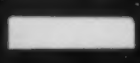
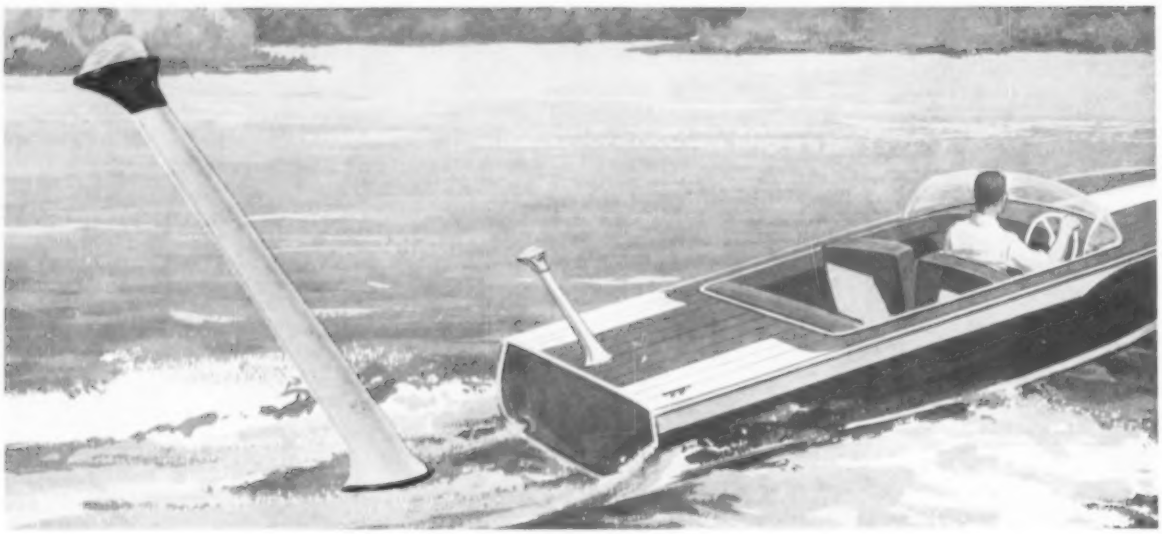
INDUSTRIAL DESIGN

4 *April 1960* *$1.50 per copy*

INDUSTRY ON THE SCREEN — *the design and production of sponsored films*

THOSE FABULOUS ITALIAN CARS





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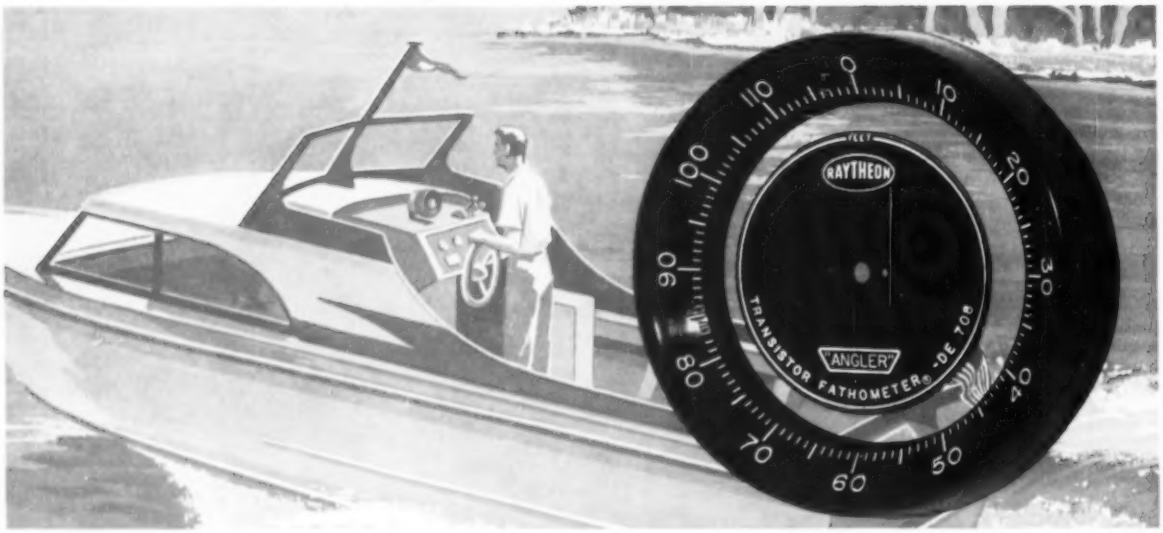
Plexiglas...Implex



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ID

MEMO TO ADVERTISERS

April, 1960

INDUSTRIAL DESIGN

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

The Editorial Excellence of INDUSTRIAL DESIGN

Although INDUSTRIAL DESIGN has only been published as a monthly for the past three years...

...It has already won 15 awards for outstanding editorial achievement in competitions sponsored by Associated Business Publications and Industrial Marketing Magazine

...It is the only magazine whose editors have received TWO Jesse B. Neal first place awards for outstanding journalism within a single year

Prompts Avid Reading by Industrial Designers

The outstanding editorial content of INDUSTRIAL DESIGN encourages readers to digest it from cover to cover. INDUSTRIAL DESIGN is the favorite professional publication of industrial designers and design-minded executives. Circulation has increased from 2,500 to 10,000 A.B.C. at $10 annually for only twelve issues.

And Attracts Advertising by Leading Companies

In the first quarter of 1960, INDUSTRIAL DESIGN shows a 20% increase in advertising pages. Advance reservations for the balance of the year indicate a further substantial increase.

This is due to awareness by leading advertisers of the ever-increasing importance of industrial designers as selectors of the materials, finishes, and other factors that influence usefulness, durability, price and appearance of a product to make it sell better.

The list of current advertisers, together with the date of their first INDUSTRIAL DESIGN insertion, appears on the flap of this message. It includes many of America's most forward-looking and successful companies. We invite you to join them in the pages of INDUSTRIAL DESIGN, and would welcome the opportunity to discuss this with you in person.

Cordially yours,

Paul R Kane

Paul R. Kane
Vice-President, Advertising

APRIL, 1960 VOLUME 7 NUMBER 4

INDUSTRIAL DESIGN

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

CONTENTS

Coming

IN MAY—Aluminum as a designer's material; public relations for the designer

IN JUNE — The evolution of products from blue-sky research; a round-up of new packaging materials

COVER: Art Director James Ward has made a photogram of a film reel, combined it with a band of sprocket holes from a section of motion picture film, and put the two against a crepuscular blue to symbolize the subject of our story on industrial films, on page 48.

FRONTISPIECE: A still from Willard Van Dyke's documentary film, Skyscraper, catches the distorted reflection of one of New York's glass-and-metal office towers on the face of its neighbor across Park Avenue.

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in this issue...

Lyman

George F. Lyman, who reviews some of the notable developments in Italian automotive design since World War II (page 78), is an industrial designer for Farrington Manufacturing Company (soon to become Intelligent Machines Research Corporation) in Needham Heights, Massachusetts. Among his current projects are a machine that reads and sorts mail for the Post Office, and another that reads documents in one language and types them in another. Most of the information for his article comes from first-hand experience: he has visited nearly all of the Italian automobile factories and coachworks.

Galentine

Bud Palmer is president of the recently-formed film company, PGL, Inc., one of the sponsored-film-makers whose operations are discussed in the article beginning on page 48. Mr. Palmer came to film-making through tv and radio sportscasting (which he still does), and to sportscasting from an athletic career. He was All-American in basketball, baseball and hockey while at Princeton, and was for two years captain of the New York Knickerbockers basketball team.

Palmer

Wheaton Galentine, the freelance film-maker who made *Silk,* mentioned in our article (page 48), is a graduate chemical engineer from the University of California, and worked in the research and technical service departments of two major oil companies until 1951, when he "retired" to the film business—partly because of frustration with the verbal communication problems at company business meetings. He has been involved in various phases of film production ever since.

Van Dyke

Willard Van Dyke's distinguished career as a producer began in 1939 with *The City;* since then he has produced or directed more than 100 sponsored films for such clients as General Mills, American Petroleum Institute, Princeton University, the U. S. Government, the Government of Puerto Rico, and the Ford Foundation. He has also been producer-director of films for such tv programs as "Omnibus" and "Excursion." Mr. Van Dyke is shown here as photographed while on location in the far north, (see page 54).

Zucker

Nathan Zucker, president and co-founder of Dynamic Films, Inc., was formerly an audio-visual writer for Bendix Aircraft and has acted as producer and director for such tv series as "On Stage with Monty Woolley" and "Let's Make Music." A graduate engineer (Yale and Columbia), he was one of the first producers to successfully use audio tape for commercial film production and color film for telecast.

Moore

Dean Moore, production manager of Condor Films, Inc., came to films by an even more circuitous route than most people in the field. He is a graduate home economist from Ohio State University, worked for a while as a dietitian, then somehow drifted into motion picture equipment sales (home movies had been his hobby). During this period he developed a method for freezing French-fried potatoes, and (no connection) developed an ulcer. The latter drove him to the pastoral environs of an ivy-covered educational tv station, and this led eventually to film production.

BOOKS

Chicago 1953 *Aaron Siskind*

How to see a sunset

AARON SISKIND PHOTOGRAPHS. *Introduction by Harold Rosenberg. Published by Horizon Press, 220 West 42nd Street, New York.* 104 *pages,* 50 *plates.* $12.50.

On the dust jacket of this weird and wonderful collection of pictures, the photography editor of the *New York Times* asks: "Are they merely doodles, or nature's enigmatic notes to those who can read them?" Since the question is rhetorical, he answers it by calling Mr. Siskind's pictures "a kind of hieroglyphics of modern life." Yet this is precisely what they are not, any more than they are doodles (irresponsible and arbitrary playing with form) or nature's notes. They are compositions in which the camera has been used to organize material into forms capable of eliciting a genuine esthetic experience, as distinct from the mere sensation for which clever photography is so much admired.

In other words, since Siskind (who teaches at the Institute of Design) is creating pictures rather than recording scenes or making his lens do handstands, the camera is really used as an instrument of art. The photographs are unaccompanied by affected titles, and are identified only by time and place. Undoubtedly, there will be a great deal of subject guessing (is it a weathered plank? a sea urchin? an ink blot?), and this is harmless so long as no one thinks he can get at the secret of the pictures in this way. For knowing what these are pictures *of* is only as useful as knowing the prose meaning of a poem, or knowing whether Whistler liked his mother's cooking.

One of the most astonishing and pleasing things about these pictures is that they bring us a world it is exciting to know someone sees. Once a woman looking at a Turner seascape protested "But Mr. Turner, I never saw a sunset like that!" And Turner replied, "Of course not, Madam, but don't you wish you could?" Few of us see things the way Siskind's camera sees them, but don't we wish we could?

The book, designed by Ivan Chermayeff, has an introduction by Harold Rosenberg that says very clearly why most "art photography" is not art photography.—*R.S.C.*

World packaging survey

GRAPHIS — PACKAGING: AN INTERNATIONAL SURVEY OF PACKAGE DESIGN. *Edited by Walter Herdeg. Amstutz & Herdeg, Graphis Press, Zurich: 1959. 322 pp. $17.50. Available through Wittenborn & Co., N. Y.*

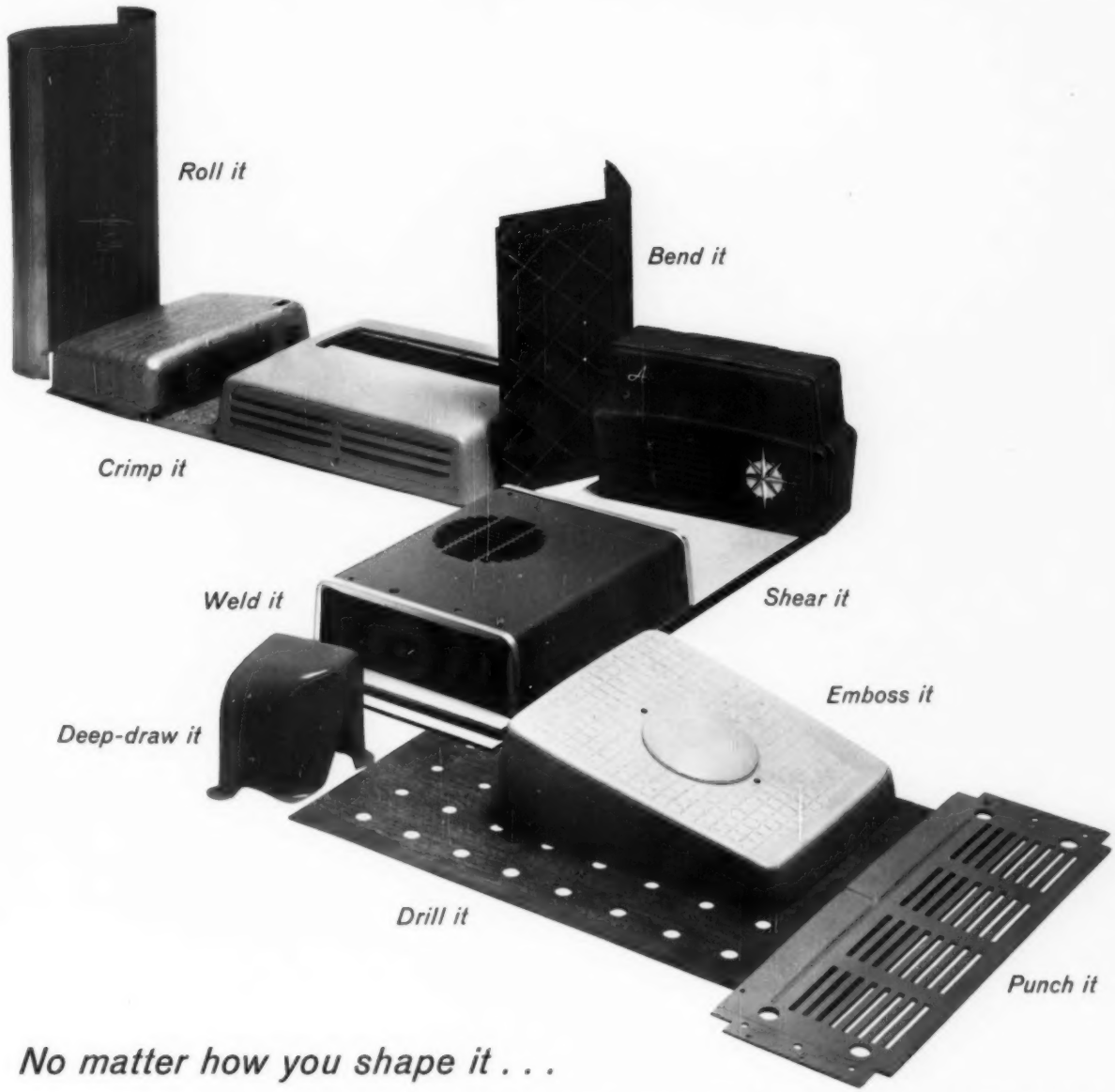
Handsomely designed and packaged, but with an austerity that understates the scope of its contents, this anthology of contemporary packaging design is unique. It is a comprehensive, almost encyclopedic, review of international packaging design that will no doubt be—even at a price of $17.50 — a useful work of reference for anyone who earns as well as buys his bread in packages.

The main part of the volume is pictorial. All told, there are over 1000 illustrations (mostly in black-and-white) of designs by an untallied number of designers for an untallied number of manufacturers in over a dozen countries, not excluding such out-of-the-way-of-packaging-design places as Finland and Formosa, but with contributions mainly from this country, Britain, Switzerland, Japan, and Denmark.

There is, happily, very little text in this volume. Each picture is accompanied by terse captions describing the package and product (purpose, materials, colors, special details, etc.) and by listings of designers, art directors, firms for which the packages were created, and countries of origin. The illustrative material is grouped in 14 categories of: packs for textiles, clothing, and accessories; for foods and sweets; for drinks; for household items; for sports goods; for cosmetics and perfumes; for pharmaceuticals; for stationery; gift packs; shipping containers; package "lines"; point-of-sale displays; re-usable packs; record covers; and folding box construction.

Opening with a modest forward by the editor, Walter Herdeg, the brief textual section of the book contains a few short articles, mostly by American designers, on: "The Means and Ends of Package Designing," "The Testing of Packages," "The Design of the Folding Box," "The Training of Package Designers," and "The Design of the Gift Pack." The text concludes with a 100-point "Check List for Package Planning." All articles are in English, German, and French.

In "The Means and Ends of Package Designing," New York designer Will Burtin makes a plea for improved taste in packaging design (a plea echoed by Britain's W. M. de Majo, in his article, "The Design of the Gift Pack") to match the progress which has already been made in merchandising and technology. Asserting that "the taste standards of packaging are still almost monotonously low," he goes on to propose that designers "set up professional criteria that incorporate the lessons of merchandising and technology and use them as vehicles to reach the larger and basic destination—an esthetically pleasing environment." Considering the general run of packaging design today, Burtin's assertion is accurate and his proposal urgently in need of action. But the thousand select designs which follow Burtin's essay stand in wonderful contradiction to his remarks, creating, as they do, as esthetically pleasing an environment as any reader could wish for —*R.M.*



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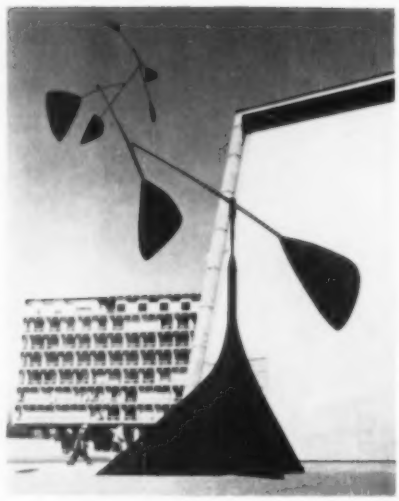
NEWS



Church interior by Clark and Beuttler, left; Calder's mobile for UNESCO, right.

Architectural League prizes

The Architectural League of New York has awarded first prize in its recently-concluded National Gold Medal competition to Mies van der Rohe and Philip Johnson, for their design of the Seagram Building in New York.

Winners of the Gold Medal for achievement in four other categories of the building arts (Design and Craftsmanship, Sculpture, Engineering, and Landscape Architecture) were:

Hervey Parke Clark and John F. Beuttler, architects, for the hand craftsmanship in the Episcopal Christ Church in Bortola Valley, Calif. (above, left).

Alexander Calder, for his mobile for the Paris headquarters of UNESCO (above, right).

Isadore Thompson, structural engineer, for the engineering of the Vista Mar Elementary School in Daly City, California.

Skidmore, Owings & Merrill jointly with Isamu Noguchi, for the landscaping of the Connecticut General Life Insurance Building, Hartford.

The League also awarded Silver Medals of Honor in four of the categories: to Edward Larrabee Barnes and Eero Saarinen & Associates (architecture); to Robert Alden and George Nakishima (design and craftsmanship); to Richard Lippold (sculpture); and to B. M. Dornblatt & Associates (engineering).

An exhibition of giant-size drawings and photographs of the winning entries has been on view at the Museum of Contemporary Crafts in New York since February 25th, when the awards were announced, and will continue there through May 15th. Following the New York showing, the American Federation of Arts will circulate the exhibition to museums elsewhere in this country and Canada.

IDEA Conference

This year's meeting of the Industrial Design Education Association will be held at the University of Cincinnati on April 8th and 9th.

Friday morning, there will be a symposium on the subject of "Technics and Values," led by Dr. Campbell Crockett, dean of Cincinnati's Graduate School of Arts and Sciences. Graphic designer Noel Martin and Cincinnati Professors Richard M. Emerson (sociology) and James L. Titchener (psychiatry) will participate.

"Minimum Acceptable Qualifications for Industrial Design Graduates" is the theme for the Friday afternoon workshop session, which includes Arthur J. Pulos, head of the Industrial Design Department at Syracuse University; Jay Doblin, director of IIT's Institute of Design; and ASID president Richard S. Latham. Saturday will be devoted to films and business meetings.

Belgian design show

As part of its centennial celebration the Brussels department store, Au Bon Marché, put on an exhibition of industrial design last month with the announced purpose of stimulating appreciation "of present-day esthetic and functional values" among the Belgian public.

Products from 15 countries were shown (below, the French and Belgian displays), including some 30-odd American products. Among these were: Gordon Florian's Dictet portable recorder for Dictaphone Corp., Harley Earl's Argus 35mm slide projector, Peter Müller-Munk's Westinghouse refrigerator, Walter I. Bieger's Parker ball-point pen, a Cory electric can-opener by Palma-Knapp Associates, and a number of pieces of Knoll furniture and fabrics designed by Harry Bertoia, Eero Saarinen, Florence Knoll, Clay Michie, and Esther Haraszty.


ALUMINUM IS TEXTURE
ALCOA IS ALUMINUM

S. L. Fahnestock,
Chief
Industrial Designer,
Alcoa

ALUMINUM IS TEXTURE

e. g., NEW LOW-COST ALCOA "3-D" SHEET COMES IN FOUR DESIGNS, ELEVEN COLORS

YOU—Well, what's new from Alcoa this month, Sam . . . in textured aluminum, I mean?

FAHNESTOCK—3-D sheet—in four new designs; it's now IN STOCK and can be specified in eleven colors.

YOU—What is it?

FAHNESTOCK—This is economical, decorative sheet for room dividers, display backgrounds, solar shades, building facades and so forth. Use it outdoors or in.

YOU—I presume the four designs are those shown above?

FAHNESTOCK—Right. The three immediately above have an open-weave effect, to permit passage of light and air. But they are not expanded metal, nor has metal been removed. The fourth design, at the top, is solid metal with a rolled pyramidal pattern.

YOU—Now what about these eleven colors? Are they color anodized?

FAHNESTOCK—No. Whichever color you specify is applied in Alcoa* Alumalure . . . a baked enamel finish. Beautiful and durable. Some of the Alumalure colors are heavy in aluminum pigment to give a lustrous anodized look. Or you can get Alumalure in a matte finish.

YOU—Couldn't I have gotten designs like these from Alcoa before?

FAHNESTOCK—Sure—as special jobs. You'd have had to pay for dies, short production runs, etc. But these four designs are in stock. Just specify the Alumalure color you want and tell us where to ship it.

YOU—How about alloys, sizes, gages, etc.?

FAHNESTOCK—Very simple. One alloy. One thickness. One size—48-in. x 96-in. sheets.

YOU—Well, let's see; where could I use this 3-D sheet . . . spandrels, panel grille overlays, signs, ceiling panels?

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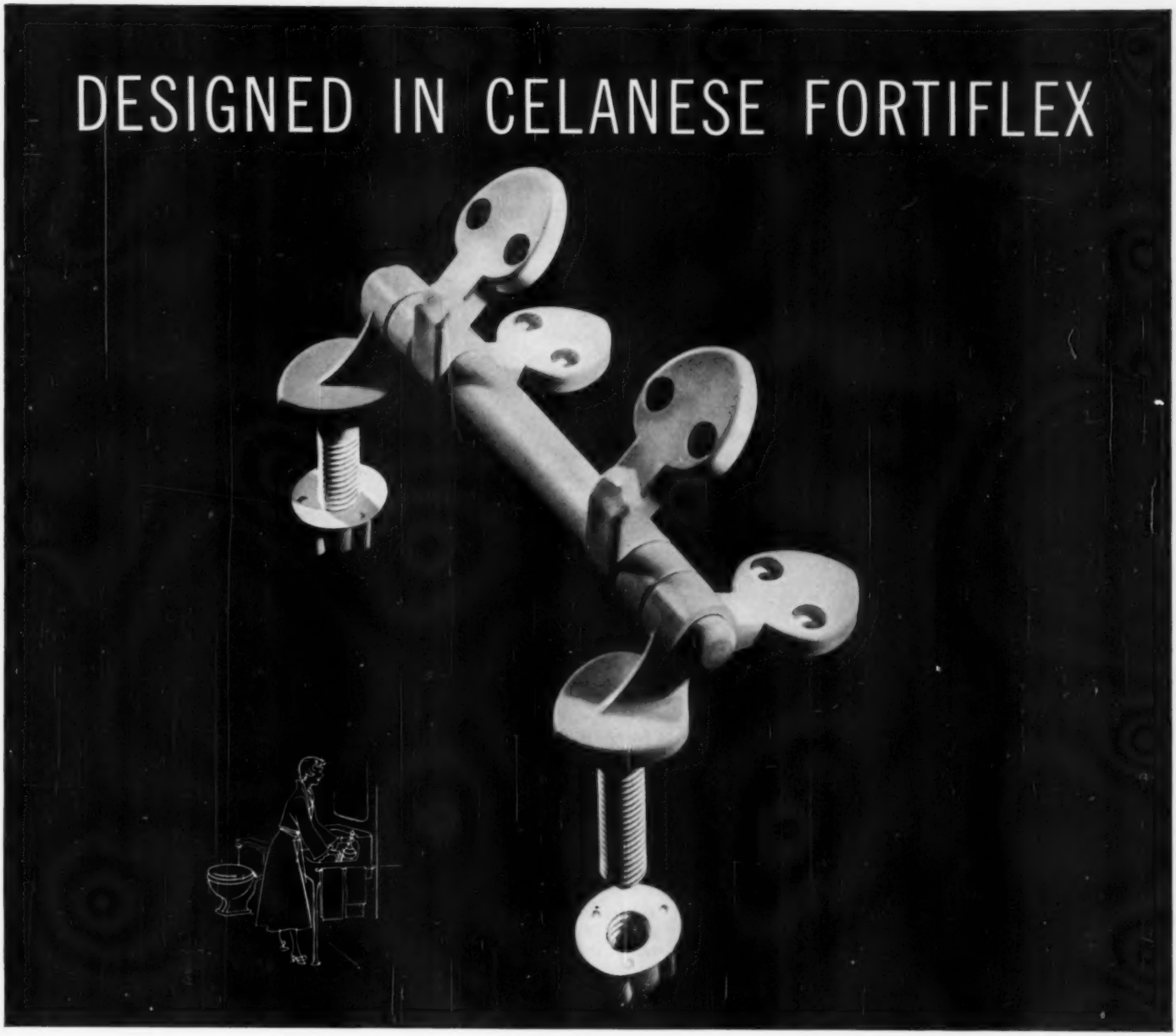

Hinge for Century seat eliminates metal

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a Division of Celanese Corporation of America,
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Please send me your new booklet, "Celanese Fortiflex in Design."

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Title _____

Company _____

Address _____

City _____ State _____

Courtesy of the Henry Ford Museum, Dearborn, Michigan

Flashback in Brooklyn

A comprehensive exhibition of American Victoriana goes on display at the Brooklyn Museum beginning April 7th. Over 200 examples of Victorian design in home furnishings and decor produced between 1840 and 1890 will be shown, including the work of such men as Tiffany, Lenox, and John Henry Belter.

One of the chief purposes of the exhibit, according to Decorative Arts curator Marvin Schwartz, is "to meet the current public demand for ideas in decoration, and assist today's homemakers and designers in their effort to break away from the extremes of functional design by showing how the first industrial designers in America solved the problems of ornamentation."

Included in the exhibition will be a neo-gothic cast iron stove (left, top) dating from the 1830's and designed by the Rev. Eliphalet Nott; and a candelabra-like hat-rack designed around 1850 (left, bottom).

The exhibit will run to June 5th.

British trade fair in N. Y.

What preliminary reports call the most comprehensive display of British consumer and industrial products, science, and technology ever shown outside Great Britain will be mounted in the New York Coliseum June 10th-26th.

The Council of Industrial Design will occupy 2500 square feet of exhibition space with a display of current "good design" in British appliances, sports equipment, tools, furniture, tableware, and light fittings. The 1960 Design Centre Awards and the Duke of Edinburgh's Prize for Elegant Design, all to be announced on May 19th, will be displayed also.

Sponsored by the Federation of British Industries and under the patronage of Queen Elizabeth II and President Eisenhower, the show will include a vast range of British products: textiles, furnishings, cars and trucks, engineering and electronic equipment, glass and silverware, foods, packaging, light and heavy machinery, tools, and instruments, as well as a replica of the original Lloyd's Coffee House and a traditional English inn complete with British barmaids. The 17-day exhibition will also have the first complete display of British commercial vehicles in the U. S., designed to increase British exports in this field.

With the typically British fanfare of pomp and circumstance, a Military Tattoo and Tournament will be staged in Madison Square Garden in conjunction with the opening of the show. Participating will be 500 trumpeters of the Household Cavalry, massed pipers and drummers, and members of the Coldstream and Grenadier Guards.

Teague office looks to future

Walter Dorwin Teague Associates will design the U. S. Government's Science Pavilion exhibits at the Century 21 Exposition to be held in Seattle in 1962. The exhibits will be designed, according to the Teague office, "to dramatize the contributions of modern science to human knowledge, and the part which science will play in solving the problems facing the human race."

Minoru Yamasaki will serve as architect of the Pavilion, in collaboration with the Teague office and the Seattle architectural firm of Naramore, Bain, Brady & Johnson. Exhibits, building, and operation will have a total budget of $9,000,000.

The Teague office has also designed the Virginia Civil War Centennial to be erected under the sponsorship of the Virginia Civil War Commission in Richmond's Confederate Memorial Park. This building, (above), whose domed roof measures 115 feet in diameter, will be completed in 1961.

Color show at Cooper Union

"The Logic and Magic of Color," a major exposition of the scientific, symbolic, and esthetic aspects of color, will open at the Cooper Union Museum on April 20th. One of the events in Cooper Union's centennial celebration, the show will be designed to demonstrate the ways in which colors and colorants are produced and used, and how they affect human beings in work and leisure activities.

Among a host of contributors to the exhibition will be Allied Chemical Corp., the Brookhaven National Laboratory, CIBA, Container Corporation of America, the Corning Glass Center, General Electric, Lippincott & Margulies and Union Carbide.

Lamp-design contest

Winners in the National Lamp Design contest, concluded last month, are Raymond E. Kuta, Lawrence K. Wallen, and John F. Christian, all students at Pratt Institute. Kuta won the first-prize award of $500 for his modular table lamp design. It consists of a rigid wire frame to which molded plastic louvers are attached. Kuta points out that although he used a hexagon for his basic form, production of such a lamp could use any geometrical pattern so long as the width of each side corresponded to the width or a multiple of the width of the louvers.

Modular travel display kit

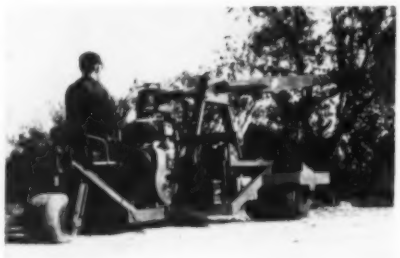
One solution to the problem of three-dimensional advertising in travel agents' windows, where the advertising message literally changes with the seasons and available window-space varies considerably from shop to shop, is a new put-it-together-yourself modular travel display kit (right) made for KLM Royal Dutch Airlines by Metropolitan Travel Display, Inc., Gerald N. Kurtz, designer.

Packaged in a trim carrying-case and assembled without tools, the kit contains a basic display unit (the KLM world-stripe logo) to which users may add 17 other copy and art panels describing flight destinations and other sales points. These are attached with aluminum extensor rods and peg-in balls and stands. The display firm is making similar kits, but with different messages, for a number of other airlines, American Express Co., and Western Union.

Two new showrooms

Jack Lenor Larsen has opened a new showroom at 677 Fifth Avenue, N. Y. (below). Designed by Edward L. Barnes, it features a shallow black-bottomed pool sprinkled with coal which makes a striking base to the two lightweight fabrics seemingly floating above. One of these fabrics, suspended from a lattice-type sub-ceiling, is Larsen's new diagonal strip weave consisting of cocoa brown stripes of different widths set at various diagonals on an air web-like white background. The upholstery fabrics are shown as covering on small square cushions which fit into benches; the cushions not being used are shelved in wall cases like books. The cushion device gives the buyer a better idea of what the fabric looks like in use and also is convenient for carrying around to match with draperies.

Knoll Associates will open a new showroom for furniture and textiles in Los Angeles on March 28. Designed by the Knoll Planning Unit, it will be the largest of the company's thirty-four showrooms with more than 6500 square feet of floor space devoted to room settings and displays.



"Tree-knocker"

Goodyear's stout, cylindrical, "go-anywhere" tire, called the "Terra-Tire," which has been rolling around for a few years, carrying vehicles through mud, sand, snow, swamps, and other usually impassible terrains, has recently found a new use on the novel "Tree-Knocker" vehicle (below), a leviathan hammer designed to harvest pecans. The vehicle is driven about the orchards, butting the trees, thus shaking the units to the ground where they are later gathered. The smooth-tread, low-pressure tires transfer the load of the vehicle to a wide surface of the ground, preventing damage to the fallen pecans.

Design on educational tv

Aluminum Extrusions, Inc. is going to film a series of educational tv programs on architectural and design subjects for the free use of educational tv stations, AE president William E. Dunlap announced last month. The first program, to be filmed in Chicago in the next month or so, will feature a discussion on architecture and design by George Nelson, Richard S. Latham (both of whom are on AE's board of directors), and Minoru Yamasaki.

Eleven stations in six midwestern states have expressed interest in broadcasting the series, and three, WTTW Chicago, WCET Cincinnati, and KETC St. Louis, have said they will definitely run the programs. After initial broadcasting, each film program will belong to the individual stations, and may be made available to commercial stations at their discretion. The programs, which will be produced by AE's public relations agency, Agel and Friend, will carry no commercial message by AE.

Jim Nash

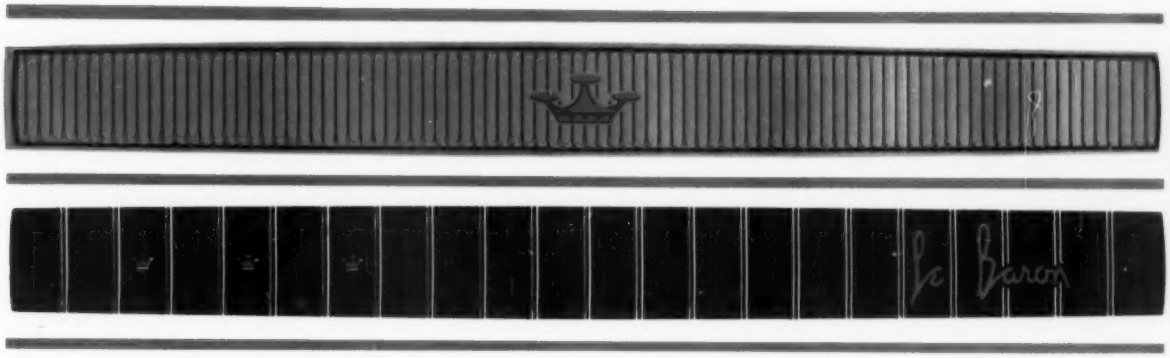
Jim Nash, chairman of the board of Jim Nash Associates, died on March 3rd at his St. Thomas, Virgin Islands estate, of a heart attack. He was 68.

