# INDUSTRIAL DESIGN

2 *February 1958* *$1.50 per copy*


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MARKET RESEARCH: PART II—how designers use it

CARS '58: designs for luxury and for utility

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FEBRUARY, 1958 VOLUME 5 NUMBER 2

# INDUSTRIAL DESIGN



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

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## Coming

*In MARCH—Packaging I, beginning a new series on leading packaging designers, new techniques, and new approaches to this broad design field.*
*In APRIL—Fabrication techniques: copper and brass. Industrial design behind the Iron Curtain.*

COVER AND FRONTISPIECE: The eye of a camera, the lens, is singled out on our cover to introduce a discussion of how and what professional photographers and designers "see" with their cameras, the subject of the article "Photographing Your Product," on pp 44-57. The frontispiece shows the photographer's first positive look at his work — "contact" strips. These are Herbert Matter's working pictures of an Eero Saarinen chair shell.


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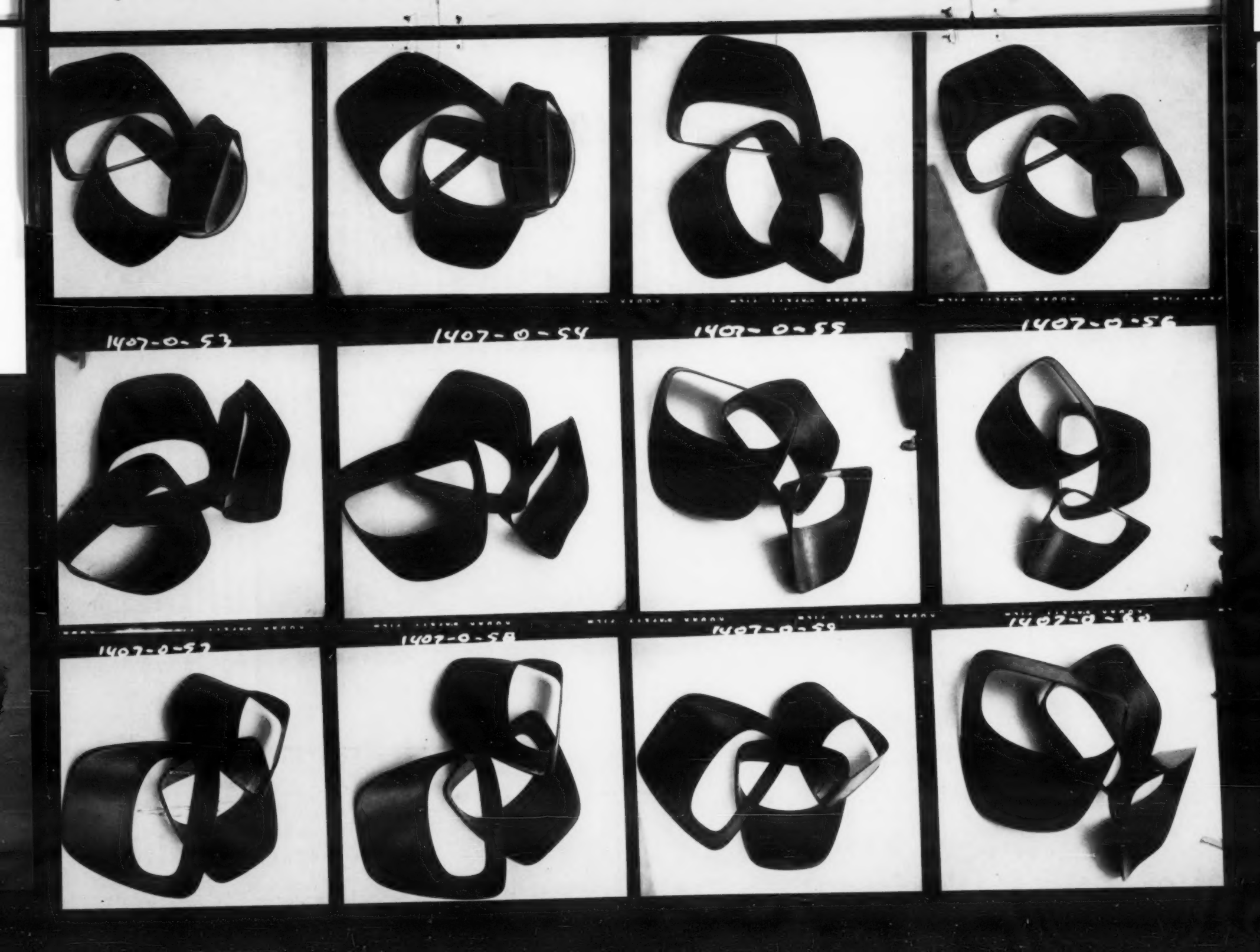
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# BOOKS

### Pioneering in concrete

THE WORKS OF PIER LUIGI NERVI. *Preface by Pier Luigi Nervi. Introduction by Ernesto N. Rogers. Notes by Jurgen Joedicke. Translation by Ernst Priefert. Frederick A. Praeger, New York. 140 pages of plates. Illustrated.* $10.00.

*Reviewed by Paul J. Mitarachi, architect*

To the list of pioneers in the use of reinforced concrete—Beaudot, Perret, Freyssinet, and Maillard—Italy has recently added the name of engineer Pier Luigi Nervi. His contribution has now been summed up in a handsome volume of photographs that will be a revelation to everyone interested in the relation of form to the elements which generate it. Where Perret and Le Corbusier gave concrete the nobility of art; Freyssinet, the daring of his imagination; and Maillard, the refinement of form dictated by economy; Nervi has added a character clearly related to the methods of construction he has evolved, especially those which stem from the economic use of prefabrication.

An evaluation of Nervi's work is timely. The recently built Congress Hall in Berlin, together with some other more or less "structure-conscious" buildings, have created doubts in the minds of many as to the proper relation of structure to form. There never seems to have been any doubt in Nervi's mind about what that relationship should be. The two-page preface of the book states clearly his belief in the essential need in architecture for a "good structural organism worked out passionately in detail and in general appearance." For Nervi, "Structural architecture leads to that synthesis of the . . . aesthetic sensitivity, technical knowledge, and mastery of execution which produced the masterpieces of the past."

Perhaps Nervi's best thoughts on the subject were stated in *Structures*, a less ambitious volume published last year by F. W. Dodge. The mind, Nervi writes, must be trained to grasp physical reality "by adding the results of experiments to the mathematical results, by observing the actual phenomena, by understanding intuitively the static behavior of our work. In other words, we must perfect and go beyond the scientific, mathematical stage of our knowledge and reach a stage of intuitive knowledge." This does not represent a denial of the existing body of theoretical, mathematical developments on which most structural calculations are based, but rather the understanding that as far as reinforced concrete is concerned, there are wide discrepancies between theoretical premises and physical reality. Nervi has mastered the correct relationship between calculations and reality. He has done it through long years of experience both at the drafting board as a designer and in the field as a builder. The result of this familarity with all aspects of building can be seen in his preoccupation with methods of erection which in the end affect the total form of the building as well as the details. More important, it has developed and strengthened the intuition and "feeling" for the material which can come only through empirical knowledge and without which the designer has to fall back on the formulas evolved for the more predictable beam and column forms.

Unlike *Structures*, in which Nervi's text predominates, *The Works of Pier Luigi Nervi* is the pictorial representation of his idea. One hundred and forty plates of photographs and drawings explain how the structures illustrated were designed or erected, and brief commentaries on each plate further clarify the photographic statement. The format and layout are both clear and handsome. For those not familiar with Nervi's work, the book should open a new window. Others who have seen photographs of his buildings scattered through American and foreign publications will find this a good and necessary summing up.

### Contemporary Design in Italy

FORME NUOVE IN ITALIA. *Editorial committee: Enrico Bettarini, Teo Ducci, Tommaso Ferraris, Agnoldomenico Pica, and Italo Zetti. Preface by Ivan Matteo Lombardo. Bestetti, Rome. American distributor: Wittenborn and Company, New York. Illustrated.* $15.00

*Reviewed by Aldo Giurgola, architect*

This survey of industrial design in Italy is significant in view of its publishers, the Milan Triennale and the Compagnia Nazionale Artigiana—in other words, the two official Italian authorities on the subject. The objects illustrated in the 164 pages of plates range from one-of-a-kind examples to designs intended for mass production. The collection has a preface by Ivan Matteo Lombardo and an explanatory text by Agnoldomenico Pica (in Italian, with English summary.) The latter is actually a fairly complete history of the resurgence of Italian craft in the last fifty years.

The most interesting aspect of this renascence has been the influence of the Milan Triennale and the Venetian Biennale, which induced the craft organizations to turn to artists and architects for help.

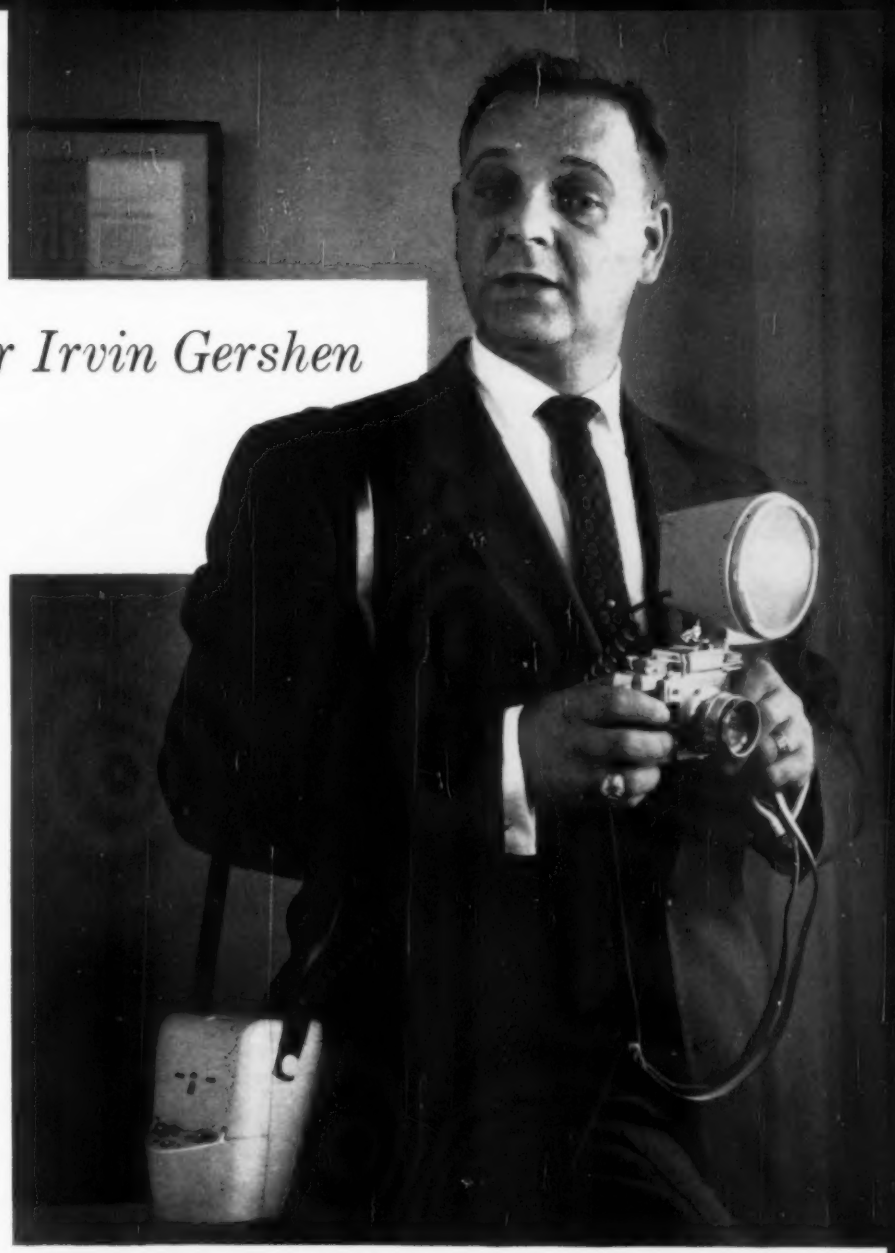
This created a strange situation. For example, an artist in Rome might be called on to design an object to be made by an artisan in the little town of Cantù, a totally different center culturally and industrially. But this artificial process, this misconception of the meaning of craft, at least gave the artisans of Italy a new awareness of their own era, together with the impulse to discover new means of expression.

The last and most substantial part of the book is devoted to illustrations of this new expression in Italy's industrial design (or "form of the useful", as it is often called, subtly, in Italian). In spite of the fact that industrial design in Italy is far ahead of what might be expected from the physical organization of the country's industry, many of the objects shown in this book have been successful in extensive production.

One characteristic of Italian design for mass production has been the refusal of manufacturers and designers to assume that objects intended for mass production must be treated with a heavy hand. Two examples of the Italian delicacy of touch are the careful attention given to the reinforcing and decoration of plastic products and the mastery shown in handling the form of light industrial products, such as typewriters, lamps and sewing machines.

The reader feels the presence of love in the interpretation of the "forme dell' utile" —a love of the same kind as that which has always exalted the Italian artisan in his struggle with matter. This quality may well be illustrated by a story. We went into a metal-working shop in Rome some years ago. The artisan was literally crying, holding the broken-off head of an iron snake in his hand. This, he explained, was part of a large chandelier, of the kind that is placed twenty-five feet up on the ceiling of some public hall. We clumsily suggested that he weld the broken piece; after all, nobody could notice at such a distance. He looked at us with a smile—it would not have been the same thing—and we felt like a fool.

It is because of this love that the authors have not been afraid to put side by side the products of handicraft and of industry as new forms of Italy.



# *Industrial Designer Irvin Gershen talks plastics:*

"TODAY'S Industrial Designer must exercise selectability in choosing a material," says Irvin J. Gershen, member of the Industrial Designers' Institute, "because he has a responsibility, not only to the product-purchasing public, but also to the material he works with.

"In the case of selecting a material for the Rush Instrument Company's Power Guard (an electronic photo-flash gun)*, we had to find a material that would take rough, bruising treatment, yet lend itself easily to sales-catching colors. We then had to decide on the most effective production technique, and, lastly, make certain that the material was available.

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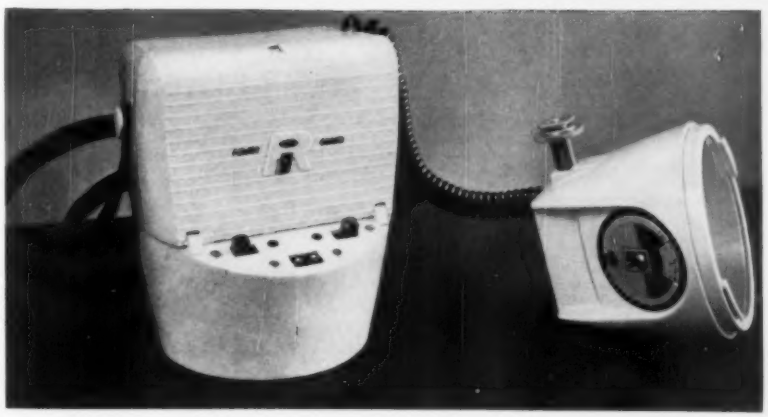
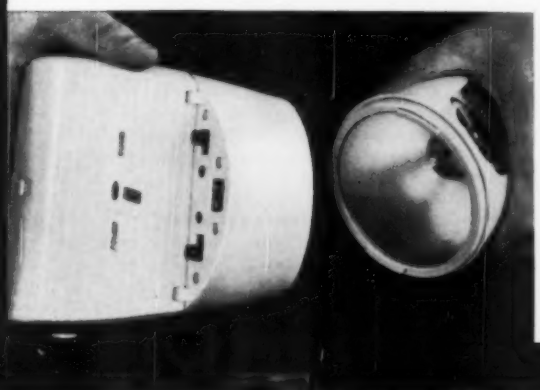
**Circuit Design by David Most*





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# INTERNATIONAL DIGEST

*Summaries of articles from leading foreign publications that reflect the current design climate abroad*

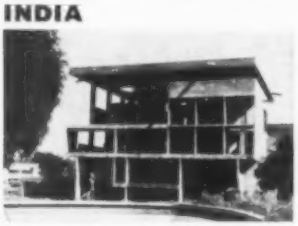
## YUGOSLAVIA

MOZAIK, Beograd
Number 2, page 10

**Problems of Industrial Esthetics:** Apparently assuming that industrial design is an almost unknown concept to the magazine's readers, this article points out that it is the "science of the beautiful in industrial production." Examples of good design may be found in all types of mass-produced products, ranging from shoes to airplanes (above). The author feels that industrial design has the social function of raising the taste of consumers by providing them with everyday goods which also satisfy esthetic requirements.

In an introduction to this, the second issue of Yugoslavia's only magazine devoted to "industrial esthetics," the editors express the hope that the examples of good design which they publish will stimulate Yugoslav industry to raise its design standards.

## INDIA



DESIGN, Bombay
August, 1957, page 8

**Contemporary Architecture Misunderstood in India:** Continuing an emphasis on the problems of architecture in India, *Design* this month publishes an article by J. Mugaseth, which finds most Indian architecture "definitely bad" because of an ignorance of basic principles. Indian buildings by such foreign architects as Le Corbusier (who designed the residence shown) Antonin Raymond, or L. L. Rado are the rare exception to this rule.

Also concerned about the lack of city planning in India, Mugaseth says that Bombay is fast becoming an overpopulated slum. Comparing the luxury apartments to the "dilapidated shambles in which the majority exist," he says that the social aspect of architecture is being ignored. A revision of archaic municipal laws, such as the one which forbids buildings more than 70-feet high, will be necessary before a farsighted planning program can be developed.

## JAPAN

KENCHIKU BUNKA, Tokyo
December, 1957, page 45

**House with a Pergola,** a well-illustrated article on H. Miyajima's house in a Tokyo suburb, draws a comparison between this house and the work of Frank Lloyd Wright. Here, as in some of Wright's work, one has the impression of a solid mass which has been pierced by windows. The architect creates strong textural variations by contrasting, in both the interior and exterior, oil-finished Philippine mahogany with concrete blocks.

## GERMANY

GRAPHIK (Advertising Art and Industrial Design), Munich
September, 1957, page 34

**The Triumph of the "Verbundkreis":** An exhibition entitled "Form-color-fabrication" will soon circulate throughout Germany, displaying articles produced by the Verbundkreis—an alliance of nine German firms cooperating in the production of well-designed, reasonably priced articles intended for mass production. The nine firms, who began their venture in 1955, are Max Braun (radios), Bremer Tauwerk-Fabrik (carpeting), Gralglas Werke (glassware), Knoll International (furniture and textiles), G. M. Pfaff (sewing machines), Rasch (wallpaper), Römmler (Resopal plastics), Rosenthal (dinnerware), and Württembergische Metallwarenfabrik (flatware). The program's commercial success was achieved in spite of traditional reluctance in Germany to accept new design and unfamiliar forms in the field of home furnishings.

## SWITZERLAND

WERK, Winterthur
November, 1957, page 376

**Rotterdam's Department Store, "De Bijenkorf":** The "Bijenkorf" (beehive), the most modern building of its type in prewar Europe, was struck by a bomb in 1940 and, like the rest of Rotterdam, almost completely destroyed. After the war, Marcel Breuer and A. Elzas were commissioned to rebuild it as "the ideal department store."

The architects designed a cube-like structure with almost windowless façades, a striking contrast to the window walls of Dudok's original building. Only the third-floor restaurant and the offices on the top floor are lighted by bands of windows; the narrow slits at the other levels serve a decorative purpose. Inside, pillars nearly forty feet apart permit free circulation through the sales area, which is organized for self-service. The interior was designed by Daniel Schwartzmann, of New York. The counters are no higher than 4'3" so that the whole floor can be seen at once. Attached to the store by an enclosed passageway is a glass display pavilion. Sculptures by Naum Gabo and Henry Moore decorate exterior and restaurant.

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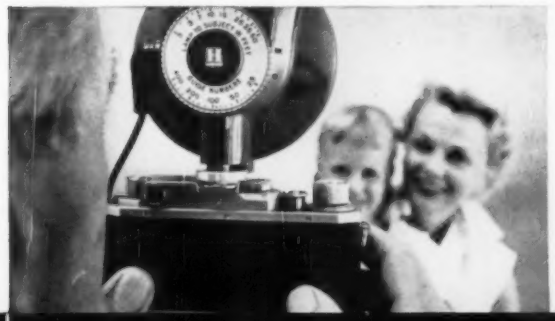


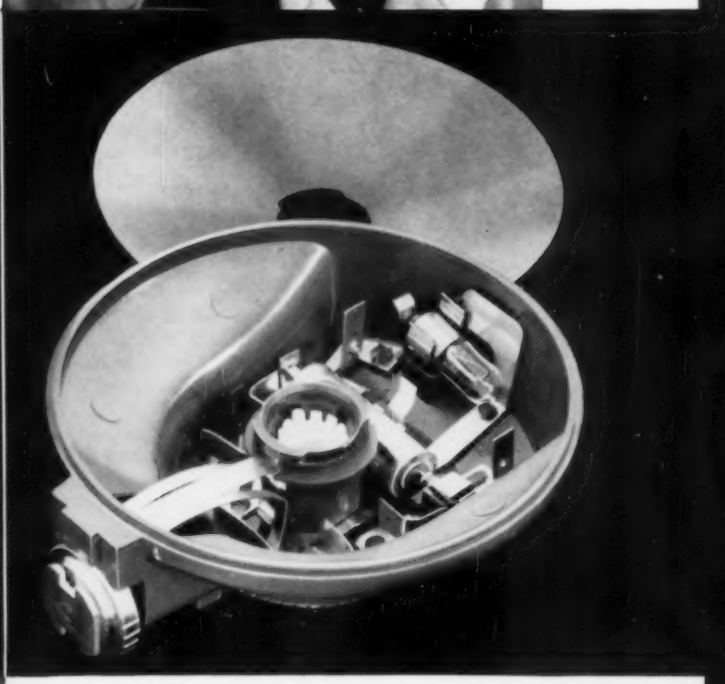

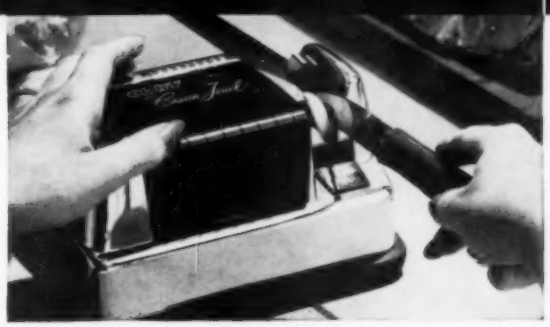

This electric knife sharpener is an example of how high-impact Styron® 480 contributes to good product design and low manufacturing cost. The clean, rugged lines of the housing were easily achieved through the superior moldability of Styron 480. It takes surface finishes well (in this instance, gold-tone vacuum metallizing). And, of course, this durable Dow polystyrene is also available in a wide range of trend-setting colors.

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# NEWS

### Visual environment to be Aspen focus

"The world that can split the atom should be ashamed to live in visual squalor," said executive committee chairman Albert E. Parr (above) in explaining the basis of the Eighth Annual International Design Conference in Aspen, Colorado. Dr. Parr, director of New York's Museum of Natural History, went on to state that "The mastery of urban space, its reorganization to conform to the needs of modern life, is the biggest task facing designers today."

The subject matter of the conference, which will be held in June, will be divided into three cycles: The City, Its Basic Elements, Its Connective Tissues. The theme will concern the redesign of our surroundings, with emphasis on their *visual* character, according to James M. Fitch, conference vice-chairman and Associate Professor of Architecture at Columbia University. Specific projects to be taken up in the program are the sculpture and murals of the new University of Mexico, the new Brazilian capital city of Brazilia, the sculpture gardens of the UNESCO building in Paris, re-building of parts of Philadelphia, plans for the reconstruction of Coventry, England and problems related to the "roadtowns" springing up beside America's highways.

Conference participants represent three groups—the creative professions, education, and business—and will include Professor Christopher Tunnard, head of the School of Landscape Architecture at Yale; Erwin A. Gutkind of Philadelphia, city planner and author of *The World from the Air*; Willo von Moltke of the Philadelphia Planning Commission; Isamo Noguchi, sculptor and designer for the gardens of the Paris UNESCO building; Professor Gordon Stephenson of the University of Toronto, planner of many post-war British towns.

Since the purpose of the International Design Conference in Aspen is to promote new and significant ideas in design generally, discussions will concentrate on the concepts of design vital to all groups represented rather than on the technical details of any one phase of design. Membership in IDCA is open to corporations and students, as well as to designers, and the conference itself is open to the general public.

The executive committee includes Morton Goldsholl, Chicago designer; Edmund N. Bacon, executive director of the Philadelphia City Planning Commission; Will Burtin, New York designer; George D. Culler, director of museum education at the Art Institute of Chicago; Garrett Eckbo, Los Angeles landscape architect; and James Real, Los Angeles designer.

Further details and dates will be announced in the near future on these pages.

### 1958 trade fair program

In outlining its 1958 schedule, the U. S. Office of International Trade Fairs announced its new philosophy: first, more space for private manufacturers, and, second, more emphasis on the industrial process itself.

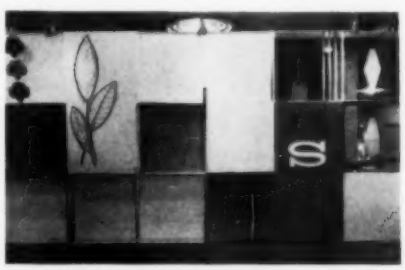
As an example of the first point, American manufacturers and their European distributors will take over U. S. pavilions at the Paris and Stockholm fairs. Government funds thus freed will be devoted to exhibits at fairs in Iron Curtain countries and in "uncommitted" Asian countries.

In line with the new policy of showing the "how" of U. S. production, the OITF exhibits in Bombay and Calcutta this year will be designed to demonstrate small industrial plants and processes in operation, showing the role of small business and private enterprise in this country.

This spring the OITF has plans for eight fairs: Lyon, Hanover, Paris, Bombay, Milan, Osaka (Becker and Becker are designing the last two), Casablanca (designed by Charles Shaw), and Poznan (designed by Reino Aarnio). Tentative plans call for exhibits at ten more fairs in the fall.

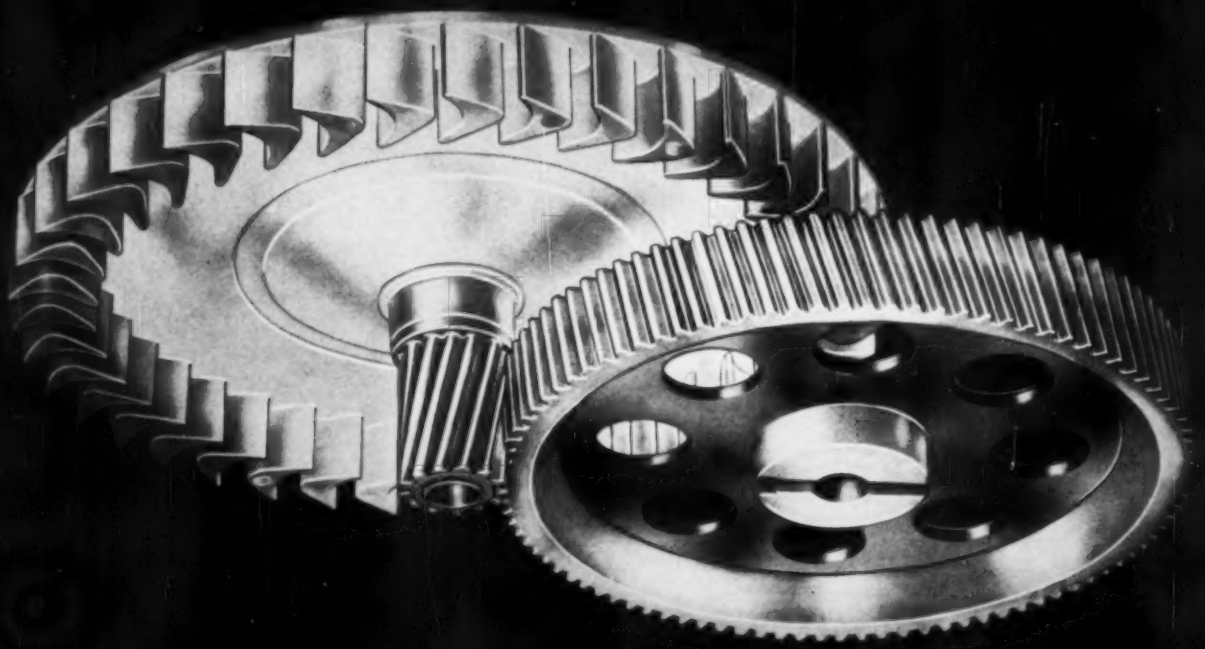
### Girl Scouts try fresh display ideas

A bright picture of the Girl Scouts and their organization was presented in an exhibition at the recent thirty-fourth Girl Scout Convention in Philadelphia. The displays, designed by exhibits director Salvatore A. Carbone with the assistance of Leonard Lowy, described by means of graphs, pictures, and text the function of each Girl Scout department and its relationship to the entire organization. Utilizing 15,000 square feet in Convention Hall, the exhibit was the largest ever put up by the Scouts.





Mr. Carbone created a building block effect with contrasting large panels in vermilion, burnt gold, or turquoise. Simplified symbols were used throughout the exhibit to help carry the message. For example, a leaf (top) in three sizes suggests the three age groups within the Scouts. In another unit (above), flat panels describing the purpose of the Scout magazine, *Leader*, contrast with three-dimensional cooking and sewing displays from the actual magazine pages.



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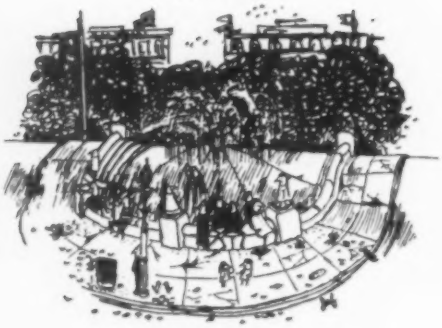
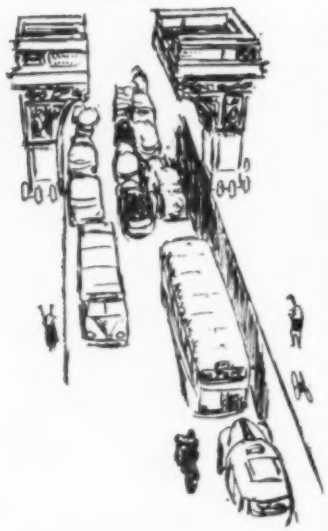
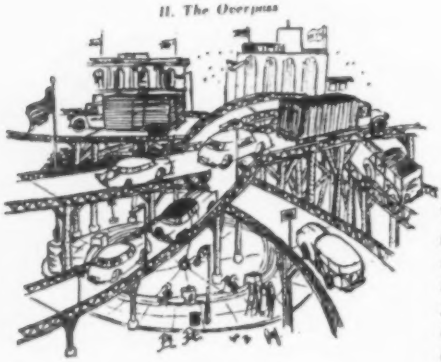


III. The Ditch



II. The Overpass

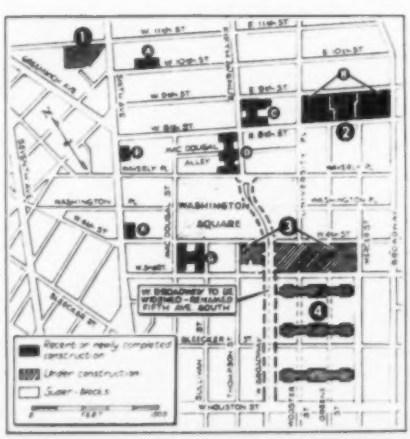


Cartoons by Jaf, reproduced by permission of Village Voice

*Village Voice, neighborhood weekly, illustrates three proposals for allowing more traffic through Greenwich Village's Washington Square. Park Commissioner Robert Moses wants two depressed roadways with bridge connecting bisected square. Residents favor closing park to all traffic.*

## New buildings create planning problem in New York's "Village"

*Dotted lines on map show projected widening of Fifth Avenue at Washington Square Park and its extension down West Broadway. Letters indicate recent Village construction: apartment houses at A, B, C, and D; banks at E and F; N.Y.U.'s Vanderbilt Hall at G. Buildings now going up include* 1) *P.S. 41 replacing picturesque apartments of Rhinelander Gardens;* 2) *Twelve-story apartments;* 3) *N.Y.U. student center;* 4) *Washington Square Village.*




*Designed by Harrison and Abramovitz, NYU's Loeb Student Center (below, left) will have lounges, dining room, offices, and 1,000-seat auditorium. Washington Square Village apartment (right) will be faced with colored ceramic panels.*

In implementing new city developments, planners and politicians alike are often in danger of destroying—by replacing them with artificial structures—the very neighborhoods they are trying to help. Because the problem of how to create planned communities without losing the warmth and spontaneity of unplanned ones is a country-wide problem, the story of building development in New York's Greenwich Village is important to designers and planners across the nation. Recent developments, including a new student center for New York University, an upper-middle income housing project, proposals for a wider road through Washington Square (see map for other new building), make Greenwich Village a demonstration model for the planning problems that "high density rental areas" in such cities as Philadelphia, Chicago, and San Francisco also face.

Besides being a traditional haven for rebels, Greenwich Village is a small, friendly community in the center of perhaps the most impersonal city in the world. Houses, streets, and stores on a human scale; a congenial diversity of racial groups; and an outdoor community center (Washington Square Park) give the Village a cohesiveness unusual in large cities. Any developments seeming to threaten this quality have met with strong local opposition.

New York University, as owner of most of the land surrounding Washington Square, has been the chief factor in visually changing what is the heart of the Village. As part of its extensive building program, N.Y.U. is now constructing the $3,500,000 Loeb Student Center, on the south side of the Square. This will make an almost complete ring of university buildings surrounding the Park, which run in style from the original Federal architecture on the North side through the neo-Georgian of the recent Law School on the South side, to the contemporary style of the Loeb center.

The seventy-five million dollar Washington Square Village (below, right), an upper-middle income project for 2,000, will also create a major visual change in the Washington Square area. Plans by the architectural firm of S. J. Kessler and Sons, and by design consultant Paul Lester Weiner, devote less than one-third of the project's twelve acres to buildings, and distance between each of the three 17-story apartments will be 1½ blocks. However, there has been opposition to this handsome development in terms of community politics as well as planning.

Local critics have asked why, with plenty of high-income housing in Manhattan and with low-income housing still desperately needed, the city chose to support Washington Square Village, where rent will average approximately $60 per room. A more far-reaching criticism of this type of development was expressed by Greenwich Village

*(Continued on Page* 14)

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(*Continued from page* 12)

Study, a group of thirty-four professional people interested in maintaining the Village's diversified but residential quality. "Any new building, whether for middle or low income groups, should not be in the form of 'projects' such as we are accustomed to see elsewhere in New York and as we shall soon see rising in the Washington Square Southeast high-income project. Asthetically, the approach is out of keeping with the Village. Furthermore, its implicit economic class segregation is socially undesirable and retrogressive from the situation now being found in the Village."

One solution to Greenwich Village's planning problems, which might well be applied to other areas, such as Chicago's Near North Side, may be found in an amendment to the General Municipal law, Section 72-m, passed by the New York legislature last Spring. This gives the city authority to condemn land for renewal in *deteriorating* areas, and is probably the first city planning law ever to consider the rehabilitation of declining neighborhoods rather than simply slum neighborhoods. Under the new amendment, spot rebuilding, rather than changing the complete character of a block, would be done where necessary on the basis of a comprehensive community study. The aim of the amendment is a rehabilitation (rather than redevelopment) retaining the community structure.

### Progressive Architecture

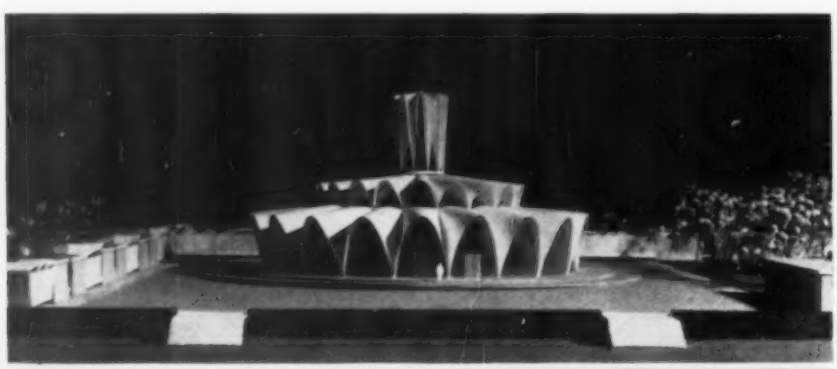
More than twenty-five building projects won awards on January 10 in Philadelphia in the Fifth Annual Design Awards Program, sponsored by *Progressive Architecture* magazine. The competition, open in a variety of classifications but only to actual commissions, represents a cross-section of outstanding contemporary American architecture.

Winner of the First Design Award and the Design Award in the residential category was the proposed public housing project in Darby Township, Pennsylvania. Submitted by the firm of Robert L. Geddes, Melvin Brecher and George W. Qualls, the project uses an undulating building pattern in order to define outdoor spaces for different uses.

The Church for the Priory of St. Louis and St. Mary (below) in St. Louis, Missouri, by Hellmuth, Obata and Kassabaum, Inc., was winner in the religion category. It is composed of three concentric rings of parabolic arches. The ground floor ring will form niches for twenty small chapels, the second ring will bring light into the nave, the top ring will form a lantern above the high altar.

The Recreation Design Award was won by Corlett & Spackman and Kitchen & Hunt for the Olympic Arena (bottom) for the 1960 Winter Olympics in Squaw Valley, California. The building will have a 300-foot clear-span roof rising to 90 feet at the ridge. It will work on a derrick principle: each half of the roof acting independently, with the roof girder functioning as the boom, the column as the mast, and the inclined cables as guys.

Other winners include the exhibition building for Theme House, Inc., in New York, by architects Antonin Raymond and L. L. Rado: Commerce Award; University of California Student Center in Berkeley, California, by Donald Hardison and Vernon DeMars: Planning Design Award.



