult to produce from bar or tube stock. But tooling costs for screw machine products are lower and, like stampings, they can be made from steel and other alloys that cannot be cast. Such comparisons can be made between zinc die castings and products made in any other material by any other process. The choice of a material and the method for fabricating it must depend on the shape of the object, what it is going to be used for, and its price tag.

Photographs and material were gathered for this article with the help of: American Die Casting Institute, American Zinc Institute, Gries Reproducer Corp., Paul Hance Productions, Inc., Lee Silver Service, Nelmor Corp., The New Jersey Zinc Co., Precision Castings Co. Inc., Reed-Prentice Corp., Wheeling Steel Corp.

by Hugh B. Johnston



From old IBM *to new* IBM

TRADE MARK

Thomas J. Watson, Jr.

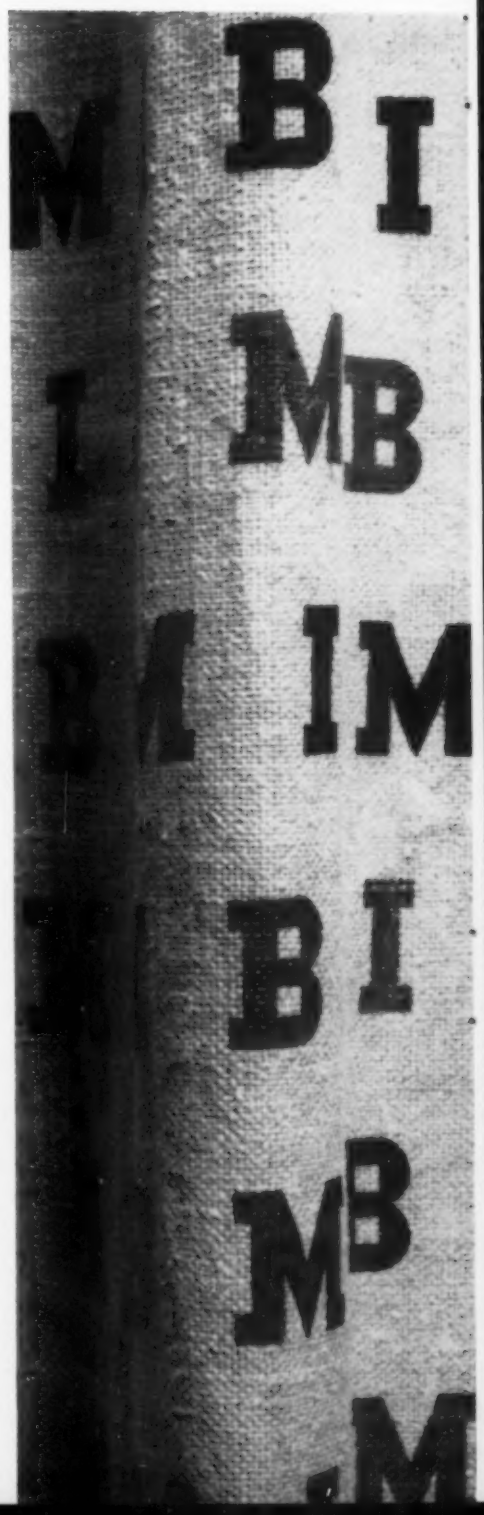
"Take the central processing unit of the 705 machine," said Eliot Noyes. "This is an interesting case in point. The IBM designers in Endicott and myself were working over an early version of its design. It was completely covered with gray panels. We started stripping off the panels, and the more panels we stripped, the more beautiful it became. We found blues and oranges and wonderful reds, and wound up exposing the entire unit behind glass. And besides the coat of many colors, this revealed the machine's true character."

Not long ago, in February, 1956, architect and industrial designer Eliot Noyes was asked by IBM to become Consultant Director of Design, and since his appointment he has led the company into an ambitious and unusual program to coordinate and upgrade design across the board, across every aspect of the company's vast operations. This extends from the IBM trademark (note the recent change, as incorporated into the headline above) through packaging, graphics, exhibitions, interiors (and interior furnishings, such as the new Paul Rand drapery to the right), to the business machines themselves and the buildings of the company.

A design consultation of such scope—in the product design area alone it involves guidance of two staff design departments and of Sundberg-Ferar's hired services—is more than a one-man job; wanting the highest design standards to be established in the program's initial phases, Noyes has already called on three distinguished designers and one design critic to serve as additional consultants: Rand, to coordinate graphics; Charles Eames, George Nelson, and critic Edgar Kaufmann, to be general design consultants to the Consultant Director.

But this is not intended to be a bundle of designs created outside the company and then imposed on it; the consultants' main responsibility is to kindle and direct a heightened sense of design *within* the company. According to Noyes, the very spine of the project is Thomas J. Watson, Jr., President of IBM, and the man responsible for coordinating company aims with design aims is Gordon Smith, a veteran IBM sales executive who has recently gone to work in a newly created staff position, Director of Communications. This corporate and consultant team, only a year into a project of

Gordon Smith



the story of a company's increasing sense of design

Consultant Director Eliot Noyes

Paul Rand, Charles Eames, George Nelson, Edgar Kaufmann

indeterminate length, has left some interesting marks already, but the main accomplishment thus far has been a firm realization of purpose: to strip off the wraps of the old IBM—whether the unnecessary metal panels of a machine or the simulated walnut panels of an executive office—and to find and express everywhere, as with the 705 unit, the true character of the new IBM.

What is the new IBM?

If the design project is out to express a new IBM, then between this and the old IBM there must be important underlying differences; the first of them is size. Once a company that was small enough to be genuinely folksy, IBM today is not only very large ($734 million gross in 1956) but growing at a fabulous rate—20 per cent annually. The second major difference between the IBM of ten years ago and today is its leadership. Thomas J. Watson, Sr. reigned supreme over the company until 1952, and he continued to exert influence as Chairman of the Board until he died in June of last year. Now T.J.W. Jr. is in charge; to administrate more effectively over a company whose enormity is a fairly recent phenomenon, he is updating some established company patterns. In the manner of executives like G.E.'s Cordiner (and U.S.A.'s Eisenhower), Watson Jr. has tended to delegate responsibilities; wanting to increase the speed and precision of executive decision-making, he has reorganized IBM structure into autonomous divisions, with a corporate staff to coordinate them.

As IBM's sales position became increasingly competitive, the company attitude toward design became increasingly serious. Product design in earlier days at IBM was largely a matter of embellishment. (This was true for the business machine industry as a whole, which had, and still has, a basically non-consumer market.) Arcs and parallel lines and other relics of *art nouveau* decoration were carefully traced onto the bulging black machines, and these were eventually replaced by an indigenous American motif—the chrome (or otherwise) strip. It remained for the IBM product closest to the general consumer to call forth the company's first *original* design effort, an effort which heralded the new design emphasis. With the Noyes-designed electric typewriter of 1948, IBM arrived at a product design which was truly advanced—that is, which treated masses, textures and details in terms of the machine itself, and with an ultimate and overall effect in mind, one that was at once appealing visually, structurally and functionally.

When Watson Jr. assigned the typewriter redesign project to Noyes, it was the first in a succession of occasions when he showed a singular interest in stepping into advanced design in an industry which, while technologically advanced, had not yet awakened to the importance of expressing itself in contemporary visual terms. On this occasion, Watson Jr.'s action was thoroughly vindicated by subsequent sales figures, for the drastically new typewriter (see photos, p. 48) played an important role in reviving a sluggish company division; by last year Electric Typewriter Division sales had climbed over $50 million and the number of IBM electrics sold exceeded the combined total of all other makes.

In 1950, when he was Executive Vice President, Watson Jr. initiated the company's first move toward modern architecture when he had Noyes redesign his office and, indeed, the entire 16th floor at IBM World Headquarters in New York. This is one of two floors for the company's highest executives, and it was dark and shrouded in walnut panels, some real, some simulated. "After we finished with the 16th floor," Noyes relates, "the girls called it 'Cloud Club' or 'Rainbow Room' or something like that, because it had carpets and colors and so forth." Since then, Hugh Smallen, who is Noyes' associate, has redesigned a series of IBM executive offices, so the 16th floor is no longer the exceptional sight that it once was. Sandwiched there between the other cavernous floors, the 16th was IBM's first slice of color and light.

Noyes becomes Consultant Director

By the beginning of last year, Noyes' activities for IBM were many in both architecture and product design. At about the time that he carried out the corporate reorganization, Watson Jr., anxious to get into a comprehensive design program, asked Noyes to join the company as Director of Design. Noyes was not of a mind to relinquish all of his private practice, so they worked out a compromise whereby Noyes would devote the bulk of his time to IBM (about three-quarters, as it turned out) and have the remainder to devote to his own practice (including pet projects, such as the concrete bubble house). In February, 1956, Noyes went into action as Consultant Director, IBM's first high commissioner of all design.

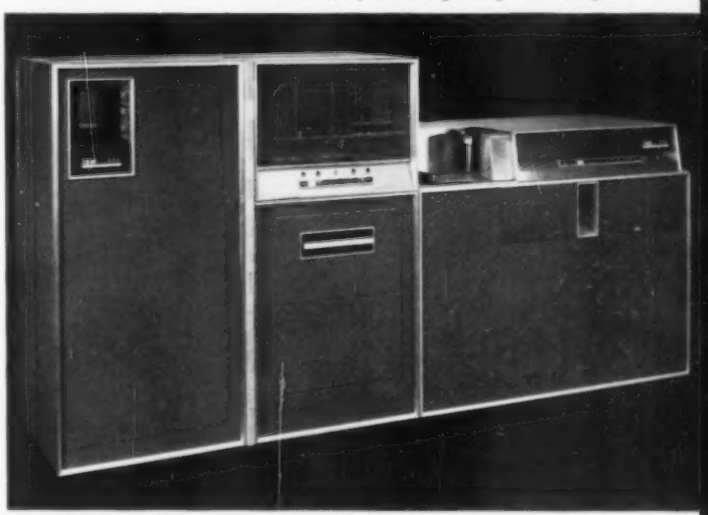
Title or no, it was not going to be an easy job for Noyes to alter the appearance, much less the method, of an enormous company with deep traditions. When he and Gordon Smith planned their attack, they decided against exerting a strict corporate authority in order to advance the program. "The way to make it effective," Smith explains, "is not to send down a weighty memo from above, but to kindle spontaneous enthusiasm with a succession of good works." "And this will happen," Noyes continues, "only when good design—the awareness of it and the desire for it—begins to come out through their own skins. That is why this is not an outside movement. We are trying

to start one within the company, using a variety of stimuli, and the IBM industrial design people, the graphics people, the window display people are very much a part of it. They are the very heart of it, in fact, for long after we have retired from the project, it should continue in their work, in work directed by people like Peter Siks of Display, Marion Swannie of Graphics, Walter Furlani and Charles Jaworski of Industrial Design." Smith and Noyes are planning to acquaint everyone involved in IBM design with the standards that are to be advanced; to accomplish this, they will hold seminars across the entire company map.

"A house style"

These standards are supposed to add up to something more than an overall family identity. "A house style, as the British say"—Smith thus describes the objective. "This doesn't mean that everything should look the same or even have common stylistic elements. It means that you should be able to recognize all of it as coming out of one company, simply because the company is honest about itself and expresses itself honestly, imaginatively and consistently." Eero Saarinen is designing an IBM plant for Rochester, Minnesota, and Noyes had something to do with his selection as architect. "When I recommended Saarinen for the job, I was not thinking about what appearance his building would have. I was thinking that if he does the job, I will not have to worry about its integrity or its modernity, and these are certainly the qualities that IBM should represent." His thinking was along identical lines when Noyes, shortly after his appointment, called in Paul Rand to be Graphic Design Coordinator. At their first meeting, Smith asked Rand to work up a few changes that he would suggest in IBM graphics. "I went home," Rand says, "and the first thing I saw was the trademark. I redesigned it strictly as a presentation, and later they (Watson and Smith) decided to adopt it. Now it is replacing the old in every new appearance of the mark." Rand's redesigned trademark typifies the Noyes approach in that it more honestly expresses—and effectively serves — the IBM of today. Its greater boldness and sharpness and better proportioned masses, besides being an aesthetic improvement by contemporary standards, are more adaptable to mass usage in a vast company. The mark permits more variation in spacing and coloring, and its relative impersonality makes it easier to use in a variety of graphic situations. Rand is now spending better than half of his time organizing an IBM graphic art staff, counseling on the design of company publications, and developing a new personality for packaging, office supplies and graphic miscellany. He has designed nameplates for more than 40 machines, introducing a consistent approach where none had existed previously.

Ezra Stoller



Shown are recent examples from various spheres of IBM design. Top: new product development laboratory in Poughkeepsie. Designed by Noyes, it is just one of many buildings in the company's current architectural program. Center: 608 transistorized calculator, designed by Sundberg-Ferar, with Noyes as consultant. For unit at left, designers first tried a glass front. However, printed circuits inside were not visually coherent, so they closed the unit, showing only the magnetic-core grid (in black frame) and, to its right, an excerpt from printed-circuit bank. Bottom: fabric cover for looseleaf salesbook, designed in blue, red and off-white by Paul Rand, new graphic director.

Rand's aluminum plate, with anodized colors, can be easily attached to the machine with mastic, so that the plate can be given a suitable placement every time the machine's position is changed. Rand carefully places the plate as a design element in the overall machine scheme (see large photo), and the layout readily accommodates different divisional colors and machine names of varying lengths.

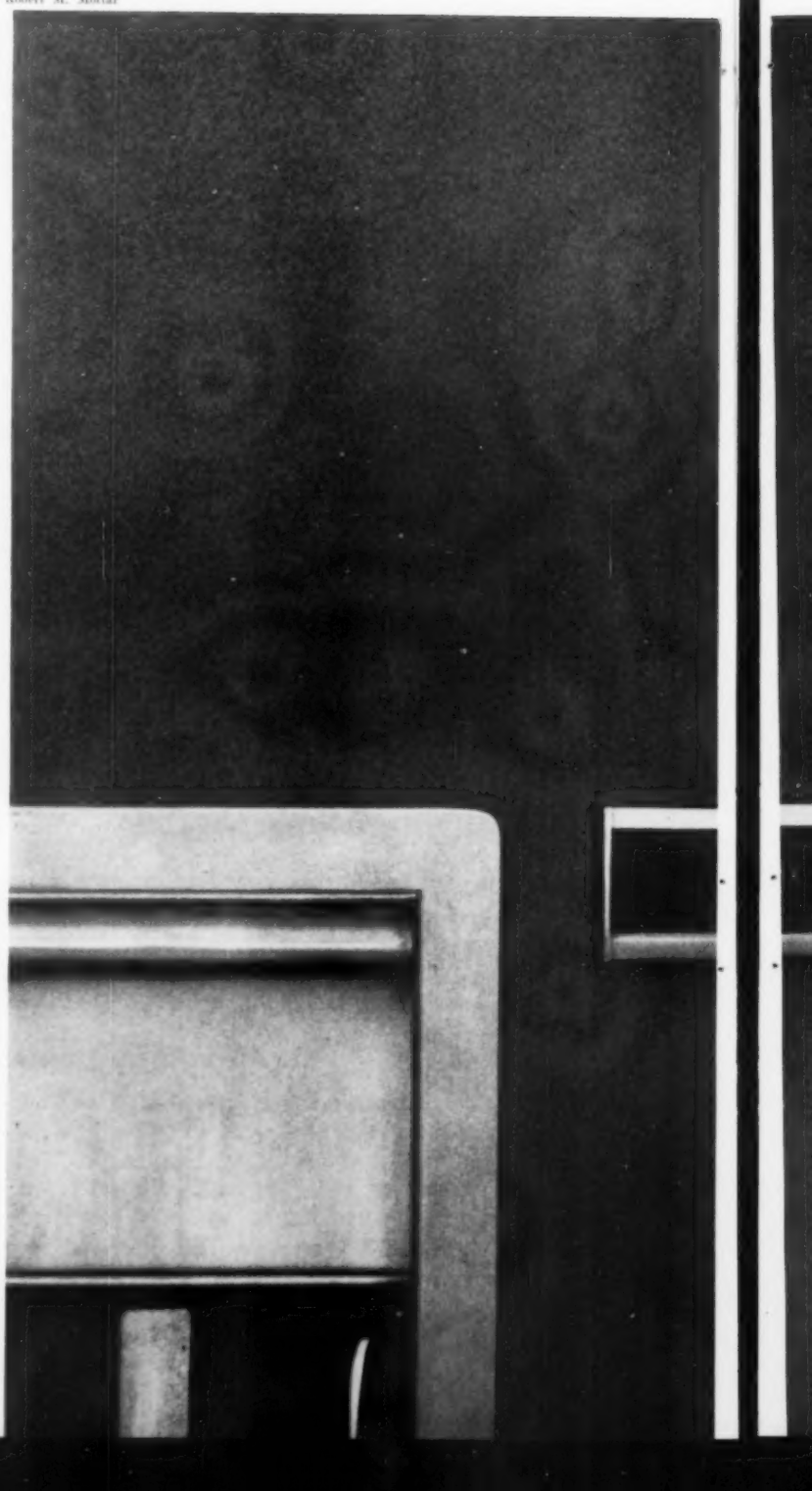
Product design at IBM is a complicated picture. Besides maintaining the two staff design departments—one at Endicott, managed by Furlani; another at Poughkeepsie, managed by Jaworski—IBM relies heavily on the Sundberg-Ferar office, which has been retained by the company even longer than Noyes, since 1943. In times past, both staff and consultant design—no distinction is made between the types of work done by either—was under George H. Kress, who was Industrial Design Director until last spring (and is now in practice for himself in Newark). Now these units, and a small staff working on IBM machine design in Noyes' own New Canaan office, are administratively responsible to Smith, who confers regularly with Noyes.

In frequent meetings with the scattered design sections, Noyes has promoted an architectural treatment of machine masses. Under his influence (see small photos, opposite), machine units have been panellized, decorative belly-bands and kick-strips (where you don't kick) have been dropped off, rounded end and top covers have been sharpened, and second colors have been introduced to organize irregular masses. He has coached the various designers to bank significant interior elements behind glass, wherever they are visually coherent, and to articulate the operational elements on the machine's surface. "Before, there was no expression of structure," said Noyes. "But these machines should not be like a ranch house. They should be like a Mies house. They should have that much integrity and joy."

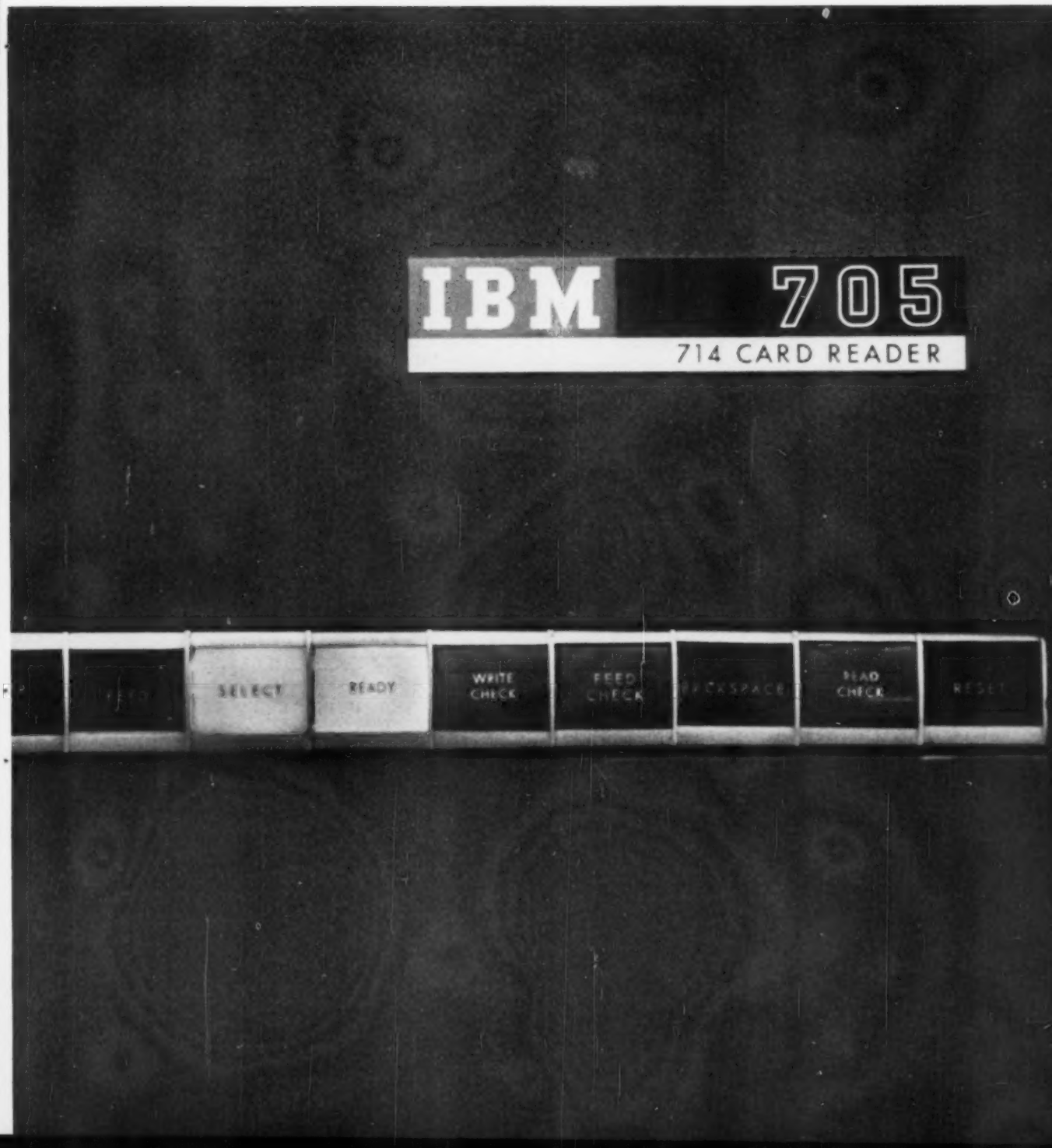
Towards a truer personality

Gordon Smith has summarized IBM's new design program. "We came to realize that our company was not reflecting the personality that we have inherent in our business of producing complicated machines. Our machines are very modern, and if our personality is to be truly expressed, then our design had better be modern too—always advancing, like our machines do." IBM is shucking off pretensions of quality—the simulated walnut panels—in an effort to find its own distinctiveness, to express its own actuality, and the support that the agents of that effort are beginning to receive through every layer of personnel is their promise of lasting success. At any rate, Noyes and Smith already have their heads together over a design to present the new IBM to the nations at the 1958 Brussels World's Fair.

Robert M. Mottar



Same card punch, both versions designed by Sundberg-Ferar, has been remarkably refined. Current version (right), for Ramac group, had Noyes on hand as consultant. Large photo shows how design theme of Rand's nameplate relates to details of the machine itself.



by Arthur Gregor

IBM develops its random-access memory accounting machine

One recent example of collaborative effort between designers (Sundberg-Ferar), consultant designer (Eliot Noyes) and product coordinators and engineers is IBM's Ramac, a new type of computer that brings to accounting what earlier computers brought to nuclear engineering and aviation design: the electronic brain. Development of the Ramac, started in 1953 at IBM's San Jose laboratories, grew out of the problem of a serious lag between the rate of business transactions and the rate of record keeping. Present-day accounting uses separate machines in a fixed sequence; it lacks a system as direct as the one used in the days before mechanized accounting, when records were maintained in a series of ledgers, and each transaction was posted manually by clerks who had direct access to all accounts and could keep records up to date as transactions occurred. To approach this kind of "in-line accounting" on a mechanized basis, a data storage device is needed, and the key to a system that can dip into stored facts is the means of data storage.

What confronted IBM engineers in their attempt to find the right storage device was not so much how to make random access possible, but how to devise a large capacity storage system with a high access rate; "randomness" proved to be the result of such a system. Some years ago, the National Bureau of Standards experimented with a disk on which data could be recorded in the form of magnetic spots. The project was dropped, but it was along these same lines that IBM's project was carried on. Other companies at work on similar types of accounting computers—RCA, Potter, Burroughs—achieved a "random system" by storing data on a continuous magnetic tape. By breaking storage records down into a series of magnetic disks, IBM engineers were able to produce the desired large-capacity datafile with high access rate.

On 50 magnetic disks (see opposite page for schematic) with a storage capacity of 1000 records per disk and 100 characters per record, IBM was able to provide a permanent storage of 5,000,000 business facts. This gave the machine its memory, and in conjunction with the processing unit (see diagram on top of opposite page) its brain. Around this center IBM then proceeded to construct the elements necessary to create a functioning body. In December 1955, the 305A Ramac engineering prototype was completed, and this model was further developed into the 305 Ramac, production prototype.

How the Ramac works

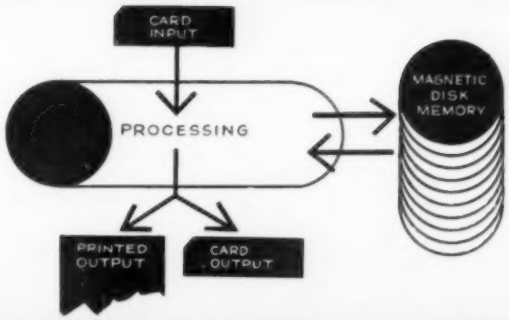
The Ramac is a *multi-purpose* machine. It differs in this respect from IBM's early electric accounting machines, which could carry on only *one* operation at a time and relied on manual routing and on company personnel for decision-making. The Ramac, on the other hand, requires only one or two operators to keep up an in-line processing of accounts, so that there need be hardly any time-lag between business transactions (purchase orders) and record keeping (inventory). Whether the Ramac is set up to take care of billing, inventory, sales analysis, updating accounts receivable, payroll or production control, it can take care of all the steps necessary to record a transaction.

The diagram on the opposite page shows that the random-access memory accounting machine has four basic elements. These are the same in all types of computers whose function is random-access accounting. The components that make up these elements have been arranged in the 305 Ramac within the input, processing, and output cabinets. The elements are:

1) **Input**—the IBM console designed specifically for the 305 Ramac (this is the basic difference between the 305 and the 305A engineering prototype, where the input console is part of the processing cabinet). The console consists of the *card reader* and the *supervisory station*. Information to be processed through the Ramac is punched on IBM cards and entered in the card reader at a maximum rate of 125 cards per minute. The Ramac operates independently of this input operation, so that cards can be fed into the machine in random sequence. The input console's keyboard, typewriter, signal lights and control keys for program checking make this section of the machine the supervisory station. Here the operator can ask the machine's memory for specific stored facts. Inquiry is made by use of the keyboard; the Ramac answers by producing the requested information on the typewriter.

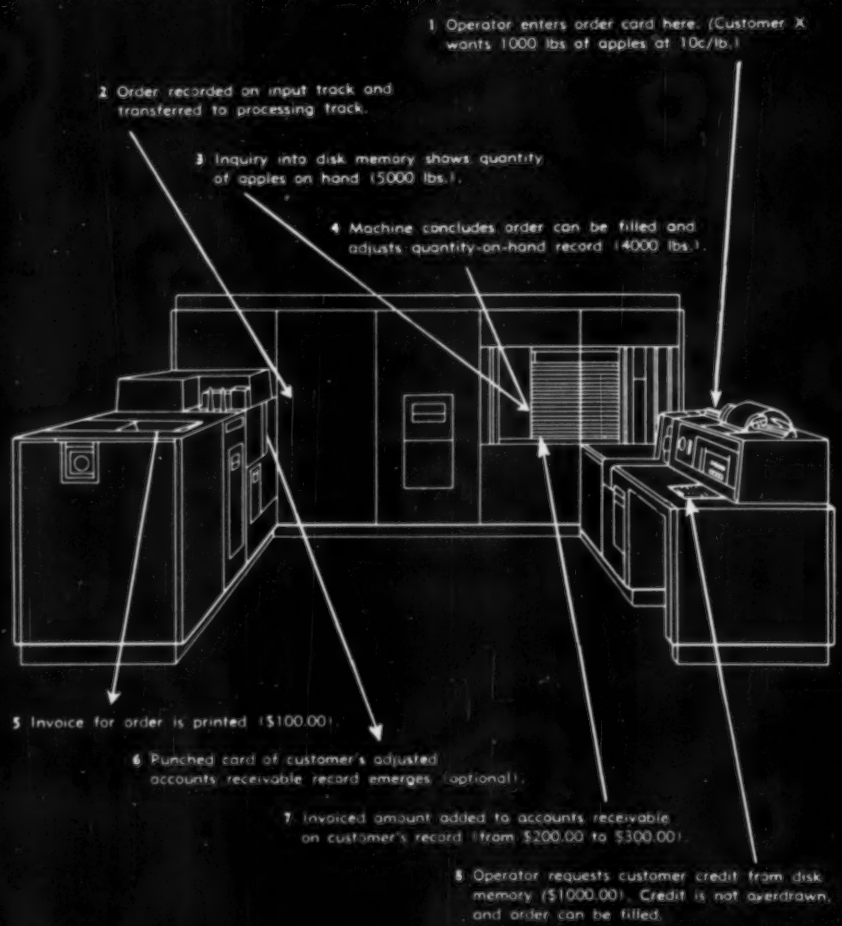
2) **Processing Unit**—the magnetic drum with input and output tracks for program instruction and processing of information. Requests are recorded from the card on the input track of the drum. Data received from the memory is recorded on the output track.

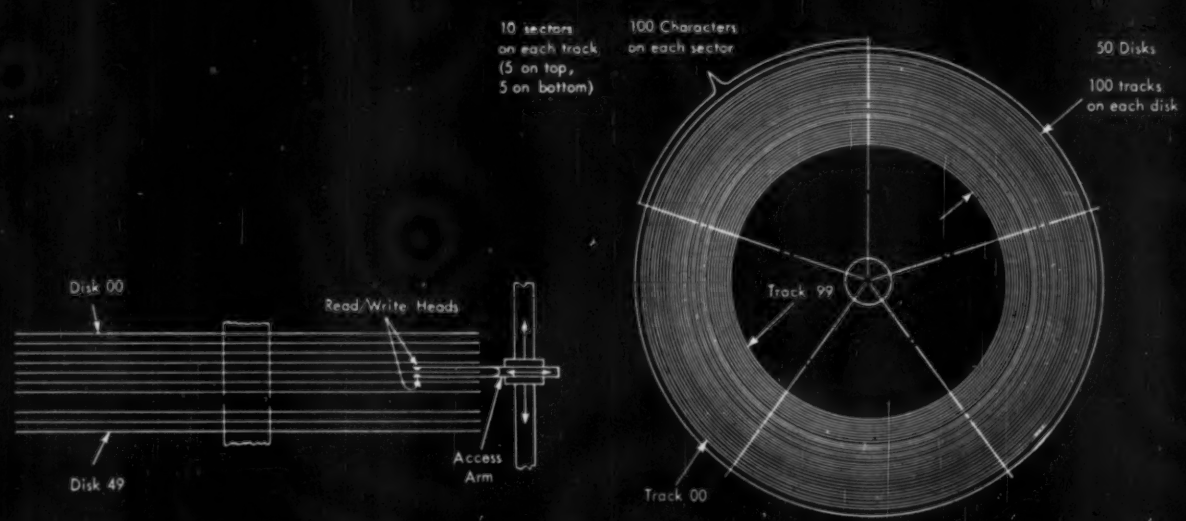
3) **Random-Access Memory**—IBM 350 magnetic disk unit consists of 50 metal disks about 2 feet in diameter, 0.1 inch thick with a separation of 0.3 inch between disks. Disks are coated on both sides with a ferrous oxide recording material. Each disk consists of 100 concentric tracks and is subdivided into sectors, five on each side. Each sector stores a 100-character accounting record on each track. The access arm at the side of the disk stack moves electronically to any desired track on any disk and records or reads the data applied to the disks in form of magnetic spots. The speed of disk rotation, 1200 rpm, and the fact that each digit can be obtained in less than a second, help



Ramac flow diagram

Example of Ramac's basic recording steps, and memory-disk schematic





to make data access a rapid one. Data is conveyed from the access arm to the output track of the processing drum, which sends instructions to output cabinet.

4) **Output**—Consists of the 323 Punch and the 370 Printer. Final results of transactions transferred from the processing unit can be printed on documents, punched on IBM cards, or both. Cards are punched at a maximum rate of 100 cards per minute at the same time that printer prints document.