One of the pioneers of merchandising-oriented package design, Nash won a number of awards for package design over the past 25 years.

He opened his own package design office in 1934 (after seven years at the Art Students' League and seven more with advertising firms) and was active with the firm until two years ago, when he turned over active management of the firm to Eric H. A. Teran.

Nash is survived by his wife, Madeleine, and three daughters.

Why Chrysler's Le Baron and Crown Imperial are the easiest cars to Park



Chrysler Corporation designers thought they'd come up with a really difficult manufacturing problem when they specified handsome decorative escutcheons to gleam in black, gold, and silver from the interior door panels of their two top models, the Le Baron and the Crown Imperial. The location is open to lots of abuse from hands, rings, buttons, and elbows—even in cars as elegant as these.

That's why Chrysler designers went to Park Nameplate. Park's engineers, experts in anodizing and processing light gauge aluminum, had the answer: Park *Thinplate Dimensional*.

Park often has the answer—particularly when the problem concerns decorative trim.

PARK nameplate company, inc.

Flushing 54, New York

How **THINPLATE DIMENSIONAL** solved the problem for Chrysler: High purity aluminum, .008" thick, custom anodized in polished black, matte silver, and polished gold. The design is embossed in precise register. Park's solvent-activated adhesive backing bonds the *Thinplate Dimensional* to the die-cast bezel permanently, without unsightly fasteners. Park selective anodizing makes color and design part of the aluminum—it never wears.

Receive Park's informative design case histories—with samples—of how Park THINPLATE *and* THINPLATE DIMENSIONAL *solve design problems. Send your name on your letterhead to Park Nameplate Company, Inc., 34-10 Linden Place, Flushing 54, New York.*

Events

CONFERENCES: The subject of the **International Design Conference** to be held in Aspen, Colorado June 19-25 will be "The Corporation and the Designer."

EXHIBITIONS: **Pottery and artware of Scandinavia** was shown during the past month at Georg Jensen, Inc., N.Y. The figure/vase shown below is by Denmark's Finn Lynggard. . . . A **photography show** entitled The Sense of Abstraction is on view at the

Figure-vase at Jensen show

Museum of Modern Art through April 10. . . . There will be an exposition on **Modern Industrial Design** at the Hanover German Industries Fair from April 24-May 3.

COMPETITION: The AIGA is calling for entries to its **"AIGA Packaging 1960"**—a show of noteworthy contemporary packaging design to be mounted some time next fall. Deadline for entries is May 15. Karl Fink is chairman of the show.

AWARDS: All entries for the **ASID Student Awards** must be received by April 15, 1960. Each student is to submit three projects. At least two projects must be product design, the third may be in a related area (packaging, interiors, display, graphics, furniture, etc.) Entries should be sent to: ASID Student Awards 1960, Industrial Design Department, School of Architecture, University of Southern California, Los Angeles 7, Calif. Judging and announcement of Awards will take place the next week. . . . Two faculty members of the Institute of Design, Illinois Institute of Technology, have been presented grants by the Ford Foundation for their creative efforts in sculpture and print making. **Cosmo Campoli**, assistant professor at the Institute and a nationally known sculptor, was awarded $10,000; **Misch Kohn**, an associate professor in visual design and an outstanding wood engraver, was awarded a retrospective exhibit of his prints.

Grant for packaging study

The American Management Association's Fund for the Advancement of Packaging has awarded a $25,000 grant to Rensselaer Polytechnic Institute for a study of the organization of packaging in a representative sample of industries. Object of the study, which will cover the organizational placement of packaging responsibility and authority, communication procedures, and the characteristics of packaging personnel, is to determine the most successful kinds of corporate packaging organization.

People

APPOINTMENTS: **Jay Doblin** as chairman of Plans Boards for Raymond Loewy Corp. on a limited-term consulting basis. . . . **Frank P. Bennett** as an associate for Paul McCobb Design. . . . **Robert M. Smith** (below) and **Donald M. Streiff** (below) as product designers for Smith, Scherr and McDermott. . . . **H. John Kretschmer** as executive assistant for Monte L. Levin. . . . **Milton I. Brand** (below) as director of Product Planning Services for Harley Earl Associates. . . . **Thor G. Christensen** as business manager for Jack Collins Associates. . . . **Robert H. Adams** (below) as controller, **Alfred J. Przybylowicz** (below) as director of product design, **Phyllis C. Dempster** (below) as office manager, and **Theodore Luderowski** (below) as chief designer for interiors and exhibits for W. B. Ford Design Associates, Inc. . . . **Raymond T. Cassidy** as staff industrial designer for Remington Rand electric shaver. . . . **Dann T. Deaver** (below) as associates for William M. Schmidt Associates.

ELECTED: **Ralph Kruck** as chairman of the 1960 Annual Southern New England Chapter Design Symposium. . . .**Irving J. Gershen** as chairman of the executive committee of the New York Chapter of the IDI for a period of one year. . . . **Peggy Bacon** and **Pietro Belluschi** as vice-presidents of the National Institute of Arts and Letters.

IN THE NEWS: **George Labalme, Jr.**, of Labalme and Chang, is now in Milan overseeing the construction of the American exhibit, designed by his organization, at the Milan Trade Fair, which will run from April 12-27. The American exhibit will demonstrate quality control techniques in mass production.

Company News

RETAINED: **Eliot Noyes** by Westinghouse. . . . **Bruce Kamp Associates** by Lockheed Electronics Co. . . . **Sundberg-Ferar, Inc.** by the International Nickel Co. to develop new uses of nickel in architectural and product design. . . . **Leon Wirch Associates** by Roland Radio Corp., to design their entire line of radios. . . . **Norman Cherner** by Raymor Mfg. Co. to design a coordinated group of ceiling and wall electrical fixtures.

ESTABLISHED: **A Plastics Technical Evaluation Center** at Picatinny Arsenal, Dover, N. J. by the Department of Defense.

GOING PLACES: **Robert Hagenhofer, Museum Graphics** to 210 East 58th Street, N. Y. . . . **Richard Neagle** to Via Prati 8, Milan, Italy. . . . **Packaging Corp. of America** (the result of the three-way merger last year of the former Central Fibre Products Co., American Box Board Co., and Ohio Boxboard Co.) is moving its corporate headquarters to Evanston, Ill.

Luderowski

Brand

Dempster

Streiff

Smith

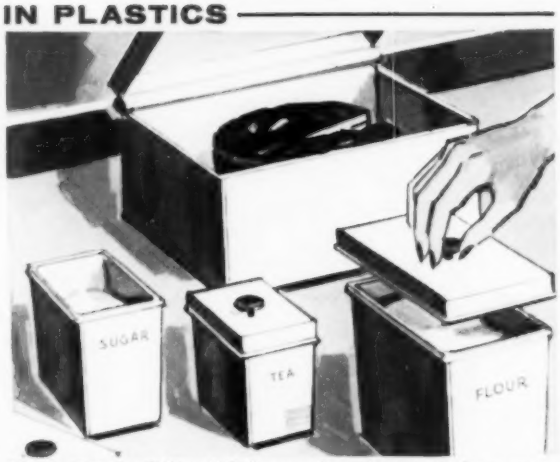
Przybylowicz

Adams

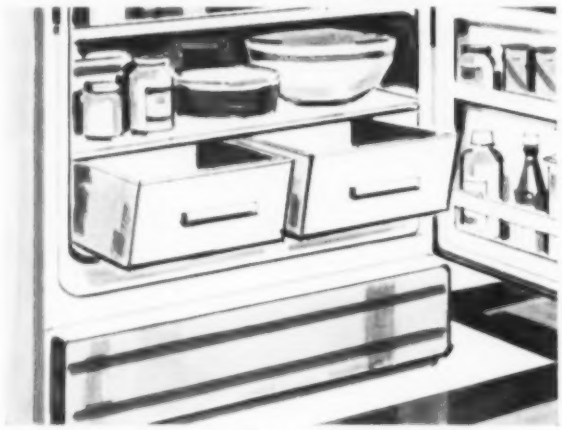
Deaver

WHAT'S NEWS IN PLASTICS

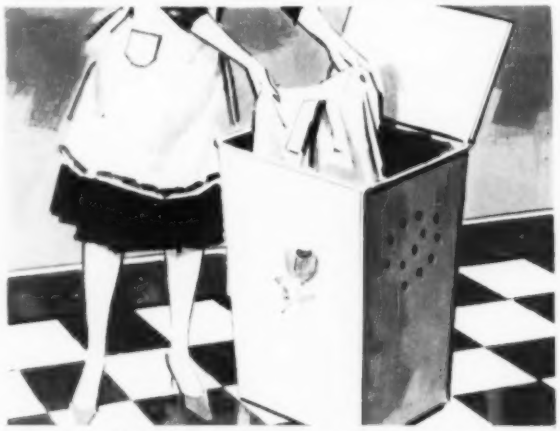
Beats the Heat! Housewares made of Escon get repeated use without warpage. That's because the heat resistance of polypropylene is greater than any other polyolefin. This makes it the desired material for such items as colanders, drainboards, dishpans, tumblers and lighting grilles.



Fresh Point of View! Polypropylene is 2 to 4 times more impermeable to gases and liquids than other thermoplastics. This means freshness stays in, outside elements can't enter. This makes Escon ideal for canister sets, bread boxes and cookie jars—which can be snap-fitted or self-hinged.



Cool Item! Escon is excellent as a food crisper for several reasons. It won't absorb strong food odors and, when properly molded, has the ability to take normal cold without cracking. The design possibilities with versatile Escon are limitless, providing the opportunity to expand existing markets.



New Idea! Escon can be undercut at high speed production cycles. Such items as clothes hampers can be molded in single flat pieces of various colors, then snap-locked for assembly and hinging. This means manufacturers can ship more products in less space . . . retailers will use less storage space, too.

Escon* POLYPROPYLENE CATCHES HER

Important news for molders and designers . . . Escon polypropylene is here! It's the amazing thermoplastic ideally suited to your product needs.

Versatile Escon is easy to work with! It can be injection and compression molded, extruded, thermoformed and heat sealed. The injection molder can start at stock temperatures of 400-450°F., for small items . . . slightly higher for larger ones. In addition, gates and runners for Escon could be of the conventional type, and normal clamp pressures would be employed when molding it. And Escon molds easily—

ENJAY
PLASTICS

EXCITING NEW PRODUCTS

ENJAY COMPANY, INC., *15 West 51st Street, New York 19, N.Y.*

EYE WITH NEW BEAUTY AND VERSATILITY

without warpage! Because of its low density, this amazing thermoplastic resin yields more pieces per pound.

For the designer, the high strength of Escon plus its excellent chemical and abrasion resistance allows accurate production of fine and intricate designs with high surface gloss.

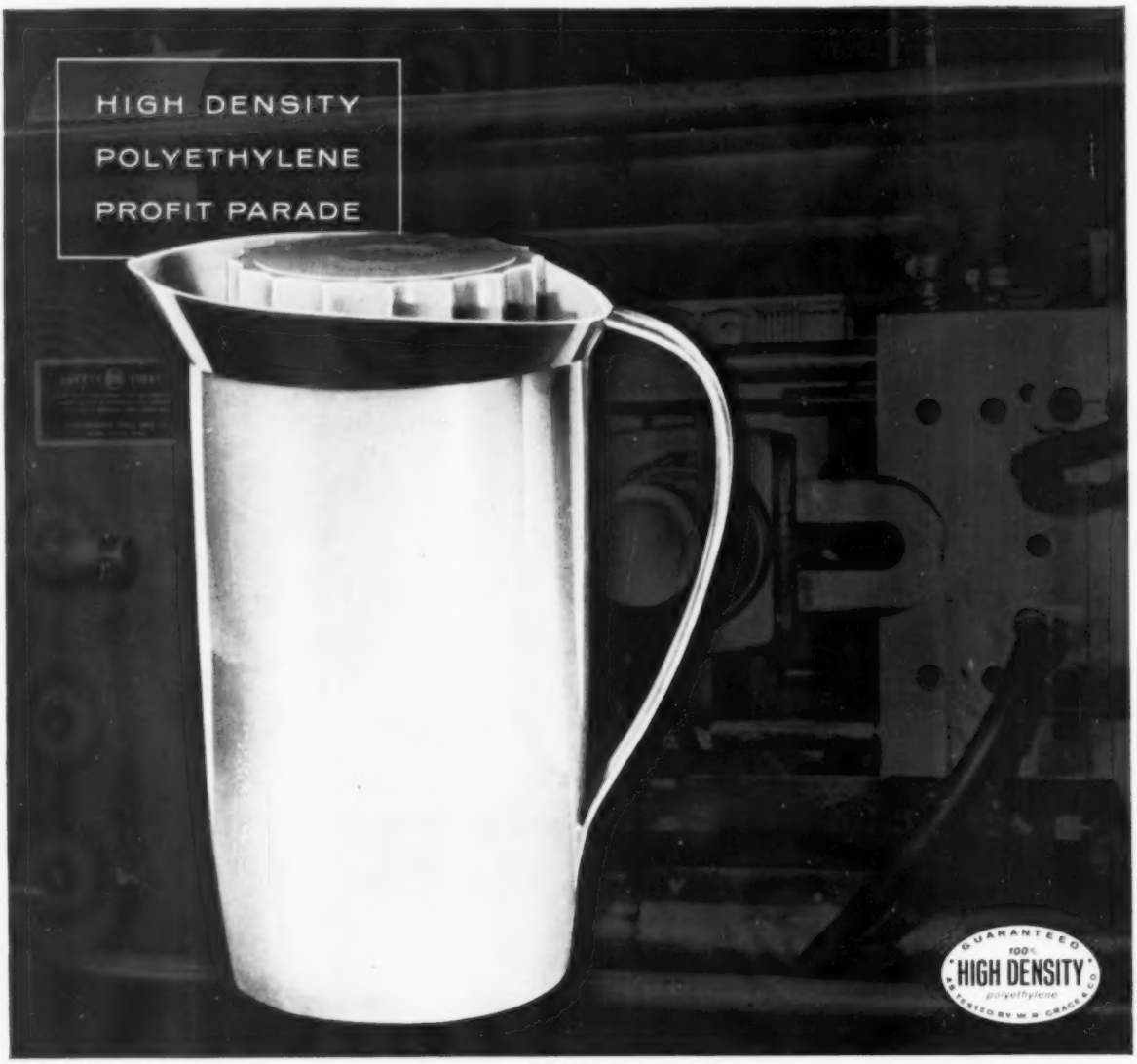
And because polypropylene offers greater heat resistance than any other polyolefin, products manufactured from Escon can be readily sterilized by heat or chemical means. *Trademark

THROUGH PETRO-CHEMISTRY

Akron • Boston • Charlotte • Chicago • Detroit • Los Angeles • New Orleans • Tulsa • Toronto

Escon can help you make a better product! For technical assistance or to order Escon, contact the nearest Enjay office.

ENJAY
PLASTICS



Grace Helps Expand a Housewares Line

If you have an idea for a new product that lends itself to high density polyethylene—but haven't done much more than preliminary thinking—now is the best time to call Grace in for help. Plastray Corporation can tell you this philosophy really pays off.

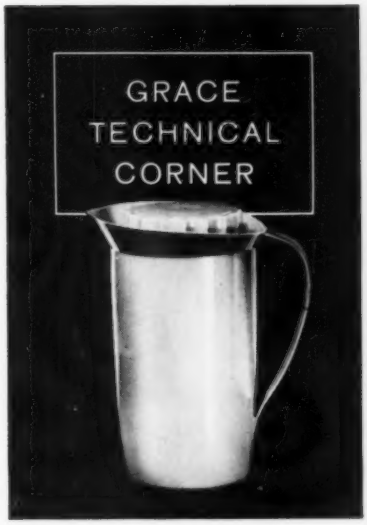
An established manufacturer of plastic housewares, Plastray wanted to expand its line with a new pitcher which they had designed and that would take full advantage of the profit-building properties of Grex high density polyethylene. Grace was brought into the picture from the beginning to help in the design and construction of Plastray's molds, and produce the first samples in the Clifton laboratories in time for the manufacturer to write orders at important trade conventions.

The finished product offers almost every feature that housewives look for in a pitcher. It is big enough to hold over two quarts, yet remains rigid and strong. It withstands the lowest refrigerator temperatures without losing its strength, and boiling water without losing its shape. Colors are permanently molded in. Chemicals often harmful to pitchers made of other materials cannot mar, stain or soften its attractive glossy finish.

Naturally, we are pleased to have played a major role in its development—and would like to help put your product in the Grex profit parade, too. Grace has the resin production facilities, technical service and experience you need. Everyone says we're easy to do business with.

Grex is the trademark for W. R. Grace & Co.'s Polyolefins.

W.R. GRACE & CO.
POLYMER CHEMICALS DIVISION
CLIFTON, NEW JERSEY



Pitcher reflects valid principles in designing for Grex.

Chances are you will never design a pitcher in high density polyethylene. Yet an understanding of the design characteristics of this particular pitcher may help you do a better job on applications for Grex in your own field.

Strength is needed. One of the major requirements for the pitcher centered on the fact that a full 70-ounce capacity was wanted. The need for strength and rigidity naturally followed. It is an interesting comment on the design itself and the physical properties of Grex that these requirements were met by generating a compound curve and using thin wall sections.

Use of thinner walls in any design for high density polyethylene results in production economies just as it did in this case. Fast molding cycles were achieved and material was saved. This is made possible by the outstanding physical properties of the material used. Variations in wall thickness and heavy sections were avoided in the pitcher design as a precaution against warpage, shrinkage and points of stress concentration.

Surface finish. A high gloss on the outer surface and pouring lip of the pitcher was desired for eye appeal. This was obtained by using a highly polished chrome-plated mold. The inner surface of the pitcher has a matte finish due to the fact that the mold's core is vapor honed to prevent sticking or freeze-up when ejecting the part. Practically any finish is possible in designing for Grex.

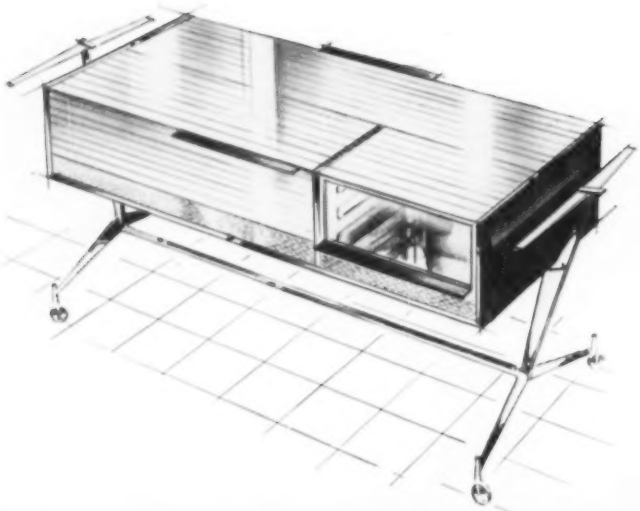
Call us for help. The pitcher story is a good example of the type of service we are ready and willing to provide you. If you are working on a design that calls for high density polyethylene —or are just in the thinking stage—now is the time to contact:

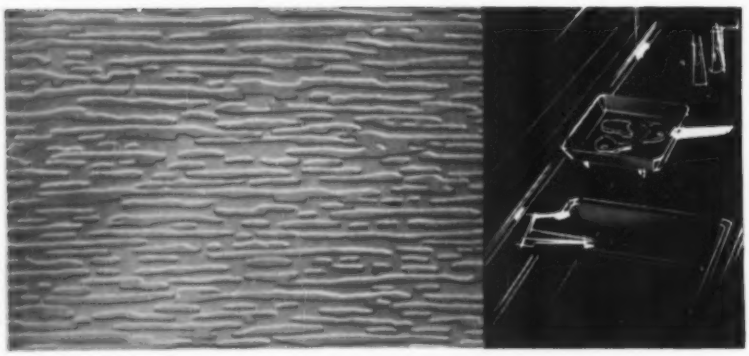
Technical Service Department
W. R. Grace & Co., Clifton, N. J.

Carl Sundberg and Montgomery Ferar joined fortunes in 1934 and since have had a great influence on improving the design of mass-produced consumer and industrial products.

One of the largest of the nation's recognized design firms, they have put their talents to work on hundreds of nationally known products ranging from pencil clips to heavy-duty motor trucks and electronic computers. Recognized leaders in the design of electrical appliances, they are permanently retained by many of America's best known appliance manufacturers.

Sundberg-Ferar designs a unique, portable kitchen caddy with wonderful....



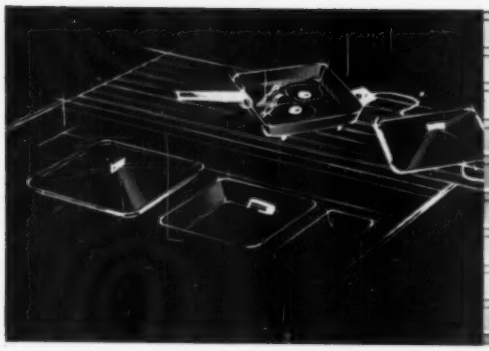


• Sharonart® is truly the designer's metal. Evidence of this fact is this modern kitchen caddy designed in Sharonart® by Sundberg-Ferar, one of the oldest, largest and most successful industrial design firms in the United States.

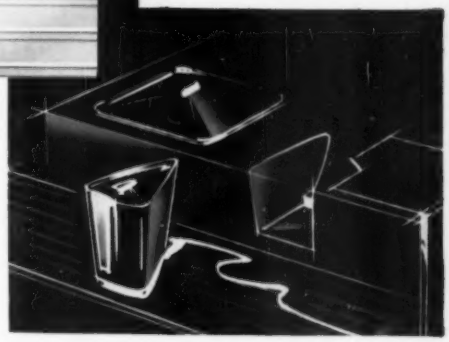
The portable caddy permits complete cooking facilities anywhere inside or outside of the home. To make sure it would be able to absorb the punishment of daily use, yet stay bright and clean, Sundberg-Ferar designed the cabinet and working areas in patterns of Sharonart® Stainless. Wood grain Sharonart® steel panels at each end give the furniture-look that blends with other home furnishings.

The textured beauty of Sharonart® can be produced in an almost limitless number of patterns. This permits easy model changing. It's easy to clean and will not show wear. It can be painted, plated, or vinyl coated with beautiful results. Is it any wonder that more and more of the leading designers are turning to modern Sharonart® for modern product design? *Sharon Steel Corporation, Sharon, Pa.*

About the portable kitchen caddy: This is a design only, produced to show the tremendous utility of Sharonart®. All the seemingly built-in utensils are self-energized, and can be plugged into any electrical outlet as well as being used with the caddy itself. The rotisserie has vertical elements that can be moved closer together for the smokeless vertical broiling of steaks. All utensils are removable and can be used at the dinner table for gourmet cooking. Plenty of workspace is provided for complete meal preparation right at the caddy.



Steel



..SHARONART®

SHARON *Quality* STEEL

SHARONSTEEL

BOOKS RECEIVED

ARCHITECTURAL RENDERING. By Albert O. Halse. 277 pages. Illustrations, drawings. F. W. Dodge Corporation. $15.75.
Every technic and medium used in architectural rendering today is discussed, along with the treatment of exteriors, interior, nature, perspective, lighting, how to buy materials, etc.

THE CONTEMPORARY CURTAIN WALL. By William Dudley Hunt, Jr. 454 pages. Illustrations, tables, graphs. F. W. Dodge Corporation, New York. $12.75.
Detailed information on the design, fabrication and erection of the curtain wall.

ENGINEERING MANUAL. By Robert H. Perry, Editor. 650 pages. Illustrations, tables, graphs. McGraw-Hill Book Company, New York. $9.50.
A practical reference for data and methods in architectural, chemical, civil, electrical, mechanical, and nuclear engineering.

HOW TO DESIGN AND BUY INVESTMENT CASTINGS. Edited by Robert H. Herrman. 176 pages. Illustrations, tables, graphs. Investment Casting Institute, Chicago, $3.95.
Detailed information on investment casting for the executive and technician, covering basic production techniques, design, the advantages of investment casting and how to buy them.

THE NORTHWEST ARCHITECTURE OF PIETRO BELLUSCHI. Edited by Jo Stubblebine. 100 pages. Illustrations. An Architectural Record Book. F. W. Dodge Corporation, New York. $6.50.

THE PACKAGE. Museum of Modern Art exhibition September 9-November 1, 1959. 39 pages. Illustrations. Distributed by Doubleday & Company. Museum of Modern Art, New York. $1.50.

PICTURE SOURCES: An introductory list. Edited by Helen Faye. 115 pages. Special Libraries Association, New York. $3.50.
Index of picture sources according to chief subject matter.

POTTERY: FORM AND EXPRESSION. By Marguerite Wildenhain. 149 pages. Illustrations. American Craftsman's Council, New York. $6.50.

TOOL ENGINEERING. By S. E. Russinoff. 326 pages. Illustrations, tables, graphs. American Technical Society, Chicago. $6.75.
Comprehensive information for the tool engineer in consulting with designers, studying costs, planning the processes of production, analyzing equipment and operations, selecting and improving equipment.

THE U.S. INDUSTRIAL OUTLOOK FOR 1960. United States Department of Commerce, Business and Defense Services Administration. 304 pages. Tables, graphs. Superintendent of Documents, U.S. Printing Office, Washington, D.C. $1.50.
Compilation of press releases of individual annual Outlook Studies on 89 selected U.S. industries.

ZINC: The Science and Technology of the Metal, its Alloys and Compounds. Edited by C. H. Mathewson with the American Zinc Institute. 721 pages. Illustrations tables, graphs. Reinhold Publishing Corporation, New York. $19.50
A comprehensive book on the subject of zinc, from geology to the end product.

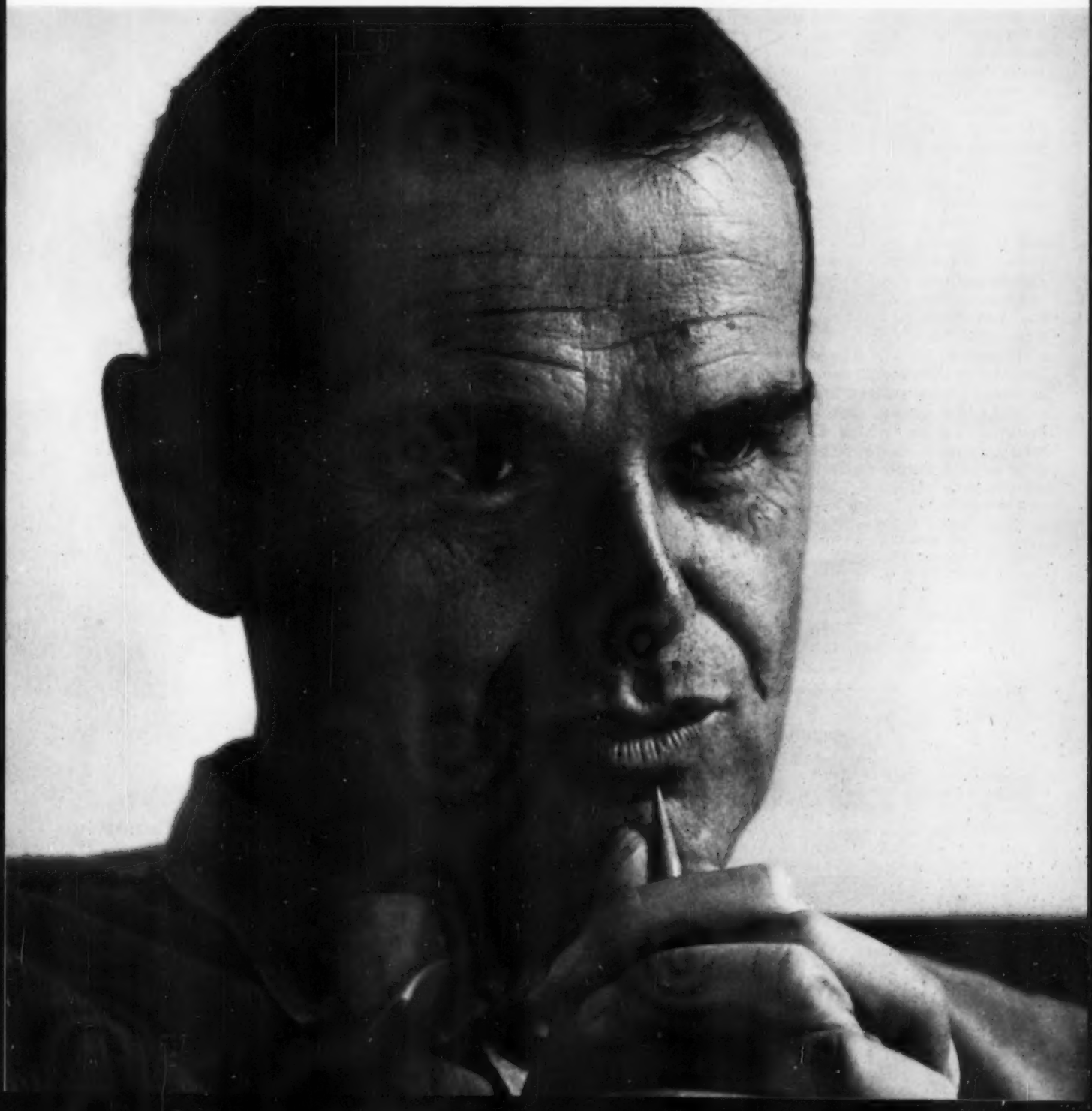
The Uninhibited Eye of the Designer

THE ALCOA INDUSTRIAL DESIGN AWARD presented to Charles Eames in recognition of notable achievements in design incorporating imaginative and effective use of aluminum. Deborah Allen, Alfred Auerbach, William Freidman, Ada Louise Huxtable and Arthur Pulos comprise the distinguished jury of critics, editors and educators in the design field which chooses recipients of the award from the Alcoa collection of industrial design.

When Charles Eames drops a marble into the top of a hollow wooden column, you cock your ear in delight at the melody that traces its fall over a series of metal bars. He sets a coin to spinning around a concave rubber cone and you watch in fascination while it swoops and spirals in a tightening orbit. You study his "Do Nothing Machine" and marvel at the myriad disks and stars and pinwheels, all alive with movement under power from the sun.

You might call them toys, but they are toylike only in that they represent the completely uninhibited approach that is the goal of every designer facing a problem. In the Eames office, the wooden column is the xylophone in revolution, the conical membrane is our universe modeled on a table top, with gravity drawing lesser bodies inexorably toward the sun, and the "Do Nothing Machine" is an eloquent argument for conservation of natural resources through employment of solar energy.

The same escape from orthodoxy that brought all three into being is responsible for Eames' innovations in design for the Herman Miller Furniture Company. Management can gain new insight from the following account of Eames' progress from inspiration to fruitful productivity.



1946

1947

EAMES: DESIGN IS A CONTINUITY OF RESPONSIBILITY

1951

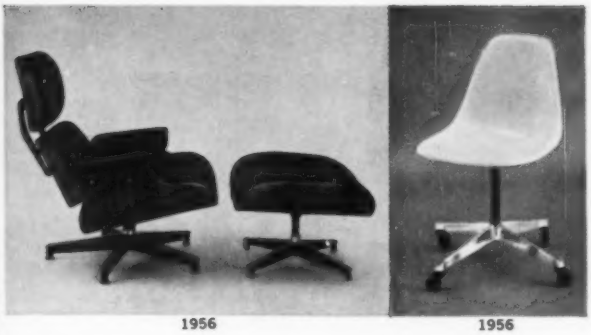
1952

1953

To Charles Eames, the client-designer relationship is substantially more than a series of spot assignments . . . of new models for the spring line or the annual trade showing. It is, instead, a continuity of responsibility.

For the Herman Miller Furniture Company, that relationship began 14 years ago and is readily traced through the sequence of Eames' designs that followed in logical progression. Each one came into being by discernment of a need . . . . precise definition of the problem, and the application of total objectivity toward its solution—responsibilities that Eames assumes as his.

The latest product of this continuum is the award-winning Eames Aluminum Group. Its beginning was triggered by an immediate need of a personal friend. The key to the concept came aboard an airliner in the doodle on an envelope. It resulted in a unique approach to chair design based on holding fabric under tension to support the body. (Scientifically minded Eames approached this as a problem in topology.) The culmination is the first luxury furniture to be equally at home indoors and out.

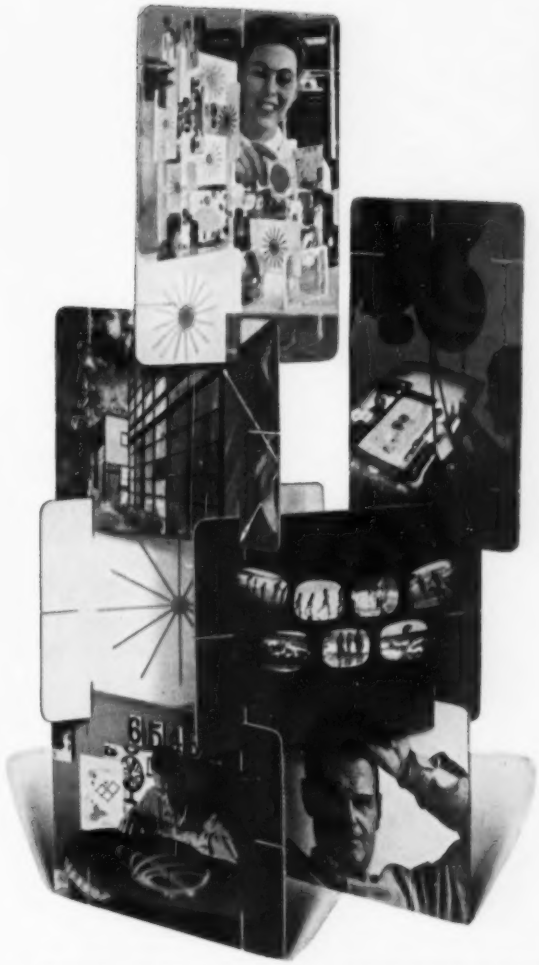


1956

1956

Point of departure in the chair's design is the cast aluminum frame, above. Fabric, wrapped around a plastic insert, is held in the slot by its own tension, without adhesives or fasteners. The heavier the sitter, the tighter the grip. (The designer sees the joining of one material to another as the most critical of all the problems. He always seeks a solution which is "elegant" in the same sense as a mathematical solution can be elegant–that is, clear, simple and foolproof.)