### Griswold made IDI chapter chairman

John Griswold (above), a partner in the design firm of Griswold, Hickel and Keiser, was elected chairman of the IDI Southern New England chapter at their meeting on January 13 at the Silvermine Guild of Artists, Silvermine, Connecticut. Former chapter secretary Douglas Merrilees, of the University of Bridgeport design department, was elected vice chairman. Gerald Ewing, an independent designer, was made secretary, and Edward Conroy, designer for the International Silver Company, was reelected treasurer.

Tucker Madawick was elected to the board of trustees, and Joseph Parriott was chosen as chairman for the Fifth Annual Symposium, to be held next fall.

### ICA to explore company identification

"Integrated design for company identification" will be the theme of a conference based on case studies of eight nationally known companies. Sponsored by the Center for Design Studies, Institute of Contemporary Art, the conference will meet at the Sheraton-Plaza Hotel in Boston, March 5 and 6.

Two company case histories will be presented each morning and afternoon, followed by discussion. An exhibition on company identification programs will also be held.

Representatives of companies whose case studies will be presented are: William McConnell, Diamond Alkali Co.; C. Frederick Schaus, consultant, appearance design, General Electric Co.; H. Creston Doner, director of design and color, Libbey-Owens-Ford Glass Co.; J. Gordon Lippincott, Lippincott and Margulies; Herbert J. Zeller, Jr., director of styling, Motorola, Inc.; Frank Hohmeister, advertising manager, and Lester Beall, consultant designer, Torrington Manufacturing Co.; R. W. Tillotson, manager, art design and photography, Union Carbon and Carbide Co.; and J. C. Gauntlet, director of advertising, and Will Burtin, consultant designer, Upjohn Co.

Those who wish to register for the conference should write to the Institute of Contemporary Art, 230 The Fenway, Boston 15, Massachusetts.

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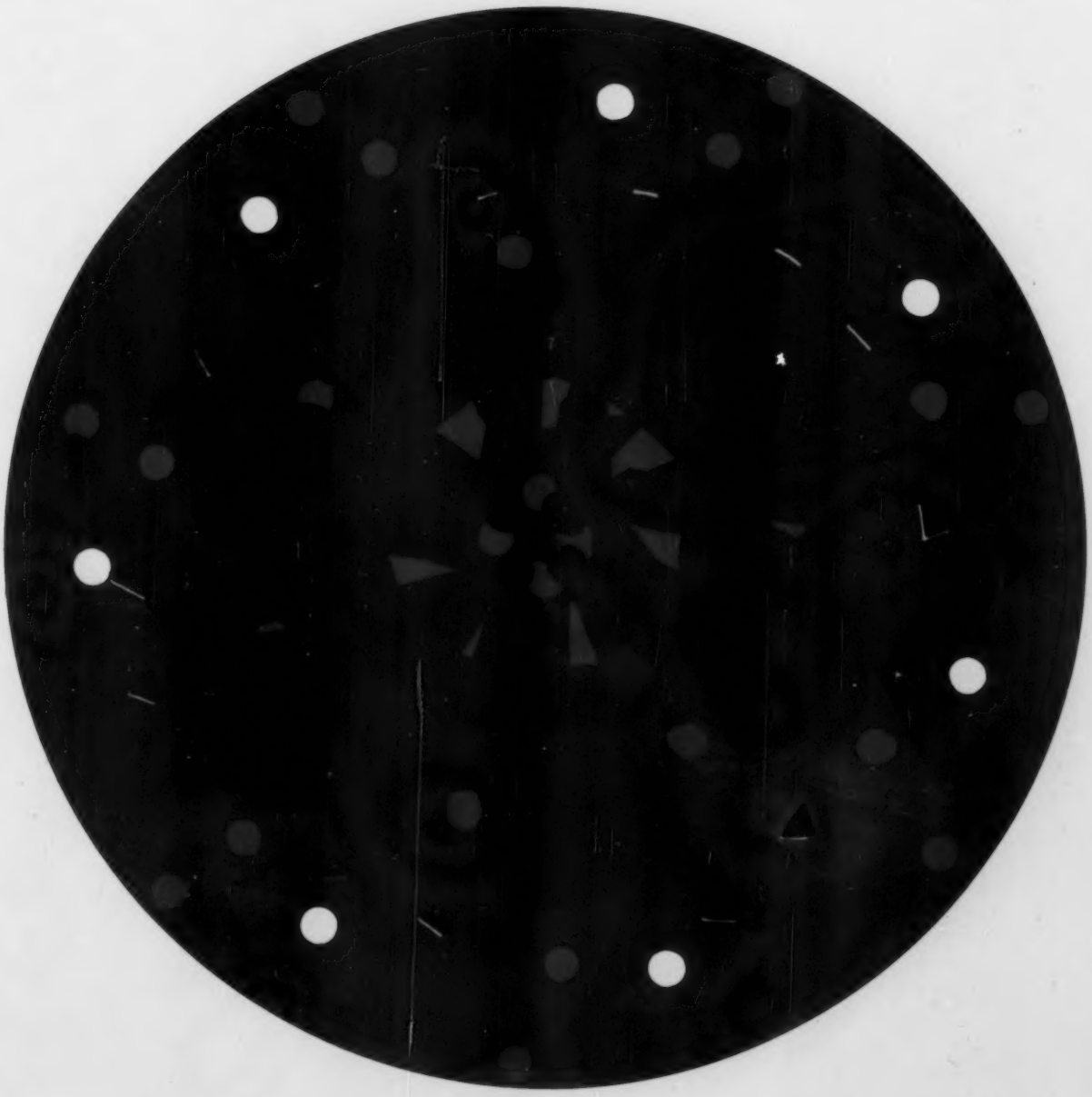

# ALUMINUM IS COLOR: THE WONDERFUL PROCESS OF ANODIZING

One of the best known techniques for giving aluminum a protective finish is *anodizing*. The basic purpose of anodizing is to increase aluminum's resistance to corrosion and abrasion. Anodizing actually builds up an aluminum oxide coating electrolytically which gives aluminum a "built-in" armor hide that is part of the metal itself. It cannot chip or peel or flake off. Density and thickness can be controlled, depending on whether a hard, impenetrable finish or a softer, more flexible coating is desired. Furthermore, this armored hide resists corrosion from all but the most caustic alkaline agents.

## COLOR IN ANODIZING

Anodizing does not arbitrarily alter the appearance of the metal, regardless of surface treatment applied. The crystalline cellular structure of the anodic layer, however, is highly receptive to an unlimited range of organic dyes and pigments. The coloring agent permeates the oxide layer before the surface is sealed, thus actually becoming part of the metal itself. Sealing is accomplished with a solution of boiling metal acetates. Colors cannot chip off or peel away.

## FACTORS AFFECTING APPEARANCE

Appearance of the anodized metal can be controlled in a number of ways. Choice of alloys has a strong influence on final appearance. Silicon alloys impart a gray tone, chromium a pleasing yellow tint, and manganese a brownish coloration. High-purity alloys give a clear, transparent finish; translucent or opaque finishes result from constituents introduced in the alloy. If colored anodic coatings formed in sulfuric acid electrolytes are used, the aluminum takes on a unique metallic luster. Opaque anodic coatings are possible using chromic acid electrolytes to give deep, rich, solid tones. Multicolor effects are possible by masking the metal before coloring or dyeing. Lithographing, silk screening and other special processes are available.

## ALCOA DEVELOPED ANODIZING PROCESS

Alcoa developed and patented the anodizing process under the trade name, Alumilite. We have worked extensively with different dyes and pigments and have developed a complete spectrum of colors for interior use. Other colors—such as gold—which are completely resistant to fading from sunlight and other atmospheric agents are recommended for outdoor exposure.

## ALUMINUM WEARS A RAINBOW OF COLORS

Actually, aluminum can be colored more ways than any other metal. Its good forming properties, ready response to etchants and high adherence for inks and enamels make it a good base for all color treatments of the conventional type. With proper surface preparation, almost any type of paint, lacquer or enamel can be used.

**GET MORE INFORMATION ON DESIGNING IN ALUMINUM**

Write for Alcoa's inspirational bibliography which describes Alcoa books and films to help you design in aluminum. Aluminum Company of America, 2183 Alcoa Building, Pittsburgh 19, Pennsylvania.

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### IDI Convention marks 20th year

The Industrial Designers Institute will be celebrating its 20th anniversary during their national conference at Detroit's Hotel Statler this month. The meeting, which will run from February 27 to March 2, will focus on various aspects of automotive design.

A Product Information Show, featuring new materials of special interest to designers, will run concurrently with the conference. R. G. Wood has been chosen show manager by the Executive Committee (above, left to right, from top of stairs): H. Creston Doner (chairman), Carl Reynolds, Lawrence H. Wilson, Kenneth A. Hopkins, Ladd J. Orr, Charles Sawyer, Walter B. Ford II, and Aarre Lahti.

In celebration of its anniversary, the IDI is sponsoring a chartered trip to the Brussels World's Fair, leaving New York July 21 and returning from Paris August 8. In Brussels IDI will give a dinner for European designers. The group will stop off in Copenhagen and in London, where they will hold a formal conference to which British designers will be invited. Gerald Thurston, senior designer at Lightolier, Inc., is chairman for the trip and Dorothy Fontan, IDI executive secretary, is general coordinator for all trip arrangements.

### NYU will study creativity

A new Creative Science Program has been established by New York University's Division of General Education, for the recognition and encouragement of scientific talent. The program will be directed by Adjunct Professor Myron A. Coler, technical director of the Markite Company of New York, who has been working with NYU officials for several years on the development of a research program on the nature of the creative process.

One of the first projects will be a series of seminar meetings, to begin early this year, and Dr. Coler will be pleased to hear from anyone interested in attending. The first subject will be "The Role of Conjecture." Other projects include the establishment of a reference library and the publication of a bibliography.

The research program will be concerned particularly with three areas in which creative talent may be dormant: in young people in whom it has not yet been recognized, in older people where it is perhaps no longer being utilized, and among persons whose creative talent has been misplaced or misdirected.

### British Design Center statistics

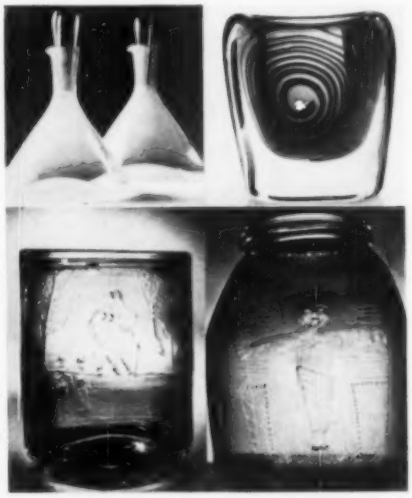
The results of an attendance survey of visitors to Britain's Design Center have just been made public by the British Council of Industrial Design, the sponsor of the Design Center.

An average of 2,500 people a day have visited the Center since it was opened eighteen months ago. Of these, one out of three comes back for another look at the show, which is a permanent national exhibition of selected consumer goods. One visitor in nine is a trade buyer or in an occupation that makes him a potential large-scale purchaser. Main interests among buyers are furniture and textiles.

### Jensen awards Lunning Prize

Two glass designers will share the Frederik Lunning Prize for talented young industrial craftsmen from Scandinavia, Georg Jensen, sponsor of the competition, has announced. The $5,000 award will be divided between Erik Hoglund of Sweden and Hermann Bongard of Norway.

Erik Hoglund, 25, has worked as a sculptor and as an artisan since his graduation from the Konstfack School in Stockholm. He is presently a designer for the Boda Glassworks and has shown his work (bottom row, below) throughout Sweden and abroad, notably at the 1957 Milan Triennale. He has also been working recently with colored glass in simple, undecorated forms.



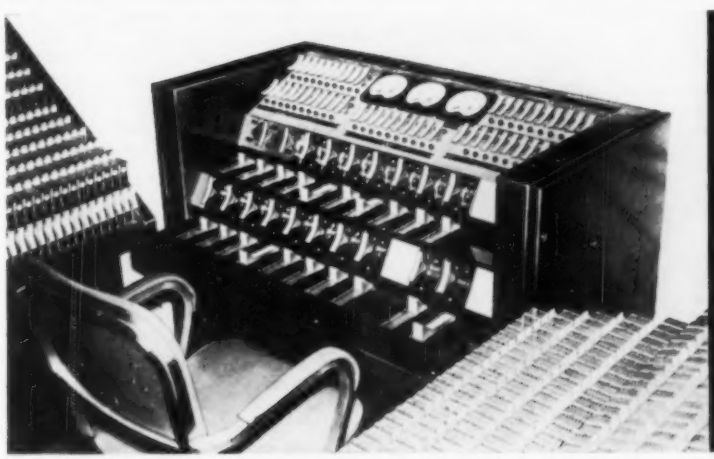
Hermann Bongard, 36, was a commercial illustrator before he joined the Hadelands Glassworks. He is also chief designer for a stainless steel factory and industrial consultant for the Figgjo faience factory. In this country, his work (top row, above) can be seen in the Whyte Gallery, Smithsonian Institution, both in Washington, and Norway House in New York.

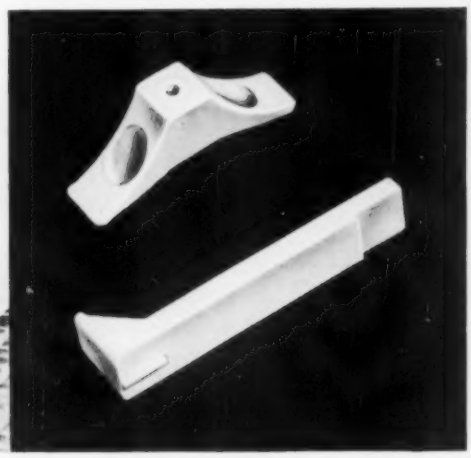
The Frederik Lunning Prize is named for its originator, the founder of Georg Jensen, Inc.

*Participants in a Philadelphia Museum School of Art symposium December 10 on "Design this Day" were, left to right: Louis I. Kahn, E. M. Benson, Dean of the Museum School (co-chairman with Raymond A. Ballinger, Director of the Department of Advertising Design, not shown), Walter Dorwin Teague, William Armbruster, and Will Burtin. The symposium was the fifth in a series relating the artist-designer and other creative fields.*

CYANAMID

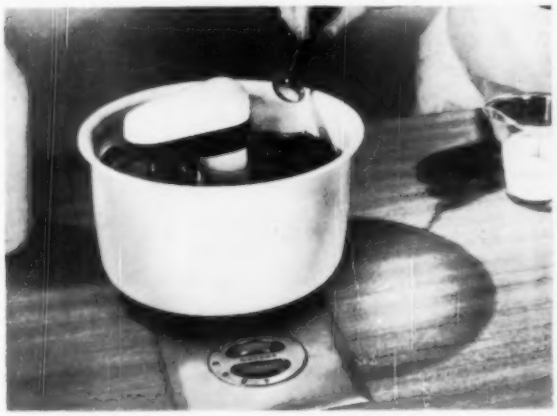
# PLASTICS NEWSFRONT





## Plastic Keys Conduct an Orchestra of Light

One operator can play infinite variations in stage-lighting effects on the plastic "keys" of the Lumitron Lighting Control System. Control handles and slide bars are molded of BEETLE® urea plastic, an excellent dielectric which requires no insulation. Permanent, molded-in colors permit quick circuit identification. Developed by Metropolitan Electric Manufacturing Company, the Lumitron has an excellent record of performance.



## "Five-in-One" Counter-Top Appliance Features CYMEL® Plastic Accessories

The new multipurpose NuTone Food Center operates a mixer, blender, meat grinder, knife sharpener and fruit juicer from one motor that can be set flush in a counter top Counter clutter, tangles of electric cords and heavy separate appliances are eliminated. A gleaming white 3½-quart bowl made of CYMEL melamine molding compound serves the mixer and juicer. CYMEL makes the bowl lightweight, dent-proof and easy to handle. The bowl is molded for NuTone, Inc., by Prolon Plastics Division of Prophylactic Brush Co.

## New Insulated Beverage Set Joins Growing List of Boilable CYMAC® Housewares

Suitable equally for hot or cold beverages, these new double-shelled Thermo-Serve tumblers and pitchers are molded of CYMAC 201 methylstyrene, Cyanamid's new heat-resistant thermoplastic. This CYMAC ware resists staining by fruit acids, coffee and other beverages, and can be washed in boiling hot water, even in automatic dishwashers, without cracking or warping. All parts are injection-molded by NFC Engineering Company and sealed together under heat.

*Furniture by Mogensen from Danish film*

### Company News

A new industrial design organization called **Packaging and Product Development Institute, Inc.**, has opened offices in Cincinnati. Charles A. Bosworth is president and treasurer, and Theodore E. Luderowski is vice-president and director of design.

The **American Iron and Steel Institute** says that trans-Atlantic television transmission may be possible by next year. Engineers are now planning the construction of 60-foot steel antennas on land masses across the Atlantic.

A **color film**, "D for Design," about Danish design and produced by the Danish government is available from Brandon Films, 200 West 57th Street, New York.

In a day of overall expansion, **W. R. Grace & Company** on January 9 announced the completion of its Washington Research Center near Clarksville, Maryland, launched its 300-passenger liner "Santa Paula," and dedicated its new polyethylene plant at Baton Rouge. The new plant has a capacity of 25,000 tons a year of the plastic which the company will market under the trade name, **Grex**.

The **Print Council of America**, 527 Madison Avenue, New York 22, has brought out the first issue of its "News of Prints." The new publication, devoted to all aspects of the graphic arts, is eager to receive information about exhibitions, "positions open," workshops, and, in general, any news of prints and printmakers.

Among the contractors for the Thor missile are GM's **AC Spark Plug Division**, **Douglas Aircraft** (air frame), **North American Aviation** (propulsion), and **General Electric** (nose cone).

*Mitarachi, Giurgola and Kallman*

**Southwest Research Institute's** Department of Engineering Mechanics is conducting a survey of design theories in all fields of structures to determine how such principles may be applied to the structural design of modern merchant ships.

### People

**Jay Doblin**, director of the Institute of Design, Illinois Institute of Technology, has designed a new package for Old Golds, unique in that the word "cigarette" appears nowhere on the package.

**John Thornton**, formerly with General Electric in Louisville, Kentucky and with Henry Dreyfuss, has joined William Renwick in New York.

**Henry Dreyfuss** has been made a member of the board of directors of the Educational Facilities Laboratories, a new organization established by the Ford Foundation to examine means of improving the construction of school and college buildings.

Jim Nash Associates announces the promotion of two officers: **Eric Teran** to executive vice-president and **Gerald Frisch** to vice-president for plans and marketing. **Gene Tepper** (right) of Smith and Tepper Design Associates, **Carl Clement** of Hewlett-Packard and **Lee Winniger** of Food Machinery and Chemical Corporation were guest speakers at a recent meeting at Stanford University of the Professional Group Chapter on Production Techniques. Their topic was the industrial designer's contribution to products used predominantly by engineers.

*Tepper*

**G. L. Erikson**, vice-president; **Ralph M. Evans**, secretary; and **Norman Macbeth**, treasurer.

**Mirko Basaldella**, the Italian sculptor, usually known simply as **Mirko**, is the new director of Harvard College's Design Workshop.

**Romaldo Giurgola**, **Paul Mitarachi**, and **Gerhard M. Kallman**, are working on the installation of the Brooklyn Museum's exhibition of modern home furnishings, which will open on March 5 and remain open until April 27.

**Jack Lenor Larsen** is completing an eleven-week trip through southeastern Asia, where he has been designing fabrics intended for the American market.

New officers of the Inter-Society Color Council are **Walter C. Granville**, president; I.B.M.'s **John W. Haanstra** has been named assistant manager of product development in charge of all development programs.

The #5500 Hydraplex oil rig hook designed by **Hunt Lewis** (below) in collaboration with Byron Jackson Tools, Inc., has received a gold class I National Subject Certificate in the Steel Founders' Society of America's Product Development Contest, under the category of "Redesign of Steel Casting."

**Gio Ponti** (below) was in New York briefly last month for conferences on his auditorium for the new Time and Life building, and for a reception given by Reed and Barton to introduce their new line of Ponti-designed silverware. Signor Ponti's next stop was Caracas for the housewarming of a villa he designed.

### Competitions and Awards

**ASID Education Committee** chairman Stowe Myers announces the 1958 **Student Awards Competition.** Inquiries should be addressed to ASID, 15 East 48th St., New York. All schools teaching industrial design are invited to participate in the contest, which closes April 15.

*Lewis*

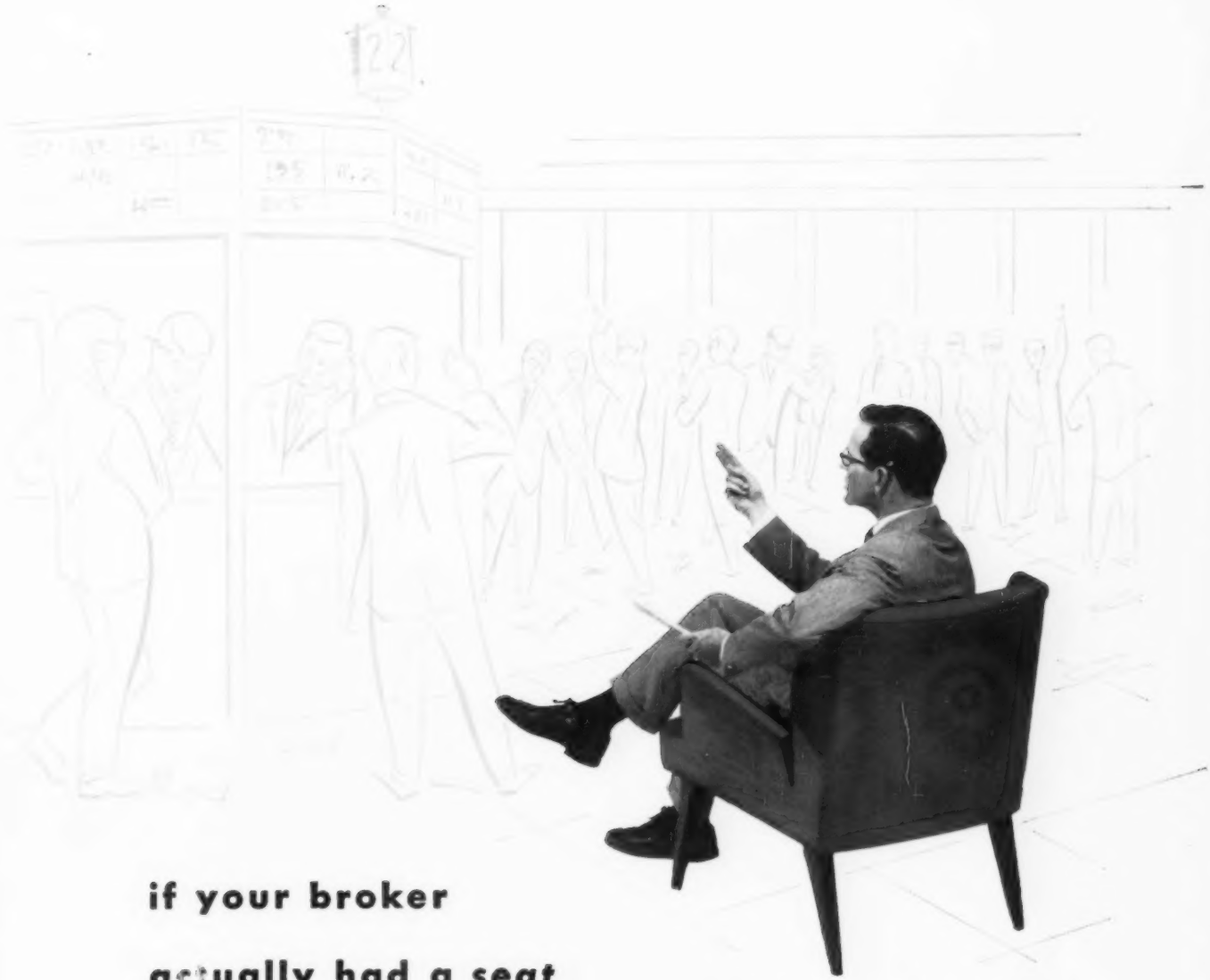
*Ponti*

**Designs for Business, Inc.** has given a one-year scholarship, worth $675, to **Pratt Institute**, to defray tuition costs for a student in the Interior Design Department of the Institute's Art School.

Improvements in the die casting process (new techniques, production methods, etc.) are eligible for the $500 **Doehler Award**, made by the **American Die Casting Institute**, 366 Madison Avenue, N. Y. 17, which will accept nominations until April 15.

The **Koppers Company** has announced a $5000 **plastic toy competition**, for the benefit of summer camps for handicapped children. Manufacturers can obtain entry forms from the Administration Committee, Koppers Design Competition, 950 Koppers Building, Pittsburgh 19, which must be returned before April 10.

Students in architectural history or design are eligible for the **Kate Neal Kinley memorial fellowship** carrying a stipend of $1,500 to be used in this country or abroad. Applications should be sent before May 15 to Dean Allen S. Weller of the University of Illinois College of Fine and Applied Arts in Urbana.



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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 12, 1958. The award is open to all designers, regardless of affiliation.*

**submissions** Entries may be made either by the designer himself, or by anyone else on behalf of the designer. Copies of the submission form are obtainable from the address below. Forms must be returned postmarked not later than May 12, 1958.

**presentation** Announcement of the designers to be honored and presentation of the award medals will be made at a luncheon on June 26, 1958, at the Sarah Siddons Walk, Hotel Ambassador East, Chicago.

PAST RECIPIENTS OF IDI DESIGN AWARDS

1957 Arthur N. Becvar, ASID
and Robert W. Blee
Virgil M. Exner, IDI, and Henry T. King,
and H. T. Bannister, and C. C. Voss, and
Carl Reynolds, IDI, and Robert Bingman,
Carl W. Sundberg, IDI, and Montgomery Ferar,
IDI, and R. W. Figgins, and U. J. Pepin, IDI,
and H. F. Weber and Eliot Noyes, ASID.

1956 William E. Clements
Jon W. Hauser, ASID
George W. Walker and Elwood P. Engel, IDI,
and Joseph Oros, and Eugene Berdinat, jr.,
IDI, and Herbert Tod, IDI, and Rolo 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

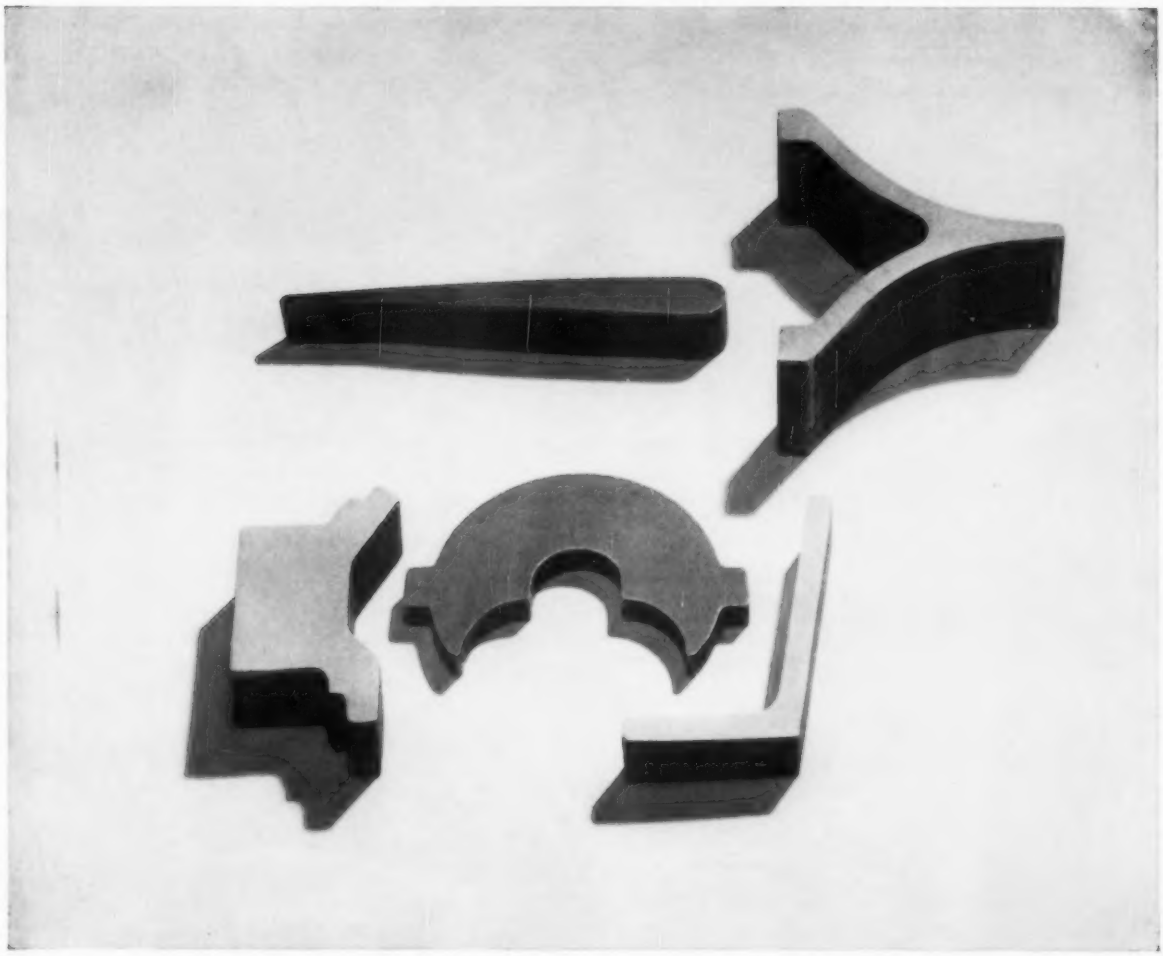
1952 Henry P. Glass, IDI
Donald L. McFarland, ASID

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

**the Industrial Designers' Institute announces**

*the 8th annual design award program*

**Request Forms From James L. Hvale, Chairman, c/o Ekco Products Company, 1949 N. Cicero Av., Chicago, 39**



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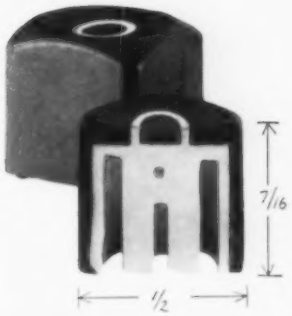


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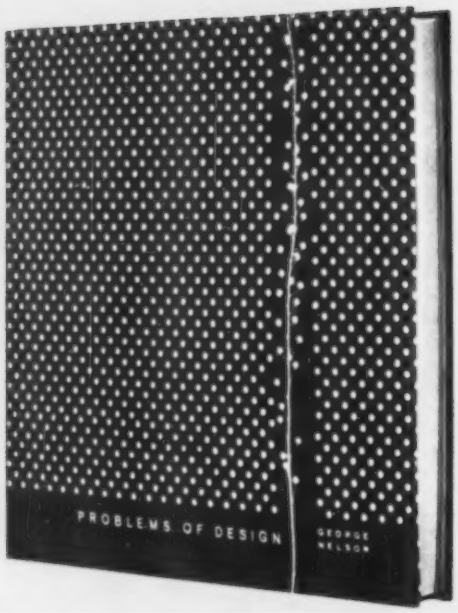


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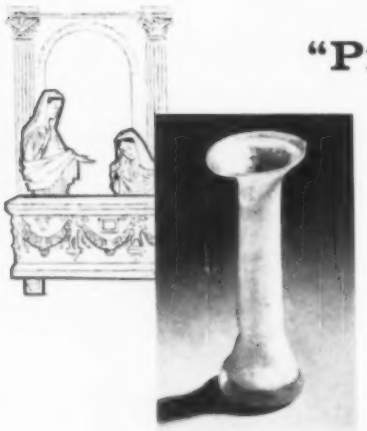

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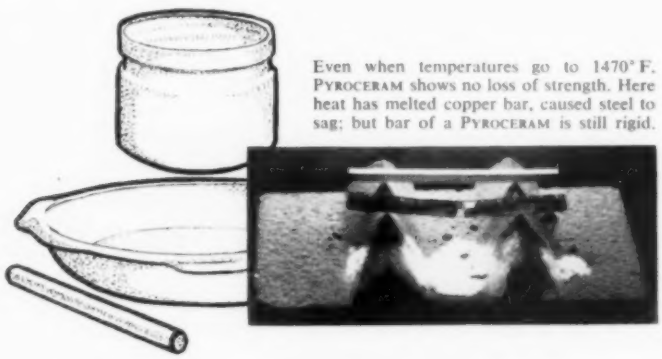

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# On the designer's side

For the first time since the inception of *Industrial Design*, Jane Fiske McCullough is not Editor. While we can't argue with her reason for resigning—to devote more time to family life—the announcement comes hard to us. We rather wish Jane had said it for herself, in the lucid, authoritative, and undeniably feminine style that has for the past four years made this page so much worth reading and saving. But if the burden of announcement is ours, so is the privilege of tribute.

Tribute in this case comes simply. For without detailing her obvious contributions—the special issues, the comprehensive reports, the prodigious achievement of molding a new magazine for a profession that was in a sense hot off the press itself—there is one important thing to say about Jane McCullough: as editor of its journal she has served the design profession in America as devotedly and as significantly as any industrial designer.

The present editors intend for ID to deserve in the future the respect it has earned in the past. And we believe it has earned respect in the past largely because of Jane's awareness that a magazine, like any other designed product, evolves as the needs and character of the people who use it evolve. We are committed, then, not to an inflexible program—which would be antithetic to design—but to an evolutionary process.

Yet while evolution has no map, it does have direction. Once Jane McCullough asked a job applicant to describe the editorial philosophy of ID, and he replied that it was "on the designer's side." She liked the answer (at least, she hired the writer) and we like it too. It means writing a journal of news and interpretation that has something to say not just to designers but to everybody who cares about design and who thinks about it, or who should.

It means more. For to be on the designer's side is not necessarily to stroke him or his prejudices. When some literary critics in the twenties proposed a new "little magazine," novelist Sherwood Anderson pleaded, "Oh please don't start another little magazine to scold us with." ID's purpose has never been to scold designers. Yet obviously there are times when the best way of serving the profession is to call attention to its weaknesses (just as at all times the worst way to serve the profession is to pretend that it has none).

Our relationship to our readers is something like the industrial designer's relationship to his clients: as experienced generalists we can offer the benefits of an unspecialized approach. The service we can perform is based largely on our being in a position to see what the designer may have neither time nor perspective to notice because he is too busy doing it. As design-conscious journalists we are, in effect, the designer's consultants.

And we believe in consultants. In fact, we've just retained one of our own—Jane McCullough, who will, in the role of consulting editor, continue her contribution to the magazine she helped create.—*The Editors*

# MR

**PART 2**

**Designers' research** *consists of more and/or less informal methods of immersing themselves in the market, of getting to know the consumer's wants and needs, of learning the facts to set design goals and to evaluate their work*

by AVROM FLEISHMAN

Not so long ago one could hear in design circles a heated yes-or-no argument on the subject of market research, with debaters rallying 'round the flags of research and design. Today, at sessions like ASID's national convention (*ID*, Jan. 1958), speakers are likely to assume that the influence of some form of market research on product decisions is here to stay, and that the wisest course is to try to generate light on the subject, rather than heat. As a case in point, a designer who, at a public symposium in 1955, shrugged off the usefulness of research to the creative professional, is now responsible for uniting research and design in a corporate product planning process; he is concerned today with the problems of using research effectively—in other words, with *managing* it. So the pattern runs: as designers find themselves participating in the management of major companies—whether as staff members or consultants—they tend to pick up the thinking, the attitudes and sometimes the lingo of the hard-facts arbiters across the table.

What's come over the average designer can't be dismissed simply as another manifestation of "if-you-can't-lick-'em-join-'em," although undoubtedly that shoe fits in some cases. The design profession itself—as designers have become known less as intuitive wizards and more as rational business advisers—has had to stress its ability to shape the product not to its own taste but to the facts of the competitive market. The designer's frequently heard argument that research is nothing new to him bears out not only his necessary sympathy with the basic idea of research but also his need to get information in a form that can help him solve design problems. The kind of researcher who is

*William Blau (left), Director of Market Research at Harley Earl, Inc. discusses research findings with design staff.*

considered inhibiting hasn't been "joined" as yet, and he's still a welcome whipping-boy; but the designer's more pressing problem is the kind of research that *isn't* inhibiting—how does he locate it, when does he do it himself, what can he get out of it?

In trying to answer such questions, designers have retained some healthy suspicions and have acquired some hearty misgivings about M/R. Many of them feel that research is inhibiting to the creative process not only in the way its findings are posed (and in its inside track with those who invest heavily in it), but also because its method is in some ways alien to their own thinking process. Research is essentially analytical and breaks down complex problems into testable elements, while the designer's specialty is bringing together diverse viewpoints into a synthesis. For him, research is a fragmentary answer to the "question" of the consumer, and has meaning only in context.

Another objection to M/R that the designer is likely to harbor is that it is only a fancy way of telling him something he already knows through long experience.

Of course, skepticism remains appropriate to a field where even the best-directed efforts can go astray—the Edsel's widely-touted market research program is only the most recent example. Yet despite such disparities between research effort and design or sales returns, M/R is bound to be summoned to help guide American industry's accelerating pressure of change. The designer, who shares the pressure to create new product features and package images, can likewise use all the guidance he can get, whether in modifying last year's model or extending himself into new markets.

Perhaps at the core of the designer's attitude toward research is his certainty that it can't be used as a specifications handbook, but needs to be translated into design terms for evaluation and action. Especially where the client lacks a design orientation, interpretation of research findings becomes the designer's *business* as well as his challenge. What research has provided the designer are hard-figure terms to express his insights, and the factual basis for breaking out of the mold of his personal tastes.

# Research in the design office: how it works, and why

Designers have been—and many still are—hostile to M/R's influence on management's design decisions, but the controversy is more than a test of strength between research and design: it can be understood as a *research competition* as well. Designers offer their own brand of research, and though they haven't pretended to formalize it into a science, the profession as a whole has a considerable body of information and a number of practiced methods for handling the multifarious factors that enter into product and package problems.

As they have broadened their problem-solving methods, designers have been forced to portray themselves as research-oriented, not only by the competition from market researchers but by the very nature of their relationship to many of their clients. It is the client's lack of clearly formulated design goals that forces designers to investigate as much of his total business operation as they can, in search of the larger context for their contribution. And it is their need to develop an exploratory, informal and even free-wheeling approach to research—while remaining creative designers—that has conditioned them to maintain their amateur standing as researchers, even though they have refined their studies at each stage of the design process.