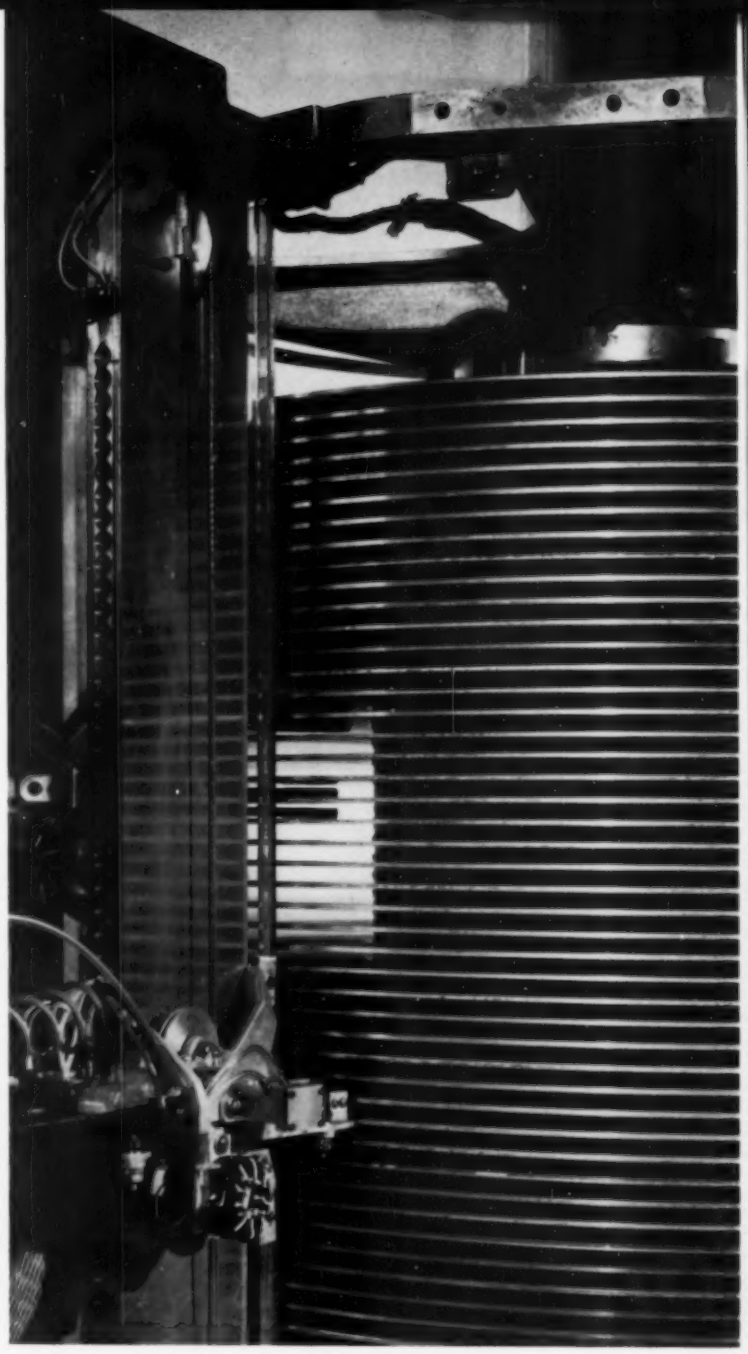
Because processing center and storage center are able to carry on "conversations," the Ramac is able to make logical decisions based on its stored facts. Information fed into a Ramac, whether for request or storage, is first punched on an IBM card. Since all data is directly available, it is not necessary to "batch" or group the cards according to the files in which the information is to be recorded—a time-consuming programming process with earlier IBM systems.

The flow diagram on the previous spread demonstrates in simplified terms how Ramac carries through a transaction. It adjusts all ledgers unbalanced by the transaction, checks the stock on hand, decides whether an order can be filled, prints an invoice, or back-orders the request if the quantity on hand is not sufficient to meet the order. And it can do more. If an item ordered cannot be supplied, the Ramac will suggest an alternate available item. These steps are done for as many items as there might be on an order.

In the last quarter of this year, IBM expects to start delivery of the 305, which is now in production. As IBM puts it, the 305 Ramac is for "modest" business. Its capacity now is up to 10,000 transactions a day, but for greater volume and transactions involving higher level computations, IBM offers the Ramac 650 —a combination of the 350 magnetic disk unit with IBM's 650 computer. The Ramac can be bought (the 305 sells at $224,000) or rented for $3,200 per month.

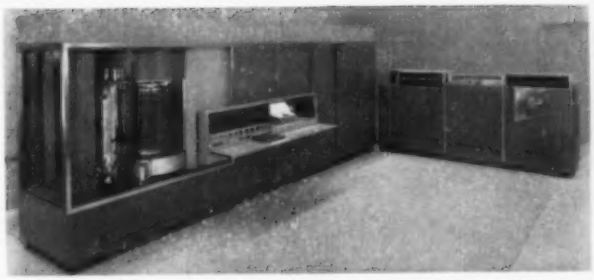
The Ramac is designed

The Ramac, both 305A prototype and 305, was designed by the Sundberg-Ferar office, with Eliot Noyes serving as consultant, and the designs are being finalized by a new embryo staff design department in San Jose. The Ramac and the 608 calculator (p. 51) are the two recent IBM machines which show Noyes' emphasis on clarity of texture and detail, and on architectural massing of the units. A black kick strip has been introduced to cover the casters and serve as a unifying visual pedestal for the entire ensemble, and a second shade of gray has been used in a number of places, such as the top of the console, to organize irregular masses. All of the elements—the keys on the console up to the units in relation to the ensemble—were arranged in what the designers finally arrived at (after an entirely different solution in the 305A) as the most logical and humane organization.



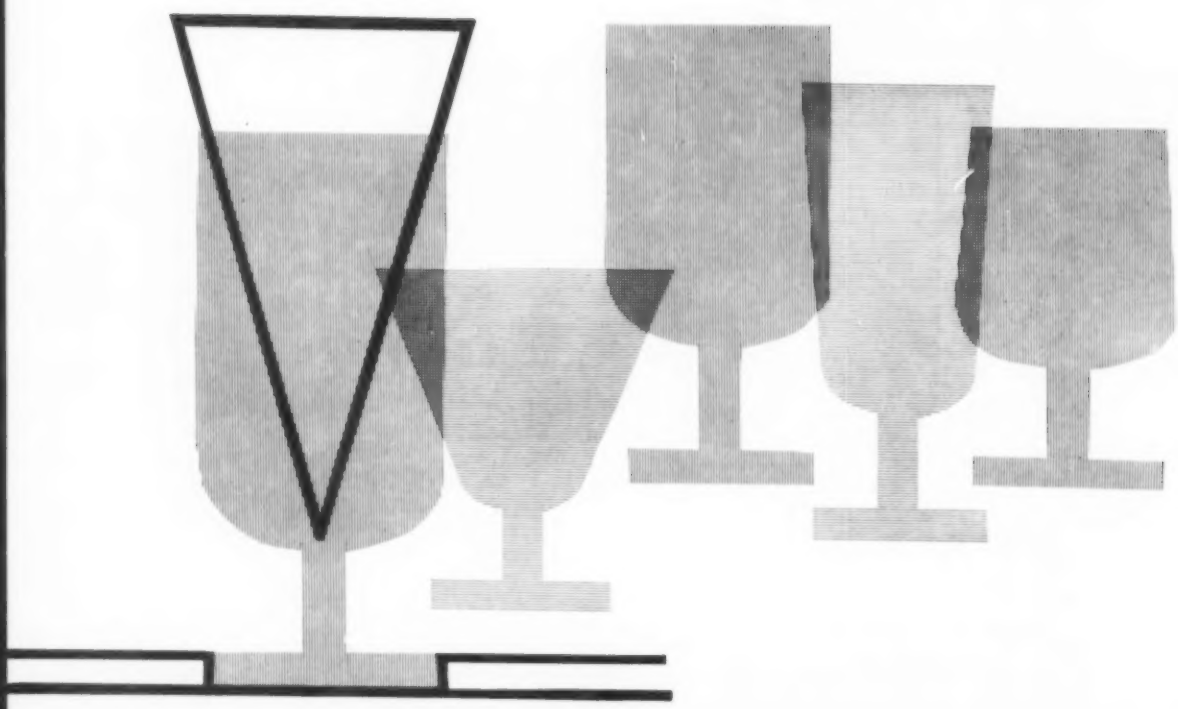
Ezra Stoller

IBM 350 magnetic-disk data storage, and access mechanism.

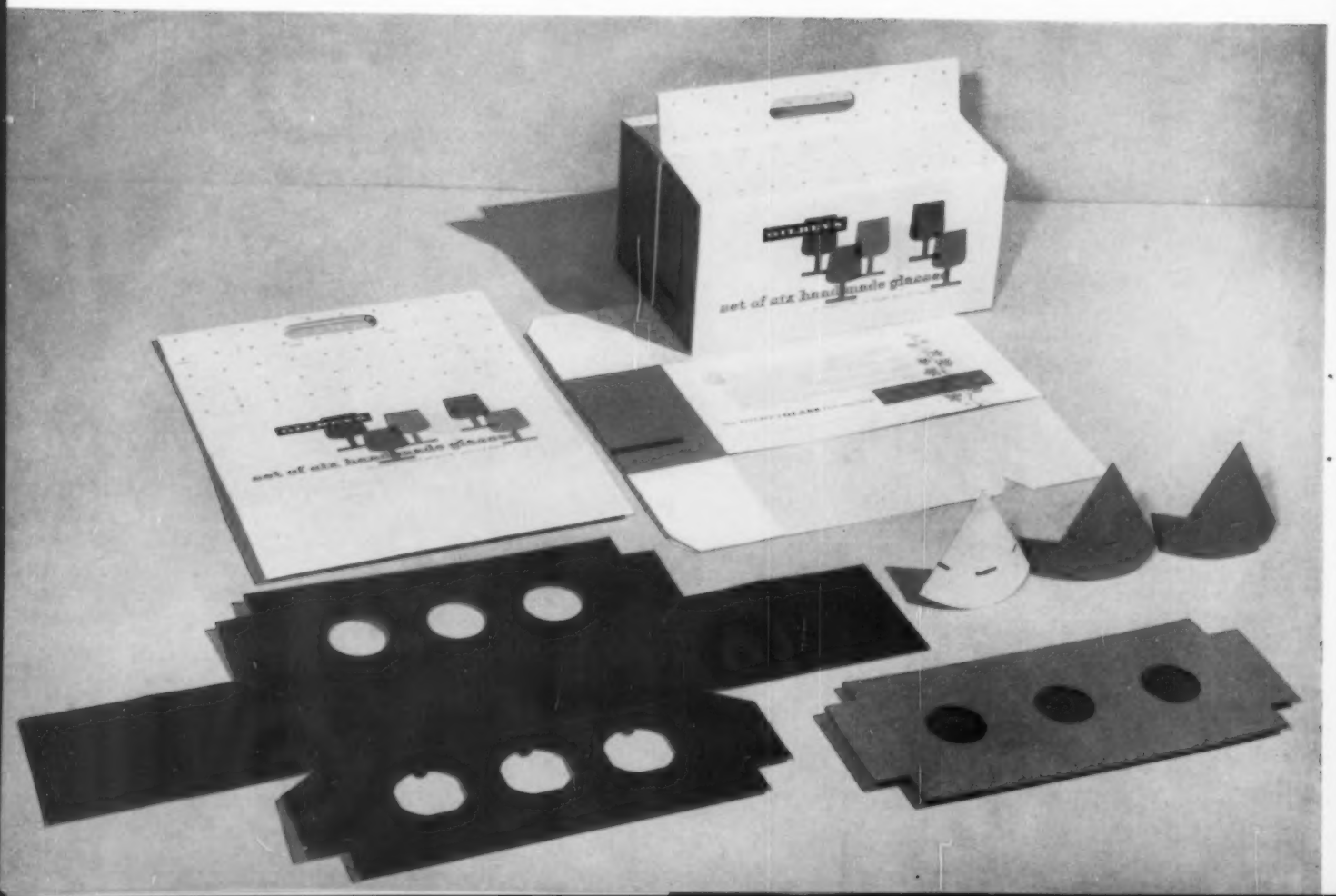


Main consideration behind the change from Ramac 305A engineering prototype above to 305 production model at right was human engineering—logical element organization and readily accessible controls for one operator at input, one at output.

The 380 console—input and control station for Ramac 305—points up design team's emphasis on architectural clarity.



Carry-home pack for connoisseur's crystal



When the British liquor firm of W. & A. Gilbey Ltd. decided to enter the glassware business last year—to bring its tasters' idea of ideal drinking glasses to the public—it commissioned London designers William and Veronica de Majo to come up with an appropriate way of packaging the new and fragile line of products. The goal was a package that would serve to ship, display and carry home the sets of six Swedish crystal glasses without the customary "stuffing" of tissue paper or excelsior that makes packing and display so messy. The result was an inventive combination of known and unique packaging techniques that provides secure shipment, attractive point-of-sale display and easy portability.

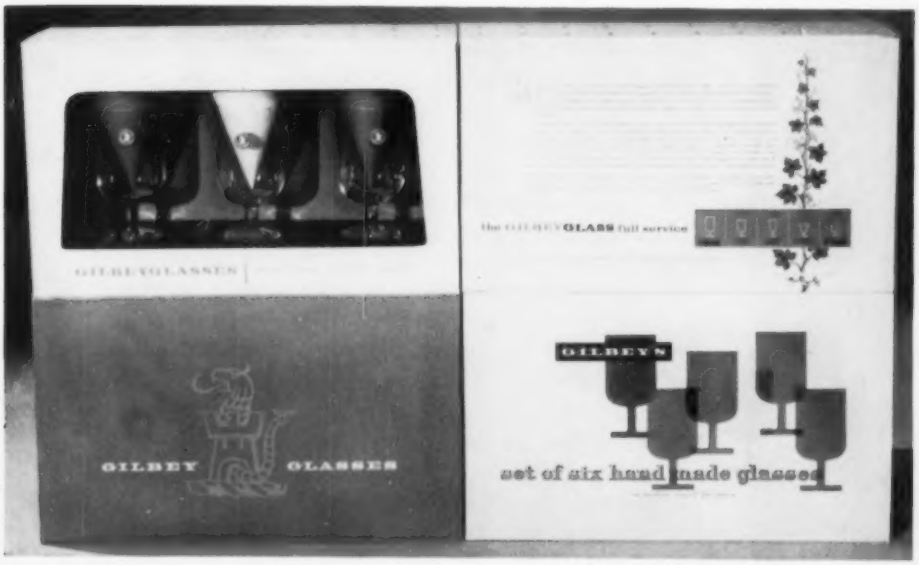
What the de Majos devised was a package that uses its cushioning elements as the center of its visual impact. The unique protective feature is a simple cone of thin cardboard in solid blue, red or yellow, that fits into the bowl of each glass and holds it firmly in a cardboard recess where the base is set. Exposed in groups of three through cutaway windows, the clear crystal glasses are highlighted by the strong color and direction of the conical shape.

The method of cushioning employs familiar packaging devices in a unique combination, and a patent has been applied for. The inverted cone is folded, slipped through a circular slot in the top panel, pushed down into the bowl of the glass and then locked in place by a series of tabs and slots. One tab is designed to prevent the assembly worker from accidentally placing the cone so that the seam shows. For the wide-angled cocktail glasses, additional cushioning is provided by a slot in the base recess that overlaps the glass itself.

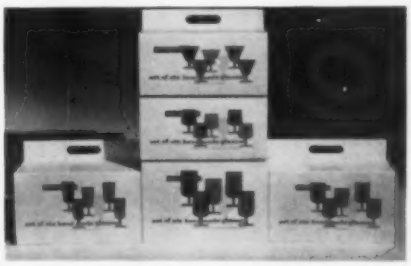
The full line consists of five types of glass, each sold in a set of six at leading British department stores. They are modifications of traditional designs by Stennett Wilson, and are manufactured in Sweden at Ekenas. Each set is packaged in three units: two inner cartons holding three glasses each, with its own display window, and an outer sleeve which folds into a handle at the top. The three elements can be stacked together as a display group, the white front and top, cerulean blue back and sides, and gold trim acting to set off the glasses themselves and their printed silhouettes.

For excellence in both function and sales appeal, the Gilbey glass pack won the de Majos a First Prize and two Highly Commendeds in the 1956 British Paper Box Design Contest.—*a. f.*

New packaging method combines protection and attraction



Counter display of outer sleeves and inner cartons exposes glasses, draws attention to them with brightly colored cones. At left, disassembled package, with die-cut cushion for glass bases at bottom.



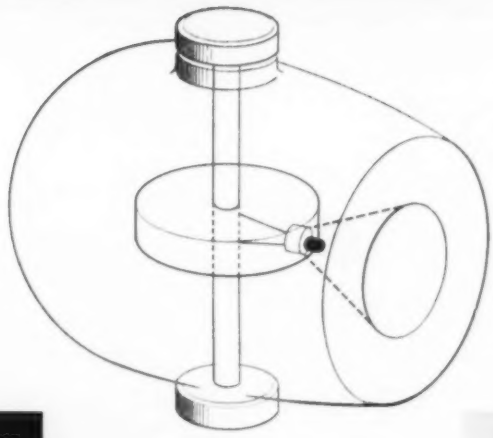
Outer sleeves for five types of glasses create display of full Gilbey glassware line. Inner cartons slide out easily; glasses are held in them securely without wrappers.

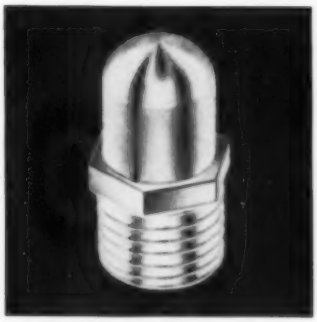
Projecting the atom

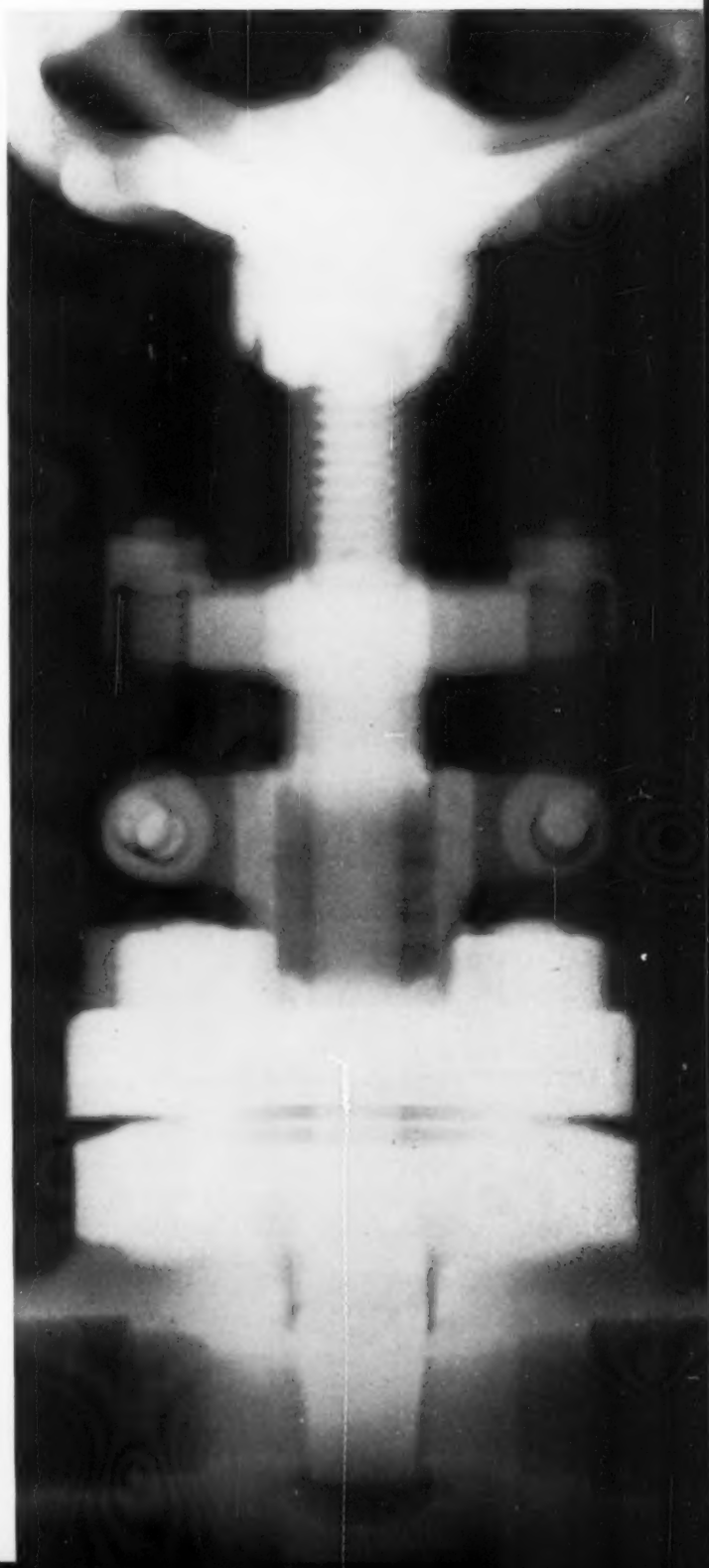
Design for housing nuclear energy widens field of industrial radiography

We hear much of the dangers of radiation through H-bomb fallouts of gamma rays, much of the wonders of atomic energy as a future power source—yet little of the fact that, for quite some time, gamma rays have been used in industry to see through solid objects. Invisible gamma rays emitted by a small particle of radium—or by other elements that have been made radioactive in an atomic pile, commonly called radioisotopes—will act as X-rays do to penetrate inches of steel and many feet of concrete, to create on film a radiogram that tells all about the inner structure without destroying the object. The technique, as we all know from the dentist's chair, is to place photographic film behind the object (or, as in the picture to the left, under it) and expose it to a beam of the invisible rays. The result is a radiogram, a ghostly image that is very valuable to the trained eye in medicine—and also in industry: to inspect pipelines and valves, for example, and other hidden functions for defects and cracks; and in manufacturing to look into whole assemblies. Now, instead of with bulky X-ray machines, the whole trick can be performed with a hand-operated projector. The secret is not mirrors, but one pellet smaller than a paper clip that projects gamma rays—as much radiant energy as a giant X-ray machine generating at millions of volts and requiring a bulky cooling system.

For many years the only natural source of gamma rays was radium—and just to rent 1,400 milligrams of radium costs $3,500 a year. Then nuclear research gave us the means to make other elements radioactive too. Since the Atomic Energy Act released these radioactive sources (radioisotopes) at a cost much lower than radium for industrial use, pioneer users—like the makers of this projector, the M. W. Kellogg Company



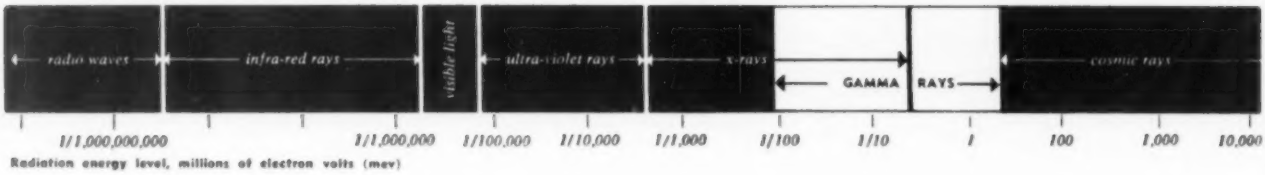




—have found the means to harness the inherently dangerous capsules so that they will make precise and calculated images. They have brought radiography into the price range of small shops and foundries and have transformed what used to be a costly and awkward operation into a relatively inexpensive and portable one. M. W. Kellogg first engineered devices for their own use as suppliers to the petroleum industry—one heavy-duty and one portable, to hold and operate the capsules—then they called in industrial designers Becker and Becker Associates to design a family of Gamma-Ray Projectors for a competitive market. As we shall explain later, a variety of equipment exists in the field of radiography; and there are many techniques, some of them quite primitive, of handling the radioactive capsules, any handling including their shipment, is legislated by the Atomic Energy Commission.

Simple though it is in the basic principle of its operation, the design of this atomic instrument was influenced by serious safety requirements. In this assignment, which represents one of the earliest examples of a peaceful application for atomic energy, the designers faced a unique "housing" problem: to relate a heavy lead and steel housing, which had to serve as shield, container and focusing device all in one, to different kinds of exposures—and to different radioactive sources which vary greatly in their potency. To understand the particular problems of designing an atomic projector, it is first necessary to explain a few simple facts about the radioactive source which makes it tick, for there is no motor involved, no power cord to an electric outlet. What the designers had to learn before approaching this product, as a kind of basic vocabulary for the atomic age, is outlined overleaf.

The electromagnetic spectrum



Though different in origin, gamma and X-rays are found to be twins

To understand how it happens that gamma rays can make radiographs just as X-ray machines can, look first at the electromagnetic spectrum (above), which shows where, in relation to nature's other visible and invisible rays, the power sources of the atomic projector belong. With the spectrum is a scale showing the increasing level of radiant energy that exists unseen—from radio waves to cosmic rays, all of which are here measured by mev. Just as radio waves are customarily measured in cycles per second, X-rays, gamma rays and cosmic rays are expressed by the mev unit which tells how many millions of electron volts are being radiated; the whole range of the spectrum is actually convertible into fractions or multiples of *mev*. It is immediately apparent that X-rays and gamma rays overlap—that they are the same kinds of rays, even in some instances radiating at the same mev level. Why do they overlap?

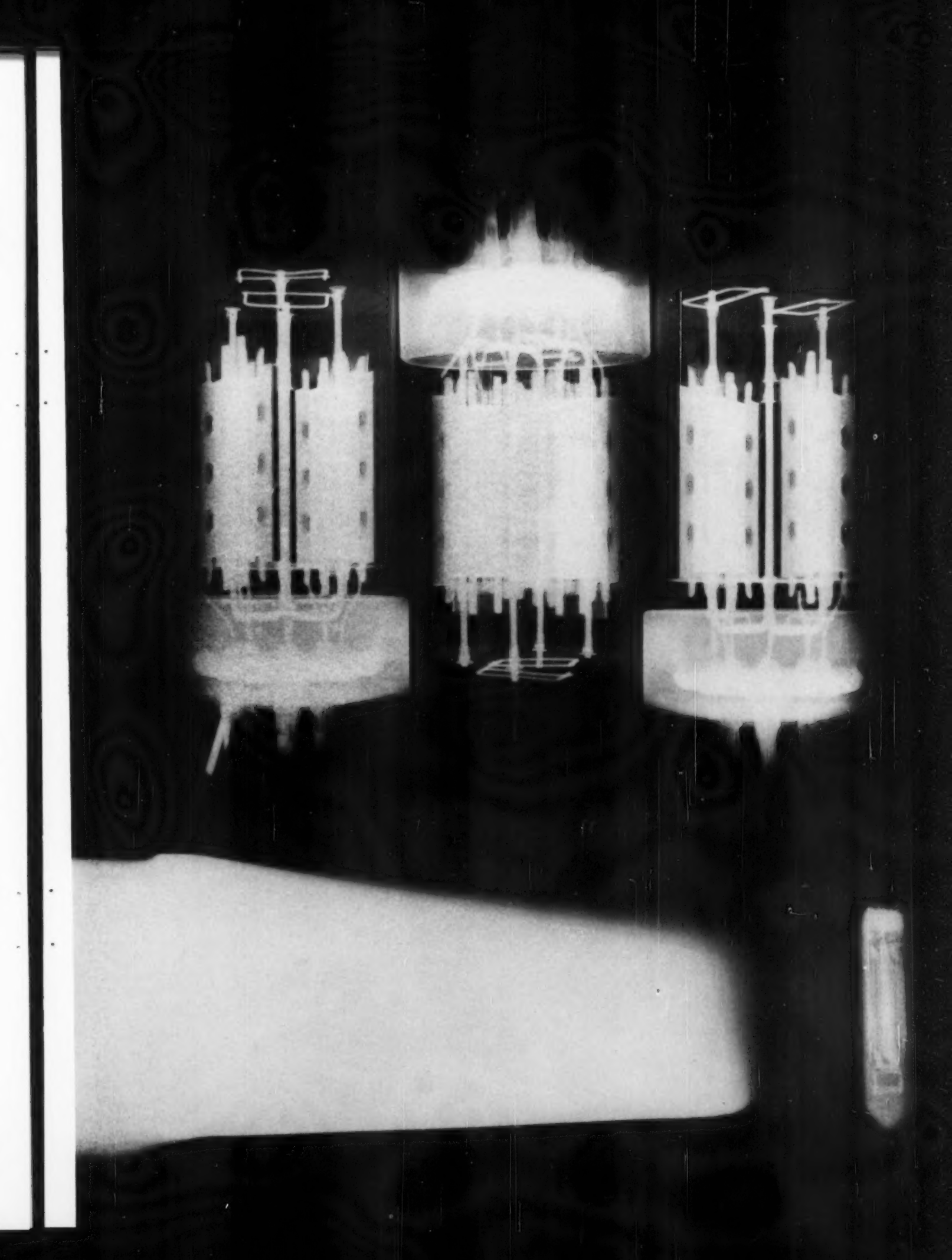
The answer lies in two separate discoveries—by Roentgen and the Curies—which, physicists eventually realized, related to each other; together they founded radiation science. In 1895 Roentgen built an apparatus in his laboratory, placing metal targets under intense electron bombardment; these metals then produced a form of radiant energy that acted in some respects like visible light, but at an extremely short wave length. He discovered that the unfamiliar rays could penetrate materials which absorb or reflect ordinary light—his proof, a shadowy photographic image, the first radiograph. It took long exposures of film to make radiographs using Roentgen's low voltage apparatus. He named the rays, which were at a level of about 1/4000 mev, "X-rays."

Not long after Roentgen's experiment, in 1898, the Curies discovered radium. Later other physicists identified the invisible emanations of this unstable element, which gradually decays and becomes lead. There were three types: alpha particles, which turned out to consist of nuclei of helium; beta particles, which are actually electrons; and the third, which they named *gamma* rays. These gamma rays were recognized finally as pure radiation energy, and they belonged on the electromagnetic spectrum at a mev level closely akin to X-rays. Gamma rays have since been isolated in other elements besides radium—and still more have been created by neutron bombardment of elements in atomic piles—so that many different mev frequencies have been isolated and observed. It is from these man-made radioactive elements that the atomic projector derives its sources. Meanwhile Roentgen's method for producing radiant energy has been improved enormously; X-ray machines are commonly capable of voltages high enough to produce 1/4 mev as compared to Roentgen's 1/4000.

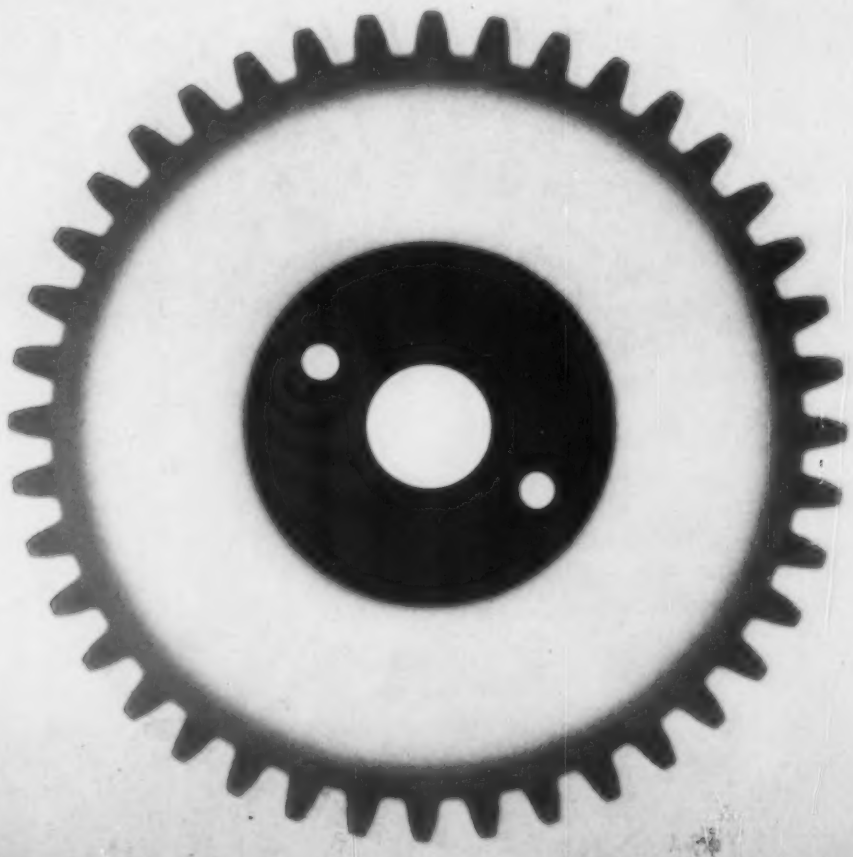
Although they are alike in *kind* of radiation, there are practical differences between X-rays and gamma rays. In general, gamma rays are "harder"—i. e., have greater penetrating power. This is not always an advantage—the softer rays produce a more sensitive image contrast—but gamma radiography techniques are being constantly improved to produce better images. When a user decides whether to invest in X-ray equipment, in radium, or a radioisotope method, he will do so on the basis of the cost of the equipment and what each is best suited for. Gamma ray sources are not necessarily a replacement for X-ray machines under all conditions, but they are equal in many applications, and are highly competitive in price, plus offering easier handling and maintenance.