Eames' associate, Don Albinson (below left), mastered sewing technology to solve problems of fabric edges and hidden strips that prevent sagging. Dale Bauer (below right) of Eames' staff illustrates evolution of frame sections; all patterns and even prototype castings were produced in Eames' shop. Final models, shown at left, with Eames and Hugh De Pree, Herman Miller's general manager, became best sellers.



DESIGN CAN TAKE MANY DIRECTIONS

The continuity of responsibility shouldered by the designer need not stop with products, or the packages that contain them, or even with the production engineering. With the Eames organization, for example, it extends to building tools, graphic arts in advertising, showroom architecture, and to mass communication through motion pictures. Shown above are examples of diverse skills Eames applies for IBM, the Indian Government, U.S. Information Agency and other clients.

Ray Eames, both wife and business partner, shows their popular toy, the "House of Cards." In the unselfconscious, unembarrassed world of toys, the Eameses see an ideal attitude for approaching problems of design.

Eames began the practice of architecture in 1930, turned his talents to the design of his own home after World War II and demonstrated his ingenuity by creating distinction out of standard materials and stock products.

Eames' photographic skills have always been important to his method of study. Recently they have extended to experiments in visual communication, to network television films, and to an exposition of electronic computers for IBM.

Two and a quarter million Russian people saw the Eames portrayal of American life at the U.S. Exhibition in Moscow. By projecting more than 2,000 color photographs, seven at a time, on separate screens, he managed to picture an entire nation in just 12 minutes.

Principles of gravitation applying to objects in space are demonstrated when a coin is set to spinning around the periphery of a concave rubber cone—an example of the designer at work as a teacher.

Aluminum is the designer's metal . . .

Charles Eames established four requisites for the frames of his furniture group: light weight, durability, capacity for form, strength. In aluminum, he found all four answers. Light weight contributed the mobility essential in furniture design. Resistance to corrosion met the demands imposed by the outdoor usage intended. Castings were supplied by Allied Aluminum Company, Huntington Park, Calif., and produced by techniques pioneered by Alcoa. Additional strength was provided where needed by increasing the web of the frame cross section at the angle of back and seat and at the hub of the base section. Finally, aluminum lent itself admirably to the finishing technique that yielded the polished surfaces Eames specified.

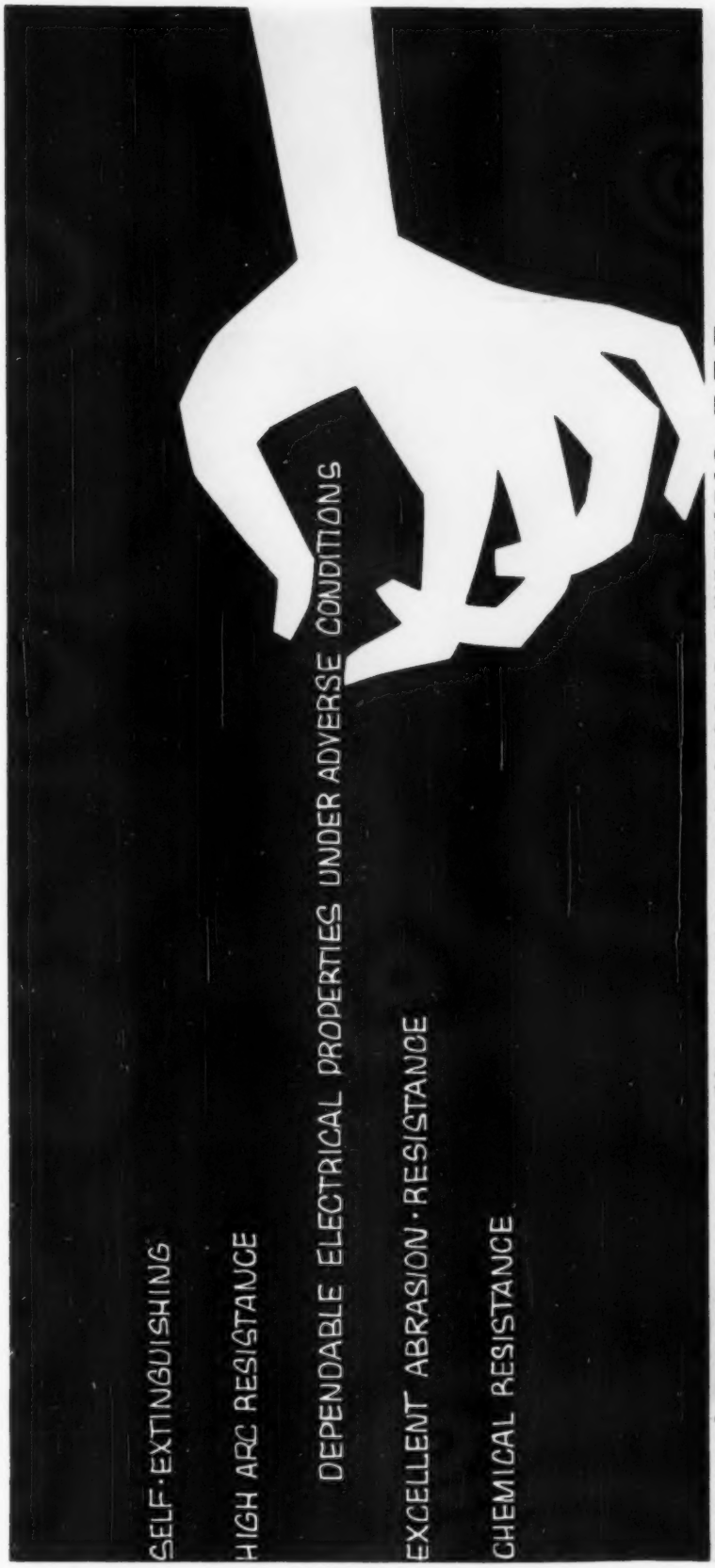
Alcoa is the designer's ally . . .

When the industrial designer approaches your product, he has an invaluable ally in Alcoa® Aluminum and the technical resources that Alcoa provides. No metal can be formed, joined, fabricated and finished by so many methods. No other metal matches its ratio of strength to weight. No other metal affords, with every pound, access to such authoritative counsel on problems of application. This assistance is offered without obligation to you, your staff designers or the independent industrial designer you retain. All that is required is a call to your local Alcoa sales office or a letter to: Aluminum Company of America, 1971-D Alcoa Building, Pittsburgh 19, Pa.

Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA, PITTSBURGH



CYMEL®
MELAMINE

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UREA

PLASTICS

REMEMBERED FOR PERFORMANCE – CYANAMID MOLDING COMPOUNDS

CYMEL 3135–3136 (glass-filled) Additional distinctive properties: outstanding electrical properties; high impact resistance; extraordinary flame resistance; good dimensional stability. Typical applications: circuit breaker boxes; terminal strips; connectors; coil forms; stand-off insulators. Specifications: Cymel 3135 (MMI-30, MIL-M-14E, Federal L-M-181 Type 8; ASTM D704-55T Type 8); Cymel 3136 (MIL-M-19061, MMI-5).

CYMEL 592 (asbestos-filled) Additional distinctive properties: resistance to atmospheric extremes; high dielectric strength. Typical applications: connector plugs; terminal blocks; a/c, automotive and heavy duty industrial ignition parts. Specifications: MIL-M-14E MME; Federal L-M-181 Type 2; ASTM D704-55T Type 2, SP1 SPEC NO. 27025.

CYMEL 1077 (alpha cellulose-filled) Additional distinctive properties: Surface hardness, heat resistance, unlimited color range. Typical applications: appliance housings, shaver housings, business machine keys. Specifications: MIL-M-14E – Type CMG (in approved colors); Federal L-M-181 Type 1; ASTM D704-55T Type 1, SP1 SPEC NO. 30026.

CYMEL 1500 (wood flour-filled)–CYMEL 1502 (alpha cellulose-filled) Additional distinctive properties: Good insert retention. Typical applications: meter blocks, ignition parts, terminal strips. Specifications: Cymel 1500 (MIL-M-14E Type CMG, Federal L-M-181 Type 6, ASTM D704-55T Type 6); Cymel 1502 (MIL-M-14E Type CMG, Federal L-M-181 Type 7; ASTM D704-55T Type 7.

BEETLE® UREA (alpha-filled) Additional distinctive properties: Economy of fabrication, economy of material, myriad translucent and opaque colors. Typical applications: wiring devices, home circuit breakers, tube bases, appliance housings. Specifications: Federal L-P-406A, LC 726-1, ASTM D705-55, Grade 1 (Arc resistance limits are in process of revision by ASTM), SP1 SPEC NO. 27026.

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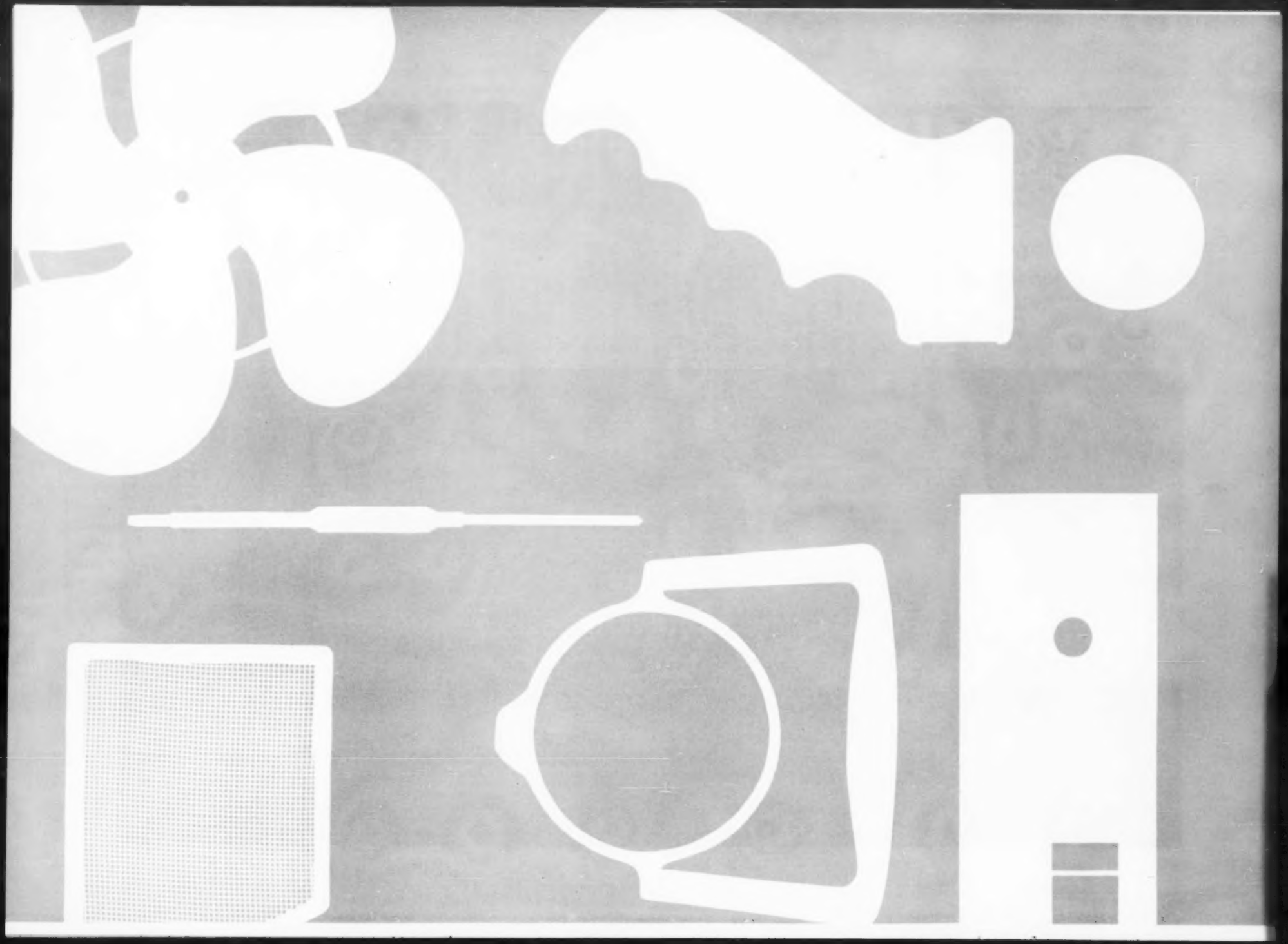
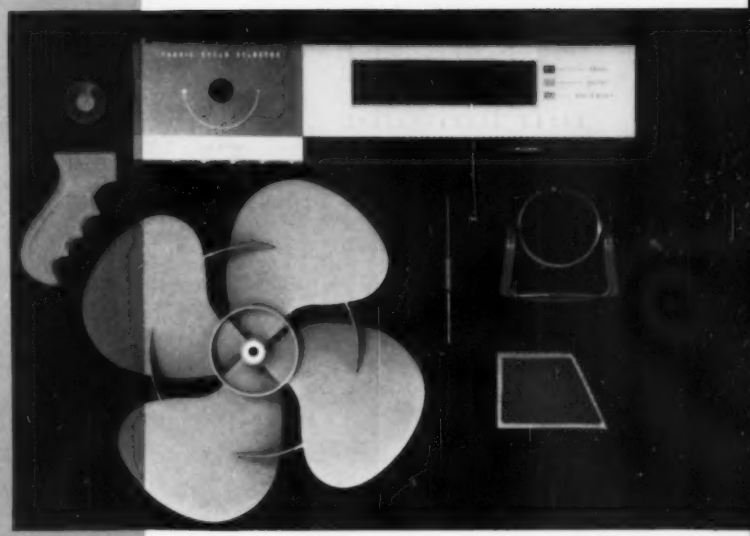


How the custom molder can help bring your product idea to life

The custom molder is well-known as a mass producer of molded plastics parts and products. But he is much more. Most helpful to the designer, the custom molder knows the design limits of the different plastics. He can recommend the best formulation for the job. He can also engineer the design to capitalize on the inherent advantages of plastics materials and the efficiencies of plastics manufacturing. His toolmakers build the master molds to the closest tolerances. His productive facilities can turn out plastics parts with unusually consistent quality, at rates to meet the tightest schedules and budgets.

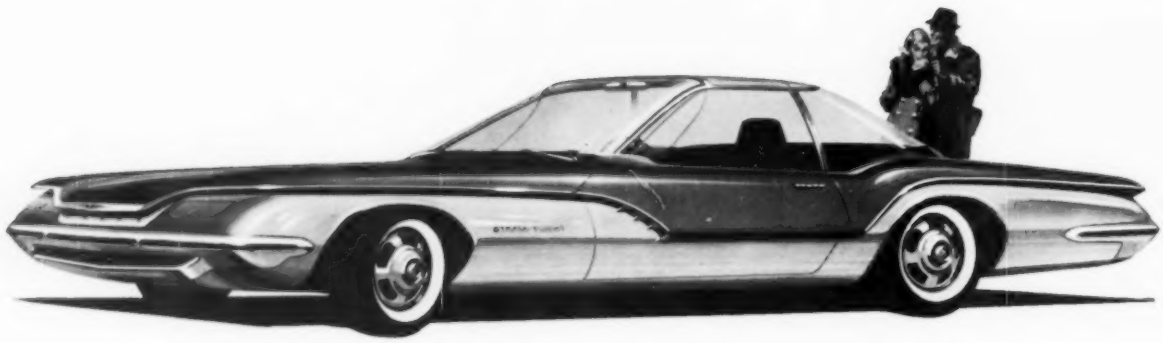
Monsanto keeps the custom molder supplied with molding formulations of Monsanto Polyethylene, Lustrex® Styrene, and Opalon® Vinyl, specially developed and constantly perfected to meet a wide range of design requirements.

Which molding compounds to consider? Use the Plastics Properties Calculator, an easy-to-read slide rule that provides comparative property data on the many different plastics molding materials. For your free calculator, write to Monsanto Chemical Company, Plastics Division, Room 732, Springfield 2, Mass.



MONSANTO ACTIVATOR IN **PLASTICS**

Monsanto



stainless steel

No other metal has the strength, beauty and versatile qualities that serve you so well today and promise so much for tomorrow.

There is nothing like stainless steel for AUTOMOBILES

McLouth Steel Corporation,
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Manufacturers of high quality
Stainless and Carbon Steels

Look for the **STEELMARK**
on the products you buy.

McLOUTH STAINLESS STEEL

CYCOLAC

THE BORG-WARNER PLASTIC THAT'S TOUGH, HARD, RIGID

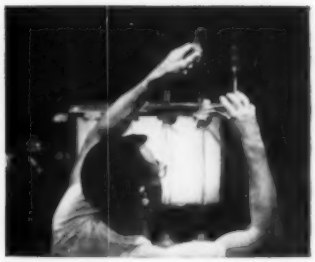
Philco had a stiff list of requirements for the door liner of their 1960 refrigerator: resistance to Freon corrosion . . . an easy-to-clean, hard, glossy surface . . . toughness at low temperatures and resistance to stain. CYCOLAC—the tough, hard, rigid **ABS** plastic from Borg-Warner met every requirement with resounding success! This is just one of many examples of how CYCOLAC is solving specific design problems for leading manufacturers such as Western Electric, Lionel, and Victor Adding Machine Company. It may solve one of **your** design problems, too.

CYCOLAC *Better in more ways than any other plastic*

Get the facts—write today!

MARBON CHEMICAL DIVISION **BORG-WARNER**

WASHINGTON WEST VIRGINIA



At Eastman

QUALITY CONTROL

is a company's conscience "at work"

Tenite is more than a trade name for Eastman's plastics ...it's a pledge of promised performance

You can measure a company's conscience by the care taken to uphold the quality of its products.

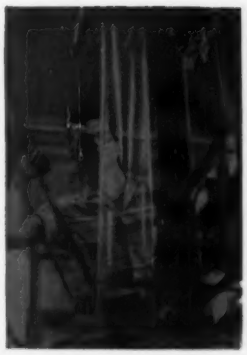
If those products are plastics, uncompromised control is a "must"...for plastics are unique materials. Perhaps no other class of raw materials used by the manufacturing industries has so many variable—yet controllable—physical properties. Flow or moldability, stiffness, heat resistance, weather durability, color, light transmission, hardness...are just a few of the properties that can be custom tailored to meet the needs of a specific application or a specific fabricating procedure. Such flexibility in setting the physical properties of a raw material is an advantage which must be protected by accurate control. For once an acceptable formulation has been created and sold to satisfy both performance and production demands, it is necessary to maintain those properties within extremely narrow limits to assure trouble-free molding operations as well as satisfactory service.

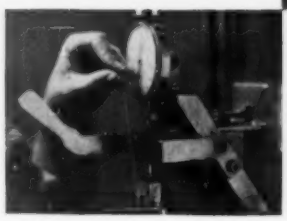
At Eastman, Tenite Quality Control is the vigilant watchdog over the production of all Tenite plastics. This group has the continuing responsibility to conduct all necessary testing to forestall deviation from the specifications set for the many formulations.

So varied and so complete is the testing done by Tenite Quality Control, that this one control section of Eastman requires a staff of over 100 trained personnel.

Acting as a nerve center, sensitive to any factor that could swing a formulation away from its prescribed limits, Quality Control approves or rejects the results in all phases of the production of every pound of Tenite plastic made.

Control of quality begins with approval of the basic raw materials. Even though most of the basic materials that go into Tenite plastics are supplied by other members of the Eastman industrial family, Tenite Quality Control has the final voice in the acceptance or rejection of these materials. At Kingsport, Tennessee, where Butyrate, Acetate and Propionate are made, raw materials such as cellulose esters, plasticizers, colorants and other additives are rigorously tested and graded on their suitability for compounding into clear transparent plastic or into transparent, translucent or opaque colored plastics. Indicative of the care taken to assure shipments of Tenite plastics that are right for each use, is the fact that no order for Tenite Butyrate, Tenite Acetate or Tenite Propionate is filled "out of stock." *Every*





order for these three plastics is made to order as a separate batch, custom-produced to meet the exact specifications requested.

At Longview, Texas, where Tenite Polyethylene in both low- and medium-density grades is produced via continuous processing, Quality Control maintains a constant check of the purity of the ethylene gas as it enters the reactors.

During production of both cellulosic and polyethylene plastics, various tests are conducted at intermediate stages to insure proper control of the chemical reaction. Similarly, after production, samples of the plastics are carefully molded by Quality Control to be sure their forming characteristics are suited to the customer's fabricating equipment. In addition, flow, color, along with physical and chemical stability are also checked. If any special qualities, such as fire retardance or resistance to ultra-violet have been specified, Quality Control runs extra tests on the plastic before shipment to confirm that these requirements have been met.

Color gets particular attention. Over the years, Tenite plastics have won an enviable reputation for accurate color matches. To date, plastics in more than 40,000 different colors and color effects have been produced by Eastman.

Finally, after Quality Control has been satisfied that the Tenite plastic will fully meet all specifications of the customer's order, it is approved for shipment. Even after shipment, Quality Control remains in the picture. Physical samples of all plastics shipped are kept for six months. In addition, all records on the processing of these shipments are retained for five years. Result: Quality Control has a continuing guide for filling subsequent orders with duplications of the original plastic.

Ever since Eastman began producing plastics in 1932, an alert awareness has existed that users of plastics have a critical need for material that is consistent in its performance and handling properties shipment after shipment. If one word were to be singled out to describe the outstanding virtue of Tenite plastics, it would have to be chosen from such adjectives as *uniform, consistent, unvarying, dependable.* But whatever the word, the end-result has been satisfaction for our customers... *and for us.*

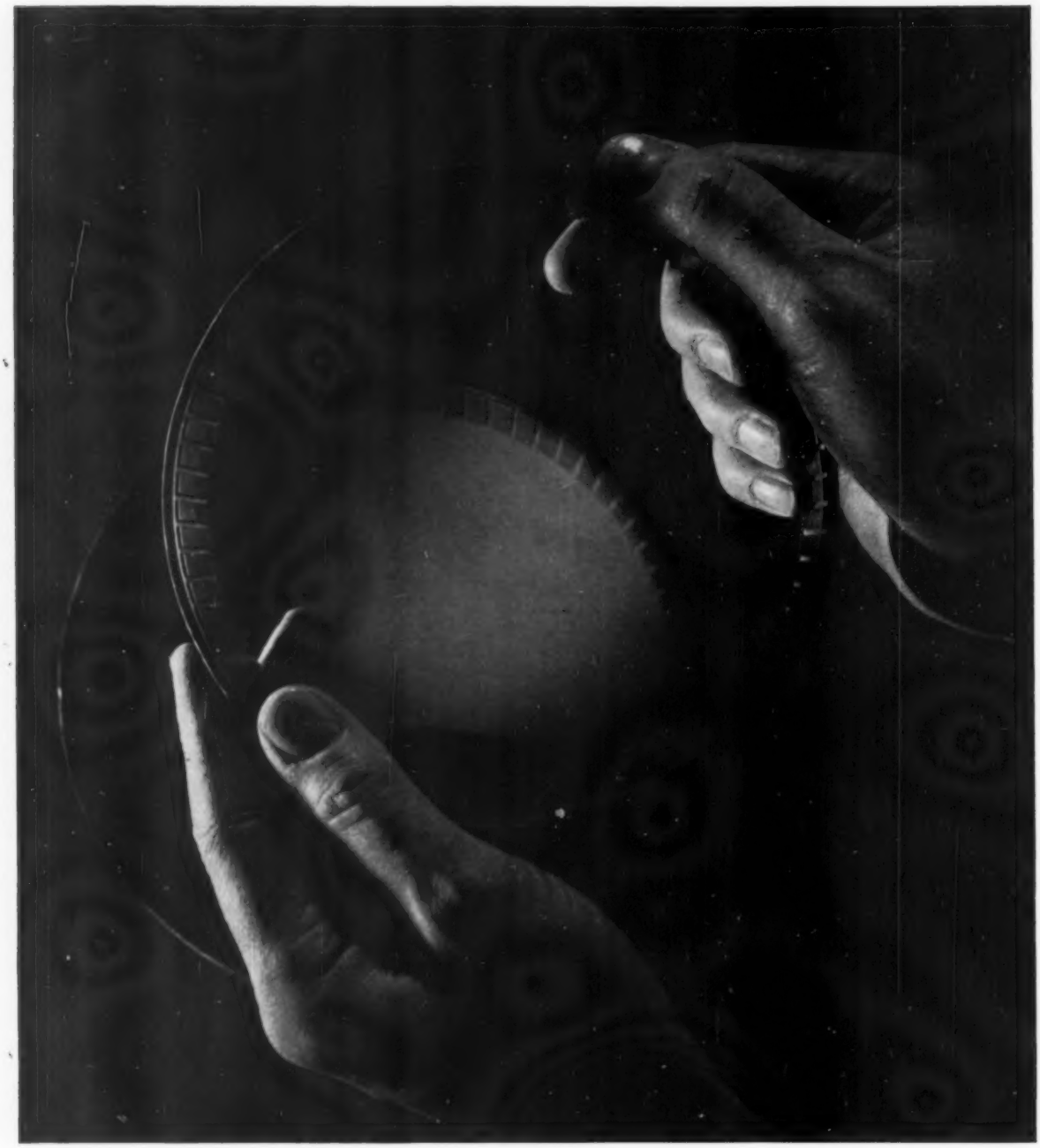
And, after all, that's the purpose of having a conscience.

The full story of the detailed testing that underwrites the reputation of Eastman plastics, is told in a 20-page booklet, "QUALITY CONTROL." For your free copy or more information on Tenite plastics, write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

TENITE®

BUTYRATE · POLYETHYLENE · PROPIONATE · ACETATE

Dependable plastics by Eastman



If you now cast it, maybe you should mold it

This is a reverse clutch cone. It used to be cast from aluminum, then machined. Not now.

Now they mold it from a Durez® phenolic that's reinforced with fibrous glass. It comes out of the mold weighing only 4 ounces and ready to transmit the full engine power of a 2½-ton car.

If you are now designing parts in metal, using costly fabricating methods to get the tolerances and structures you want, think about these newer phenolics.

Molding is often less costly than any combination of casting and machining.

Many of the new phenolics have properties that in many respects are superior to metal: surface finish, resistance to corrosion, dimensional stability.

We've got a booklet for you that spells out many of these properties and characteristics . . . along with suggestions on proved applications that may spark some ideas for you. Ask for Bulletin D400.

DUREZ PLASTICS DIVISION

8704 WALCK ROAD, NORTH TONAWANDA, N. Y.

HOOKER CHEMICAL CORPORATION

HOOKER CHEMICALS PLASTICS

1960 DESIGN ENGINEERING SHOW &

ASME CONFERENCE

New York Coliseum, May 23 to 26, 1960

Ideas to spark your thinking. *Applications* to help you create superior products. Knowledge, for better accomplishment. 400 of the nation's most imaginative materials and components manufacturers gathered under one roof to give a plus to your design and development planning. Exhibits are staffed with engineers. Compare first-hand — test — come away with hundreds of new ideas that can influence your product engineering for years ahead. You owe it to yourself to attend.

IDEA EXCHANGE: *The Design Engineering Conference sponsored by the Machine Design Division, American Society of Mechanical Engineers*

The *must* conference of the year for everyone involved in product design, research and development.

For information, write to Clapp & Poliak, Inc., Show Management, 341 Madison Avenue, New York 17, New York.

imagination AND DU PONT PLASTICS

LUCITE® *acrylic resins*

The functional beauty of LUCITE acrylic resins is being used in an increasing variety of designs—wherever high strength, light weight, outdoor stability, ease of fabrication, superior clarity and optical properties enter into the design equation. Imaginative designers have taken advantage of the combination of properties offered by LUCITE in such applications as signs, displays and lighting fixtures . . . in optical applications . . . in gemlike taillight lenses and parking lights . . . in decorative emblems and functional parts of appliances . . . in specialty packaging and jewelry . . . in colorful building panels.

LUCITE is available in a range of molding powders with a variety of molding characteristics and a broad selection of transparent, translucent and opaque colors. Molded LUCITE may be shaped with woodworking equipment; pieces may be joined by cementing, heat or spin-welding. It may be decorated with paint, stains, silk-screen designs, or by sand blasting, carving or etching. LUCITE resins are available for extrusion. Du Pont also offers LUCITE acrylic sirup for the production of panels reinforced with glass or organic fibers.

What LUCITE offers to designers

optical properties: LUCITE transmits 92% of the light striking it. It can "pipe" light around angles or curves, and it permits unusual edge-lighting effects. Economically injection-molded to close tolerances, LUCITE makes an ideal optical lens material, as in the virtually unbreakable lenses used in slide-viewer (left), which provide distortion-free brilliance and uniform light transmission.

strength: Extraordinarily strong, resistant to impact even at low temperatures, LUCITE retains its strength and durability even under exposure to a variety of corrosive solutions. For example, the heavy-duty hypochlorinator (left) has eight parts of molded LUCITE, which withstand chemical attack in industrial processes while permitting a visible check of diaphragm and valve action.

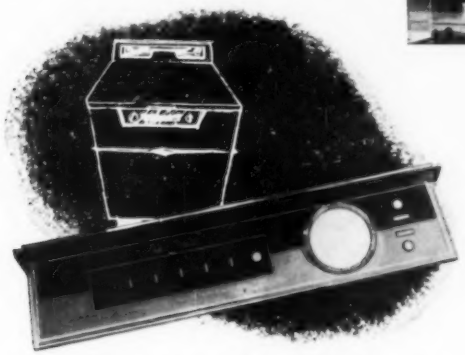
light weight: LUCITE weighs approximately one-third as much as glass. In many critical applications, it thus permits weight savings without sacrifice of optical qualities, of strength or of appearance. The portable solar radio at left uses clear, transparent LUCITE to protect the silicon cells, while dial parts of LUCITE lend a touch of beauty.

weatherability: The outstanding optical clarity of LUCITE is unaffected by aging, sunlight and moisture. It resists cracking and crazing . . . keeps its functional and decorative properties intact even under extremes of weather. Ideally suited to indoor and outdoor applications, extrudable formulations of LUCITE are being increasingly used in lighting and sign applications (left).

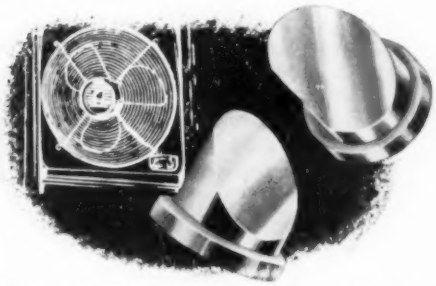
colorability: Available in a variety of highly stable colors, LUCITE finds glowing applications in signs, in boat lights, in taillight lenses (left) and in jewelry. A variety of surface effects and textures further increases the decorative versatility of these remarkable materials.

New designs made possible by LUCITE

Better-looking lighting designs use LUCITE to transmit optimum light without specular glare or shadow. Fixtures of LUCITE are strong, light in weight, free from discoloration and dimensionally stable. Improved durability and easy-working qualities reduce rejects during fabrication steps such as sawing and drilling. And LUCITE provides exceptionally high resistance to yellowing.



Control panels for appliances are molded at moderate cost from Du Pont LUCITE. This lovely silver-gray and blue panel for an automatic washer will remain bright and new-looking for the life of the machine. LUCITE is unaffected by moisture. (Molded by Kent Plastics, Evansville, Indiana.)



Automatic control for window fan uses a lens of LUCITE to illuminate a colored control window. Light enters the lens through an angled facet. The "light-piping" ability of LUCITE permits convenient placement of light sources. (Molded by Engineered Products, Inc., Hazelwood, Mo., for The Emerson Electric Mfg. Co., St. Louis, Mo.)

What problems can LUCITE help you solve?

The applications shown on these pages may suggest ways in which the unique properties of LUCITE can help you solve some of your design problems. Du Pont technical personnel are ready to assist you in your evaluation of LUCITE acrylic resins, as well as the other high-quality plastic materials offered by Du Pont, such as ALATHON® polyethylene resins, DELRIN® acetal resins, ZYTEL® nylon resins. For more information about any of these materials, write us. Address: E. I. du Pont de Nemours & Co. (Inc.), Dept., T-4, Room 2507L, Nemours Bldg., Wilmington 98, Delaware.

IN CANADA: *Du Pont of Canada Limited, P.O. Box 660 Montreal Quebec.*

POLYCHEMICALS DEPARTMENT

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

ALATHON® polyethylene resins **DELRIN®** acetal resins **LUCITE®** acrylic resins **ZYTEL®** nylon resins

Du Pont's problem-solving plastics

ENJAY DELIVERS 1,000,000th LONG TON OF BUTYL!

PRODUCTION FACILITIES INCREASED TO MEET CONSTANTLY GROWING DEMAND

There have been many elastomers developed since the first commercial ton of Butyl was used in 1943, but no other rubber, synthetic or natural, offers so many outstanding properties for so many applications.

Plant expansion plans announced recently will increase butyl production capacity some 50 percent by 1961 and, at today's rate of consumption, the two million-ton mark will be reached within the next six or seven years. Two new additions to the butyl product line, Chlorobutyl and Butyl Latex, will soon be available in commercial quantities.

VERSATILE ENJAY BUTYL'S OUTSTANDING PROPERTIES MAKE IT SUPERIOR TO OTHER RUBBERS FOR MANY APPLICATIONS. SOME ADVANTAGES:

- **RESISTS TEAR AND ABRASION** ... used in the new and revolutionary all-butyl tire.
- **STANDS UP AT HIGH TEMPERATURE** ... used in steam hose and tire curing bladders
- **HAS EXCELLENT ELECTRICAL PROPERTIES** ... used in high voltage cable insulation
- **IS IMPERMEABLE TO GASES** ... used in virtually all rubber air-holding applications
- **HAS WIDE RANGE OF DYNAMIC PROPERTIES** ... used in over 100 applications on the modern automobile
- **DISPLAYS OUTSTANDING CHEMICAL RESISTANCE** ... used for the storage and shipment of many chemical and commodity products
- **WITHSTANDS EXPOSURE TO SUN AND WEATHER** ... used in irrigation pipe and roof coatings.

Want to find out fast, how versatile Butyl can improve your product? Call or write the nearest Enjay office.

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY COMPANY, INC.