### Informal research in design


The manner in which designers have fitted research to design is a reflection of their awareness of the limitations and dangers of over-formalized M/R. In describing their overall study of the market, when the problems are isolated and the general direction of the design program is set, or in the more specific pre-action studies that weigh the importance of each aspect and develop hypotheses for solution, designers have insisted that their interpretations are *personal*—backed up not by scientific formulae but by the professional's accumulated experience with buying habits. Probably the most popular form of designer's research is querying the "experts"—the specialists and business personnel in the field under study who presumably know what people are buying and how the competition shapes up. Its popularity is a reflection of the designer's reliance on practical knowledge rather than theoretical objectivity.

Informal research methods, from the designer's point of view, have several distinct advantages over the pristine "scientific" ones. The designer who follows his nose in choosing respondents and asking questions is not limited by the random sampling standards of the survey researchers. He goes out looking, not for an average attitude, but for frankly prejudiced opinions—those that *count*, by expressing broad experience with consumer responses in a specific market, as a preview of the ultimate distribution of the product. Another advantage of the designer's informal queries is that they are rarely limited to a static questionnaire that assumes foreknowledge of the important issues. The conversational interview—while not like depth research's probing into underlying motivational matters—can unwind to follow any subject the expert thinks important. The designer is free to follow his leads into areas he never thought of (and that a formally predetermined research program might never have reached). A third advantage of going straight to those in the know is that, in touch with the day-to-day changes in the market, they can put the designer on to the realities of the situation, rather than leave him with a verified but abstract outline of it.

While designers informally rely on keeping their ears to the ground for orientation and definition of the problem, in the "action" stage, when each part of the design solution is measured for effectiveness and related to the total problem, they employ experimental methods to test out their efforts in the working-process itself (page 43). And in the evaluation period that follows design-work proper, when the final alternatives are weighed against each other, designers are seeking to bolster their decisions—and their client's—with systematic standards of total design effectiveness (page 39).

### Tapping available sources of information


The industrial designer is by nature a generalist, and the variety of facts the designer goes out to get is as wide as the set of specialties that make up his field. Materials and methods research plays a central role in design and is practiced by all design offices, if only as a continuing review of new products and processes that might prove germane to their assignments. Equally common is the designer's analysis of his client's existing information on a problem, based on sales figures, merchandising experience or previously hired marketing studies. Sometimes the facts at hand are sufficient to set the stage for defining the design problem, but more often designers find that they have to do a little homework of their own, looking at the product's past sales from the standpoint of national economic and taste trends.

The designer's main problem is knowing the consumer himself—seeing how he reacts to current market offerings and

learning what he wants and needs. To reach the consumer directly, designers apply many of the standard techniques of independent survey firms: door-to-door inquiries, point-of-sale conversations, formal questionnaires and, in the evaluation stages, pilot sales runs and home-use tests. The designer's meeting with the consumer can also take the form of qualitative depth probing, but it's usually of the specific "what-do-you-like-about-it?" kind rather than of the psychoanalytic "tell-me-everything-that-comes-into-your-mind" variety. To discover consumer responses and capacities in using the product, designers, Channing Gilson for one, do their own human engineering research on such matters as lighting effects; others hire outside consultants—as the Dave Chapman office did in a recent study of psychological effects of color in schools. When the "consumer" is himself a member of management (for example, the purchasers of industrial equipment or those who specify materials), designers will go directly to the point where buying decisions are made, just as they do in consumer research; Peter Muller-Munk Associates, as a case in point, recently surveyed other design firms to assess the potential uses and acceptability of a new U. S. Steel material.

**Research and the design office**


The designer's thorniest problem in research is deciding when he can or can't do-it-himself. It's a problem of self-knowledge, of knowing when—or whether—his impressions need backing up with facts he can't get by himself, when his insights need to be tested by quantitative studies. His natural temptation is to follow the experience of his work over the years, but he knows that times are changing fast and that facts about new market conditions can validate his ideas—or send him searching for new ones. Whether or not he goes to outside researchers for help, there is now so much to know about any given problem that he may delegate the responsibility to someone on his staff, or hire someone especially for it.

Since designers have a need for research findings that can be translated into design terms, rather than those that set definitive specifications for their work, they are trying to specify their own choice of research organization to their clients—or to hire and include them as part of their design service. Similarly, in adding research personnel to their own staffs, designers are looking for design-oriented researchers (a parallel to their demand for research-minded designers).

When research is—as it has to be—tailored to design needs, the problem of objectivity comes up: can the design-conscious researcher report his findings, or even make his studies, with the same scientific detachment as an organization hired by the client? At Donald Deskey & Associates, for instance, the role of the staff researcher's function has been redefined from one of conducting market studies to one of coordinating research. Director of Marketing Services Richard L. Pelzman acts as liaison between the design firm and outside research firms in the selection, action and interpretation stages. In other design firms, like those of Jean Reinecke, Harley Earl and Raymond Loewy, studies are both conducted and hired by in-company research directors. Still another form of working relationship between research and design has been developed by Walter B. Ford Design Corp., which has joined with an advertising agency, a market research firm and a public relations consultant in a group called Standart Associates, to coordinate their specialties in integrated marketing and design programs.

The question of how to organize research and design hasn't yet been answered definitively, and another unresolved aspect of their business relations is the delicate matter of fees and billing for designers' research. When design offices do their own research they may list it separately at a different rate, or bill for it at their standard design-time charges. When the design firm hires an outside research firm or individual consultant, it may charge such expenditures at cost, or mark up the research expenses to cover its own contribution of judgment, risk and effort in hiring. Which of these courses constitutes the most ethical or the soundest competitive practice is a subject that's been getting a hearing of late in design circles.

Though the profession hasn't yet found all the answers in handling research as a working tool or as a business subsidiary, many designers are clear on what they want to get from it—and what it is already giving them. It helps them not only to satisfy management's itch to "know for sure," but bolsters their assurance that they're coming up with better answers. It satisfies their own need to be objectively sound as well as subjectively ingenious, but it also stimulates fresh insights that help them skirt design cliches. It is encouraging designers—especially the younger ones—to become more socially aware and analytically precise in their problem-solving practices, and in the last analysis it's a challenge to the profession to continue to assert its ultimate commitment to the consumer and to the market situation, which is its field of service for the client.

In the final analysis, however, the designer has to fall back on his own creative insight in order to create products that work best for the consumer; for it is an axiom of professional experience that the consumer cannot design—he can only accept or reject. Designers are not likely to become oblivious to the demands of their public. But they are aware of a larger responsibility to the potential purchaser—to give him something he never thought of before and has no basis to evaluate as yet, something that will add new value to his purchases. M/R may prove in the long run to have its greatest value in *selling* design, in finding channels of communicating to the consumer the original concepts of function and appearance that the designer has discovered.

# Research in sales effectiveness helps set package design goals

*Evaluating the competitive market is the keystone of design research. It is a means of learning from others' mistakes, of sizing up the market battlefield for merchandising strategy, and of generating new ideas by taking a fresh look at actual sales conditions. Designers often approach the marketplace informally, relying on their long experience with stores, shelves and shoppers; some make a point of studying a sizable sample of the various types of outlets for the products they design. Other firms approach research more formally, supplementing their own judgment with the test-measurements of research specialists.*

## ZEIDMAN ASSOCIATES FOCUS ON MERCHANDISING TO DETERMINE PACKAGING NEEDS . . .

Robert Zeidman Associates, New York package and product design firm, has had occasion to call in research consultants for special problems (like naming lines of merchandise, and motivational studies), but research usually means something more direct: getting the designers out into the stores to see how the package they're designing actually competes on the shelves. By looking at the real situations that confront shoppers, the designer can put himself in the customer's shoes, see what is likely to affect him, and observe any areas of confusion that may hinder communication of the package's sales message. On every assignment, designers take a tour through the package's natural habitat, reflecting President Zeidman's belief that a designer matures by following the problem through from analysis to execution.

The firm's standard method is to assemble a color photographic record of the variety of display and distribution arrangements of a given product in a cross-section of Eastern U. S. stores. Then Zeidman Associates' Vice President of Merchandising, specially hired for the purpose, presents the client with an analysis of his product as it shows itself on the market. From the visual facts designer and client can come to a decision on present shortcomings, and the pictures also serve to stimulate new ideas in creative staff conferences.

Zeidman Associates' research methods are flexible enough to expand with the special shape of the problem: in a typical in-store study, coupled with time studies of sales efforts, the firm was able to isolate the design problem of Cameo Curtains, Inc. (Solution: simplifying the packaging of its 1600 variations, through a uniform carton and labeling system.) In more fundamental problems like the decline of the lace market, the designers' survey for Scranton Lace Co. not only looked *at* the stores but informally asked buyers and other members of their staffs what they thought the motivations and demands of the consumer were, as reflected in their interchanges across the counter.

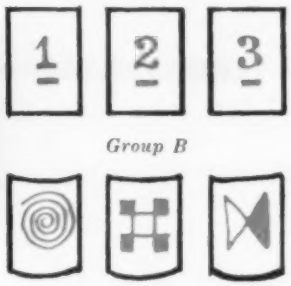
But visual reviews and expert opinions don't explain conclusively *why* the shopper buys what she buys. The former can indicate what she is likely to see best, and the latter often shows only what she *is* buying. Such informal research methods therefore are only as revealing as experienced insight and creative originality can make them.

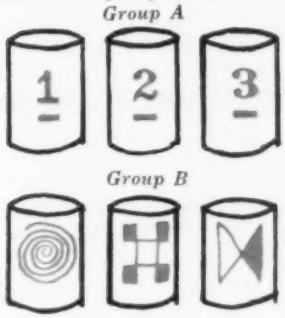
*Zeidman Associates' photographer records store displays, picking out conditions of stacking, positioning, scattering, crowding, etc., to evaluate mass-effect, outstandingness, size-impression and relative accessibility of competitive packages.*


*Store studies and interviews on Kaynee Co.'s boyswear revealed motivational impact of company's old ad of three boys and dog; designers used it as trademark in packaging and corporate identification to create unique image.*


*Store analysis of competitive packages indicated exposing 5-Day Roll-on deodorant bottle to customer's view and touch; display carton locks bottle in sizable container to discourage pilfering, creates "stage" effect to suggest larger size. Different packs for men and women.*

*Package Effectiveness Index is determined in three tests: packages are shown by flash view to rate attention-getting power; consumers' choice of brand is measured against preference for package labels to indicate purchase stimulation of package; repurchase effectiveness is shown in consumers' preferences after using containers with only brand name identification, as opposed to choice after using actual packages. Scores of competitive brands are listed in chart for comparison; there are eight general categories for cross-referencing results.*




| Test Package | Visual Effectiveness | Purchase Effectiveness | Brand Loyalty Effectiveness |
|---|---|---|---|
| 1 | HIGH | HIGH | HIGH |
| 2 | HIGH | HIGH | LOW |
| 3 | HIGH | LOW | LOW |
| 4 | HIGH | LOW | HIGH |
| 5 | LOW | HIGH | HIGH |
| 6 | LOW | HIGH | LOW |
| 7 | LOW | LOW | HIGH |
| 8 | LOW | LOW | LOW |

## . . . WHILE LIPPINCOTT & MARGULIES TEST EFFECTS TO BACK UP DESIGN EVALUATION

Designers aren't resting content with their traditional methods of weighing the package or product against its competition. Some firms are adding researchers to their staffs or hiring outside research services. Lippincott and Margulies, New York design firm, has set up an affiliated research organization called Package Research Institute, Inc. to do special studies in addition to the research hired by clients. Headed by social psychologist Dr. Myron Helfgott, PRI does research work for other clients besides Lippincott and Margulies. It has also devoted much of its effort to setting up general criteria and tests for evaluating packages — among them, the "Index of Package Effectiveness." This is a package-rating system based on three tests, using standard psychological laboratory and interviewing methods. First, "visual effectiveness"—the extent to which the package commands attention at the point of sale—is measured. With a tachistoscope—an instrument that flashes sides on a screen for controlled periods of time—a group of competitive packages is shown at short exposures to a relatively small sample of consumers. Those that are named first are judged to have highest attention-getting power, but this evaluation is checked against comparative visibility tests.

*Lippincott and Margulies developed symbols for Bavarian Brewing Co. beer packages to follow up client's research program; images of tradition, time and skill express emotional values for older generation, yet have contemporary styling to widen market to younger set. Symbols act as trademark in identity program.*


PRI's second package criterion is "purchase effectiveness," the extent to which the package encourages purchase. This is tested by consumer interviews with two matched groups of respondents (comparable in all basic respects). Group A is shown a series of cards with only the names of the competing brands, and each member is asked which one he prefers. Group B consumers, on the other hand, are shown packages of the brands, and asked the same questions. By comparing the answers, Helfgott feels, the extent to which Group B is reacting to the package itself can be isolated.

In the third package function, "brand loyalty effectiveness," Group A is asked to take home and sample a number of competitive brands in containers whose labels show only the brand name; but the containers are really all filled with the same product. Group B is asked to sample the same product with the brands' actual labels affixed to the containers. Since all the contents are the same, the only variable condition is the package, which must account for any difference between the two groups' repurchase preferences after use.

# Designers observe—and ask—how consumers use the product

*Many designers feel that knowing the consumer is the essence of their skill in shaping a product to sell, and going out to meet him is—and has long been—standard practice for many a design office. Research methods range from the informality of talking to shoppers in random store visits, to the more formal investigations (under semi-laboratory conditions) of how the consumer uses the product. Designers even undertake their own questionnaire surveys to find out how well people like what they have, and how much they want what the designer thinks they need—sometimes probing into what the consumer really is like.*

## KING-CASEY MEASURES HUMAN PERFORMANCE FOR OPERATING EFFICIENCY . . .

*Psychologist John Sullivan devised testing-model of hand mixer to determine best angle of handle for convenient use. Interviews and observations of consumers using mixer in kitchen chores turned up other functional needs.*

*Waring "Mixor" uses research findings in a design that departs from carrying handle: new handle is curved for manipulation as hand tool. Other features drawn from research: beater-ejector (front), bowl rest rack, flat back and sides for resting on table.*

Research at King-Casey, Inc., New York industrial design firm, centers around its permanent psychological consultant's work in applying theoretical principles of human behavior to product problems. Dr. John J. Sullivan, a professor of behavioral psychology at New York University, provides Eugene J. Casey, Fred King and staff with descriptions of how people react to particular products in perceiving them, using them and thinking about them. Sullivan's research may take two forms: a descriptive psychological account of the variety of behavior-patterns in the market, to indicate merchandising and marketing goals; or specific performance standards for the product, derived from empirical tests.

In a typical research-design program for Waring Products Corp. in 1956, the designers wanted to redesign the hand mixer as a hand tool and felt it should be studied as an extension of the human arm performing its tasks. Researcher Sullivan devised a biomechanical test for the best positioning of the handle in relation to the distribution of weight in the mixer. Using a model with an adjustable joint that could simulate possible design alternatives, he observed consumers handling the product in the act of food preparation.

Research recommendations included specific functional directions, but these had to be modified to harmonize with other goals in appearance and engineering design. Sullivan's testing instrument included a thumb-groove intended to stabilize the hand in holding the mixer; King-Casey decided to achieve the same effect by other means. They added a serrated switch and ribbed underside to increase the traction of the hand, and a handle curved to the best angle for holding the mixer. Other research suggestions came out of examining consumer performance with standard mixers, and the designers devised new functional features when given this research stimulus: they flattened the sides and back of the mixer to allow the consumer to rest it on the work surface without letting the beaters touch; they added a push-button beater-ejector to allow the user to clean the beaters easily; and they placed a ratchet-like strip on the bottom to allow resting the mixer on the rim of the bowl while in operation.

King-Casey considers its research into ideal performance to be the conceptual framework for design, but finds it necessary to modify it in working out the design solution.

If controls and head room could be so arranged, would it be helpful if you could stand up occasionally to operate?
___Yes ___No
If yes, why? (Check one or more)
___Could see work better
___Would notice less fatigue
Other reason:_____

Which type of seat would you prefer:
___Bus type seat
___Bucket type seat
___Bar stool type seat
Would you use an adjustable back rest?
___Yes ___No

## . . . J. M. LITTLE QUESTIONNAIRE ASKS OPERATORS WHAT THEY WANT AND NEED

J. M. Little & Associates of Maumee, Ohio, approached the problem of designing a new Lorain crane cab for Thew Shovel Co. by trying to find out from the operators themselves what desirable features they could suggest and what design proposals would be acceptable to them. When personal interviews in the field proved too difficult while the operators were on the job, JMLA set up a formal questionnaire that was distributed to locals of the International Union of Operating Engineers, and was reprinted in the union magazine. More than five hundred replies were received and interpreted in the light of the equipment each respondent used, to judge how his preferences were colored by his past experience.

The process of formulating the questions made use of the preliminary field interviews—somewhat like the use of depth interviews to gather hypotheses for larger surveys. The majority of the questions were, rather than open-ended invitations for new ideas, preference-checks of the designers' suggestions for improvement (see right). In a few cases, the questions probed for more general attitudes toward working and being comfortable in the cab, but the data collected tended to narrow down a group of possibilities to strict specifications rather than to open up the problem.

In translating the operator's demand for greater comfort into design terms, his section of the cab was isolated from the noise, vibration and hot gasses of the engine by a partition, which also reduces heat loss and draftiness in winter. The psychological benefit of an enclosed, organized working area was increased by simplifying the machinery in and around the control position, and by eliminating many of the unnecessary protrusions in the flooring. Windows and door were redesigned to allow flexibility of enclosure in various weather conditions, and for increased visibility – especially when working with the high boom. In addition, Little's application of curtain wall construction to crane cabs not only reduces costs but also facilitates servicing and reduces vibration. Obviously not all these solutions came out of explicit answers to the questionnaires, but the implications of the operators' responses to questions on fatigue, inconvenience and discomfort led the designers to search for new solutions and enabled them to check out alternative proposals with the ultimate consumer.

*Designer's questionnaire tried to probe for crane operator's attitudes toward working conditions in cabs, paid most attention to comfort (top) and visibility (below). More specific questions checked acceptability of design proposals, led to simplified working space and flexible glass enclosures. Roof has slide-back metal hood (which also acts as sun visor); front window tilts back out of operator's way; side window is part of door, which slides back for quick entry and exit.*

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How much of the time do you work with the windows open or removed?
In winter ___% In summer ___%
Why? (Check one or more)
___Glass dirty or broken
___More room
___Cooler in summer
___Better vision
___Feel safer
Other reasons: _____

Would you prefer a front window which:
___Easily slides up overhead and back out of the way
___Is easily removed and stored in the cab
___Folds over or slides together

# Staff and consultant designers organize research activities

*Just as the design service has been set up as a staff planning department in many a major corporation, market research has been made a formal departmental function in product decisions, as in other forms of corporate planning. As companies have combined the two activities in a systematic product planning process, they have related the appropriate research methods to each stage of design development. Similarly, consultant designers are hiring independent research firms to work with them throughout the total sequence of creating the package or product, sometimes employing new research tests for visual guidance.*

## GE'S PRODUCT PLANNING USES RESEARCH AT SUCCESSIVE STAGES OF DEVELOPMENT

The growth of product planning at the General Electric Company (ID, June, 1957) has fostered a close relationship between research and design – especially in creating new product concepts for new markets. At GE's Major Appliance and TV Receiver Division (Louisville, Ky.), the development of the wall refrigerator was guided by research both in Arthur N. BecVar's Industrial Design Operation and Charles A. Brewer's Market Research Department, and was coordinated by Marshall Bartlett's Product Planning Department.

Wishing to create more space in the kitchen and allow more convenient access by breaking away from the upright refrigerator form, GE's advance industrial design group began in 1952 to test experimental mockups of a wall-mounted type, determining optimum reach-in depths and maximum shelf heights for greatest consumer convenience. Parallel to the design study of accessibility, a market study of changing trends in home construction revealed an appropriate context for the new kind of refrigerator: appliances should be integrated with the rest of the furnishings, as part of the movement toward open-plan kitchens.

To find out how builders and architects would react to furniture-like kitchen styling, the design department constructed an appearance model set up like a room divider, to open from "front" and "rear". This model was presented as a purely experimental concept at Chicago's Merchandise Mart in 1952, and "experts" in the appliance field were asked to predict how–and how many–consumers would want to use it.

A new experimental model called the XR-10 was shown to dealers, distributors and consumers in 1953; this model – which opened from one side – met with stronger approval. Once the direction was set, shelf-size details were guided by a Market Research Dept. survey among retailers and wholesalers of china and food, on dimensions of their larger items.

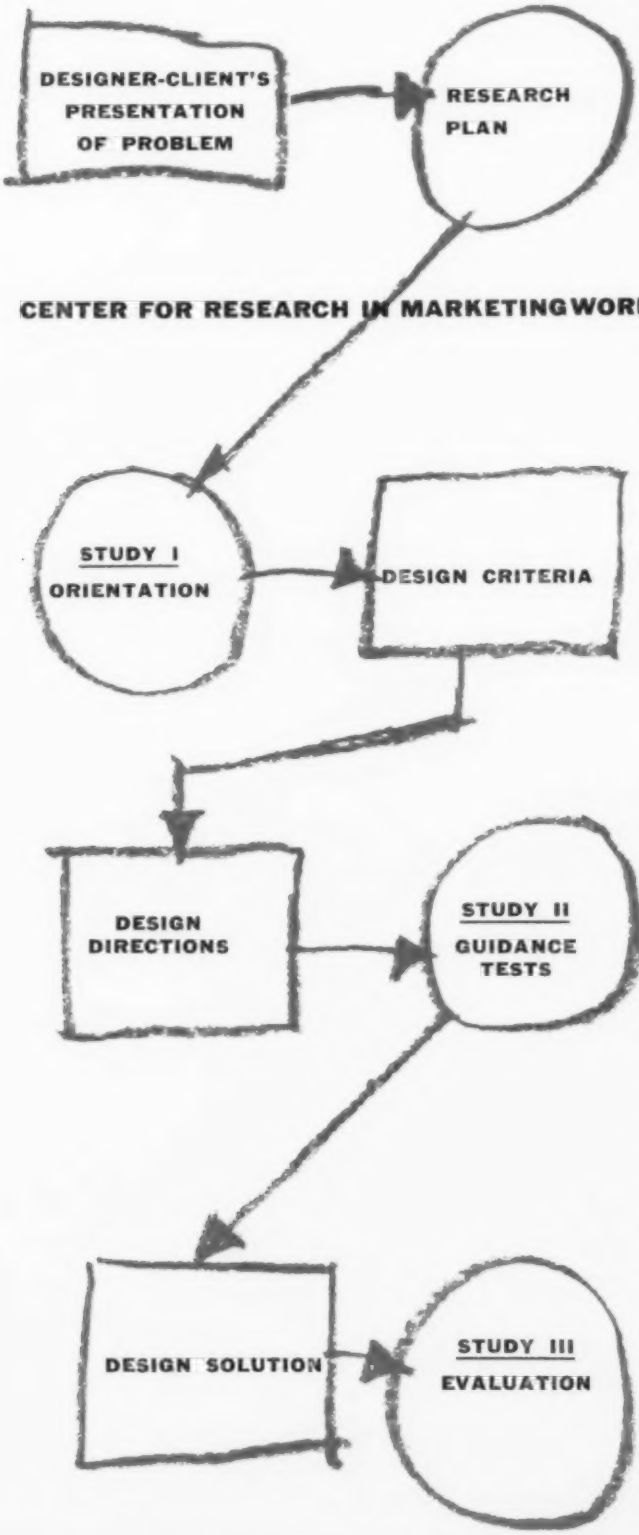
In the final stage of exploration, researchers turned directly to the ultimate consumer: the revised model was stocked with food, installed in a realistically-appointed trailer, and taken to homes in fourteen states, where interviewers from the New York research firm of Stewart, Dougall & Associates checked out the model's acceptability with 1250 housewives. Since its introduction in GE's 1955 line, the wall refrigerator has proved a success in a limited segment of the market.

*First stage of General Electric's design testing was measurement of maximum reach-in for average housewife's height. Test model of wall refrigerator was crude cardboard shell with adjustable shelves; more refined models in wood and plaster were used at later stages.*

*Intermediate stage of market research was held at Merchandise Mart exhibition and other trade shows. Builders, architects, appliance dealers and others in the field were queried to discover how intense the demand for room-divider model would be. Concept was modified from furniture to appliance context.*

*Final stage of research brought model in kitchen setting to housewives at home; since the wall refrigerator was a unique concept, consumers had to use it to report their true responses.*

*Research process at the center: research plan indicates scope, methods, sample size and time required. Exploratory study reveals brand image and motivations in the market, gives designer orientation to establish his own visual criteria. During design process, tests of the direction the design is taking are run.*





*Preen packages (l. to r.): old, new, new self-polishing variety.*

## CENTER FOR RESEARCH IN MARKETING WORKS WITH DESIGNERS IN PACKAGE PROGRAM

The Center for Research in Marketing, Inc. is making a specialty of working directly with package designers—some of whom hire its services themselves. The Center's experimental techniques (ID, Jan. 1958) are combined with standard depth and survey studies in a program that parallels the designer's work from formulation through execution to evaluation.

In a recent assignment for the package design firm of Alan Berni & Associates, and H. S. Harrison Co., manufacturers of Preen floor wax, the Center used depth interviews, group discussions and projective tests to determine the brand image of the old package. The study disclosed that the greatest appeal was going out to "old-fashioned" housewives who tend to be compulsive in their cleaning habits. In order not to lose the product's appeal to this kind of housewife, the researchers counseled that the design convey the feeling of a modern product with suggestions of traditional housekeeping values.

The Center gave the design firm guidance in developing the right images for the motivational goals. Following up what was revealed by flash room techniques, in which respondents associated descriptive words with brief looks at visual elements, the yellow color of the old can was softened from a sharp wax-identifier to a wood-tone quality, conveying the satin-like glow the housewife desires. The old trademark of a "preening" peacock was eliminated when it was found to make scant contribution toward the cleaning theme. Research indicated using the symbol of an elegant wood floor, and Berni & Associates incorporated it within the form of a house to strengthen the home-care theme.

In a final evaluation, the Center tested the new package against its original criteria and against competition. Respondents were faced with the new and old Preen packages and those of seven competitors, and were asked to rank them in order from special to general purpose use, from "really clean" to "once-over-lightly," from modern to old-fashioned, from "for me to use" to "not for me," and from house use to auto use. The new package averaged the highest rank.

Berni & Associates describe their relationship to research this way: "We have never considered it inhibiting to our creative activity; on the contrary, we feel it is only when we have all the facts and problems at our fingertips that we can fully analyze a situation—then improve it." *(End of M/R)*

*Coming soon: a roundup of reader opinions on this controversial subject of the designer's use of M/R. Designers and researchers are invited to comment.*

# PHOTOGRAPHING YOUR PRODUCT

*What elements make a simple product photo revealing and appealing? How can lighting and background help—or hinder—the quality of the everyday publicity and record shot? ID presents the first review of the special esthetic problems of product photography for designers and manufacturers who commission, supervise, or take photographs.*

If it's true that one picture is worth a thousand words, what is a bad picture worth? For the designer and manufacturer of a new product, the answer often turns out to be "less than nothing." People tend to believe what they see in photographs, and if what they see doesn't look like much, they're bound to ignore it or dismiss it. In this picture-minded time, the photo is the product's ambassador, carrying a heavy responsibility for public interest, publicity and market acceptance.

For the average consumer, who sees hundreds of pictures a week in newspapers, magazines, and tv, is used to garnering information from photos, and he goes out to buy on the basis of what he has seen. Today he is exposed to the best photographic art from the world's leading travel and fashion photographers. So to catch his eye at all, a photo must evoke a positive response and communicate quickly.

Advertising agencies have known this for years; they now make a policy of turning loose such top-flight photographers as Irving Penn and Bert Stern on ketchup bottles and shoes and whiskey. And the high-style results—appearing not only in sophisticated media like the *New Yorker*, but in *Life* and *Look* and other mass magazines—testify to the agencies' recognition of the camera as an interpretive tool, not a recording machine. For these artists rely on composition, color and mood—rather than on literal content or the once-standard baby and dog—for impact and pulling power.

### Nothing to crow about

But many products are photographed not for glamorous four-color ads but for straightforward news releases and catalogs. And a strange dichotomy shows up here. If the picture is for a press introduction, time is always at a premium. To judge from some of the results, a photographer is found in the yellow pages, hurriedly called in, and told to snap the product in the clutches of an inexperienced "model" fished out of the secretarial pool. When the prints arrive, a platoon of experts mark them with instructions to "take out that chipped corner," and "clarify controls so numbers can be read," and "for heavens sakes, touch up those highlights." That the result of this process is nothing to crow about is hardly a surprise—especially to designers, who have been trained to regard photography as an area of design in its own right, yet are often given no say in the design of the photograph of *their* product.

In design offices, photography is for record-keeping, client-getting, and general communication. Photos of wood and plaster models are often kept as an office record of product evolution. The Dave Chapman office lists two other office purposes: a photo of the engineering model is used by a designer as the basis of accurate drawings for an appearance model; and photos make vivid the steps of a research project that might be overlooked in a written report. Later there are photos of a finished product for publicity, and for the client's listings and catalogs. Naturally all such photographs of office work are critical evidence in a portfolio shown to prospective clients.

A photograph, like a designed product, reflects the time and effort put into it. Done without care and thought, it can hopelessly distort the design that went into the object. A good photo requires planning: a rough drawing of the placement of props and product, and some test shots, are among the aids that can improve the quality of results.

### The designer's headaches

There are many dilemmas in picture-taking for the average designer. He usually has no provisions for photography in either his budget or time schedule. A good photographer who can be expected to work independently expects to be paid on a professional scale for his time, training and talent; the most imaginative command fees that only national magazines and advertising agencies can afford. A cheaper photographer may have the basic skills, but probably lacks the sensitivity to compose a photograph as a designer would like it. So to his fee must be added the cost of the designer's super-

Tom Yee

visory time. Because "industrial design" is a relatively new subject for commercial photography, there are few professionals around the country who make an art of taking, with good design sense, simple product pictures at a price in keeping with their uses.

To make things worse, the matter of who pays for such photographs has never been established. Although the cost of a skilled photographer is repaid many times by the effectiveness of good publicity and catalog shots, a client rarely sees any justification for expensive work; the publicity department is expected to handle such things automatically. Unless it is otherwise specified in the original contract, the designer who wants tasteful and accurate photos for his own purposes generally arranges for them, and pays for them, himself. And so it is not uncommon for record shots to be snapped on a sheet-draped bench in the designer's workship. However haphazard, there are certain advantages to this approach. The person taking the picture is fully familiar with the object from every angle; he knows its function and its form, and is able to offer a sympathetic interpretation even without technical resources. Yet for professionally acceptable results, the techniques must also be present. Some offices—notably Dave Chapman Inc. and Henry Dreyfuss—are setting up permanent facilities, where their own publicity directors can take all necessary photographs, with unelaborate but proper lighting and equipment.

This article is addressed to the problem of the esthetic side of product photography. It is our premise that bad photos are primarily the result of misunderstanding what the camera can do, and miscalculating the result. The pointers on the next seven pages do not tell an amateur how to use a camera or a professional how to get special effects; this is a guide not to *making* pictures (we assume an elementary knowledge of camera theory and craft) but to *seeing* pictures, and to making choices that will lead to a well-designed result. It is meant to be a guide to better *photographic thinking* for the corporate publicity director, art director, the designer who supervises, or the designer who already does it himself.

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**The Camera's Limits**

It is generally believed that a photograph is an exact document. Irving Penn remarked that people believe even ineffectual pictures, like the notorious "before and after" shots. They think if it's a photo, it must be true; photos don't lie. Photographs are rarely used to illustrate fiction, Ben Somoroff pointed out; drawings are more acceptable because they don't introduce an undeniable element of reality.

In any case, the eye can be fooled and the camera can fool it, to the taker's benefit or his chagrin. The most common mistakes in photography are based on the failure to distinguish between what the *eye* sees and what the *mind* perceives. Each minute the eye receives many thousands of impressions that are composed by the brain into a comprehensive picture; the camera takes only one impression and preserves that. A photo captures one moment: it tells what happened at that one time when the lighting was thus and so, the product placed in a certain spot, the camera at a given distance, focused and tilted a certain way. If any one of those factors is changed, the photo may be something quite different. It takes fine photographers many hours to narrow down all those variables and prepare for that exact moment. They may take some forty pictures to get the one best shot.

The camera's translation from color to black and white and from three dimensions to two further complicates the job of predicting the finished photograph. Vast areas like floors and ceilings will be condensed, details that the eye notes may be ignored by the camera lens unless they are purposely picked out.

The camera lens, like the eye, can focus on only one plane and one area at a time—objects in the distance are smaller and blurred; at either side they are indistinct. This is forgotten in cases like the common demand to photograph an automobile forty feet away as distinctly as the features of a girl in the foreground. Since the camera can't do it, the usual solution is to take two photos and combine them. The result, because it is a flat representation, has no photographic quality and no point of reference. Still another kind of failure is reflected in the touched-up photograph, made by mechanical means to look the way the viewer thinks it should. The more that is drawn in on the negative and print, the closer the photograph approaches the artificiality of a drawing—and, since it loses its convincing reality this way anyhow, pencil and paper should probably have been used in the first place. For all the volumes on the subject, working with the camera is no cut and dried matter. You can use the known abilities and weaknesses of the lens to create a literal image, or to lie, or to suggest a whole world of unseen things. The limitations that hedge in the amateur are, in fact, the stuff on which the experts thrive. With superb control of their equipment and great visual imagination, they know how to break all the rules and come up with wonderfully unexpected results. While the question of photographic "style" and the art of taking great pictures are individual matters, and not our main concern here, they must concern everyone wielding a camera. For snapping even the simplest toaster or pitcher is a process full of choices—and resolving those alternatives well is one part craft, one part judgment, and one part art.

Overleaf, we discuss nine central concerns to the man composing a product photograph.—*j.w.*

# What's to be considered in photographing a product?

To get material for this section on what goes into the creation of a fine photograph, we consulted five professional photographers. Not one of them could be called strictly a "product" photographer, but each does distinguished work in the field, to which he brings experience in all phases of photography, and a personal point of view.

The five were unanimous in agreeing that there are no hard and fast rules for photographing products, and they felt that guidance in overcoming faults of taste and technique, and help in predicting the visual result, could best be implemented by what follows: a step-by-step discussion of the process of product photography. Although the camera can be used to play tricks, the aim in mind here is an honest portrayal of the product in a well-designed photograph.

**Tom Yee** *has designed fabric, furniture and interiors, and has photographed them for such clients as Directional and Columbia Records. For over sixteen years he has worked in all phases of photography and his experimental work has been exhibited. In his product work he prefers to work with simplicity and directness. This section is based largely on Mr. Yee's ideas.*

**Ben Rose** *has taught photography at Pennsylvania Museum's School of Industrial Art, where he studied, and at the Parson's School of Design. In addition to editorial assignments for national magazines and advertising work, Rose does the photography for many of RCA's record album covers. His ideas and photos contributed substantially to this section.*

**Bert Stern,** *whose work for Smirnoff Vodka made him a top cameraman at 23, is a protege of Herschel Bramson, former art director of* Look. *His product work has been exclusively in color advertising, but his insights into photography are broad. His passion for putting a product into an appropriately suggestive setting has taken him as far as Egypt.*

**Rudy Muller** *is currently at work on a book which will outline the role of photography as an art form. His preparation includes seven years as a photographer and five as an appraiser and buyer of art and antiques. For him the art of photography extends to the processing, and he finds that not enough attention is paid to this phase, in which he achieves his finest effects.*

**Ben Somoroff** *opened his New York studio in 1948, after six years in Philadelphia, and has been steadily collecting Art Directors' awards ever since for his work for* Look, Esquire, *and other national magazines, and advertisers. Products today, he finds, are often not easily recognizable in photographs and need the addition of some natural object for proper definition.*

## 1 EQUIPMENT

For product photography, a large view camera offers the most flexibility. Its front and back swings, horizontal and vertical lens mount adjustments, and extra long extension bellows will give you the necessary adjustments to approach the product from any angle or distance and come up with a believable picture. You can operate with a reflex, but it will severely limit your angle of approach.

The camera lens is the next consideration: it should be capable of being stopped down to f/32 or, even better, f/64, to increase the area in focus and give greater depth of field. Interchangeable lenses of varying focal lengths will help by allowing you to work further back, yet continue to control the size of the image.

It will be easier to get a clear photograph if you arrange to work with a 4"x5" film plate or even 8"x10". Enlarging, which increases graininess, can then be kept to a minimum.

Add to this equipment a tripod with elevating mechanism, a light meter, filters, a spotlight and two floodlights, and a roll of seamless paper. Set aside an area for your camera work and keep everything there. As your photographic ambitions grow, you'll accumulate more equipment, but this list is adequate for good work with minimum effects.

*When you come to photograph the completed object, treat it as you did when it was on the drawing board—show each detail separately. It is always a mistake to try to get into one picture all the points you want to make.*

TOM YEE

**Placement** *of the three Eames' chairs suggests their common origin and design relationship. The eye travels easily from front to back, clearly distinguishing the more complex detailing of the chair in the foreground, seeing less of the simpler third in the back. Photo by Rudy Muller.*

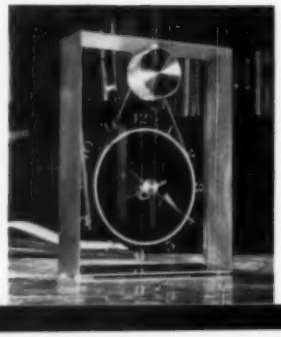
## 2 PICTURE CONCEPT

A photograph begins with an idea. It may at first be expressed verbally but, as Irving Penn notes, as you work out the details of presentation, lighting, camera perspective, the idea evolves into visual expression. Ben Rose suggests to designers that they take sample photos of the dummy as it evolves, in order to discover its photographic good and bad points, before going into the final shot. Such photos are like the "roughs" that precede any presentation drawing. Whatever flavor, point and immediacy your photo has will be up to you personally. For, as Ben Somoroff cautions, a good product photograph is not only a record (if it were, it could as well be taken by a machine or an acountant), but a personal response.