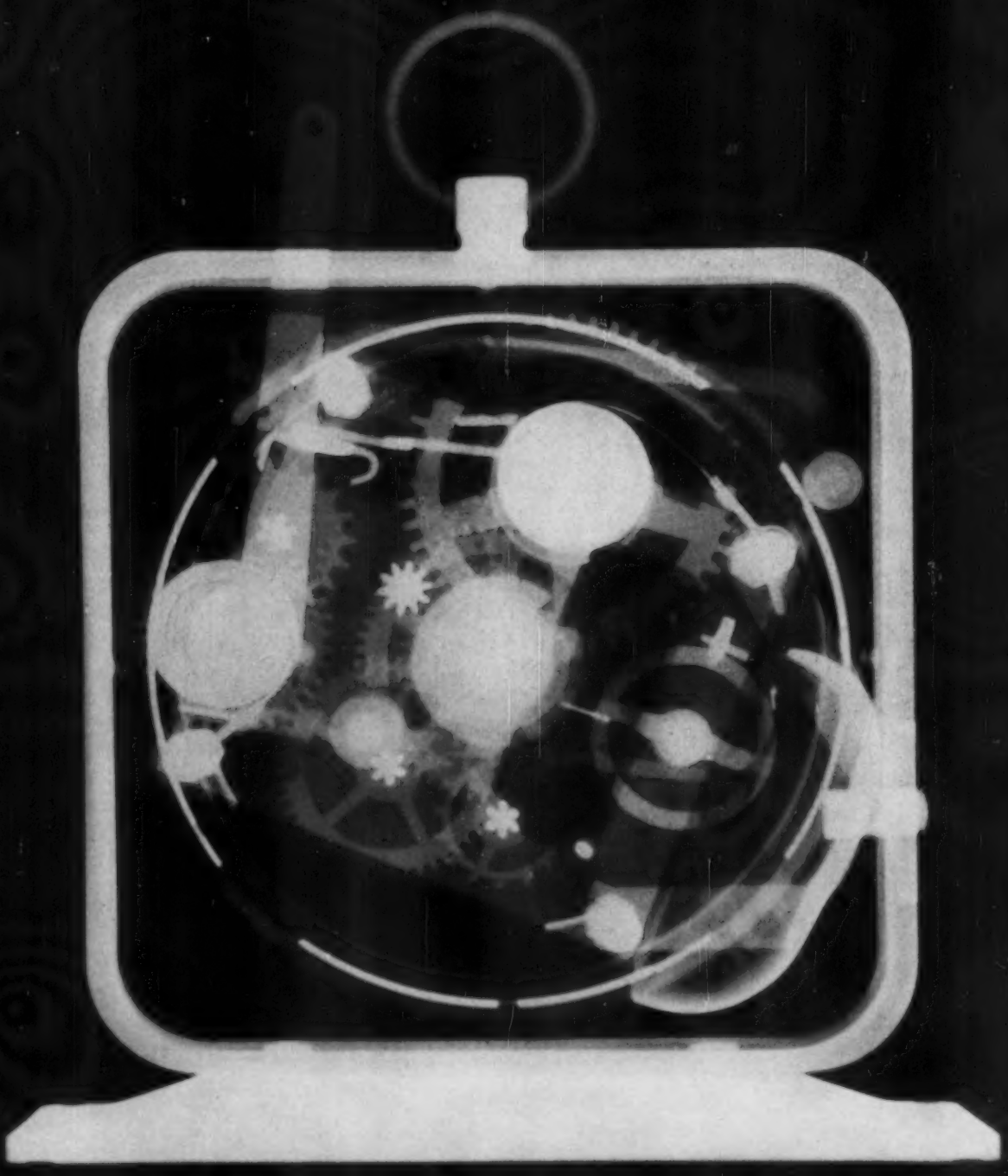
All high frequency radiant energy destroys living tissues and, whether these come from an X-ray or gamma ray source, the body can tolerate only a certain degree of exposure. But the amount of radiation is measurable by sensitive instruments, as is the density of shielding required for protection. Because exposures can be calculated closely, the Atomic Energy Commission permits a primitive radiographing technique without a projector, which can be set up for a few hundred dollars, using only a capsuled gamma ray source, film and a lead safe. The method is limited, however. The radioisotope that is to be handled even for a moment with gloves or tongs, or even at the end of a string, cannot have the strength of one safely locked in a projector, and its radiographs will therefore require long exposure time, as long as overnight.

A radiograph, made with a Kel-Ray projector, inspects radio tubes.



Further gamma radiographs taken with Kel-Ray projector: above, water faucet; below, bronze gear; right, alarm clock.





The fine filament wires of a light bulb.

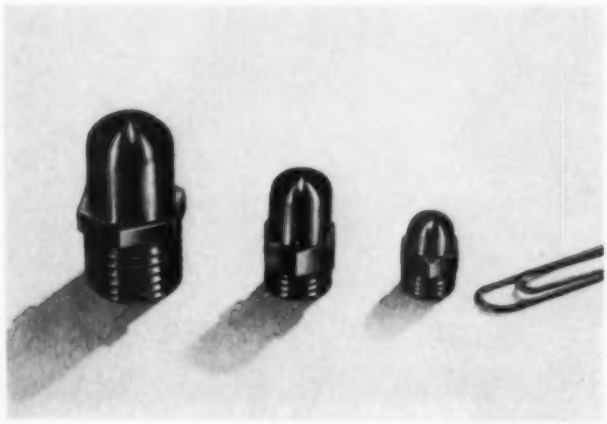
The details of a loaded automatic pistol.

The first step is to select the radioisotope according to the need

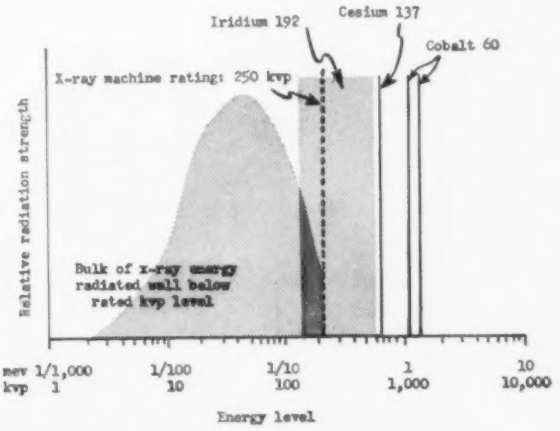
More than a thousand radioisotopes have been made from common elements—antimony, silver, iridium, cesium, etc.—by placing them in a neutron-generating atomic pile. Some of the neutrons that strike the nucleus of the atom are captured by it, so that the normal form of the element is increased by one mass unit to become the isotope form of the elements; i.e., Cobalt, with an atomic number of 59, becomes Cobalt 60. Cobalt 60 is one of the most commonly used, but there are many other possible sources for gamma ray projectors. The important consideration in choosing a source is the desired mev. Isotopes like Cobalt 60 that have high mev characteristics require thicker shielding; Cesium 137 and Iridium 192, having lower mev, require less shielding (Kellogg selected these for their smaller models, and Cobalt 60 for the heaviest duty). Radioisotopes vary not only in mev, but in the span of their radiation time, their cost, and their bulk. A comparison of the radiation strength of Kellogg's three sources and of X-rays is shown on the chart below, and makes clear their different ranges of intensity.

Like other potential users of radioisotopes for radiography, the M. W. Kellogg Company began to experiment with methods of handling them as soon as they were released by the Atomic Energy Commission (Kellogg's Nuclear Products Division now has permission to encapsulate isotopes for its customers). But they were not satisfied with the naked capsule technique described on the previous pages, or with the equipment on the market.

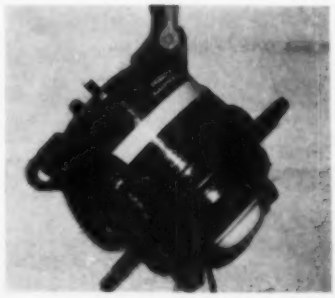
To suit their needs as specialists in the engineering and construction of petroleum refineries and petrochemical plants, they wanted to incorporate capsule and carrying safe into a radiographic instrument of maneuverable size, with a controllable beam of radiation that would be immune to inquisitive workmen and, no matter how roughly handled—even if it were to be in a hot fire—would be safely sealed from radiation leakage. They engineered a solution to these problems custom-built in heavy steel and lead, and showed it hanging in space in a magazine advertisement in March 1955, announcing it not as a product for sale but as an example of their services. So numerous were the inquiries from industries wanting to purchase "atomic cameras" that Kellogg decided to manufacture them and sell them through Metal and Thermit Corporation. Mr. Leonard Rummel, Manager, Nuclear Products Division, realizing that their device was not suited to mass production, asked Becker and Becker Associates to redesign the prototype (shown below).



Above, the size of Kellogg's three main sources varies according to strength, and selecting one is a practical matter of balancing exposure speed against projector size, weight and cost. Capsules have stainless steel or aluminum walls and are designed to transmit radiation uniformly. Right, the prototype shown in the original advertisement.



On the above chart x-ray radiation covers a wide band and gamma rays are narrower than x-rays, though Iridium 192 is still wider than Cobalt 60, which has greater penetrating power. A more accurate key to intensity is to identify the radiation by its position on the kvp or new scale, where Cobalt is higher than the other three.

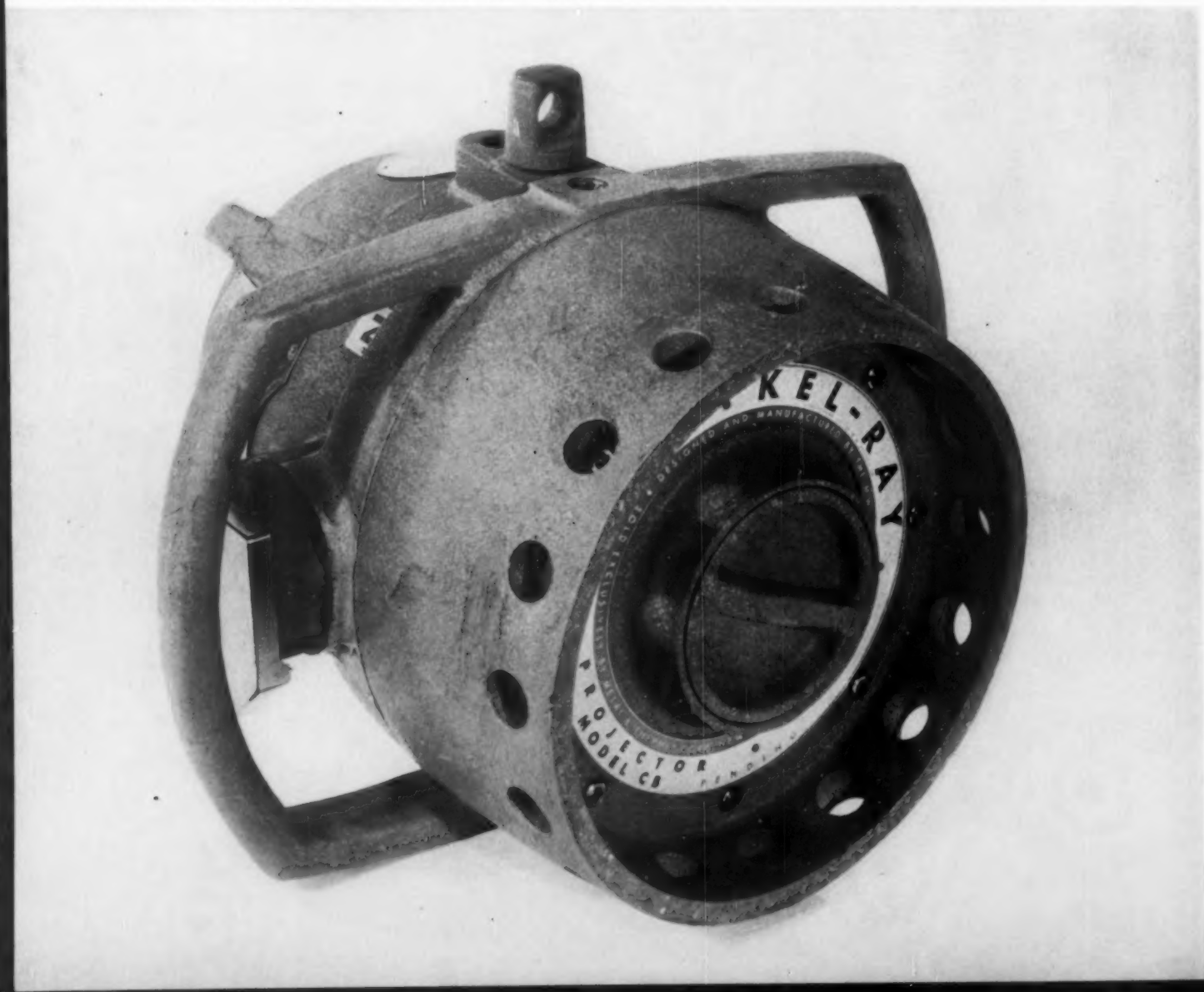


Design task was to house three radioisotopes in models of varying power

Certain basic concepts for the atomic projector were already established in the M. W. Kellogg prototype when Becker and Becker entered the scene: minimum diameter of a lead sphere to shield Cobalt 60 at 1170 kvp, for example, (18″) ; and the use of a rotor system to position the radioisotope capsule. Because each projector size is determined by the weight of the shielding, and this in turn depends upon the strength of the source, designers Nathaniel Becker and Frederick Leigh had to work with set dimensions in each model, including a mass of lead. Since regulations demand the projector be fireproof, they decided that a cast stainless steel shell would serve best, and would also be rugged for field use. They planned to use steel as a saving in production costs too, because it acts as a matrix into which the lead shielding is cast, and furnishes the conical focusing device as well as the means for attachments and handling.

Because the isotope is exposed to the aperture upon a rotor system (the projector in a sense is always "on" because the source continually radiates, and turning it off is a matter of rotating the capsule and burying it in the lead so that the rays do not escape), the housing had to be cast in at least two parts to permit assembly of the rotor. But any separation of the parts (and no matter how tightly the bolts are fastened, there is

Model CA and Model CB (below) have a one-tone wrinkle gray finish because most of the exterior parts are sand castings.

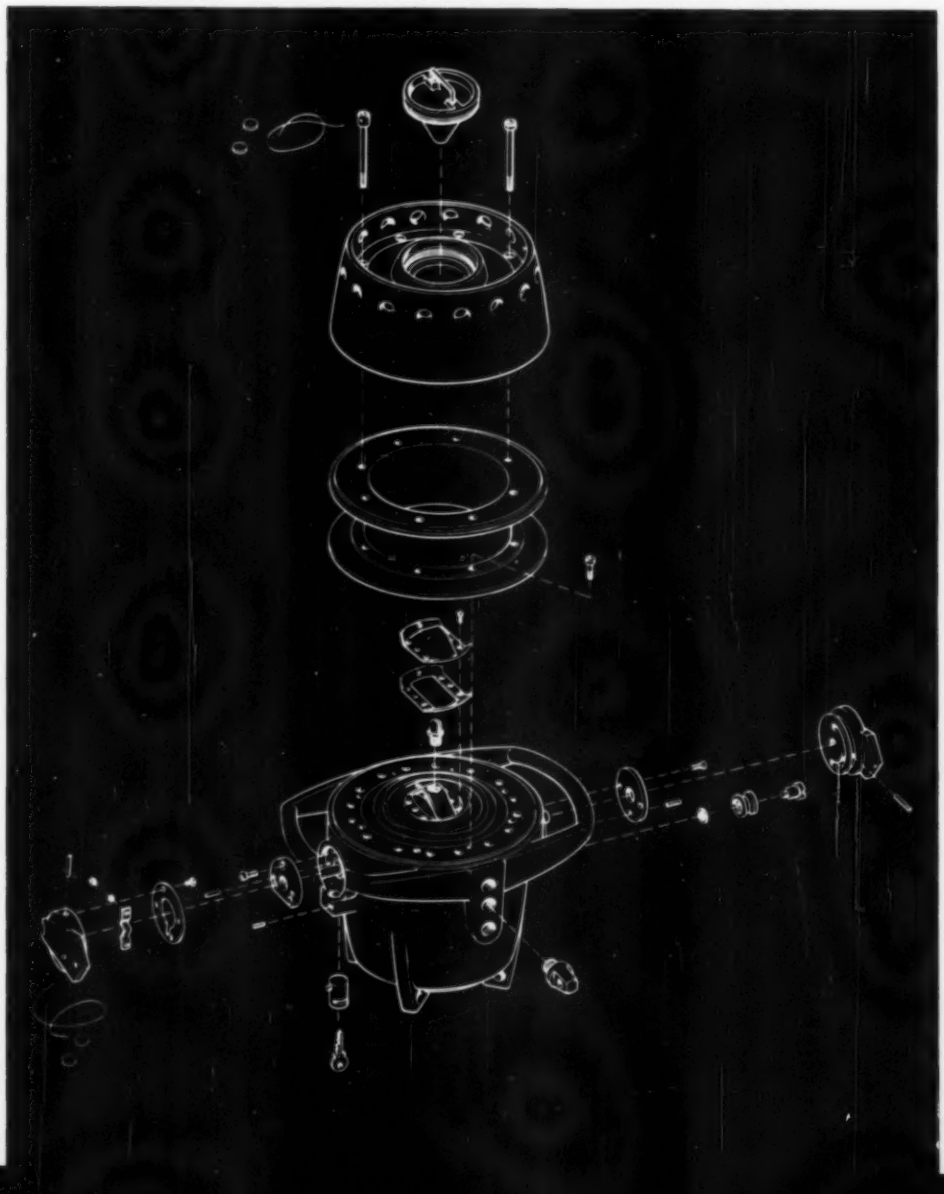


always some space) offers a possible leakage path to lethal radiation. As the diagram (below) of the exploded parts shows, the designers gave the two main sections of the housing a corrugated joint.

To avoid accidental radiation, the rotor is equipped with a self-locking lock and a key to release the lock for each new start. It turns into position by means of a hand knob, and requires two hands to turn on—one on the knob and one on the key. There is also a detent to permit placing the rotor in a cocked position, ready to turn on, should the projector be operated remotely by means of cables attached to the rotor system. Remote control affords a further safety measure, besides being a convenience in positioning an object that weighs 3000 pounds, as the heavy-duty CA model does, with a source that can penetrate eight inches of steel.

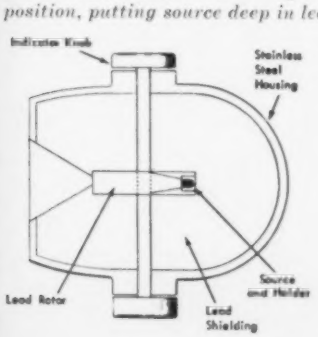
The designers developed a medium-duty model as well, the CB, which has the same basic design and configuration as the CA, but weighs only 250 pounds. It is built for a Cesium 137 source useful up to two and a half inches of steel, and is certainly wieldier for large pipe and tanks than the CA. The prize in handling, however, is the 75-pound CC (below). Equipped with a removable handle and Iridium 192, which is penetrating enough for many jobs, it is a portable package for short hauls.

This exploded view of the parts is the same for both the CA and CB.



View of portable CC shows self-lock control.

Below, diagram of rotor in "off" position, putting source deep in lead.



The projector's field of action is extended by positioners

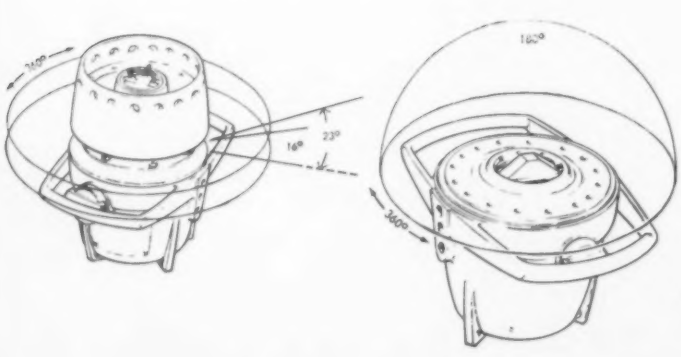
Because lead shields are the only means of directing the beam, gamma rays cannot be given a sharp focus in the way that visible light rays can. However, the built-in rotor system and the removable cover make it possible to use the Kel-Ray projector for three types of exposures. With the CA and CB projectors, the rays can be directed in doughnut, hemisphere and cone-shaped fields (below). The angle of the beam of radiation can be precisely calculated by adjusting the housing as shown, and, within that area, the capsule emits rays in all directions, the intensity falling off rapidly as the radiation progresses away from its sources.

To keep the projector in position when taking these different exposures, Becker and Becker designed the steel housing with three pairs of holes so that the 3000 lb. CA can be easily rigged with cables in any direction. The holes serve as three key balance points: one pair forward when the projector is used for panoramic shots; one pair for a normal center of gravity when the projector is set up for a conical shot; and a pair at the rear to establish a center of gravity when the front cover is removed for a hemispherical exposure. This last is the trickiest to operate because, while making that sweeping exposure, the projector itself is situated in the center of the field of radiation, at the focal point of the backscatter of gamma rays. For the hemispherical position—and for working in such obscure places as, for example, a spherical tank head a hundred feet deep—it is essential to operate the shutter by remote control. Here the maneuverability of the Kel-Ray projector gives it a decided advantage over other methods of handling radioactive sources remotely (such as lifting an unshielded Cobalt 60 source out of an underground lead-lined safe by a string) and means that only the area within the radiation zone needs to be cleared; thus the radiographer has nothing to fear. While the shot is being made, he must stay away from the beam, but between shots and when the projector is closed, there is so little surface leakage that a man can work close beside it safely for 40 hours a week continuously without harm.

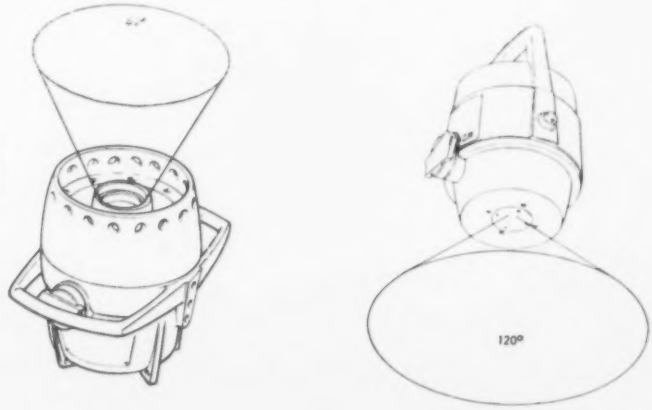
The 75-pound model CC can, of course, be positioned by hand, and carried in a car or around the factory, but there will be times when the user will want to install it in one spot. As the pictures to the right show, a positioner has been especially designed for it that works on the principle of a pipe vise and can be clamped on any kind of cylinder. Willard Converse, who succeeded Mr. Rummel as Manager of the Nuclear Products Division, asked Becker and Becker to design positioning devices for the heavier CA and CB to use in factories. A compact mobile mount (right) incorporating reduction gears and hand cranks, provides a means for quickly moving and fixing the projector within the lift limits of the work truck.

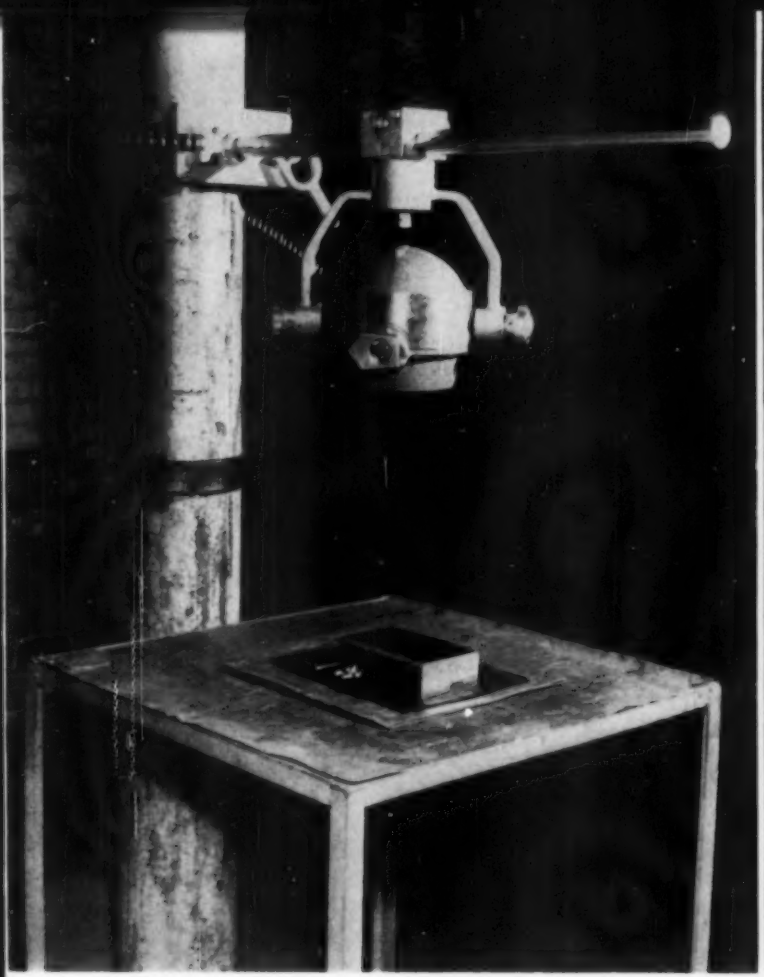
In designing these positioners, and also a handbook giving purchasers all the information they will need, Becker and Becker followed through in further detail their assignment from M. W. Kellogg. The result of the program is to bring the powers of radiography (which at equivalent strength could require complicated machines and sometimes special rooms) to new users and within the safe reach of non-specialists.—*s.b.*

The three diagrams below show the radiation patterns of the CA and the CB—the same, except for the panoramic shot, left, where the CB is wider (23°) than the CA (16°).

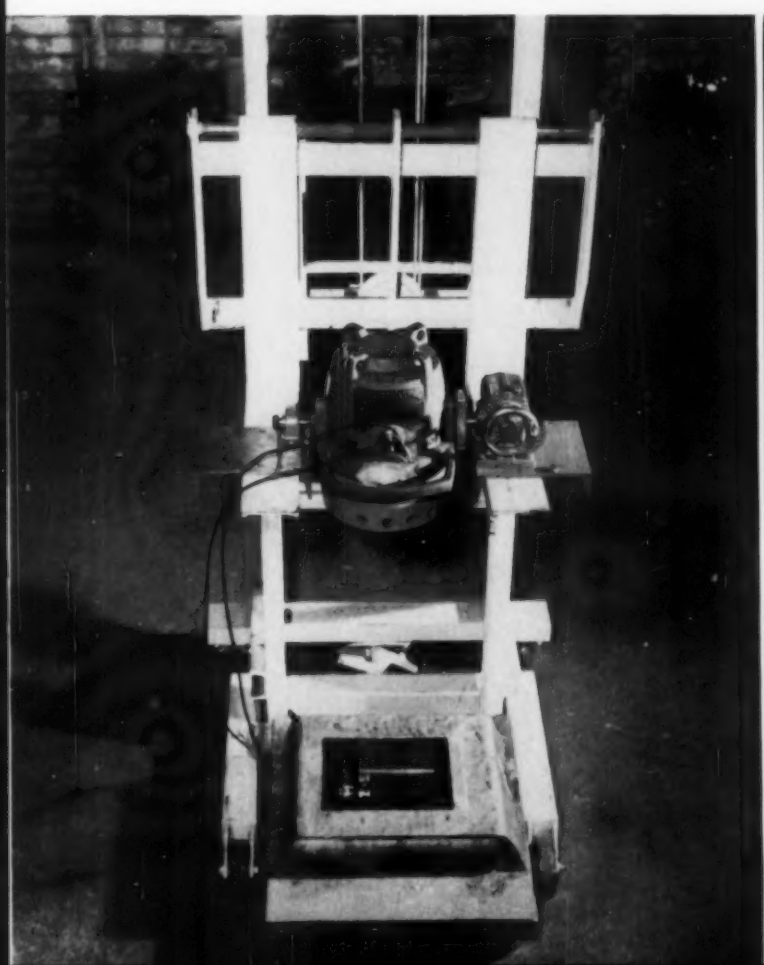


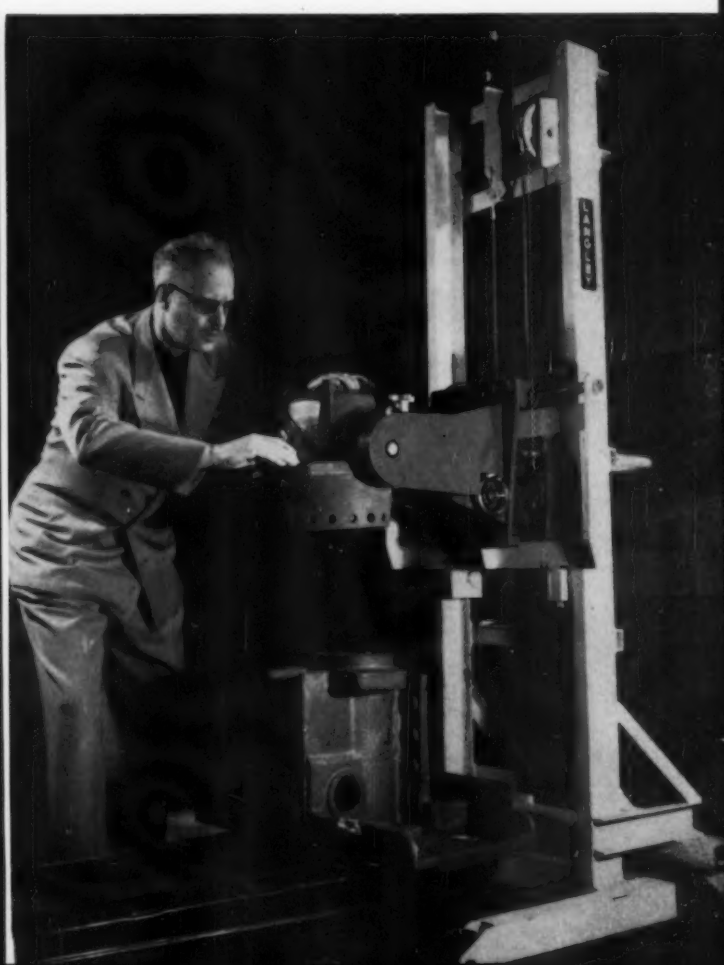
The portable CC has only one radiation field, a conical shot at 120°. It is especially designed for radiographing pipe welds and weld repairs, using lower energy sources.

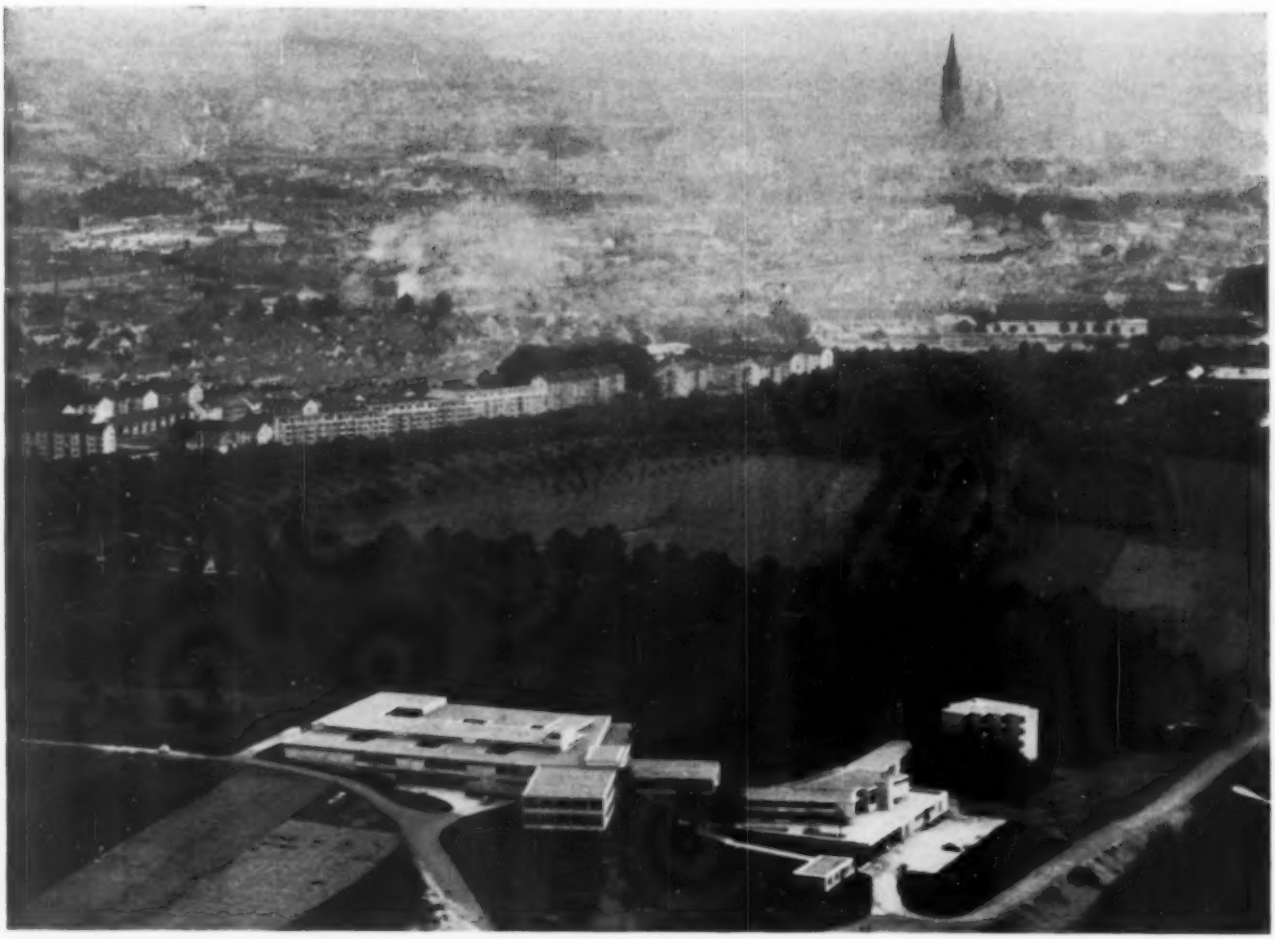




Top pictures show the portable CC on positioner, with and without handle; below, model CB can be set up on a forklift with its adapter.