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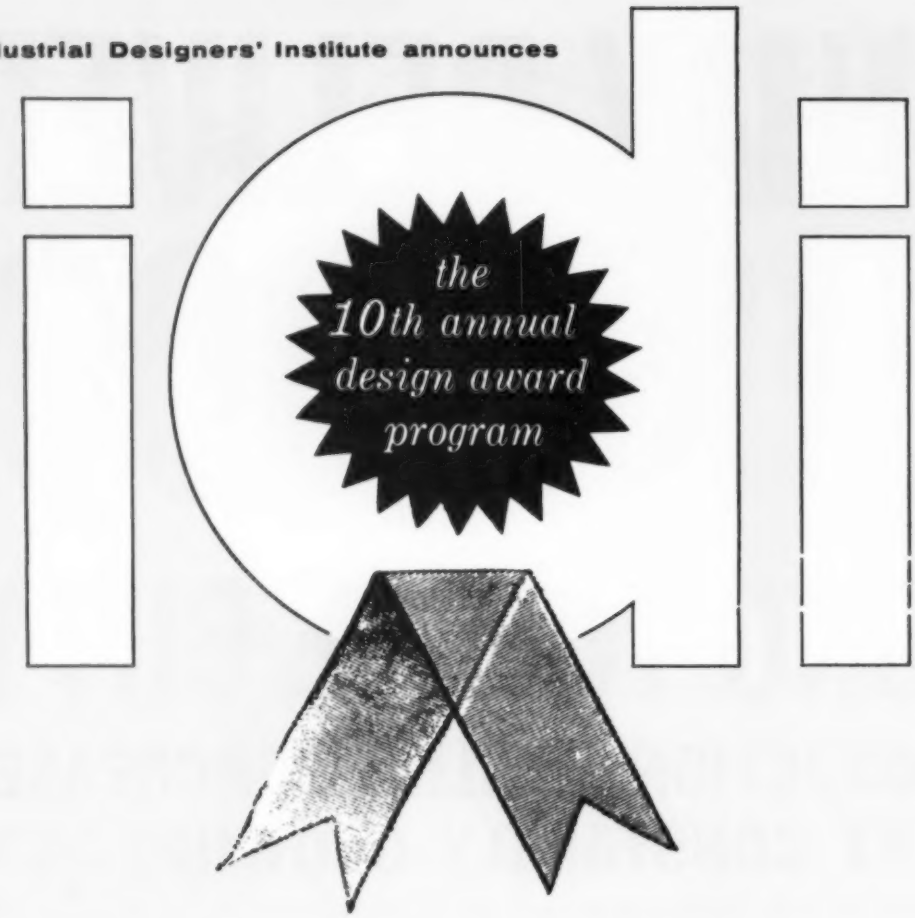
ENJAY® BUTYL

the Industrial Designers' Institute announces



1960 — marking a decade of recognition to designers

The IDI Design Award is a token of recognition bestowed on a designer or team of designers for outstanding design of any product mass produced prior to May 1, 1960. 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 may be obtained from the Chairman. Forms must be returned, postmarked no later than May 14, 1960.

presentation Announcement of the designers to be honored and presentation of the award medals will be made at a luncheon on June 23, 1960 at the Hotel Ambassador, Chicago.

Request forms from Paul R. MacAlister, Chairman, 1226 North Dearborn, Chicago 10, Illinois.

Nickel-Chrome Plating Reflects the Quality Appeal of Enduring Beauty

If salt air won't harm the eye-appeal of quality Nickel-Chrome Plating... what will?

De-icing salts? Traffic abrasions? Flying stones and gravel? Freezing temperatures?

All these meet their match in quality Nickel-Chrome Plating... plating with a good, heavy, *double-layer* nickel coating underneath.

For this good, *bright*, double-thick nickel coating with a surface layer of chromium not only provides the shining beauty you see and admire ...but it also provides *lasting* beauty, and beauty *easy* to care for. That's because it protects the basis metals from rust and corrosion. It protects new car trim against nicks and scratches.

So with Nickel in ample supply as far into the future as any man can foresee, you can now plan to use *double-layer* nickel coatings to get this *double* benefit:

1. to improve the appearance of brightwork... to make it more desirable and salable.

2. to improve brightwork durability to help keep your customers happy, satisfied, *and sold.*

For more information about versatile nickel coatings, write us for our informative booklet, "PRACTICAL ANSWERS TO 40 PRACTICAL QUESTIONS ABOUT NICKEL PLATING."

The International Nickel Company, Inc.
67 Wall Street INCO **New York 5, N. Y.**

Inco Nickel

Nickel makes plating perform better longer

Best (?) Foot Forward

An introduction to a problem

Like other creative activities, the practice of industrial design has been compared to parenthood. The analogy could be worse (at times the profession has been compared to the process of childbirth itself), and it has a modicum of validity: designers occasionally regard their designs with the anxious pride other men reserve for their daughters. But good parenthood is more than an attitude; it is a loving kick in the right direction. The time comes when every child, whether debutante or dead end kid, is introduced to society. Normally it is the parent's prerogative to arrange the introduction.

Here the analogy stops. Rarely does the designer have much to do with how his design is exposed to the public that will buy it, the trade that will sell it, the press that will announce its emergence. Yet the presentation of products is his concern because they are, in a sense, "his" products, and because presentation is one of the skills he brings to industry.

Despite the unparalleled expenditures written off to the establishment of corporate images, and to advertising and public relations, the products of industry are generally brought to the public's attention with an ineptness that belies the competence with which they were created. A manufacturer able to devise, refine, and fabricate a complex and beautiful machine ought to be able to show it off tastefully and intelligently, but it doesn't often happen that way.

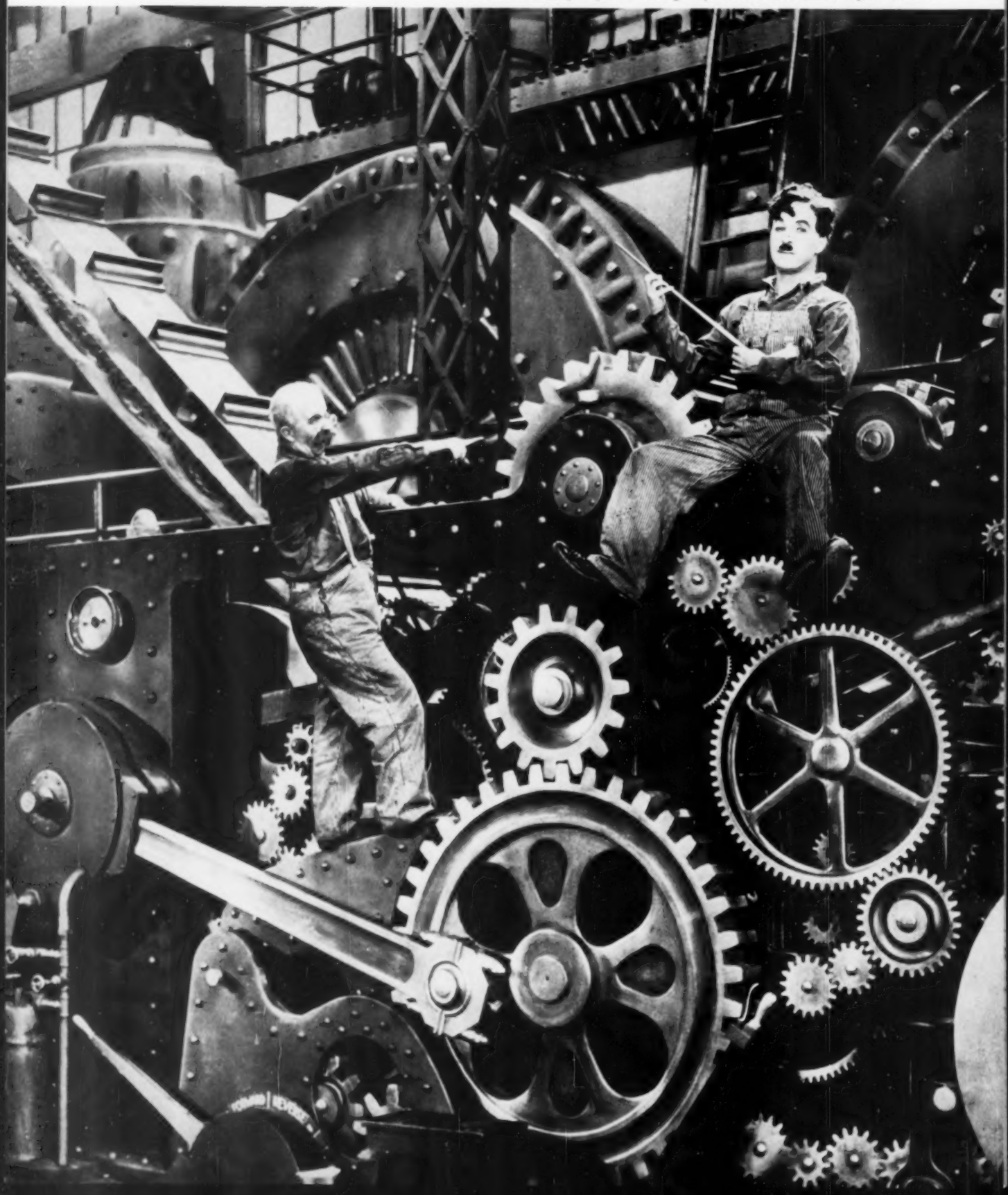
The gracelessness that marks the company manners of American industry is especially noticeable at trade presentations—often elaborate affairs designed not so much to deliver information as to bury it under strong drink, heavy meals, irrelevant entertainment, and wretched speeches by sales managers. The speaking sales manager, or company president, is victimized by a sinister circumstance peculiar to these affairs: he gets star billing, and he is the only amateur. Everyone else in the production, from the hat check girl to the salad chef, has some professional competence. The star alone is required to do what he usually has no gift for, no training in, and no business doing. And the audience is required to hear him do it.

When a giant corporation displayed its wares at a metropolitan hotel recently, a troupe of embarrassed entertainers were retained to romp through a series of songs and sketches in praise of The Corporation. There was a blonde harpist on tap. As far as musical proficiency goes, her face was her fortune. The company, on the other hand, assumed that its fortune was its face: as the president droned the year's achievements ("We are now the world's third largest producer of snowlon. . . . We have plants in Cambodia, Costa Rica, and Calumet City. . . . This banquet is costing us $50,000"), the lyric majesty of each fact was punctuated by a twang of chords contributed by the blonde harpist!

There is a young lieutenant in *War and Peace*, described as the kind of person who assumes that his good fortune will delight everyone as much as it delights him. A young lieutenant, if he's handsome, can get away with this, but a corporation cannot. No corporation has a right to be a bore. Because designers can help carry industry's messages efficiently and agreeably, ID is preparing a number of articles on the planning and design of tools for presentation. One of the strongest and most versatile of these is the sponsored motion picture, which is surveyed and discussed overleaf.—*R.S.C.*

The most popular of popular arts is designed into a tool to communicate

Charles Chaplin puts industry on film: Modern Times. *Lopert Films.*



the messages of # INDUSTRY ON THE SCREEN

by Ralph Caplan

Industry puts itself on film: *Firestone's* Building of a Tire. *Association Films.*

Outside Broadway's Victoria Theatre last month a line of people waited for the privilege of paying $2.00 to see a double feature. This was not unusual. What is unusual is that a substantial number of patrons were waiting and paying not to see the main feature — a bloody pseudo-documentary called *The Purple Gang*, but to see the companion film, a lavish (over $300,000) production lavishly entitled *Rhapsody in Steel*, and produced by John Sutherland for U. S. Steel. *Time* magazine—which didn't even bother to acknowledge *The Purple Gang*—didn't exactly rhapsodize about *Rhapsody in Steel;* but it did review it as "one of those rare industrial films with enough specific quality and general interest to play the commercial circuits."

This does not mean that industrial movies are your best entertainment, but it points up the fact that sponsored motion pictures have become an important business, and that they can now be shown not just in plants and at Rotary meetings, but in quality movie houses, along with first-run (if not always first-rate) features.

Here are some figures: last year American industry spent more than $280 million on sponsored films, is expected to raise it to $300 million this year. Last year industrial producers put out 5400 films to Hollywood's 223. And, most impressive and least credible of all, more people see sponsored films each year than see theatrical films! In fact, if all the industrial film produced during the past decade were unreeled and stretched end to end, even Dorothy Parker might be surprised.

As a business phenomenon, this is remarkable. But the sponsored motion picture is, at best, not just a business phenomenon; it is an aspect of design, with—as you will see—many of the problems industrial designers tend to think of as peculiar to their profession.

Some sponsored films have in fact been created by designers. Charles Eames, whose contribution to the process of visual communication is rivaled only by his contribution to the process of sitting down in style, has designed two informational films for IBM. "You can make statements on film that you just can't make any other way," Eames says. "Certainly not in designing a product, and not even in writing a book. You have certain elements of control—over the image, the content, the timing—that you can't have in other media."

It is the element of control that accounts for much of the effectiveness of the business film. Since, as film-makers point out, a film is a design pattern executed in time as well as space, the designer can aim at viewers who are unable to break the designed sequence of presentation. They cannot skip ahead, speed by, see the exhibit in reverse order, or turn to something else.

Saul Bass, another designer active in film-making, came in by what might be called the front door: designing motion picture titles and credits—the film-maker's counterpart to the mandatory copy that plagues package designers. He began with animation, in later films used live action, and has just designed live-action sequences in feature films, including the climactic battle scene in *Spartacus* and some of the "murder, mystery, and mayhem" scenes in Alfred Hitchcock's new thriller, *Psycho*. Although most of Bass's film experience has been in and for Hollywood, he has also done such industrial projects as the Olin Mathieson trademark sequence on the opposite page.

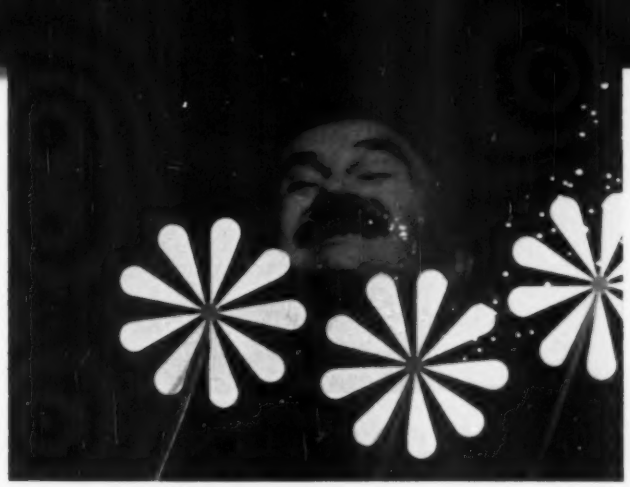
Morton Goldsholl, who has, with his wife Mildred, been making films for clients for only two years, feels that film-making gives the designer an unusual opportunity to enrich his work and broaden his scope. But, he warns, "no designer can, for long and with integrity, remain a dabbler. Film absolutely absorbs you—the concept, the psychological implications of juxtaposition and timing, the fusion of sound, the endless approaches and techniques and the overall magic, the mechanical, optical, and chemical processes—and the fact that, after considering all the complexities, you must still suffer the anxiety of not knowing what it will be like until the end!"

The Goldsholl office has made a film for Kimberly-Clark about Texoprint, a plastic printing paper, and one called *Mag* for *Life* magazine. Also for Kimberly-Clark they have just completed some short experimental films introducing a new symbol and package for Kleenex. "It was natural that we should find ourselves using film to further the communication needs of our clients," Goldsholl says, "but we are not at all interested in becoming a 'film production' organization. And it's nice not to have to be dependent on revenue from this source, so we can afford to be selective about the projects we take on."

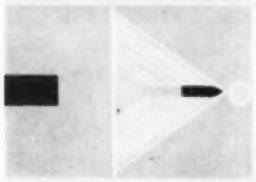
Horseshoes at the company picnic

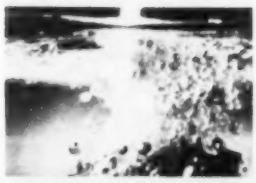
But most of the thousands of industrial movies released each year *are* created by full-time film production organizations. There are, broadly speaking, 6,800 production units, according to *Scope and Nature of Non-Theatrical Films*, a report published last summer by the Society of Motion Picture and Television Engineers. This figure makes no distinction between internal (or "captive") producers and independent producers; and it includes 3,800 one-man production units. A one-man production unit may be an independent film-maker who uses free-lance help when he needs it; or it may be a company PR man who takes "morale" movies of the horseshoe tournament at the company picnic. Still, there are 2,450 units with two to five permanent employees, and 550 units with six or more permanent employees; and the SMPTE report estimates that the "average top business film producer" employs between 12 and 24 people, in addition to the free-lance artists and technicians he may call in as he needs them.

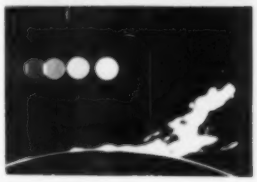
The giants of the field, outfits like Jam Handy in Detroit and Wilding, Inc. in Chicago, are self-contained, and seldom use any free-lance help. Wilding has a staff of 425 people,



Morton Goldsholl *has been making films for clients for about two years. The still above, showing animation over live action, is from an experimental short made to introduce a new symbol for Kleenex. The film was made for Kimberly Clark by Goldsholl in association with Wayne Boyer, Larry Janiak.*







Saul Bass *designed film sequence at right to show range of the five divisions of Olin Mathieson. Filmic symbols were worked out to relate to materials produced by each division. Scene below is from the soon-to-be-released* Spartacus, *on which Bass functioned as "visual consultant," working with color, wardrobe, staging, camera angles, set design.*

including 39 writers, on the payroll, and averages between 125 and 150 pictures a year. Jam Handy, with a staff of 500, puts its average annual production between 150 and 200 films each year. Both have complete production facilities, including processing laboratories, and, in addition to making industrial films, produce stripfilms, live industrial shows, and business conventions.

The production facilities of the large producers often equal those of the largest Hollywood producers, and their operations are as ambitious. In making *Wonderful World,* a new release for Coca Cola, Jam Handy covered 190,000 miles in nine months, using three camera crews and $500,000. Filmways, in New York, is the world's largest producer of television commercials, and their industrial film department also is prepared for large-scale operations: they have two construction shops and a permanent crew of designers and technicians who can turn their sound stages into anything from a hall closet interior to a cathedral nave.

When Filmways produced Ford Motor Company's around-the-world project, they set up a new company—World Highways Exposition—just to organize the task. They shot more than 100,000 feet of film, took from it 30 tv commercials, two 30-minute films, a five-minute film, and a documentary made for the 18 cooperating governments.

The everything-under-one-roof producers argue that they reduce costs and improve service by eliminating "duplicate overhead" and by maintaining control of the entire operation. The smaller producers argue that they reduce costs by eliminating the expense of maintaining studios and special equipment and personnel: they rent any special space and equipment they need, and hire experts as the project needs them. They feel that they can get better service because they are free to hire the right specialist for a particular job, rather than having to use someone because he is already on the payroll.

The fact is that today any reputable producer can deliver a film that is technically satisfactory. The problems—like most design problems—are problems not of technique, but of talent. There are very few films made today that are bad technically. However there are a great many that are artistically absurd, and a great many that are ineffective as business communication. It is in these areas that film producers differ significantly.

They also differ in the character of their work, since there are any number of ways of making a successful film. A designer surveying the field of business motion pictures will find rough counterparts of the offices and men in his own field: the industry has a "Loewy," a "Teague," a "Dreyfuss," a "Stevens," an "Eames" (who, in this case, happens to be Eames). Film-makers, perhaps because of their connection with the theater world, are very often "type-cast," and it is sometimes hard for a producer to keep success from driving him into a specialty. Earl Fultz, who has produced a number of food films, is tagged as a specialist in this area,

although he has also made films on interior decoration for American Viscose and on epoxies for Union Carbide. Francis Thompson, generally acknowledged to be one of the most imaginatively free spirits in the field, created his famous *N.Y., N.Y.* with a special, ultra-wide-angle lens to produce distortion, and once used the same technique in a sponsored film. The result brought him a certain fame; also a certain category: even *within* the industry he is thought of as a "distortion expert," and producers and clients are prone to forget that he can shoot straight if the occasion calls for it. Thompson finds it possible to take this good humoredly, remembering that years ago he was typed as a "farm film specialist." Sometimes one film is enough to type a producer, and the small companies are the ones that suffer most from this, since one film may be one-third of a small firm's yearly output.

Obviously the most important thing to know about a producer is not whether he has done films about factories or fudge recipes, but the quality of his thinking, the imagination he brings to bear on his client's problems, and how well he has succeeded in meeting their needs. Naturally any alert prospective sponsor will want to screen the work of a producer he is considering. But, since each business film is created for a specific purpose, he should be careful not to become so enamored of the details in a particular film as to assume that a film just like it is necessarily the right one for him.

Plenty of roads, lots of traffic

The kind of work a producer does may be determined in part by what he did before he became a producer. It is now possible for an enterprising young man (or woman, although women are still scarce in the field) to go to college and get a degree in film production. It is even possible that this will prepare him to produce films. But most men in the industry came to it obliquely. The Army began a number of business film careers: MPO's producer-director Victor Solow and freelancer Bill Miles both learned the fundamentals of their craft in Army film units. Producer Earl Fultz was a freelance writer. Cap Palmer, president of Parthenon Pictures in Hollywood, was a businessman who became a fiction writer who became a film writer who became a theatrical producer who came full circle by starting his own business film company in 1954. Wheaton Galentine is a chemical engineer who got interested in photography. Bud Palmer, president of PGL Productions, went from pro basketball to sports announcing to narrating industrial films, and his colleague Dick Lerner was stage manager of the Steve Allen Show. In fact the entire PGL staff, including musical director Skitch Henderson, came to industrials from the entertainment industry. Roland Reed, of Roland Reed productions, began 30 years ago as a Hollywood extra.

There are as many roads to the film studio as there are to the design office, and the traffic is likely to be just as confusing. For, like the industrial designer, the sponsored-film producer is part artist, part businessman. In most production company offices, somewhere in a corner, away from the racks of canned cellulose acetate, is what looks like an anachronistic prop: a bookcase. And in the bookcase there is probably a copy of Eisenstein's *Film Sense* leaning next to a copy of *The Dollars and Sense of Business Films*. These two volumes, these two kinds of "sense," mark the boundaries of a world in which the dead center of excellence is still unmapped.

Shoot first, ask questions later

Sometimes excellence and satisfaction seem easier to achieve if the film-maker gets the idea *before* he gets the sponsor. And, in rare instances, he actually shoots on his own. Wheaton Galentine is currently working on a film dealing with mathematical form. He is doing this on his own, because he wants to, but with the expectation of finding someone to sponsor it. Occasionally, too, a film-maker will shoot certain unauthorized sequences on the gamble that once the sponsor can see it he'll like it. Thus Francis Thompson shot, at his own expense, some of the special-effects scenes in his New York Stock Exchange movie, risking the client's disapproval (which he did not get).

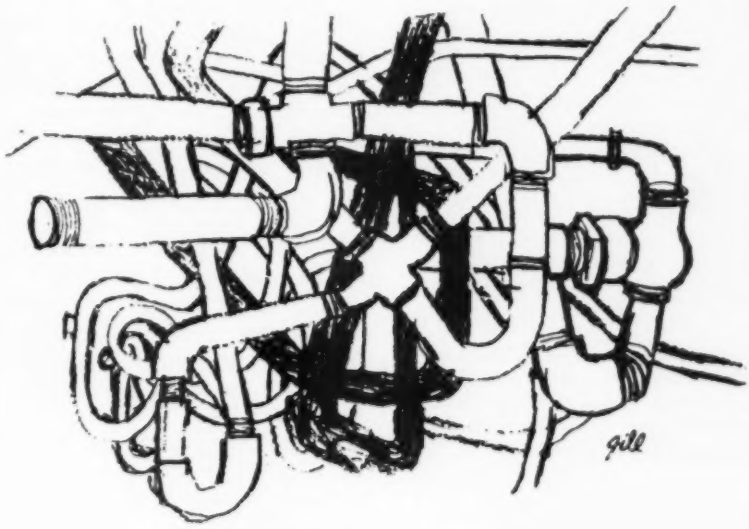
This isn't always done for the sake of art. Dynamic Films in New York frequently make socially useful films "because we want to," but they only want to when they are convinced that they have a marketable idea. They work out a complete merchandising package—a public service film concept, a promotion plan, a distribution plan including tie-ins with organizations and events—and then present it to a likely sponsor.

Dynamic is now finishing *Auto U.S.A.*, which followed this package pattern. They started with the conviction that there was both a need and a market for a film that would show communities how to solve their traffic problems, and that the sponsor of such a film would win the gratitude, and perhaps even the brand loyalty, of the viewing public. They then attended to the film *and* the viewing public by assembling an impressive advisory committee, including faculty members from the appropriate departments at Yale and New York University, and representatives of the Automotive Safety Foundation and the Institute of Traffic Engineers. In other words, from the beginning Dynamic gets the cooperation of experts who are useful not only as consultants but as supporters: since they have participated in planning the film, they are satisfied that the cause is a good one, and lend it their name. And the organizations they represent are prime distribution channels. The method is comparable to Billy Graham's principle of lining up the support of local ministers before beginning a crusade.

The *Auto U.S.A.* idea was sold to the Perfect Circle Corporation, manufacturers chiefly of piston rings but also of "Speedostat," a traffic regulating device that will appear in the film, but will not be identified by name.

Naturally most productions are initiated by the sponsor

rather than the producer, but this does not always mean that the sponsor has an idea. It may mean only that he has an urge to make a movie, and a random screening of a dozen or so industrial films will indicate that many give in to the urge without analyzing it. There is a lot of what might be called "self-indulgent sponsorship"—the kind that results in films made to please the man who pays the piper, at the expense (a costly business expense) of alienating the dancers. In *Life in the Crystal Palace* Alan Harrington describes the making of one such company movie: "Before even a rough scenario was prepared, a camera crew was dispatched . . . and brought back what must have been 75 miles of film. . . . I am sure they didn't miss a close-up shot of one nut and one bolt in the entire industry." To this was added a lot of footage showing deliriously happy company employees. Harrington calls the result "one extended hymn to the company's efficiency and benevolence," an epithet that, unfortunately, has fairly wide application. But in the eyes of the Board of Directors and other top management, the movie was a smash hit! For, Harrington explains, "in corporate public relations you begin by pleasing higher authority, and worry about the public later. So our film goes on its way boring one audience after another . . . and no one is any the wiser."



Sketch by Bob Gill, from animated part of Auto U. S. A., *was first drawn to help producers visualize traffic problem, later was incorporated into film.*

The anecdote is true to business film life. Writing in *Film Media*, communications consultant Melvin Brodshaug listed "concern for the interest of the sponsor rather than the interest of the audience" as the first of the common pitfalls in public relations films. And, as if on cue, Vincent Hunter, manager of Union Pacific's motion picture bureau, told *Business Screen* readers that "a 'premiere' of the new picture for management is probably its most important single showing."

All producers are familiar by now with the problem of making the company president realize that he is not Gary Cooper, and that few audiences want to see and hear him. Most management-directed films are not inspired by management's vanity, however, but by its lack of objectivity. A president is likely to be proud of his parking lot, proud of the new annex to the research lab, proud of the tapioca in the company cafeteria. *He* finds every step of the production process fascinating, why shouldn't everybody? One of the producers' earliest tasks may be to explain patiently and tactfully that what's interesting to the Ajax Milling and Grinding Company may not enthrall the nation.

There are other preliminary tasks. Generally films can be used to good advantage for public relations, sales promotion, employee training, and internal communications. Successful motion pictures have been made to sell a product, promote a line, create good will. But what a company can expect from a film depends in part on what it wants from a film, and not all companies know—at least not at first.

"The hardest thing to do," says Dynamic's president Nathan Zucker, "is to get the client to say what he wants the film to do." Morton Read, president of Boston's Bay State Film Productions, states flatly that "the most important aid to our creative people is the extent to which the client has formulated his objectives. Those who know why they want the film and what they want it to do, and who take our staff into their confidence, have the best chance of getting a useful, economical tool." Almost all independent producers agree that the client's attitude can make or break the picture. However, James R. O'Riley, of Fenton McHugh Productions in Evanston, Illinois, feels that, "while the attitude of the client could be a small nuisance if it were wrong, this would not determine the motion picture's effectiveness, which is a direct product of the talent involved."

But although the talent involved can sometimes guarantee an effective picture, it cannot guarantee a picture that will satisfy the aims of a sponsor who hasn't aimed. This is graphically illustrated in the brief history of a film recently completed by Willard Van Dyke. Van Dyke, who made *The City* in 1939, and has been an important documentary producer ever since, has made more than a hundred sponsored films, and has some firm ideas on the subject. As one of the *independent* independent film designers, he believes that


VIDEO FILMS

Divided page from script is typical of shooting scripts used for almost all industrial film production. This one, from Music for Everyone, *produced for Ami, Inc. by Video Films, synchronizes "form follows function" narration on audio side with dissolve to drawing boards on the video side.*

Cap Palmer (standing), executive producer of Parthenon Pictures, checks plane interior set-up for scene in an American Petroleum Institute film.

it is not the producer's business to serve industry by indiscriminately making whatever a client wants made. "The sponsor tells me what he wants the effect to be," Van Dyke explains. "Then I have to decide for myself whether this is a good or bad effect. After all, I have only so much time—why should I spend it making films I don't want to make? A responsible human being does not abdicate his right to say no." He feels strongly that there is too much timidity among sponsors, and that this often takes the form of an inability to make a decision. The resultant uncertainty can affect sponsored films, as the following experience—one that consultant designers can identify with—indicates.

Van Dyke was retained by a large manufacturer of communications equipment to make a public service film about the firm's facilities in the far north. The sponsor was sure of only one thing: the company "wanted a movie." Van Dyke thought a special treatment was called for, said so, and, with the company's knowledge, brought in poet-playwright Norman Rosten to do the script. He and Rosten spent a month on location, worked out a treatment which the sponsor approved, then returned to the north and shot the film in three months.

The film, quite simply, is about *communication*: it reveals a cold vast landscape, a white geometric plane on which are set a few clusters of small towns, and such isolated points as a trapper's cabin and the shack of a reindeer herder. The camera sweeps starkly over a frozen season, terrifying in its bleakness except for the fact that the clusters and points are bound by plane, radio, telephone and dog-sled. Communication is the human thaw that makes life on the land possible without fear or loneliness; it is poignantly described in the narration as "the need of the day to be gathered together." The sponsoring corporation is mentioned only in the credits at the beginning and end. But their equipment, which is intrinsically dramatic and highly photogenic, is shown effectively.

When company representatives saw the film, however, they panicked. There was no "sell" (it was a public service film). They grumbled that more equipment should have been shown and explained. They complained that it didn't show the beauties of the northern summer (it was filmed—to meet the company's schedule requirements—during the winter). And they protested that it was obscure, a condition they have decided to rectify by preparing a 3-minute prologue explaining it. In other words, after investing $75,000 in a visual project, the sponsor is now going to add to the cost by subtracting from the visual experience.

What most disturbs Van Dyke is not that the sponsors are not satisfied with the film, but that they knew all along what sort of film it would be. If they had only known what they wanted, Van Dyke—or someone else—could have given it to them.

Many problems in client-producer communication are rooted in the nature of film: it is a visual medium, and, as all designers know, clients are rarely men who can think

visually. Since nothing in film production quite corresponds to a designer's mock-up, there is no easy way for a film-maker to explain what he sees in his mind's eye.

Communication may be enhanced by a company's assigning one man to be responsible for its film program, and most large companies have staff audio-visual experts. Knowledgeable as these men are, however, a good film always necessitates the gamble of creation, and a good client who has found a good producer is well-advised to put his trust in him, and let him alone. Experienced clients usually do. Ruth Ratny, of Fred Niles Productions in Detroit, says happily, "In most cases we are told the problem, the budget, the key points, then given carte blanche to write and produce."

On the other hand, H. B. Butler, president of San Francisco's W. A. Palmer Films, thinks the client should be interested in every stage of production, and says that most of his are. A good many other producers feel that it's all right to have the client looking over their shoulder, as long as he doesn't breathe too hard. For that old design bugaboo, the amateur expert, is found here too, and harried producers feel that the worst liability a client can have is a wife who takes 8-millimeter home movies. Unquestionably some of the nuisance-sponsor problems come from the presumed glamor of "movies," and one film-maker complains that "our clients would like nothing better than to sit in a director's chair and wave a megaphone."

How much will it cost?

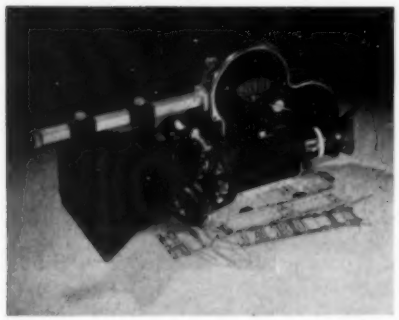
Director's chair or not, soon after determining his objectives, the client ought to determine how much he is willing to spend on them. In reckoning, he should bear in mind that a film can be used for years, and its cost amortized over the period of its service. And he should remember that since the point of making a film is to show it, printing and distribution costs must be taken into account.

Because a film exists in running time, a sponsor usually wants to know the cost-per-minute. Most producers will tell him. There is an old informal industry yardstick of $1,000 per minute, and estimates generally fall in this neighborhood for a black and white film with no special technical problems. But some feel that the figure has been rendered obsolete by rising costs. Current estimates range from a low of $500 to a high of $2,000, and in the end it all seems to boil down to the fact that the running time of a film is seldom the determinant of its production cost. James O'Riley observes that Fenton McHugh Productions has made ten-minute films for as low as $7,000 and as high as nearly $70,000. And Cap Palmer, who thinks all cost-per-minute estimates are absurd, believes that most subjects can be made into pretty good half-hour films, and points out that cutting them down is likely to cost *more* money—for editing. "To be honest," says Palmer, "when we have to quote a price-per-minute, we figure out what the film will probably cost to make, divide it by the number of minutes the man wants, then make him happy with a cost-per-minute quotation."

Production variables are the real cost determinants. Research may be a matter of a couple of hours with the sponsor's PR man (it seldom is that simple) or of doing enough searching, studying, and experimenting to qualify for a Ph.D. (it seldom is that difficult). Script costs vary. The standard trip-through-the-factory can be written by almost anyone, while certain kinds of narration may require (and get) poets. The music may be stock background wail, or it may be a commissioned score played by an expensive orchestra (*Rhapsody in Steel* used the Pittsburgh Symphony.) Color costs more than black and white, not only because color film stock is more expensive, but because it requires special lighting. For the same reason, interior shooting is more expensive than exterior shooting, and of course any location work that requires travel adds the cost of transporting crew and equipment. If the film is conceived as a photoplay, with actors instead of what the industry calls "real people," this raises the price, and if the actors are "names" it raises it even more. The cost of a film, then, can be more reasonably measured in terms of what goes into the camera than of how long it takes reeling out of the projector.

Once he has a contract and a budget, the producer does the necessary research, and prepares a "treatment"— a written description of the proposed approach. When this is approved by the sponsor, he prepares a shooting script, which is a full description of what the camera should see and what the sound track should hear. The shooting script is usually prepared by the writer in collaboration with the producer or director, but not always. Sometimes the client has the script written, either by someone on his staff or by an independent scriptwriter, before he looks for a producer. There is even, in Washington, a company that makes nothing but scripts. It bears the leisurely title of Scripts by Oveste Granducci, Inc. and has, in the past 15 years, turned out more than a thousand scripts.