To the designer seeking to make a distinctive photo several approaches are possible: he may show the product so clear and large that it becomes distinctive by virtue of simplicity; he may try to create a mood that will put the viewer in a desirable frame of mind; he may point up the product's size by comparing it to an object much larger or much smaller; he may show the product in an unusual context; he may blur the background, in order to focus on the product. But no matter how large his bag of conceptual tricks, the photographer always aims to describe the essence of the product with succinctness and clarity.

**Movement,** *conveyed by the blurred image of the man and chair, tells immediately what is most interesting about this chair — its flexible back. Done by an open shutter technique, it is no photo for amateurs Photo by Tom Yee.*

**Props,** *in this case ruler and plumb line, make a pictorial translation of the statement: wraparound windshields for today's automobiles are steeply sloped. A Libbey-Owens-Ford staff photo.*

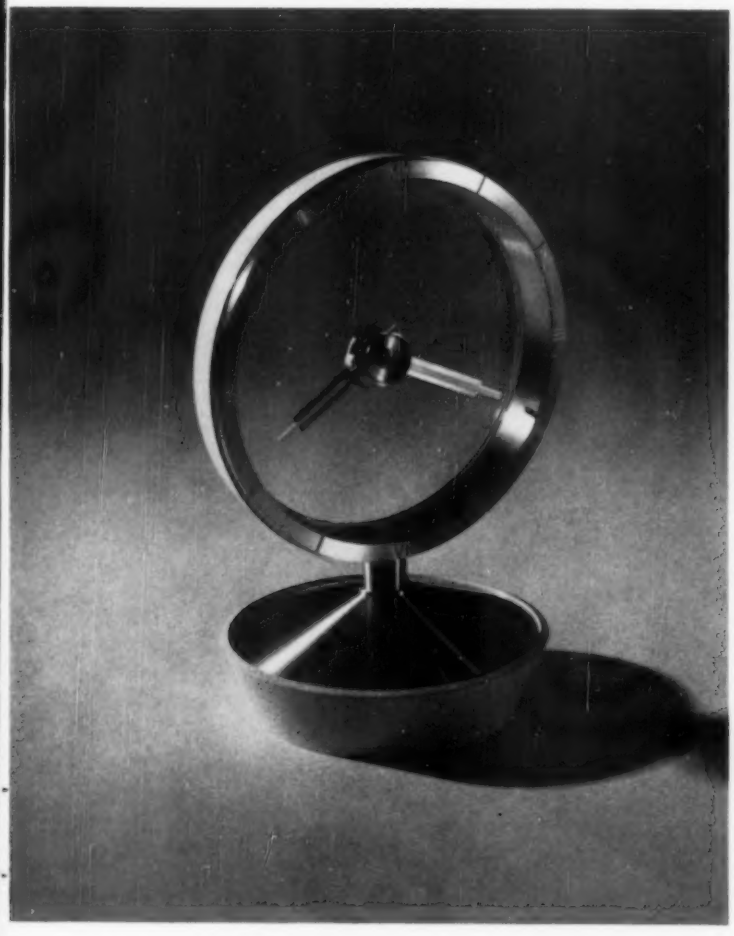


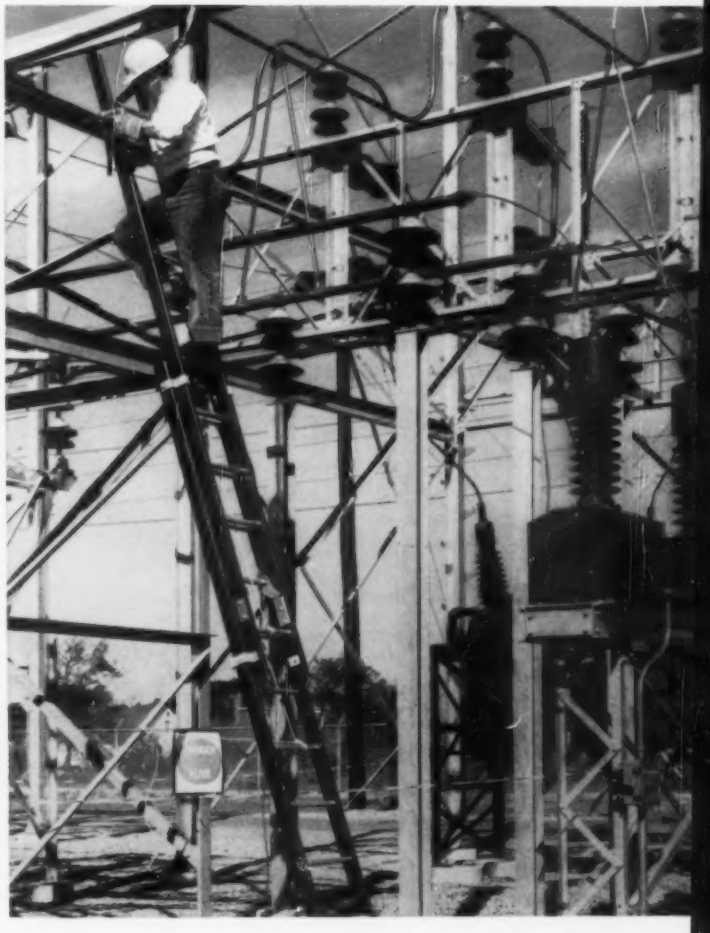
**Background** *of book shelves, seen clearly through the clock, makes the point that it is transparent and its interior mechanism is nowhere apparent. Photo by F. Carioti.*

# 3 BACKGROUND

*Whatever is shown with the product, or in the situation designed to show what the product will do, should be clear, simple and not confused with details that can be eliminated.*

BEN ROSE





*Gradations of light on noseam paper make up the background at left, which enhances metallic highlights and dark base of clock. Photo by F. Carioti. Complicated background photographed in detail, at right, resulted in getting product, a Fiberglas ladder, last in a maze of forms.*

Background poses the problem of relationships within the photo, and is effective only when it fulfills its role of being complementary (and, usually, complimentary) to the subject of the picture. It's most effective when least obtrusive. The intent of product photography is not to arouse in the viewer a response like "What a beautiful kitchen!", but rather "What a beautiful toaster in that beautiful kitchen!" Background, particularly in advertising, often provides a collection of favorable associations which relate, more or less directly, to the product. For this reason, the skilled photographer never forgets that the product's design features can be either enhanced or weakened by the surroundings in which it appears.

Choice of background depends primarily on the point you wish to make—a special use, a new ability, texture, form, quality. It also depends on how the picture is going to be used. For a small catalog shot, a direct statement of the product is about all one can attempt. The larger the picture, the more can be said—but space is no excuse for clutter.

Noseam paper makes an effective background because it does not intrude on the product and can be lighted to give a complimentary pattern of dark and light. A room-setting should be natural looking yet simple, free of eye-catching patterns and devices, and not so detailed as to overwhelm the product. One way to separate product from background is to use a lens opening wide enough to give clear focus to the product and blur the background. In planning background, it is important to remember that even relatively semi-glossy surfaces like television cabinets reflect the objects around them, which may distort the product's form.

## 4 SCALE


*A straightforward demonstration of the size of these miniature springs is made by grouping them on the very familiar dime.*

*Not only size but identity is hard to determine in this photo of two glass ashtrays. One simple prop, obviously a cigarette, would have made both points instantly clear.*

*One-inch scale model room is well filled with items you would find on the tables, walls and floors in a full-scale situation. Shadows are also in scale. George Nelson Ass.*

One important thing that a good photo will make clear about any product is its size. The most obvious way is to include some prop of known dimensions—keys, paper clips, the human hand or the full figure. This is particularly appropriate if the product is a new type, or if size is an important selling feature. Designers often need to photograph scale models and these, of course, can be made to look big as life by surrounding them with miniatures of familiar objects—the more props, the more full-scale conviction. And remember that, to maintain the illusion of full size, lighting must be in scale; this can be achieved by screening out all but narrow streams of light or a pinpoint light source.

## 5 MODELS AND PROPS

*The perfect model is dressed for what she is doing and, more important, is earnestly concerned with doing it right.*

Since products are used by people, it is natural to use people in product shots. It is also dangerous. For while the point of the woman in the picture is to show how the product is used, and/or to create a favorable attitude toward it, there is always the chance that the product will be ignored in favor of a more attractive model. Sometimes, rather than calling attention to the product, the model gets between the viewer and what you want him to see. The inclusion of a pretty girl in your picture should point out its design for human use; props may be used to create an attitude, to help identification, to point up a relationship.

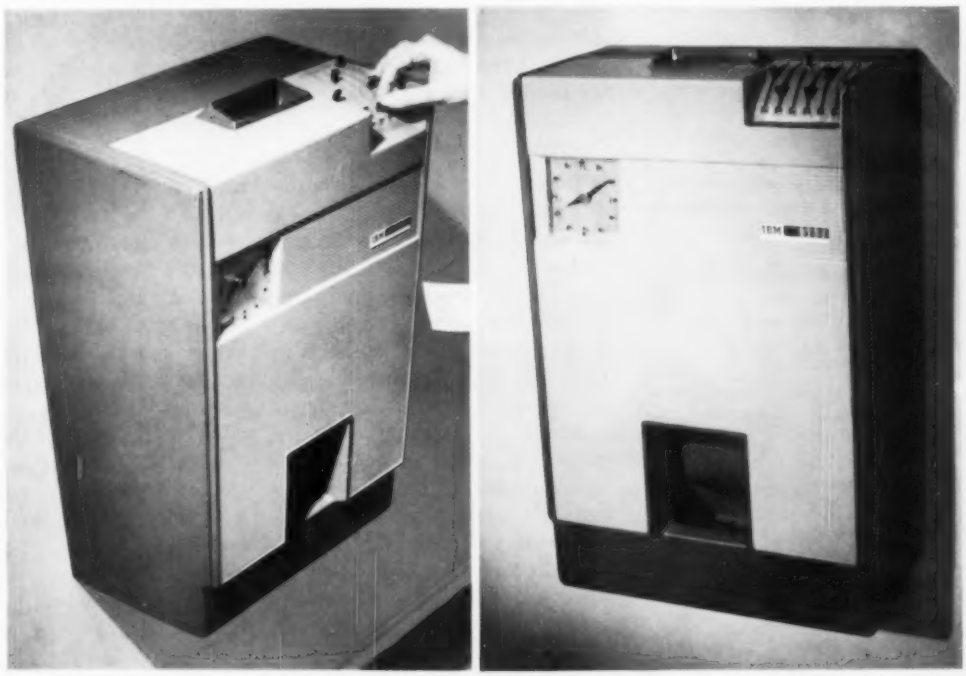
# 6 PERSPECTIVE

*The biggest problem in photography is perspective. When you are too close to an object its dimensions will be distorted. The further you are from the object being photographed, the truer perspective is.*

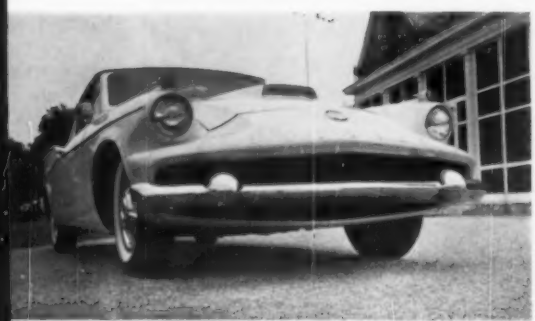
TOM YEE

Like everything else in photography, perspective is a matter of illusion. In translating a three-dimensional object into two dimensions, the photograph gives the illusion of depth with converging and receding lines. If they converge too sharply, the illusion is lost and the viewer is uncomfortably aware of distortion. Parallel lines, however, are not the only perspective problem: whole areas of a photograph can be thrown unnaturally out of scale if the camera gets too close. (A low-comedy example is the ubiquitous photo of a bather asleep on the beach taken by a kneeling photographer sighting at his feet). For truer rendition, the camera may be moved back or a longer focal length used.

The distortion of camera perspective is often deliberately used to create a desired image or feeling. By shooting from a low, close up position, the automobile photographer extends perspective to lengthen the product. Aberrated perspective can be corrected with the right tools: lenses of varying focal lengths, the view camera, with its tilting lens board and film carrier. With them, the boxy object can be shown gracefully, the complex shape can be clarified.



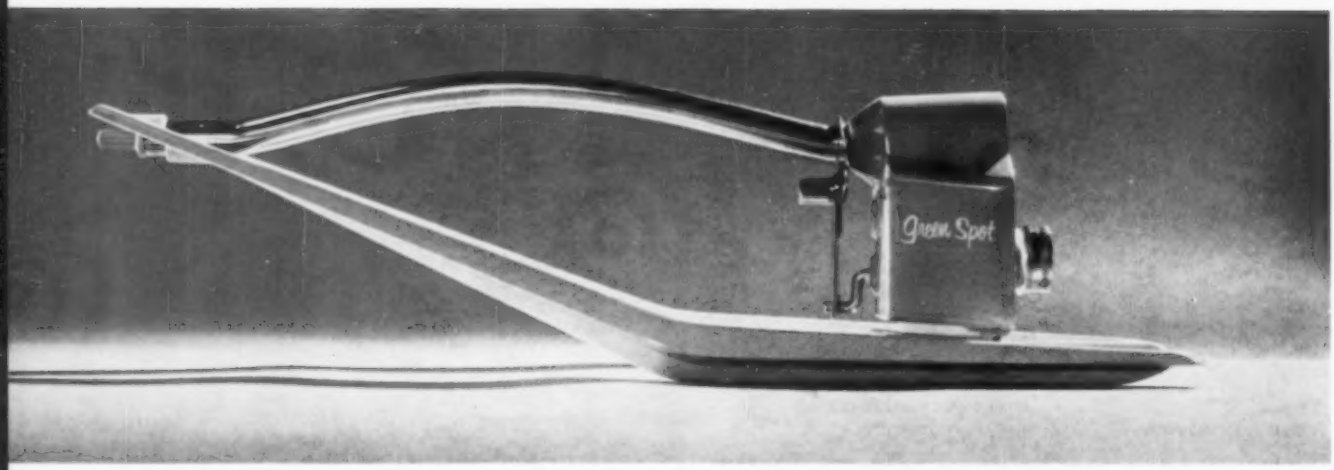
*The two photos at left represent two views of the same product, not, as one might think at first glance, two different items. The time - clock's substantial depth and tapered form are entirely overlooked by the camera angle in the nearest photo. Both photos by Ezra Stoller.*



*On-the-ground view of car is an abnormal one which is becoming fashionable. When handled too close, it overplays a certain form that, in the case of most cars, is hardly flattering, and reduces its length.*

*Each item in the dinnerware set at left is displayed at the angle which will reveal what the viewer wants to know about it. This artistic mixing of perspectives, rather than confusing the viewer, makes for a formalized, informative picture. Photo by Tom Yee. The result of trying to show three views of the saucer at right, is tumbling plates without any reference point.*

# 7 LIGHTING




*To delineate form, the main light was placed at about 10° in the 180° arc described behind the lawn sprinkler. Front lighting picks up high lights in the chrome and enamel. This photo was made with only three lights, by Frank Carioti for Dave Chapman, Inc., Industrial Design.*

*While the photographer's time and talent are the main ingredients of good product photography, they are expressed mainly through his use of light. Nor can the techniques of lighting product pictures be explained by a formula.*

EASTMAN KODAK

*"Metal objects are very difficult to photograph. Satin finishes give a nice gleam but chrome, which reflects sharply, is very hard to handle. To get bright, silvery looking planes in sterling, I use a broad source of light. The object is surrounded by tissue paper and the lamp placed at some distance." Ben Rose, who also took the photo.*

Although photographs give the illusion of being lighted from one source, it may take as many as a dozen strategically placed lights to delineate texture and form. The novice, however, should limit himself to minimum effects and use only the three lights suggested for equipment.

Every lighting scheme begins with one main light which is deliberately placed to point up contour and perhaps texture. The fill-in lamps detail secondary features: texture, if not already provided for; form; background separation or blending. The third light element, which can be provided by reflectors, is used to balance the contrasts. This system applies outdoors, too, where the sun is the fixed main light, reflector screens are often used for supporting light, and the product is moved for proper definition.

Light sources range from the spotlight, which can be adjusted from a strong, pinpoint beam to a broad ray, to direct flood light, which is softer, to reflected light from a flood—which is most diffused. Direct light will heighten details; indirect, soft light brings out texture.

*Spray mist is given substance and importance by light coming from the direction in which it is traveling. Contours and glossiness of glass bottle are also defined by same light source. Dark background is, of course, essential. Photo by Ben Rose.*

*Glassware presents lighting problems for two reasons: its reflectivity and transparency. Lighting from behind, as here, creates heavy black outlines, which may be desired for fantasy effect.*
*A more diffused source from behind would reduce the outlines substantially. Some front lighting would pick up glass highlights. Corning Glass Works photo.*

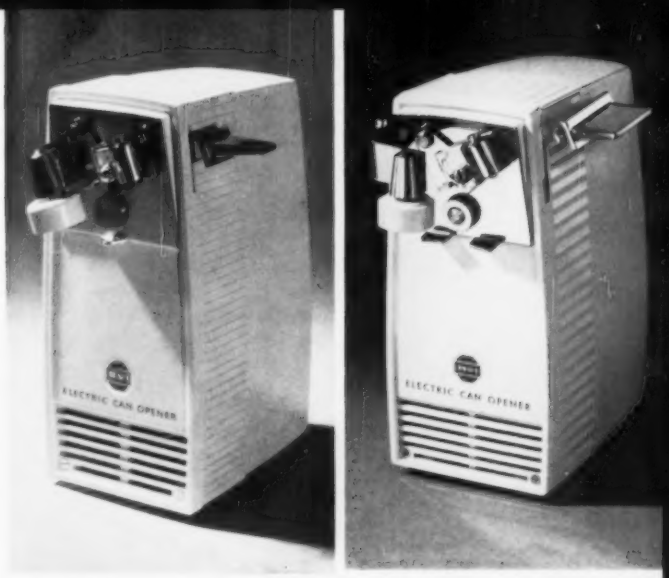
## 8 CONTRAST

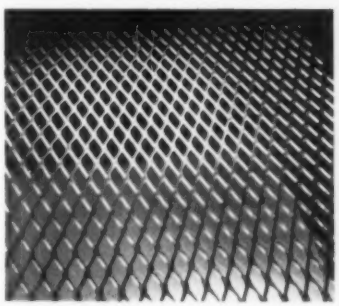
The trick in black and white photography is to capture the nuances of color differences in readily distinquishable shades of gray. This can be especially important and difficult in photographing package graphics. For colors of the same value, like red and green, no difference will be apparent unless you use a filter or certain films which will intensify the effect of one color over the other.

A monochrome viewing filter can help you judge values and avoid the mistake of too great a contrast in your pictures. Often what appears to the naked eye to be fine contrast will be more intense in the picture. Black and white objects, for instance, cannot be reproduced properly, for the reflectance scale is too great.

Shadows are often used for background contrast, but beware of the sharp, definite ones which make a second form that competes with the product. An indirect, soft-edged shadow will help outline the product.

*Getting contrast with different backgrounds and types of lighting brings interest and depth to the uniform pattern of a sheet of expanded metal.*



*Two photos of can opener (Dave Chapman, Inc., Industrial Design) show differences in quality from lighting contrast. Intense light (r.) defines form and accentuates mechanical details on front plane, but gives harsh, retouched effect. Softer one-directional light (l.) flatters product more, although uneven shadow obscures details.*

## 9 PROCESSING

*As much creative work can be done after the photo is snapped as before. Thinking does not stop when the picture is taken. The darkroom door is not a barrier.*

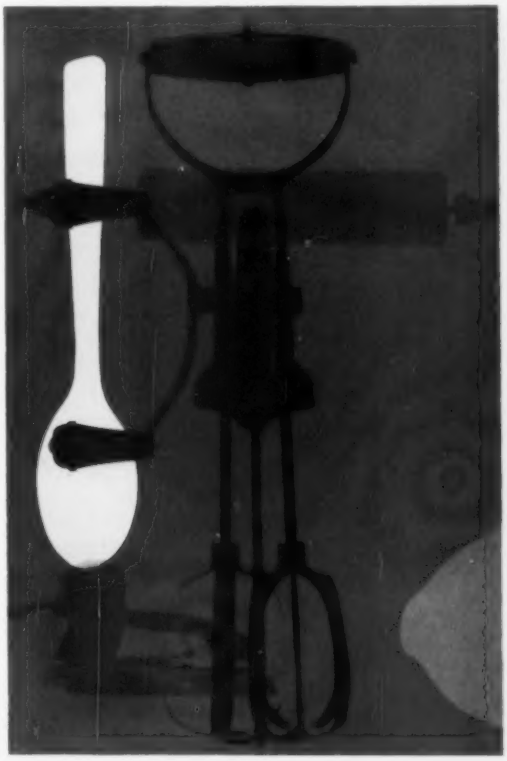
RUDY MULLER

Developing the film and printing the picture are as important to the finished photograph as the entire process that led to the snapping of the shutter. If a professional photographer takes the picture, he will carry his point of view through in his processing, for he recognizes that making a picture is a continuous process, including film processing.

For the man doing his own shooting without a darkroom of his own, there is a difference. He must put his exposed film in someone else's hand with instructions to get the most he can out of the shot. It's pretty important to work with a professional processor who works with care and understanding and who can follow specific instructions. In printing, some areas can be darkened by additional exposure, others lightened by withholding light. The right amount of exposure for the whole print is critical to realize the contrast which you have carefully built into the picture. In the hands of a creative photographer, printing can produce as many tricks as the camera.

Cropping is a useful technique for improving a print; retouching, while more prevalent, is trickier. Since it is not a photographic technique but really a painting-in, it must be used sparingly. The minute an entire reflection is painted out, or an outline drawn in, the photograph loses its photographic life. The point of working out all the details of the photograph beforehand is to keep retouching down to a bare minimum.

*A combination of darkroom techniques, including photo montage and photograms, produced this impressionistic rendering of kitchen tools. Photo by Ben Rose.*



**Irving Penn's** *apprenticeship for the profession of photographer included three years as a magazine art director, one as a painter. His photographic career began in* 1943, *when Vogue published his first efforts. On the staff of Condé Nast since the end of the war, he has seen his work reprinted in* Life, Portfolio, Graphis. *In the famous "Family of Man" collection he is represented by several pictures. His product work has set a style which is widely imitated today. He has several times been awarded the Art Directors' Club Medal.*

## Photography–a constant search for the special aspect of the commonplace

When Young and Rubicam approached Irving Penn four years ago with the commission to do the advertising photography for Jell-o, he was a noted photographer for Condé Nast Publications, dividing his time among fashion, personalities, and travel. He had done some still life work for Vogue, but this was generally impressionistic, providing the photographic background for editorial ideas carried out mainly in words. Photographing Jell-o was a distinct change not only in subject but in purpose. Penn accepted the challenge out of his strong conviction that there is no real difference between product and fashion work. He dislikes the fashion label, anyway, believing that the problem in photography is always the same—to wring the heart out of what you photograph, not just show one aspect.

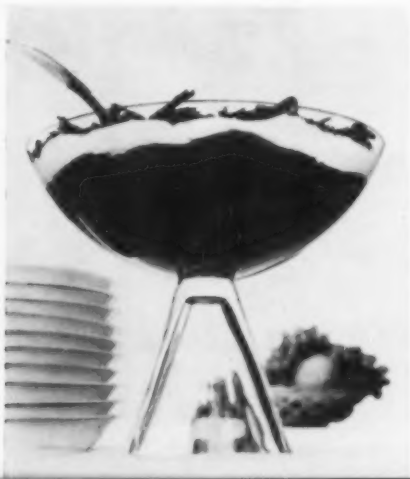
Penn does concede that the techniques for getting at the heart do vary. Working with a product, you search for the excitement in what is generally considered a commonplace article, and try to communicate it with directness. A fashion photograph proceeds in the opposite direction: you start with an ideal situation and look for some commonplace gesture—like flicking a bit of tobacco off the tongue, which, when done by a beautiful woman, makes something warm happen inside.

And the photographer whose day includes these warm moments will bring a better eye to the photographing of products, says Penn. "I don't think the specialist is the best man for the job. He has blinders on. To him the world is all food or whatever it is he works with."

Although Young and Rubicam will tell you it was fashion photographer Penn who gave Jell-o a new visual personality, it was simply Penn the photographer,who believes that every subject is potentially exciting, and tries to capture its visual uniqueness. What he discovered—pattern and texture in the pouring pudding—he communicated in a clear, clean photo that took a close-up look at the product. There are no hands doing the pouring: "What would the human hand contribute? Identity is much quicker without people present." As the series progressed, Penn approached Jell-o from all angles, even utilizing the famed worm's-eye view (left).

Although all of Penn's product work has been for advertising purposes and in color, his approach is equally appropriate for publicity shots; for the purpose of both, as he observes, is selling. And to Penn selling does not mean making involved statements about the product, or outfitting it with a complete setting, but focusing clearly on it. His searching look at the Haig & Haig Pinch bottle (opposite) brings out the wonderful effect the shape of the bottle has on the appearance of the contents, the texture of the wire, the broken seal.

Because he is a top man in his profession, Penn has the kind of freedom other photographers cry for. Agencies will come to him without a clear idea of what they want, confident that Penn will take a good picture which will sell the product. Penn isn't so sure. "That kind of freedom is a curse," he says, "limitations are what we live on." He would rather be told "you have to photograph this glass of tomato juice against a blue background" — difficult as that would be — than "just take a picture." Every photograph is the result of a multiplicity of choices, and how it's going to be used and what it's being done for are things the photographer has to know in order to make it a good one.



Everett Sabinek, Art Director, Reach, McClinton & Co.

Jell-o is a registered trademark of General Foods Corp.


HAIG & HAIG
PINCH












**Herbert Matter,** *a Swiss graphics designer who studied with Leger at l'Ecole Moderne in Paris and worked with Corbusier and Cassandre, became interested in photography in Paris in 1932. His Swiss Travel Bureau posters were some of the first to use the technique of photomontage. In 1935 Matter came to New York. He is a staff photographer for Condé Nast, teaches photography at Yale's School of Design, designs graphics for Knoll and recently designed the logo for the New Haven Railroad. He was photographer, director and editor on the color film "Works of Calder."*

## To an experimentalist, the camera's eye reveals a new world

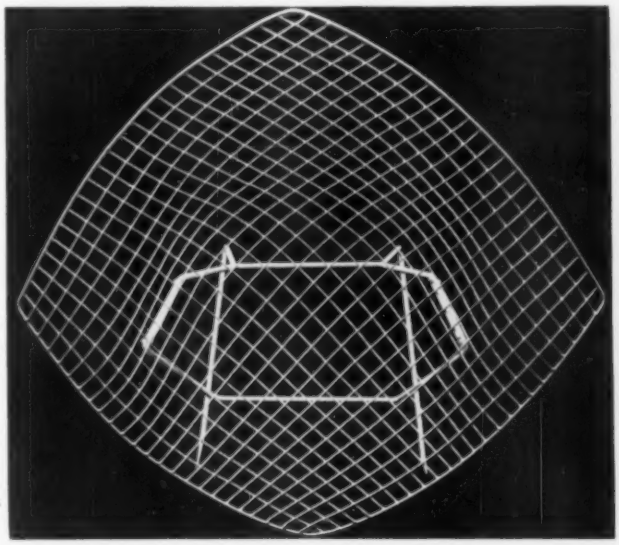
Herbert Matter deals with photographs on many levels and can be said to have three different points of reference—as art director, graphic designer and photographer. All three, of course, are put into play when he gets behind the camera.

Working on layout and format of Knoll brochures and advertisements, Matter uses the photograph as a medium for communicating his design purpose. It is just one of the elements, along with type and white space, that contribute to the impact of the printed page. For this reason he may repeat a photo numerous times to get a pleasing overall pattern, or perhaps combine the photo with line work. Often there is no dividing line between copy and photo; both merge into the unity of the printed page.

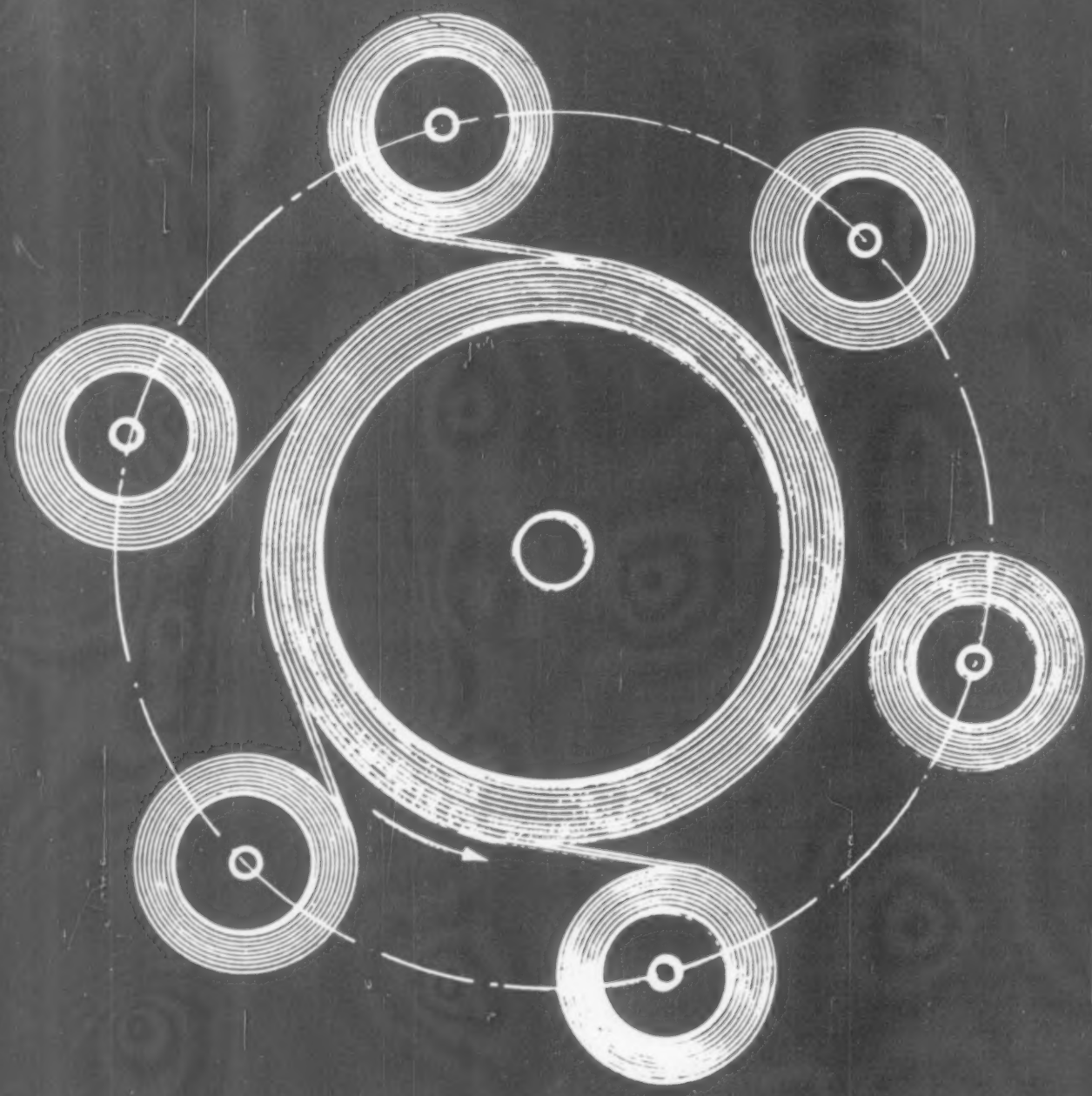
Graphic designer Matter approaches photography with a sure sense of the essential design aspect of the product and a feeling for the visual design of the photograph. His camera is used not to reproduce the product but to create a graphic entity. Matter's method of getting to the heart of the subject is to leave out details to get at the total essence. He is not concerned with the flattering view, nor even the view that shows all aspects. The photograph of the Bertoia chair (right), whch has the flavor of a line drawing, is a study of structure without any reference to sitting.

On the other hand, Matter will approach the design of a piece of furniture from the viewpoint of the human user and, often for advertising, show as model a chimney sweep or a couple of children using a chair. He has photographed the same Bertoia chair from a rear view, showing just the heads of three children peering over its back and side arms. In the series opposite, his son illustrates the limitless seating and other positions possible with a Hardoy chair.

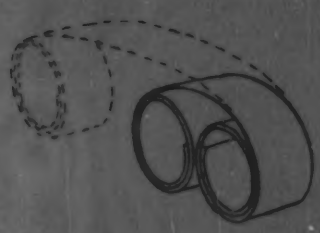
Cameraman Matter is an experimentalist and an innovator. To him the camera is not a limited instrument. On the contrary, he thinks that the photographic eye has gone beyond the human eye in discovering a new world. With every new technical advance, it brings unknown and unimaginable facts to light. Using microscopic, strobocopic, infra-red and x-ray cameras, we can see what the human eye fails to discern. The camera can stop and analyze motion, grasp the split second in which some small part of the human drama is unconsciously revealed.



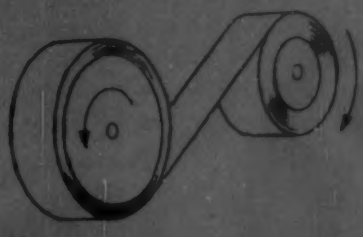
Behind the camera eye, however, is a human hand which brings to expression the material revealed by the camera. The forms, textures, unexpected shapes and patterns the camera finds can be selected, weighed, combined and presented in a multitude of ways. The various photographic processes, all the things that can be achieved in the darkroom, are an endless source of inspiration to Herbert Matter.



*Extension spring*



*Clamp*



*Motor*

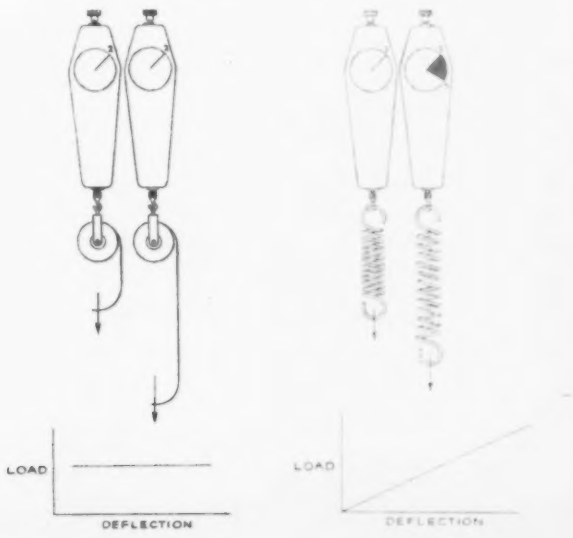
# Neg'ator–a versatile, constant-force spring

The Neg'ator, a simple spring device, is offering fresh solutions to problems in an increasing number of applications mainly by virtue of the characteristic that distinguishes it from a conventional spring—the ability to produce a "constant" force. This feature of the Neg'ator was discovered in 1949 when engineers at Hunter Spring Company, Lansdale, Pa., found that if they coiled a band of highly stressed spring steel so that each portion of the band was set at the same curvature, the force exerted by the spring as it was uncoiled or extended remained constant, regardless of the amount of extension. This performance was contrary to the usual rule for spring behavior, the rule maintaining that force exerted increases in proportion to the spring's extension. It was also found that the amount of force delivered by a Neg'ator could be accurately established during manufacture, and widely varied by using stock of different widths and thicknesses and by changing the radius of curvature formed into the spring steel by Hunter's new forming and thermal processing methods. The two most important advantages of the Neg'ator are: first, since stress is noncumulative, it does not limit deflection; second, the force from a Neg'ator does not depend on its deflection.

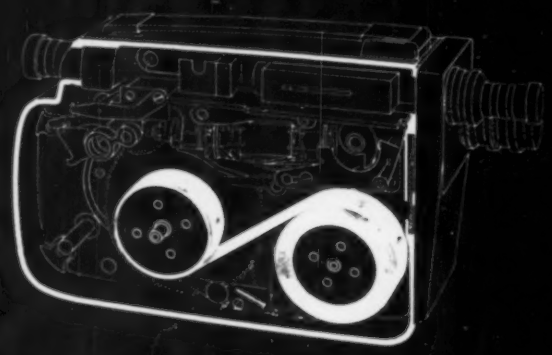
Neg'ators were put to immediate use as clamps, bands, and clips—where a constant and predeterminable force was desirable. These applications are fundamental and take advantage of the Neg'ator's basic tendency to return to its original manufactured form. As an extension spring, the Neg'ator is essentially a coil with a free end. As the spring uncoils, energy is stored in the uncoiled portion and becomes active when the force or weight at the free end is released. But it is as a motor that the Neg'ator is most promising and interesting as a relatively unexplored component.

There are two basic types of motors that can be made with Neg'ators. The simplest, or "A" motor, is a spring-steel band wound around a storage bushing, with one end attached directly to a second and larger output bushing. The coil tends to return to the smaller bushing when rotation is released, creating a constant torque. The more powerful "B" motor can be made by reverse bending the Neg'ator around the output bushing, and producing more torque than the directly wound "A" motor. Several "B" motors can be connected to a single output bushing to deliver their total torque to a single shaft (opposite).

Although the Neg'ator can perform the functions of an ordinary spring, it should not be considered a replacement for springs. Rather, its "constant force" characteristic makes it a *new* component available to designers and engineers. The examples on the following pages showing the Neg'ator in use are evidence of the variety of its applications and an indication of how its basic simplicity and flexibility can be utilized in solving both old and new design problems.




*Using a mechanical force gage, it can be seen that the amount of force needed to extend a Neg'ator remains constant regardless of the amount of extension. With a conventional extension spring (far right), the load or force must be increased in proportion to the amount of extension.*

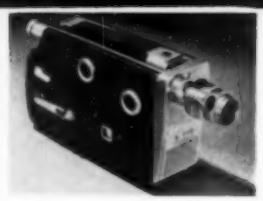


## *as a* **MOTOR**

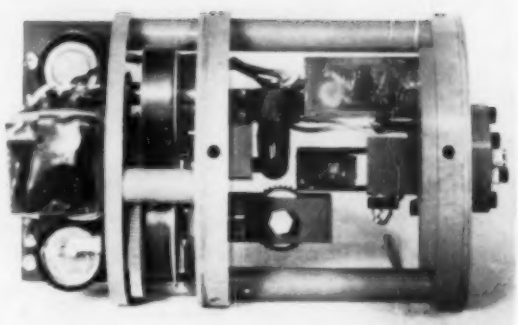
The Neg'ator supplies constant torque—the primary reason behind its use in the applications on this page. The Eastman Kodak 16 mm. Cine-Kodak K-100 (above and right) was the first production motion picture camera to use a Neg'ator in place of a conventional power spring. The result was longer film footage per wind (40 feet or 100 seconds of exposure at 16 frames per second) without taking up any more space. Constant torque eliminated the inconsistent output—peak at full wind, and low torque at near rundown—experienced with conventional spiral springs, and made it possible to simplify gearing and governor design.