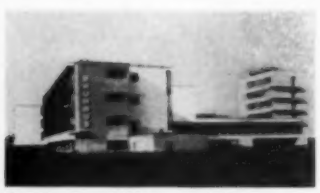






Design 'Hochschule' emerges

The Ulm Design School
becomes
a focal point
of central European
design
and planning



Bauhaus at Dessau, 1926

Inge Aicher-Scholl and Walter Gropius (founder of the Bauhaus of the 1920's) at the Ulm Design School inaugural.

A new industrial design school in Ulm, Germany, has been arousing interest on both sides of the Atlantic—as the first major design school to emerge in Central Europe since the war, and as a near relative to Germany's revolutionary Bauhaus. Ulm is, in fact, already being referred to by some as a *new* Bauhaus—raising an important question as to the nature of its kinship to the school that gave birth to the concept of design education as we know it today, and its own potential influence.

The Bauhaus, the first design school to cast off arts and crafts ideals and orient itself to the problems of an industrial century, based its teaching on the belief that the machine is a medium of creation worthy of an artist's effort. Its faculty, headed by architect Walter Gropius, was laden with names of now-famous artists, designers and architects: Klee, Kandinsky, Moholy-Nagy, Marcel Breuer, Herbert Bayer, to name a few. Though they worked in different fields, they sought a common esthetic basis for all design, proposing to the world of the easel-artist that esthetic values could be expressed through the form of every day factory-made objects.

The Bauhaus philosophy and teaching approach influenced, among other things, virtually every design curriculum in America—both by the force of its ideas and by the fact that many of the faculty came here to teach after Hitler's suppression of the school in the early 30's. After its demise, ironically, the country that cradled the Bauhaus went on without any school offering intensive, industry-oriented training—a lack that became particularly apparent against the dramatic postwar revival of German industrial power. Thus the new Hochschule has a chance to fill an urgent industrial as well as educational need. The questions are what is its view of today's problems, and what are its design objectives?

Properly, the story of what the Ulm Design School stands for starts during the war, in 1943, when Hans Scholl and his sister, Sophie, students at the University of Munich, were executed for high treason by the Hitler regime for having distributed inflamatory pamphlets which urged active resistance to fascism. Out of this tragedy came the impressive and vigorous resolve of their surviving sister (now Frau Inge Aicher-Scholl, wife of graphic designer, Otl Aicher) to commemorate their sacrifice in an institution that would contribute to the "spiritual regeneration of a destroyed and confused post-war Germany" and take on the problem of educating young people toward an unaccustomed social and cultural responsibility. Her vision could not have been more exalted; her energy more inexhaustible.

Inge Aicher-Scholl's early efforts centered about the development of an adult education center in Ulm, which the city aided her in starting. Then came the idea for another school, at university level, which would exist "to encourage the development of the creative individual in our technical age" and would seek to revive the Bauhaus tradition of the Weimar republic. The Scholl Foundation, which administers the financing of the School, was set up in 1950 with funds from the Norwegian Aid For Europe. In the same year, the American High Commission For Germany became interested in the project. High Commissioner John J. McCloy and his advisers agreed to make available to the Foundation $250,000 from the McCloy Special Projects Fund, provided that an equal sum could be raised from German sources. Within a remarkably short time this amount was accumulated, very largely through the resolve and dedication of Frau Aicher-Scholl. Help came from the City of Ulm in the form of free utilities and a hilltop sight overlooking the city. There was no regular endowment, but the state of Baden-Wurtemburg and the Federal Republic of Germany gave guarantees of yearly subventions which would come to about $70,000 a year. In 1953 construction of the new school began. Money for the school is still very much needed and undoubtedly will be far into the foreseeable future. Frau Aicher-Scholl comes to America this month, among other things, to seek financial aid.

The school was officially dedicated in 1955, with the Swiss artist Max Bill as Rector. (A committee of five faculty members now shares the administrative work: Otl Aicher, Visual Communication Department; Max Bill, Product Design Department; Hans Gugelot, Product Design Department; Tomas Maldonado, Foundation Course and Visual Communication Departments; Friedrich Vordemberge-Gildewart, Foundation Course and Visual Communication Departments.) For two years before the school officially opened, the faculty and the students worked to construct and furnish the campus buildings, all designed by Max Bill. This is reminiscent of the Bauhaus of the 1920's, whose slim budget dictated a similar project. (It is hard to imagine an endeavor that would bring an entire school into closer contact with the practical facts—economic and technological—of an industrial society.) Enrollment has been held to a maximum of 150 students with an international selection sought in both faculty and students. On the following pages is the first published report of the school.—*r. c.*

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What Ulm stands for

Inge Aicher-Scholl resolved to "contribute to the creation of a new culture by helping to form a way of life consistent with our technical age." This echoed the Bauhaus tradition, but Ulm's founders saw a clear difference in the spirit of today's problems when it added, "Anything employed by modern man in shaping his environment, even to communication of a visual or verbal nature, constitutes a component of our culture which the curriculum will consider." Directing its program unequivocally to design in mass production, (paring away many of the craft and art disciplines of its predecessor) Ulm divided its fields of interest into these disciplines: Product Design, Building (Prefabrication); City Planning (projected), Visual Communication, and Information. Underlying this curriculum runs the thesis: "The comprehensive designer should fulfill responsibilities to society and not to the commercial interests of industry alone." Yet, in denying opportunism, Ulm remains wholly in sympathy with the validity of mass production for a mass culture.

The course of study at Ulm takes four years, with one year devoted to the classic Foundation Course (overleaf) and three years to one of the Divisions mentioned above. Because all teaching begins with a Foundation that is very close in principle to the Bauhaus, certain esthetic similiarities are not surprising: in the severe architectural forms of the products (page 78) the lineage is clearly visible. The concepts of form and expression that the Bauhaus developed through continual experimentation, and which artists like Klee and Mondrian explored in the beginnings of modern art, are accepted at Ulm as a well established alphabet of form, line, color and structure. The purpose of study is to learn this alphabet so that it can be consciously applied. There is a specific injunction against the artist who is "seeking to bestow his inner expression" in design; rather, individuality is encouraged to find its way within a disciplined framework. In the other areas of the curriculum there would seem to be an eager acceptance of modern social sciences and a psychological approach to perception, which Ulm considers a scientific base for all its teaching. Max Bill summed up the aims in this way: "Ulm wants to bring young people to a point where they will be able to furnish our planet as well as possible. We do not regard culture as just high culture, but as something contained in daily living, in all things that have form—for all forms are an expression of purpose and have meaning."

Time will test Ulm's effectiveness. In the area of pure design, it seems to be striving to apply the known, rather than to originate new concepts about today's visual world: its disciplined certainty about an established esthetic base, which always helps to clarify an academic approach, may also limit the depth and flexibility of the student's learning experience. By contrast, Ulm's clear orientation toward the most relative of today's sciences—sociology and psychology—promises to turn out students who are realistic and open-minded about the problems of industry in today's culture. It will be interesting to see if these two attitudes, now dissimilar and in part contradictory, will transform each other as the new school at Ulm grows and matures.

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Students and faculty of the new school took as their first project the actual construction of the campus buildings designed by faculty board member Swiss architect Max Bill. (1, 2) Two views of the spare concrete buildings; (3) a covered walk connecting the living quarters with the main building; (4) students of the Foundation Course at work in the plaster workshop; (5) a typical student room in the dormitory furnished with economical multi-purpose benches.

Curriculum

The course of study at Ulm fills four years, with one year devoted to a Foundation Course, and three years given to one of four Divisions. The Foundation Course, required of all new students, covers perception, color, form, and space—and training is given in presentation methods: photography, technical drawing, etc. Exercises are based on the "scientific foundation of the perception theory, visual semantics, symmetry, theory of color, and topology." The Division of Visual Communications covers graphic arts, photography, typography and exhibition planning, with tv and cinema to be added at a later date. Closely tied to this is the Division of Information: preparation in the techniques of press, tv, radio and advertising in general.

These Foundation Course problems are similiar to those used by the Bauhaus and now standard in most design schools: (1) black as a tone rather than a degree of density; (2) volumes arranged within a system of coordinates; (3) precision through the fusion of spots; (4) primary and secondary elements; (5) from inexact media to exact results; (6) exact media creating inexact results; (7) dissolution of a form through a linear topological system.

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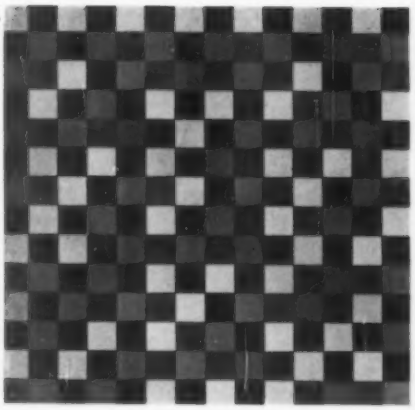

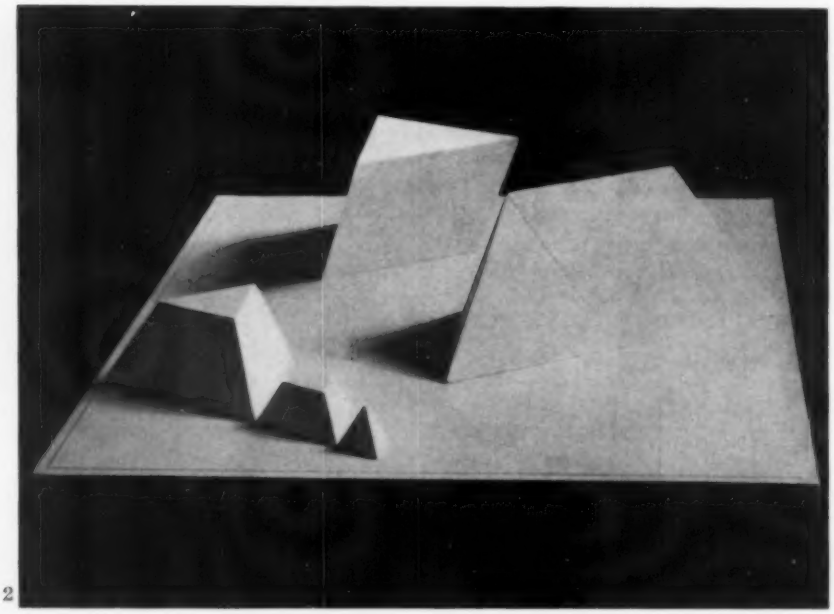

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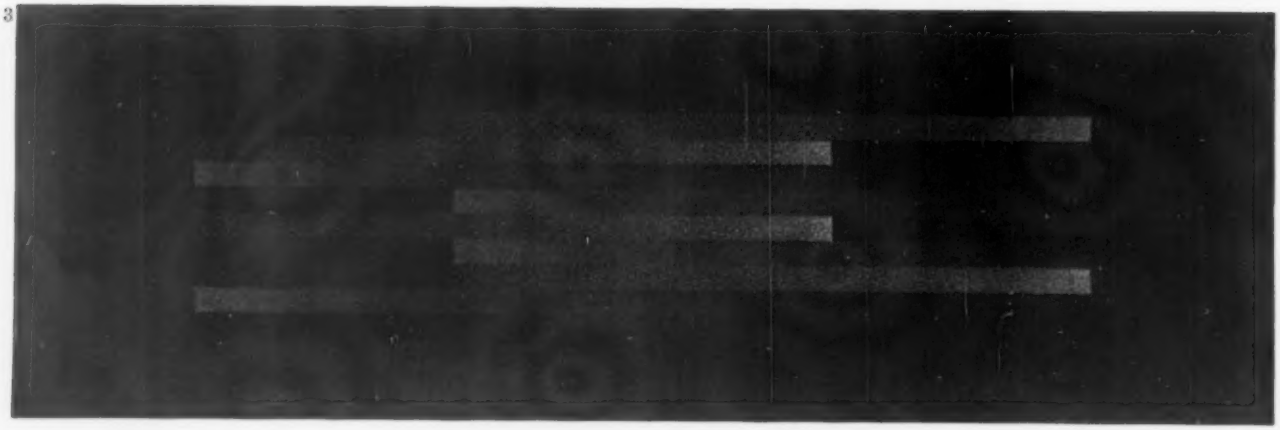

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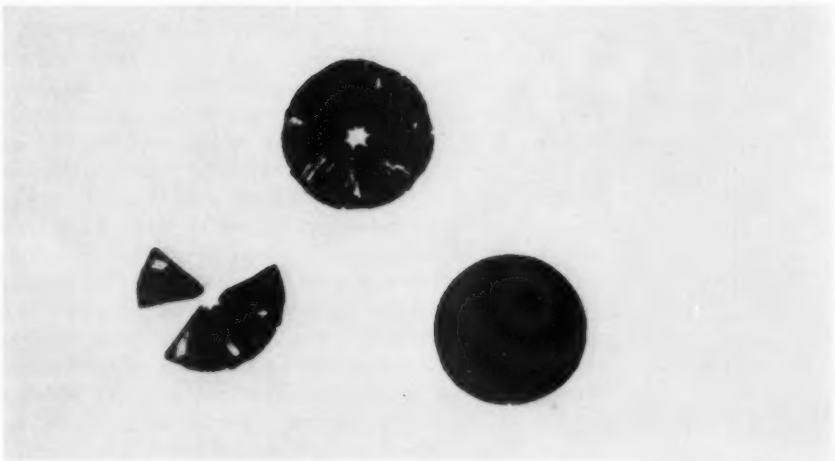

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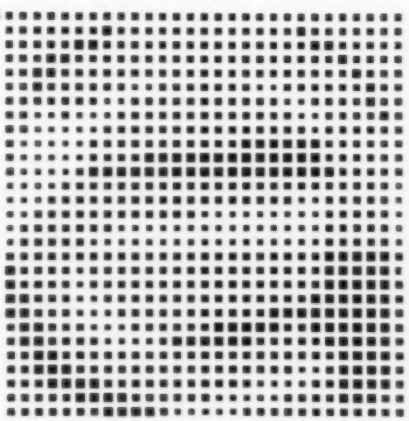

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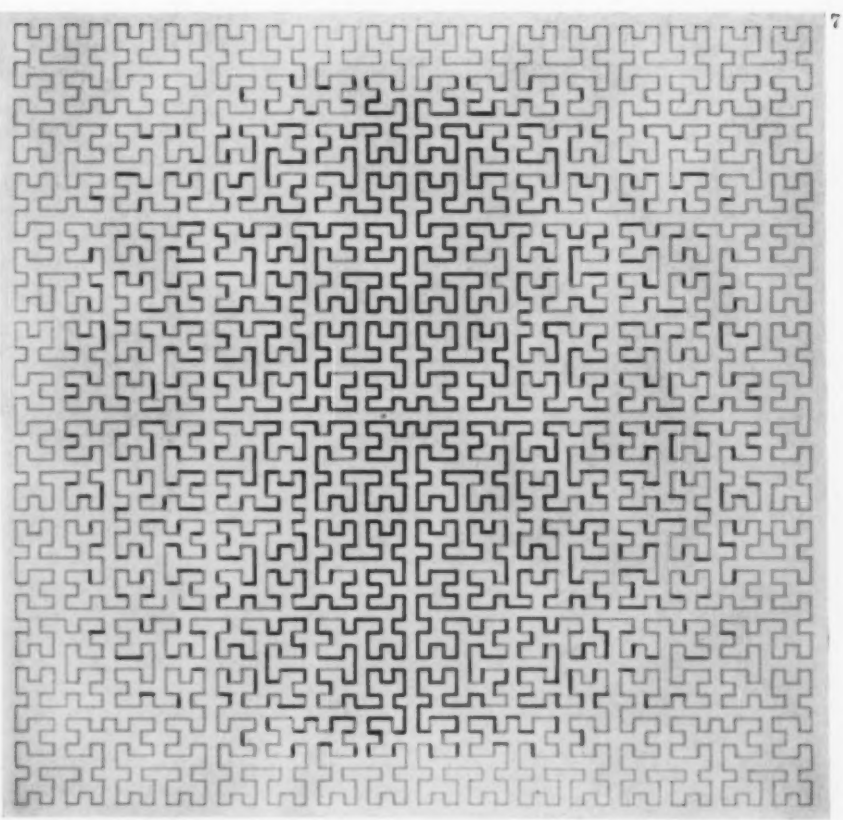

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Product Design

Students in the Division of Product Design are taught to determine the form of an object with regard to its "useful value and cultural implications." They are to think of themselves as complementing the production-engineer who is primarily interested in the proficiency of a product's operations and its means of production. The distinction between the fields is one of approach, which should lead to close cooperation and "deep penetration into the comprehensive problems of our industrialized world." Students of the Architectural Division study every problem directly or indirectly related to industrialized structure. They analyze, through actual projects, the mechanics of organizational and constructional problems. (The building of the school itself was the Division's first project.) The social responsibility of the artist is especially stressed. At a later date, a Division of City Planning will be added. And, finally, the Ulm curriculum includes what they term "Cultural Integration," which is a system of lectures and seminars whose courses include The History of Culture in the 20th Century, The Theory of Perception, General Semantics, and Aesthetics. Special problems concerning the work of the various divisions are related to the demands of contemporary culture, with the realization that solutions to these various problems of design must also be sought in relation to the specific fields of knowledge. The aim of Ulm's training is to make the future designer alive to the important inquiries of our time in philosophy, psychology, economics, literature, art, music and history.

These student-faculty products have much of the simple austerity of the Bauhaus and pre-war German design: (1) plastic dishes, (2) convertible double bed, (3) adjustable non-glare light source, (4) school lighting with ceiling used as a reflector, (5) radio-record player, (6) plywood bed foundation, (7) plastic lavatory.

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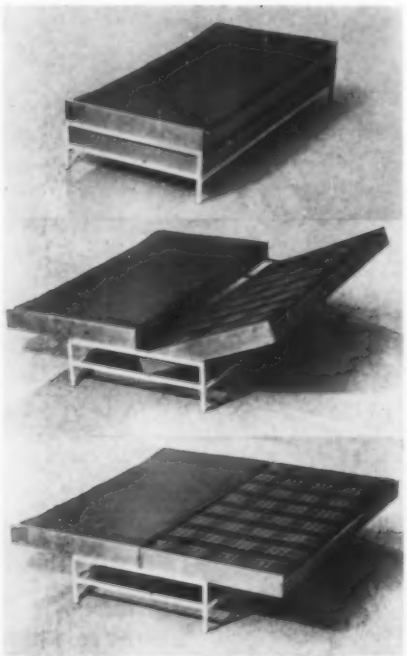

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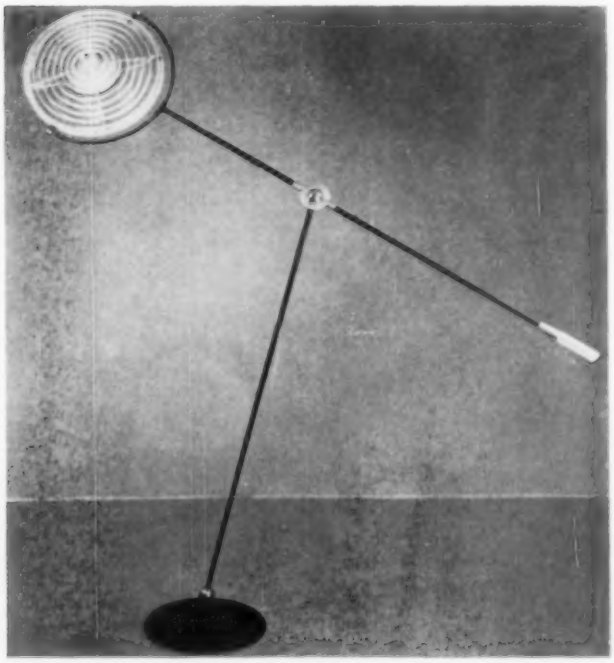

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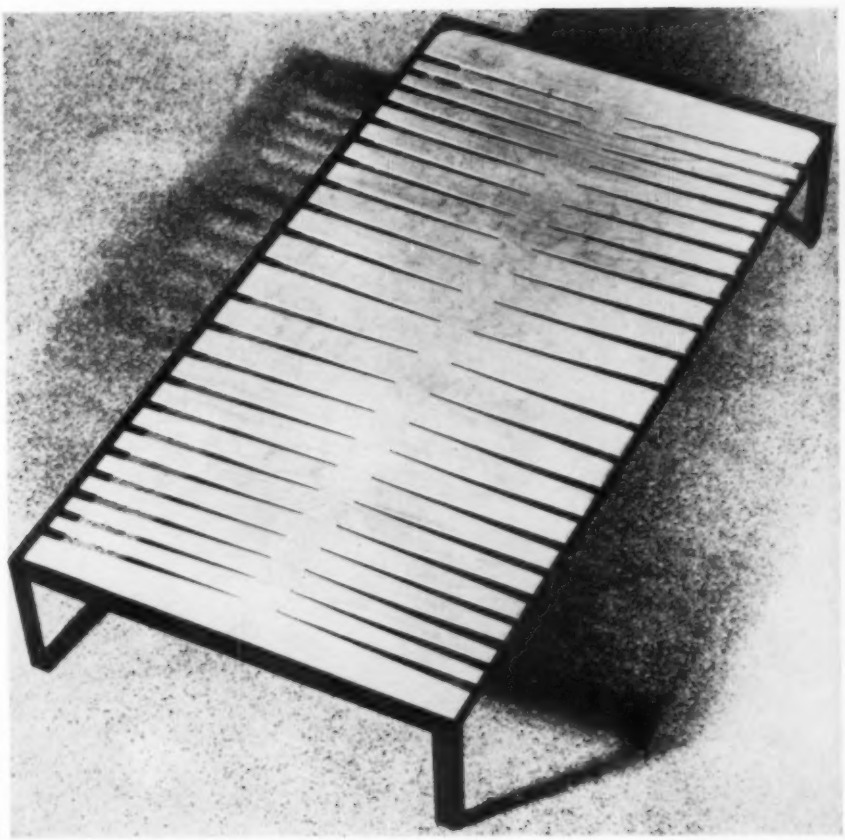

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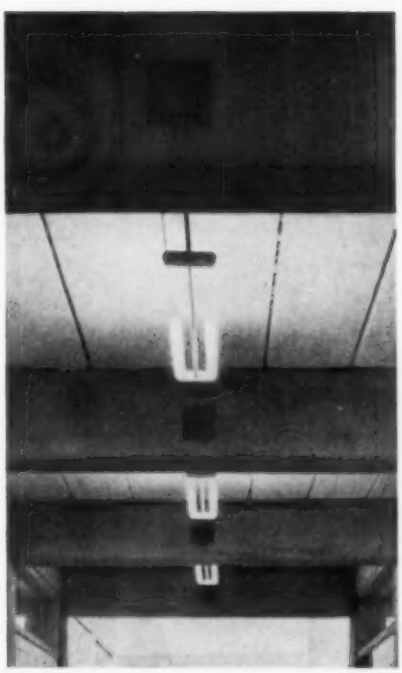

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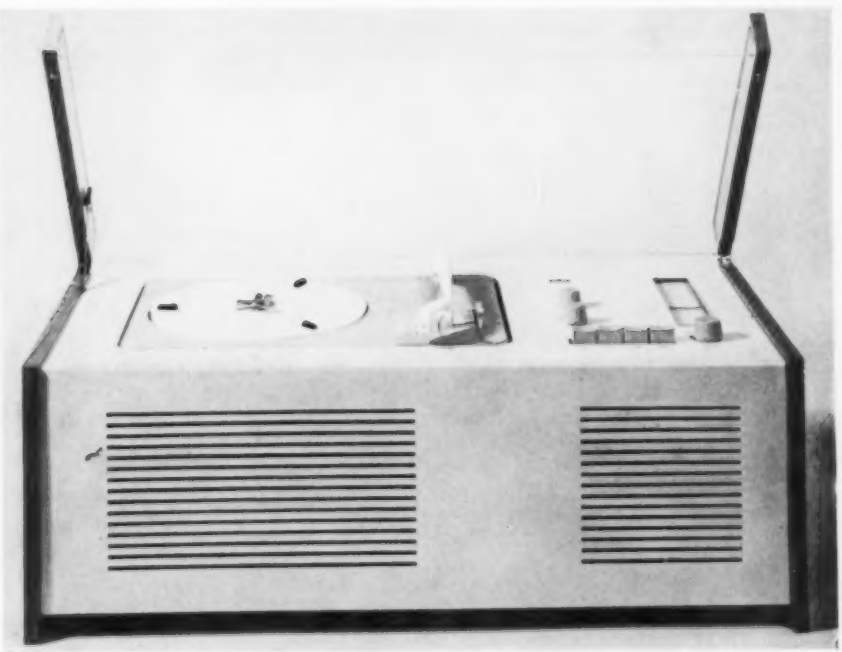


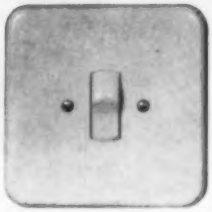
Swiss Werkbund bestows annual accolades

Hardware by Willy Guhl, made by Schlossfabrik Heusser.

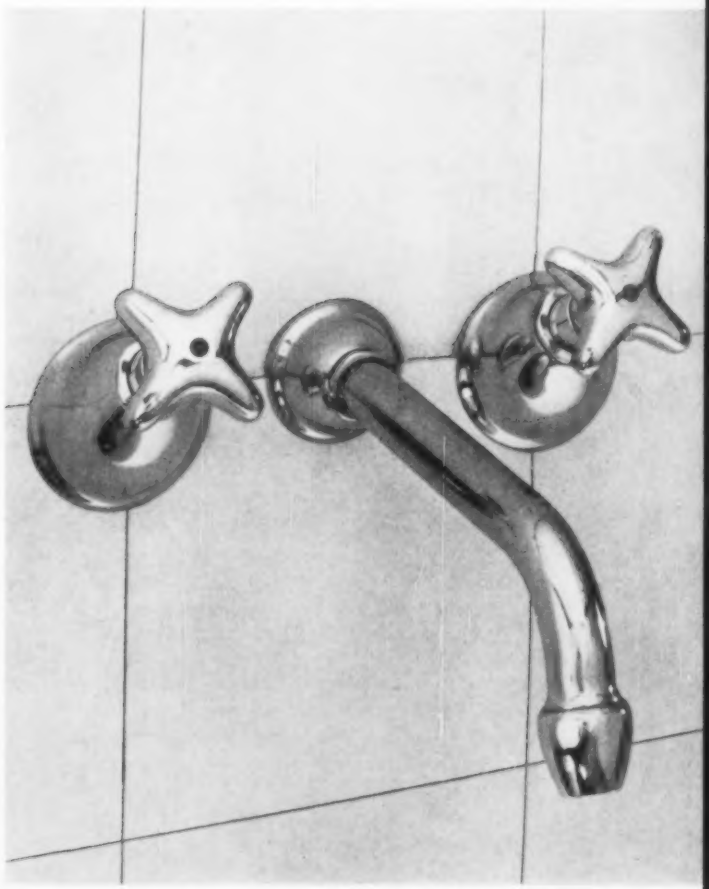
An Oriental influence can be detected in the leading designs displayed at the Swiss Industries Fair in Basel in 1956. Under the approving canopy of "Gute Form" — a script designed by Emil Ruder — the exhibit, to a Swiss public, corresponds to the "Good Design" shows that used to be sponsored by the Museum of Modern Art, and to the annual Compasso d'Oro exhibition in Milan. For this, too, is a juried selection of the nation's products.

The guiding spirit behind "Die Gute Form" is the Swiss Werkbund, a guild of designers and craftsmen, who also help to sponsor a monthly design magazine, *Werk*. The handsome steel framework, constructed to approximate room heights, was designed by architect Alfred Altherr. Eighty-seven Swiss firms received design citations, and of 259 winners, we show a select few.

Ceramic group designed by Reni Trudinger for Werkgenossenshaft Wohnhilfe.



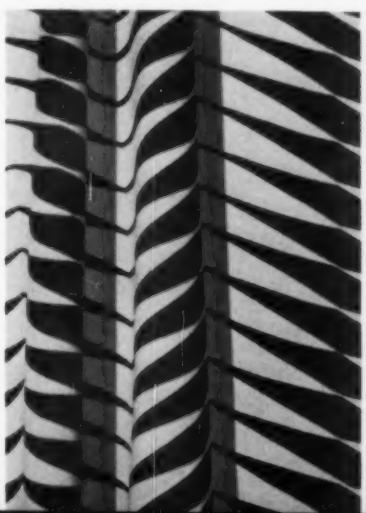
Electrical fixtures were designed by Adolf Feller.



Wall fixtures are by Karrer, Weber & Cie, and Unterkulm.

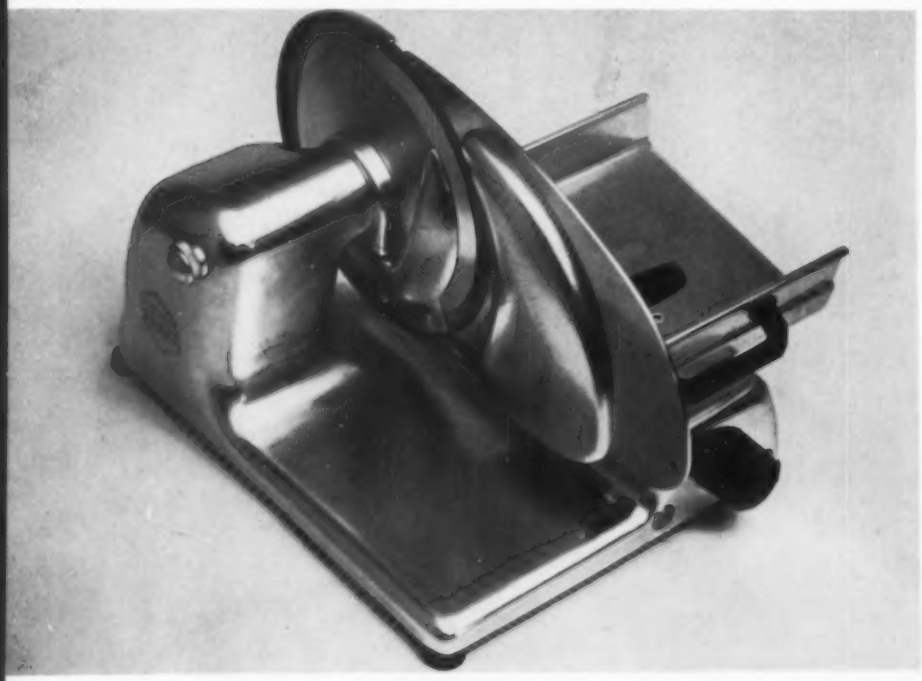
Sandbox and planter was designed by Kunstgewerbeschule, Zurich, made by Eternit AG, Niederurnen/GL.

Fabric design "Guepe" was designed by the Kunstgewerbeschule, Zurich, is manufactured by Wohntextil.



Washing machine is produced by Gallay S. A, Geneva.

Slicer was designed by Ditting, Zurich, made by Walter Latsch.

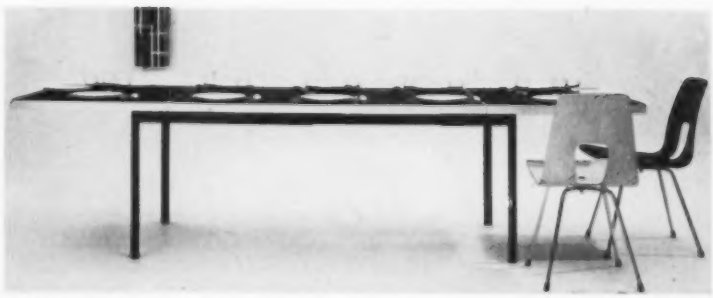


Porcelain design "Landi" was designed in collaboration with the Swiss Werkbund, manufactured by Porzellanfabrik Langenthal AG.

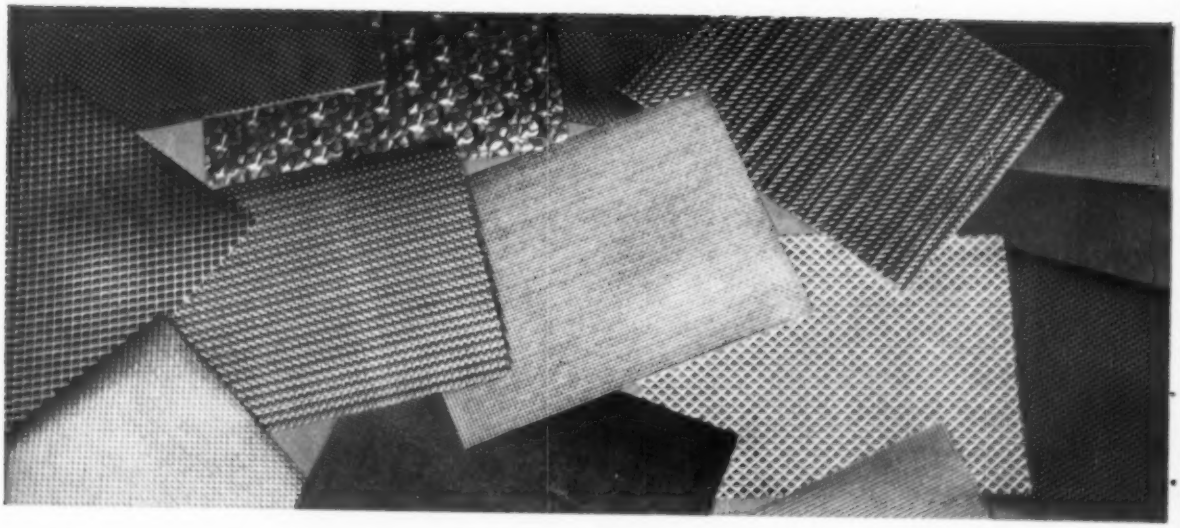
Shoe cabinet was designed by W. Kienzle. Manufacturer is Wohnhilfe, Zurich.