The cast must be fed. Non-theatrical actors receive daily rations while on location for Hail the Hearty, *produced by Parthenon Pictures for the Borden Company.*



Arriflex 16mm camera is widely used for industrial films. Basically a hand instrument, it can be equipped for full studio work.

Although on its mother's side the business film goes back to Robert Flaherty (whose classic *Nanook of the North* was sponsored by the Revillon Frères Fur Co.), the family resemblance is not often noticeable in the working method. Flaherty's method had the simplicity of genius: he lived with a people until he understood them (this sometimes took years); then he shot and shot and shot, using no script at all; and then he cut and organized the footage into a film.

But simplicity can be expensive. This free-wheeling documentary approach is, to most business film-makers, a luxury neither they nor their clients can afford, and today a sponsored film is rarely begun without a shooting script. Some producers are downright vehement on the subject, suggesting that anyone who shoots "wild" or "blind" is either incompetent or irresponsible, or both.

The advantages of a shooting script are not hard to see: it saves time and money. A script tells the director in advance what shots he can and cannot afford, what kind of equipment he needs, what kind of people and scenes to look for. And clearly it is easier to revise and reorganize words on paper than it is to shoot and edit a lot of footage. Yet in film-making, even more than in other creative enterprises, the most exciting achievements are likely to be unanticipated, and the director on location will find scenes that are improvements on the script. In filming "real people," you can't tell what will happen, and only the most insecure director will follow a script slavishly. For, as Saul Bass says, "the director is the designer of the film."

Armed with, but not bound and gagged by, a shooting script, the producer notes the crew and equipment he will need, and begins rounding them up. Al Viola, producer-director at PGL Productions, has his own working list of 20 items to be attended to for each production. That doesn't sound formidable, but each of the 20 may be expanded into another 20 by the time work starts. For example, one item: construction. To a small firm, this means hiring a set designer, which in turn means hiring carpenters and painters. Props have to be bought or rented. And, since film technicians are heavily unionized, it may be necessary to hire an outside prop man to bring the prop to the door and an inside prop man to handle it in the studio.

Despite complications like these, the day's shooting somehow gets done. Producer, director, and editor screen the rushes, indicate what they want, and the editor takes over. First he does the rough editing: cutting and splicing for sequence only. (Shooting schedules rarely permit scenes to be shot in the order in which they will appear.) Later he puts in special visual effects for pace and refinement, and finally he does the mixing: harmonizing the visual track with voice, music, and special sound effects. The composite, called an "answer print," is a motion picture.

The client may be wild about the print, but it still hasn't done anything for him, and won't until it is distributed and shown. If the film is for internal use, all the client needs are

Cameraman sprawls perilously across hood of moving car to shoot driver-reaction scene for a Pilot Productions film entitled The Quota.

Surplus gun camera is ingeniously mounted under car to photograph effect of shock absorbers on wheel action, in picture produced by Video Films for Monroe Auto Equipment Co.

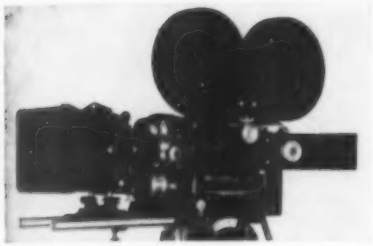
Producer-director Victor Solow, of MPO Productions, rides high to get aerial view of The Big Train *for New York Central.*

Hydraulic crane, normally used by tree-trimming and line-clearing crews, lifts Video Films cameraman for overhead shot.

Cameramen on location apply special equipment and dramatic shooting techniques

"Slaves in Egyptian quarry" are betrayed by their crewcuts as University of Tennessee drama students used by Pilot Productions in film for the Clark Equipment Co.

Arranging the props: a dozer is upset in preparation for accident scene. Industrial film-makers become accustomed to heavy machinery, handle it with skill. Pilot film.



Mitchell cameras, both 35mm and 16mm, are widely used for in-studio shooting.

Action shot in the studio becomes a film in the cutting room

Actor Ronald Reagan is coached by Tom Rook of Fred A. Niles Productions in recording sound track.

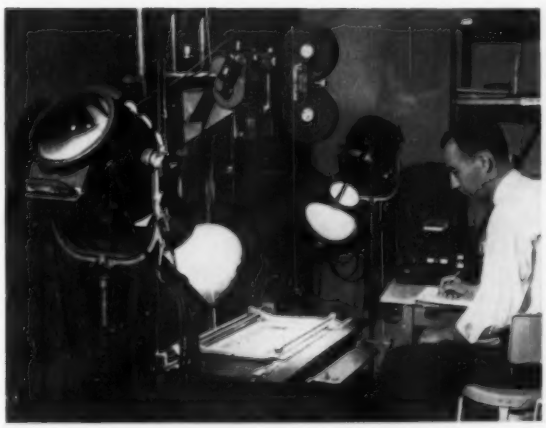
Clapsticks are used to visually identify each take and synchronize sound and picture tracks in editing.

Lip-sync shooting of safety film by Pilot Productions shows judgment day at receiving station in Heaven.

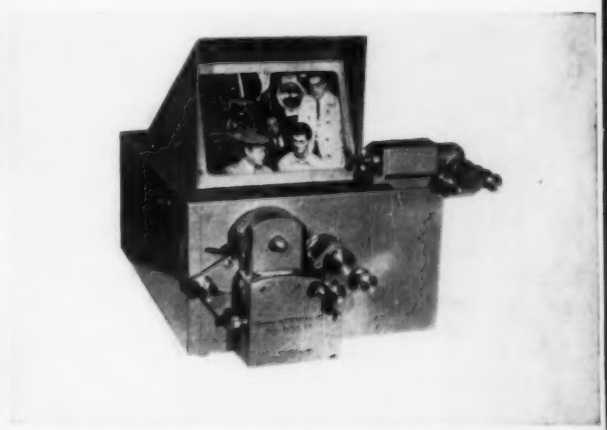
Below: lip-sync shooting (simultaneous audio/video recording, synchronizing sound with actor's lips) in Condor studio for Ralston Purina.

Henry Trettin runs off rushes in PGL cutting room while Anthony J. Ciccolini (foreground) operates Moviola, editing device that runs film at standard projection rate of 24 frames per second, enables editor to determine exact frames at which to cut.

Synchronizer, incorporating sprocket holder and frame counter, lines up parallel rolls for splicing and for correct placement of visual effects, insures that the sound track and picture track match up properly.



Animation technique (to be treated in later ID story) is often combined with live action shots. Rheostat-controlled motors raise and lower camera, move artwork.



Film viewer, hand-operated off standard rewinders, is used to pull out bad takes, make rough-cut work print before using Moviola. Made by Camera Equipment Co.

more prints. And if it is intended for a small, highly specialized audience, he may be best able to handle the distribution himself. But if the film is intended for general distribution—schools, clubs, churches, theatres, free-loan tv, small-town road-shows—he will probably take it to a distributor. The most picturesquely named distributor of business films is Modern Talking Pictures. Both Modern and its major competitor, Association Films, provide the following services for sponsors: they promote the film and circulate it; they give the sponsor advance notification of showings, for his own tie-in plans; and they file a monthly report on how many people saw each film, who they were (age, sex, profession), and how they liked it. The reports are based on cards (page 61) that borrowers fill out and return with the film print.

For a more selective evaluation, there is the Educational Film Library Association, a non-profit organization whose subscribing members either want films, have films to offer, or both. EFLA's job is to keep members informed about all available films that may very broadly be called educational. The program is directed by Emily Jones, an energetic, film-wise woman who sees what's available, and assigns it for screening to one or more of 75 screening groups scattered around the country. The screening groups are made up entirely of highly qualified non-paid volunteers, although occasionally they call in specialists for films technical enough to warrant it. After screening, the group sends its evaluation (with any dissenting opinions) to the New York office, and Miss Jones writes them up into card form for library indexing, as shown on the opposite page.

Titles for our time

Recent industrial films range in purpose from the loftiest reaches of disinterested public service (a paper company's film on "getting along with your neighbor") to the most prosaic problems of workaday life (a film urging factory workers to throw their cigarette butts into urns instead of on the floor). The titles themselves suggest the diversity. They are sober (*Progress in Modern Basic Refractories*), practical (*Your Festival of Cheese Recipes, Use Your Noodle*, sponsored by the National Macaroni Association), avuncular (*Uncle Jim's Dairy Farm, Uncle Henry Saves the Play*), Brobdingnagian (*The Big Kitchen, The Great White Way to Good Laundering*), dramatic (*Crisis*—"the story of how your milkman may save your life"), obvious (*Falls Are No Fun*, sponsored by the National Safety Council), jolly (*More Fun With Parakeets*), joyous (*It's Wonderful Being a Girl*, "from the same people who brought you *Molly Grows Up*"), Bacchic (*Toast to Truth*, sponsored by the liquor industry, *A Drink For Judy*, by the National Association of Plumbing Contractors, and *Grape Juice — An American Story*), sociable (*Let's Take A Trip, Let's Bowl With The Champions, Let's Talk Turkey, Let's Have Lamb*), nocturnal (*Bedtime For Janie*, who happens to dream about the cotton industry), demonstrative (*This is Lumber, This is Steel, This is the Dairy Industry, This is Aluminum, This is Automation, This is Bermuda*), and political (*Why the Kremlin Hates Bananas*).

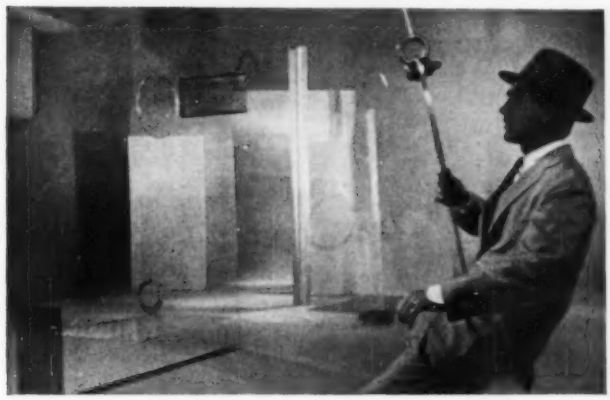
Some of the titles tell you all you want to know about the films, and if they suggest gimmicks, the suggestion is apt: just as in the design of products and packages, the gimmick too frequently dominates the material. A dishearteningly large number of films appear to be predicated on a disbelief in what, essentially, they mean to say: that the sponsor's product, operation, or service is important and interesting. Francis Thompson reports that he has never discovered an industrial subject that was intrinsically uninteresting, and Cap Palmer states that a film writer does not invent a story, he *finds* it in the material. But too few industrial films reveal that anyone has found the story in the material, and in some cases no one seems to have even bothered to look. As a consequence, business motion pictures tend to impose an extraneous story line on material that might be fascinating if imaginatively exploited.

Boy gets tube

An example of the forced plot that a motion picture can be made to carry on its back is *The Teacher Wore White*, made for General Electric, and intended for showing in educational and sales training programs. Described by the sponsor as "the first full-length educational motion picture based on the design and manufacture of receiving tubes—and with a love story woven into the background," the film tells the story of Don Manning, boy engineer, and Susan Wells, girl girl. Actually the love story is not so much woven in as stitched on: we have a few minutes of love, then a few minutes of tube assembly. Don is a brash know-it-all. His father, a crusty old GE hand himself, is worried, and he has reason: Don is spending his nights playing second trumpet with a dance band, and—callow youth that he is—plans to chuck his GE engineering job for a cooler world. In a frantic phone conversation, Pop and Don's supervisor plot to have Don transferred to the receiving tube department in Kentucky, where old Joe Smith will know how to handle him. (At this point the receiving tube department is presented as a sort of company reform school; and nothing happens later to remove the impression.) The next scene shows Don in Kentucky, scoffing at receiver tubes because he has heard of solid-state devices, but Joe Smith, in the true spirit of Science, explains: "We will always need receiver tubes!" Then Joe gets Don off his hands by passing him on to what the movie really wants to be about but is afraid to admit: a trip through the plant. And who leads the trip through the plant? Susan. So boy gets girl, and receiver tubes get the most passionate advocate since Lee De Forest. It's a dull film, of course; but the receiver tubes aren't dull, Don and Susan are.

Once in a while the material is strong enough to survive

Color and Texture and Finish in Aluminum *features "designer on a skyhook" below. At right are two evaluations of it. Top one is report submitted to distributor by borrower. Cards are later run through network of computers for monthly report to sponsor. Bottom card is typical report sent to its members by Educational Film Library Association. EFLA's standards are high: nationally praised Alcoa film is labeled "commercial," rated "good."*



MODERN TALKING PICTURE SERVICE, INC.
415643 18
PLEASE FILL IN
PLEASE RETURN PROMPTLY
NUMBER OF TIMES FILM WAS SHOWN 1
NUMBER OF MEN 27
NUMBER OF WOMEN 7
NUMBER OF BOYS
NUMBER OF GIRLS
TOTAL 34
CHICAGO RAWHIDE MFG. CO.
Extremely novel & interesting. Aided us in many of our design problems.
SIGNATURE Ivan A. Watters, Jr.
IMPORTANT: REPORT ATTENDANCE AND COMMENTS. SIGN AND RETURN THIS CARD TO US. FILM MUST BE RETURNED TO US IMMEDIATELY AFTER YOUR SCHEDULED SHOWING. PLEASE REMEMBER ALSO TRANSPORTATION CHARGES UPON RECEIPT OF INVOICE

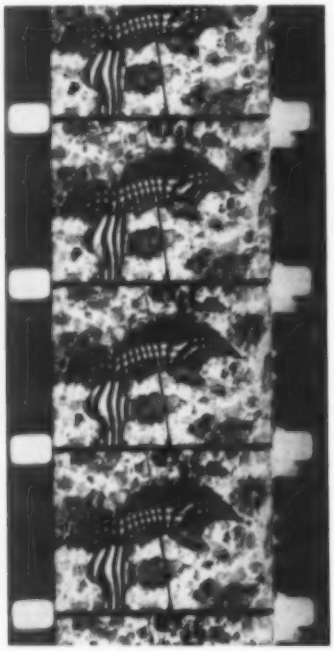
COLOR AND TEXTURE AND FINISH 745
20 min., color, free loan, 1957 EFLA EVALUATION
On File for Alcoa; Bio-Association Films, 347 Madison Ave., New York
Subject Area: Industrial design
Evaluator: Indiana University
Synopsis: Describes and displays the functional qualities, finishes, and production of aluminum articles. Emphasizes that aluminum is "functional color" and that it can be finished in many ways: with organi coatings of plastic, lacquer, and paint; with metallic silver and cadmi plating; with porcelain, sheen and matt finishes. Stresses mass produc- tion means of cutting, finishing, and coloring.
Uses: For manufacturers interested in aluminum as raw material for thei products; for college chemistry classes in study of anodizing and color finishes for aluminum; for classes in industrial design and film media
Age Level: college, adult
Technical: Sound--good; Photography--good
Comment: Commercial approach. Use of modern displays and experimental designs captures the viewer's interest.
Rating: Good
Copyright 1959 by Educational Film Library Association, Inc.
250 West 57 Street, New York 19 EFLA No.1959.3878

Clay modeling is presented as step in automotive body design in American Look, *a motion picture about product styling, made for General Motors by Jam Handy.*

Film aimed at General Electric dealers and distributors tells story of 1960 *product line. Called* The Dream Merchants, *it was made for GE by Fred A. Niles Productions.*

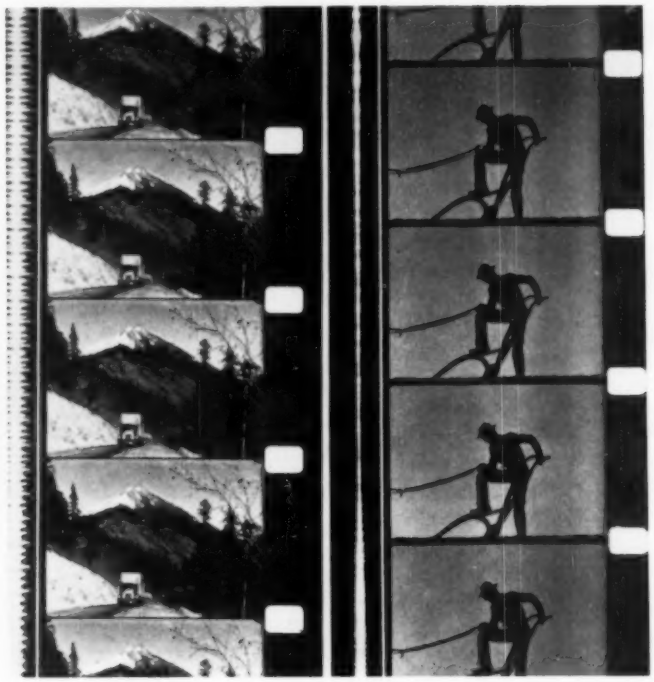
Intense scene below suggests increasingly theatrical quality of non-theatrical films. The picture, Production 5118, *was made by Wilding for Champion Paper & Fibre Co.*

Imaginative treatments have created a rich variety of industrial motion pictures



Strip from Silk, *made by Wheaton Galentine, shows traveling matte technique in which figures in one pattern "dance" over other pattern to illustrate fabric qualities.*

Strips below indicate range of visual techniques in Giants in the Land, *an MPO production explaining the importance of Diesel power.*



Stills from Skyscraper *show construction workers at work and at rest. An Academy Award nominee, the picture was created by Willard Van Dyke and Shirley Clarke.*

what's done to it. Consider *Once Upon the Wabash*: Jack and Jill, newlyweds, are poking along in their convertible when the Wabash Bluebird overtakes them. "I wish I were on it," sighs Jill, and the Friendly Old Man who is a staple in at least a third of American sponsored films, comes out of a vapor, all twinkles and mellowness, and whisks them into one of the coaches. This gives them a chance to ask what they're doing there, and it gives the Friendly Old Man (now cast as a conductor) a chance to show them what the train is like, and how important the railroad system is in the life of the nation. To prove this last point the film goes into the superannuated syndrome that Charles Palmer has identified as "Imagine-a-world-without-XXXX's." But the film is alive because railroads *are* important, the train *is* interesting, the midwestern countryside is pretty, and the photography is sensitive. As a business tool *Once Upon the Wabash* is a hit: more than 28,000,000 people have seen it, and the Wabash Railroad credits it with effecting a substantial rise in freight traffic.

The two pictures described above both use young actors. A fair number of industrials use "names," and Bob Hope, Raymond Massey, James Stewart, Pat Hingle, Charles Matthews, Dinah Shore, Jerry Lewis, Burgess Meredith, and Fred MacMurray have all performed in sponsored films. Roland Reed Productions, based in Hollywood, makes more than the usual number of films using the photoplay technique, and often casts stars in their productions. How do the actors like it? They tend to be ambivalent: they like industrials because the pay is good, dislike them because the characterizations are two-dimensional and because they feel that the average non-theatrical director is more at home with engines than with ingenues. But one character actor puts it this way: "So I'm not proud—I'll be Harold Brown the careless driver any day for the Bixby Tire Company. There isn't much difference, really, between acting 'legit' and making love to a worn-out innertube. One still needs his scene-to-scene motivations, objectives, and concentration." (The actor problem is eliminated in animated film, which is the subject for another story.)

Apparently one of the hardest subjects to design into a film is design itself. General Electric a few years ago released *The Eighth Lively Art*, presumably industrial design, although its liveliness was pretty well concealed by a writer who hadn't even bothered to find out what the *seven* lively arts are. About a year and a half ago General Motors made *American Look*, a popular film that was unpopular with the designers who saw it, partly because the term "stylist" was used exclusively, and partly because it presented so misleading a picture of how design gets done. *American Look* throws on the screen almost every widely-shown-in-all-the-right-places design from the Barcelona chair to the quadreflex speaker. This is followed by a sequence advertised as one in which "the audience looks over the shoulders of the giants of American design to see sketch board dreams become reality." Well, the audience did see some sketch boards –but always over the shoulders in the GM style shop, the implication being that what's gooed for General Motors is standard operating procedure for Eames, Mies Van der Rohe, and Wright. Far and away the best film on the industrial design profession is *Walter Henry Raymond*, a home-movie conceived and executed as a gag by members of the Jean Reineicke office and starring designer G. Harold Hart.

Rediscovering the visual

One reason *Walter Henry Raymond* is so much fun is that, like most amateur efforts, it is silent, forcing the film-makers to concentrate on the visual aspects of the production. Ever since the advent of talking pictures, film-makers have tended to work on the assumption that sound has liberated them from the discipline of a visual medium, and far too many industrial films tell what they could show. They use the sound track not because it is needed, but because it is technically available (just as they use color, whether called for or not, just because *it* is technically available). "The great need in film today," Saul Bass insists, "is to rediscover the visual." And Frank Herman, who directed *Men With Cars*, suggests an easy criterion of visual strength: "Just close your eyes, and listen to the sound track," he advises. "If it makes much sense, then you know something is wrong with the picture."

A picture that does use the medium's visual resources effectively is *The Ages of Time*, produced by MPO for the Hamilton Watch Company. When Hamilton wanted a film introducing their new electric watch, producer Victor Solow proposed making a film not about the watch but about the concept of timekeeping. The sponsors "fought like steers," finally agreed hesitantly, and didn't feel comfortable about it until they saw the result—an 18-minute pictorial survey of the philosophy of time, including some unusual color filter representations of medieval tower clocks and Elizabethan wristwatches. More than three quarters of the film goes by before either the sponsor or the electric watch is mentioned, but by the time they are mentioned, the audience has some reason to care about them.

Not all approaches are so politely institutional: American Motors has just released a film that does what traveling salesmen don't even do any longer—it knocks the competition. On the other hand, occasionally a company will release a film that is "pure" public relations, that has not even the most tenuous connection with the sponsor or his products. A case in point is *Production* 5118, a film made by Wilding to satisfy the altruism of the Champion Paper & Fibre Co. This is a truly fresh idea for the industrial genre: why borrow from the Warner Brothers when you can borrow from Pirandello? So the film, which deals intelligently with the problem of human communications, is a movie about a movie about making a movie. The concept is mature, the acting and directing are superior, and the photoplay generally has a theatrical polish rare in sponsored productions. It seems too good to be true. And in a sense, it is. For Pirandello's genius was not in contriving the plots within plots, but in resolving them, and this is what *Production* 5118 never figures out how to do. Altruism and a good idea are not, in themselves enough.

To reach a visually sensitive audience, a film *must* make

its statement visually; a case in point is *Color and Texture in Aluminum*, a beautifully designed film aimed at designers. Produced for Alcoa by the Princeton, N. J. firm called On Film, it won first prize in the Educational Film Library Association's annual film festival, and the *New York Times* called it "probably the most strikingly imaginative industrial short subject ever filmed in the United States."

Why was *Color and Texture* so successful? An Alcoa representative says it was "because the vice-presidents kept their cottonpitckin' hands off." The director, Wheaton Galentine, modestly implies that the secret ingredient was money: it was a high-budget production, with no expense spared to get each scene right. But anyone seeing the film is likely to observe that the not-so-secret ingredient was talent—talent, and restraint. For example, the film begins when a designer walks onto the set and— as the narrator says "A man with a problem has no time to waste"—sits down on a skyhook (see page 61) and is whisked through the plant. Most viewers remember this so strongly that they think it is carried through most of the film. Actually the hook appears, very briefly, only four times, and the man is seen on it just twice.

Choreography for fabric

Shortly after directing *Color and Texture*, Wheaton Galentine, this time as producer-director, made *Silk*, an impressionistic short sponsored by the International Silk Association. It is easy these days to call anything that is not downright dull a "poem." Yet it is hard to call *Silk* anything else: it is a finely wrought lyrical arrangement of patterns set to music. There is no commentary, no sound but the musical score. Organized as a three-movement dance, *Silk* moves from a rhythmic series of close ups of the weaving process, to a sequence from Chinese fabric designs and silk paintings, to a fantasy in which one silk pattern "dances" over a background composed of other silk patterns (see page 62). The "choreography" was done before there was a score, but Galentine had a rhythm in mind for each shot, and the music was composed to the rhythm.

Silk is such a wild thing of wonder that one viewer, reminding himself that this was a business film, asked Galentine, "How did you get away with it?" The answer is that the film is intended primarily for use in conjunction with other, earthier films on the same subject, illustrating that a business film can succeed as both business and art if the sponsor is clear about his purpose.

Filmic sensibility of another species can be seen in *Men With Cars*, a middle-budget ($30,000) racing film made for the American Oil Company by PGL Productions in New York. It presents, almost too graphically for comfort, the 12-hour International Grand Prix, held at Sebring, Florida. A slightly overwritten narrative is, by way of compensation, slightly undernarrated by Bud Palmer in what must surely be one of the most excitingly paced, dramatic portrayals of automobile racing ever filmed. *Men With Cars* does what few industrials even try to do: it creates a mood, builds on it, and sustains it. Beginning in documentary style, the soundtrack picks up the Sebring natives preparing to be invaded by the men with cars; then the drivers and mechanics discussing their cars, their strategies, their chances. But the theme of this tense film is speed, extraordinarilly photographed with cameras mounted on moving cars. (The producers used a camera welded onto the grille of one of the participating cars for this year's Sebring film.) The camerawork, the music—a nervous score by Skitch Henderson—and the editing combine to make *Men With Cars* a motion picture of consummate power.

Changing skylines and trends

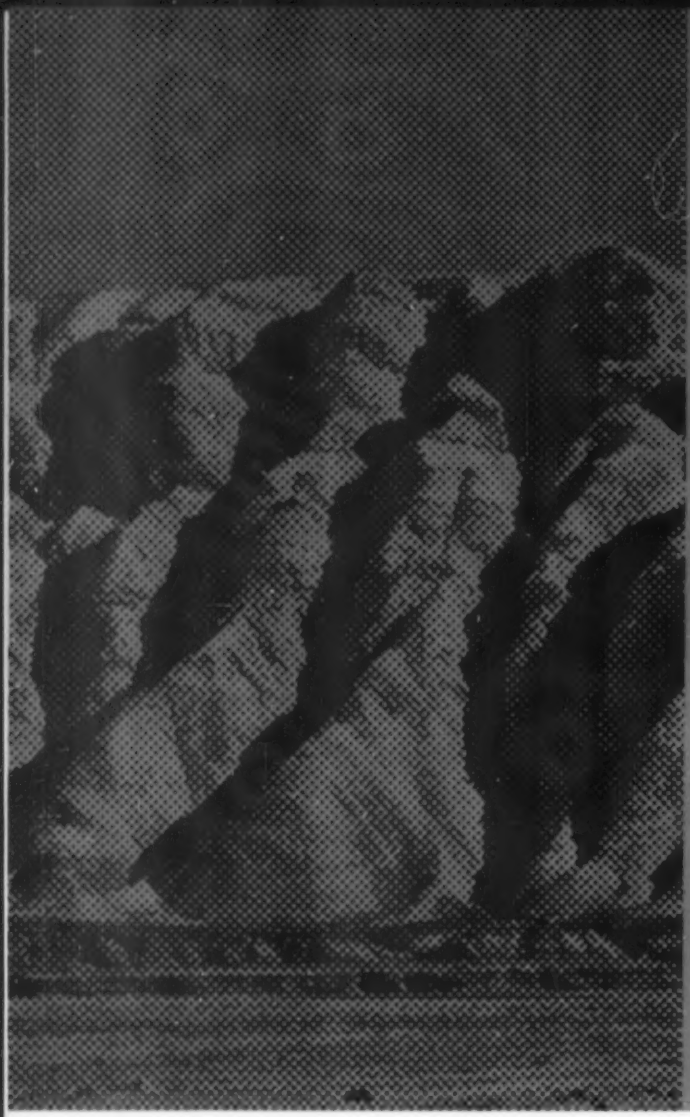
One of the most delightful new films is *Skyscraper*, produced by Willard Van Dyke and Shirley Clarke, and sponsored by Reynolds Metals, Bethlehem Steel, Westinghouse Elevators, and York Air Conditioning—all suppliers to New York's Tishman Building. The 41-story building, which makes even a New Yorker's eye soar, is the star of the picture in the same way that Godot is the star of "Waiting for Godot," in absentia, or rather under construction: *Skyscraper* is the story of a building going up, of a skyline changing, of a city loudly composing itself.

Skyscraper cost $60,000 and took 18 months to produce (the building itself took 16 months to produce). It is full of action and of fun, enhanced by a musical score celebrating urban renewal, and a narration that consists of the remarks of workmen (simulated by actors) watching a movie about themselves. *Skyscraper* has won two first prizes at the Venice Film Festival, an award of merit at the Edinburgh Film Festival, and first prize for shorts at the San Francisco Film Festival. And it has been nominated for an Academy Award. This is impressive, even in an industry that has more awards than a country fair.

Not all of the awards given to business films are based on filmic excellence, however, and, ironically, those that are have not always been welcome in business quarters: some sponsors still fear that what critics find "good" may be better than industry can afford. Yet there is abundant evidence that the one thing industry can no longer afford is triteness. A business tool, like any other tool, is least effective when crude, imitative, and makeshift. Undeniably, business films are becoming increasingly sophisticated—a trend pleasantly noticeable in pictures like *Skyscraper, Silk, Color and Texture, Ages of Time*, and *Men With Cars*. They show that it is possible for a sponsored motion picture to be at once entertaining, informative, artistically excellent, and commercially effectual.

Film, like love, is an experience that happens in the dark. Industrial design can't be expected to throw any light on it, but the industrial designer may. For although there are not many designers who can or want to produce motion pictures, the designer is often in a position to be uniquely valuable to the film programs of his client. He is one of the few principals in industry who can lay claim to what corporate psychologists call "visual orientation." As a man largely responsible for a company's look, he has an investment in how that look is projected onto a screen, and he ought to have some understanding of how a corporate image can be dynamically drawn on a strip of cellulose acetate. As the artist-in-management, he has a much greater than average ability to imagine what a described film sequence will look like. No one else is so thoroughly equipped to understand both sponsor and film-maker, and to interpret them to each other. And such understanding and interpretation are important, for the motion picture is still one of the most effective means ever devised for business to communicate with the public and with itself.

The End



A NEW STATE GETS A NEW PROFESSION

Israel's need to export has brought about a unique experiment: the integration of design and industry from the beginning of both

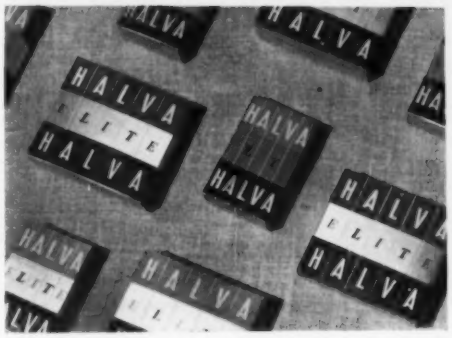
There are two ways of planting a culture in a desert: you can start from the beginning, with seeds and time and patience, or, where there is no time and therefore no patience, you can transport it, root and branch, from its original environment and trust that, with proper care and nourishment, it will become a true graft. The State of Israel itself did not just grow: it was designed to meet the urgent needs of a new people that could not wait; and, similarly, the new nation could not wait for an industry to develop; it needed, immediately, an economy as modern as those many of Israel's new citizens had left behind them in their former homes. Unlike Japan, which had to compress an industrial revolution into a few years, Israel had nothing to revolutionize; and since, like Japan, and for many of the same reasons, Israel increasingly depends on her ability to export to industrially advanced countries, she has devoted all her energy to building new foundations without having to alter old ones. This has not, however, been pure advantage, since the absence of old economic foundations has meant the absence of a clear national form and character.

Industrial design in Israel shares the strengths and weaknesses of the state itself: it too is the result of official fiat, and has depended, in its first steps, which are just now drawing to a close, on help from abroad, most particularly, from the United States. When the State of Israel was established in 1948, the Jewish Agency, which had until then assumed many quasi-governmental functions, turned over its Department for the Development of Applied Arts to the government, where it became the Section for Product Development within the Ministry of Commerce and Industry. As advisors, the government retained two Israeli industrial artists: Jean David and Zahara Schatz.

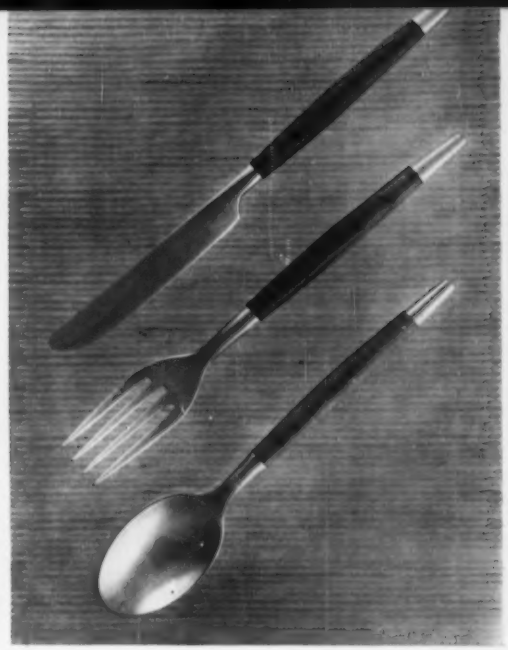
In 1950, James Plaut, then the Director of the Boston Institute of Contemporary Art, became the first of the government's American consultants in industrial design. One of his earliest projects was the National Council for Industrial Design, composed of representatives from government, industry, and professional organizations, which was responsible for Israeli participation in international trade exhibits; notably, the 1954 Triennale.

By 1955, the government had decided on an intensive design program to be financed partly through the United States Operation Mission in Tel Aviv. American help was not to be only financial: two separate technical assistance projects aimed at establishing Israeli design practice and education on American prototypes. One of these projects was to establish an industrial design office, subsidized by government funds, which would train Israeli designers while serving as a consultant to Israeli manufacturers. The project was initiated by a contract between the Ministry of

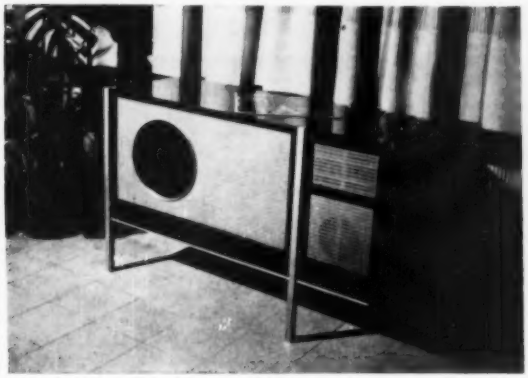
Paul Karlen (left), American Director, and Natanel Cohen (right), Israeli Director, confer with Aryeh Solomon, one of the Israeli designers trained at IPDO. Solomon is now in charge of package design.