Compactness and ruggedness were additional considerations that prompted the specification of a Neg'ator as a chart drive motor in the tensiometer (right), developed to record the duration, frequency and magnitude of transient forces exerted by a parachute on its load during deployment and deceleration. A constant-speed motor was required to establish an accurate time base, and engineers at Exline Engineering Company found that a Neg'ator resisted a change in speed at the moment of impact.

In the McEvoy automatic valve operator (below, right), conventional spring motors were replaced with Neg'ator motors because maximum torque is required at the instant of final closure. With ordinary motors, torque decreases as the spring runs down, giving the least torque when the most is needed, necessitating an excessively large motor to insure positive closure. The Neg'ator gives sufficient torque at the critical moment of closure, yet need not be excessively large.

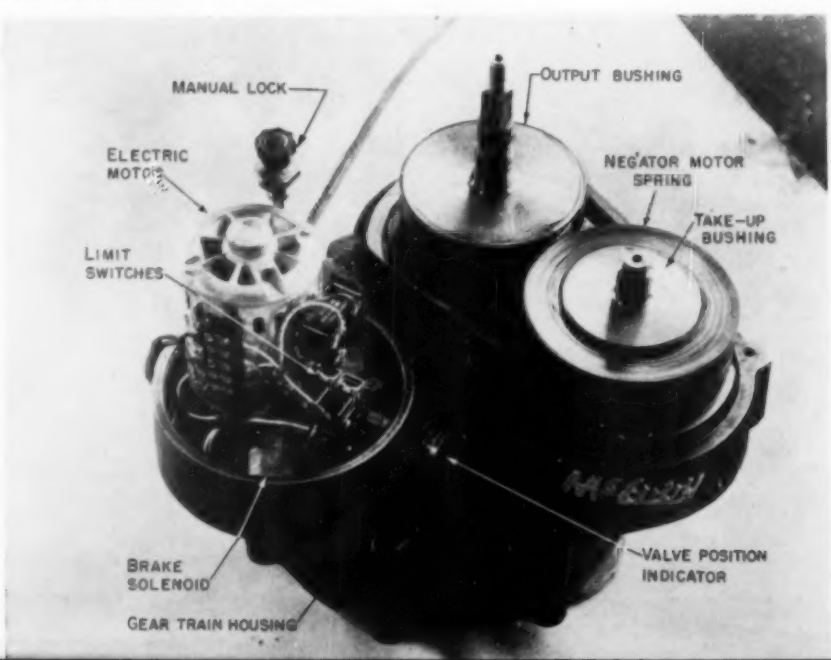


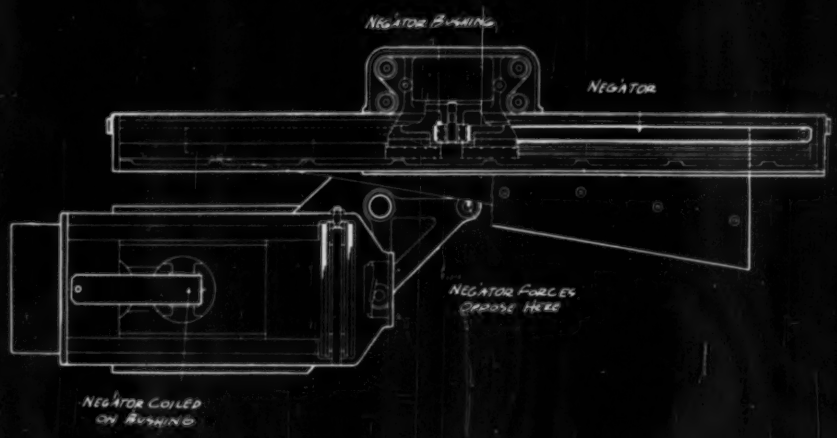
*Eastman Kodak's K-100 achieves longer film footage per wind, simpler gearing and governor assemblies, by using a Neg'ator motor in place of a conventional spring.*



*Tensiometer used to record forces exerted by a parachute on its load takes advantage of the Neg'ator's ability to resist impact, by using one as a chart drive motor.*

*Constant torque is important in this automatic valve operator which needs maximum force at the final instant of closure. Neg'ator eliminated the need for an excessively large motor.*



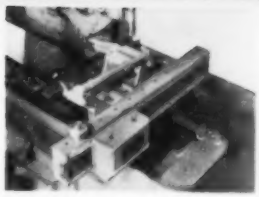



# *as a* **SPRING**

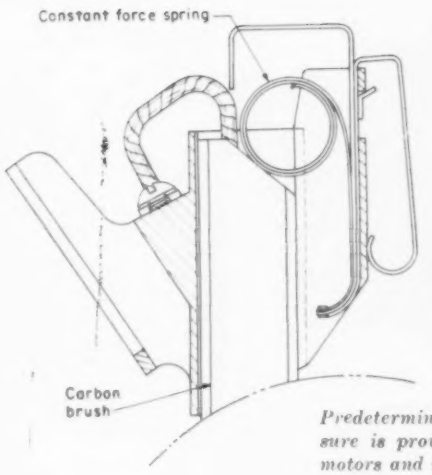
Long deflection and constant force offered by the Neg'ator have made it possible to simplify the design of many mechanisms. For example the ratio mechanism in the contour wheel dresser (above and right), made by Hoglund Engineering and Manufacturing Co., Inc., uses two opposing Neg'ators to maintain optimum constant contact pressure on the contour-cam follower. Helical springs cannot be used because they would be too difficult to match and would not exert constant forces through most of the follower path.

Longer brush life and commutation efficiency in electric motors depends upon brush contact pressure. Neg'ators are used in the brush holders of the General Electric Kinamatic dc motor (right) to maintain a predetermined and constant pressure throughout brush life. The use of this type of brush holder eliminates periodic manual brush pressure adjustments and also simplifies the assembly, which makes brush removal and replacement easy and requires no tools.

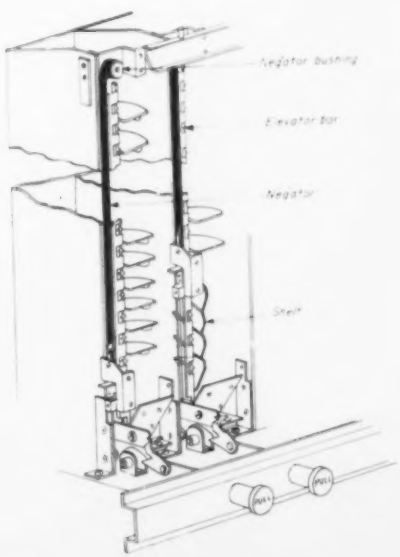
Each vertical column of shelves in the vending machine on the right (bottom) has a Neg'ator that exerts two pounds of pressure at any point on the elevator assembly from the bottom to the top of a notched channel. Here again, the Neg'ator's constant force solved a problem encountered with power springs and other actuating mechanisms that could not provide the minimum force at the first notch without exerting excessive force at maximum extension. Neg'ators in this vending machine, which is made by Rowe Manufacturing Co., Inc., make it possible for each column of shelves to be designed as a compact self-contained unit, easily removed for servicing or replacement with a column of a different capacity.



*Two opposing Neg'ators maintain constant contact pressure on the contour-cam follower in the ratio mechanism of the contour wheel dresser.*

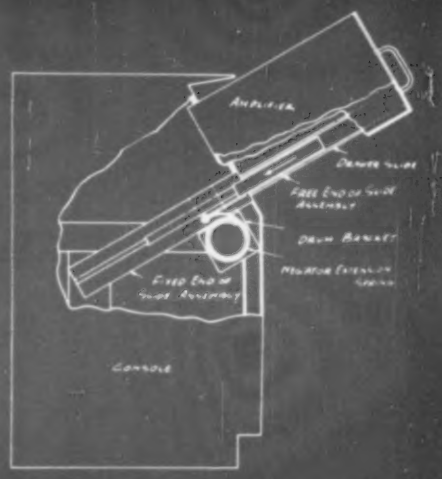



*Predetermined and constant brush pressure is provided by Neg'ators in electric motors and manual brush pressure adjustments are eliminated.*

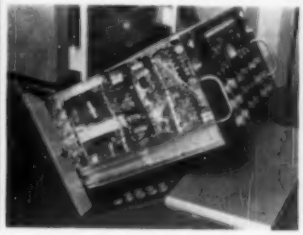



*Constant pressure is given by Neg'ators to each vertical column of shelves at any point on the elevator assembly in this vending machine.*

*as a* **COUNTERBALANCE**



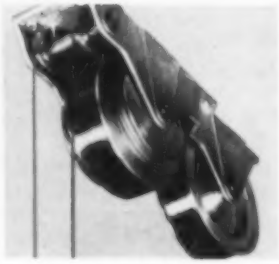

*A 48 pound RCA amplifier is counterbalanced by Neg'ators for easy access for inspection and maintenance.*



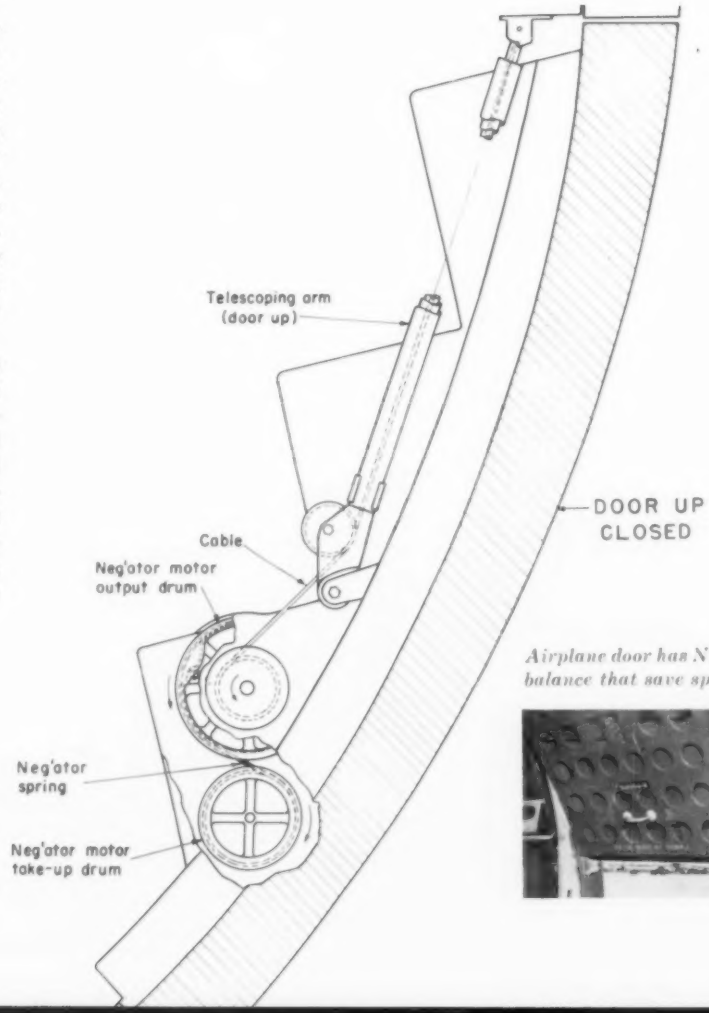
In certain applications the Neg'ator can replace heavy counterbalances. Heavy equipment, like the airborne amplifier above, that must be moved frequently from its operating position for inspection or adjustment, has created a problem for years. Neg'ator extension springs, used as counterbalances, serve as lightweight and compact assists to facilitate the withdrawal of this forty-eight-pound RCA console. Also since the springs exert a constant force, they hold the weight in any position on its track, eliminating any danger of the amplifier's running down its slide to a jarring halt, a problem prevalent with conventional spring counterbalances.

The compact unit on the right consists of two Neg'ator "B" motors that serve as a counterbalance for a fluorescent lighting fixture. This arrangement permits fixtures to be drawn down from operating height to remain stationary at any level for cleaning and servicing. As the fixture is pulled down, the Neg'ator winds from the storage bushing onto the output bushing carrying the cable drum. Similar arrangement can be used to counterbalance x-ray equipment, windows, venetian blinds.

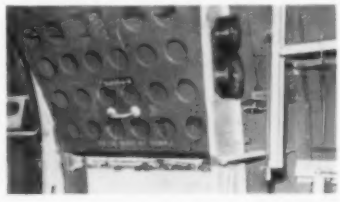
Neg'ator springs were found to be lighter and less bulky than conventional mechanisms to counterbalance the vertically opening doors on the Lockheed C-130 Hercules cargo plane. Weight and space were, of course, prime considerations in this airborne application, but it was also important that the doors remain in position once they were opened; this was accomplished by the Neg'ator's constant force.

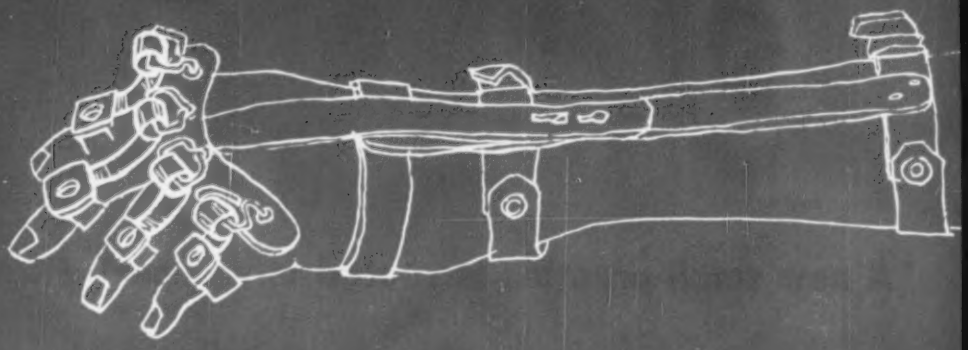


*Counterbalance assembly for lighting fixtures uses Neg'ator "B" motor for easy raising and lowering.*




*Airplane door has Neg'ator counterbalance that save space and weight.*





## *as a* PROBLEM SOLVER

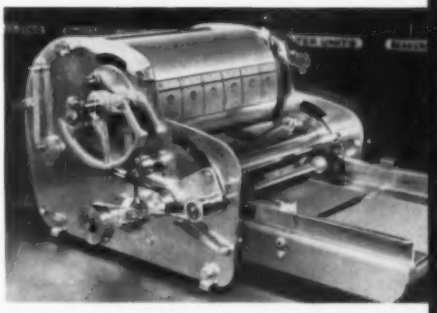
There are many logical—even obvious — applications of the advantages the Neg'ator offers. But there are other areas, like those on this page, where it can solve problems that are unique and obscure. As assistive supports, Neg'ators have proven to be very effective in the rehabilitation of paralytic hands. Compared to rubber bands, a more familiar type of assist, Neg'ators offer the advantages of compactness and constant force.

In Standard Duplicating Machine's duplicator (at right), Neg'ators replaced gears to transmit the oscillating motion of the timing drive, maintaining the necessary registration accuracy, yet saving space, simplifying the operation of the mechanism, and cutting down noise.

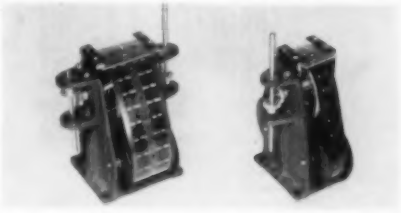
In computers, graduations can be printed directly on Neg'ators to make scales that are compact and rugged. Ultrasonic Corp., who made the instruments on the right, have used Neg'ators for expanded scales and claim that they have an accuracy of .0033 per cent with a scale 150 inches long. A calibrated drum would have to be five feet in diameter, and a spiral scale two or three feet, for the same reading accuracy.

Grit is prevented from flying out of the grinding machine (right) as the dresser crosses the wheel by two three-inch Neg'ators which act as an effective slot closure on this Van Norman Co. machine. The Neg'ators slide in lateral grooves and exert sufficient force for proper precoiling of the dresser head. Similarly, two balanced Neg'ators are used for slot closures in the radar controlled tail turret to provide a close-fitting wind barrier. Their flexibility permits smooth operation over curved surfaces.

*Paralytic hands are assisted by Neg'ators that give the advantage of constant force—an improvement over the variable force of elastic bands.*



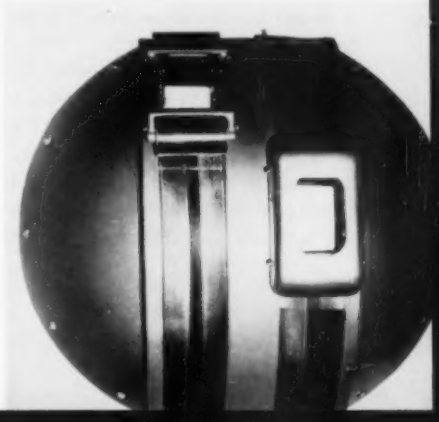
*Duplicator's timing drive has Neg'ator springs instead of gears.*



*Graduations are printed directly on Neg'ators for accurate scale in computers.*

*Neg'ators serve as slot closures on grinding machine to prevent grit from flying.*

*Curved surfaces of tail turret do not inhibit operation of Neg'ators which act as slot closures.*

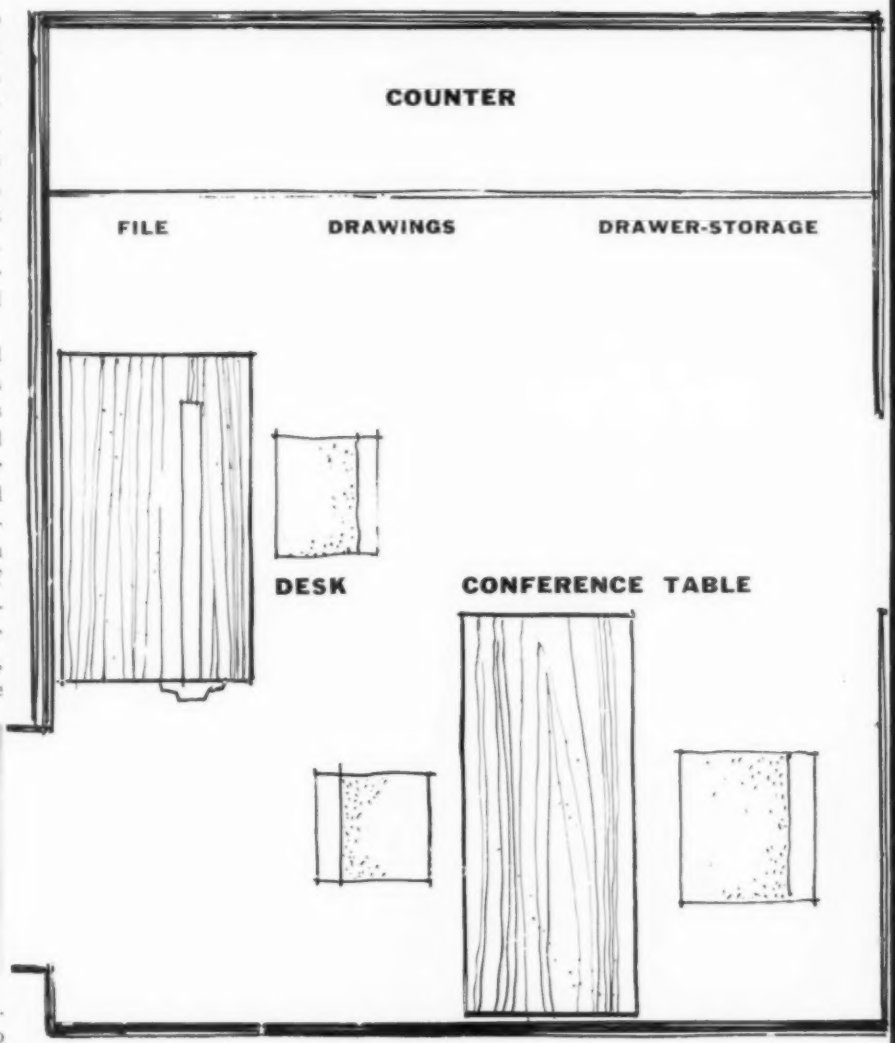


*How they work:*

# A new small practice is rooted in a super-efficient office

When William Renwick decided last summer to open his own office, he had a plan for a new small practice. His would be a purposefully one-man operation, in which he could work closely and intensively with clients, unencumbered by draftsmen, receptionists and secretaries. The point was not to neglect all peripheral services; his idea was rather to design a practice that would benefit from smallness and be all the more efficient for it. He thought the secret lay in designing an environment conducive to efficiency and good housekeeping.

Renwick took a two-room office in New York and proceeded to organize its 220 square feet into a sort of designer's Pullman kitchen, with features arranged to do the most with the least, and still add up to a congenial place to work. The outer room includes a conference area (table and chairs), library (countertop) and workshop (extra drafting table) with sample room, mail room and filing area all incorporated into one bank of shelves; it is set up for the designer as Businessman. For the designer at work there is an inner sanctum with a presentation wall, client's chair, and a super-desk with everything from phone

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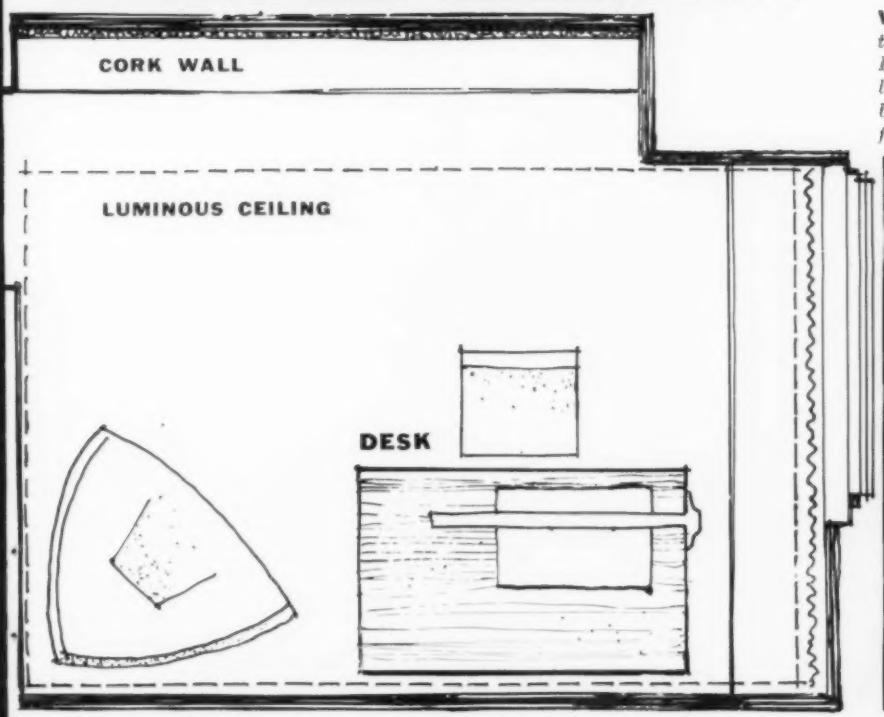
**WILLIAM CROSBY RENWICK**

book to pencil sharpener within seated reach. Much of the equipment, Renwick found, he had to fabricate himself to suit himself. This included the desk with built-in lightbox, the shelving made from prefab drawers and a KD frame, and even a sealed double glass panel in the door (above) to hold letters in place.

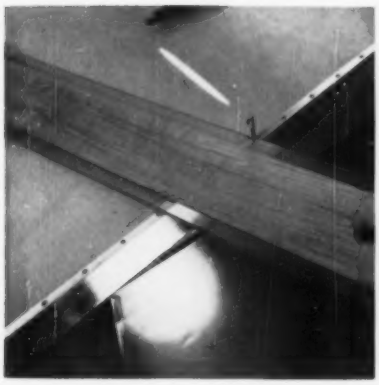
The total effect—enhanced by good lighting and a few bright colors against a pale background—is both cheerful and neat. Furthermore, the system works—so well, in fact, that Renwick has had to take on a designer to help him, a pleasant move made possible by that extra drafting table he so farsightedly provided.

**Office needs** *are concentrated in bank of drawers for samples, tools, mailing supplies. One drawer without pulls is paint-spray booth. Plastic furniture (Reiss) in KD steel frame.*

**Wall niche** *is exploited for large-scale storage of mats and shipping materials. Thin Formica counter placed for convenience under dark cork presentation wall. Hinged doors are walnut; aluminum pulls. Wall in outer room (page 64) has "brick" wall covering.*




**Work surface** *of drafting desk expedites tracing and perspective drawing. White Plexiglas top has cut-out, below which a light box is suspended. Simple strip of rubber matting keeps pencils and instruments from sliding.*



**Combination desk-drafting table** *(left) Renwick made from standard file drawers. Right side drawers hold ink, pencils, lettering materials; larger art letters and type specimens at bottom. On left, phone book can be used without removal from drawer; bottom file drawer is also used (paper-lined) as a wastebasket.*

**Variable vanishing points** *are located by device of Renwick's design: extruded edging to board has pin holes for regulating position of vanish points. Angle calibrations on T-square are set for vanishing points at indicated distance. System derived from Doblin's "Perspective."*

*After losing sleep over the snowballing effect of the Annual Model Change in the American economy, a design consultant concludes it is high time to ask:*

# Is this change necessary?

*by* RICHARD S. LATHAM *Latham-Tyler-Jensen*

We've been having some fun in our office lately speculating on a subject near and dear to America's heart: it is the topic usually referred to as "The Annual Model Change." I suppose there's nothing unusual about designers talking about it, since that's what they do most of the time, at least in popular fiction. But ours is a new and somewhat subversive kind of speculation, along the lines of "What if we didn't have one?"

It is hard to disclose this publicly; since even *we* make a living because there is such a thing, it seems a bit ungrateful, not to mention unpromising, to take such an unAmerican tack. But somehow, even when we try hard to toss the idea aside and get through the day with the same cheerful outlook that some of our colleagues manage, we just can't stop having little one-man dialogs, in which an inner voice asks embarrassing questions and an outer one gives embarrassing answers:

*What is the annual change for? To help designers? To help progress?* No, because in America everything changes every year, and that's what people want and wait for. *Refrigerators,* the irrepressible voice pipes back, *get changed every year, yet statistics show that people want a new one every twelve years. Is that the American kind of wanting and waiting?* Well, after all, bills are collected every month. We get a new calendar every year. The leaves fall. Couldn't have a used car market without a model change. *Couldn't you?* Everyone knows a car wears out; maybe not as fast as they say, but eventually it rusts, and if you put it next to a new one, it looks old. *But that has to do with use, not the calendar. Suppose you couldn't tell differences in age by style, and had to price a car according to the service left in it?* Everyone would get confused. *What about Volkswagen?* That's different. *What about Rolls Royce?* That's different too. *Oh.*

And besides, people get tired of selling the same thing, and need something new to get excited about. *But—how about shoe salesmen?* That's different. *Oh.* And besides, if you didn't change, stylists wouldn't have a chance to do THIS YEAR'S STYLE, which is always super-new and shows progress. *You mean last year's wasn't really good enough — or they changed their minds?* People expect it. They won't buy a new one if it isn't changed. What if they don't need a new *one?* Well, now—WAIT A MINUTE. Detroit's got to keep going, you know. You don't want to blow up our economy, do you? *No. But I don't understand why, when people say they want things to last longer and be cheaper, Detroit says, 'We have learned that the public demands change—so we have changed this year's model and it has cost* $2,000,000*—which will, unfortunately, have to be reflected in the selling price.' I always thought people were afraid of things that were too radical — like the Airflow.* Well, they are. That's why we change every year—just a little bit. *You're sure?* Absolutely! *But didn't Buick say they found they hadn't changed enough last year, so this year they were really going to change?* That's different, *Oh. But what about furniture? How do you create this year's model of Early American?* Well, we change the pulls. *Radically?* No, we just put new ones on. *How do people know they are different?* We tell 'em! *Oh. But are they better?* Certainly. *Really? What about the piece I bought a little while back, on December* 15? You probably got a year-end reduction. *Oh, because it sat around for a year?* No, it was probably just made. *Really?* Yes, but with new models coming out, it's worth less. *Less than what?* What it cost in October, you dope! *Oh, I see—a product doesn't work as well in December as it did in October?* Of course not, everyone understands this. It isn't that it doesn't work as well—it's an *old* model. *Two weeks old?* No—last year's model—you're confused! *I am?* You certainly are. *I see: everybody waits until December* 15*th to get the same product cheaper; is that what they mean by* BETTER THINGS CHEAPER THROUGH THE AMERICAN WAY? No, of course not, nobody waits — what they wait for is the NEW model. That's why they mark down the old one, because everyone's waiting. *Waiting for what?* Next year's model, because it's new. *If the old one was just made, isn't* IT *new?* Yes, but not new like the next new one—I mean the NEW one will be NEWER. Got that? *Yes, but I thought sometimes you just changed the nameplate.* That's right. *And that's a new model too?* Of course. *And better?* Well—it's a new nameplate, isn't it? *I see.*

*Now, thinking it over, is all this changing necessary?*

*Do people really buy things because of the Annual Model Change?* Of course they do, everybody knows that. You have to change—that's America, that's what's made our standard of living so high: change every year —everybody buys one. It's simple as pie! *Do they all believe that?* CERTAINLY! *Do you?* I certainly do — everybody who is successful does it. *So you wait and buy the new model every year?* Well—no. NO? No—I buy it when I need it. *Even in December?* Well—sometimes. *I see!*

The trouble is, we actually do fall into conversations like this and then one thing bothers us strongly. The fellow doing the explaining is obviously a designer, and the one who keeps saying "Oh!" sounds and looks as if he might know the score better than any of us. It's hard to explain that look, but we've seen it several times on the faces of Financial Vice Presidents who have just approved $1,000,000 for new tools.

#### The real motivation

Still, there is no question that change is part and parcel of American industry. It is tightly locked up with a way of life. We have come to believe that new things are good things, and this philosophy is itself new. Previous cultures have not felt this way; in fact the reverse has been true. The usual pattern has been to revere the old. It is hard to say when this attitude of NEW-GOOD got a foothold, but surely the increase of propaganda and communications have helped to make it a permanent part of the buying public's outlook.

Along with the NEW-GOOD equation has come another interesting concept, having to do with size. It springs from the idea that things must grow to live, and that a company must expand to survive. You hear it said that in business "to stand still is to go backward."

Growth-for-survival and change-is-good seem to be the real motivations behind the Annual Model Change, and all paths seem to lead back to these two sources.

Now this means that there are two underlying reasons for American industry to pursue a pattern of change; one their's, one the public's. This produces some interesting contradictions.

When you begin to look into the plumbing of modern industry, you find many powers militating for change, demanding and pressuring for it. Yet the fact is that in mass production the basis of monetary success (net profit) is often in conflict with change. For the sake of efficiency, the internal organs of mass production need to turn out the same things for continuous periods of time. They need to refine operations to show real gains and become efficient. Constant change in the "thing" to be produced works against efficiency and creates problems everywhere, and particularly with such complex modern appurtenances as cars, appliances, tools, the products themselves need prolonged use to be perfected.

Until recently it could be said that one of the most inefficient aspects of product change was its cost in new tools. But now it seems quite possible to reverse the argument. Recently a major appliance executive pointed out in a speech that production tooling actually wears out on a cyclical basis; why, then, shouldn't it be replaced with tools that produce a different product, if the new one seems to offer more? And why not introduce refinements and innovations at these times?

In other words, there are cyles of production that are completely natural to certain industries, and there is a cycle of refinement and improvement that is also natural. Just what this cycle is depends on both the nature of the industry and the demand for its products. In some industries, sales are such that a natural retooling cycle is now close to one year.

But technologically, the cycle is changing. If we examine the introduction of innovation and technological refinement into useful products, we find a curve starting just before 1900 and rising continually until today. The arc represents the incidence of discoveries resulting in new materials, techniques and products—the kind of "change" that is on the upswing. This sudden invention has been traced by some to the invention of the new language of mathematics. There has been one major "brake" on its effectiveness: the time and brain power needed to run out all possible solutions to any formula, in order to find the most likely one. The computer represents a major breakthrough that could eliminate this brake. So apparently we look forward to an even sharper rise in scientific knowledge—one that should make our present curve of technological innovation rise like a rocket.

#### The human lag

But this ability to innovate is by no means matched by human ability to assimiliate. Unlike inanimate objects, as social scientists know, people change slowly and assimilate new forms and ideas at their own pace, which is often far from the pace of modern machinery. This is not to disparage the enormous amount of change

people have been able to assimilate in the last half century—more than in any other period of human history, when you consider mores, travel, work, dress, etc. But the pattern of acceptance is uneven—sometimes taking a radical step like air travel in its stride, while suffering major upheavals over an esthetic innovation, such as modern furniture. And, too, the somewhat passive acceptance of the individual is usually not matched by that of organized groups, which have demonstrated much slower shifts to active patterns of creating and thinking ahead to keep up with change. It has been possible for industry to produce a motor car capable of amazing speeds, but the culture finds it impossible to utilize the vehicle. This lag is not because the speeds are unacceptable, nor even because know-how is lacking, but because civic bodies cannot make the mental shift needed to coordinate the resources for producing the required new kind of highways. Jet passenger transportation is a technological possibility, yet runways and public facilities necessary to bring the service into being are far behind the fact of the aircraft.

This demonstrates one kind of evidence that helped convince the developers of our economy that technological innovation was not, in itself, enough to insure market acceptance. Slowly techniques were refined to promote maximum customer acceptance — and to induce customers to pay money for a given product. This was called *merchandising*. It was bordered on the left by pricing, packaging, and promotion, and on the right with display, advertising, and communication of all kinds. Eventually the cart began to drag the horse: merchandising ceased to be an aid to acceptance, and became an aggressive sales weapon with "newness" as its chief ammunition. Lately, to this collection of merchandising techniques has been added *styling* — the introduction of some new visual element to make a whole product appear new, usually without the kind of basic change that requires major adjustments by the consumer.

#### What's wrong with styling?

Now there is nothing, to our mind, inherently wrong with the idea of style change *per se*, provided it is applied where it belongs. It works quite successfully in soft goods and women's clothing, for instance, where it is recognized that people like change when it is optional, inexpensive, or just plain fun. And certainly style itself—as a reflection of a cultural outlook—does inherently change, and technology makes it possible for the look of things to change in both substantial and superficial ways. It seems only logical that a society should keep evolving to look like what it is, or can be.

The designer gets into trouble because of the very fact that styling trends, assumed to operate on a short-term basis, are relatively easy to measure and predict; therefore they are considered safe to rely on without any heavy commitments. Genuine innovation, even in appearance, is less measurable because it is difficult to determine whether people will accept or reject it until their decision is made in a real situation. Furthermore, innovation is thought to be a good deal more expensive kind of gamble—in most cases requiring long-range planning just to bring it into being. (This idea is obsolete—as we shall presently see—but it persists.)

So short-term style change is the usual road to newness. But, in using it, the stylist cannot depart too radically from the overall characteristics of the object, be it hat, dress, or automobile. It took literally years to eliminate fenders, and the symbol of the radiator cap and temperature gage is still with us, even though the instrument itself long ago went to the dashboard. The fact is that the stylist has a very limited palette. If the calendar of change is speeded up, he begins to run short of acceptable variations. Then, little by little, he is pushed into creating ridiculous changes. When people realize this at a mass level, however slowly, then styling ceases to motivate people to buy.

There is another way out discovered by the designers who use style and function in almost equal quantities. Because it is based in the main on real progress, new looks and forms can generally be generated by functions that are new. But this approach never really works unless there is a genuinely new technology behind it. When the designer attempts to instill a sense of newness into something which is in fact no different, the consumer is seldom taken in for long.

This premise leads to the central question for the manufacturer and designer: What is the optimum point, between a natural cycle of change and styled obsolescence, for changing my product?

#### Patterns to fit the product

We can see many patterns fitted to different product types. The telephone shows a very gradual, carefully spaced change, with appearance directly geared to — and in fact, always paced by—technological change. Most recently, there was twenty years between new models. One reason this works is that the telephone equipment is paid for by the company, not the consumer. It is only a symbol of the service, which is what the customer is actually buying.

We see the same sort of conservativeness about

change, of course, in products that represent a large investment to their owners—i.e. producer goods, where change must pay its own way. However, the closer you get to areas where goods are discretionary rather than essential, the closer you get to an emphasis on new looks and the harder it gets to distinguish meaningful from superficial change. In pots and pans and kitchen tools there is a brisk trade in semi-annual new looks. Several factors defend this practice. 1) Rarely do these looks interfere with the working of the product. 2) Since tooling is often minimal in this industry, there are no economic forces legislating against change if it can be made. 3) Materials themselves often make the difference in appearance as they improve function (as with copper-bottom pans or enameled steel pans), and new materials and techniques literally produce new looks. 4) No one expects one new style to obsolete all that has gone before. The housewares industries offers a vast range of quality and choice in nearly all products, so that the cost of achieving a more fashionable product is borne only by the consumer who wants it.

The individual major appliances that compose a kitchen have enjoyed a more gradual evolution of form. In recent years these products have begun to take on a more integrated appearance, the esthetic goals being related to an understanding that the individual parts make up a whole that is architectural in quality. There has long been yearly publicity about "new" models, but the changes were so minor in character and so gradual that the old and the new could live side by side for the useful life of any single product. And the changes boasted by the exterior appearance were, in the main, coupled with genuine improvements in the functioning of the machines.

But even the smooth pattern of this industry is subject to the upset of radical innovation. Occasionally a new product (the wall oven, for instance) has been produced by a firm so convinced of an idea that it was willing to risk a broad step ahead. What they found was that it wasn't a risk at all. For almost without exception, the companies willing to undertake new evaluations of need, with such products as built-ins or the 30" range, have had the field literally to themselves before the competition caught up. The standard argument of competitors has been that "pioneering is for those who like risks; if and when consumer demand is proven, or created, we'll follow the trail too." Sound as this may appear, the facts of marketing today negate it: the two-year lapse before potential sales can be accurately calculated, and the three-year lapse before an appliance can reach the public, add up to five years of unrestricted market for the pioneer. If the innovation has any merit at all, five years of free market is like being handed the key to the candy shop. Who can afford *not* to take that kind of risk?