Master telephone device is by Hasler AG, Bern.

Lamp design by Altherr.



Folding table was designed by Fred Ruf; chair, by Hans Bellmann for Wohnbedarf, Zurich and Basle.



Color Problems V:

Transparent plastics

by Douglas G. Meldrum

The transparency and optical clarity of some plastics have been used for years to good advantage for their own sake—to be seen through. Acrylics were widely recognized during World War II, when they replaced glass in aircraft; cellophane became a household byword almost as soon as it was used to protect and spark up a package of cigarettes. But airplane "greenhouses" and cigarette packages do not suggest how the transparency of these plastics can be used *in combination* with colors to give a variety of decorative effects quite different from those obtainable with other plastics or materials that are opaque.

This article, the fifth in a series on Color Problems, will be concerned with two types of plastics that have a high degree of clarity: Mylar, the comparatively new polyester film produced by Du Pont, which is enjoying new uses almost daily; and acrylics—Du Pont's Lucite and Rohm & Haas' Plexiglas. Though the latter have been commercially available for more than 20 years, they have been isolated, with Mylar, from opaque plastics (ID, August, '56) and from vinyls, styrenes and other clear plastics because they constitute what is essentially a special group of sparkling materials that involve different color *effects*.

The colorability of a material is usually thought of as *one* of several physical properties that it offers. A *range* of colors is invariably available, but *how* the colors are given to the material is usually restricted to one method: either it is applied as a surface coating or integrated with the material. Acrylics and Mylar, however, by virtue of their transparency, can be colored in not only both of these ways but several others as well. This means that they offer some unique possibilities for coloring products and, of course, pose problems that are not encountered with other materials.

The use of Mylar as a decorative material is, compared to other applications, fairly recent. Its outstanding strength, insulating qualities, resistance to moisture, solvents and alkalis made it a logical choice for such industrial applications as electrical insulation and magnetic tapes. But, with the combination of some of these advantages and its transparency and colorability, it has turned out to be an excellent material where color, protection and durability are required—three requisites that are always in demand. And the key to attaining all these properties in one application again lies in the transparency and sparkle of the plastic film.

Acrylics are well-known for their strength, lightness and weatherability, as well as their clarity. They too can be used to protect a colored surface and have the additional advantage of optical properties of reflection, transmission, transmittance, and reflectance. These properties introduce still more problems when color is introduced, but with proper attention to design factors can be turned into a great asset in many cases.

Several methods can be used to color acrylics and Mylar to take advantage of their clarity. The choice of how color is added depends on the application and the desired appearance, but as the alternative methods can be used singly and in combination, all possibilities should be considered. Clear plastics, firm or flexible, *can* be colored integrally, but not entirely satisfactorily, because to retain advantage of the plastic's clarity, *clear* colorants must be used. A fairly wide range of dyes is available that give good lightfastness for clear plastics, but they are never as brilliant or strong as colors used in opaque plastics. Integral coloring is nonetheless used a great deal with acrylics where light transmittance is important, as in automobile taillights and signal lenses, and it can also be used in combination with backpainting or metallizing for a wide range of colored metallic effects.

It is an obvious advantage to apply color to the back or underneath surface of a transparent plastic. This also protects the color from abrasion, or from discoloration and staining by gases and liquids. In addition, both acrylics and Mylar act as a filter for ultraviolet light. This means that if a colorant is applied to the back of these plastics, or if a sheet of Mylar or acrylic is placed over a colored surface, the color is protected against fading from sunlight, and finally it adds the glitter of the clear plastic to the color.

Patterns and designs can be printed on Mylar with special equipment and special inks (thermoplastic), and patterns can be embossed in the film to provide a textured finish that can be applied to virtually any surface. The increasing acceptance of Mylar as a replacement for wood or metal surfaces (or as a covering for them) is based on greater color flexibility, lower production costs, and in many cases, greater durability. Some specific examples of applications are given on the following pages. Some use the material to definite advantage, adding physical properties as well as attractiveness to a product, while others apply it to add glitter without substantially improving a product.

Acrylic, with its glass-like clarity, offers many of the advantages of the traditional material without some of its disadvantages. New methods for fabricating acrylics, some of which are mentioned on page 88, are giving them wider diversification and, combined with a choice of coloring techniques, are making them an increasingly important material for component parts in major appliances.

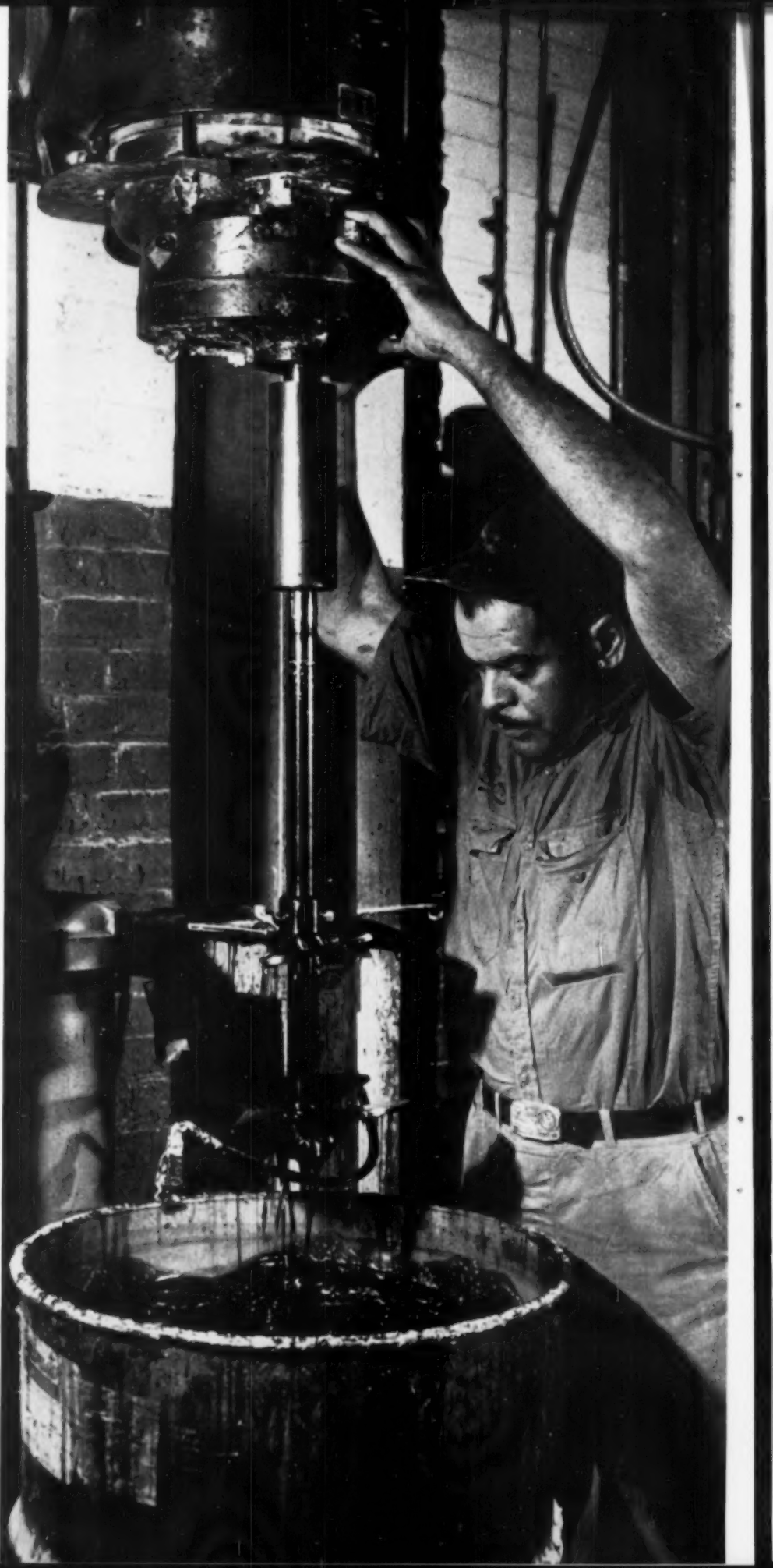
Some color effects that can be gained with Mylar and acrylics are illustrated on the opposite page. At the top, swatches of Mylar laminates show how the material can be colored and embossed in a variety of textures. The acrylic letters (below), formed by Rohm & Haas, demonstrate various ways Plexiglas can be colored. The large "P" is formed in a sheet that is integrally colored mauve. The other letters are seen through the sheet and are formed from clear plastic that has been backpainted in several ways.

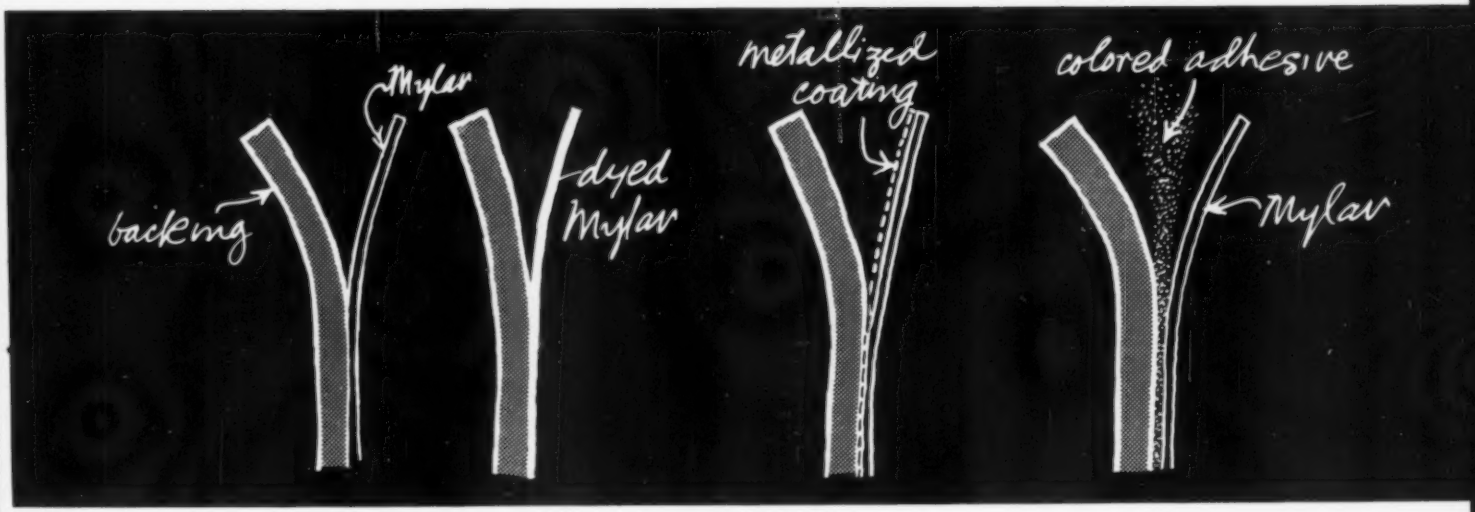
Coloring clear film

For decorative applications Mylar is rarely used alone, but usually laminated to some sort of backing — and the backing is often the key to coloring this transparent film. It can be laminated to almost any material, including paper, mica, metals, leather, foils, vinyls, cloth, asbestos, and more Mylar. One of the areas where laminates of Mylar find wide use is in metallic yarns, which have been popular for centuries to add glamor to fabrics. Attractive as they were, yarns made from real metals were always a source of trouble because they tarnished, became brittle, and did not stand up under the abuse of washing and cleaning. Acetate butyrate was introduced a number of years ago with considerable success because of its strength and cleanability, but it is rapidly being replaced by Mylar laminates which offer additional durability and some unique color approaches.

Metallic yarns using Mylar are produced in one of two ways — by lamination and by vacuum metallizing. In the lamination method, a wide roll of Mylar is laminated to both sides of aluminum foil with a clear or colored adhesive, depending on the color desired. The foil, of course, gives the metallic appearance, and the adhesive, if other than silver or gold is required, gives the color. A two-faced effect can be gained by using a colored adhesive to bond one side of the Mylar to the foil and a clear adhesive (or one of another color) for the other side. For vacuum metallizing, the plastic film is subjected to high vacuum conditions in contact with aluminum vapors. The vapors condense in a thin layer, creating a bright mirror-like effect. Another alternative for different colors is first to coat the film with a transparent colored lacquer before it is metallized. The vacuum metallized film is then laminated to still another sheet of Mylar to protect the metallized surface on both sides, and the film is split into very narrow widths — as small as 1/64 or 1/120th of an inch, depending on the weaving requirements.

Fabrics containing metallized Mylar yarn can be piece-dyed at a boil, since Mylar is unaffected by temperatures up to 300°F. Mylar reacts to dyeing—both in resistance and affinity—just as its chemical twin Dacron. Using special dyes, the Mylar can be colored without affecting the fabric, or in reverse, other dyes will color the fabric and leave the metallized yarn unaffected.

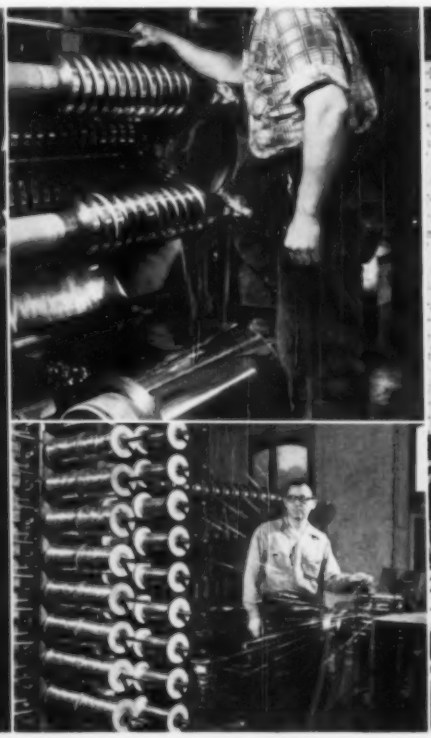




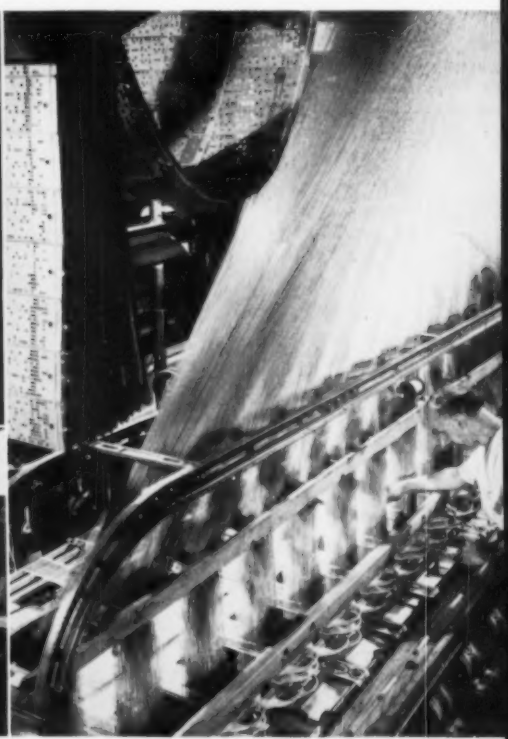
Color can be added to Mylar by any one or a combination of the methods shown above.

Making metallic Mylar yarn at Metlon Corp., colorants are added to the adhesive (left) used to laminate two sheets of Mylar to a sheet of aluminum foil (below).

The laminated sheets of Mylar and aluminum foil are slit into narrow widths on an automatic cutting machine (top) and then wound on spools for shipment to mills.



An automatic loom weaves metallic yarn into a fabric, giving it sparkle. The strength of Mylar permits weaving at normal speeds without fear of breaking.

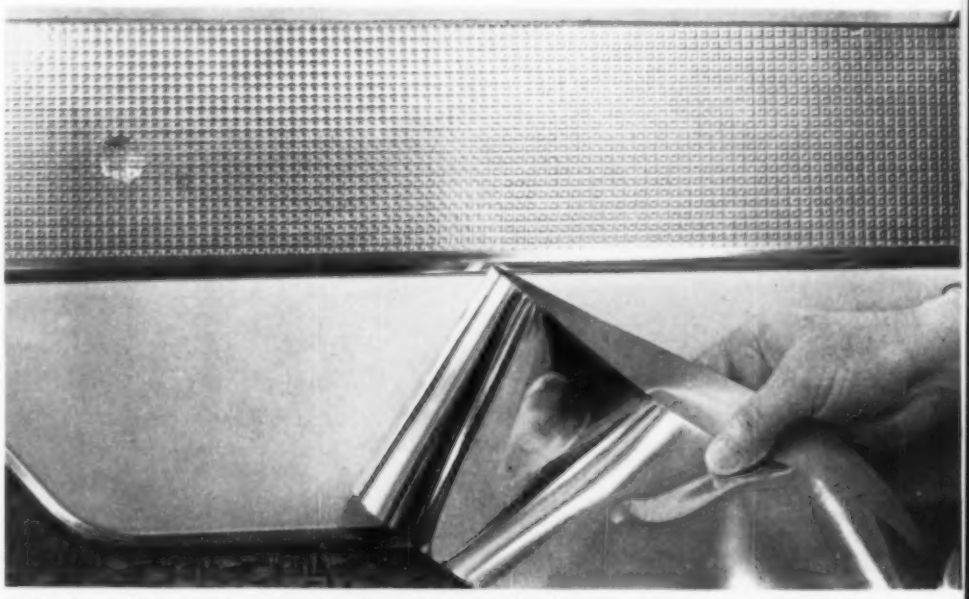


More and more, color and glitter are linked in applications of Mylar. How Mylar can be used to add both color and glitter to a product—for better or worse—is suggested by several of the applications on the opposite page. The bathing suit and towels use metallized yarn, the belt and books have Mylar laminated to leather, giving a durable finish with a grain, the laundry bin is covered with Mylar that has a pattern on the back surface. Mylar's glitter is not always a plus: A sheet of Mylar bonded to wood to give it protection, for example, is not necessarily attractive if it is shiny; to overcome this, it is now possible to etch Mylar chemically or sandblast it to remove its reflectivity, making the surface coating virtually invisible.

The automotive industry was the first major one to use Mylar for decoration and protection, and it still accounts for a major portion of Mylar laminates. Major appliance manufacturers, however, are also beginning to replace other plastics and metals with the film for trim, like that on the 1957 Philco refrigerator. The material is gaining popularity because its flexibility makes it easy and inexpensive to install; it can be turned out in a wide range of colors and embossed in an unlimited number of patterns.

Embossed door panels for automobiles are produced by laminating metallized Mylar to a backing material, embossing it, and then bonding it to a panel. Colors can be introduced by any of the methods shown on the preceding page. The backing material can be almost anything from paper to vinyl, depending on how much strength is required. According to automotive trim manufacturers, Mylar is less expensive than most metals, easier to handle, and it offers a wider range of design and color possibilities. One of the most recent applications of Mylar is as a surface coating for metals. The Sieberling Rubber Company uses it as a protective coating on electrical control panels. Previously they finished their panels with paint, but found that they developed a "shabby look" fairly soon when in use. Although Mylar-covered panels are more expensive, it is claimed that the improved maintenance is worth the difference. The metal part on the right is covered with an embossed Mylar-vinyl laminate. The metal was formed and stamped *after* the Mylar surface was applied. How the embossed pattern was retained during forming is a secret that fabricators have not yet revealed.

Mylar is laminated to automobile door panels at National Automotive Fibers, Inc.

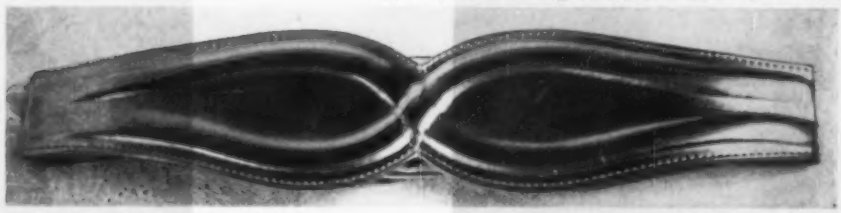


Mylar is metallized and embossed at Dorrie Process Co., Inc. for automotive applications.

Aluminum part covered with embossed Mylar retains pattern after forming and stamping.

Metallized Mylar yarn is used in bathing suit.

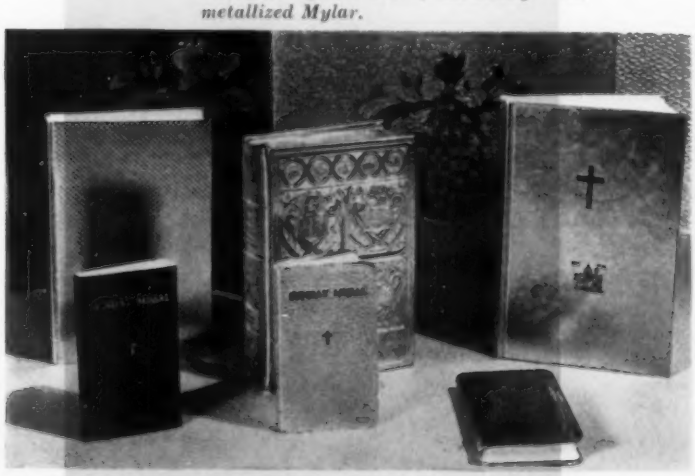
Mylar provides scuff-resistant surface for belts.



1957 *Philco refrigerator has metallized Mylar trim.*

Metallized Mylar yarn adds glitter to towel decoration.

Books are given sheen, durability with metallized Mylar.



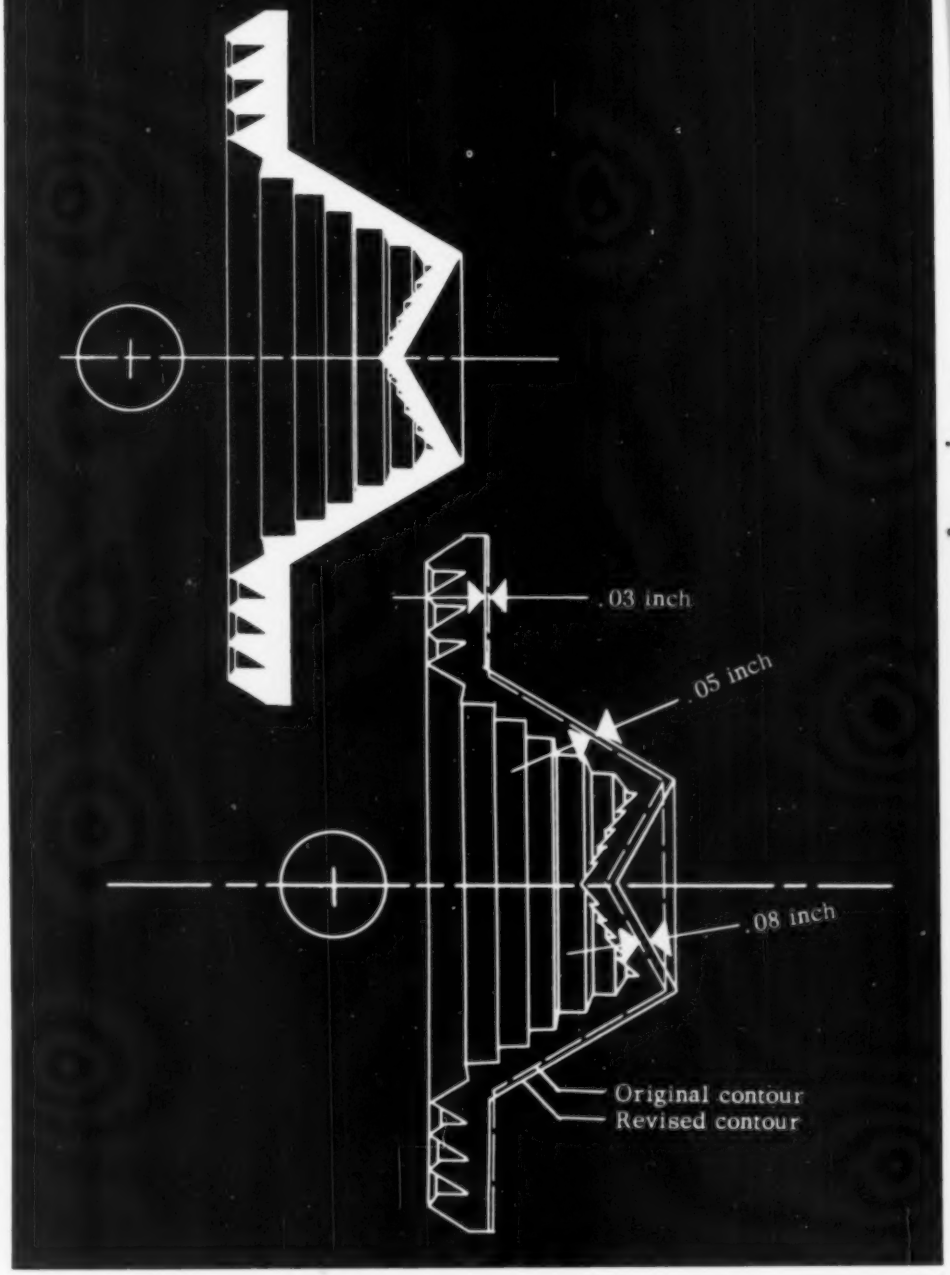
Clear Mylar brings out printed pattern on laundry basket.

Acrylic

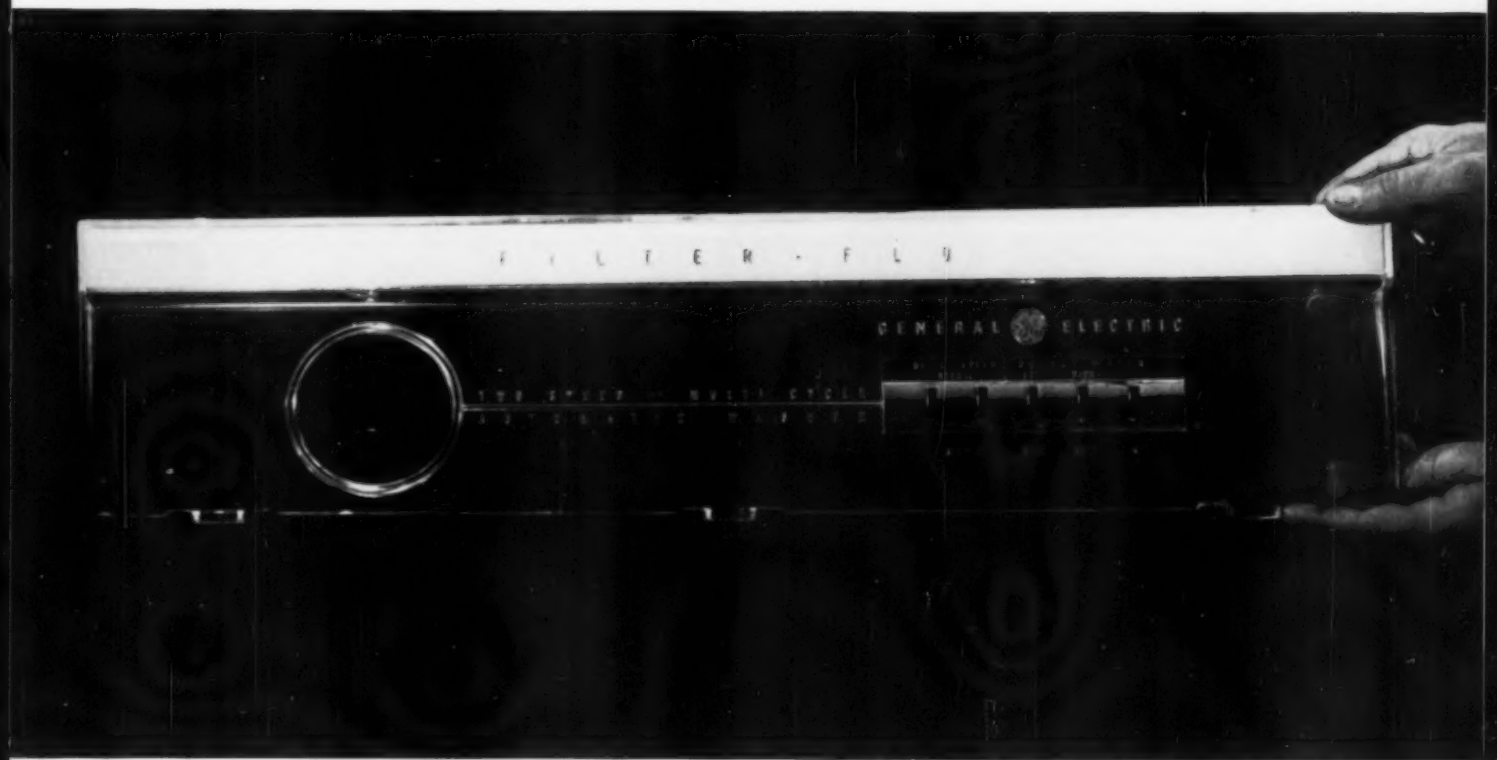
Molded or extruded, acrylic—more than Mylar film—offers a chance for either integral or applied color, and the latter has grown in use in recent designs. But there is a major color complication with acrylic, not encountered with Mylar: the thickness of an acrylic sheet is a vital consideration when color is being specified. Basically, as the thickness of the clear acrylic increases, the luminous transmittance decreases. In addition, the chromacity and the hue of an integrated color in the material will vary with the thickness. This is a very important factor when the color range is critical, as it is for taillights and warning signals: a yellow lens, for example, will become orange if it is too thick, greenish if it is too thin. The drawings on the right show a typical automotive lens whose design had to be modified to meet the limits of a particular color and transmittance established by the Society of Automotive Engineers.

Recent developments in extrusion and vacuum-forming techniques with acrylics have made it possible to produce in one piece large components that previously had to be made in several units and then assembled. Also, the thermal properties of some acrylic formulations have been improved so they can be molded at higher temperatures and have better flow. These advancements have resulted in units like the washing machine control panel on the right, which was extruded in a single piece. This unit shows how the transparency of Du Pont's Lucite makes backpainting an effective way to combine colored areas with clear areas to bring out design, dials, trademarks, numerals, and so forth. Recessed letters are molded into the back surface of the plastic and paint is wiped into the depressed areas.

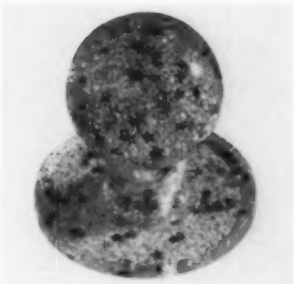
Other effects can be obtained with acrylics by using transparent tints integrated into the material in combination with a metallized or painted second surface. By metallizing the second surface, reflectance can be obtained and the color of the part can be varied by changing the integrated color or the thickness of the sheet. Acrylics can also be colored by spray painting, silk screening (usually restricted to fairly flat surfaces), hot stamping, and rolling. These techniques can be used in various combinations, or with acrylic's famous ability to "pipe" light (right).



The top drawing on the left is a cross-section of a typical automotive lens made of Lucite. The exterior contour was determined by styling requirements and the interior to direct the transmitted light horizontally. Since the observed color is determined by the thickness of the acrylic or the distance that the light travels through the material, it is necessary to determine the thickness range that will meet specifications for each color. It was found that a standard red had the desired range, but no yellows were satisfactory. Consequently, the modification indicated in the lower drawing were necessary to meet specification for a yellow lens.

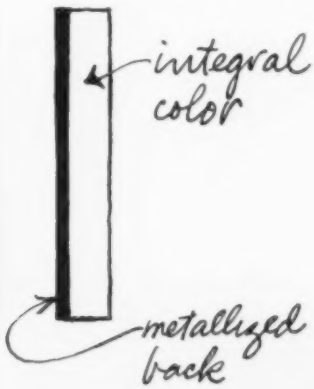


Panel for a General Electric washer shows how clear acrylic can combine backpainting and letters depressed on the back surface for three-dimensional and colorful design.

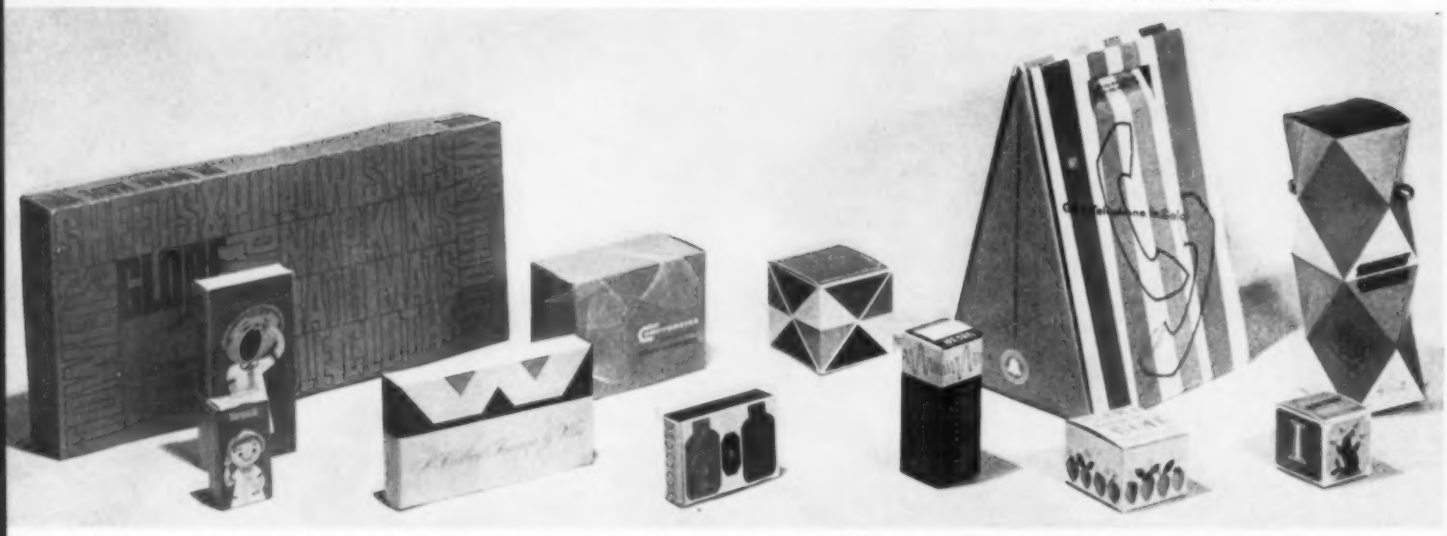


Embedments in acrylics take obvious advantage of the material's clarity for colorful, if sometimes gaudy, effects.