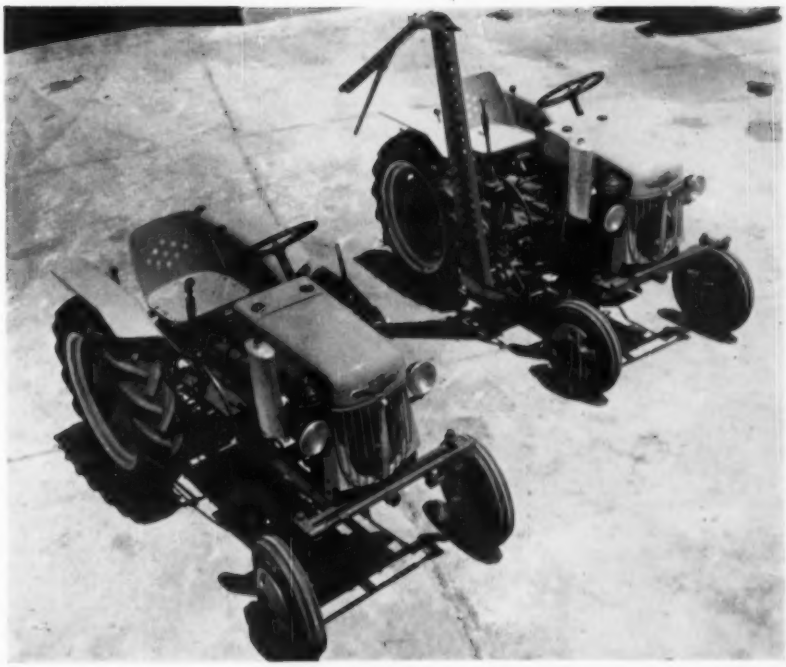
For the Elite Chocolate Company, IPDO designed this halva export package. Candy is one of Israel's most important exports, and candy packaging was the subject of a U. S. market survey commissioned by the Israel Institute of Industrial Design in 1958. The survey concluded that Israeli packages should look more Israeli, but did not say how.



One of IPDO's objectives is to find new uses for Israel's few native materials. This tableware has handles of Israeli olivewood, which is of unusually high quality.

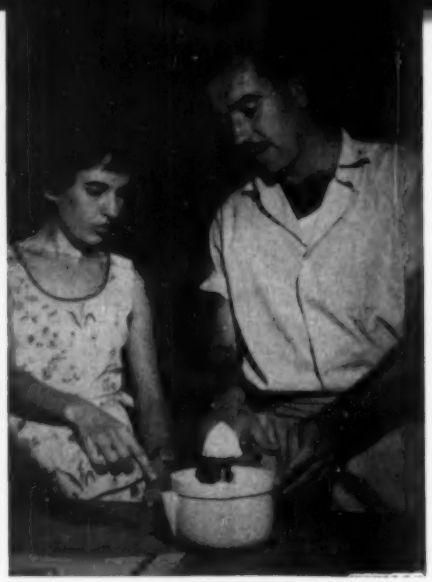


Some of Israel's large manufacturers are beginning to employ IPDO regularly. This hi-fi speaker enclosure was designed for Amron Radio & Electronics, whose radios IPDO has also redesigned.



The IPDO staff produced this redesign of a 9 hp garden tractor imported from the U. S. and strengthened for field use. Their task was complicated by the fact that the new components: motor hood, fenders, seat, and front wheel weight, had to be designed for local hand production.

Students in the Israel Institute of Industrial Design listen to the Institute's co-directors: John Cheney (second from left) and Nathan Shapira (right).



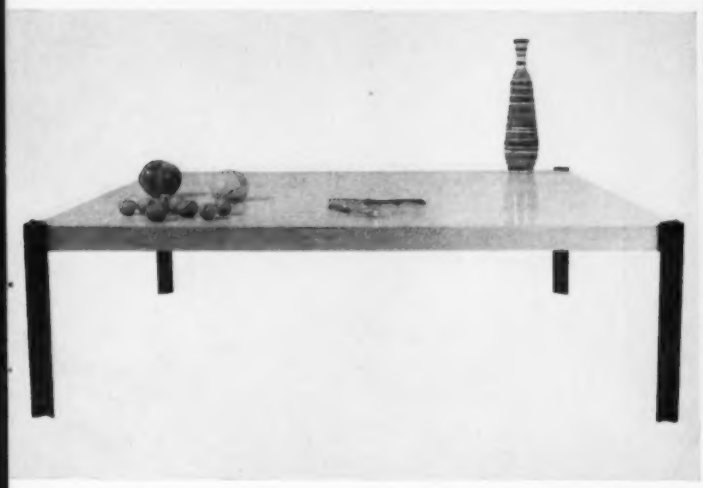
Two projects by students at the Institute: above, the student designers with their orange juicer, which is powered by downward pressure with half orange on the rotary extractor. Below: student designers with their push-button telephone.

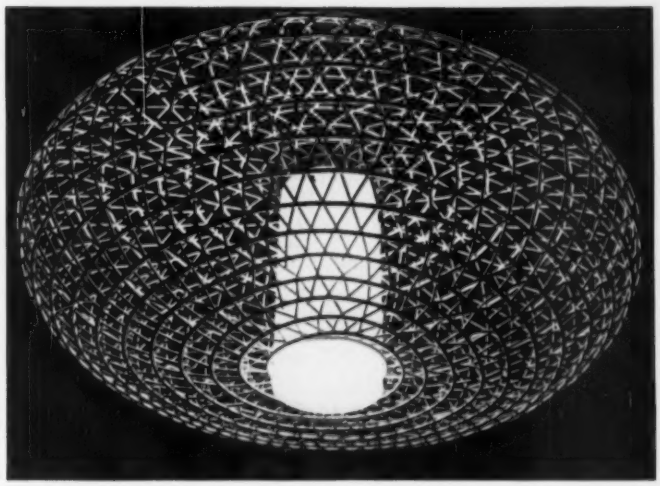
DESIGN EDUCATION FOR A WHOLE ECONOMY

The Institute maintains an Exhibition Center in Haifa, to display well-designed Israeli and foreign goods. Above, a packaging exhibition designed by John Cheney.

Commerce and Industry and the American design firm of Peter Muller-Munk Associates, which prepared a preliminary report. This noted that the nature of industry and of design in Israel was determined by the high standard of living which keeps labor costs high; the scarcity of native raw materials and the high cost of imported materials; the abundance of skilled labor; the proclivity of many Israelis for small, independent enterprises; the psychological and cultural need to utilize the handicraft skills of many immigrant groups; and the exceptionally independent tastes of Israeli consumers. When the report was written, there was not a single industrial designer practicing in Israel, and although, because of heavy foreign investment, productive capacity was high, actual production was low.

The Israeli Product Design Office, established in May, 1956 on the basis of recommendations made in the report, had, as its American Director, Paul Karlen, a Muller-Munk partner, and, as Chief Designer, Mort Rothenberg, another Muller-Munk staff member. Both of these had Israeli counterparts: Natanel Cohen and Aryeh Lavi, both of them American-born and educated, were, respectively, Counterpart Director and Counterpart Chief Designer, and heirs-apparent to the office. The Israeli staff was recruited from varied backgrounds (graphics, engineering, advertising); few of them had had any experience with actual product design. Their practical training on the job was supplemented by after-hours seminars. In all, IPDO has trained, partially





Two designs by Nathan Shapira: at left a coffee table of wood and iron; right, a lamp of wicker and plexiglass combining craft and industrial processes.

Most industrial design is an adjunct of architecture, as it is in the office of Joseph Mochly, Haifa architect, shown here with his design colleagues.

INDEPENDENT DESIGN TAKES ITS FIRST TENTATIVE STEPS

or wholly, 18 Israeli designers, and the present staff consists of nine Israelis. IPDO's service to manufacturers has followed a pattern which conforms as closely as possible to that of the private American consulting office. In the beginning, it charged a flat fee of IL 4.250 an hour: a sum which represents about half the actual cost and which was subsidized by Israeli and American government funds. (The American directors insisted on a fee, because manufacturers would feel more respect for services they had to pay for.) Since 1956, the fee has risen to between IL 6.000 and IL 7.500 an hour; and the directors estimate that it will be another two or three years before the office can reach self-sufficiency.

The second technical assistance project is more strictly educational in nature, and is the result of cooperation between the Boston Institute of Contemporary Art and the Israel Institute of Technology (Technion). At the end of 1955, John Cheney was assigned by the Boston ICA to establish an Institute of Industrial Design at the Technion within the Faculty of Architecture. With the cooperation of architect Nathan Shapira, who had been responsible for a number of government exhibits, including "Forms from Israel" (ID, February, 1959), Cheney set up a number of basic industrial design courses for the Technion architecture students, as well as extension courses for engineers, craftsmen, and other workers in fields allied to design. But the Institute was established to educate manufacturers and consumers as well as designers. From the beginning the Institute has offered advisory service to manufacturers—usually of a more generalized nature than that available through IPDO. Technion's engineering and scientific faculties supply technical assistance, and the Institute maintains a register of local design offices (including IPDO). and makes recommendations if the manufacturer requests The Institute's consumer-education program consists of lectures, films, exhibits, and a Design Index of Israeli goods intended to serve as a shoppers' guide. The Institute has sponsored a number of research projects, including several market research surveys in the United States.

This year marks the end of the beginning of industrial design in Israel. The American designers, which had for the past six months acted simply as observers at IPDO, have gone home, and the office is in the process of negotiating its future with the Israeli government. The USOM technical assistance project for the Institute of Industrial Design ended last summer, although John Cheney has remained to teach and practice. Like the few other designers in Israel, he finds that, although manufacturers are just starting to grasp the point of industrial design (a point sharpened by competition as the country has moved from a sellers' to a tion. But five years have not taught Israel patience, and there is still plenty of room in the desert to grow.—U. M. H. buyers' market), the economy is still too small to support an American pattern of industrial design for mass produc-

A 2000-pound batch of ink being discharged from a milling-machine in one of California Ink Company's plants.

In package design the high road to impact is color—and it is paved with

INK

by Richard Moss

Printing ink is color. And although ink plays only a relatively small role in the total production of a package, color counts for about half the "total" design. Like many things which are paradoxically both insignificant and important at the same time, like air for example, printing ink tends to be taken for granted. (You are looking at some.) In fact, ink is so "obvious" that one young purchasing agent for a large printing company, asked to order some invisible ink for a special government project, acquired it from his ink supplier, put it away in some glass bottles, and, according to latest reports, hasn't been able to find it since.

That story may be apocryphal, but this is certain: with the growth of self-service purchasing and with product manufacturers so largely dependent for profits on the colorful salesmanship of their packages, with applied psychologists researching (and discovering) the precise effects colors can have on those elusive human motivations called "subliminal," and with marketing specialists making yearly revisions of the fashion hierarchy of the spectrum, color itself has become one of the strategic weapons in each company's war on the competition. And, for these reasons, just as the designer has grown more sophisticated (if not more subtle) in his use of color for a design effect, he has grown more aware of the complex character of the substance of printed color, which is ink. Designers' increasing dependence on the ink manufacturers* for technical assistance in establishing color standards and making color-matches for packaging lines is evidence of their realization of both the importance and the problematic nature of ink in package design.

But communication between designers and the ink people has not always been free and easy, and it is still not ideal. There is a certain amount of distrust in both camps. Designers sometimes think of the ink manufacturers as backward in their business policies and unappreciative, like many "outsiders," of the designer's special problems. Conversely, some ink men accuse designers of remaining stubbornly ignorant of printing and ink technologies. In this, they do not always distinguish between the experienced package designer and the artist who happens to do a package.

Moreover, it is easy for the uninitiated to regard the business of making ink as a somewhat occult occupation. For, despite the elaborate precision instrumentation used in ink research, and in the manufacture, control, and testing of inks, ink fabrication is still to a surprising extent a craft. The 225-million-dollar industry produces an estimated total of three-quarters of a million new inks a year, and the crucial step in the manufacturing process, the formulation of each new ink's "recipe," requires a skill more like that of a master-chef than that of the girls who make the automated sandwiches at Chock Full O' Nuts. Formulating a new ink is as much a matter of technique as of technology—first of all, because there are no exact mechanical means of translating the complex chemistry of ink into the actual production of the stuff, and, second, because the analysis and control of color by instruments is limited chiefly to theory and research. In the final judgment of color, at the presses where it is being laid down and in the client's executive suite where it is going to be approved, the eyes have it.

Essentially, a film of printed ink as you see it on a package consists of microscopic particles of pigment (or, more likely, of a mixture of pigments) uniformly dispersed in a vehicle composed of oils, resins, solvents, or a combination of these. The pigment, of course, provides the color, while the vehicle serves the double purpose of carrying the pigment fluid through the printing press and then allowing it to solidify on the stock when the vehicle itself dries.

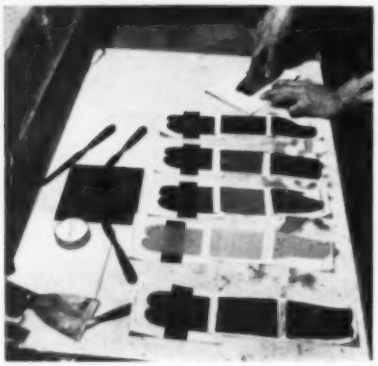
The mixture of pigments and vehicles for a particular ink—the formulation which is unique for each package design—depends only in part on what color is desired. Of

* The three biggest producers of ink are: Interchemical Corp., Sun Chemical Corp., and Sinclair & Valentine Co., all headquartered in New York. The California Ink Company is the major west coast producer.

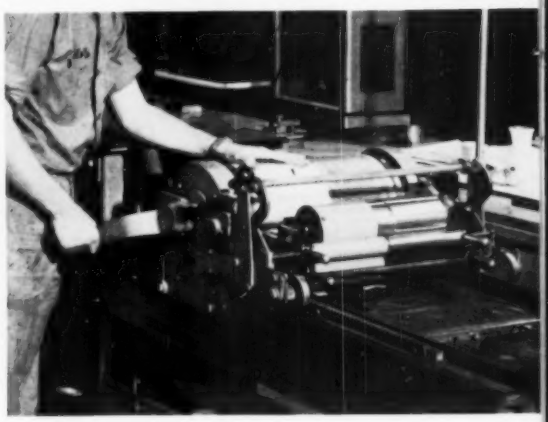
American Ink Maker

Formulation of an ink to match a designer's color swatch begins on a glass slab where an expert combines pigments and vehicles selected not only to reproduce exact color but to meet many other specifications, too.

Matching a color standard that has been previously formulated (i.e., for a new batch of an old ink) requires a series of "draw-downs" (below) where the old and the new ink, smeared side by side, can be compared.



Since the same ink on two different stocks will be different in color, a match is not final until it is proofed on the stock which it will be used to print. Divided cylinder allows proofing two inks at same time.



equal importance are a number of considerations which have no apparent connection with the problem of color but which have a very substantial bearing on the problem of ink. These other factors involve the entire complex of package production, including (1) the printing process in which the ink is used, (2) the materials on which it is printed, (3) the conversions, or forming and processing operations, which the stock must undergo after being printed, (4) the chemical nature of the contents of the package, and (5) the performance specifications which the ink must meet under the conditions of package end-use.

1. Printing process. Each of the four printing methods commonly used for package printing—letterpress, flexography, gravure, and offset lithography—requires its own special ink. An ink of any specific color can be made for each of these printing methods, but its formulation in each case is vastly different. Primarily, it is the difference in the character of the printing plates used in these processes that necessitates the difference in ink formulations. But of great importance, too, are such factors as the type (and even the make and model) of the press, press speeds and required drying time, the size of the plates, the sequence of color overprinting, and the particular nature of the design. (For example: all other conditions being equal, a fine-screen halftone ink is usually different from an ink used to print large solid areas.)

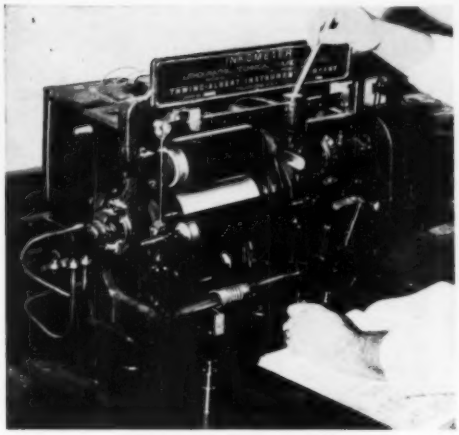
2. Stock. The many coated and uncoated papers, boards, films, foils, and metals used for labels and packages all differ with respect to such characteristics as absorptive qualities, inherent coloration, and surface smoothness and uniformity, with the result that each ink used in package printing requires a formulation specially suited to the stock. In this connection it should be noted that the same color to be printed on two different stocks will require two entirely different inks.

3. Post-printing conversions. The proper formulation of an ink also depends on what kinds of post-printing treatment it will get—and it is often pretty rough. Ink formulation for a specific color may be limited (and, for some colors, made impossible) by such converting operations as die-cutting, folding, heat-sealing, or wax-coating. For example, Johnson and Johnson sterilize their first-aid products after they are packaged. Until recently, the high temperatures developed in the sterilization autoclaves made it impossible to formulate the light shade of blue which the new J and J line, designed by Donald Deskey Associates, now carries.

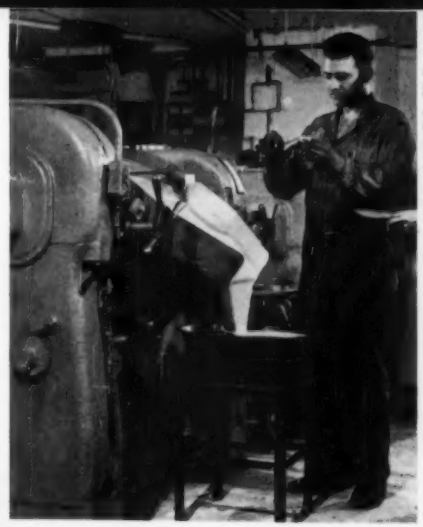
4. Package contents. Not all pigments will resist discoloration or bleeding in the presence of such substances as soaps, acids, alkalis, fats, oils, and adhesives. Consequently, the formulation of an ink must also take into account its chemical compatibility with the contents of the package it is to be printed on.

5. Performance specifications. Finally, but of prime importance, an ink must be specially formulated to meet such requirements as lightfastness, rub-resistance, moisture-resistance, non-toxicity, and odorlessness. The more rigid the designer's specifications in this area, the narrower is the range of colors he can choose from. The clean, brilliant

Physical properties required of a new ink depend (for one thing) on what position it occupies in the order of overprinting. This Inkometer, which reproduces the operating conditions of the ink-distribution system of a printing press, helps measure ink's "tack" and "body."



American Ink Maker



American Ink Maker

During actual ink production, which follows laboratory-formulated "recipe" to the letter, samples are taken from milling machines (above) and tested for conformity to the laboratory specifications.

Inks are formulated not only to match a specified color but also to accommodate themselves to the idiosyncracies of the individual printing press (below), and, sometimes, those of the pressman.

colors, for example, are attained by use of pigments which are generally far less permanent than the pigments which give the richer, but dirtier, colors.

So the ink formulator's requirements do not end with the simple specification of a color. But neither does the package designer's responsibility to his client. In the production of a package, both ink men and designers are equally concerned with the decisions (which the designer makes and the ink formulator must take into account) necessary to the creation of a package: decisions on color, form, printing process, materials, and performance. But commercially, designers are several steps removed from the ink manufacturer, since the ink man is the designer's client's supplier's supplier. And it is only in the past couple of years or so that a few of the ink companies have realized that while designers are not potential customers themselves, they can be instrumental in the sales of great quantities of ink. Consequently, the top ink companies, aware more than ever that while their product is ink their business is printed color, have been encouraging designers to make use of their technical services.

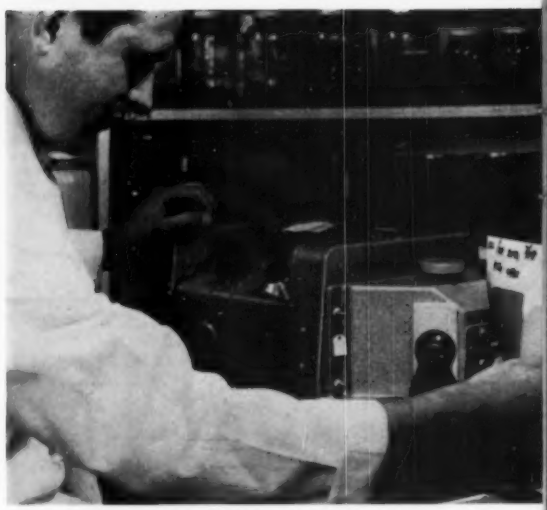
One service which all ink companies offer is at once the most obvious and the most easily overlooked. The nature of their work requires continuous experimentation not just with inks but with inks *in relation to* the variety of printing processes and printing materials, old, new, and experimental. The result is that if anybody in the graphic arts industry has a bird's-eye view of new developments and techniques in packaging, it is the ink companies' research people—and their knowledge and advice is free for the asking.

An example of their individual services is the Colortrend Report issued annually by the California Ink Company, San Francisco. It is a folder containing swatches of the colors currently most popular in this country, together with an analysis of trends over recent years and projected into the coming year. Price: $10.00.

The ink manufacturers' most common service, however, is color-matching for a particular job. Their color-matching service is indispensable to a packaging program involving the standardization of corporate-identity colors to be reproduced on a number of materials, because, as has already been noted, the inks in each case must be different.

There is no set way in which a designer works with an ink company, but here is one example of a project in which the designer made typical use of the ink company's services. A few months ago the Frito Company retained Dixon and Parcels Associates to redesign their entire line of pretzel packaging. Packages had to be designed for a variety of shapes and sizes(straight and twisted, large and small) of an assortment of different kinds of pretzels (regular, cheese, and "Dutch"). To distinguish the members of the pretzel family, and to create as much impact as a tight packaging budget would allow, DP relied heavily on a group of eleven colors, "coded" to the different products and printed in large solid stripes on each package. The designers made up swatches of these colors, together with a chart indicating all the other information necessary for ink formulation in this case. Alongside a description of each package, this chart

Inks designed to meet rigorous specifications for light-fastness, rub-resistance, weather-resistance, etc., are tested in a battery of instruments which reproduce package end-use conditions. Two of these are the Fade-ometer (above), which subjects sample of printed ink to artificial sunlight, and oven (left) which determines an ink's resistance to high temperature.



This "Color-Eye" measures the relative values of red, green, and blue in a sample of printed color. When two colors do not exactly match, color-matcher can quickly find out in what direction of the spectrum the match is "off."

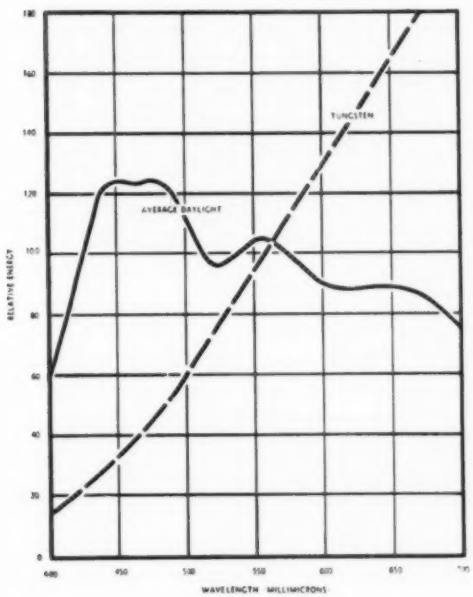
incorporated the following information: (1) the color to be used, and, in the case of multicolor printing, the order of overprinting; (2) the stock to be printed on—cellophane, paper-board, wax paper, kraft paper, or tin; (3) the printing process—all four processes were used; (4) specifications for odorless inks in two cases where package end-use required them; and (5) the names of the printers, this being sufficient indication to an ink man of the makes and models of the presses for which he must formulate his ink.

Dixon and Parcels then submitted these color swatches, together with the design specifications, to the production labs of Sun Chemical Corporation's General Printing Inks division in East Rutherford, New Jersey. GPI formulated inks to match the original color swatches and furnished DP with proofs taken on samples of the same stocks the inks would be printed on. When it came time to order the packages from the printers, DP used these proofs to specify the desired colors. The printers were not obliged to use GPI inks, of course. They could have mixed their own, or they could have ordered them from another ink manufacturer. But, since the proofs all carried GPI's coded formulation-number, it was logical for the printers to order GPI inks, and in every case but one (where geographical location favored the printer's use of another company), that is what they did.

All the major ink companies can handle designers' color problems as effectively as Roy Parcels says GPI handled his. But they are not all set up to do so in the same way. Interchemical Corporation's Printing Inks division (IPI), with whom Dixon and Parcels have also worked satisfactorily, has what is probably the neatest and most aggressive organization in the industry for helping customers and designers. IPI's Color Service Department has all of Interchemical's vast research facilities at its disposal, and, operating out of New York, has been extremely successful in promoting its services to designers. IPI's position is characterized by a casual remark package designer Richard G. Neubauer, who was not attempting to coin a slogan for IPI, recently made: "When you think of color—you think of ink —you think of IPI."

One of the most interesting facilities at the disposal of IPI's Color Service Department is a Color Center, whose unpretentious layout in a livingroom-size space in Interchemical's New York research labs does not reflect the huge cost of its equipment or the importance of the work its staff of expert color physicists carries on. The principal feature of the installation is a kind of variable-pitch lighting system (made by Macbeth Daylighting) concealed behind the honeycomb ceiling. Six kinds of lighting are obtainable by pressing buttons: north skylight, overcast north skylight, average daylight, super-deluxe cool white fluorescent light (which is the usual lighting in supermarkets), a special color-transparency illumination used for judging the fidelity of four-color proofs against the original color transparencies, and, finally, a tungsten light like the incandescent illumination found in the average home.

Spectrophotometer (above) provides graphic record of color-reflectance properties of any printed surface, aids color standardization because two perfectly matched samples will give identical curves. Color-radiation properties of two kinds of light are shown below (solid line, daylight; broken line, tungsten). Daylight is strong in blues (left summit), weak in reds (right decline); tungsten is high in reds (right incline). This explains why a red surface viewed in daylight is darker, bluer, than the same surface viewed in tungsten light, which brings out bright reds.



This convertible lighting system is important for color-matching because a match attained under one kind of lighting will not necessarily match under another. This phenomenon was dramatically demonstrated recently to a group of Colgate-Palmolive executives who came to the Color Center to inspect the color qualities of the trademark red that is as important to Colgate as it is to Coca-Cola. By rapid comparison under two conditions of lighting they learned that the brilliant red brought out by the reddish tungsten lighting of the average home became a dull, dark red under the bluish lighting commonly used in supermarkets.

IPI's Color Center is also equipped with two spectrophotometers. These instruments, manufactured by General Electric (they cost $30,000 each), are designed to record, in the form of a graph-curve, the color-reflectance values of a printed surface. These spectrophotometric curves are indispensable to long-term standardization of colors for packages. Although products become obsolete and packages are often redesigned, manufacturers usually want packages to carry a trademark color that will last many years. The color of a package will fade over a long period of time, as will proofs taken of the color. The wet sample of the ink formulation which the ink company keeps in its files, while it is not subject to changes induced by exposure to light, may change in its chemical constituency. Therefore, the only way to be sure that the re-order of a package several years hence will bear the same color that the package now carries, is to take a spectrophotometric curve of the original. When the time comes to reorder the package, a proof of the new ink can then be checked against the curve of the original package.

IPI is not the only ink company to have these instruments; a few others are equally well prepared to fill the color standardization requirements of designers. But IPI's Color Center, bringing together these and other color-measurement and -analysis instruments in a space expressly devised to help solve other people's color problems, "bridges the gap," as Neubauer puts it, "between the designer and his client." The Color Center is probably a major contributor to IPI's supremacy in the business of inks.

If IPI's leadership in the field is indisputable, however, it is not unchallenged. GPI, already IPI's closest competitor in both volume of sales and in service to designers, is bidding vigorously for a greater share of both the ink market and designers' packaging projects. Earlier this year GPI set up a Marketing Department to lubricate the wheels of its nationwide service machinery. It also expects to complete construction on a new $600,000 research laboratory later this year. Headed by Sun Chemical vice-president M. J. Hoover, the Marketing Department will be chiefly concerned with bettering service to customers and potential customers; and in the process, it has its eyes on designers and designers' clients—and these are more likely to be helped, than withered, by the stare.

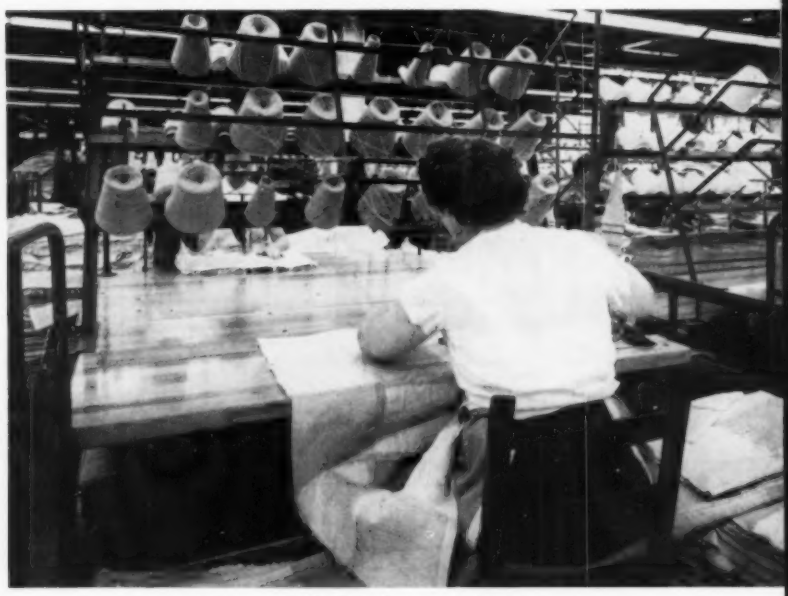
BITTAN VALBERG ADAPTS THE HAND-LOOMED LOOK TO LESS COSTLY MACHINE-TUFTED RUGS

Until recently, budget-bound consumers have decorated only their dream houses with custom-designed rugs. Now a single-needle tufting machine makes them available to a much wider market at less than half the customary price. Using these machines, Swedish designer Bittan Valberg has created a collection of area rugs retailing at $7.50 a square foot, impressively low when compared to the $20 a square foot price of the average hand-loomed rug. A full month is required to complete a five-by-seven foot rug on hand looms; the tufting machines of Cabin Craft, the Dalton, Georgia textile firm which produces Mrs. Valberg's designs, do the equivalent job in a week.

Mrs. Valberg begins with a large water-color sketch and a hand-knotted sample, then transfers the whole design to a piece of duck, keying each shade with a number. To get the full range of desired effects, she and Cabin Craft's technicians have developed a complete production process with unique short cuts. Most important, Mrs. Valberg has eliminated the time-consuming necessity of making an individual sketch for each rug in a smaller size of the same pattern. She develops every design in a way that enables her to take a section from it for smaller rugs without spoiling the final effect of the composition.

Cabin Craft's tufting machines look like complex industrial sewing machines. Actually, that's exactly what they are, except for being slower and heavier.

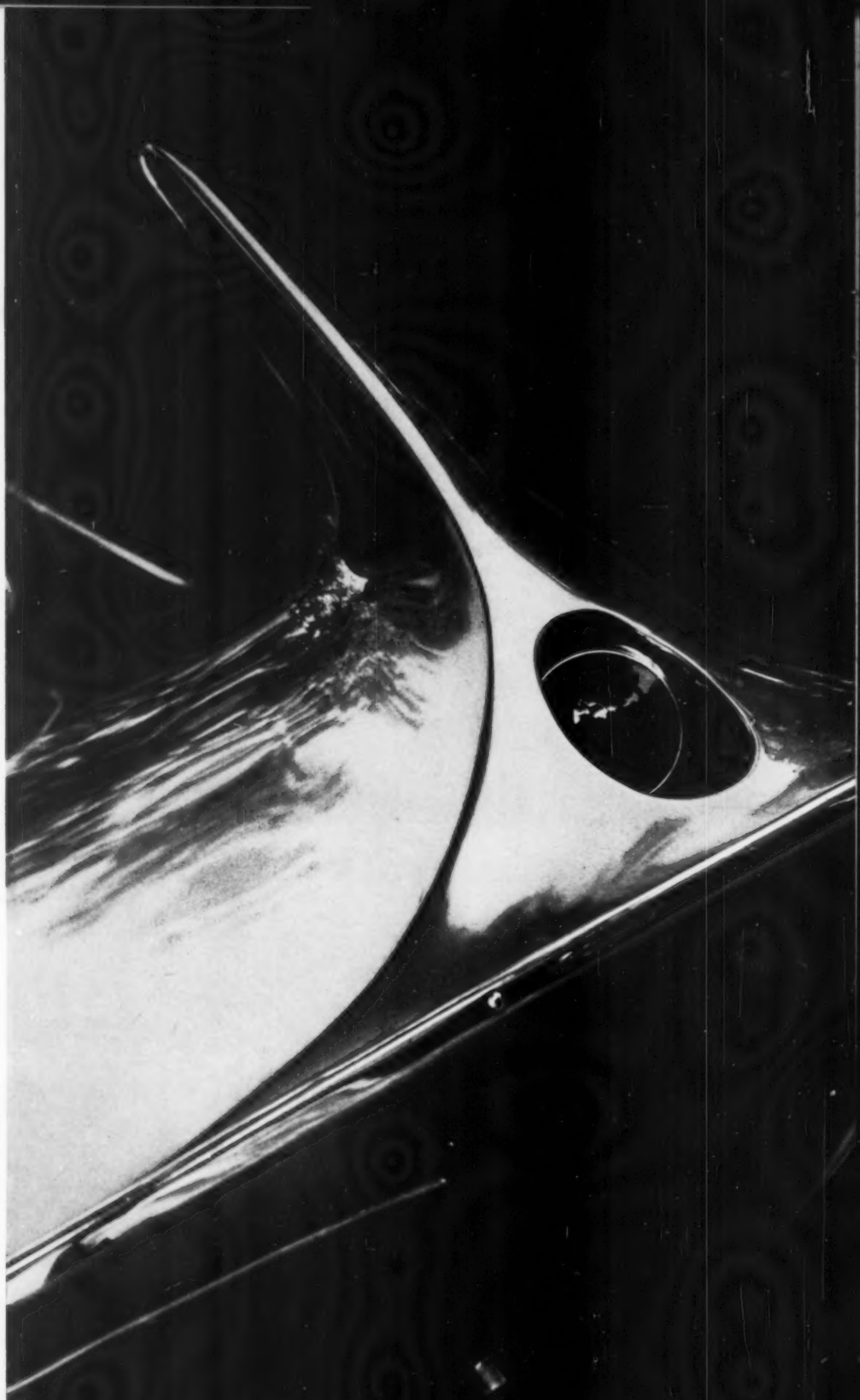
Bittan Valberg (right) checks over the hand-loomed sample of Moon Missile before placing it on machine (rear), which will complete a 5-by-7 foot version in about a week. This rug retails at $348.75.