As a matter of fact, this realization is causing some fascinating upheavals in the appliance industry today. A number of manufacturers are flying in the face of pressure for the annual model change. They are trying a new approach: they will design and engineer a line of appliances to be sold over a period of several years, and make model changes only when genuine innovation warrants it. They will not, of course, leave innovation to chance, but will rather be in a position, after each introduction, to devote their full creative energies to designing really new products to fit projected needs. This could add up to a successful way to introduce and merchandise all "considered-purchase" products.

There are still other alternatives in, say, the home furnishings industry, where completely new style lines are ushered in as many as four times a year and — representing minor investment and development time —ushered out again if they do not sell. Or in the example of publishing, which promotes completely new titles twice a year, but retains each year's best as part of a staple list that sells year in year out, and provides the backbone of any publishing house.

#### Blind alleys for Detroit

And then there is Detroit—the symbol and source of the Annual Model change. The automotive industry, without question, faces the most difficult problems of all in this area. For one thing, Detroit is already in the midst of a cycle based on a completely retooled line of products every two years, with a face lift on alternate years (which, based on costs, very closely approximates a clean slate) and desperate attempts to give the illusion of complete change in any event. One firm is now claiming all-new models every year. With the emphasis, as it is, on styling and gimmicks first and functional improvements second — and with the really vast number of individual models that each firm must produce each year—this is a prodigious demand for elephants to dance on the head of a pin.

Detroit's pattern of change is not one that suits most industries—nor is it, to our mind, one that suits America's most critical consumer industry either. Styled obsolescence, as we have indicated, suffices in some industries, but it cannot be depended on to perform the monumental miracles that Detroit asks of it —and indeed *needs* of it. For styled obsolescence is *not* planned obsolescence, since styling is a piecemeal (short

term) rather than goal-oriented (long-term) activity. Too often, such "goals" as exist in the industry have to do with the next product on the agenda, not with a purposeful course toward the future. Styled obsolescence cannot help getting itself up blind alleys where it must wait, often desperately, for some technological miracle to show it the way out.

**The short-term fallacy**

In the confusion of Detroit, we see dramatically how the security of "short term styling" breaks down. Auto stylists continue to work on the assumption that new models worked out year-by-year mean less of a commitment, hence less of a risk. What they overlook is that the only risk worth taking, at this scale, is one based on a firm commitment. For styling as Detroit must do it requires long-term commitments, and these become enormous gambles unless backed by long-term planning. The all-new models of 1958 were commited to paper in 1955, and to metal in 1956. The Edsel, a wholly new product said to have cost $250,000,000 to develop, is the result off four years research into "what the consumer really wanted in a middle-bracket car." The conclusion that one cannot fail to reach, from its apparent and proven lack of success, is that it was indeed research into what people wanted—four years ago. For during its prolonged period of gestation, its little sister Ford grew up and filled the need for a middle-bracket car. At this rate, with planning lacking at several levels, a new car family becomes just as much of a gamble as a totally new car type.

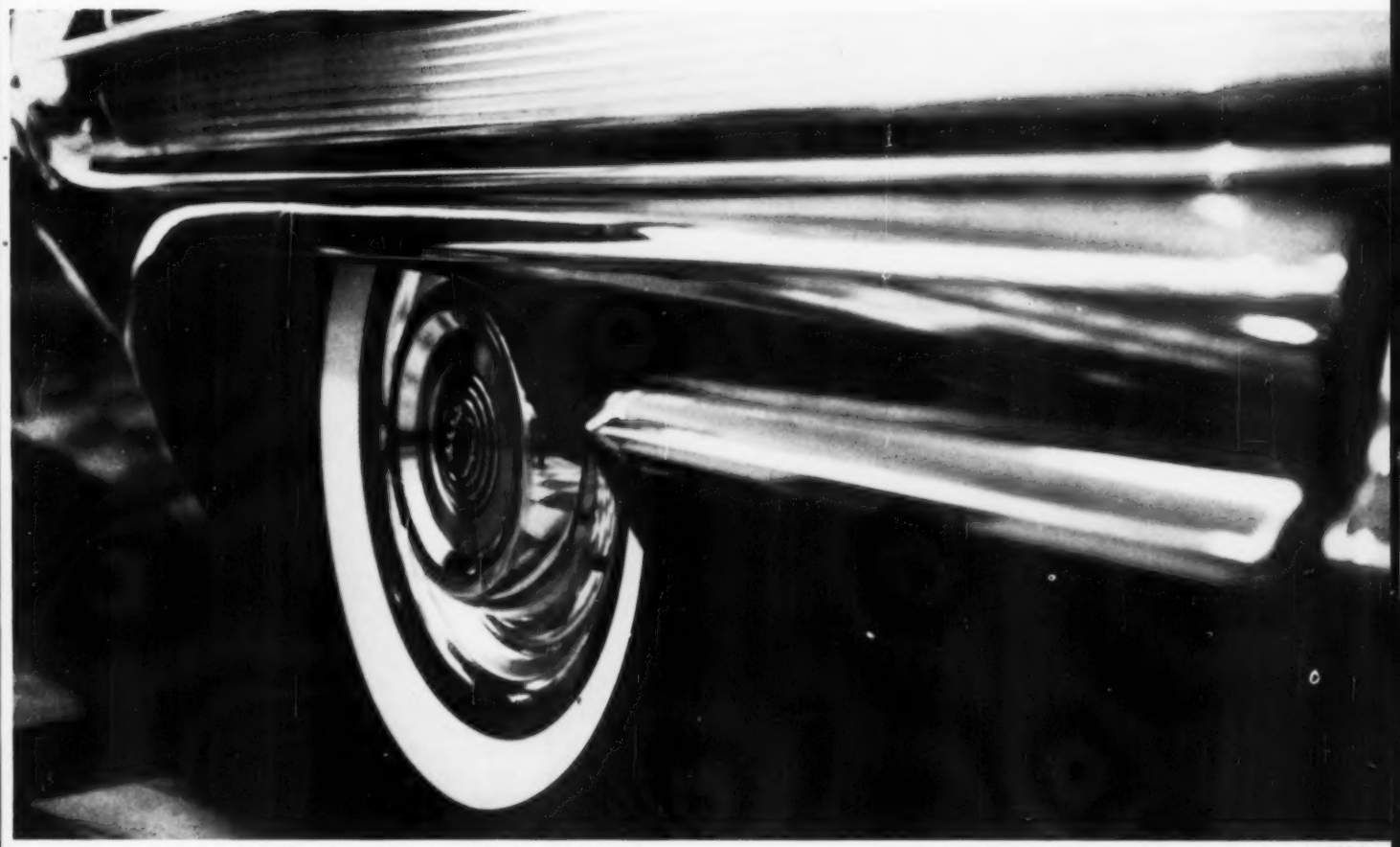
What is planning in this context? It is, generally, a manner of thinking. It is the willingness to push out and beyond the immediate environment for a new answer, and then to plot the steps necessary to its achievement. Planning *synthesizes* fact and feelings of probable lines of future growth. Planning does not wait for research to come to the rescue with a new technique; it feeds problems to research in order to get answers it hopes may meet the needs it already anticipates.

Planning has admittedly been employed by the auto industry. It produced the pick-up truck and the station wagon, two valuable products that have, unfortunately, been almost styled out of usefulness. But by and large the word "planning" has, in our opinion, so far been misunderstood in Detroit. This was pointed up when we were recently asked by an acquaintance if we thought the Volkswagen would replace the Chevrolet. The idea startled us because we have assumed for some time that the Volkswagen *has* replaced the Chevrolet —as it was, not as it is. It seems to be a fact that the American "small" car is so busy replacing the big car that it has left a neat vacuum, and little imported cars are literally being invited to fill this space as fast as they can move in. Another question seems much more critical to Detroit: Has the Chevrolet replaced the Buick—and can changing advertising agencies reverse a trend that can only be blamed on lack of basic planning?

But perhaps the most important feature in a definition of planning, and of the design that takes place within its orbit, is this: planning acknowledges that a product must relate to its next larger context. In the case of a refrigerator, it is the kitchen; in the case of the automobile, what? The city, the roadscape. When anything as domineering as the car finally reaches the point of violating the next larger context, it cannot get away with being just a bother: it becomes the object of ridicule, and ultimately of civic action. It hardly seems necessary for the mayor of a large city to point out to car manufacturers that their product will no longer work in the existing community, for it is here that planning should begin. And yet it was necessary. Mayor Wagner of New York may be annoyed because a Cadillac takes up two parking meter spaces, but his protest simply backs up, with the weight of civic authority, the unheeded cries of the American consumer, who for years has been unable to get his car into a standard garage.

For the millions of dollars that it cost to launch the Edsel, it seems possible to envision any number of experiments that would give the industry a grip on the future and a less skittish relationship to its next larger context. We'd be willing to bet that it would pay for all the research and development necessary to eliminate every single car from the streets of downtown Dallas, and to equip the city with a small, light electric vehicle that would answer the problem of congestion in big cities. Considering all the crowded cities in the U.S.A. (not to mention Paris), that could offer a considerable market for a product planned to meet it.

Dr. Jacob Bronowski once said thoughtfully that there are two things people can be induced to consume because it makes them happy: food and dope. Both stimulate the mind and body, but in the long run only one provides the nourishment to keep the person alive. Because our economic system as well as our digestive system needs nourishment, this seems like a good question for manufacturer and designer—in their own self-interest—to ask themselves: Is this change food for the system, or is it a drug?



Arnold Saks

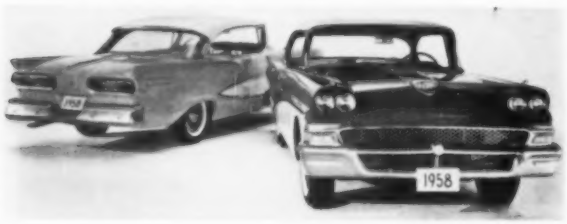
CARS '58

# CRISIS YEAR FOR CARS *by Deborah Allen*

*Slipping sales suggest some change is necessary, but what direction should it take?*

Last year's sales figures offer new proof that car making is a slippery business. And they aren't the only omen. Although annual complaints about the size, unsafeness, and vulgarity of the new cars are traditional, this year the voices are louder. New York's Mayor Wagner spoke for countless worried planners with his complaint to the five car manufacturers that big cars have shrunk curb and garage space and intensified traffic congestion. Ford's promise of major styling changes every year gave pause to car men and laymen alike. At the quiet center of controversy, Detroit is apparently unanimous for longer, lower cars with softer, lower seats and costlier features. Yet the new cars reveal certain dilemmas: If low-price cars are luxury liners, and if high-price cars are out of this world, what happens in between? Can the Buicks and Mercuries maintain sales with a quick face-lift and more make-up? At this early date, sales figures tend to support the face-lift. GM, which skidded last year, is on the mend with a new-looking line. Chrysler's unchanged cars have slowed up and Ford's various lines are selling in rough proportion to their novelty. But sales figures can be interpreted in various ways.

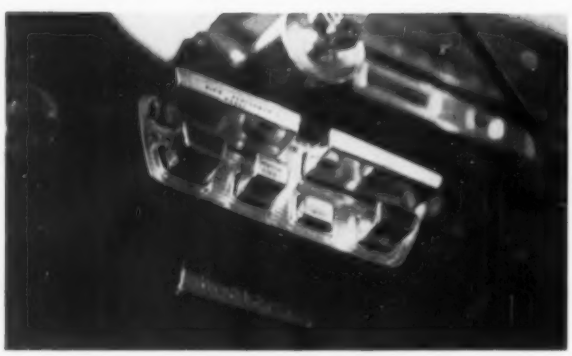
## Ford revamps the top of the line



FORD

EDSEL

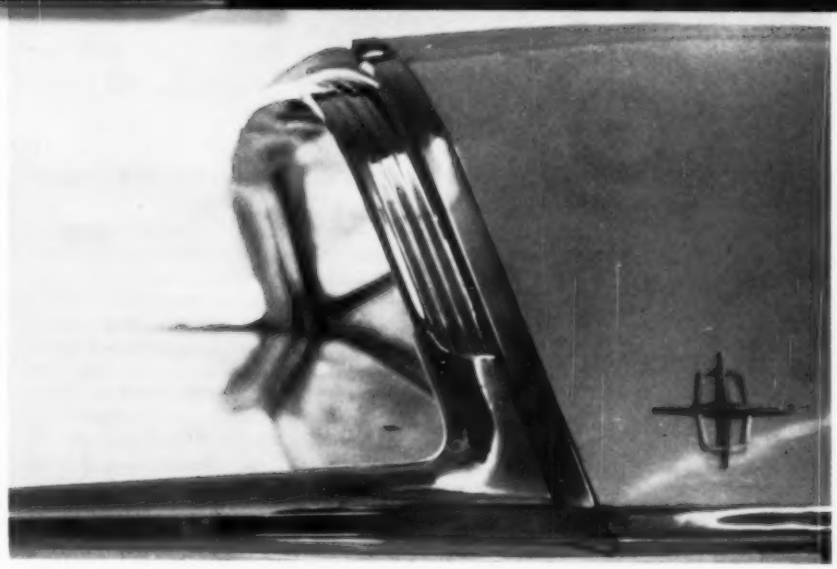
MERCURY



**THE LINE.** Ford likes to emphasize family relationships among its cars: Lincoln was supposed to be influenced by the first Continental, Mercury learned from Lincoln, Ford learned from Thunderbird, etc. If the company keeps its promise of annual major changes, we may expect looks to be passed around like so many hats. Actually, Lincoln has the only all-new body this year. Chief evidence of the $185,000,000 reportedly spent on **Ford** are a new bumper-grill that emphasizes the racy cant of the headlights, a fluted roof top, and oblong rear light mounts pasted across the trunk opening at a height that makes the car look unnecessarily bulky. Under the superficial sculpture, Ford remains long and flat-sided, plain but not unpleasing. Access and interior finish still await improvements.

**Edsel**, Ford's third new car since the war, made the bad mistake of prancing into the medium-price market as the medium-price market gave way to pressure from below. But the shopper, unconcerned with statistics, can take a simpler view: what does Edsel offer that familiar cars don't? Designwise, the answer is largely hybrid: a rear roof overhang like Mercury, a rear fender motif from '57 Ford, and rear lights that are neither straight (Ford) nor bias-cut (Mercury) but a curving compromise. The boldest feature is the illusion of a narrow nose on the broad front end, an attempt, it is said, to recall "the elegance of motoring three decades ago." When we look at Edsel, we recall that thirty years ago was the time not only of classic cars but also of *moderne* and its factory counterpart, borax: stylized triptychs based on the skyscraper, cut-away corners, light pillars, oval mirrors, chrome bandings. Among Edsel's practical features are wheel-mounted shift keys and a one-switch heater.

**Mercury**, squarer than ever this year, has adopted the Turnpike Cruiser's rear roof overhang throughout the line. This doesn't seem to improve rear seat vision, but it may prevent the back shelf from becoming a furnace in the sun. Mercury's drive controls (left) are arranged in an interesting keyboard with brake release and warning.

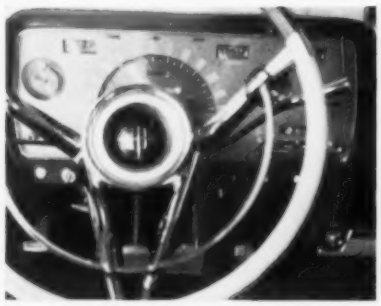


**THE NEW LINCOLN.** Except for the limousines, the brand-new Lincoln is the longest car on the road. At 229 inches, it is 4 inches longer than the last model, which also broke existing length records. The Continental, which Ford spoke of as a refining influence on all its cars, must have had the desired effect on Lincoln. Whatever the reason, it now shares Lincoln's body and is no longer custom but simply extra-high-price, like Cadillac's Eldorado.

On the inside, Lincoln is the only car that achieves richness by means of a calculated simplicity. The dash panel, a plain slab of brushed metal that looks like machined steel, stands well forward from the cowl. Round, bluish metal dials have white numbers. Like Edsel, Lincoln has a heating system controlled by just one knob. Leg room is abundant except over the drive shaft; anyone crowded into this third-man spot might get a sharp crack from the dash edge in a crash.

From the outside, Lincoln's attempt at elegant understatement is less successful. American cars often look as if they were based on quick sketches rather than a careful study of form. At Ford, especially among the high-price cars, these sketches are apparently in clay: on Lincoln's side-body, the sculptor's tool shows clearly in swift long lines, sharp edges, and concave modeling. This breeziness is slightly out of place in expensive hardgoods—with a little more time the sculptor would certainly have smoothed out the kick of metal ahead of the front wheel, the dust-catching ledge down the body, the extra metal at the back window. Furthermore, this sophisticated side-modeling conflicts with front and rear motifs that seem to be borrowed from below: sloping light mounts and chromed ovals recalling Edsel and Mercury, and coy wings from the lowly Ford.

Undeniably, Lincoln has a certain elegance, but one cannot help feeling that the company's deliberate working over of a limited vocabulary of motifs — stylized motifs that bear little relation to function or to a total design concept—is bound to have rather synthetic results.



**LINCOLN**

## At General Motors it's Chevrolet's year

**The Chevrolet.** GM — unlike Ford — does not encourage the trading off of design motifs; the main reason the all-new Chevrolet looks so much like GM's bigger cars is because it has caught their substance—**and** something of their size. It is now 209 inches long, which is two inches longer than the longest Ford, three inches over Plymouth, and a fraction over the Oldsmobile 88. To achieve the lowness of its competitors, Chevvy uses a new frame that seems to provide good interior space, although some doubts have been expressed about its strength. Rather than a box frame or an x-frame, this is an "hourglass" frame that concentrates structure at the driveshaft, where there is a hump anyhow. In place of the heavy side rails that brace the usual x-frame, Chevvy has light rails attached to the body rather than to the frame.

In decided contrast to Ford and Plymouth, with their wings, cants, and cantilevers, Chevvy is built tight against its building line—it looks almost as though it had been blown into shape against the sides of a box. This gives it a substantial appearance, emphasized by the absence of sharp breaks in the metal, the hooded look of the roof, and a bumper-and-grille heavy enough to recall yesterday's Oldsmobiles. Although it is conservative by 1958 standards, the new Chevrolet should be a big success. In the tradition of GM's big cars, it is both massive and breezy, yet wholly lacking in style. The gull wing is as easy to identify and as annoying in its relationship to the rest of the car as all of GM's trademark tails. Interior detailing is unremarkable, but careful workmanship adds to the car's substantial feel.

**CHEVROLET**

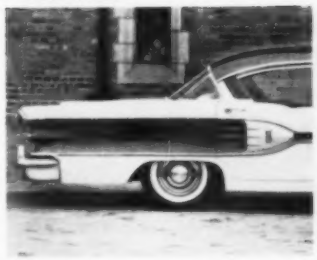
**The rest of the line.** More than one **Pontiac** dealer has been heard to complain that Chevrolet is his biggest rival. Pontiac's problem has always been to offer more than Chevrolet on a body that is basically the same. On '58 Pontiac, the trademark is not integral, like Chevvy's new gull wing, but a gaudy panel of decoration on th rear quarter. Bumpers are extended, there is more chrome all around, and upholstery is flecked with metallic yarn. As a result, Pontiac looks bigger but somewhat less reliable than Chevrolet. The dash, which recalls a rather effective series of dials that stood isolated on the cowl of a GM dream car several years ago (Chevvy's upgrading included the borrowing of Pontiac's wrap-around dash) is covered with gleaming non-sequitors. Two of the large "switches," for example, are actually pull-out ashtrays.

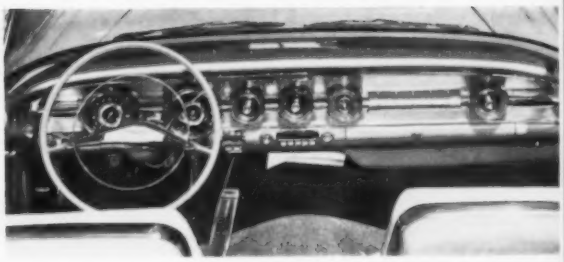
Now that its heavy, hooded look, deep roof, and low center of gravity have filtered down to Chevrolet, **Buick** is reemphasizing its greater weight and worth with still more and heavier chrome. In what is a major change for Buick, the weight has been moved to the rear, where heavy, chrome-striped bombs are hung on the rear quarter panels. Beneath the chrome-sheathed rocket tails, the bumper suggests another pair of bombs. This arsenal of chrome, which is unusual even on GM cars, is complemented in front by a series of four take-off rockets. All in all, Buick is a gaudier car than it has been since the early days of streamlining. Buick's dash panel is virtually unchanged. The overhanging cowl, a detail found on many cars this year, is generally described as a safety feature, but its sharp edge looks as dangerous as the knobs it is supposed to shield.

**Oldsmobile** seems to have adapted the gull-wing idea to the front of the car, where it terminates as an enclosure for the headlights. It is interesting that this suggestion of an insert is, on several GM cars, the only hint of a break in a solidly packed body. GM designers have never cared to admit that their medium is a sheet material: when GM's dealers say "That's a lot of car," they can thank their designers for underscoring their words with a solid look. It is also interesting that GM, though devoted to the winged tail, refuses to use a rising line at the rear. This year, in a seeming gesture of defiance to competitors, the horizontal is reiterated in every car.

With chrome and weight added to GM cars all along the way, **Cadillac** is about the cleanest and lightest-looking body of the whole line. Among minor changes are the building out of hood and fenders to give the **appearance** of greater length to a car that really has no place to go. Cadillac's air suspension system includes a lift valve, operated from the dash, that allows the driver to raise the car five inches for getting over humps.

**PONTIAC**





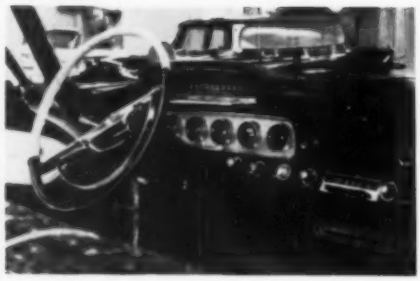
**BUICK**

**OLDSMOBILE**

**CADILLAC**

**PLYMOUTH**

**DODGE**



**DESOTO**

## Chrysler Corporation stands pat, makes only subtle changes

Chrysler is staking itself on a premise quite the opposite of Ford's. The premise: if you have a good seller, you don't need to change it—at least not right away. This unique policy keeps last year's cars in style, and gives the company a chance to iron out any bugs left in this year's cars. But Chrysler's dealers, a famously loyal lot, are asking if the improvements had to be quite so subtle; many claim it takes an expert to see the change from '57 to '58.

One thing that makes **Plymouth** look different this year is its contrast to the new Chevrolet. Plymouth's body is basically neat, but beside the tight-knit Chevvy its wings and canted front end—which are unequivocally decorative in purpose—give the whole car a frivolous look. Plymouth, Dodge, and DeSoto are alike in their wrap-around bodies: instead of hooding the car, the sheet metal stops abruptly at the front and rear lights, so that the body looks almost like an extrusion with the innards slipped in from one end. The effect is heightened by flat metal inserts around the lights and a new bumper that mimics the sharp edge of the hood. Although there is a certain honesty in the concept, it makes Chrysler cars look like lightweights beside more fully-sculptured lines.

Plymouth's interior is a model of neat detailing, but the outside is finished with a hodgepodge of chrome, stainless steel, and textured aluminum sheet. This dual standard of quality is found throughout the Chrysler line.

**CHRYSLER WINDSOR**

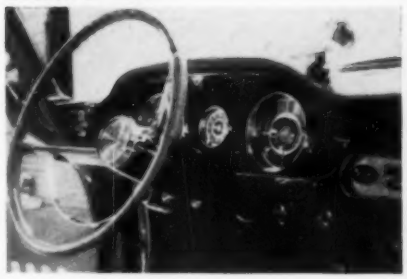
**CHRYSLER SARATOGA**

The tendency with middle cars, as with middle children, is to show off. **Dodge** and **DeSoto** have this problem in an unusual degree just because the Chrysler line is so much more of a piece than most lines. Somehow these two must offer more than big Plymouth, yet less than the top cars in the line. Rising prices are expressed on the one hand in more luxurious details, on the other in increasing gaudiness. It seems most appropriate that the Chrysler line culminates in not one but two cars: Chrysler and Imperial.

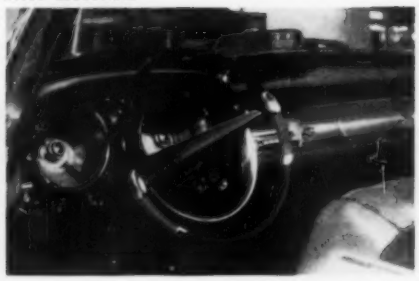
In **Chrysler**, easily the most tasteful of American cars, the flight lines are toned down, the trim is minimal, the nose is tapered instead of flat. Dashboard dials are big, like the instruments on all big cars, but they are sensible. **Imperial**, however—with its long swaybacked line and bubble roof, the elegant penmanship of the repeated circles on its tail, and the obscene size of its hooded instruments—is easily the most extreme of American cars. How can one company produce two such different effects in cars that are broadly the same? The answer, we think, lies in a rare design skill that manipulates form as chrome is usually manipulated.

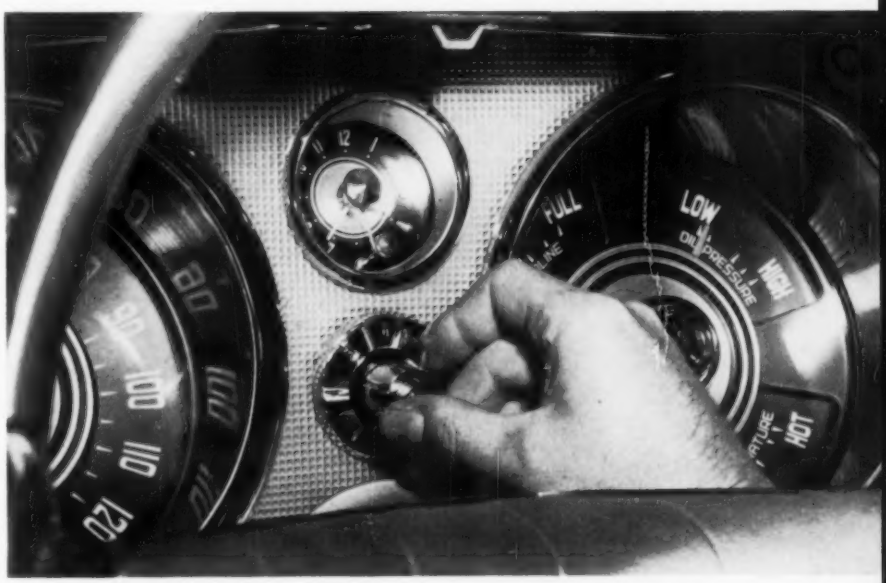
The sales records of these two cars tell a lot about the current car market. Hemmed in on the side of luxury by Imperial, Chrysler is trying to bolster slipping sales with a new lower-price line of Windsors (the nose of the Windsor, shown on the opposite page, eschews the tapered line for the hard edge of the Plymouth-Desoto bodies). Imperial is following the commoner course by piling luxury on luxury. So far, it is the only Chrysler car to show a sales increase with '58 models. Among the optional extras this year are a new version of the wheel-embossed trunk lid (last year, the company says, this option was purchased by 80 percent of its buyers); two sizes of extra-soft tires; and an "auto-pilot" (shown at right) that maintains a set speed until the indolent driver touches gas or brake pedal. Imperial, in fact, is one of the few contenders for a '58 record in percentage sales gain. Another contender is Rambler. (Page 81).

**CHRYSLER**



**IMPERIAL**



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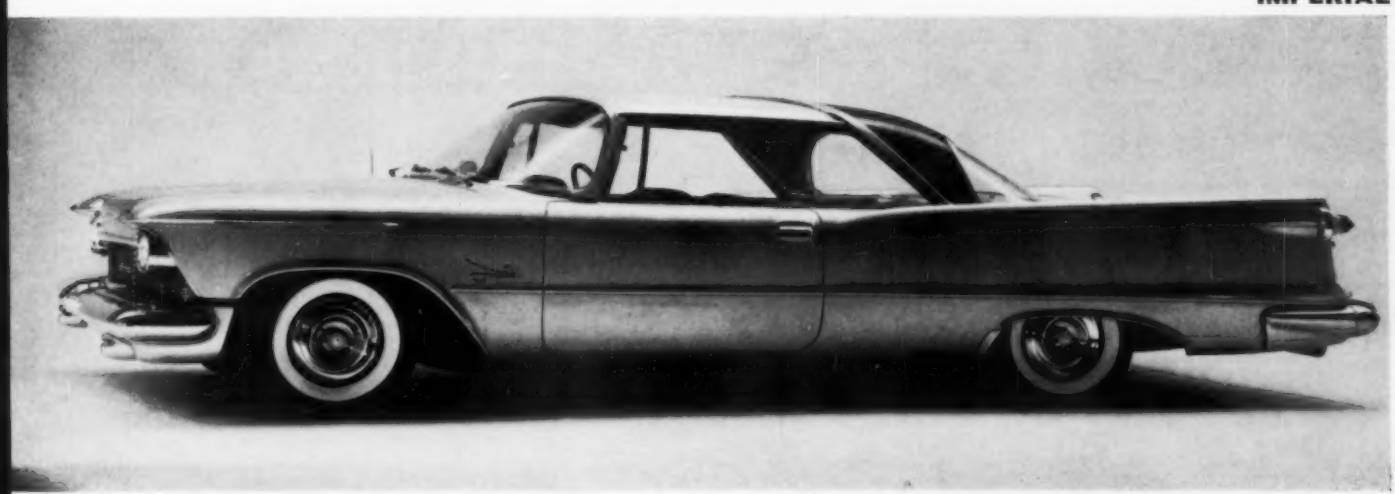
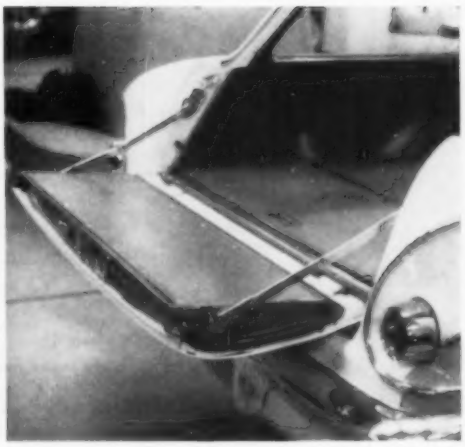


# The wagon: sales are climbing faster than utility

The 1958 station wagon is almost as unvaried as the ordinary car. Faced with such questions as whether to build a passenger car with extra cargo space, or a small truck, or a bus, how important the third seat is, and whether to spring for loads or comfort—most manufacturers end up simply making a sedan with an extended roof. Rear seats are generally uncomfortable, hardware menacing, finish atrocious.

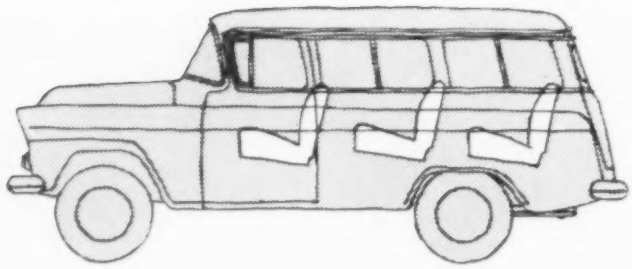
Though traditional in layout, the new **Chevrolet** wagon is distinguished for a lower, more comfortable second seat, neat and practical detailing and finish in the cargo space, and a lift gate cut well back into the roof to make the rear opening about as large as the cargo space itself.

The most ingenious wagon on the market was introduced last year by **Chrysler Corporation**, which uses one basic body for all its lines. Chrysler's third seat (optional, like all third seats) faces rearward and folds into the floor so it needn't be removed for load carrying. Located behind the axle, it is a lot more comfortable than the usual third seat, which sits high over the wheels and crowded against the second seat. Furthermore, since the third seat is placed over the bumper, the second seat can be full length and one piece. Chrysler has also simplified the back end by replacing the lift gate with a roll-down window in the tailgate, and designing the tailgate to rest solidly on the bumpers so hangers are unnecessary. In three seaters the spare is under a hinged fender section, or omitted and captive-air tires used.

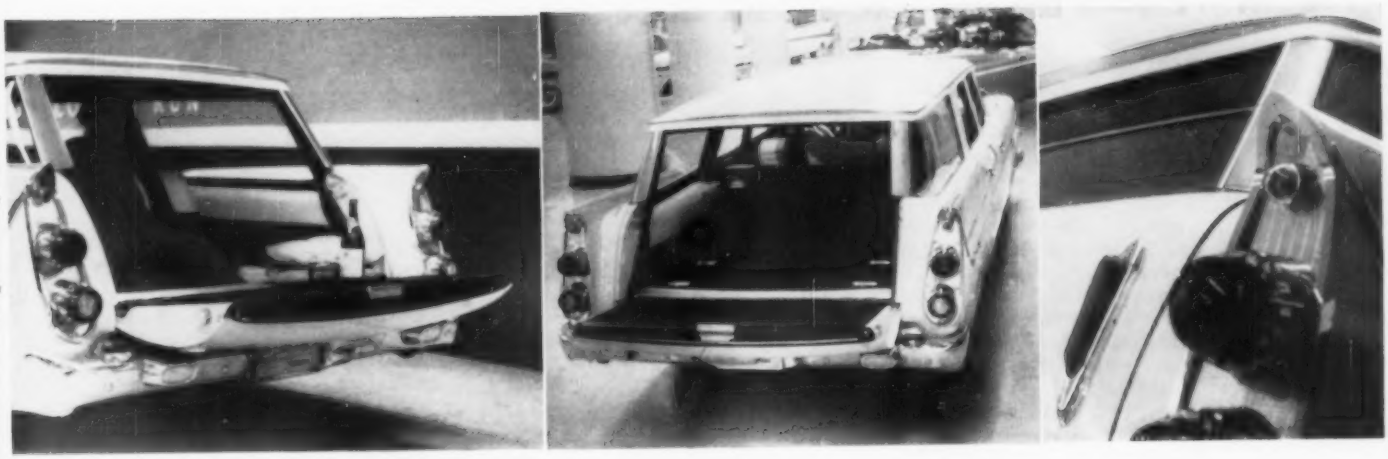


**CHEVROLET**

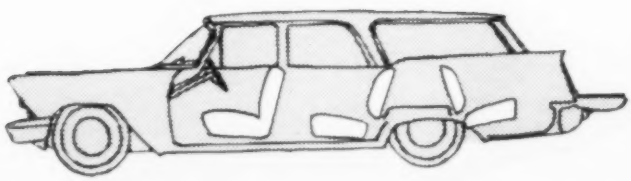
**CHEVROLET CARRYALL**



Although the standard wagons of all five carmakers are essentially modified passenger cars, GM and Ford also offer wagons on truck chassis. The Chevrolet **Carryall** offers a lot of cargo space in a body so high that there is a step inside the front doors. Side doors and second and third seats are optional. Designed more particularly for family use, International Harvester's **Travelall** is a real load-carrying wagon, with old-fashioned legroom and cargo space that outdoes the standard wagons in every dimension. Its overall length is just 202½ inches. Instead of two or four doors, the Travelall has three, allowing access to the second seat from the right curb side only. Large, neatly outlined windows contribute to the straightforward good looks of the Travelall (unfortunately, this cannot be said for the bolt-of-lightning motif on more expensive models). Travelall is not cheap; it starts at about $3000. For those who can afford it, options include automatic transmission, roof-mounted radio, and panel doors in place of the tailgate at the rear.



**CHRYSLER CORPORATION**



**IH TRAVELALL**

# The small car—a big gap left by the big three

Small cars still don't command a big market proportionally, but they're causing quite a stir in the marketplace this year. More and more dealers (especially, it seems, those with middle-price cars) are taking in a small imported car for extra revenue. American Motors has finally turned its sales curve upward by limiting its line to scaled-down cars. And GM—never a company to throw unnecessary compliments in the direction of competition—must know what it's doing when it imports two of its own foreign makes—the Vauxhall and the Opel—for Pontiac and Buick dealers respectively.

The English **Vauxhalls** and the German **Opels** are fairly unremarkable 4-cylinder cars combining European proportions with low seats, wrap-around windshields, and faint-hearted sweepspears. Built on a 100" wheelbase, the Opel Rekord is 174" long, about 64" wide; Vauxhall's Victor Super is about 8" shorter. Though they only qualify as five-seaters, space is one of their advantages: despite the low seats, legroom is generous; roomy trunks have the spare stored upright so it is easy to get at even when the trunk is loaded.

**VAUXHALL VICTOR**

**OPEL REKORD**

The only U. S. cars that can be called small or economical this year are those of the "little two," Studebaker-Packard and American Motors. **Studebaker-Packard** has achieved this distinction by default—unwilling or unable to tool up a brand new body, the company has made the most of a trend by identifying its modestly-scaled cars with sports cars. Now with its stripped-down "Scotsman" series, it has leapt into the "economy car" vacuum. The old Studebaker body is still more interesting than most.

**American Motors** this year is facing with renewed verve the problem of how to compete among companies it cannot emulate: it has staked a claim on the small car field with a line that starts at the tiny imported Metropolitan and ends four cars later with the Ambassador V-8, which at 200" overall is shorter than anything from the big three. Sharper, simpler lines have benefited bodies that—despite grotesque styling—were always distinguished for the square unbroken windows made possible by unitized construction.

**STUDEBAKER SCOTSMAN WAGON**

**RAMBLER AMBASSADOR WAGON**

What about the small car that is so noticeably missing from the lines of the big three this year? Should it be a midget or a modest sedan or a stripped-down economy car? American Motors is taking no chances. In between Metropolitan and the bigger cars it has inserted the **American**, a revival of its 100"-wheelbase Rambler of a few years ago (with Nash and Hudson officially obsolete, all American's cars are called Ramblers). The American lacks many advantages of the bigger Ramblers, which, despite their compact size, are genuine U. S. cars with the usual sitting-room luxury. But it has many others: it seats five (three in front); its accessible six-cylinder engine comes with a do-it-yourself repair manual; automatic transmission is optional, and so are reclining seats.