By metallizing the back surface of an integrally colored piece of acrylic, a colored mirror can be obtained. Diagram below shows breakdown of color.



photos this spread by Curt Gunther



Left to right: laundry box, Locke Miller of Hixson & Jorgenson; Serpasil boxes, Ciba Design Group, Harry and Marion Zelenko; Wiss gift package, Lester Beall, James Hight; Comptometer and Unimatic Foot Control box, Fred Denzler; Selsun sample package, Ed Bedno; Avon Before and After, Hugh Purcell, Richard de Paul; Tungsol, Ray Grove; phone box, Raymond Loewy Associates; Avon box, Max Rogers, Margery Markley; Abbott Aspirin, Bert Ray Studios; Early Times gift carton, Raymond Loewy.

Colleagues choice:

Three competitions in graphic arts

That major landscape of the market, packaging, is the work of individuals, and two organizations — the American Institute of Graphic Artists and the Package Designers Council—separately have announced their preferences among the units of the 1956 landscape. We here show a light cross-section, the AIGA on this spread and the PDC overleaf. The AIGA jury, made up of Edgar Kaufmann, Walter Landor, Albert Shephard, and Albert Kner—in that order, critic, independent package designer, psychologist, and head of Container Corporation's Design Laboratory—saw merit in a diversity of tastes and qualities. AIGA citations (simply a matter of being named among the best) were given to 50 packages and 50 record sleeves. As the photo to the right suggests, the choice in both packages and record sleeves included some tailored for the hard sell and others more discreet. The 50 records had a special jury: Bradbury Thompson (*Mademoiselle*); S. Neil Fujita, Columbia Records, and designer Harry Zelenko.

The powerful influence of the supermarket is amply spread before the eyes in the assortment of "50 packages of the year." That notice on the shelf need not necessarily be attracted by loud reds and blaring typography is also implied by such successful designs as the Aqua Velva carton by Donald Deskey (which also won three awards from the PDC). The entire hundred packages and albums will be exhibited by the AIGA in mid-April in New York.

Left to right: Aqua Velva, by Robert P. Vuillemenot of Donald Deskey; Spreckels sugar box, Walter Landor; Topco detergent, Jack Penson; Pepperidge Farm cookie box, Jim Nash; Food Club, Albert Kner, Tom Shorer; White Arrow, Rene Burvant of Robert Sidney Dickens; Eveready, Robert G. Neubauer; Blitz, Walter Landor and Associates; Country Club box, Rolph-Clark-Stone, Ltd.

50 Records of the Year

The Natural Seven (RCA Victor Record Division)
Robert M. Jones, Art Director; Marjorie and Leon Auerbach

Beethoven Sonatas: Solomon, Piatagorsky (RCA Victor)
Robert M. Jones and Leon Auerbach

The Man with the Golden Arm (United Artists)
Saul Bass

Tone Poems of Color (Capitol)
Saul Bass

T. S. Eliot Reading Poems and Choruses (Caedmon)
Marianne Mantell, Barbara Cohen

Ravel and Roussel Trios (Hayden Society)
Jacob Landau

Shostakovitch plays Shostakovitch (Capitol)
Jerome Gould

Everybody Likes Hampton Hawes (Contemporary)
Robert Guidi

Shelly Manne and his Friends (Contemporary)
Robert Guidi

Lennie Niehaus, Vol. 5 (Contemporary)
Robert Guidi

Moondog (Prestige)
Tom Hannan; Robert Weinstock, photographer

The Tone Poem (RCA Victor)
Robert M. Jones, Eugene Karlin, artist

Gox the Great (RCA Victor)
Robert M. Jones, designer, artist and typographer

Larry Clinton in Hi Fi (RCA Victor)
Robert M. Jones and John Murello, designer and photographer

Pete Jolly Trio (RCA Victor)
Robert M. Jones and James Flora, artist

Miguel Fleta Sings (RCA Victor)
Robert M. Jones and Herb Lubalin, designers; Gerry Gersten, artist

Boris Godounoff (RCA Victor)
Robert M. Jones and Robert Fabian, designers; Austin Briggs, artist

The Drum Suite (RCA Victor)
Robert M. Jones and Acy Lehman, designers; David B. Hecht, photographer

Rachmaninoff Concerto (RCA Victor)
Acy Lehman and Herb Lubalin; Art Kane, photographer

Cambridge Treasury of English Prose (Vols. 1-5) (Caedmon)
Matthew Liebowitz

Poems of Shelley (Caedmon)
Matthew Liebowitz

Harpo
Mercury Records

Dinah
Mercury Records

Sibelius Symphony No. 2 (RCA Victor)
Robert M. Jones and Herb Lubalin, designers; Gerry Gersten, artist

Salute to Satch (RCA Victor)
Robert M. Jones and Herb Lubalin, designers; Jay Maisel, photographer

Debussy: Children's Corner (Capitol)
Marvin Schwartz and Lee Friedlander

Four Freshmen and Five Trombones (Capitol)
Marvin Schwartz

Mexican Waltzes (Capitol)
Marvin Schwartz

Music for this Swinging Age (Decca)
Marc Brody and Alex Steinweiss

Music for Strings, Percussion & Celesta, Bartok (Decca)
Marc Brody, Alex Steinweiss

Conversations Regarding the Future of Architecture (Reynolds Metals)
Richard DeNatale; Edward Hamilton of John Peter Associates

Roger Williams, the Fabulous Fifties (Rapp)
Irving Werbin

Music by Gershwin and Herbert (RCA Victor)
Acy Lehman and Irving Werbin; Loring Eutemey, artist

Bruno Walter (Columbia)
S. Neil Fujita

1956 (Columbia)
S. Neil Fujita, Peter Adler

Leonard Bernstein (Columbia)
S. Neil Fujita

Brahms and Walter (Columbia)
S. Neil Fujita

Modern America Music series (Columbia)
S. Neil Fujita, Museum of Modern Art; Leo Lionni, artist

Hi-fi Ellington (Columbia)
S. Neil Fujita; Jay Maisel, photographer; Charlotte Gordon, type

Rhythm Plus 1 (Epic)
S. Neil Fujita

Trumpeter's Holiday (Epic)
S. Neil Fujita; Alfred Gescheidt, photographer

The Rhythm Section (Epic)
S. Neil Fujita

Adlai Stevenson Conversations (AMI Inc.)
S. Neil Fujita; Fred Plaut, photographer

Other Columbia (and Epic, a division of Columbia) winners under S. Neil Fujita, Director of Design and Packaging:

What is Jazz?
Bob Gill; John Wrinn, photographer

From the New World
Milt Fisher, artist

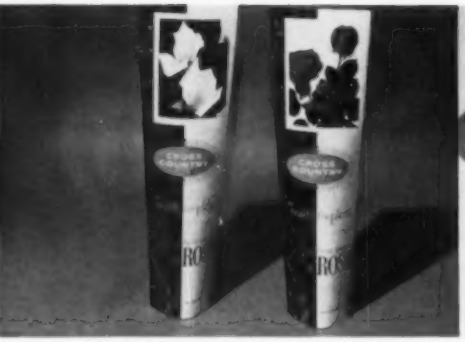
Chicago Style Jazz
Ben Shahn, artist

Music for Brass Ensemble
Peter Adler; Don Hunstein, photographer

The Art of Jazz Piano (Epic)
Peter Adler

Joe Carroll (Epic)
Ivan Chermayeff; Don Hunstein, photographer

First award, Soft Goods, Allen Porter.



First, Gardening, Elaine Bramhall.

PDC Aluminum Award, G. L. Canfield.

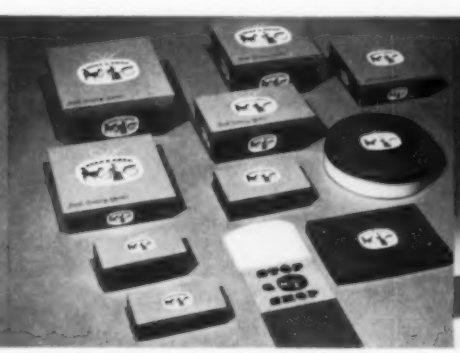
PDC cites excellence in 20 categories

The Package Design Council's survey of the field covered 1000 entries. (Both AIGA and PDC selections were limited to entries, rather than covering a survey of the vast market.) Conclusions coincided with the AIGA, however, in the case of a few packages, in spite of the different points of view represented by one organization made up of professional packagers and one of art directors and graphic designers, who select a different jury every year.

The PDC's new system of appraisal is to divide a jury, made up of a battery of designers, packaging and marketing experts and headed this year by Gerald Stahl, into four panels. Each panel was to evaluate a package on the basis of four qualities: design, construction, merchandising effectiveness and consumer appeal. Once a package qualified on one of these counts, it was then evaluated on the basis of its total effectiveness. Among 20 categories, ranging from Chemicals to Cosmetics, there was even one for redesigned packages, among which Donald Deskey's Aqua Velva was named best. The same package also scored best in the Toiletries category, and it topped all other entries by winning the PDC Gold Medal. A special award of $1,000 was allocated by the Aluminum Company of America. Winner was designer G. L. Canfield of Indianapolis, who, with the Basca Manufacturing Co., developed the Kraft Party Snacks packaging in corrugated aluminum foil cups (above right).

PDC Gold Medal, Donald Deskey Associates.

First, Stationery, Sidney Beller.



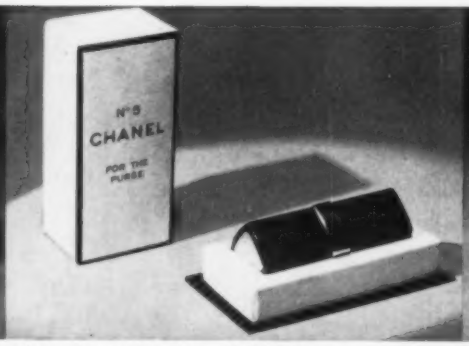
First, Food, Morton Goldsholl, John Weber.

First, Chemical, Bruce Beck, William Harris.

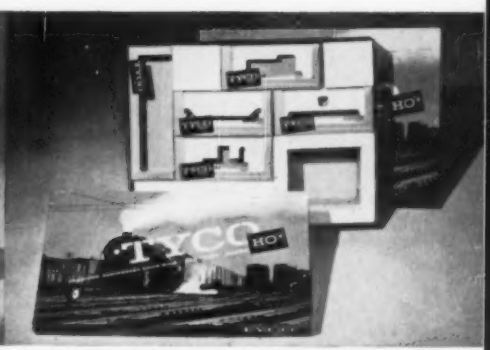
AIGA's 50 packages of the year

Selsun sample pack: Abbott Laboratories; Ed Bedno • Comptometer Commander carton and Unimatic Foot Control box: Felt & Tarrant Manufacturing Co.; Fred E. Denzler • Tung-Sol Electron Tube cartons: Ray Grove of Design Associates • Aqua Velva aftershave lotion: J. B. Williams, Glastonbury, Connecticut; Robert P. Vuillemenot of Donald Deskey • White Arrow soap box: Armour & Company; Rene Burvant of Robert Sidney Dickens • Topco detergent: Robert Gair Division, Continental Can Co.; Jack Penson of Penson-Tuttle • Six can pack: Blitz-Weinhard Co.; Walter Landor & Associates • Avon Before and After Lotion Container Corporation, Philadelphia: Hugh M. Purcell, Richard de Paul • Avon Strawberry Cooler Carton: Max Rogers and Margery Mark'ey • Laundry box: Globe Laundry, Los Angeles; Locke Miller of Hixson & Jorgensen • Eveready flashlight carton: National Carbon Co.; Robert G. Neubauer • Cookie carton: Pepperidge Farm Inc.; Jim Nash • Gift telephone carrier: Chesapeake & Potomac Telephone Co.; Raymond Loewy Associates • Serpasil sample boxes: CIBA Pharmaceutical Products; Harry and Marion Zelenko; John Marmaras, Sidney Jackson, Leo Zahn, CIBA design group • Country Club table napkins: Interlake Tissue Mills Co., Ltd., Toronto; Rolph-Clark-Stone, Ltd.; Clair Stewart, Art Director, Ted Morrison, designer • Wiss gift package: J. Wiss & Sons, Co., Newark; Lester Beall and James Hight • Dulcet Aspirin block box: Abbott Laboratories, Chicago; Bert Ray Studios, Richard Collignon, Art Director, John Docimo, designer, illustrated by George Suyoka • Topco Frost and Food club; Albert Kner, Container Corporation, designer; Tom Shorer, photographer • Jane Amherst gift pack; Kerr Conserving Co., Portland; Artwork Associates, Douglas Lynch and Janet Green • Superba Tableware (Imperial Knife Co.); Albert Kner, Container Corp. and Phoebe Moore • Illinois Bell Telephone gift box: Albert Kner and Leo Kenke, Container Corporation • Santa Fe pet carrier; Albert Kner, Robert Widmer, Container

First, Drinks, Raymond Loewy Associates.



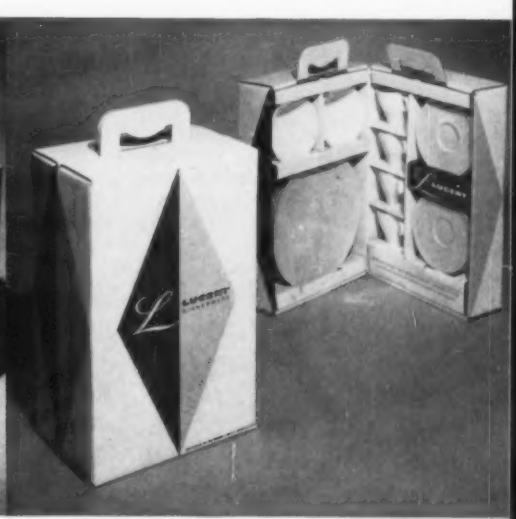
First, Cosmetics, Jean Helleu, Paris.



First, Toys, William R. Galbraith.

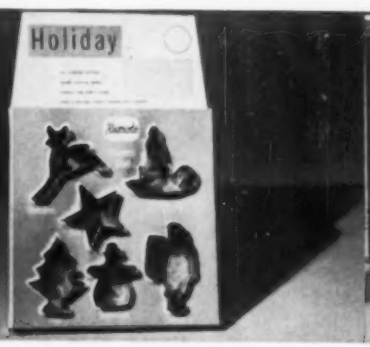
First, Categories 9 & 20, Gerald Stahl.

First, PDC (10) and AIGA, Robert Widmer.



First, PDC (5) and AIGA, Raymond Loewy.

First, Tobacco, George Pisani.



First, Household, Donald R. Keil.

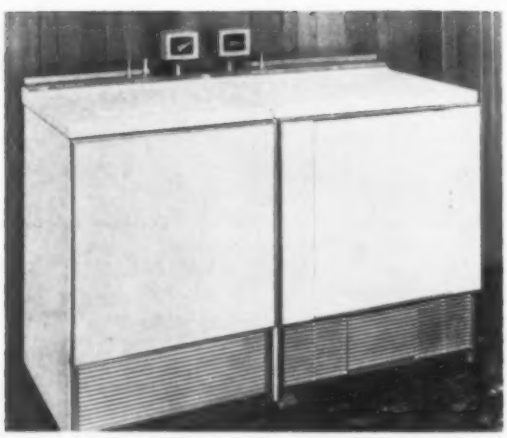
First, Candy, Robert Zeidman.

Corporation • Jazz carton (Helena Rubenstein): Eric de Kolb • Crest toothpaste box (Proctor and Gamble): Robert P. Vuillemenot of Donald Deskey • Lady Ellen Pin Curl Clips (Kaynar Co.): Eureka Paper Box Co.: Robert Hubbell • Jim Beam decanter gift box: Robert Gair Division of Continental Can, Inc.: Robert Ericksen, Art Director: Jack Penson • Courtley cologne box: J. Chris Smith • Pepsodent Floor Stand shipper: Gibraltar Corrugated Paper Co.: Fred Zinneman, Art Director, Lever Bros. and Gibraltar Designing Department, Display Division • Sheperd Casters Box: Morton Goldsho'l and James Lunde • Hillman's Inc. bakery boxes: Morton Goldsholl and John Weber • Stop and Shop bakery boxes: Morton Goldsholl and John Weber • Motorola shipping containers: Morton Goldsholl, John Weber, Fred Nomiya • Jane Arden Party Animals box: Walter Landor and Associates • Old Fitzgerald gift carton: Walter Landor and Associates • Spreckels Sugar box:Walter Landor and Associates • Old Cabin Still, "Copperstill" shipping case: Walter Landor and Associates • El Producto, 25 packs (GHP Cigar Co.): Paul Rand • La Palina Ideals (GHP) Paul Rand • Old Forester decanter gift carton: Raymond Loewy Associates • Lucent Dinnerware display carton: Raymond Loewy Associates • Harmony House gift bath set: Sears Design Department, David Osborne, Art Director, and Phil Laverty • Harmony House gift towel set: Sears design staff, David Osborne, Art Director, Lawrence Muesing • J. C. Higgins golf balls carton: David Osborne, Sears Design Department • Allstate seat cover carton: Sears Design Department, David Osborne, Art Director, and Anderson Studio, Herb Levine • Nieman-Marcus "Kiss Me" lipstick box: Susan Crane, gift packaging: Harry Traywick, Art Director and designer • Vi-Penta stork box: Harry and Marion Zelenko • Wiss Solid Steel snip package: Lester Beall, James Hight • Stanley Surform file and plane packages: Lester Beall, Richard Rogers • Space Spider carton: Walter Landor and Associates • Old Fitzgerald "Twin Candlelight Gift Carton and Shipping Case": Walter Landor and Associates • Early Times Jingle Bells Christmas carton: Raymond Loewy Associates.

"Budget" kitchen shows that bold, bright Frigidaire appliances lend themselves well to built-in effects while still maintaining strong trademark value. Pink appliances are here combined with Bilt-Well cabinets, Crane stainless sink.

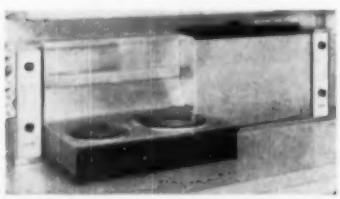
Design review: the '57 appliances

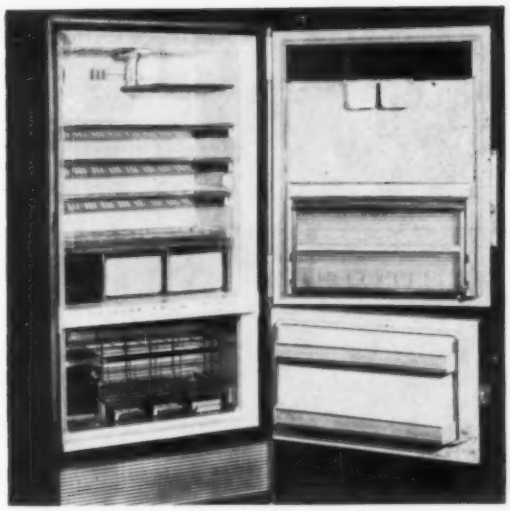
Frigidaire sharpens up



Despite plain surfaces, square corners, Frigidaire appliances are not simple boxes. Slight offsets separate planes; metal trim lifts front panel away from sides and top; shiny metal lightens base.

Among built-ins in the Frigidaire line are the fold-away cooking units introduced a few years ago and an oven with automatic rotisserie. Frigidaire ovens use a new "Miracle Filter" that cleans cooking smoke before it reaches room.





Interior of Frigidaire reflects geometry of outside with striking color patterns. New flat door opens 180° with cabinets built flush at either side. With handles offset, nameplate overhead, door is unadorned. Designed on 4″ module.

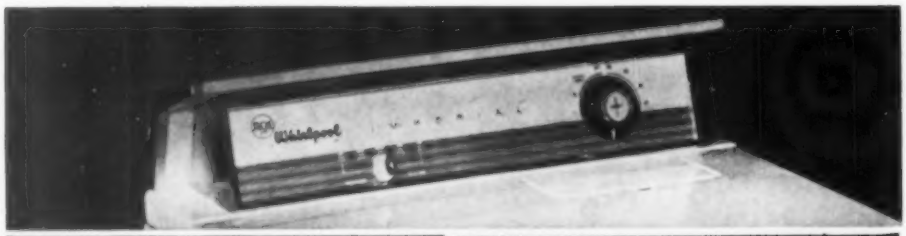
Flat black-and-white control panel of Frigidaire range is easily absorbed in geometric background. Oven handles attached to chrome frame leave door surface unbroken.

a trend with its dream kitchens for today

Most remarkable of Frigidaire idea kitchens combines sheer-look appliances with new off-the-floor cabinets by St. Charles. Stainless steel legs, designed by St. Charles to give furniture look and eliminate stoop storage, are also used under dishwasher. Pattern-conscious Frigidaire has introduced charcoal on refrigerator, also plays up white.

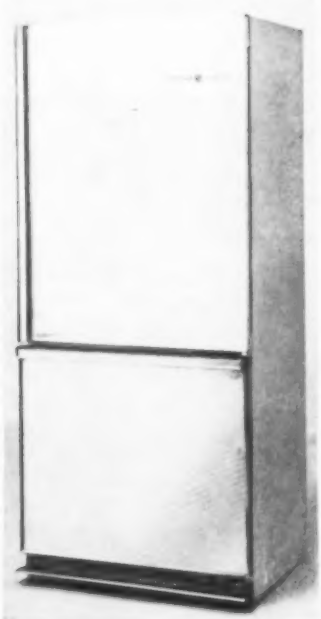
Frigidaire's sheer look is brand new, but the trend it illustrates has shown up before—in the Westinghouse bold look, GE's built-in look, and the modest good looks of the true built-ins that inspired them: Thermador, Revco, and others. What these lines share is an architectural bias: they look a lot like built-ins; often they can be built in; at their best they permit or even enhance the design of the kitchen as an interior rather than a showcase for capital goods. This year even the bulkiest equipment has been squared up. Many that retain their soft curves use flat panels instead of streamlines for decoration. Bold new finishes like jet, copper, and stainless exemplify a new view of appliances as design elements rather than separate products.

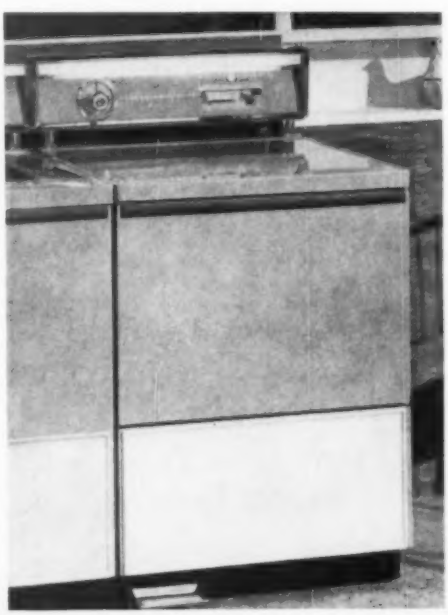
Among adherents of the new look, Frigidaire stands out for a unique effort to unite design and salesmanship toward one goal: that of providing the means for the most spectacular kitchen the customer can dream up. The first element is the group of appliances shown on these two pages. The second is a series of sample kitchens imaginatively designed to show results available to any purchaser. To prove these are not dream kitchens, Frigidaire gives credit to such suppliers as Republic, St. Charles, Eljer, Formica, Knoll, Howard Miller and Wasco—*d.a.*

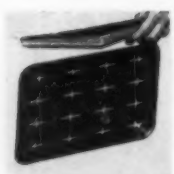


Suites of appliances continue to grow in popularity. Among the most important in '57 is a comprehensive line under the new label of RCA-Whirlpool (left). These first products of a merger between RCA-Estate and Whirlpool Seeger are similar to Frigidaire's in their flat surfaces and broad use of gleaming metal for semi-structural effects, but they are not as rigidly architectural in concept. For example, the chrome frame around Frigidaire's refrigerator makes the door a separate plane, while the trim on the RCA refrigerator is a picture frame that opens with the door. Also, RCA follows the usual practice of reflecting price differences in varied design motifs; Frigidaire sticks as closely as practicable to the top design in each category. Several interesting functional innovations in the RCA-Whirlpool line are discussed on the following pages.

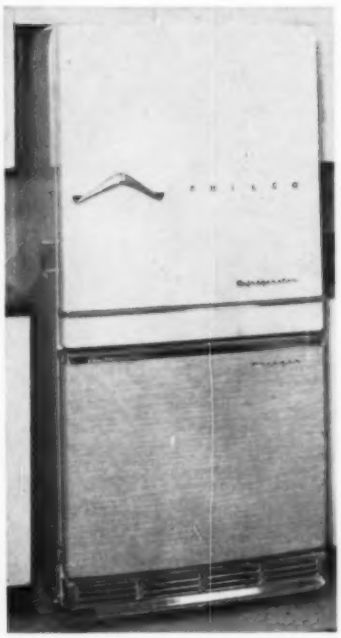
Coordination can be simple or subtle





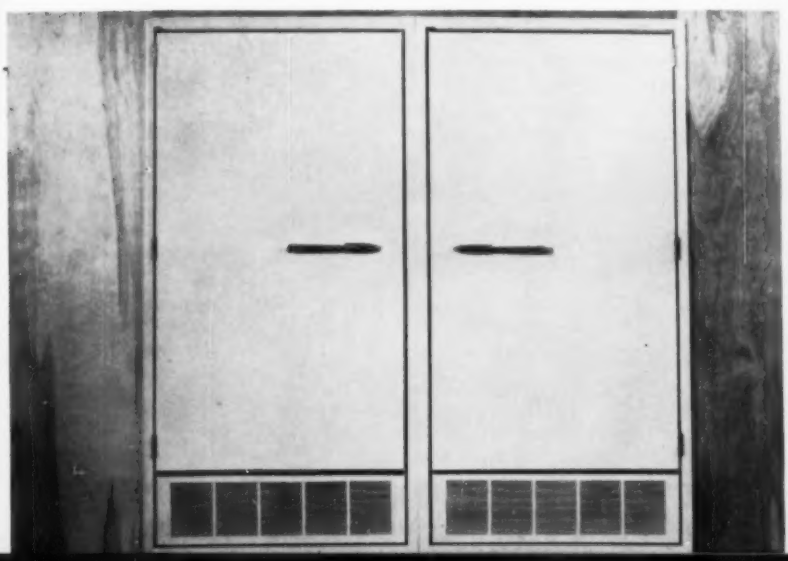


GE, one of the first companies to square up its appliances, advances the built-in look in several ways this year (left). Elaborately engineered new hinge on flat refrigerator door allows it to open 180° without any backdraft. This and a forced air condenser that vents at front make it possible to place refrigerator tight against cabinets or walls at back and sides. Long chrome door pulls on refrigerator recall frames on RCA and Frigidaire. The square look of counter-height appliances is enhanced by raising controls away from box. On range, effect is marred by indispensable glass splash. Kelvinator (below) recalls that the easiest way to give unity to appliances is by the repeated use of a set pattern.



Panelized design helps to flatten bulky products

The refrigerator is the *bete noire* of appliance design; when its old soft curves have been squared up it remains the biggest and least interesting of major appliances. A most effective way of reducing the bulk of large equipment is found in Frigidaire's range (left), where each side is a separate plane, and contrasting materials make each plane seem to float. The majority of manufacturers have sought to dematerialize their refrigerators by the simple device of breaking the front door into panels. In some cases these panels are changeable, allowing a wide color choice at relatively low cost; in some cases they can be replaced with decorator materials to match the kitchen. As the photographs above suggest, the square look is no more a guarantee of good design than any other look; if it is overdone, the result is as obtrusive as the old curves. The best of the new refrigerators are handsome case goods. True built-ins like Sub-Zero and Revco (below) can be sunk in the wall so that only the door tells their purpose, and the door itself is easily covered to match surrounding walls.



Refrigerators

New features in '57 refrigerators include a wider use of safety latches (following GE's magnetic latch various makers offer mechanical latches which open as easily from inside as out), the use of circulating fans to distribute cold air evenly (Westinghouse and RCA-Whirlpool), and continuing attempts to improve storage space.

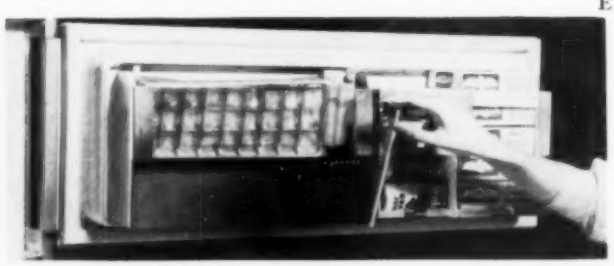
A

B

Boldest storage system is still GE's use of revolving shelves (A). With shelves swung out, food is at hand, smooth walls are easily cleaned. When button is pressed shelf can be rotated 360° for raising or lowering (B). GE bottom freezer is a double drawer opened by a foot pedal. Many makers have increased accessibility this year with roll-out shelves. Since runners must be stable, most roller shelves are non-adjustable, but Hotpoint provides track on which runners themselves are raised or lowered (C). Frigidaire's decorative Plan-a-Door is also serviceable, as shelves and boxes can be rearranged (D). This model has three drawers inside box; another has two drawers and egg shelves in box and crisper in door. New ice ejector, which drops ice in basket when you insert tray and pull lever (E) might seem wasteful of precious cold space to some.

C

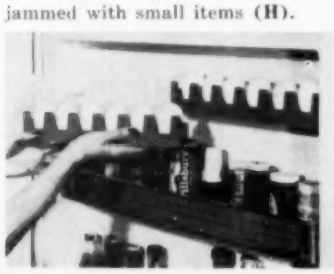
D



E

In '57 most makers have moved fruits and vegetables from accessible interior drawers to a door crisper that tumbles them as it closes (F). Long egg box is convenient for deep-shelf storage and eggs should be covered, but they are usually displayed in door (G). Extreme of compartmentalization finds bulk storage in door, interior jammed with small items (H).

F



G

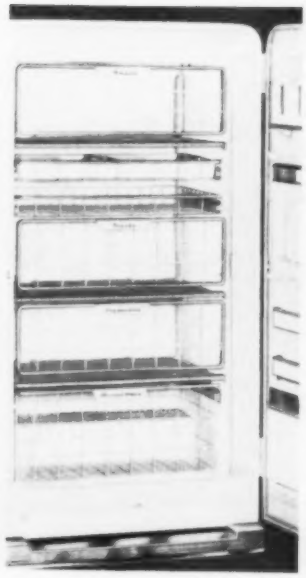
H

I

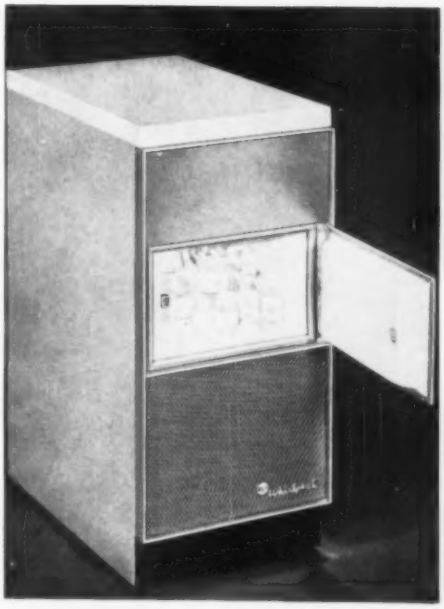
J

K

L



Freezers For easy access, space economy, GE eschews chests for undercounter drawers and uprights with "book-shelf" storage (I). Hotpoint upright features tilt-down racks, movable shelves (J). (Fast-freeze shelves can't be movable. RCA, not shown, uses fan in door to blow freezing cold through box.) Amana has adjustable gravity racks, pull-out service shelf (K). Pull-down guards make service shelves on Norge (L).



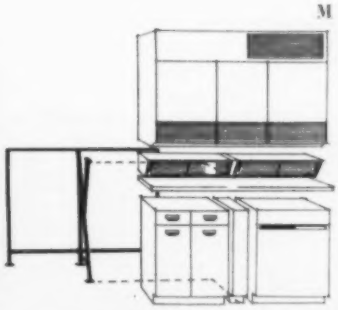
O

N

New cold spots

Exploring uses of its unique wall-hung refrigerator, GE now offers X-frame to support unit away from wall (M). Combined with drawer freezers, result is large-capacity cold center that can serve as room divider (N). RCA-Whirlpool's new ice-cube maker produces 1200 cubes a day by freezing water on inclined plate, sliding ice slab onto grid of heated wires. 16"-wide counter-height unit keeps 16½ pounds of cubes on tap (O).