The yarns Mrs. Valberg uses for her collection are all Chemstrand's Acrilan, similar to hand-spun wool yarn. She has dyed the yarn by hand to get the precise shadings of color she wants to use in her designs.

"Sky City" is based on Bittan Valberg's impression of New York seen from the air. Blue with red and orange highlights, it retails at $405. Four new rugs have been added to the collection for the current market.

Originally, Mrs. Valberg tried producing her rugs on Cabin Craft's giant-size, multi-needle tufting machines. When they failed to retain the hand-loom quality, she turned to small, single-needle machines. Now the rugs come alive with a multitude of shadings and textural excitement — some yarns are cut, some are looped, and others shaggy. The machines do have limitations. Although theoretically they handle an infinite variety of colors, in practice Cabin Craft must limit colors to keep production time within reason. But these machines are still the best means yet for making the work of top craftsmen like Bittan Valberg available to a bigger market.



Bertone's ***BAT*** *No. IX* **(1959)** *More sculptural experiment than practical solution*

In Italy, when autoworkers take a coffee break, they build a fire in the middle of the shop and brew up their own espresso. This is a lot different from Detroit, and a lot of other things about Italian car design and manufacture are different from the way things are done here. The Italian auto industry is a tripartite affair. It has its big manufacturers, turning out assembly-line production models. But it also has two other important, autonomous groups whose counterparts in this country are now almost non-existent except as small departments in the huge enterprises which turn out our mass-produced transportation. These are the coachbuilders and speed shops. Although they depend on the big manufacturers for their basic component, the bare engine-and-chassis assembly, they transform this stock part into a product that, from Main Street to the Mille Miglia, is regarded with everything from affectionate delight to worshipful adoration. One admirer, with emotions midway between, explains here some of the mysteries behind the magic, and follows it with a pictorial survey of

THOSE FABULOUS ITALIAN CARS

by George F. Lyman

The Italians are an emotional people, and this is expressed in the cars they build. The international racing color of Italy is a brilliant red, and most cars are painted this color. But there is more to excitement than color. There is sound: a Ferrari approaching from the horizon first sounds like an angry mosquito, then, as it passes, the throbbing lower tones of its exhaust pound into your ears. And there is shape and texture: the bodies of many Italian cars are hand-pounded from sheet aluminum. Paint may be applied as many as 20 times, and each coat separately rubbed and polished. Forms thus created are sensuous to both hand and eye.

All this excitement results from, or is influenced by, custom design. Italy is a poor country and only one out of 35 people own cars, but because the income tax is very low there are a number of extremely wealthy people. To satisfy the needs of these wealthy few, designers and builders of custom automobiles still flourish in Italy. It is the $15,000 custom-bodied Maseratis and Ferraris that are driven flat-out over narrow, twisty mountain roads and must therefore handle flawlessly and stop quickly. To do so they must be both light and aerodynamically correct, and these two qualities are the special genius of Italian automotive designers.

Zagato and Touring are known throughout the world for their "super light" construction methods. When Aston Martin of England hired Touring of Milan to design their new DB-4 sports car, they were so impressed with its lightness and rigidity that they sent their engineers to Italy to study Touring's methods. Several of the Gran Turismo coupes built by Zagato weigh less than 1000 pounds, and will quickly and safely go 100 miles per hour with an engine producing less than 50 horsepower. Driving a car this light and fast is a delightful experience, for the controls respond immediately and positively to a feather touch. But unless it has been designed with an understanding of aerodynamics, such a car will never reach a high speed, and side winds will have dangerous effects on its stability.

Scaglione, the designer and engineer for Bertone, has led the way in applying these aerodynamic principles to automobile performance. Correctly designed, a car will slip through the air easily, resulting in a much higher top speed and increased gasoline mileage, and since there will be little air turbulence, wind noise will be almost inaudible to the occupants. Most important, the car will be completely stable on the road at all speeds and in high winds. Detroit usually ignores these problems by building cars as aerodynamic as cinder blocks; they batter their way through air by brute force alone, and they hold the road in cross winds only by the momentum of their great weight. With slow, unresponsive steering, soft suspensions, and poor brakes, they can be treacherous at speeds over 75 miles per hour.

But if the Italian cars shown on these pages are more beautiful and more pure than our automobiles—and they are—it is not necessarily because Italians are better designers. Rather, they design for the smaller builder who needs to sell only one or two cars a week to prosper, and who usually makes bodies with the distinctive design character of his own shop. The designer has only to satisfy himself. If his approach is honest and intelligent, there will be discriminating buyers who will appreciate it; if a car comes off badly and does not sell, he simply makes no more like it. Even the builder who has no design experience eventually gets quite proficient if he has a critical eye. The best points of former cars are carried over and poor features are

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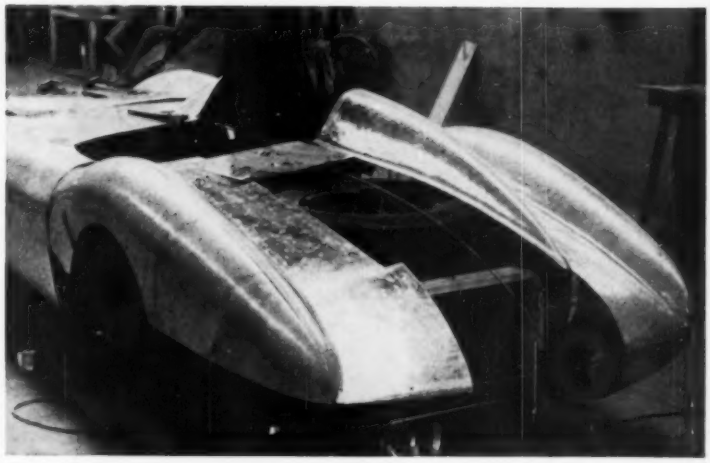

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Building a custom body, Italian style

1 *Finished Ferrari chassis arrives at Scaglietti shop, and designers bend a skeleton of soft iron wire over frame to outline body shape. Drawings are seldom made, but designers and builders work closely together on each car.*

2 *The metal beater, a highly skilled craftsman, studies one of the smaller areas outlined by the wires and rough-hammers a sheet of soft aluminum to the shape of each panel over a sand bag or hollow log.*

3 *Next, he beats out the panel on a flat iron block until the surface is smooth and the metal is work-hardened.*

4 *Panels are laid loosely in place over the wire skeleton.*

5 *Panels are hammered to match perfectly, right on the car.*

6 *Panels are overlapped and temporarily screwed together, scribed around the edges, then disassembled and cut with tin snips along the scribed lines. Finally, they are butted together, each seam is welded and filed down flush.*

7 *The car, now welded together, is road tested to locate rattles, insufficient clearances, and to check brake and engine cooling, etc. At this point, the customer often tries it to check seating position, visibility, and such. Here, test driver Signolfi checks out a competition Ferrari.*

8 *Any defects noted are remedied and the aluminum is filed, sanded, and polished to a mirror finish. It is prime-coated, lacquered (as many as 20 coats), rubbed down, then fitted with hardware and upholstery. It will now be returned to the manufacturer (in this case, Ferrari) for final road tests, engine tuning, chassis and wheel alignment, and balancing. After cleaning, polishing, and waxing, it will look as it does here: this is a finished Scaglietti Ferrari Berlinetta similar to the one begun in photo 1.*

The Manufacturers

Fiat (an industrial empire)
Alfa Romeo (cars with racing-type performance)
Lancia (builder of quality cars)
Moretti (inexpensive hand-made cars)
Ferrari (fabulous racing and sports cars)
Maserati (fabulous racing and sports cars)
O.S.C.A. (makes great competition cars)

The Speed Shops

Cisitalia (pioneer speed shop, famous for early Farina envelope coupe bodies)
Siata (modified Fiat components and distinguished coachwork by Bertone)
Stanguellini (originator of the Formula Junior racing car built from Fiat components)
Nardi (modifies cars for special customers, makes a line of hop-up kits for nearly all European cars)
Abarth (originally made high performance equipment, but now growing rapidly as maker of modified Fiats with special coachwork by Zagato and Allemano)
Conrero (rebuilds Alfa Romeos so they win nearly every race)

The Coach-builders

Farina (largest and most famous, can produce 20 cars a day)
Bertone (radical prototypes, forerunners of new design trends)
Ghia (prototypes for manufacturers have universal sales appeal)
Touring (highly serious and purposeful machines)
Zagato (little formal style, but simple, light, and aerodynamic shapes)
Vignale (true artists, created smooth-flowing coupes for early Cunninghams and Ferraris; not much lately)
Scaglietti (Italy's finest builder of specialized bodies for racing cars)
Allemano (little distinction in past, but some surprisingly fine work in recent years)
Boano & Michelotti (sometimes great, but more often flamboyant)

The Smaller Coach-builders

Frua	**Savio**	**Canta**
Monterosa	**Castagna**	**Baneschi**
Colli	**Lombardi**	**Monviso**
Viotti	**Fissore**	**Motto**

dropped. Italian cars are praised for their simplicity and lack of trim—and rightly so. But I suspect simplicity would reign here, too, if Detroit workers had to pound fins and bombs and wings and chevrons from steel by hand to decorate the flanks of American cars.

Nevertheless American designers can learn much by studying the work of the major Italian coach-building shops —Farina, Ghia, Bertone—that design cars for mass production on either their own assembly lines or those of manufacturers who have retained them. Farina, for instance, tools up completely for runs of 1000 cars or more, where Detroit might have to make 100 times that number to break even on tooling. Farina designs so that draws are simple and shallow, and stamps out all panels using conventional dies. (The shop builds a number of Cadillacs on its production line, and has had some trouble because the panels were designed for American deep-drawing with heavy, expensive presses.) The small stamped steel panels are butt-welded together and filed smooth into a monocoque structure typical of all Italian bodies, none of which have visible seams. As the accompanying photographs of recent Farina designs show, their simple, nearly flat shapes are often accented by sharp creases or changes in plane where panels are joined together.

Although Ghia builds a number of handmade limited production Chryslers and Dual Ghia Dodges, and has built many one-off show cars on Chrysler and Ford chassis, it concentrates mainly on designing and building prototypes for eventual mass production by automobile manufacturers throughout the world. Because of this, its designs feature dramatic sculpturing and deep draws, often accentuated with more trim than the other builders use. Bertone also builds many prototypes for various European manufacturers, but has its own facilities for fairly large production runs as well. Its prototypes are always imaginative and usually very radical, but its own cars are simple, handsomely finished, and well proportioned. Bertone bodies are built with a combination of hand and production methods. Although it has never worked with Detroit manufacturers before, it is now building a Gran Turismo body for the Corvette.

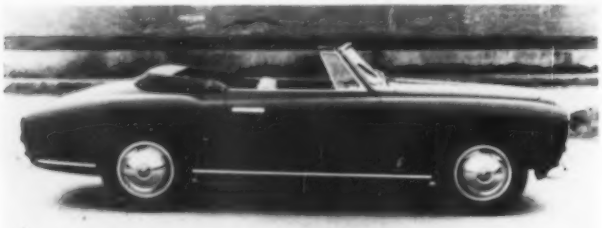
There are only three Italian manufacturers building family cars in mass-production quantities. They are Fiat, Alfa Romeo, and Lancia. Fiat is a huge industry, producing a highly diversified line of automobiles, trucks, buses, tractors, aircraft, and home appliances. In one of the world's most modern plants, Fiats are made in every size from minicar to full Detroit-size product. The Fiat engine may be in front or rear, may have two, four, six or eight cylinders, and may be gasoline- or diesel-powered, air- or water-cooled. No other company in the world offers such a wide selection.

Alfa Romeo makes several family sedans, but they are better known for their racing breed chassis and double overhead cam engines, which, when supplied with bodies by various coach-builders, make up a thoroughbred line of sports cars. Lancia, like Alfa Romeo, builds production sedans plus sports car chassis for the special body builders; it is known for fine quality cars with unorthodox engineering features such as V4 and V6 engines. It was Lancia who introduced unit body construction in the early '30's. In a fully stocked Lancia showroom you can see, in addition to the sedans, nine entirely different sports cars with handmade bodies by Vignale, Zagato, Touring, and Farina.

There is a fourth family-car manufacturer, Moretti, that

Cisitalia Spyder

Touring's Ferrari 212 Spyder, 1949



Farina's Alfa Romeo Spyder, 1950

The Spyder, racing roadster

Shortly after World War II, Italian manufacturers began building competition roadsters, called Spyders, in an effort to regain the racing supremacy they had lost to the rich government-sponsored German racing teams of 1934-39. These first post-war Italian cars are noted for their envelope, or fenderless, bodies. A little-known Cisitalia, with a body probably by Bertone, is simple and to the point. A Ferrari 212 with body by Touring, about 1949, unbeatable in competition, has a body of *very* thin aluminum; the crease along the side is to add rigidity and to stop panel drumming. A 1950 Farina bodied by Alfa Romeo embodies much of the simplicity of form associated with the racing Spyder although it is a convertible and not a competition car.

builds inexpensive sedans and sports cars by hand-making their own engines, running gear, and bodies in a tiny plant in Turin, but their output is very small, and their quality varies from day to day and car to car.

And there are Ferrari and Maserati, who build engines and chassis for racing cars and competition sports cars. These are the fastest and most expensive cars in the world, and, since the various coach-builders reserve their best designs for their chassis, they are usually the most beautiful as well.

The coach-builders and manufacturers are two segments of the Italian automotive industry, but there is a third, connecting the two. These are the speed shops which take the production chassis and engines from the manufacturers, modify them for full sports car performance, and then pass them on to the coach-builders. Let us follow the building, and naming, of one special-body sports car.

The speed shop Abarth places an order with Fiat for a series of perhaps 50 Fiat 600's without bodies or interiors. These are scheduled into Fiat's production run, and delivery is no problem since both plants are in the same city, Turin. Abarth removes and completely disassembles the stock 24-horsepower engine. It saves some parts which will be lightened by drilling and machining away excess weight, balanced to the exact weight of like parts in the same engine, examined by "Magnaflux" for any structural weaknesses, and, finally, buffed to a high finish. The cylinders are bored out for greater displacement, and the engine is fitted with a twin carburetor double-cam shaft head for very high rpm, performance, and "breathing". Finally, the engine is run for many hours on a test stand, then entirely disassembled for signs of abnormal wear. Besides this, there are many other alterations, such as an Abarth-tuned exhaust system—which increases the horsepower from 24 to 75.

The chassis are now sent to the coach-builder Zagato in Milan to be fitted with competition coupe bodies. If Zagato has made a series of similar bodies before, he may have kept a set of body panels from that run, but it is doubtful that any drawings were ever made. One of the metal beaters will be given a finished panel and told to make 50 more like it. Zagato's beaters prefer to pound out metal on hollow wooden stumps, but some other shops use sand bags. The finished body panels are then welded together on the Abarth chassis. If the car is to be used primarily for competition, the upholsterers will build special lightweight sling seats and the layer of padding beneath the interior panel lining will be eliminated. Also, the windshield and windows will be made of clear acrylic instead of heavy glass. The finished car is always road tested and personally inspected by one of the Zagato brothers. With its modified engine and light, streamlined body this car will go about 120 miles per hour compared to the 60 miles per hour of the sedan from which it was derived. Its name is Fiat-Abarth Zagato 850 Bialbero Record Monza Coupe. All special cars are named in this manner: First, the manufacturer (Fiat), then the speed shop (Abarth), the carrozzeria, or coach-builder (Zagato), the engine size in cubic centimeters (850), alterations to engine, i.e. dual overhead cams (Bialbero), and finally, body style (Record Monza Coupe), which also shows that the car holds speed records at the Monza race track.

The Spyder, later versions

The competition sports car has developed along very logical lines. Two later versions, both now rare, are shown here: a 1953 Siata by Bertone is an excellent example of a Spyder of that period; a 1959 Stanguellini by Scaglietti is an evolution of the same functional elements. The Stanguellini is much lower, reducing the frontal area and thereby reducing air drag on the car when it is traveling at high speeds. The headlights are faired with transparent plastic covers and all protrusions are eliminated to prevent air turbulence. The hood slopes down smoothly so that the air stream will put extra weight on the front wheels for sure handling at high speed. Any styling is the honest result of making the smoothest, fastest body shape possible.

Bertone's Siata Spyder, 1953

Scaglietti's Stanguellini Spyder, 1959

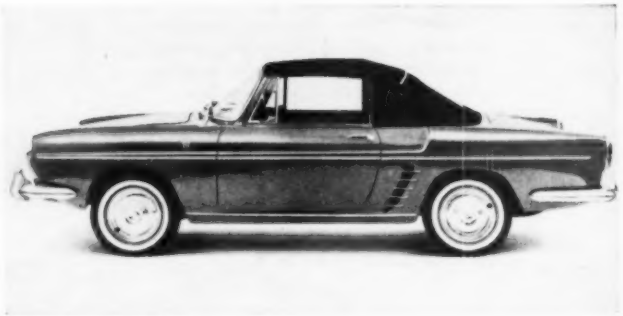
Designs by coach-builders for mass production

With the emergence of Italian coach-builders as design leaders, many European manufacturers have consulted them for deluxe sports bodies for their sedan chassis. Volkswagen started the trend by commissioning Ghia, and the resulting Karmann-Ghia is perhaps the best-known car of this type in the world. Ghia's Caravelle on a Renault chassis is less known; its sides are badly cluttered, but the front and rear treatment are fresh and logical. From the dumpy N.S.U. Prinz, Bertone has developed the delightful Sport Prinz, a modern fast-back coupe with a rear engine (for other fast-backs, see page 86). Farina's coupe and convertible on the Fiat 1200 sedan are the first designs for mass production on a chassis that has been, because of its excellent performance and fine handling characteristics, the basis for hundreds of special-bodied Italian cars. Farina's solution retains a family resemblance to the sedan, and is perfectly proportioned and detailed throughout. Unlike the other special cars shown here, which are mass-produced by the manufacturers, the Farina Fiat will be produced by Farina, at the rate of 12 a day. The price range of the cars in this group is from $2200 for the N.S.U. Sport Prinz to $2800 for the Fiat convertible.

Volkswagen

Karmann-Ghia

Renault Dauphine



Renault Caravelle

N.S.U. Prinz

N.S.U. Sport Prinz

Fiat 1200

Farina Fiat Coupe

Eight different body styles on the Fiat 600 chassis

Fiat 600 sedan; reliable and economical

Abarth 850 coupe; a belt-high 100 mph Gran Turismo

Bianchina 500; slow but more fun than a new toy

Zagato 750 coupe; an everyday car which can also be raced

Allemano 600 Milady; elegance on a small scale

Bialbero 750 Zagato Record Monza; best used for competition only

Siata 750; faster and flawless

Abarth-Bertone 750 Berlina; so low most people can't fit inside

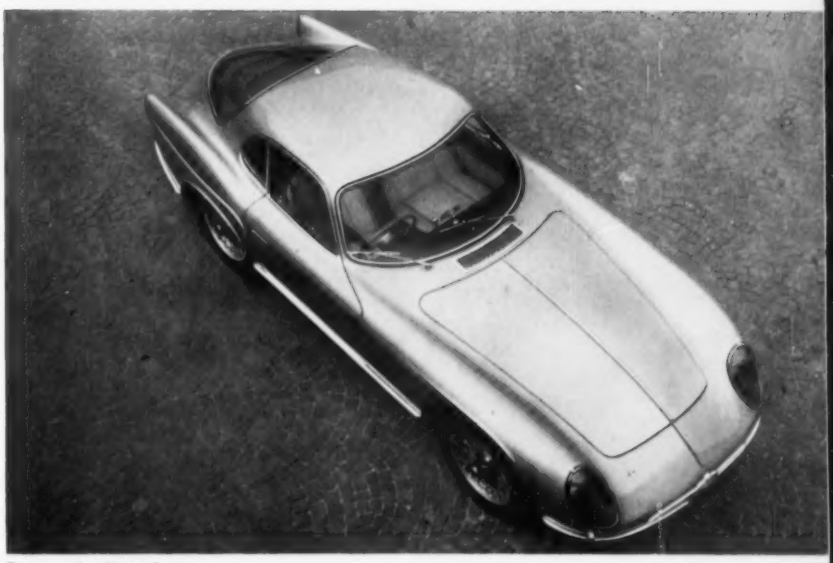
Ghia's Moretti

The Fast-Back Coupe

Vignale's Ferrari

Touring's Pegaso

Shortly after the first Spyders appeared (page 82), the thought occurred that an enclosed body, properly designed, would offer certain aerodynamic advantages over an open car in competition; the "fast-back coupe" was the direct result. As early as 1946, Farina built aerodynamic envelope bodies for the now familiar Cisitalia and Maserati coupes. Other builders soon created their own versions, showing remarkable mastery in reducing a complex of forms into one simple, well-organized shape. Vignale's Ferrari of about 1950 is the honest and direct result of hammering panels of aluminum by hand. Touring's 1952 Pegaso is a calculated combination of the ferocious and the elegant; notice that the panels do not stop abruptly at an arbitrary bottom line, but sweep right under the car—a minor point perhaps, but typical of Italian design and often ignored by designers in other countries. Ghia's 1953 Moretti is, from any angle, an exciting and perfectly controlled sculptural form. From its faired headlights to its teardrop cab, Bertone's Alfa Romeo Sportiva was designed to slide effortlessly through the air.



Bertone's Sportiva

Design experiments

The purist may always prefer the simple fast-back coupe, but when every Italian builder began to turn them out, one after another and nearly all quite lovely, interest in them began to wane. By 1953 a tide of restlessness was apparent; designers were obviously searching for something new and different. In retrospect some of the results are grotesque, but new ideas often are, until they are reworked and refined. One of the pleasantest is Bertone's body for a 1953 English-MG-TD chassis which combines the classic vertical MG grille and long, flat hood with a typically Italian envelope body. Ghia's coupe on a Alfa Romeo 1900 chassis shows a fascination with the large vertical radiator and penetrating forms. The forms are poorly defined, but the inboard lights and horizontal bar were a new approach. On a Nash Rambler chassis Farina used an almost circular radiator, but the theme is quite similar to the Ghia Alfa Romeo. The forms are crisper, but still somewhat artificial. In 1954, on a French Simca chassis, Ghia tried again and this time everything fell nicely into place. Several years later, Allemano built a small series of Gran Turismo coupes on a 2-litre Maserati chassis. Although the concept is conventional, with hardly a trace of the original theme, the car would probably never have been designed in quite this way without the earlier experiments of Bertone, Ghia, and Farina.

Bertone body, MG-TD chassis

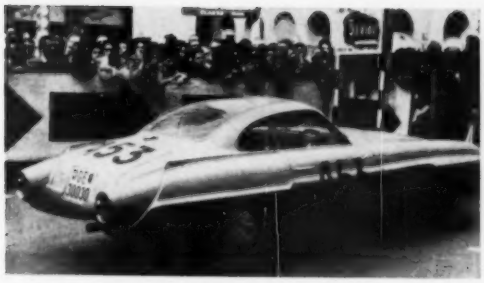
Ghia body, Alfa Romeo chassis

Farina body, Nash Rambler chassis

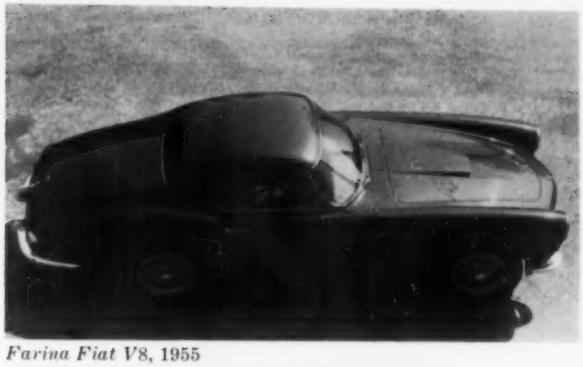
Ghia body, Simca chassis

Allemano body, Maserati chassis

Farina Lancia, 1954



Ghia Alfa Romeo, 1953



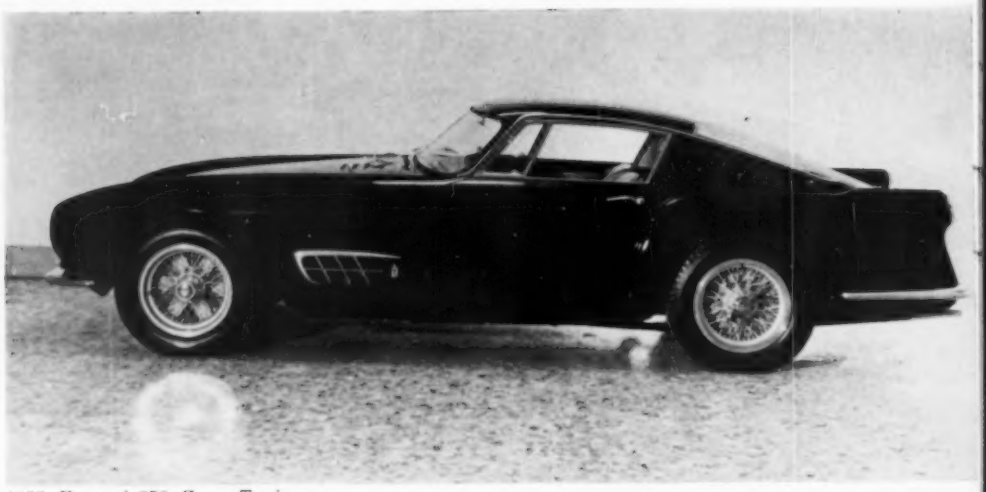
Farina Fiat V8, 1955

In the continuing search for something new, Ghia carved up the surface of a transparent-rooted Alfa Romeo 1900 coupe in 1953, and four years later Detroit invented Sculptured Styling. Farina pulled fins directly from the cab of a 1954 Lancia with sickening results, but two years later used the same idea more successfully on a 1955 Fiat V8. Boano split the fast back of a 1955 Alfa Romeo into two huge window areas; his first try is heavy-handed, but on the second he recovers. And Vignale went mad with a paint brush on a Fiat V8 but only hid a basic form which didn't amount to very much either.

Vignale Fiat V8

Boano Alfa Romeo 3000, 1955

Boano Alfa Romeo 2000, 1955



1955 *Ferrari* 250 *Gran Turismo*

1957 *Ferrari* 250 *Gran Turismo*

Courtesy: Sports Car Illustrated

1959 *Ferrari* 250 *Gran Turismo*

Three Farina Ferraris

The 1955 Ferrari uses a collection of the new ideas explored on the preceding page, and is somewhat contrived. But despite all these "tricks" it has a brutal, attention-commanding beauty. The lines of the 1957 Ferrari are fairly sophisticated expressions of the "dart" or "wedge" shape. If Chrysler's styling had developed in a more logical direction after the introduction of the Forward Look, today's Plymouth might resemble this Ferrari. Instead, the influence flowed the other way. Farina saw the American Thunderbird and Mark II Continental, and the 1959 Ferrari shows it, although it is something more than a copy. The slightly folded plane on the side gives a subtle two-tone effect—an idea that is also used by Italian designers in the contouring of appliances, typewriters, and similar products.

Current custom designs

For the most part the custom-bodied cars being built in Italy today are simple and honest. The designers' growing pains are over, and the grotesque has practically vanished. Although there is some similarity between the new cars shown here, the design goals of their various coach-builders are actually quite different.

Zagato's Lancia, shaped by aerodynamics and devoid of all protrusions and trim, is an outstanding example of his development into a leading Italian designer.

Farina's Lancia Flaminia coupe shows his current bent-plane approach. The squared-off fins drawn back from the cab are the next step following his 1955 Fiat V8.

Touring of Milan treats the Lancia Flaminia Gran Turismo as a deadly serious, high performance machine, he has made it direct and purposeful in every line.

Touring's new 4500, V8 Maserati, perhaps the fastest touring car in the world, has a front that seems to descend from a series of earlier grilles, and yet is somehow radical, controversial.

Bertone's Fiat-OSCA 1500 coupe is a logical design development from his well-known Citroën DS-19 sedan designed in 1955.

Giulietta Coupes

Alfa Romeo Giulietta Sprint Coupe

Alfa Romeo Giulietta Streamlined Sprint Speciale

The Giulietta coupe was designed by Bertone in 1954, and is considered by many enthusiasts to be the world's most perfectly proportioned car. It is still made in its original version, the Alfa Romeo Giulietta Sprint coupe, although Bertone has gone on to do other things with the same chassis. In 1958, he designed the Giulietta Sprint Speciale as an experiment in streamlining, and many of the forms were altered during wind tunnel testing into the version shown here. In the Alfa Abarth 1000 of 1959, Bertone reduced the wheelbase length and engine size of the standard Giulietta chassis. His idea was to make a car as small as possible, and yet fit two people comfortably, so the body stops abruptly at the rear wheels. The various elements—doors, top, fenders, etc.—are so well integrated to one another that it is hard to say where one stops and the other begins. This fierce and stubby car may be the start of a significant new design statement from Italy.

Alfa Romeo Abarth 1000

Touring "Flying Saucer" Coupe

Touring "Flying Saucer"

Flying Saucers and Super Cars

The "Disco Volante" (flying saucer) bodies, built by Touring in 1952 are the forerunners to the imaginative BATS and Darts (following page). Touring built them for a newly introduced Alfa Romeo racing car chassis, and Farina was so inspired by them that he ordered a chassis for himself. His first super car, Super Flow I did not appear, however, until 1955 and is so cluttered with novelties that no central theme dominates. Farina knew he could do much better, and soon Super Flow II was introduced. The impractical transparent wheel covers were removed and transparent plastic bubbles over the headlights and clear tail fins were substituted, but the novel glassed-in top was not changed. Farina may have been trying to contrast positive volumes against negative volumes with his use of transparent materials; he may well do it better some day. In the latest version, the 1959 Super Sport Spyder, the fins and two-tone paint job are gone, and we can see that there was something fairly sound here all the time —Alfa Romeo might take a close look at it with production in mind.

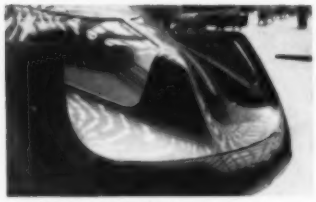
Super Flow I

Super Flow II

Super Sport Spyder

BAT V, side view

BAT V, front view



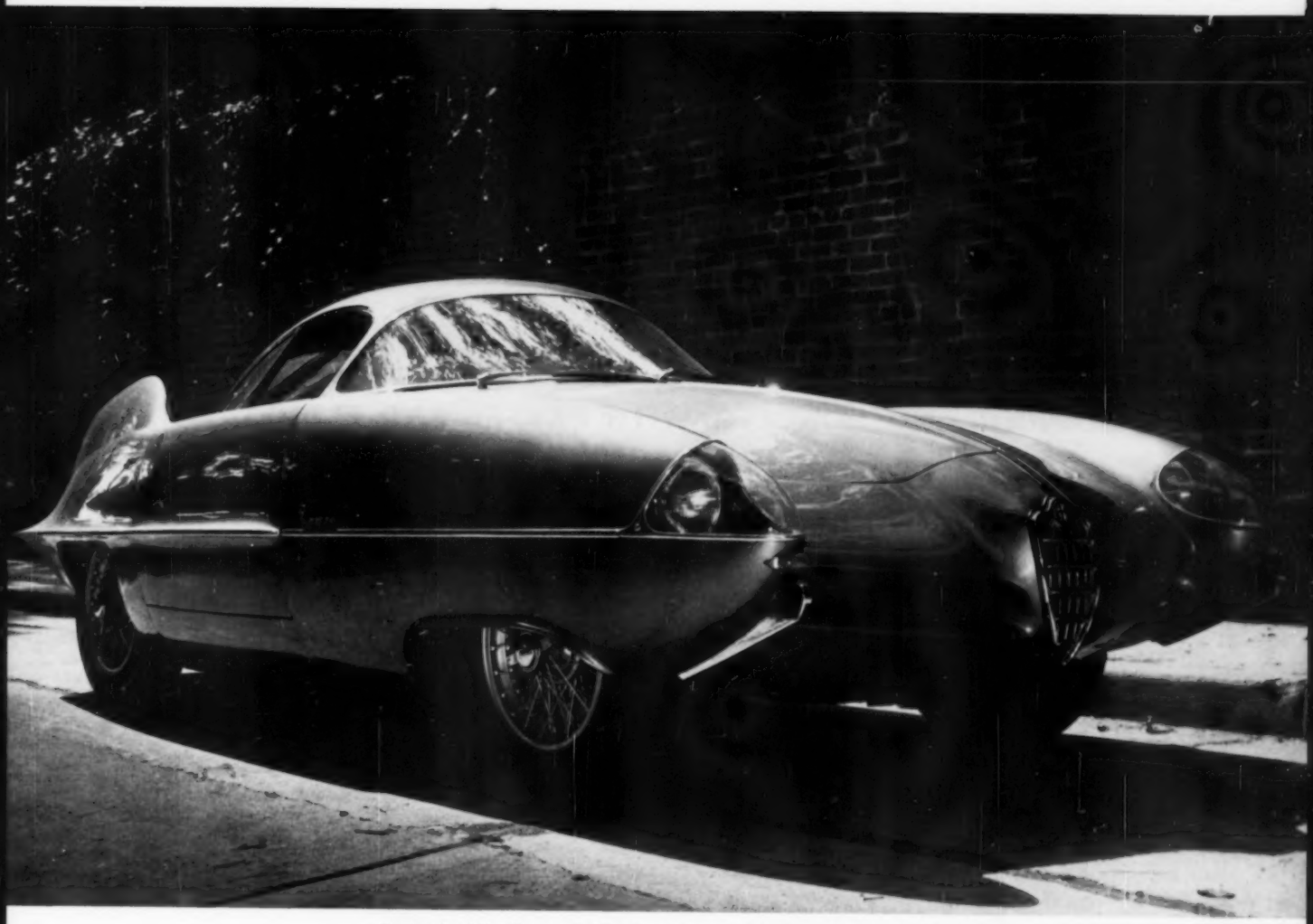
BAT V, rear view

Bertone's Alfa Romeo BATS are built primarily as show cars and should not be criticized too hrashly for being impractical. The various fins, slots, and notches are included as experiments to observe their effect on air at high speed. In BAT VII, for instance, cooling air is drawn past the brakes through the large side openings which duct it toward the dished-in rear wheel opening, over the brakes, and out the back opening where it passes around the venturi-shaped tail pipe, relieving back pressure on the exhaust system. BAT V, introduced in 1953, introduced the wedge-shaped body to the automotive world. While Bertone builds BATS, Ghia builds Darts for Chrysler. These are cleaner designs and are practical for everyday use. The Dart shown here is not the latest, but is notable for its clean top surface, a concept popular in America this year.