Though the car is no beauty, neat design is one of the American's virtues. Bumper, grille, lights, etc. look well made simply because they were designed to suit the tools that made them. All the instruments are compressed in one dial, and a steering wheel set tight against the dash puts the driver on top of the view. Yet head space and leg space appear to be ample. One disadvantage is the small, badly arranged trunk. A higher rear deck would have given more room and also made it easier to find the rear end in the mirror.

The American's high price ($1900 and up) raises the old question of whether it is possible in the U. S. to produce a really low-cost car.

**RAMBLER AMERICAN**

P *roduction*
S *pecialties*
1

*How did a former industrial designer overcome the various difficulties of mass-producing precision industrial parts and packages from plastic rolls? What's in it for designers? What new product potential does this new technique promote? These are some of the points taken up in the first of a new series in Designers' Aids and Sources—investigations of techniques of manufacturers whose experience and unique production methods offer critical contributions to the successful output of new designs.*

# PRESSURE-FORMING, AN AUTOMATIC PROCESS FOR LOW

Two Long Island City, New York, organizations—Design Center Inc., designers and builders of *automatic pressure-forming* equipment, and Plaxall, Inc., manufacturers of pressure-formed packages and industrial parts—are headed by a man who was himself once an industrial designer, and who has contributed greatly to establishing the new production techniques that characterize the activities of both his companies.

Louis H. Pfohl (opposite page) won't so much as show a photograph of the automatic equipment he has developed over the years, so secret are some of the operating techniques behind pressure-forming. Pfohl does, however, talk about the principles that make this method an automatic process, how it differs from vacuum-forming (to which it is related), and the type of designs this new process can put out economically. And he is frank in pointing out where and why it should not be used.

Speaking at a recent conference on packaging, Pfohl said:

"There is no conflict between pressure-forming and vacuum-forming. Each has its own field. If you have a large display piece or limited packaging job, or if you require refrigerated doors or similar large pieces which cannot be made from roll material, then vacuum-forming continues as the best possible medium. If, on the other hand, you need many thousands or millions of pieces per day of some package or industrial part, and if you must have precision and complete uniformity in both size and quality, then we believe that pressure-forming is the answer."

Pfohl's first encounter with plastic-forming dates back to 1938, when, as an industrial designer, he was carrying

## COST PLASTIC PARTS

*Louis H. Pfohl, president of both, Plaxall, Inc. and Design Center, Inc. is shown here holding a sample of a relief map of the world, manufactured by Plaxall with automatic pressure-forming equipment (the material is .060 impact styrene). Before Pfohl got started in the plastic forming field in* 1938, *he had worked in Chicago since* 1924 *as an industrial designer-architect.*

out a commission for a display case. He wanted to try to form part of the case, the dome, in acetate. He heated the plastic sheet on a gas stove, and formed the dome with Bakelite dies mounted in a foot-press. It was a crude process, but it worked; and it started Pfohl in the plastic-forming business. The first company he organized, Design Center, functioned as a plastic-forming company until 1946, when Plaxall was formed. Today, Plaxall is Pfohl's busy, producing company that works exclusively on pressure-formed pieces, sometimes runs on three shifts, and has turned out millions of plastic packages and industrial parts. Pfohl now operates the Design Center (housed within the same building block as Plaxall) as a research and development firm which builds automatic pressure-forming equipment, and licenses and leases it to other companies. Pfohl and his staff—engineers, machinists, modelmakers, tool-and-die makers—have worked directly with many industrial designers (Nelson, Loewy, Deskey among them) who come to Pfohl for know-how in effecting their new designs with the most advanced forming methods.

Pressure-forming today is an automatic process combining all production steps at a single station. Like vacuum-forming, it employs heat and pressure as its fundamental forming element, but it differs from it in the forming assists used and in the amount of pressure applied during the forming cycle. In vacuum-forming, parts are shaped in molds at atmospheric pressure (14.7 psi); in pressure-forming, dies (matched dies and meeting point dies) are used in forming assists at pressures higher than vacuum (50 to 300 psi). But what has interested designers in the newer method, is its ability to turn out huge quantities of low-cost precision plastic parts on a continuous basis.

Turning pressure-forming into a continuous method was a slow and complicated process; it meant developing equipment which could take care of all operations at one station.

Pfohl's early method of using manually operated presses to obtain the pressures he needed was obviously a highly inefficient use of power, and he began to experiment with a number of pressure mediums to replace the press. He found oil, his first attempt, an inconvenient medium to work with, and tried steam and air pressures. But regardless of the pressure mediums used, the forming process continued to involve a number of separate operations carried out at different stations. During the early heating process—the sheets were heated separately before they could be inserted into the forming machine—Pfohl made some important discoveries: he found that by shielding parts of the material or by heating some sections more than others, the distribution of the material—its thickness—could be controlled, and better and more *complicated* formings could be produced. This was the beginning of the *pattern of heating*—a significant aspect of automatic pressure-forming.

Following the development of a method which eliminated sheets and fed material into the machine *continuously from rolls*, Pfohl was able to combine the major steps—feeding, heating, forming—into an operation cycle carried out at a *single* station, making pressure-forming an automatic process. The various production steps that occur at the single station, the product features that have been obtained, and the product potential implied follow on the next six pages.

## Variables in operation cycle permit a variety of product features

The operation theory of automatic pressure-forming is based on three fundamental steps—feeding, heating, forming—which constitute the structure for the production variables that make this a flexible process; the variables can be controlled to obtain a precision that comes close to metal-stamping.

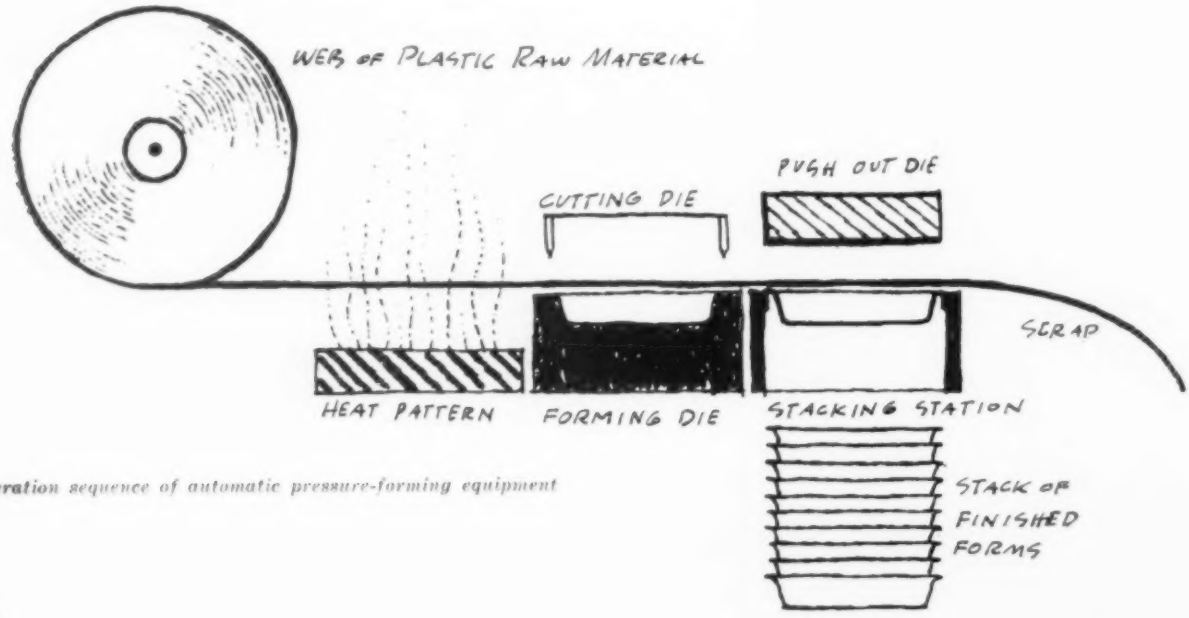
The forming elements of automatic pressure-forming (heat, tools, pressure) are variables, and since a vast number of element combinations are possible, a wide range of product types and shapes can be obtained within the limits of this process. These are material thickness (.0050 to .080), product size, and quantity.

Shape complexity is made possible by the fact that the operation during the forming process can be adjusted at each step of the cycle. The diagram below illustrates the sequence in which the various steps occur with standard Design Center equipment.

At the start of the process, the heat pattern, which varies for each forming type, is applied to the material as it comes off the roll. The heated material section is then transferred and registered accurately over the forming section where the preset forming elements (dies, pressure) are applied, and where such successive operations as blanking, printing, and punching take place; at the end of the cycle, the formed pieces are pushed out of the web and stacked into piles. The precision with which parts can be blanked or punched automatically and continuously by this process is equalled only by metal-stamping; successive operations of this sort are, of course, not possible with vacuum-forming, in which the entire part is shaped in a mold. Nor can a similar complexity be obtained with vacuum-forming, in which the amount or type of pressure cannot be varied.

With pressure-forming, the required type of pressure depends largely on the material thickness. Air is most commonly used, but in certain cases steam pressure is more appropriate. For some complex formings a combination of pressures is needed (another thing not possible with vacuum-forming) — low pressure at the beginning and high pressure at the end of the forming process; for some materials the pressure must be let in slowly, for others the volume must rush in as quickly as possible. To correct for the material variations in thickness or quality — no plastic roll is ever uniform — an operator continuously adjusts the heat pattern, speed, pressures, the heating and cooling of the dies.

Pressure-forming tools and dies usually differ for each product output. The design of the dies is determined not only by the shape of a product but by what it's made of. Without exception the dies are expensive: they consist of cavities and assists; the cavities are made of cast, machined, or sprayed metal, and the assists of epoxy.




*Operation sequence of automatic pressure-forming equipment*

The specific product features that can be incorporated in shapes turned out on automatic pressure-forming equipment, are best indicated by the following outline of what has been achieved so far with acetate, butyrate, vinyl, impact styrene, polyvinyl chloride, linear polyethylene, stretched oriented styrene, pre-plated butyrate.

*Complex shapes*: *curves, undercuts, rolled edges* can be combined in a single product (the specula at right and on the following page); a *reinforced hole* can be punched *at the same time* that the rest of the forming takes place (cord dispenser at right and on page 89).

*Slideplax packaging*: a simple *roll-over* along two straight sides of a package into which a piece of cardboard is inserted; this construction permits easy opening and inspection of the package not possible with the standard blister-type article. The Slideplax track can be combined with any type of package made of thin, transparent plastic.

*Deep formings*: (at right and on page 88) now producible in *a diameter to depth ratio of* 1:3; this method can be extended to form vials, test-tubes, and small bottles.

*Leather-grain texture* surfaces resembling leather can be produced *in* the dies; the polyvinyl package is formed with a double-wall construction which contains a piece of cardboard for structural rigidity. (This type of fabrication has been used by Plaxall to make the lids and base for the Chas. D. Briddell "Carvel Hall" packages.)

A list of some pressure-formed product possibilities includes food packages, caps, bottles, tops, lids, medical examination accessories, disposable plastic cups and plates; paint, cream, ointment containers; plugs, grommets, washers; other industrial products with material characteristics between metal and paper.

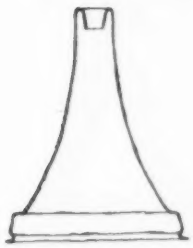
Mass-production is, of course, a prime consideration in determining whether or not this process is to be used. The quality output it can handle is almost limitless: for example, it can produce 7.5 million pieces of an item 4 sq. in. in area, provided the machine runs 24 hours per day, five days a week, and the material thickness is .010. The obvious cases for which application of automatic pressure-forming would not be economical and for which other processes (vacuum-forming most probably) should be used are:

a) products whose material thickness falls outside the .0050 to .080 limits;

b) products needed in relatively small quantities (it is difficult to give figures here, but obviously pressure-forming is feasible only if the quantity required is sufficient to absorb the initial set-up costs);

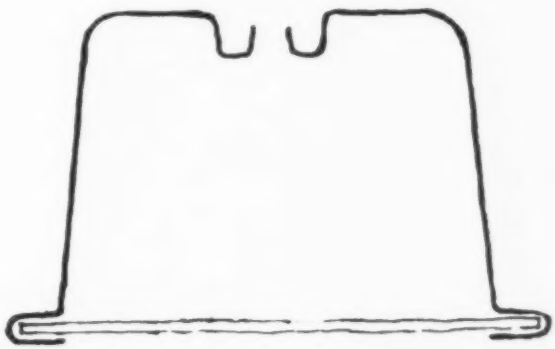
c) large products, for which sheet forming is not feasible; (Pfohl claims that his equipment is in fact capable of forming pieces as large as 27" x 50", but this is theoretical rather than practical.)

Most of the production methods that turned out the design features shown here resulted from specific customer requirements. Pfohl feels that his firm can develop the production cycles and tools for almost any thermoplastic part needed in mass-production quantities, and likes to work with designers on new products that will help in pushing back the frontiers of this new process. Some low-cost products that have been manufactured by Plaxall using the Design Center equipment, are shown on the next four pages.



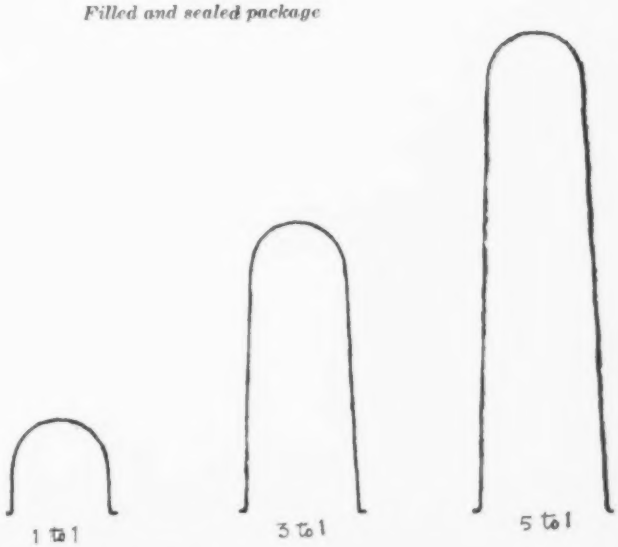
*Complex shape (specula)*

*Slideplax package*



*Slideplax package with blanked top (cord dispenser)*

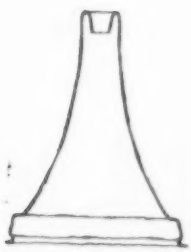
*Filled and sealed package*




*Deep-formed parts*

## Parts come off the machine singly or in sets, empty or filled

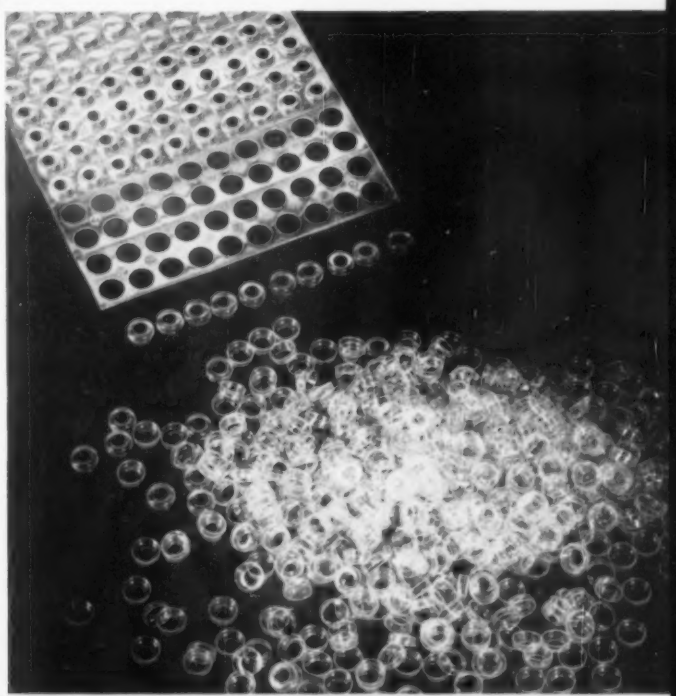
Within the high-speed automatic process a number of combinations of product shape and feature are possible—rolled edge and undercut, luxury interior for jewelry cases and other containers, corrugations and printing on milk bottle tops.



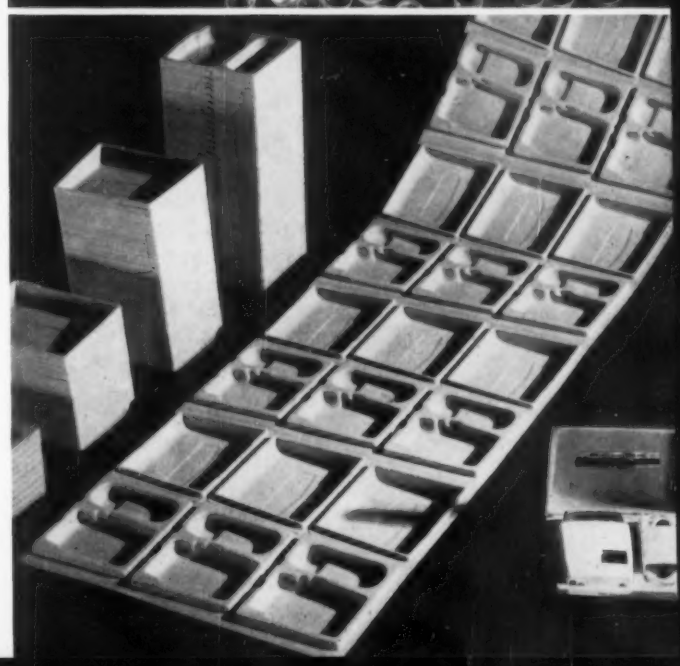
**SHAPE COMPLEXITY** is illustrated by the specula, a disposable cap used with an otoscope—a medical instrument for ear examination. The part has a return of about $\frac{1}{8}$ at the top with a hole in the center; it also has an undercut to permit the piece to snap onto the otoscope, and prevent reuse—the part is torn when removed. The part is made of .010 vinyl, and produced on a 32 cavity die directly from the roll (above) at the rate of 10 cycles, or 320 pieces per minute; each cycle consists of fifteen separate operations including three different pressure formings and two tool formings. The part is being made by Plaxall for Welch Allyn Co.

**SLIDEPLAX PACKAGE** is an inexpensive type of construction (a complete package can be produced for as little as 1¢) in which the sides are bent over to form a track at the bottom. Part of package is piece of cardboard on which printing can be done economically and which is inserted in the track. Unlike the blister package, Slideplax can be opened for inspection. Quantity variations are made possible by tandem dies, with which up to ninety pieces per minute have been produced. Package shown here is made for Tek Hughes hair brushes; .015 butyrate is used.

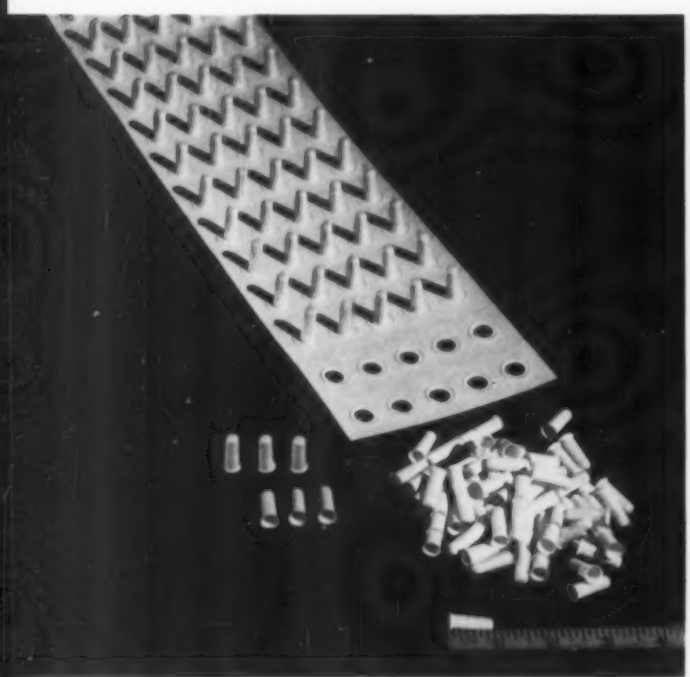
**CONTINUOUS BLANKING,** similar to those used in metal stamping, is employed in the production of such industrial parts as washers or grommets. The successive steps during this type of production cycle are: forming the cap, punching a hole in the precise center, trimming the outside edge, knocking the formed pieces out of the web. The material for these parts is .015 acetate.

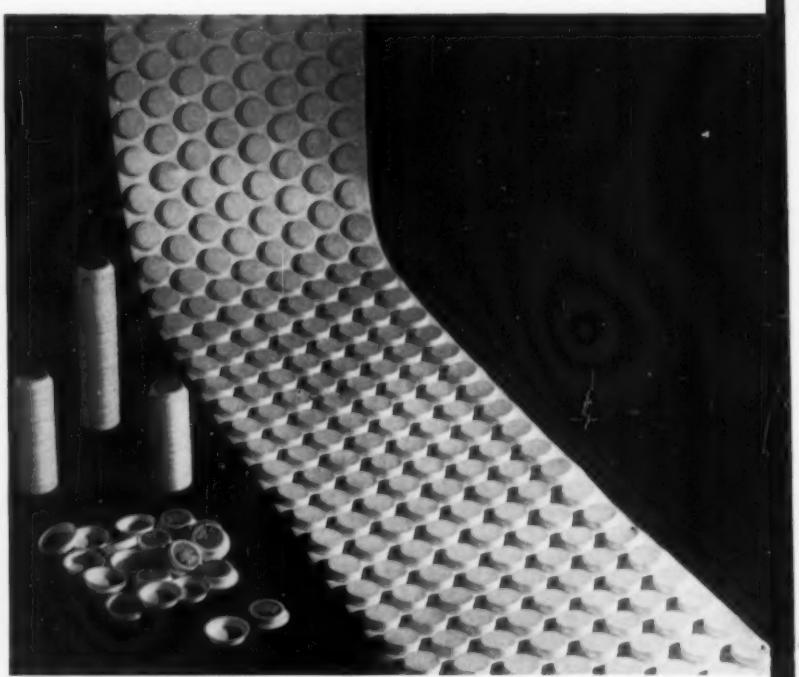


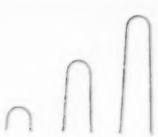
**PREFLOCKED MATERIAL,** .030 impact styrene flocked by the Nashua Corporation, is now being supplied in continuous rolls, and used by Plaxall for the interior of some packages and cases (the Schick Electric Razor case shown here.) Plaxall uses a three-cavity die to form them three sets at a time, at approximately nine cycles or 27 sets per minute; the tops and bottoms are formed and blanked in tandem operations and stacked at end of cycle.



A variety of product features, and the combination of package-forming and filling in one operating cycle, can be achieved without much loss in speed, and—as long as the parts are small—with unvarying precision and a uniformly high quality output.

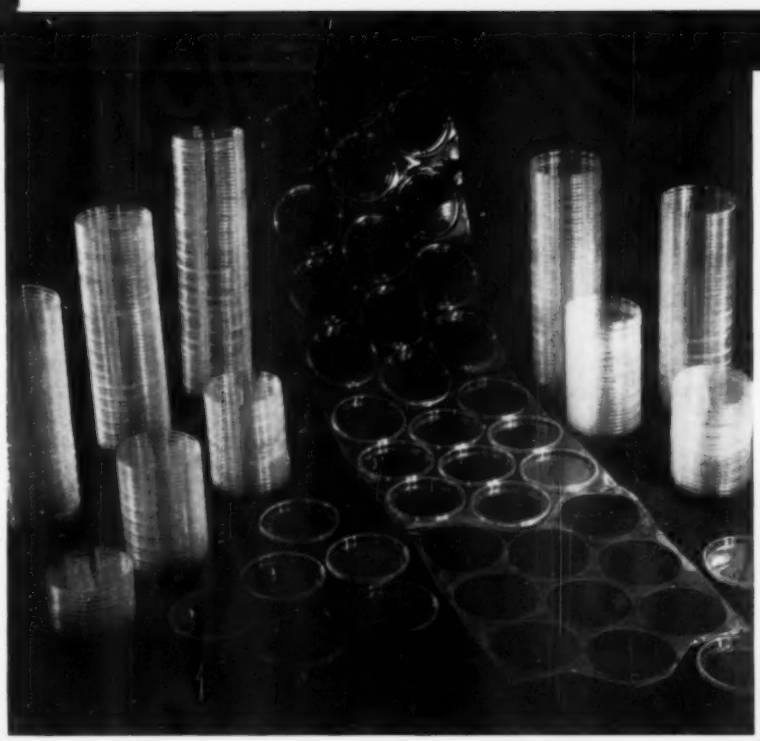






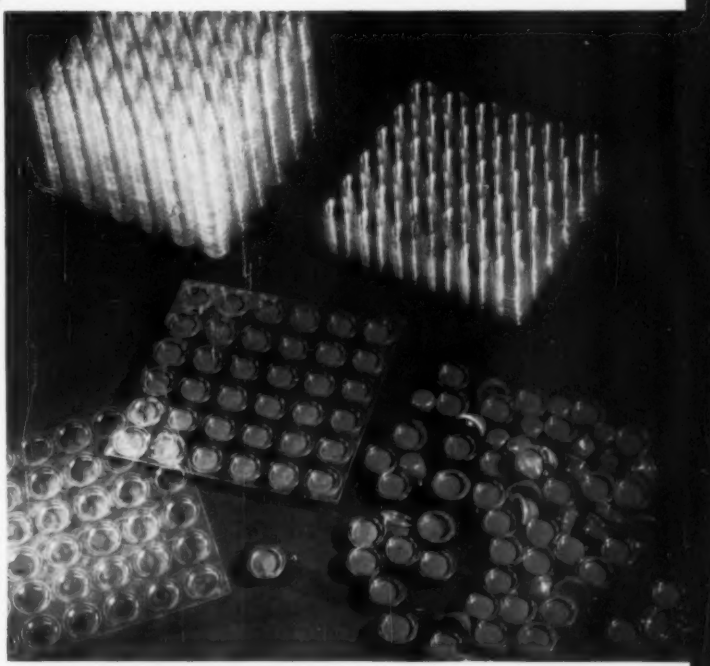
**DEEP FORMINGS** could not, until recently, exceed the dimension of a part's diameter. Plaxall now forms parts with a diameter-to-depth ratio of 1:3, Design Center engineers expect to increase the ratio to 1:5 before long. The medical component shown here has a ¼" opening and a ¾" depth, and is made of .020 vinyl. The succession of operating steps is similar to other cavity formings; the parts are punched out of the web at the conclusion of each cycle.

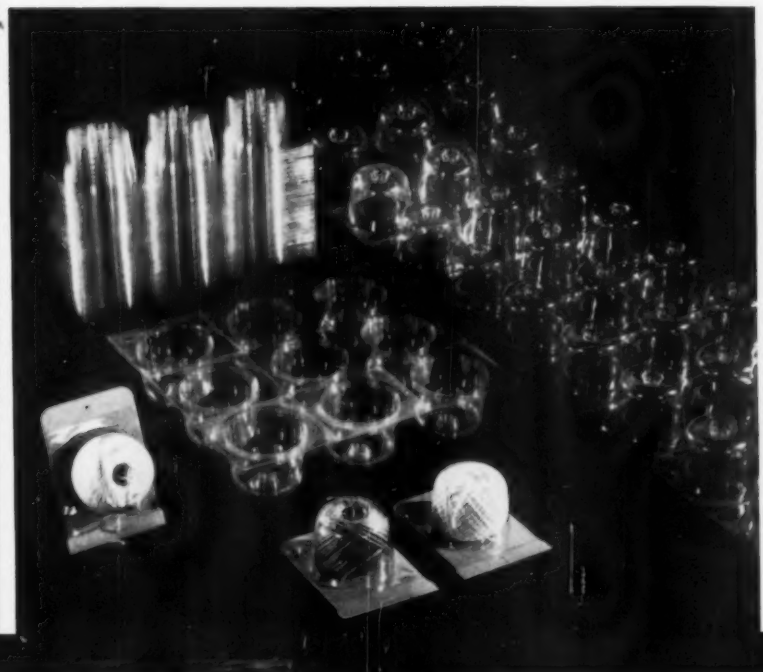
**CORRUGATIONS AND PRINTING** are part of the total production cycle performed on special equipment the Design Center built and licensed to the Sealright-Oswego Falls Corporation for the manufacture of milk bottle caps. The caps are self-sizing as the result of the very fine corrugations around the rim of the cap which permit self-adjustment to the bottle tops. The corrugations also make it possible for the caps to be taken off many times and replaced without losing their sealing ability. The machine can turn out caps at a rate of over 1 million per day; to conform to the material requirements for food packaging, the caps are made of a special formula non-toxic .010 Bakelite vinyl.

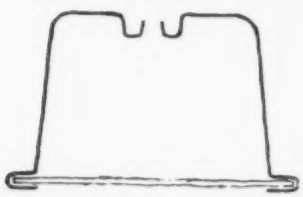


**ORIENTED STYRENE** has been a difficult material to form because of its tendency to contract; those oriented styrene parts that have been produced commercially were shaped on large equipment with individual forming stations where the pieces had to be blanked before forming could take place. Design Center has developed new automatic equipment capable of producing oriented styrene covers by very exact control of the cycle. The .010 material is fed into the machine in continuous strips.

**FORMING, FILLING, SEALING** can be done in a continuous operation cycle for packaging certain food, cosmetic and medical items. The paint-holding cups shown here are used in numbered paint sets; the cups are formed (seventy-two at a time) on one machine, the lids on another. An automatic filling machine fills thirty-six cups at a time; the lids are applied and sealed before the units are separated from the web at the push-out station. The material is .015 acetate.







**COMPLEX SLIDEPLAX PACKAGES,** twine domes, combine complex blister shape with Slideplax construction. The dome is formed first — main forming includes a reinforced hole punched in the center — and the sliding track is shaped at the bottom in units of three; these are stacked and shipped to the customer, where they are separated and filled. The twine domes are made of .015 Celanese acetate; nine pieces are formed every seven seconds at a precise rate.

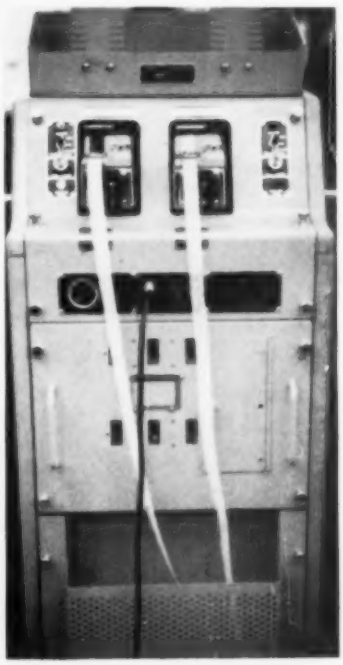
## Business Machines

All but obscured by the bright dazzle of pink typewriters and aqua dictating devices, were the technical innovations in last year's crop of business machines. Colors are brighter than ever this year but the viewer, accustomed to their dazzle, is, happily, less blinded, and more likely to observe such subtler novelties as punch tapes, in desk-size machines, and voice-actuated dictating recorders.

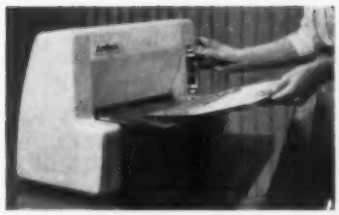
↑ **Invoices and orders** are figured, typed, and memorized by the IBM 632 calculator, which consists of an electric typewriter, a ten-key keyboard, a magnetic "Memory," and a program reading device. Small typewriter takes data; large machine automatically prints out the results.

↓ **Punched tape** acts as common "language" for many modern machines, forming the basis for integrated data-processing. The Remington Rand electronic typewriter both writes into a punched tape and translates into letters, punched tape prepared by it or other machines.

↓ **Teletypewriter** set by Kleinschmidt Inc. is comprised of two units transposing punched tape into sequential electrical signals for use in, among other systems, data processors. Pictured: reception console.



↑ **Sales slips** are said to become old fashioned with the introduction of the Clary Transactor, which adds and machine-prints sales checks, thus eliminating the need for sales books and penciled records. The automatic printing calculator rests on a turntable, lazy-susan-style, for operation from either side of the counter. The total Transactor unit includes cash drawers, electronic tape punch section, open-two-way bag compartments, control mechanism box.



↑ **Plastic film,** clear cellulose triacetate, encases either or both sides of business papers, drawings, or cards for preservation, in the Ply-On by the American Photocopy Equipment Company.

↓ **Hot water** tap and ice trays have been added to Kelvinator's Hot 'N Cold, extending the range of this office refreshment device to include soup, instant coffee, cocoa.

## Keyboard machines


† **Phone-size,** Underwood's Add-Mate electric adding machine adds, subtracts, multiplies, totals, using a simple 10-key keyboard. Weighs 7½ pounds, genuinely portable.

† **Calculator-like,** the Everest Multa-rapid is a printing multiplier which uses a telephone style dial and multiple cipher keys to add, subtract, and figure credit balance. Prints 200 figures per minute.

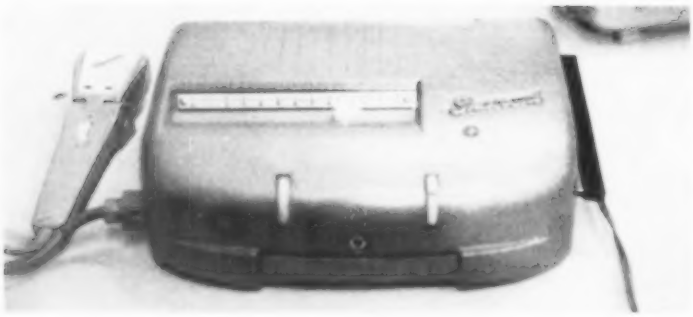
† **Touch operation** is stressed by the Remington Rand Co. in its "98" Printing Calculator which divides, multiplies, adds, and subtracts, operated entirely by buttons with no bulky lever arms to swing. Dates or identification numbers can be registered on the punch tapes used, in addition to the number columns.

↓ **Color** performs a dual function in the Olivetti Tetractys: a two-tone scheme lightens a possible bulky appearance; black, white, ivory, green, red give added clarification to the keyboard. Two registers and a "memory" device broaden the calculation possibilities.

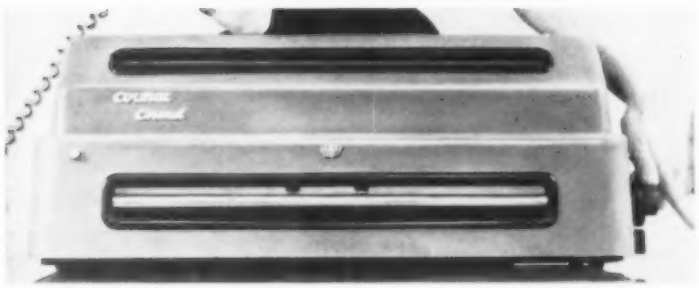
↓ **Compact** 10-key operating panel is placed handily on the sculptured form of the Walther Co.'s Compotograph "200 M" which adds, subtracts, multiplies, and divides. Calculations are made at the rate of 220 cycles per minute, said by the manufacturer to be faster than calculators of comparable size.

↑ **Stair-step** arrangement of succeeding rows of keys minimize the danger of accidentally depressing two keys in the same column on National Cash Register Co.'s "live keyboard" adding machine which adds, subtracts, and multiplies.

↓ **Strong horizontal** lines tend to lower an already sleek form in the Royal McBee standard office typewriter. Compound shapes in the large planes impart a luxury look not found in flat surfaces. Smaller parts such as top cover plate and paper table are sub-assemblies for which many colors can be easily inventoried, while the main-assembly is always gray.



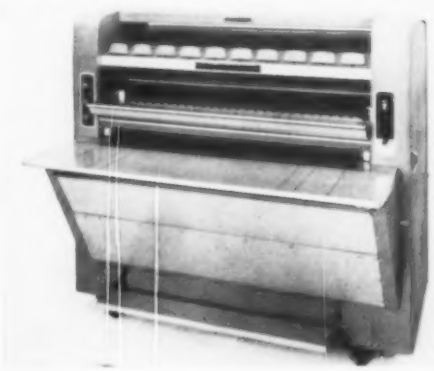
← **Dictator-transcriber.** Industrial Office Supply Co. Stencord weighs 9 pounds, travels in a leather case, plugs into automobile dashboard power outlets, employs single switch on microphone to control start-stop, dictation, playback, and measured backspacing. Correctable magnetic tape is said to be reusable hundreds of times.

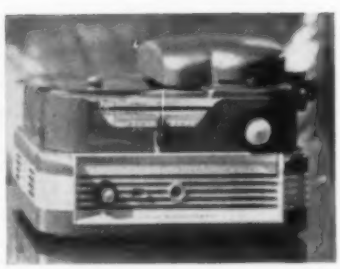


← **Speed** is the asset for which Cormac Industries prize their Coronet photocopier, which they say is twice as fast as any other photocopier. Less than 15 seconds is required to make a standard copy. Documents can be full newspaper width and still have 3¾" clearance to spare. Copies can be made under any lighting conditions.

↓ **Printing and developing** are handled simultaneously at speeds up to 100′ per minute in the Printmaster 1000 by Ozalid Div. of General Aniline and Film Corp. Rapid printing speed and high-intensity mercury vapor lamp make the Printmaster 1000 effective with intermediates.

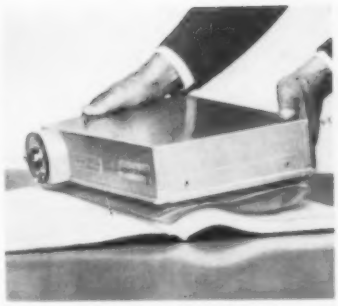
← **Phonaudograph** by the Gray Manufacturing Co., was designed to serve more than one person and can be adapted to accommodate additional dictating telephones and, as required, multiple recorders. When one user is dictating, the other members of the system are automatically locked out.





→ **Oscillograph monitor** lights tell the user whether his words are being fed into Gray Mfg. Co.'s Audograph 5A at the proper pitch level for clear transcription. Since the actual recording disc is in the user's view as it is being inscribed, he can judge available disc space. 20, 30, and 60-minute discs are available.