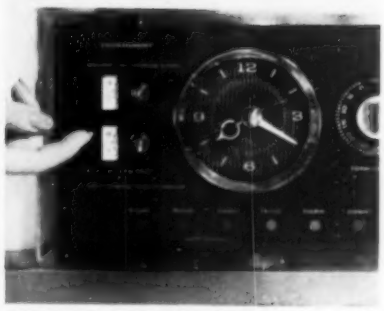
M



Ranges

In '57, as always, each range has its gimmicks, but this year a group of important performance features appear on almost all electric models. Thermostatic surface units, double burners, automatic roast meters, and infinitely variable heat controls combine automatism implied by electricity with a closer approach to the gas range's heat flexibility.

A



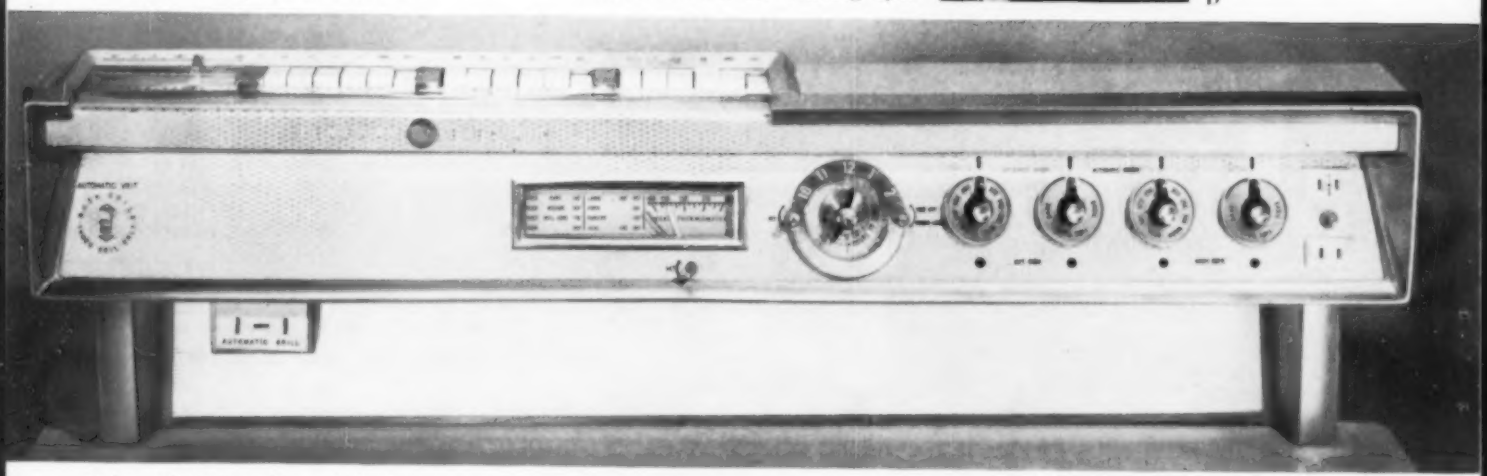
C

B

Designing its new console from scratch, Frigidaire has brought a certain order to the multifarious controls (A). For top burners, two of which offer infinite heat selections, four simple switches move colored indicator up back-lighted panel. Simplified method for time-setting oven uses two clearly marked controls (B). Their inverse order is unimportant beside over-all improvement. Built-in oven (C) has fixture in back for rotating spit.

Deluxe GE (D) shows ultimate confusion on range that has everything. Three surface units have piano-key controls; a fourth has its own infinitely variable control

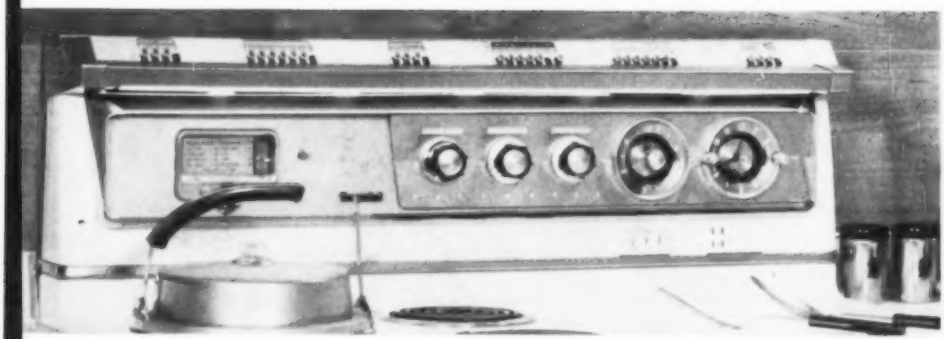
D



and a switch that allows choice between inner coil and whole surface. Meter indicates internal temperature of roast, activates buzzer when set temperature is reached. Multi-dialed clock with two switches is traditional method of providing automatic start and stop for oven. Outlet at left takes automatic grille, one at right times minor appliances. Other new GE features include a new division of oven space (E) and oven doors that slide off to facilitate cleaning (F).

E

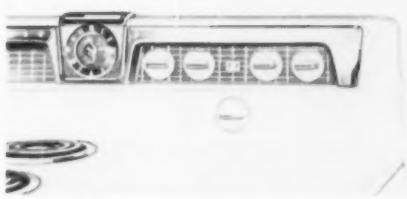
F

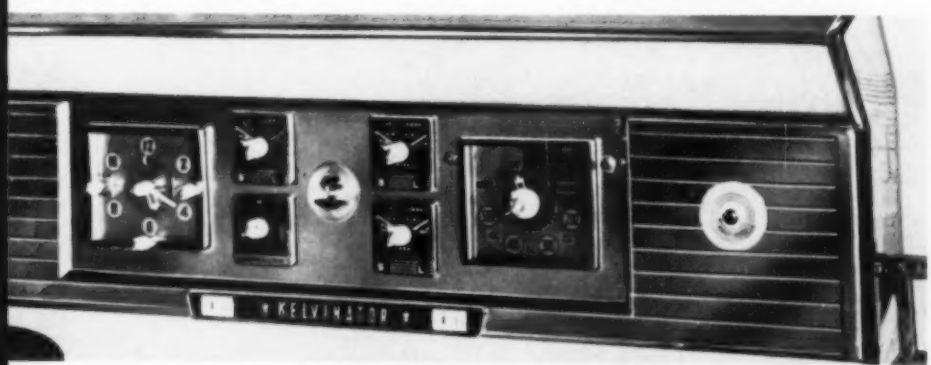


G

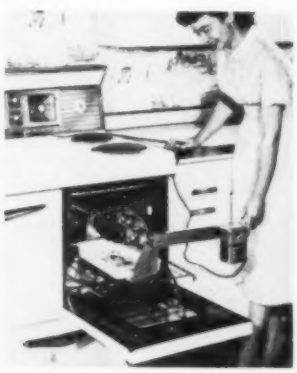
Deluxe Hotpoint (G) has 5 keyboards, 4 dials, 2 clocks to control vertical broiler, oven, two ordinary burners, a fast-heating unit, a time-and-temperature controlled two-diameter unit. Westinghouse (H) achieves gas-range simplicity by using unlabeled infinitely variable knobs on all burners.

H





I



J

Unusually compact Kelvinator panel (I) gives choice of six or eight-inch coil on three units. Two units have high-speed element and one runs by thermostat. Optional rotisserie plugs into panel. As photo shows, outlet is placed so cord may fall on burner (J).

K

L

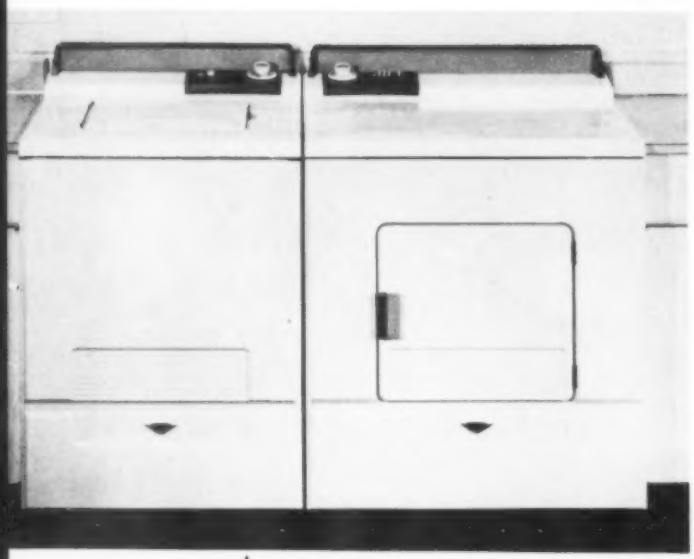
RCA surface units now have guide-line controls like those on RCA washer: red line moves against backlighted surface (K). On top model, under-griddle unit and one other have thermostatic controls. RCA electronic oven has its own browning element to sear food as it cooks (L).

One of the boldest appliance innovations at the winter markets came from a cabinet-maker: Coppes, Inc., makers of custom wood cabinets, built a model kitchen around a revolving island equipped with four surface units (M). Current came through collector rings on fixed center column.

M

Clothes washers and a dishwasher

Among '57 washing machines the news is in special short cycles for delicate fabrics, lint filters, a number of new washer-dryer combinations, some new washing methods.



A

Hotpoint (A) features a new coaxial transmission to cut down noise. As often happens, this medium-price pair is handsomer than top models. Washer has a side-hinged door.

New RCA washer-dryer combination (B) gives clothes a shower instead of a bath: reduced amount of water circulates through filter and sprays tumbling clothes. 24" RCA New Yorker (C) is a small model with deluxe features like built-in lint filter, two cycles, infinite automatic water selector, a door that flies open at cycle end. 25" Westinghouse Spacemates, like many, can be made portable (D).

B

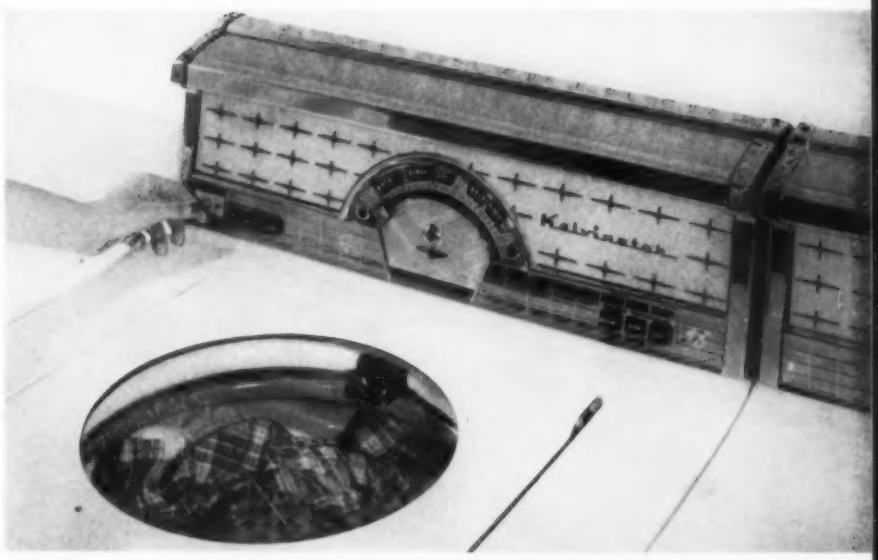
C

D

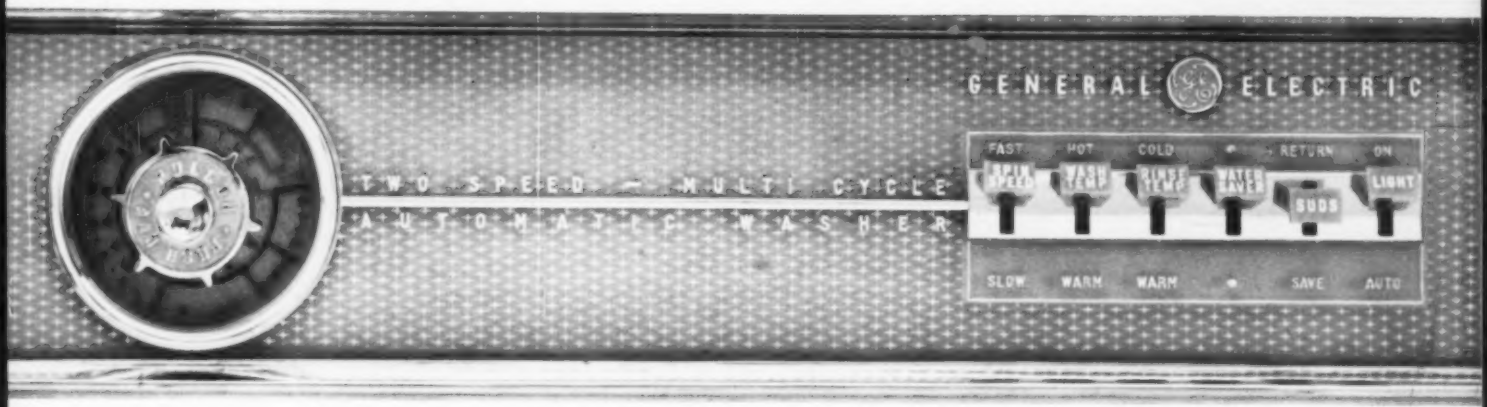
Kelvinator (E) offers Magic Minute that is supposed to end scrubbing: when machine is partly filled, water shuts off temporarily and clothes are worked in concentrated suds. Kelvinator short cycle is typical of those found on many '57 washers: with indicator turned to second time-line, machine provides shorter wash time, reduced number of rinses.

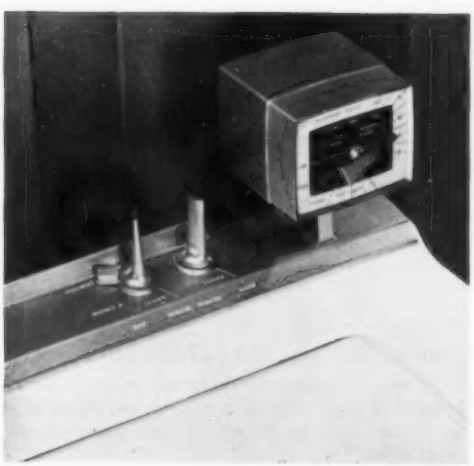
GE clothes washer, like GE range, offers an embarrassment of conveniences (F). Well-labeled panel provides choice of wash speed, spin speed, wash temperature, rinse temperature (including cold-water rinse for miracle fabrics), water saver, etc. To remove lint, water overflows during wash and rinse and is pumped back through filter placed over agitator.

E



F





G

Frigidaire (G) has normal and short cycles described on concentric dials. Deluxe machine uses an up-and-down pulsator that is said to eliminate rubbing and wash clothes by water action alone, overflow washing and rinsing, and 1,140 rpm spinning to hasten drying time. Bleach dispenser is located in agitator. A "control ring" is said to keep articles separate.

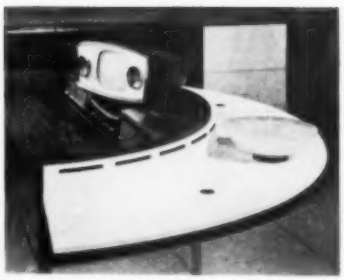
GE's Mobilmaid dishwasher (H) has water and drain in one "Unicouple" connector that snaps onto any faucet and disappears into machine, along with power line, when not in use. Its chrome handle is heat insulated. Like other GE dishwashers, this one is lined with pink vinyl, has a deeper tub and a Flush-away drain that is said to make hand-rinsing unnecessary.

H

'57 dream kitchens: two views of progress

Two '57 dream kitchens, alike in detail, vary vastly in concept. While Kelvinator (opposite) reports on two research projects, RCA-Whirlpool (this page) generally explores "remote and automatic space control." By playing master control keys or waving her hand at cabinets, lady of this air-conditioned, moodlit, vault-roofed paradise makes the kitchen wash its floor, open drawers, lower cabinets, remove and wash dishes, open, empty, and destroy cans, deal infinite ice supply in any form, project menus, monitor nursery, make meal from prepared foods. Sundberg-Ferar, consultants.

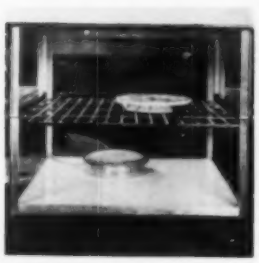
Planning center has tv monitor, keys for dishwasher, cleaner, etc. Discs on range at back emit energy on contact with special serving utensil, leave bowl cool.



Floor scrubber-waxer, dispatched from niche by remote control, refills and recharges automatically.

Auto serving cart delivers table service, returns to mechanized niche to do dishes, dispose of waste.

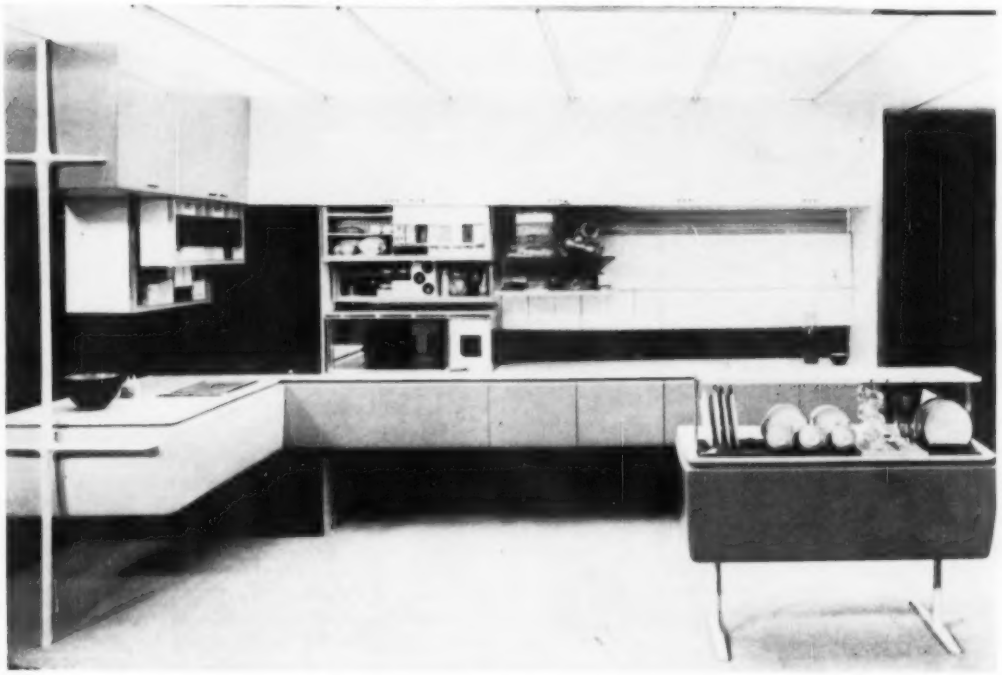
One currently available product, washer-dryer described on p. 105, lies behind rosewood doors.



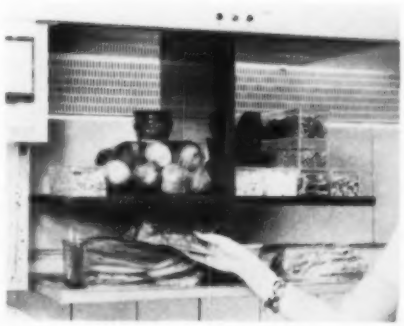
Refrigerator (top) and electronic oven (below) descend from overhead cabinets at wave of hand.

Self-cleaning mixer drops from cabinet to mix, grind, shred at proper speed and duration.

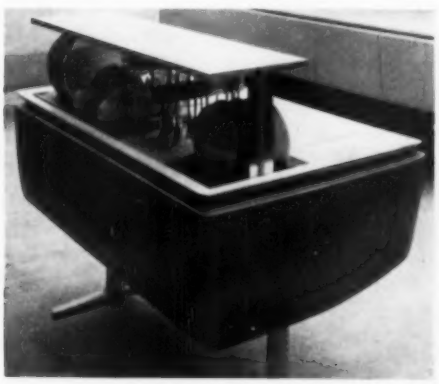
Kelvinator kitchen, sponsored by Monsanto, uses plastic for cabinets and countertop with integral sink. Kitchen also previews a method of preserving food by gamma radia-



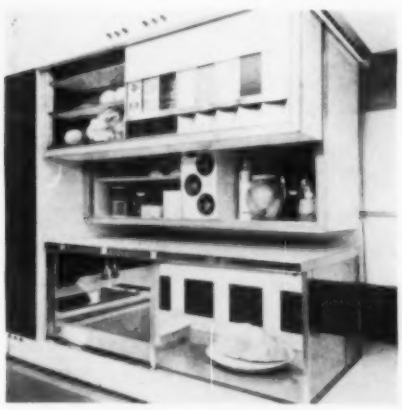
tion under study at University of Michigan with Kelvinator support. Cold storage comprises freezer, ordinary 40° refrigeration, and a 50-55° area where irradiated foods will keep for long periods. Equally interesting to designers is thoughtful storage system that organizes over-counter space into three layers from front to back. Wall behind counters is striped with a row of food bins, shallow utensil storage, a continuous ventilating strip. Refrigerator drops down in front of this area in two sections.



Cold storage shelves descend from ceiling-hung cabinets by push-button. Irradiated food section (above) has open sides; refrigerator (below) and freezer lower in two sections. Electronic oven rises through counter; mirror walls reflect cooking energy, reveal interior when light is on.



Island dishwasher with pipes in legs lowers dishes for ultrasonic washing. Back surface provides desk and communications center.



2026:
There will come soft rains

In the kitchen the breakfast stove gave a hissing sigh and ejected from its warm interior eight pieces of perfectly browned toast, eight eggs sunnyside up, sixteen slices of bacon, and two coffees.

"Today is August 4, 2026," said a voice from the kitchen ceiling, "in the city of Allendale, California." It repeated the date three times for memory's sake. "Today is Mr. Featherstone's birthday. Today is the anniversary of Tilita's marriage. Insurance is payable, as are the water, gas, and light bills."

Somewhere in the walls, relays clicked, memory tapes glided under electric eyes.

Eight-one, tick-tock, eight-one o'clock, off to school, off to work, run, run, eight-one! *But no doors slammed, no carpets took the soft tread of rubber heels. It was raining outside. The weather box on the front door sang quietly: "Rain, rain, go away; rubbers, raincoats for today . . ." And the rain tapped on the empty house, echoing.*

At eight-thirty the eggs were shriveled and the toast was like stone. An aluminum wedge scraped them into the sink, where hot water whirled them down a metal throat which digested and flushed them away to the distant sea. The dirty dishes were dropped into hot water and emerged twinkling dry.

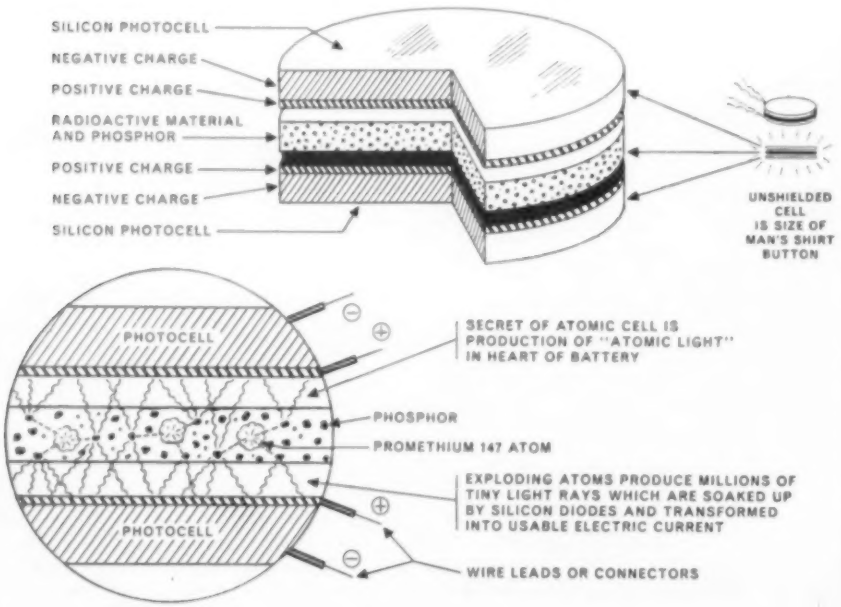
Nine-fifteen *sang the clock,* time to clean. *Out of warrens in the wall, tiny robot mice darted. The rooms were acrawl with the small cleaning animals, all rubber and metal. They thudded against chairs, whirling their mustached runners, kneading the rug nap, sucking gently at hidden dust. Then, like mysterious invaders, they popped into their burrows. The house was clean. A dog whined, shivering, on the front porch . . .*

This excerpt from Ray Bradbury's story of an automatic house that survived a nuclear blast is reprinted from *The Martian Chronicles,* published by Doubleday & Co., 1950.

Radioactive wastes used in battery provide long-life power supply

Elgin National Watch Company and Walter Kidde Nuclear Laboratories have announced their joint development of a new principle in power supply—a miniature, nuclear-powered battery. The more evident advantages of this new power source are its size (about the head of a thumb tack), and its span of continuous power supply (a minimum of five years). But the significance of this new development extends beyond its product advantages: it is one of the early applications of atomic energy for personal use, and as its energy source is radioactive waste, it utilizes material that has lost its usefulness in its original function as atomic fuel for nuclear reactors. Although radioactive material used in reactors loses its energy after a cycle of operation (usually a year in reactors now being built), it remains radioactive enough to be harmful in large quantities to any form of organic matter. The use of radioactive waste material in this new product will certainly not take care of the disposal of large quantities, but it does indicate that the conversion of waste fuel into usable energy is possible; the successful completion of this experiment might also serve to encourage other developments in a similar direction. The decay energy used by the new battery stems from a beta-emitting radioisotope which is the power supply's source of energy.

Operation of the battery depends upon a two-step conversion of energy: from beta emission to light and from light to electricity. The beta particles emitted by Promethium 147, one of the most abundant nuclear fission products, are absorbed by finely divided phosphor and are converted into red and infra-red light. This light is captured by two or more photocells and is, in turn, transformed into electric current. The secret of this atomic cell is the production of "atomic light" in the heart of the battery.



The battery's light source

According to Dr. Miller, Elgin's manager of physical research, promethium was selected as the battery's source material because it combines a number of favorable properties for a battery of this size and power level. Primary gamma radiation is absent when promethium is used, and the relatively low energy of its beta radiation allows all of its energy to be absorbed in a layer of phosphor having a weight of only 50 milligrams per square centimeter (approximately 0.005 inch thick).

Promethium is put through a process of purification before it can be used as the source material for this new battery. The reason for this is that the impurities of promethium—one of which, europium, emits gamma rays—are considerable when received from the Oak Ridge National Laboratory; if retained, these impurities decrease the efficiency of the light source. However, in spite of the purification, a minor amount of secondary gamma emitters, generated when beta particles are absorbed by matter, is retained in the power center of the battery. The amount of radiation is not significant, and for some uses the battery requires no shielding. But to avoid any possibility of contamination due to contact with emitted rays, the battery is made entirely safe for applications involving possible body contact by sealing it in a small case of dense material such as Hevimet, tantalum, or Mallory metal.

The outside dimensions of a shielded battery are 0.2 inch thick and 0.6 inch in diameter. The area taken up by the light source is 7/16 inch in diameter, which includes the space taken up by the 50 milligrams of phosphor used as the light activating agent. Each side of the light source is covered with either one circular photocell or two semicircular photocells. By connecting these cells in parallel or in series, the voltage may be varied from about ¼ volt to 1 volt, the total power remaining unchanged. The amount of current drawn from the battery determines the life span of this new power supply. In an application requiring 20 microamperes, the battery will operate for about 2½ years and will be good for 5 years when the current drawn is 10 microamperes.

Applications

The battery's nominal power output of 20 microwatts when new makes it a suitable power source for such products as hearing aids, miniature portable radios, and civilian defense warning receivers for the home. Elgin has also predicted that the battery will some day be used for an atomic-powered wrist watch. In such application, the power unit will be as safe as modern radium-treated wrist watch dials. When the battery is made commercially available, other likely applications for it are in military high-altitude missile and rocket work and in scientific deep space experiments.

Promethium 147 is presently available only in limited quantities and at relatively high cost, but the Atomic Energy Commission has indicated that the element will be treated and made available for commercial application in large quantities at a cost of approximately 50¢ per curie when a new plant, now under construction, goes into production at the end of this year. Manufacturers: Walter Kidde Nuclear Laboratories, Inc., 975 Stewart Ave., Garden City, L. I., N. Y.—Elgin National Watch Company, Elgin, Ill.

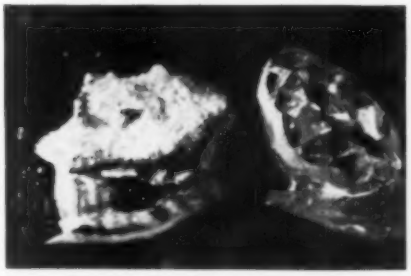
A new photocell

"Powermaster," a new photocell, has been developed by Hupp Electronics Company. With a voltage rating of 120 volts ac or dc, a continuous power dissipation of ½ watt with short-interval higher peaks is said to be practical for the new cell, which is moistureproof and shockproof as a result of total resin encapsulation. Photosensitivity is stable in the temperature range from 0 degrees to 175 degrees Fahrenheit, but decreases slightly as the temperature approaches 212 degrees Fahrenheit.

Primary use of the Powermaster lies in ac or dc relay application, which the cell will operate directly, as well as in electronic trigger circuits at 1000 counts per second. Installed in a circuit, the cell acts as a variable resistor; the lowest sensitivity cell will pass 10 ma at 22.5 volts (at 50 foot-candles). The cell's maximum sensitivity is to blue-green light. Measuring ⅝ inch wide by 9/16 inch high by ¼ inch thick, Powermasters come equipped with 1-½ inch leads, and list a dark resistance of over 1 megohm.
Manufacturer: Hupp Electronics Company (Division of Hupp Corporation), 743 Circle Avenue, Forest Park, Illinois.

GE's material of superior hardness

The discovery of a new material as hard as diamond has been announced by General Electric. Called Borazon, the new material, not found in nature, is a compound of boron and nitrogen called a "cubic boron nitride." Research in synthetic diamonds has been actively carried out at GE's Research Laboratory at Schenectady for some time. But when the development of synthetic diamond was announced two years ago, experiments along similar lines did not come to a halt.

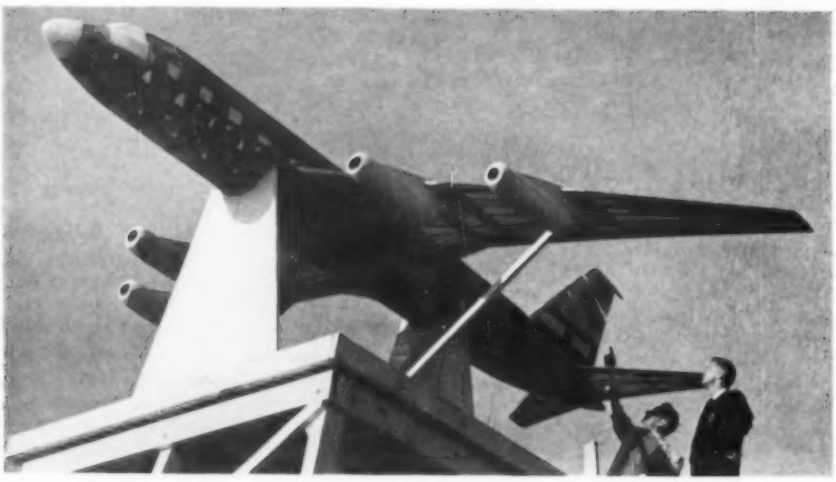


Borazon withstands high heat test

A substance in some ways similar to graphite — a material related to diamond — is hexagonal boron nitride. The difference between soft graphite and hard diamond, whose substance is carbon, is inner structure. In diamond all electrons are used up to form the strong bonds, which distinguishes hard diamond from soft graphite. To form a boron nitride compound whose inner structure differed from that of the hexagonal boron nitride, scientists at the GE laboratories were confronted with a somewhat different situation than when they developed synthetic diamond. Then their aim was to simulate a material which actually exists in nature. But no such parallel was true for hexagonal boron nitride. Theoretically, the material they wanted to develop—a material whose inner structure would be tight compared to that of hexagonal boron nitride—was a cubic boron nitride crystal. But there was no evidence at all that the formation of such a compound was possible. It is for this reason that GE's director of research, Dr. C. G. Suits, said when Borazon was shown to the press: "What we are announcing today is not a product; it is a major scientific achievement."

Borazon — Bor comes from Boron, and Azon from Azo, which refers to nitrogen — was formed by putting hexagonal boron nitride under pressure of 1,000,000 pounds per square inch at temperatures of 3000 degrees Fahrenheit. The result was a crystal with hardness equal to that of diamond, but a heat resistance that far exceeds that of the gem. When samples of Borazon and diamond were exposed to a temperature of 1600°F. (see photos left), the diamond melted, but the Borazon sample remained unaffected.

No one was certain, until it had actually been done, whether or not the hard material of cubic structure could be formed. The exact process is still held secret, but the scientists responsible for Borazon feel that it will have "far-reaching impact on industrial processes and thus increase the value of products in the future."
Manufacturer: General Electric Research Laboratory, Schenectady, N. Y.