← **On-the-spot reproduction** of microfilmed engineering drawings for reference purposes can be made on the REP 11, a microfilm reader-enlarger-processor by Remington Rand. Planned for engineering and drafting departments, the machine was designed to tabulate aperture cards holding 35 mm. film slides.



↑ **Portable photo copying** of anything drawn, printed, or written, even in bound books and magazines, is accomplished by the Contoura Portable by F. G. Ludwig Co., Inc. Patented plastic foam cushions follow page contours all the way to margins, producing detailed copies in 30 seconds.

→ **Microfilm enlargements** can be automatically printed in less than 10 seconds with the 3M reader-printer by Minnesota Mining and Mfg. Co., who say this is six to eighteen times faster than any other microfilm printer. The 3M is table-top size. Printing is accomplished by an electro-chemical process on a special white paper.

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

### Plastic molding costs cut

Savings of up to 25% in manufacturing costs are being claimed for the valve gating process, a variation on plastic injection molding techniques. Valve gating, a patented development of Columbus Plastic Products, Inc., is said to make possible economies in the molding of a wide variety of thermoplastic consumer and industrial products through reduced molding cycles, decreased scrap and rejects, and lower finishing costs. Columbus says that products have improved physical properties and reduced shrinkage. The molded parts are said to weigh less and permit a higher degree of automatic molding.

Conventional injection molding usually takes place when the molten thermoplastic starts to ooze through an opening into the mold cavity. The valve gate technique holds the thermoplastic in a reservoir so that pressure is built up, and it is this pressure that eventually releases the valve and causes the material to gush into the cavity at high speed. By employing several valve gates, it is possible to mold wider and deeper pieces with considerably smaller machines. The basic plastics engineering principles are the same for valve gating as for conventional molding techniques.

Source: The Polymer Chemicals Div. of W. R. Grace and Co., which has been granted an exclusive license for the new technique by Columbus Plastic Products, Inc.

### Rust-proofing bath

European car manufacturers have for some time dipped their car shells in a rust preventive, using it as a primer. Now, for the first time, an American manufacturer is doing it: entire car shells of all the 1958 models of the American Motors Corp. are dipped into a giant bathtubful of rust preventive solution. In the dip method used by American Motors, car bodies are dipped into a tank suspended from an overhead monorail; this primer dip precedes the enamel coats. The dip solution is Ferrochrome (Pittsburgh Plate Glass Co.), red oxide alkyd fortified with zinc chromate. About two gallons of solution are used on each body.

The corrosion problem for cars has been accentuated in recent years by the increased use of salt on roads during the winter and by the use of more complex shapes of sheet metal on cars, resulting in moisture-and-dirt-collecting areas.

Source: American Motors Corp., Detroit 32, Michigan.

### Capped nut

Designed as a buffer between nut ends and other assembly elements, a miniature clinch-type self-locking nut (below) by the Elastic Stop Nut Corp. has an integral metal cap which prevents potting compound from flowing inside the nut threads in potting applications, and can be used to protect closely packed, delicate wiring and components from bolt-end damage. The need for smaller, lighter components in thinner materials created the demand for miniaturization of the clinch-nut design, which provides flush installation.

The clinch fastener is mounted by expanding the short knurled shank in the installation hole. It then becomes a fixed fastener, particularly suited for applications where restricted space will not permit normal wrenching procedures or where a blind nut is required to simplify maintenance.

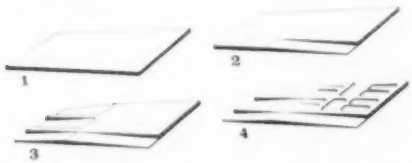
The nut is made with 4-40, 6-32, and 8-32 threads and is designed with a shank length of .040" for use in material of .030" to .050". The 8-32 is also designed with shank of .060" for use in material .050" and greater.

Manufacturer: Elastic Stop Nut Corp. of America, Union, N. J.

### Complex panel by chemical milling

Said to produce sturdier sheet metal assemblies at a lower cost than those joined by conventional welding or riveting, chemical milling has taken over a variety of operations heretofore performed by machine tools. The chemically milled fuselage piece (below), said to be the most complicated part formed up to now by the new technique, replaces nine separate pieces which normally would have been riveted, bonded, or welded together to form a subassembly. Milling the fuselage panel involves three different taper angles and requires nine milling steps:

A coating of maskant is applied to the sheet (1) which restricts the removal of the metal to the exposed areas. The first cut, a taper cut, is made by controlling the rate at which the part is immersed in, and withdrawn from, the chemical solution. After the first cut (2), the exposed section is masked again and two other areas are each scribed, stripped, and tapered (3). Since the remaining steps involve shallower cuts, no further masking is required. The finished part (4) is milled to close tolerances, ready for installation in the airplane.




Originated in 1953, the chemical milling method has been most frequently used on aluminum products—as here—for the aircraft industry. Because it allows thousands of parts to be milled simultaneously, chemical milling is called a substitute for machine tooling, which produces only one part at a time. Complicated shapes that cannot be stamped are chemically milled to close tolerances. Milling machines are limited to relatively flat surfaces but chemical milling can be used on any complex contoured surface. It has been suggested that chemical milling could speed up home appliance production lines. The forming of thin metal parts is another application of chemical milling. Small linkages and levers, too complicated for stamping, are chemically milled out of thin metal sheet. The thickness of the parts is generally limited to .015". Photographic, screen or offset printing techniques can be used to apply a maskant, which restricts the chemical action to the exposed areas. After masking, the metal sheets are placed in a chemical milling solution, and parts are etched out of the sheet stock.

Manufacturer: United States Chemical Milling Corp., 1700 Rosecrans Ave., Manhattan Beach, Cal.

### Synthetic "natural" rubber

A synthetic rubber called Natsyn is said to duplicate the molecular structure and performance characteristics of natural rubber. The development of a synthetic "natural" rubber and the ability to produce it in quantity—Natsyn goes into tonnage production with the completion of a large pilot plant in Akron by the Goodyear Tire and Rubber Co.—helps cover the U. S. against the eventuality of a world-wide shortage of natural rubber.

Natsyn is made from the same basic molecule of isoprene that is found in the rubber tree. One big difference between man-made rubber and the tree variety is the matter of production speed and efficiency. Where the rubber tree requires about seven years from planting to latex production stage, Natsyn can be polymeried in a matter of hours.

Natsyn should prove particularly valuable in such large-scale uses of rubber as heavy-duty tires for trucks and buses, where high heat build-up is a factor; present day synthetic rubbers have not proved satisfactory in these uses.

Manufacturer: Goodyear Tire and Rubber Co., Akron 16, Ohio.

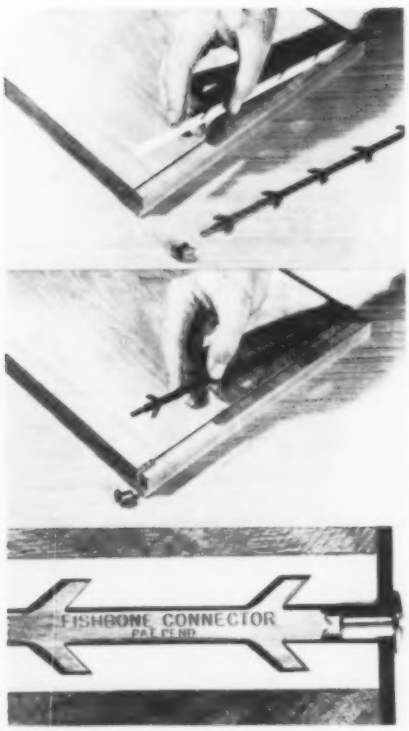
### Wider panels—less weight

An ingenious fabricating technique is helping reduce the weight of seemingly irreducible sheet metal structures, including airplane fuselages. The new technique stems from the fact that the heaviest portion of many sheet metal structures is at the point where the metal skins—already reduced to minimum poundage—overlap to form a seam, to which the rivets that bind the skins add their weight. The new technique makes it possible to roll wider sheet metal strips, thus minimizing the number of seams. The elimination of many joints and seams is now made possible by a process which consists of sandwiching stainless steel plates between heavier plates of ordinary steel, closing the assembly with welded-in side and end bars, and—after heating—rolling the "sandwich." (below)

The sandwich has the working characteristics of the carbon steel cover plates rather than the stainless or alloy steels inside, so that no revamping of rolling mills to supply more power or stiffen the rolls has been necessary. A typical experimental sandwich rolled at U. S. Steel's Homestead District Works contained four 12% chromium stainless steel plates, each 5/16" thick. They were enclosed in carbon steel cover plates each 1" thick so that the assembly, after welding, was about 3" thick.

The sandwich was heated and rolled down to a plate 3/8" thick, 100" wide and 250" long. This effected a reduction in each individual component in assembly, amounting to a total reduction of 90%. As a result, the original 5/16" thick stainless steel plates were rolled to a nominal thickness of .033 of an inch. When the expendable end and side bars were sheared off to open the assembly, the stainless sheets measured 90" wide and 230" long. The sandwich rolling technique is said to have yielded the widest sheets ever produced on existing mills—as much as twice the width of sheets produced by conventional methods using stainless plates.

Source: United States Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.




**Fishbone Connector with prefab holes**

The Fishbone Connector, Funco Products, described in the August ID (pages 86-7) has already been improved, following a survey of a number of furniture manufacturers who were enthusiastic about the novel fastener but found that the necessity of drilling holes to close tolerances through a variety of woods with different densities and strengths was a serious production problem. Basically the Fishbone Connector is a spine stamped from heavy gauge steel, with a series of ribs angling from both sides that fit into notched holes in adjacent panels, holding them together when a cap nut is tightened. To overcome the production difficulties Funco now provides manufacturers with both the connector and the drilled wood strip that receives the fastener spines. This makes it possible for manufacturers to install the Fishbone by techniques with which they are familiar; that is, cutting a slot in the work and bonding to it a receiver strip with pre-drilled holes.
Manufacturer: Funco Products, 450 Lincoln St., Denver 9, Colorado

**Seals as it bolts**

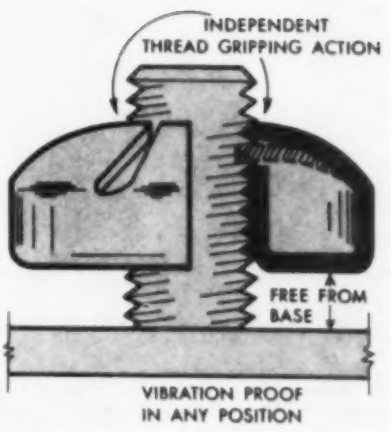
Every company, from basic material supplier down to nuts and bolts maker, that contributed to the development of Project Vanguard, the satellite vehicle, has touted its contribution loudly—and with good reason. The materials and components that went into the satellite project were chosen because they met the most exacting specifications in their category—strength with light weight, resistance to intense friction heat, etc. The end product would seem to be so removed from the ordinary that we might imagine that the materials and components bear no relation to more mundane usages. Actually, the materials used in Vanguard fulfill the usual demands made of such materials, but carried to the nth degree. Therefore, what is good for Vanguard may be superlative for less specialized uses.

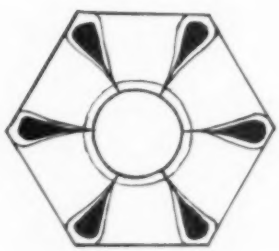
A case in point is the Blind Bolt, product of Hi-Shear Rivet Tool Company, used in the satellite launching vehicle, the second stage of Project Vanguard. This use, literally at the nuts and bolts level, makes dramatic some of the strong points of the Blind Bolt that are of broader interest to designers. The Blind Bolt was designed for use where work is accessible from only one side. The three piece fastener consists of a core bolt, a threaded expander nut which resists installation torque and locks the core bolt in place, and a sleeve which expands to fill and seal a hole, over a range of clearances. The sleeve expansion also gives vibration resistance.

In Project Vanguard, Blind Bolts are used to attach a metal skirt to welded steel pressure tanks containing propellants, including acid. High corrosion-resistance and strength at upper temperatures are the basic requirements that the bolts had to meet.
Manufacturer: Hi-Shear Rivet Tool Company, 2600 W. 247th St., Torrance, California


**New design in hexagon nut**

The use of a material not previously employed in this particular application, and a fabrication technique which gives a new design to the hexagonal nut, have resulted in a recently patented hexagon nut. Called Torq-Lok, the new fastener is stamped from stainless steel to meet high temperature, non-magnetic, corrosion resistant and lightweight properties required by aircraft and electronics industries. The unique feature of this item is the new design on top of the nut: six bracing fins which provide uniform tension around the studs. When the fasteners are used, a locking action is achieved in this way: the stud is tapped with a round hole which is slightly smaller at the bracing fins; when used the fins expand to the size of the stud, but due to spring action can return to normal size. The Torq-Lok can be used with short studs since its height has been reduced; it is made in required sizes including micro sizes.
Manufacturer: Tubing Seal Cap, Inc. 808 West Santa Anita St., San Gabriel, Calif.



**Cushions out of a faucet?**

The Du Pont Company is demonstrating the first prototype automated equipment for molding cushions of urethane foam. The equipment, in a new laboratory near Wilmington, Delaware, has been set up to aid customers in evaluating equipment and techniques used in the manufacture of urethane foam products. The prototype production line consists of a pre-heat oven, a mold-filling station, and a curing oven. Other pieces of equipment complete the range of the main production facilities and demonstrate cutting, sewing, stitching and other operations.

Urethane foam has been gaining use and publicity lately by virtue of its increased acceptance in such things as clothing interliners and other padding applications (ID,

April, 1957). Du Pont feels that laboratory tests point to a larger volume use of urethane foam in cushions in competition with foam rubber. Commercially, Du Pont makes Hylene (organic isocyanates), one of the basic ingredients of urethane foam but does not make the finished foam. Address: The Du Pont Co., Wilmington, Delaware

### Plexiglas pump emblem

Shell Oil Company engineers in consultation with Raymond Loewy, Inc., and plastic experts at Rohm and Haas Company, have designed an unusual outdoor display plaque which is being used to identify premium "Super Shell" gasoline. It is said to be the largest three-dimensionally decorated piece


of acrylic ever to have been injection molded.

The red letters, yellow shell shape and gold background of the plaque are obtained by spray coating the second surface of the transparent molding. The gold color was obtained by using transparent amber lacquer, then vacuum metalizing. The "Super Shell" banner is also second surface decorated with white letters against a red background. The back of each molding is sealed with white epoxy resin for abrasion and weather resistance.

The plaque is 11" by 12" by ½" thick. A three-tier embossment includes the shell rising ¾" from the background and letters rising ½" from the shell. The banner is 3¾" by ⅛" thick, a flat molding.

The plaque and banner, Shell says, is the first molded plastic part to be used in the petroleum industry on service station pumps. The success of the display is such that Shell is contemplating similar Plexiglas emblems, this time with red backgrounds, on pumps delivering other grades of its gasoline.

Manufacturer: Kent Plastics Corporation, Evansville, Indiana

### Tests simulate flight

Testing is always a problem—particularly when it involves flight simulation. The ultra-high speeds and altitudes of today's planes are especially hard to simulate on the ground. In an attempt to base final design on actual flight conditions, the new laboratory for the Canadian Westinghouse Company at Hamilton, Ontario, has been equipped with two Tenney environmental test chambers which, in one unit, can simulate all the varying conditions called for in government specifications. These include vibration, impact, sustained acceleration, climate, and altitude. For example, the Tenney Stratosphere can perform vibration tests under any specified climate conditions; a separate Tenney altitude chamber permits the study of high speed ascents and descents so that actual flight conditions can be simulated and a record made of their effect on various components.

Use of the new test facility, Canadian Westinghouse believes, will give them an awareness of the limitations on the use and operation of the various parts and steps can then be taken to see that these limits are not exceeded.

Manufacturer: Tenney Engineering, Inc., Union, New Jersey

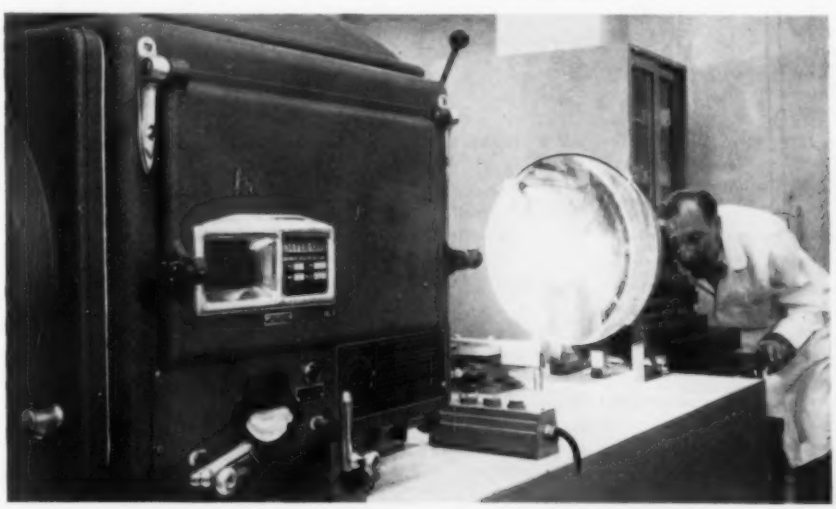
### New use for old principle

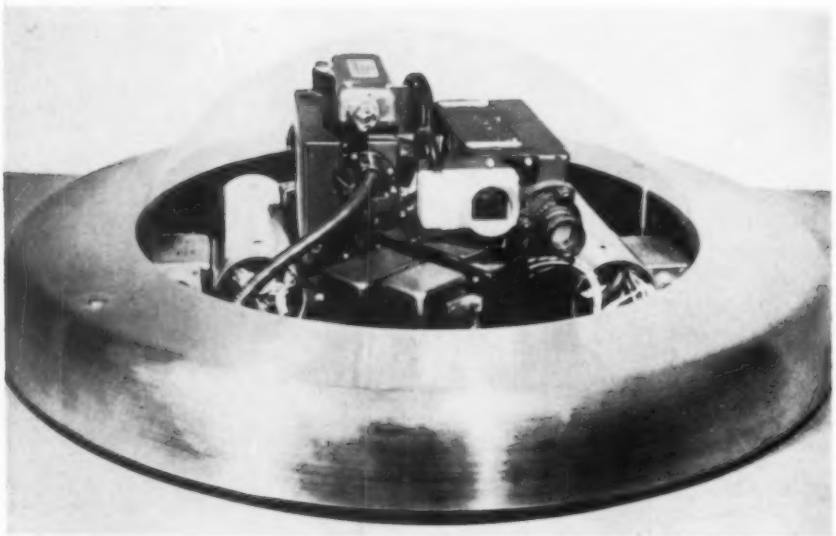
A scientific version of the schoolboy's trick of setting fire to a piece of paper with a magnifying glass has resulted in the production of temperatures approaching that of the sun's surface, with ordinary motion picture projection equipment. The experiment was made in connection with high-temperature studies at the research laboratories of the National Carbon Company, Division of Union Carbide Corporation. The arc image furnace, as it is known, an extremely "clean" source of heat, is ideally suited to basic metallurgical research, where purity is particularly important. The beam can be projected through a transparent window into an enclosed vessel in which the atmosphere can be controlled, and which can be raised to high pressures if a combination of high temperature and pressure is desired. A valuable research tool now, the arc image furnace might well become a useful production tool in the future as high temperature operations become more common in industry.

The furnace uses arc carbons focused by mirrors approximately 18" in diameter and placed about 6' apart. The arc draws a current of 200 amperes, which is approximately twice the electrical requirement of a modern home. The new design uses two elliptical mirrors of the standard type found in motion picture projection equipment. One mirror directs the energy of the arc at the other, which in turn concentrates the radiation on the specimen being heated, forming a life-size image of the actual arc.

Below, a small crucible made of an experimental high-temperature material is positioned at the short focal point of a highly polished mirror, where it will be heated to incandescence by the energy-beam from a carbon arc.

Address: Research Laboratories, National Carbon Company, Parma, Ohio





**Compact Bubble for camera system**

Designed for the lowest possible drag, the Fotodome wraps a complete aircraft camera system under a plastic dome so compactly that relatively large numbers of them can be externally mounted on a single aircraft without seriously affecting its performance. The self-contained unit is mounted, bubble-like, on test aircraft, to record mechanical operation of aircraft components, or on target drones to record the miss-distance of missiles. It can also be mounted on aircraft carrying missiles to record missile performance and intercept. The unit pictured, one of several versions of the Fotodome, consists of a circular aluminum base, 24" in diameter, covered by an optically ground and polished clear plastic dome. The unit houses motion picture cameras, power supplies, timing and sequencing apparatus, other accessories. There is an unobstructed and undistorted view in any direction.
Manufacturer: Traid Corp., 17136 Ventura Blvd., Encino, Cal.

**Temperature effects on metal**

The behaviour of various ferrous metals under high and low temperatures, and under conditions where avoidance of galling is an objective, has now been tested. Working with experimental quantities of stainless and other ferrous tubing supplied by the Superior Tube Co., the Test and Development Laboratory of Teleflex Inc., tested the metallurgy of conduits. Teleflex was interested in improving its mechanical remote control systems, which are formed of a cable enclosed in a metal conduit, which, functioning as a flexible pushrod, or a flexible rack, follows contours and bends around corners without intermediate links or pulleys. The use of mechanical remote control systems in jet planes has imposed increasingly severe temperature requirements on them. For example, the average skin temperature of an after burner is 1700°F. To meet this situation, Teleflex put into operation a furnace which permits testing of a variety of metal elements including conduits, at temperatures as high as 2000°F. The high temperature-proof materials and exotic fuels which have made it possible for jets to push beyond conventional speeds have also resulted in a low temperature problem as they entered higher altitudes. Once the lowest temperature encountered was —67°F. Now, at altitudes as high as 90,000', temperatures plummet as low as —100°F.

To test the behaviour of mechanical controls in low temperatures, Teleflex uses a dry ice cabinet which lowers temperatures to —100°F.

A typical test result—in this case resulting from high temperature research — showed that the temperature of stainless conduit will rise about 25° above normal operating temperature just before galling begins.
Source: Test and Development Lab., Teleflex Inc., North Wales, Pa.

**PE moves outdoors**

A new ultra-violet inhibitor is overcoming a familiar color-retention problem in Eastman Chemical's Tenite polyethylene so that Tenite can be used in molding or extruding outdoor products. Molded sections of the improved Tenite are said to show an outdoor life expectancy up to four times as great as that of sections molded from uninhibited polyethylene. Film extruded from this new Tenite formulation is said to remain pliable and smooth under accelerated weather testing in the Eastman laboratory at least twice as long as film of the same thickness extruded from polyethylene without the ultra-violet inhibitor. With this extended life expectancy, polyethylene film will have greater usefulness in a variety of outdoor protective cover usages. The thicker the film, the greater the resistance to outdoor weathering.

The new formulation is available in red, orange, yellow, blue, and two shades of green, as well as natural.
Manufacturer: Eastman Chemical Prods., Inc., 581 Fifth Ave., New York 17, N. Y.

**Remote tv control**

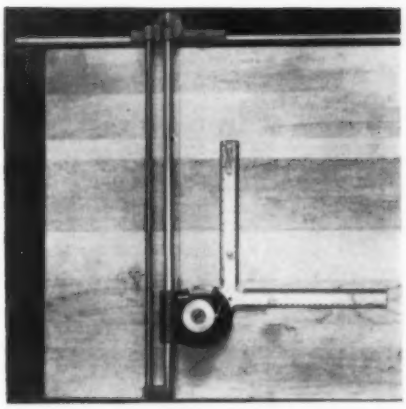
The latest wrinkle in ultrasonic waves is a wireless palm-size device which uses the waves to turn on a tv set, adjust the volume to any one of four different levels, change stations, turn on the automatic record changer, reject records, turn on the AM or FM radio, and turn off the tv, radio, or phonograph. Named the Son-R, it includes a clapper which strikes rods emitting ultrasonic signals in the range of 38-to-42-thousand cycles.
Manufacturer: Admiral Corp., 1191 Merchandise Mart, Chicago 54, Ill.

**New grade of Plexiglas**

A relatively inexpensive grade of Plexiglas unshrunk cast acrylic sheet, designated G-grade, has been made possible by a process that doesn't require heat treatment as a step in production.

Plexiglas G provides maximum flatness for applications that involve no forming.
Manufacturer: Rohm and Haas Co., Philadelphia 5, Pa.

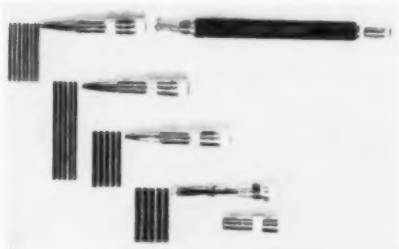
### Drafting room aids



A drafting unit called the Glideline (above), claims such assets as the elimination of machine overhang; the ability to draw long, continuous parallel, horizontal, or vertical lines; controls so located that the machine can be operated with one hand; the ability to work with the drawing board at any angle without the necessity of changing counterweights or counterbalances. The stainless steel and aluminum Glideline fits standard boards from 24" x 30" to 48" x 96", or wall boards up to 8' x 30'.

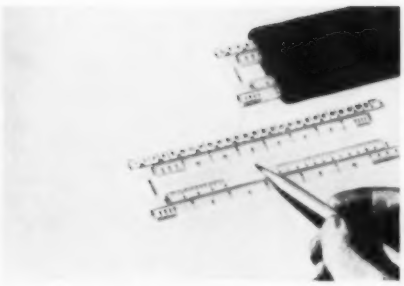
The indexing head is precision machined for 15° angle settings through a full 360°. Vernier settings give intermediate angles to 5'.

Manufacturer: Glideline Corp., 300 So. Potomac St., Waynesboro, Pa.



The Riefler Grafika Pen (above) operates by capillary action, lessening the tendency of the ink to blot and permits the use of ordinary ink on any drawing surface. It is said to join lines without any discernible thickening—at connecting points. Lines terminate in right-angle ends. The capillary principle has the effect of a vacuum: broken when the pen touches paper, instantly sealed when it is lifted, producing sharp endpoints. Five interchangeable ruling nibs allow a continuous range of line widths from hair line to 3/16". Each nib is infinitely adjustable within its range.

Manufacturer: Ozalid Div., General Aniline and Film Corp., 2 Corliss Lane, Johnson City, N. Y.



Old New

A clear acrylic ruler just introduced shows eight scales on just one flat side, thus eliminating the revolving necessary with conventional triangular-shaped rules.

Manufacturer: A. Lawrence Karp, 16 Putnam Park, Greenwich, Conn.

### Polyethylene becomes film

A low-cost linear polyethylene film is challenging the dominant position of cellophane and cellulose acetate in the packaging field. Linear (high density) polyethylene, which is finding application in so many fields, has been subject to stickiness and brittleness as a film and has also tended to have a bluish cast, imparting a sickly color to foods packaged in it. The Philips Chemical Co. has developed a clear, transparent, and strong film for packaging such products as cigarettes, food, candy, cosmetics, and toiletries, applications in which another asset of the new film — good moisture vapor transmission resistance — is important. Foods that would normally absorb atmospheric moisture are said to keep their dry, crisp texture and original flavor.

Since the new film is sufficiently stiff to handle easily in automatic packaging machines, it is suited to mass production facilities. Philips points out that it is possible to heat-seal the film and print on it, using conventional methods.

The film is marketed under the trade name of Marlex. Philips has licensed W. R. Grace's Polymer Chemicals Div. to extrude it and they have added it to their Grex line of polyethylene materials. Philips plans to release the technical process to other leading extruders.

Manufacturer: The Philips Chemical Co., Bartlesville, Oklahoma.

### Honeycomb core

A versatile core material, applicable to both curtain wall panels and interior partitions, Asbestos Cell-Air-Core combines both insulating and fire-protection qualities. A honeycomb structure, Cell-Air-Core can be faced with a variety of skins and cut so that the conduits can be run inside the panels.

Cell-Air-Core panels are available in thicknesses of 1" to 4".

Manufacturer: The Bettinger Corporation, Waltham, Mass.

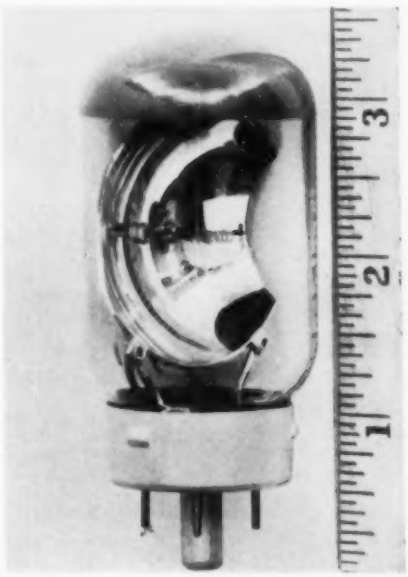
### Smaller cameras possible

Lighter, less bulky photographic projectors are now made possible with the introduction of an unusual electric lamp that looks like a miniature lighthouse beacon. Called the Tru-Flector, the new lamp includes a silvered metal mirror inside the bulb (below) which eliminates external reflectors and condensing lenses, standard equipment in present projectors. The new lamp also breaks through the so-called "wattage barrier" which has made the light output of a lamp dependent upon the number of watts included in it.

The Tru-Flector, which has 150 watts, gives the same screen brightness as a 500 watt bulb. The sharply lessened cooling requirements make it possible to reduce projector blower size and noise. An immediate application is in eight-millimeter movie projectors. Development work toward other photographic applications—such as 16-millimeter and 35-millimeter projectors —is going forward and a variety of undisclosed non-photographic uses are under study.

The 115 volt Tru-Flector lamp utilizes a 150-watt horizontal coil filament that is precisely positioned in relation to the silvered metal mirror. The mirror is mounted on the same base as that introduced with the Tru-Focus projection lamp in 1956

Manufacturer: Sylvania Electric Products Inc., 1740 Broadway, New York, N. Y.



## Manufacturers' Literature

**Bolts.** National Machine Products Co., Utica, Michigan. 8 pp. The slotted type "Place" bolt, a one-piece cold-formed bolt with an elastic diaphram in its head, is described.

**Epoxy.** Marblette Corp., 37-31 13th St., Long Island City 1, N. Y. 2 pp. Maraset resin, a lead-filled epoxy casting material, is described.

**Extruded plastics.** Anchor Plastic Co., Inc., 36-36 36th St., Long Island City 6, N. Y. 12 pp. ill. The application of extruded plastic parts to a variety of products is discussed.

**Fasteners.** Gries Reproducer Corp., 125 Beechwood Ave., New Rochelle, N. Y. 8 pp. ill. The company's die-cast threaded fastener line is described.

**Formica.** Formica Corp., 4575 Spring Grove Ave., Cincinnati 32, Ohio. 8 pp. Gives case histories of the use of Formica in a variety of applications.

**Nylon parts.** Pee-Wee Molding Corp., 1720 Atlantic Ave., Brooklyn 13, N. Y. 4 pp. ill. Engineering data on a variety of molded nylon parts is included to assist the designer.

**Phenolic.** Chemical and Metallurgical Div., General Electric, Pittsfield, Mass. 12 pp., ill. A product design file describing the GE line of phenolic materials.

**Plastic.** Marbon Chemical, Div. of Borg-Warner, Gary, Indiana. This information sheet folder describes Cycolac, a high-impact thermoplastic resin used in injection molding, extruding, calendering.

**Plastic.** Bakelite Co., Div. of Union Carbide Corp., 260 Madison Ave., New York 16, N. Y. 12 pp. ill. The 1958 edition of Bakelite's "Condensed Reference File," includes data on polyethylenes, vinyls, styrenes, phenolics, and epoxies.

**Plastics.** Taylor Fibre Co., Norristown, Pa. 8 pp. ill. The catalog presents a summary of application and engineering data on laminated plastics and vulcanized fibre.

**Plastic laminates.** Mica Insulator Co., Schenectady 1, N. Y. 20 pp. ill. Lamicoid thermosetting laminated plastics are described in detail.

**Rivets.** Deutsch Fastener Corp., Box 61072, Los Angeles 61, Cal. 16 pp. ill. A new line of drive-pin rivets is described. Typical design applications, dimensions and weights are given.

**Springs.** Associated Spring Corp., Bristol, Conn. 12 pp. The use of springs is discussed in relation to industrial design.

**Steel.** Steel Founders' Society, of America, 606 Terminal Tower, Cleveland 13, Ohio. The 1958 revision of the Society's "Fundamentals of Steel Casting Design."

**Steel.** Alloy Steel Casting Co., 101 County Line Rd., Southampton, Pa. 2 pp. This data sheet discusses the magnetism of wrought and cast stainless steels in its relation to corrosion resistance.

**Vacuum metalizing.** F. J. Stokes Corp., 5500 Tabor Rd., Phil., Pa. 22 pp. color ill. Vacuum metalizing, or vacuum plating as it is sometimes called, is described.

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## For Your Calendar

**February 24-26.** Convention and trade show of the International Council of Shopping Centers at the Hotel Statler in New York. Exhibits of products and equipment, construction and maintenance methods.

**February 27-March 1.** IDI annual national meeting at the Hotel Statler in Detroit.

**February 28-March 3.** International Housewares and Hardwares Fair in Cologne, Germany.

**March 3.** Cleveland Engineering Society's 15th annual Machine Design Conference, 2136 E. 19th St., Cleveland. Theme: "Putting Machine Controls on Trial."

**March 4-6.** The 2nd annual Advertising Art, Photography and Modern Reproduction Show at the Biltmore Hotel, New York.

**March 5-6.** Second conference on integrated design for company identification, sponsored by the Center for Design Studies of the Institute of Contemporary Art, at the Sheraton-Plaza Hotel, Boston.

**March 5-April 27.** "DH '58" Design-for-the-Home Exhibition at the Brooklyn (N.Y.) Museum.

**March 7-April 6.** A selection of industrial products from the city's metalworking industries at the Contemporary Arts Center in Cincinnati.

**March 9-12.** The First National Lighting Exposition, sponsored by the Lighting, Lamps, and Electrical Manufacturers Salesmen's Association, Inc. Coliseum, New York.

**March 17-18.** The Steel Founders' Society of America will gather for its 56th annual meeting at the Drake Hotel, Chicago.

**March 17-19.** The American Management Association's seminar on "Setting Up an Over-All Program for Product Line Planning" at the La Salle Hotel, Chicago.

**March 17-21.** The 1958 Nuclear Congress ("Industrializing the Atom"), accompanied by the 1958 trade show of the atomic industry. International Amphitheatre, Chicago.

**March 29-31.** The 12th annual convention-exhibit of the National Office Furniture Association will be held in Convention Hall, Philadelphia.

**April 1-10.** The 37th Annual Exhibition of Advertising and Editorial Art and Design, sponsored by the Art Directors Club of New York, at the Waldorf-Astoria.

**April 2-3.** The 3rd annual Communications Conference of the Art Directors Club of New York, at the Waldorf-Astoria. Creativity is the theme.

**April 11-May 18.** The Society of Typographic Arts' Exhibition: Design in Chicago; at the Art Institute of Chicago.

**April 14-17.** Design Engineering Conference, sponsored by the Machine Design Division of the American Society of Mechanical Engineers, concurrently with the Design Engineering Show, at the International Amphitheatre in Chicago.

**April 14-18.** The American Welding Society's annual technical meeting will be held this year at the Hotel Statler, St. Louis. The Society's annual show will be held in the Kiel Auditorium, St. Louis, April 15-17.

**April 17-October 19.** The Brussels Fair: the first world's fair since World War II.

**April 18-June 1.** A survey of decorative art and design by recipients of Fulbright grants, at the Museum of Contemporary Crafts in New York.

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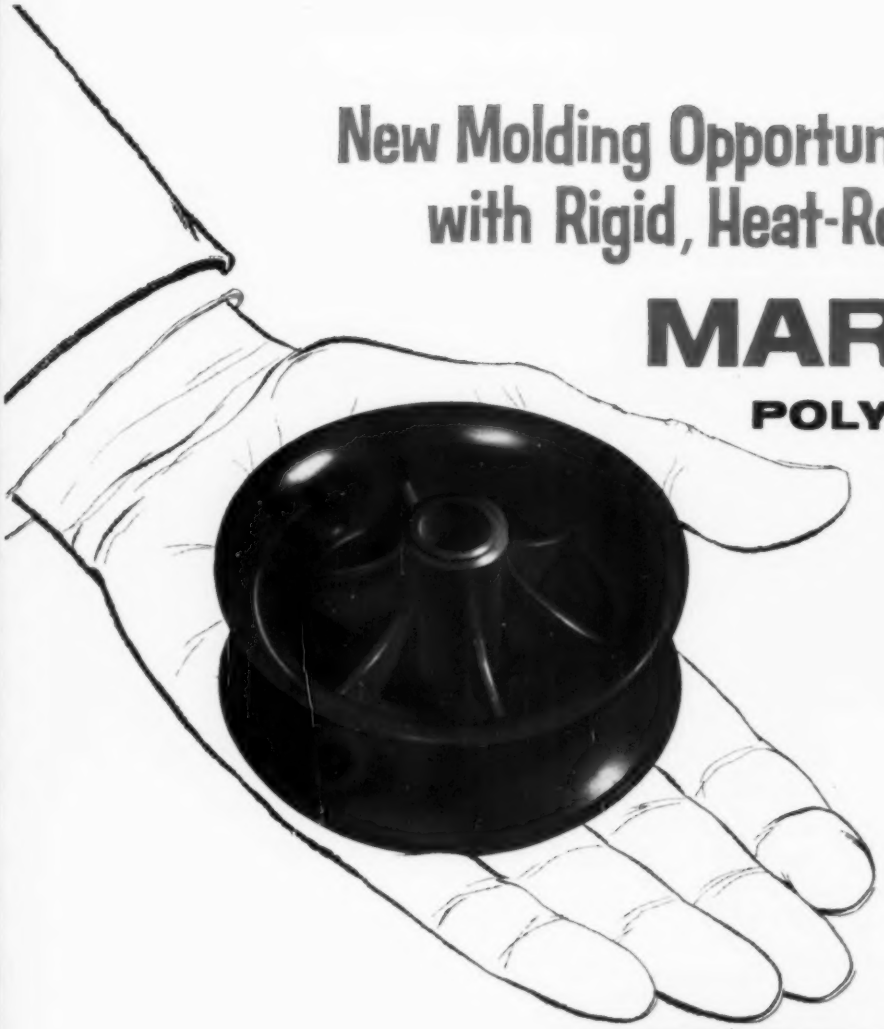

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