Jets will have "invisible" antenna

The 17-foot wingspan model of Convair's new Model 880 jet airtransport demonstrates the type of antenna that will be used for the plane's 1000-mile communication system. There will be no separate antenna; what will be used to send and receive messages will be the top four feet of the Model 880's vertical fin. The passenger planes will be known as the Golden Arrows. They will carry 80 first class passengers at cruise speeds up to 609 miles an hour. The new transports are expected to be certified for passenger service by the Civil Aeronautics Administration in 1960. Manufacturer: Convair Division of General Dynamics Corporation, San Diego.

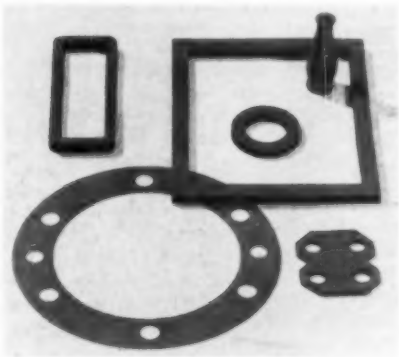
Hammarlund's centralized control

The musical "beeping" that is heard after the telephone operator is given a number is now being used as the order-transfer in a new system of remote automatic control. Hammarlund Manufacturing Company is utilizing this electronic signal as the electronic language in their Centralized Operation Control (COC) equipment, which enables supervision and control of operations many miles away; this is possible since the electrical impulses that make up the electronic signal called audio tone control are low enough in frequency to be heard by the human ear. COC enables an operator to watch meters or any kind of indicator located at a distance from the main office, to control pumps, valves, motors or other equipment at the remote location, or to do both. What is needed to carry on this remote control is the installation of the COC system at the operator's station and at the remote location. Utilizing the electronic signal, the "beeping" of the telephone wire, makes possible the equipment measurement and control. Ordinary telephone lines of the local telephone system are used to connect the two COC units. The telephone company will make the installation, and once it is in operation, performance of 22 different functions will be possible over this new system. COC comes packaged in a case about the size of a toolbox.
Manufacturer: Hammarlund Manufacturing Co., Inc., 460 West 34 St., New York.

Corrosion resistant plastic lining

"Fligid," an unplasticized polyvinyl chloride lining, originally available only in a .085" thickness, is now being marketed in an additional thickness, .055". The lining is a combination of unplasticized polyvinyl chloride on one face and plasticized polyvinyl chloride on the other, which gives it the desirable strength and corrosion resistance of the unplasticized material and the property of the plasticized polyvinyl chloride, which permits bonding to such structural materials as steel, concrete, and wood.

"Fligid" linings offer chemical resistance to a wide range of corrosive materials such as concentrated mineral acids, oxidizing agents, alkalies, and many organic compounds. The original "Fligid" was first introduced two years ago for the protection of tanks, vessels and other process equipment against corrosion. Both linings have a maximum operating temperature of 180-190°F, and good abrasion resistance.
Manufacturer: Kaykor Industries, Yardville, N. J.



Low durometer silicone rubber

COHRlastic R-11568 is a new stock, low durometer silicone rubber, moldable in $\frac{1}{4}$" to 1" sections, $\frac{1}{8}$" to $\frac{1}{2}$" sheets, extrudable in 10 feet lengths, and has a compressibility in the range of silicone sponge rubber. These properties recommend it for applications where a soft sealing material is desired in thick or thin sections, in simple or complicated shapes. The advantage of this new material over silicone sponge rubber is its good moldability, although the new material is slightly softer than silicone sponge rubber.

The temperature range of COHRlastic R-11568 is —100° F to 500° F. The new rubber stock is immune to ozone and weathering, odorless, tasteless, non-corrosive, and non-contaminating. It is available in custom-made sheets, moldings and extrusions.
Manufacturer: The Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.

Portable drafting unit

Sketch-Faster is a portable drafting unit for scale drawings in any location, in or out of the shop, and can also be used for accurate line work on office forms. 11 inches high and 13 inches wide, the portable sketching unit fits in a briefcase but can give accurate coverage of a standard "A" size drawing ($8\frac{1}{2}$ x 11). The item is sold with a plastic carrying case for the drawing board, with sufficient room for triangles and accessories.
Manufacturer: Lloyd Tool Corporation, 1620 North Broadway, Burbank, California; mailing address: PO Box 647, Burbank, Calif.

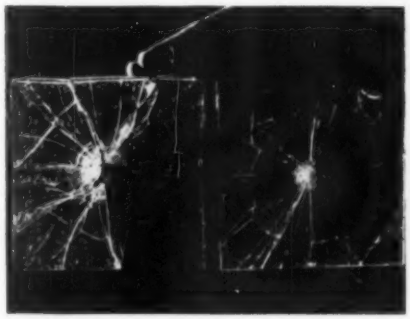
For supersonic aircraft windshields

The use of silicone rubber for frames, cushions and seals around aircraft and other "extreme temperature room" windows has been extended to application inside the window itself. Developed by Dow Corning Corporation in conjunction with Wright Air Development Center, the new silicone rubber, identified as "Silastic Type K Interlayer," is used specifically as the center layer in "safety glass" windshields for supersonic aircraft.

The reason for this development is that conventional safety glass interlayer—plasticized polyvinyl butyral—could not withstand the intense frictional heat generated by potential aircraft speeds. Above 180° F, for example, this standard type of interlayer softens, evolves gas bubbles, and rapidly loses shear strength, while temperatures in the low range make it almost as brittle as glass. But at either temperature range, the conventional interlayer material is unable to prevent glass from shattering if cracked.

Windshields laminated with the new Silastic Type K, on the other hand, retain full strength at temperatures from —65° to over 350° F, and at 200° F are twice as strong as those made of plasticized polyvinyl butyral, although at temperatures up to 160° F, the new material has somewhat less shatter-resistance than the conventional one.

The new material flows readily under pressure, and therefore requires no bonding adhesive. Uncured, it is a soft plastic sheet calendered between layers of polyethylene-coated paper. When laminated and cured under pressure, it forms a tough, rubbery interlayer with supposedly good optical properties: with haze and distortion minimized, transmittance is possible over the entire spectrum.
Manufacturer: Dow Corning Corp., Midland, Michigan.



All electronic readout tube

The Electronic Tube Division of the Burroughs Corporation has announced their volume production of the first mass-produced all-electronic readout tube known as NIXIE. A small, low-cost electronic device able to convert electronic signals directly to readable characters, the tube contains all the numeric digits, any one of which can be selected and displayed in a viewing area. The tube can be set in operation by beam switching tubes or any suitable voltage source requiring approximately ¼ watt. Applications for the new tube include computer readout, industrial control, electronic instrumentation, military electronic control, and channel selectors. The tube is constructed to meet military requirements for shock, vibration and temperature.
Manufacturer: Burroughs Electronic Tube Division, Plainfield, N. J.

High-strength alloy

A new jet engine alloy has been announced by GE's Flight Propulsion Laboratory. Designated J1300, the new material is the latest in a line of GE-developed jet engine alloys which includes J1500 and J1570, two high-temperature materials in current use. A high-strength iron-base alloy, J1300's operating temperature is 100 degrees Fahrenheit higher than materials now in use. The claim is made for the new alloy of making possible a reduction of several hundred pounds in overall engine weight, thereby improving jet performance beyond that obtainable with currently used materials.

The new alloy had its start in an investigation of the effects of various alloying elements. When sufficient information on these effects had been gathered, GE launched a program to develop new materials on the basis of this knowledge. The program resulted in various high-temperature alloys. The composition of the new alloy was conceived on the basis of diagrams and other research information. Requirements that the research scientists wanted to meet were: no content of strategic metals (no cobalts, no columbium, and little nickel) and a life of 1000 hours or more at 15,000 pounds per square inch pressures and temperatures of 1500 degrees Fahrenheit. Evaluation work on J1300 proved it to be a good forging material for the medium temperature range, and to have good potentialities as high-strength sheet in the 1200-1400 degree Fahrenheit range. Because of these characteristics, plans are now under way to specify the new alloy for critical structural sheet components throughout the entire jet engine.
Manufacturer: Metallurgical Products Department, General Electric, Detroit.

Screwdriver operates new switch

A new switch for operation in limited-access areas is being marketed by a division of Minneapolis-Honeywell Regulator Company. For use in installations in out-of-the-way places, or where a switch needs to be operated only occasionally, such as when testing circuits, the new switch is actuated by a screwdriver.

Called the IRA1, the switch is a subminiature single-pole double-throw assembly, with a 90-degree rotation, slotted actuator head that gives visual indication of switch position. The IRA1 is listed by Underwriters' Labs for 5 amperes, 125-250 volts ac, or 3 amperes inductive at 30 volts dc.

Manufacturer: Micro Switch, Freeport, Ill.

Three indicator thermometer

Two auxiliary indicators which can be manually set against the high and low sides of the indicating pointer by means of a knob, are the feature of a new line of Maximum-Minimum Stainless Steel Stem Thermometers. Since the maximum-minimum settings are adjusted manually, it is possible to compare a reading of the present temperature with the maximum and minimum readings of the last measurement.

This new line of thermometers are precision built with stainless steel stems and large dials that are easily read. The knob for the maximum and minimum settings is hermetically sealed on the glass window, which means the meters are protected against fumes or moisture.

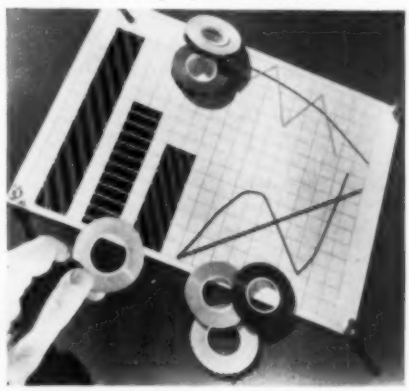
The thermometers are of the direct-drive, bimetallic type, without gears or linkage. They withstand corrosion and can be used in liquids and gases, and do not require preheating for use in hot materials. They are accurate to 1% over the

entire scale, are offered in seven different ranges, including both Fahrenheit and Centigrade, and come with either 2" or 3" faces, with stainless steel stems in any length required, from 3" to 86".

Manufacturer: Pacific Transducer Corp., 11836 West Pico Boulevard, Los Angeles 64, Calif.

Self-adhesive acetate fibre tapes

A new method for making graphs and charts has been developed by American Chart Service, Inc. A series of self-adhesive fibre tapes in various widths, colors and designs are used to make the graphs. When no longer needed, the tape can easily be peeled off and new graphs can be made. The adhesive tapes can be applied to almost any surface, and those of narrow width can be curved without much difficulty. They come in 15 different colors, 6 widths and 9 different striped designs. This makes it possible to present graphs and charts having a number of values and variables. The tapes vary in width from 1/32" to 1" and are wound around an Aeroflex core tubing made by Anchor Plastics Company, Inc., 36-36 36th Street, Long Island City 6, New York.

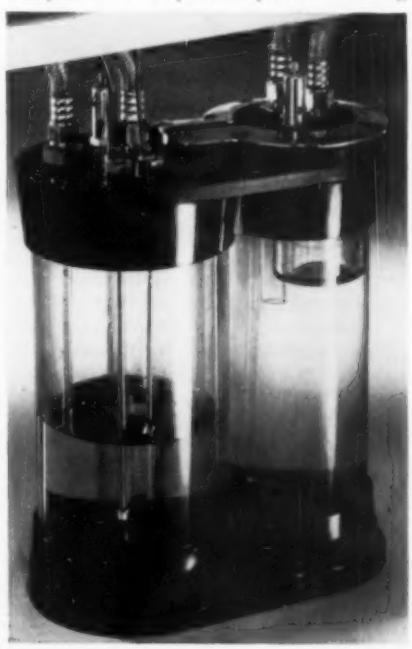


The new acetate fibre tapes are used by architects, advertising men, researchers, statisticians, city planners and map makers for a variety of graphic representations.

Manufacturer: American Chart Service, Inc., 101-103 Dover Street, Somerville 44, Mass.

Motorless, pumpless carbonator

Eastman Chemical Products, Inc., has developed a transparent plastic housing



made of Tenite butyrate for a new motorless, pumpless carbonator to be used by dispensers of carbonated beverages in restaurants, vending machines, bars, homes and plants. Called the Yan-Nell Jet Carbonator, the new unit has a capacity of 30 gallons per hour operating at a water pressure of 20 lbs. Larger capacities are also possible with higher water pressures, or an increase in carbonator height.

The carbonator body consists of two cylindrical chambers. Water is carbonated in the charging chamber under constant pressure from a 60 lb. gas line. When this chamber falls to refill level, an electric relay operates a valve to permit pressure from an intermittent carbonating gas line which is connected to the reservoir chamber and acts in place of a pump.

The Yan-Nell Jet Carbonator is installed with 110 volt ac or 12-24 volt dc batteries using an inverter.

Manufacturer: Wilshaw Enterprises, Inc., 210 Central Ave., Newark 3, N. J.

Reeves develops new gyroscope

The gyroscope, "nerve center" of giant guided missiles and ten-ton jet planes, has been miniaturized by Reeves Instruments, a subsidiary of the Dynamics Corporation of America. The new gyro — 2 inches long, 1 inch in diameter, and containing 200 separate parts — will be produced at the new Reeves installation at tolerances of 0.00001 of an inch. To accomplish that, Reeves has built a "super-controlled" development laboratory, constructed so as to exclude particles of dust as small as twelve millionths of an inch. In the laboratory, technicians work with high-powered microscopes and various electronic measuring devices.

Manufacturer: Reeves Instrument Corporation, Roosevelt Field, L. I.

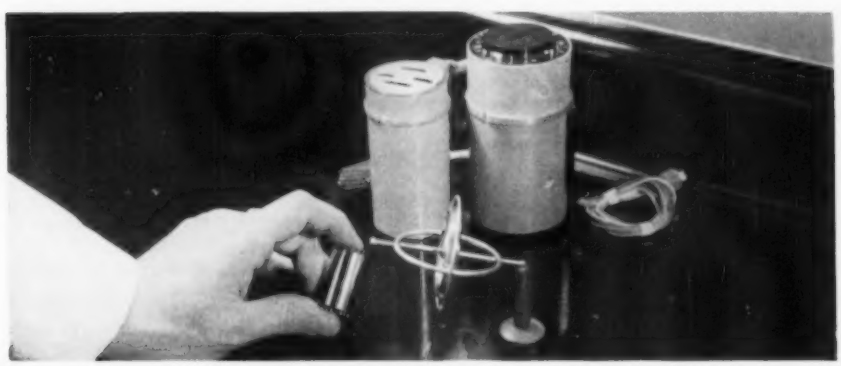
High-temperature lubrication

Two new dispersions of glass in isopropyl alcohol have been developed for use in metalworking lubrication. Applied to the work at room temperature, the dispersions form a dry, continuous film which acts to prevent oxidation and work-surface contamination during the heating cycle. The reason for this prevention is the glass fusion to the surface at a temperature below that at which the work is forged; the glass fusion provides the desired hydrodynamic film during the forming operation.

The new glass dispersions, numbered 239 and 240, find application for the forging of special alloy steels, titanium and other metals which are subject to oxidation or gas absorbtion at high temperatures during pre-heating and forming of the metal for which they provide a protective and lubricating coating. To prevent the molten glass from adhering to the die during the forming operation, pre-treatment of the dies is necessary.

Dispersion numbers 239 and 240 differ only in the composition of the glass used in their preparation. No. 239 contains a glass with a fusion temperature of about 1100 degrees Fahrenheit, while the glass in No. 240 has a fusion point of about 1300 degrees Fahrenheit. The two dispersions are compatible and can be mixed in any proportions in order to take full advantage of the temperature range. They come in concentrated form.

Manufacturer: Acheson Colloids Co., Port Huron, Mich.



New hand notcher

The new No. 241 Hand Metal Notcher is a light tool that cuts 90° notches up to 1" deep in all thicknesses of metal up to and including 16 ga. mild steel. A slightly hooked shape design of the blade makes possible accurate location of the notch due to the engaging action of the tip.

The construction of the No. 241 Notcher permits a notching die to be fixed to the end of one handle, and a blade operated by a double lever or linkage action that multiplies the force exerted on the handles; it also permits replacement of blade as well as die. The length of the notcher is 21".

The new notcher is useful for several types of notching operations: the usual 90° notches; oddly angled notches in corners of the sheet, up to lengths on a side of 1½". In addition, the tool can also be used for notching flanges and folded-up edges, in narrow channels, decorative moldings, and the like.

Manufacturer: Whitney Metal Tool Co., Rockford, Illinois.

A new styrene molding material

Lustrex LHA Natural, a new medium-impact styrene molding material, has been developed by the Monsanto Chemical Company. The new compound, with improved transparency, is recommended for applications requiring more impact strength and clarity, suggesting potential applications in the packaging field. The company also claims that their new product represents a good combination of clarity and toughness.Until now manufacturers of molded styrene containers have had to sacrifice one of these properties for the other. Luster LHA is said to be strong enough to reduce breakage during handling but at the same time sufficiently clear to show off most packaged products to good sales advantage. In addition to Lustrex LHA Natural, the company also manufactures general-purpose and high-impact styrene molding materials for packaging applications.
Manufacturer: Plastics Division, Monsanto Chemical Company, Springfield, Mass.

New self-adhesive "Mylar" for product trim

Fasson Products has announced a new self-adhesive "Mylar," comprising DuPont "Mylar" polyester film and Fasson Products' S-201 adhesive, which adheres to any clean, smooth surface. The Mylar adhesive is expected to find applications for use with nameplates, decorations, protective pads, lamp shades, electric blankets, hot water heaters and others. Fasson Mylar is applied by removing the protective paper backing and pressing the Mylar into place. The manufacturer claims that the new self-adhesive is tarnish-proof, resists abrasion, is not damaged by moisture, organic solvents, most acids and alkalies, and that it lends itself well to quick application around product contours. Provisions are made for printing on it, and it is available in metallic gold, chrome and colors in a variety of embossed designs.
Manufacturer: Industrial Products Division, Fasson Products, Painesville, O.

Low-cost storage vault for Cobalt-60

Baldwin-Lima-Hamilton Corp. has made two vaults for radioactive storage and has built them at a total cost of less than $200.00. Substituting for equipment which, according to the manufacturers, costs as much as $2700.00, the storage units have been approved by the Atomic Energy Commission as safe storage containers for Cobalt-60 sources up to 1-curie in strength. The main reason for this low cost is that the new containers are not intended for shipping purposes and therefore can be made of low-cost, but heavy, materials.

Cobalt-60 is used by the company as a high-energy source of gamma rays for radiographic inspection of thick-section weldments and castings. The vaults holding the radioactive material consist of a section of 10-inch steel pipe reinforced at the bottom and filled with lead. The radioactive source is stored in the center of the lead in a small space approximately ½ inch long and ½ inch in diameter.

The simple and inexpensive container promises a more wide-spread application of radioactive materials in industrial radiography. At the Baldwin-Lima-Hamilton company, the Cobalt-60 source is used in the inspection of heavy precision weldments and castings manufactured by the company. These include guided missile components, pressure vessels, hydro-electric power equipment, bridge sections, and heavy components for supersonic wind tunnels.
Manufacturer: Eddystone Division of Baldwin-Lima-Hamilton Corporation, Philadelphia 7, Pa.

Manufacturers' literature

Concrete Finish. Vitricon, Inc., 26-02 First St., Long Island City 2, N. Y. This 4-page folder describes the properties, uses and methods of application of Vitricon cold-glazed concrete finish, a fast-curing glazed finish for concrete block, wall panels, pipe, and other rigid finishes.

Control Equipment for Insulated Wire and Cable. Industrial Gauges Corporation, West Englewood, N. J., 4 pp., ill. Brochure deals with descriptions, specifications and applications of the Microlimit Control Cable Gauge, an automatic diameter-control device for thermoplastic insulated cable, extruded tubes, shapes and others.

GE Silicone Products. Silicone Products Department, General Electric Company, Waterford, N. Y. 8 pp., ill. Among the silicone uses discussed in this new catalog are rubber products, cosmetics and polishes, electric insulation, water repellents, textile finishes, lubricants, release and antifoam agents. Also given is a list of specialized literature covering product and application information.

Gravity and Power Belt Conveyors. The Rapids-Standard Co., Inc., 342 Rapistan Building, Grand Rapids 2, Mich. 4 pp., ill. Bulletin shows photographs of belt conveyors being used in receiving, work in progress, warehousing, shipping, packaging, order selection, and other areas, and describes the use of basic "packaged" conveyor units, portable lines, and controlled flow systems.

Lighting. National Lighting Bureau, 115 E. 44th St., N. Y., N. Y. Two 8-page folders discuss proper illumination as an aid to efficiency in "Offices" and for "Industry."

Liquid Filters. Air-Maze Corporation, 25000 Miles Road, Cleveland 28, O. 16 pp., ill. Engineering Bulletin on new all-metal liquid filters lists complete data for designers and users of equipment requiring full flow filtration of lubrication, hydraulic or fuel oils. Specific data on pressure drop, inlet and outlet sizes, weight, and overall dimensions is also given for a wide range of filter models.

Magnesium and Titanium. Brooks and Perkins, Inc., 1950 West Fort St., Detroit 16, Mich. 44 pp. Design data covering the physical and mechanical properties of these two metals, with weights, forming characteristics, specification tables, corrosion behavior, welding and joining, and other data of interest to the designer.

Polytetrafluoroethylene Insulating Films. Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn. 4 pp., ill. Featured in this new booklet is a chart listing electrical, physical and chemical properties of the four films and tapes as well as information on methods of applying each. PTF tapes and films are used by manufacturers of electrical and electronic equipment for Class H applications.

Stainless Steel. Electric Steel Foundry Co., 2141 N.W. 25th Ave., Portland 10, Ore. 12 pp. An alloy notebook on 17-4 PH precipitation-hardening stainless steel. This is the first report on a continuing research project in this field.

Standard Fastener Categories. The Chicago Screw Company, Division of Standard Screw Company, 2701 Washington Blvd., Bellwood, Ill. 6 pp., ill. Color folder describes and illustrates standard fastener categories, along with company's engineering, quality control, delivery services, and company's "Carbon Restoration" process for all of its heat-treated products.

Classified Advertisements

15c A WORD PER INSERTION, $5.00 MINIMUM, PAYABLE IN ADVANCE. BOX ADDRESS COUNTS FIVE WORDS.

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POINT-OF-PURCHASE DISPLAY ORGANIZATION *seeks creative young designer to work on national accounts. Designer should be familiar with plastics, wood, metal, etc. and be able to understand their use in practical construction. Write stating age, experience, and salary required. If portfolio shows real promise, our company, located in Milwaukee, Wisconsin, will pay traveling expenses. Box ID-112,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22.*

ENGINEER—*creative ability in product design, development. Knowledge of materials, manufacturing techniques. Desires meeting young industrial designer with art background, preference in styling, package and display design, model-making. Purpose—to form nucleus for industrial design office in New York City area. Box ID-113,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22.*

ARCHITECTURAL-DESIGN-DRAFTING PERSONNEL: *small office-medium sized, commercial, semi-public, original work. Experience and background important; initiative necessary. Salary and responsibility compatible with ability. Written initial application preferred-confidential. L. L. FISCHER/ARCHITECT, 341 Nassau Street, Princeton, New Jersey.*

Miscellaneous

PRODUCT STYLING & DESIGN. *Ambitious young business with "sixth merchandising sense" offers comprehensive service—(design development through blueprint specs.) Highly suited to creative and diversified assignments calling for experienced understanding of manufacturers production and sales needs. Project or retainer basis. Box ID-110,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22.*

Index to Advertisers

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Two distinguished Design Executives interpret the expanding role of design in industry...how form, technique, and appearance have emerged as major factors in volume manufacturing and marketing.

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WHITNEY PUBLICATIONS, INC. 18 EAST 50 STREET NEW YORK 22, N. Y.

For Your Calendar

March 1-31. 50 Packages and 50 Record Album Covers of the Year, Freedom House, New York.

March 5-6. Inter-Society Color Council annual meeting, Hotel Statler, New York City.

March 11-15. The 1957 Nuclear Congress will be held at Convention Hall, Philadelphia, Pennsylvania.

March 12-15. The National Association of Chemical Engineers Show, Kiel Auditorium, St. Louis, Missouri.

March 18-21. 1957 SPI National Conference and Pacific Coast Plastics Exposition, Los Angeles, California.

March 18-21. National Convention of the Institute of Radio Engineers, Coliseum, New York City.

March 23-31. Modern Living Exhibition, Navy Pier, Chicago, Illinois.

March 25-27. Technical Meeting and Convention of the American Society of Tool Engineers, Shamrock Hilton Hotel, Houston, Texas.

March 25-29. Western Metal Exposition, Pan-American Auditorium, Los Angeles, California.

March 27. Integrated Design for Company Identification. Conference sponsored by the Institute of Contemporary Art, Boston, Massachusetts.

April 4-7. First International Gadget Show, Trade Show Building, 500 Eighth Ave., New York City.

April 8-11. The National Packaging Exposition and Conference, International Amphitheatre, Chicago, Illinois.

April 9-11. The Fifth Welding Show sponsored by the American Welding Society, Convention Hall, Philadelphia.

April 11. A symposium, "The Future of Mass-Produced Housing," sponsored by the ASID at The Museum of Modern Art, New York City.

April 14-27. United States World Trade Fair. Exhibitors from 41 countries will display products and services. Coliseum, New York

April 15-17. The Building Research Institute's Annual Meeting, The Drake Hotel, Chicago Illinois.

April 27. The Design Management Forum co-sponsored by INDUSTRIAL DESIGN and The Philadelphia Museum School of Art, Broad and Pine Streets, Philadelphia 2, Pennsylvania.

April 29-May 3. National Materials Handling Exposition, Convention Hall, Philadelphia, Pennsylvania.

May 15-June 15. Design and Printing for Commerce Show sponsored by the AIGA, Freedom House, New York City.

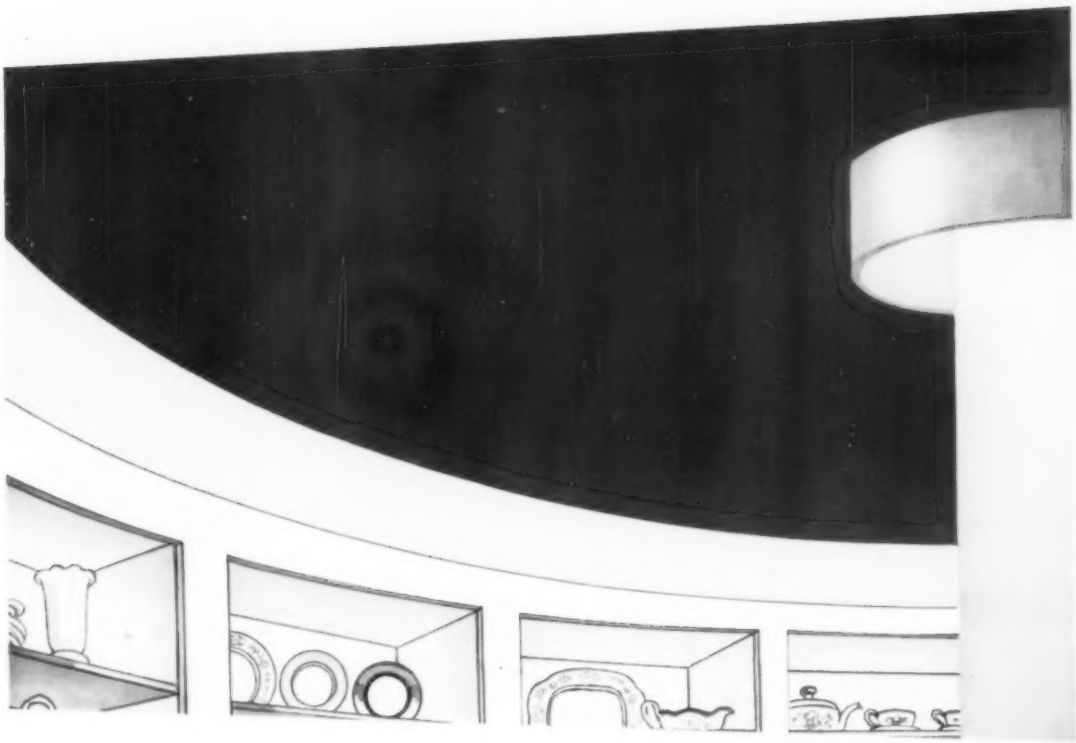
May 20-23. The Design Engineering Show will be held at the New York Coliseum.

June 1-30. The Chicagoland Commerce and Industry Exhibition will be held at the International Amphitheatre, Chicago, Illinois.

June 23-29. The International Design Conference in Aspen. Subject: "Design And Human Values." (Address inquiries to: Mr. George Culler, Chairman, International Design Conference, Art Institute, Chicago, Illinois.)

July 8-August 16. Processes for design problem-solving. Six-week summer program, Institute of Contemporary Art, Boston, Massachusetts.

WILSON AIR-FLOAT CEILINGS* – another new application of Homasote



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For new construction . . . for modernization of any type of structure . . . here is continuous, crackproof coverage of any ceiling area. It is actually "continuous dry-wall" construction — with no perceptible seams — made possible by weather-proof Homasote in big sheets up to 8′ x 14′.

The whole ceiling, whether one-layer, two-layer or more, literally floats — clear of all walls — free to expand or contract *as a unit* in either dimension.

It is hung from ceiling joists or rafters or collar beams. The supporting members need not be uniformly level at the bottom. It can be applied below old plaster ceiling.

Consider this ceiling method in any type of new construction *of any size*. Consider it for modernization — to lower a ceiling, to introduce indirect lighting or air-conditioning. Let us send you complete blueprint details and construction data. Kindly address your inquiry to Department C-31.

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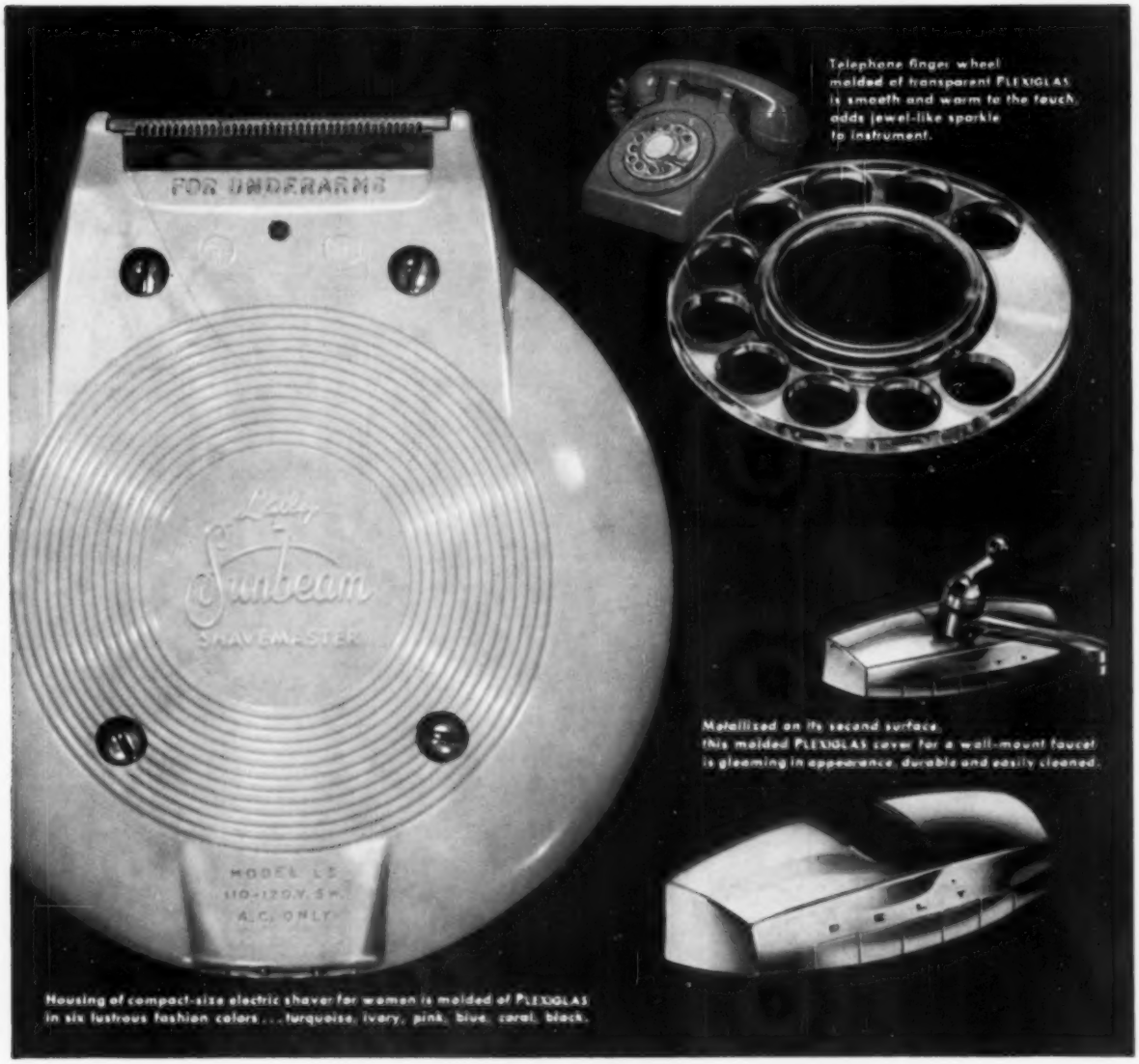

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