BAT VII, side and rear

BAT VII, side and front

The author wishes to express his thanks to the staff of Road & Track for their cooperation in locating many of the photographs used here.



Bertone's Alfa Romeo BAT IX, above; Ghia's Chrysler Dart, below

Fasteners and Fastening Techniques, Part 3

JOINING AND BONDING WITH PASTES AND FLUIDS

Chemical fasteners in their newest formulations can perform a structural function in the joining of materials that are thick or thin, flexible or firm, and as dissimilar as metal and plastic

by Arthur Gregor

An industrial product that bears a strong resemblance to ordinary household glue is becoming a prominent ingredient in the design and manufacture of many a sophisticated object. Bombers like the B-58 Hustler, houseboats for river and lake cruises (see next page), structural members of honeycomb core, and other products in the "frontier" class as well as those of more ordinary persuasion — packages, shoes, motors — rely heavily on these apparently simple construction aids which are *concealed* within the product's structure. But although adhesives for bonding materials surfaces and joining parts may look simple and "common", they cannot be taken lightly. Recent developments have made them significant in structural applications; they can solve joining problems where lightness, concealment, or assembly economy are main issues; and they can influence the design and production process of new products by virtue of some outstanding intrinsic properties. There are many adhesives on the industrial scene, and success in using them depends on an understanding of just what they can do, where they are best used, and where they are best avoided.

Loading a joint bonded by adhesives

Adhesives must be able to withstand forces working against their own force of adhesion. The drawing on the opposite page is a graphic presentation of the types of stress to which product parts and sections bonded by adhesives can be subjected. A brief study of these indicates the inherent characteristics of this simple joining method. The greatest bond strength is obtained in structural applications in which a tensile or shear load is at work (two top sketches), since the entire area of adjacent sections can be joined; in both these stress applications *all* of the adhesive is put to work at the same time. This is an obvious advantage over all mechanical fastening methods, and most of the welding techniques, in which joints are made in spots or, at best, seams.

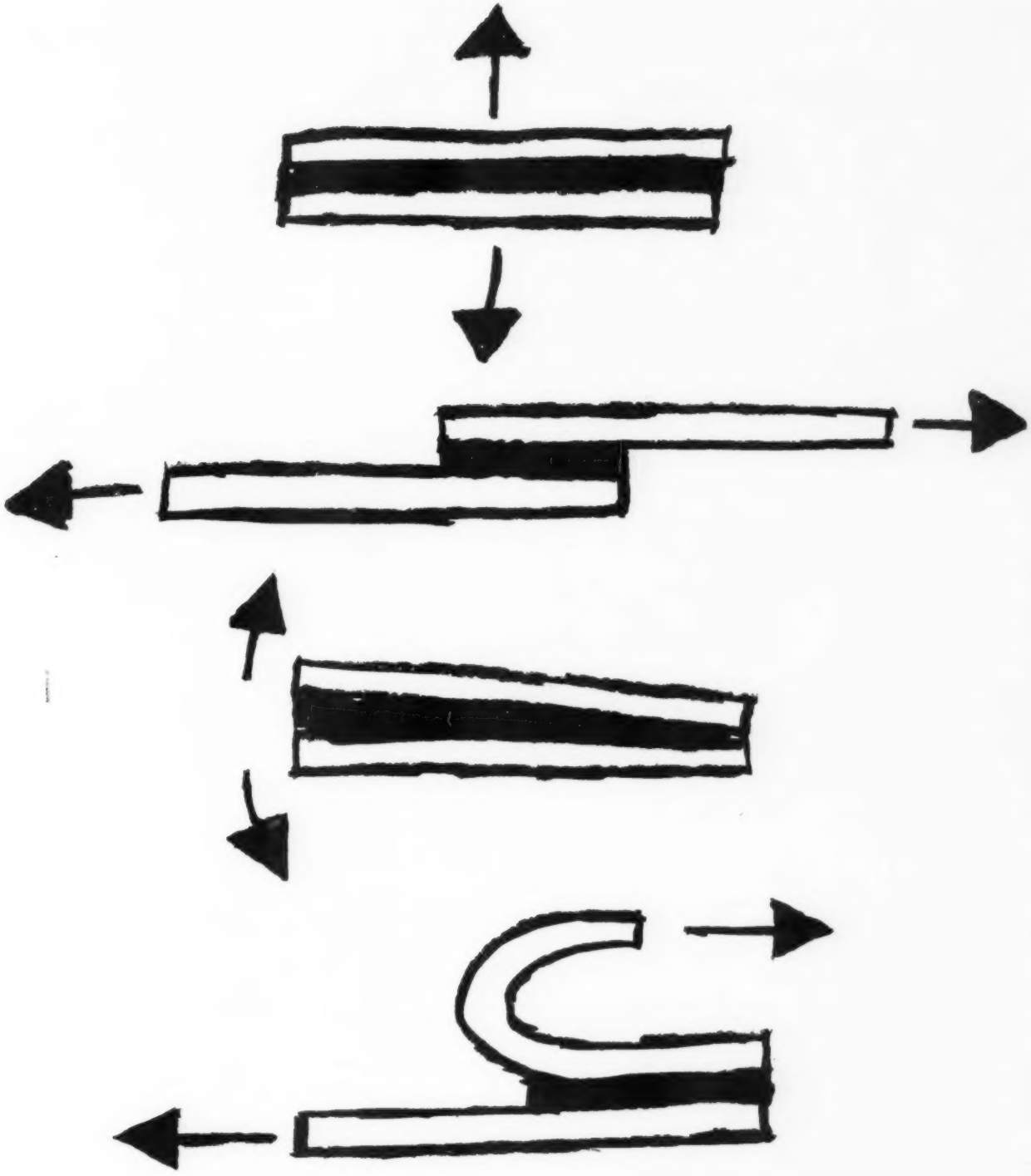
In the other two stress types illustrated here, the main advantage of this type of fastening, namely *large area bonding*, is not utilized. Cleavage loading, in which one side of the joint is under great stress while the other is under no load at all, and peel loading in which only a portion of the adhesive is used, should therefore be avoided.

The illustration indicates another characteristic advantage of this type of fastening. Since, unlike other fastening means, the fastening force in adhesion is applied not from without but within, adhesives can bond thin as well as thick sections, solid as well as flexible materials. Furthermore, and of particular interest to designers, adhesives can join *dissimilar* materials. The chemical compositions of the joining agents can be adjusted to bond sections of metals, plastic, paper, rubber, and glass, or combinations of these.

A simple assembly technique

The use of adhesives as a mass-production method is comparatively new. In assembly, it is the simplest fastening method, and one of its distinct advantages is that, unlike welding or mechanical fastening, adhesive bonding requires neither special skill nor special production equipment. The bonding agents for product applications ranging from the assembly of costume jewelry to that of aircraft wings and bodies, are likely to be supplied in bottles, jars, and tubes similar to those used by housewives and hobbyists for pasting things together. Their compositions do differ, however. More adhesives used in product manufacture, and *all* structural adhesives — those that bond rigid sections in body constructions and other structural shapes — consist of some synthetic materials.

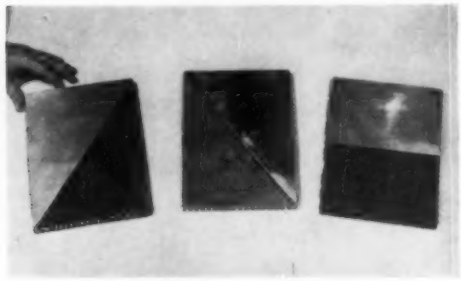
Like many other plastic products, adhesives trace their popularity to the wartime urgency of finding substitutes for scarce materials and improved fabrication methods — particularly in airplane manufacture. The aircraft industry needed fasteners that would be lighter than rivets and would be able to withstand vibration, stress, and weather extremes with greater efficiency than rivets. (It was found that rivet holes created structural weaknesses and metal fatigue in combat aircraft). The types of joint design for which adhesives are suitable, and the very light weight of adhesives, gave the aircraft industry the type of bonds they needed. And in fact these properties—*light weight*, ease of assemby resulting in *low cost*, the ability to join *dissimilar* metals and *thin* as well as thick sections, and *high strength* resulting from bonds over large areas — are the features of this assembly method which have caused its wide use in structural applications and product manufacture. They are also the characteristics of interest to the designer when develop-

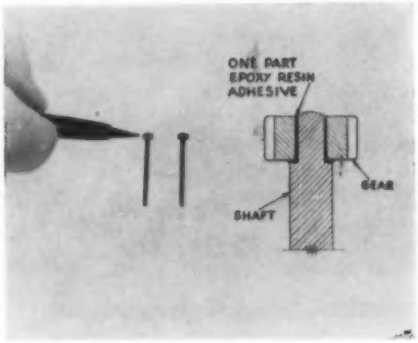


Two types of joints that are good for adhesives, and two that are not: tensile-loaded joint and shear-loaded joint (top two) are good; cleavage-loaded joint and peel-loaded joint (bottom two) are poor.

Construction *is popular field for adhesives. Aluminum deck of houseboat (Imperial Mfg. Co.) is assembled with Williamson adhesives.*

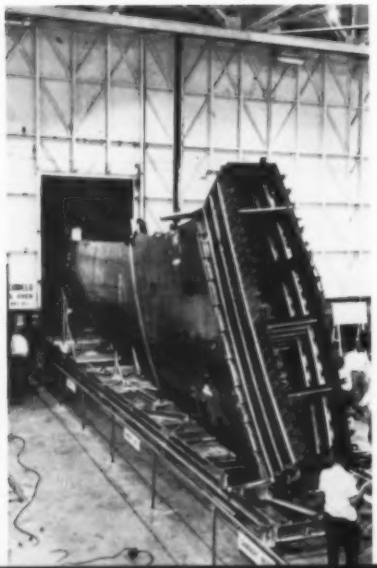
Sandwich panels *like these would not be possible without adhesives which join aluminum honeycomb cores to thin aluminum or glass.*





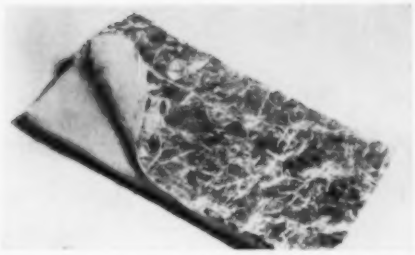
Tiny and hard-to-get-at *assemblies could not be joined without adhesives. This tiny pinion gear and shaft were bonded with Minnesota Mining & Manufacturing product.*

Void filling *and joining adjacent parts is unique function of adhesives. In this rail joint adhesive fills void and joins bar to rail. Adhesive is by Armstrong Cork Company.*



Aircraft *industry is major user of chemical fasteners. Adhesive-assembled half wing of Convair 880 is placed in oven for curing. Minnesota Mining & Mfg. product.*

Flexible *materials are joined exclusively with chemical "glues." Seats in the "707" jets are covered with upholstery attached with strips of Velcro fasteners; these are bonded to metal seat frames with Bostik Adhesive.*



Laminating *flexible materials is another adhesive "exclusive." This foil-glass fiber composite laminated with Morningstar-Paisley adhesive is used for insulation in buildings.*

ing his concept and visualizing the production methods for a new design. There are of course certain limitations to adhesives, the most prominent of which, from the designer's point of view, is their inability to withstand high temperatures. Above 350°F they must be carefully protected from oxidation, and they can generally not be used at all above 450°F. (Attempts are under way to raise this temperature limit to 800°F. and higher by developing ceramic adhesives; but these are still in the research stage.)

Types of adhesives

Although some adhesives can be used with a number of materials in a wide variety of joints, there is no single all-purpose adhesive. Consequently, the number of adhesives on the market is vast and — since special formulations can be determined to meet specific requirements — steadily increasing. Attempts have been made to classify them, and *The Handbook Of Fastening And Joining of Metal Parts* (by V. H. Laughner and A. D. Hargan, McGraw-Hill Book Company, New York) lists several classifications. One table called "Properties And Uses Of 43 Adhesives Classified According To Chemical Type" summarizes the composition and curing conditions, strength, and application of adhesives grouped in the following categories: synthetic thermoplastic, synthetic thermosetting, cellulose derivative, rubber, rubber-resin, vegetable gum, protein, and starch (pastes). Of these categories, the bonding materials that fall in the thermoplastic and thermosetting groups are those most widely applied in products manufacture. The single group of adhesives that concerns the designer more directly than any other is probably the thermosetting category (epoxies, vinyl-phenolics, vinyl-butyral phenolics, neoprene-phenolics, etc.); these materials yield the strongest bonds and make up the adhesive group known as *structural* — adhesives which contribute to the load-bearing properties of a bonded assembly. In this group, epoxies are most widely used for metal-to-metal bonding and for honeycomb sandwich construction. They resist most solvents, have very high shear strength and rigidity, but suffer from poor peel strength, lack of flexibility and inability to withstand high impact.

Thermoplastic materials (vinyls, acrylics, butadiene-styrene, etc.) yield bonds that are not as strong as those obtained with thermosetting adhesives and are therefore used in non-structural applications with flexible materials where less bonding force is required. Typical uses are the assembly of paper containers, shoes, laminates of paper to metal foil or plastic films, packaging, wall and ceiling tiles, installation of floor tile and linoleum. A combination of these two adhesive types (thermosetting and thermoplastic) are semi-rigid materials with medium bonding strength.

Design considerations

With welded or mechanical joints, there is a choice: they can be made part of the total design motif, in which case they are visually accented; or they can be concealed completely, which is usually done in product designs in which the joints have nothing to do with the function of the product. But with adhesives, no such choice exists. They are always part of the construction of a product and are always concealed. Nevertheless they do influence the design, for they determine what material combinations are possible; and, where they can be used in place of nails, screws or rivets, they obviously influence the product's appearance, and can reduce weight and size.

There are a number of considerations the designer ought to keep in mind when planning products using adhesives. As listed in *The Handbook Of Fastening And Joining of Metal Parts*, the most important "rules" are:

1) Allow for the maximum possible contact area in a joint. Since adhesives have less unit strength than metal fastenings, a greater area must be utilized to support a comparable load. A lap joint should provide sufficient overlap to ensure adequate strength.

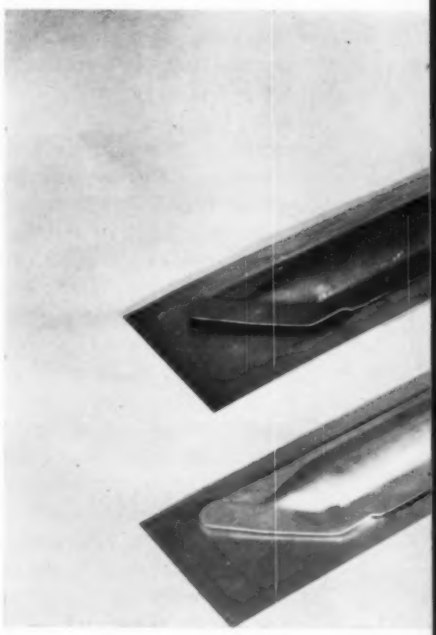
2) Put the maximum amount of adhesive film to work. Consider the manner in which load stresses will be applied, and try to have them acting in the most advantageous direction. Tensile and shear loadings bring the whole adhesive film into play and consequently give the greatest strength.

3) Investigate thoroughly the properties of the adhesive. A proper balance between service requirements and adhesive properties is necessary.

On the next eight pages, the place of adhesives in product design and manufacture is taken up in greater detail without, however, attempting to discuss the properties of each (thousands of manufacturers' brochures and many articles are available to supply this information). The emphasis in the pictorial discussion that follows is not on what adhesives are, but on what they can *do*.

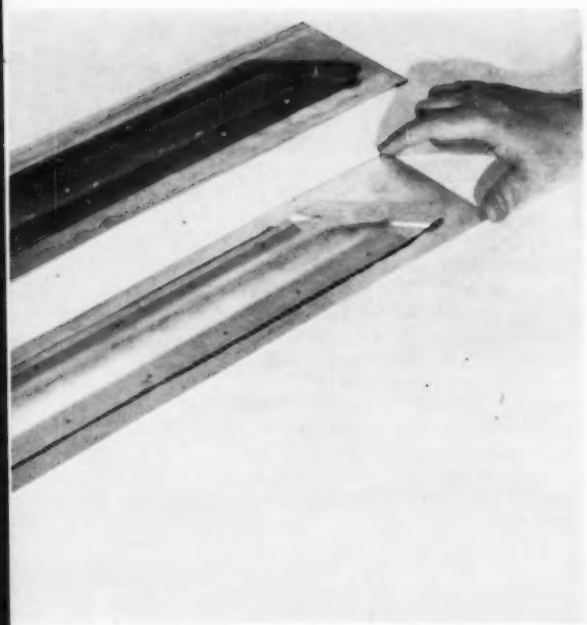
DESIGN CHARACTERISTICS *of adhesives figure critically in the shaping of many consumer and industrial products. Five of the properties that can affect the performance of a product, and help determine its assembly and cost, are shown here. But there are others: the ability of adhesives to serve as seals for liquids, as vibration dampers, as electrical insulators provides a number of bonuses to their fundamental function as construction aids in product manufacture.*

High strength *is required inherent characteristic of most structural adhesives; they create a bonded joint that is not only load-bearing along the joining surface, but can also contribute strength to the total structure. In the application shown here (above and left), an epoxy resin bonds two steel plates in a lap joint strong enough to lift a 22-ton tractor and to withstand an overload test. No welding, rivets, or bolts were used. This kind of structural joining of metals is called, for obvious reasons, "chemical welding." The product used here is by Narmco Resins & Coatings Company, Costa Mesa, California.*



Thin section *bonding is one of the joining methods for which adhesives are particularly well suited. In fact the bonding of thin materials (foil, paper, films) could not be done as simply and effectively by any other fastening technique. An important application of this type of bonding is in the construction of honeycomb panels (above) in which structural adhesives join the aluminum facings and foil honeycomb core. Product is by Minnesota Mining & Mfg. Co., St. Paul, Minn.*

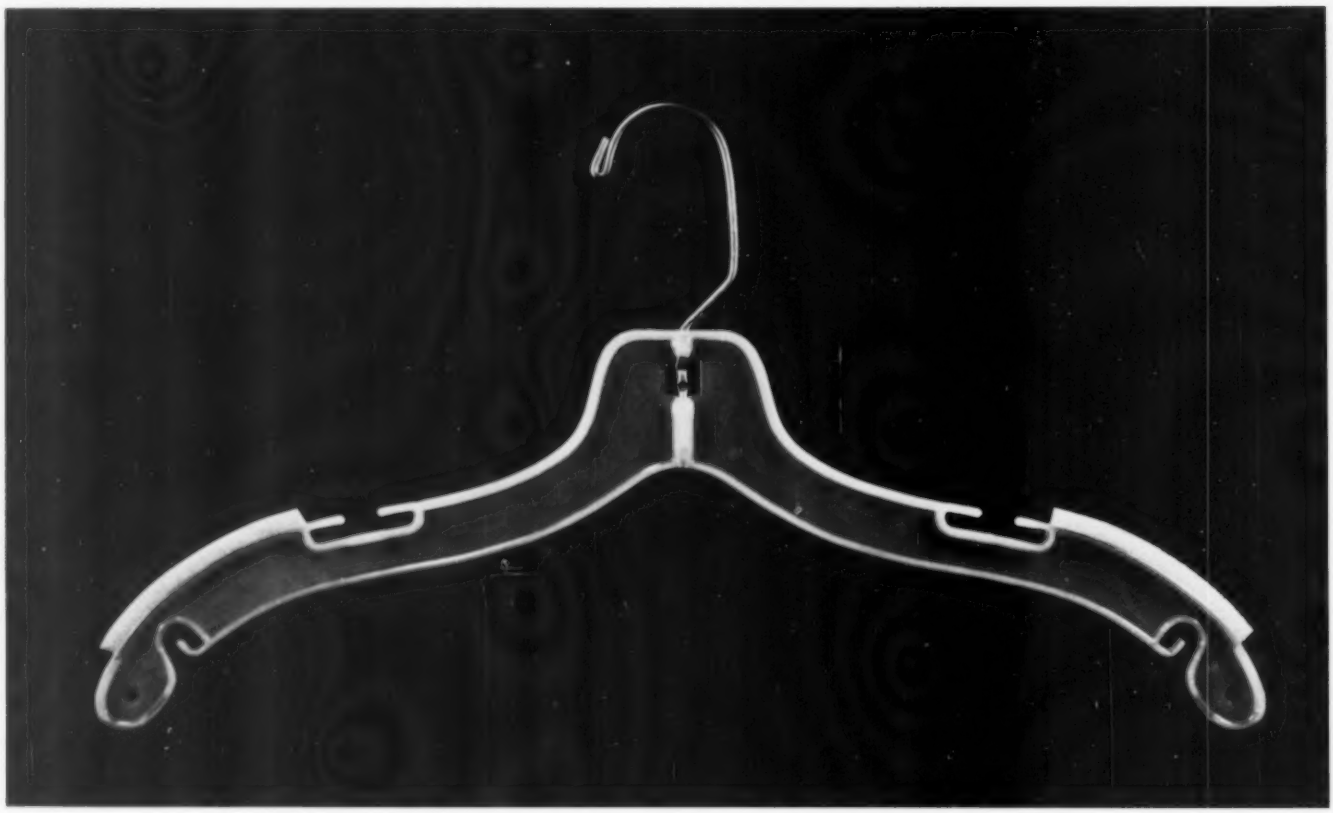
Dissimilar materials *can be bonded by adhesives, and this is one of their most attractive contributions to product design. In the application shown here, a non-structural adhesive bonds a polyethylene tip protector to the glass vacuum filler (left) of a thermos by the American Thermos Products Company. Adhesive by Raybestos-Manhattan, Inc., Bridgeport, Conn.*



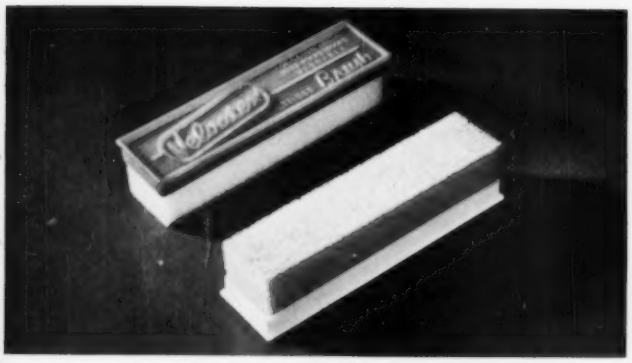
Light weight *is an obvious but significant property of adhesives, which weigh practically nothing compared with nuts and bolts or even welded joints. A product's overall weight is cut down considerably when rivets are replaced by adhesives, as in this aircraft part. (Riveted assembly is on top). Minnesota Mining & Mfg. product.*

Low cost *results chiefly from the simplicity of adhesive application in the assembly process. It uses inexpensive equipment, requires little skill when done manually, and in some cases can be programmed into the machine process. In the manufacture of aluminum storm doors at General Aluminum Company (above) adhesive is supplied with a plastic squeeze container. Bostik adhesive by B. B. Chemical Company, Cambridge, Massachusetts.*

PLASTIC PRODUCTS *utilize adhesives more extensively than products of any other material. Besides the attributes of light weight and low cost, the ability of plastic pastes and liquids to join dissimilar materials in itself makes possible many a plastic package, housing, and laminate that would not be feasible without them. This is particularly true of all plastics that—because of their sensitivity to high temperatures—cannot be joined by thermal welding or heat-sealing. What can be done in plastic product design with the aid of adhesives is shown in these examples.*

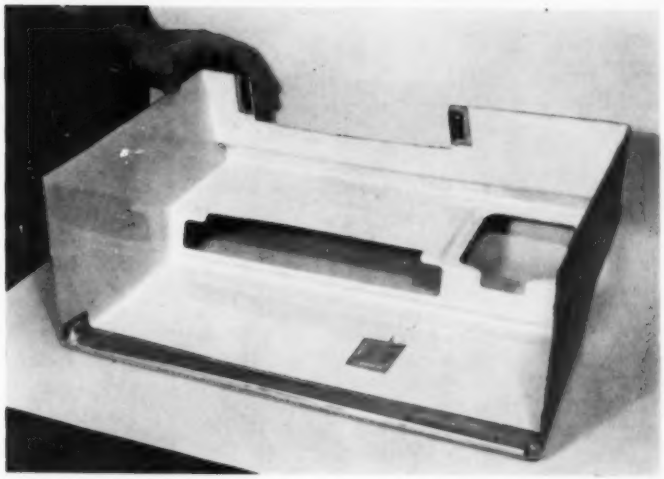


Plastic assemblies *rely heavily on adhesive bonding, which is the simplest joining technique for plastic sections. The choice of adhesive depends to a large extent on the types of plastic to be joined. For plastic foams special adhesives have been developed which provide for better "spreadability," softer seams but stronger bonds. In the coat-hanger (above) a specially prepared adhesive is used to attach the foamed polyurethane pads to the acrylic shape. The adhesive is by Rubber & Asbestos Corporation, Bloomfield, N . J.*



Plastic-to-plastic *combinations would in many cases not be feasible were it not for "chemical welding" which does not affect the heat-sensitivity to which many plastics are subject. In the brush shown here a special formulation combines urethane foam and rigid polystyrene into a single product. Adhesive by Rubber & Asbestos Corp.*

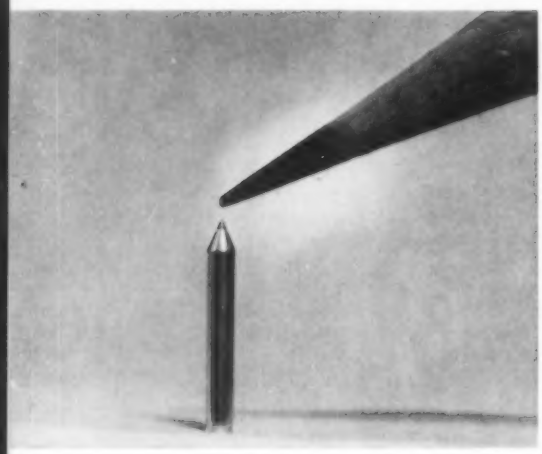
Plastic-to-steel *joint in this steel head and plastic handle hammer assembly made by the New Plastic Corporation of Los Angeles, is result of adhesive bonding. Within seconds of application adhesive forms a bond strong enough to permit use of hammer for packing and shipment. In a test the plastic-to-steel bond withstood 300,000 blows. The adhesive is by Eastman Chemical Products, Inc.*



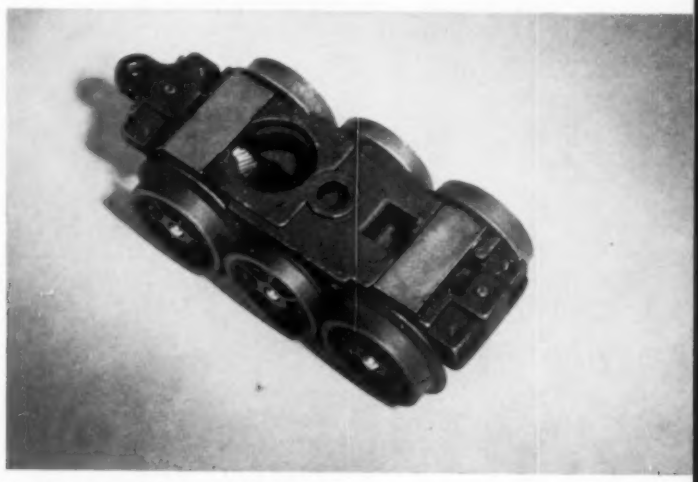
Metal-to-plastic *assemblies in which adhesives are used result in even stress distribution which prevents cracking, and also permit, attachment of metal parts to plastic bodies which cannot support rivets. In the plastic cabinet shown here, rivets would not stay in place in earlier assemblies, but a two-part epoxy resin adhesive yielded a permanent bond. Adhesive by Minnesota Mining & Manufacturing Co.*

Plastic-to-glass *assembly with adhesives presents none of the problems (e.g., high heat, material hardness) of other joining methods. In fact, in this particular application, nothing but adhesives could join the glass body to the molded styrene base. The adhesive is a special formulation by Rubber & Asbestos Corporation.*

METAL ATTACHMENTS *can become strong links when secured with adhesives. The ability of "chemical welds" to withstand rigorous performance, their contribution in making products lighter, and their adaptability to various types of joints and material thicknesses — these are some of the features which have made adhesive bonding a highly acceptable fastening technique in products ranging from aircraft to toy trains. A critical limitation is the temperature range, which cannot exceed 350°F. Here are examples of adhesives used in joining metal parts.*

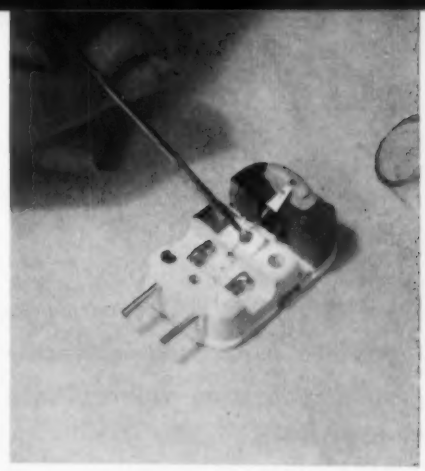


Unusual metal combinations *needed for special components in aircraft or any product area where precious or exotic metals are used, can in some cases be chemically bonded, thus eliminating welding which is one of the major problems in exotic metals fabrication. One application for the chemical "glues" is shown here; sapphire tip is joined with steel shank by means of Rubber & Asbestos product.*

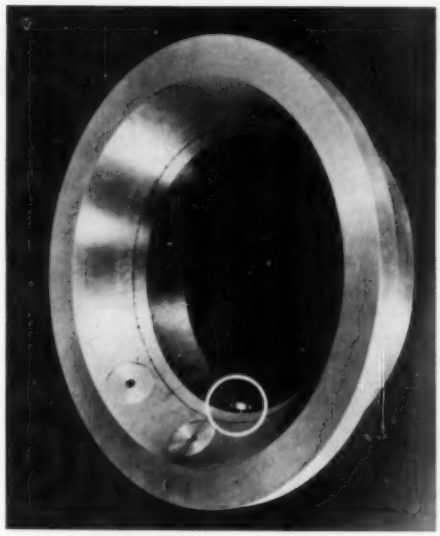


Double function *of adhesive is illustrated in this Lionel model train undercarriage in which an epoxy-based adhesive joins Alnico magnets to Zamac #5, a zinc die cast part, and also fills up voids between parts. Adhesive replaces silver solder which require additional finishing to obtain smooth joint. Adhesive by Rubber & Asbestos Corp.*

Metal assemblies *are facilitated by newly developed quick-setting adhesives which are used widely in joining similar and dissimilar metals in the manufacture of costume jewelry and related products. In the application shown here, a medallion is placed on the cover of a bowl (by L. G. Balfour Company) with the aid of a fast-setting adhesive. The bond is made almost at once. Adhesive by Eastman Chemical Products.*

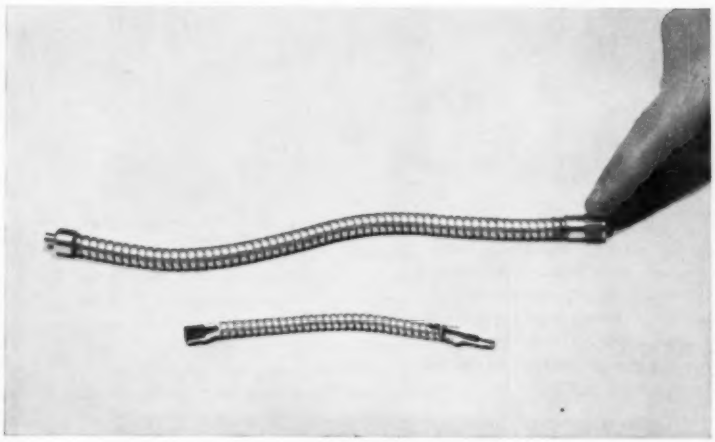


Multiple joining *of various dissimilar materals is indicated by this playback cartridge assembly (by Fairchild Recording Equipment Company), in which Mylar film, aluminum, mu-metal, sintered iron, Alnico magnets, copper wire, rubber and silver plated brass are bonded together with an epoxy adhesive by Rubber & Asbestos.*

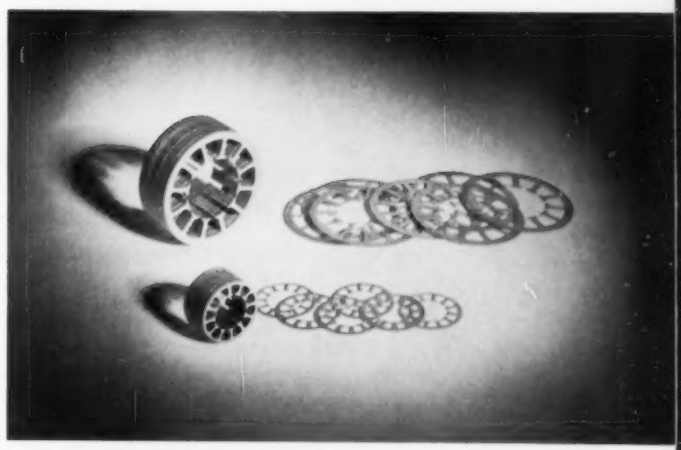


Joining thick metal sections *with adhesives has particular advantage in bonding castings; this method eliminates the danger of burn-throughs or embrittlement that may result from the welding of cast parts. The sections of the tooling ring shown here were joined by an adhesive before the whole part was machined. Adhesive by Narmco Resins & Coatings Co.*

Adhesive-coated metal sheets *are supplied for applications in which large areas of thin metal surfaces are to be joined in a quick assembly process. The product at right is a printed circuit for which a special adhesive-coated copper has been developed by the Rubber & Asbestos Corporation.*

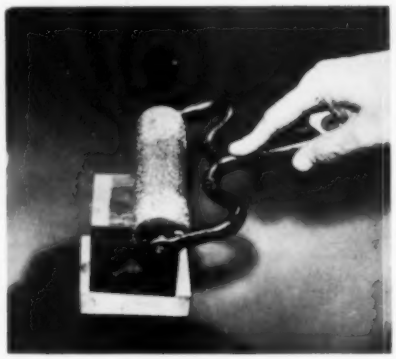


Metal-to-metal *joints with adhesives can mean design simplicity and quick, non-messy production. The end-connectors of this flexible steel tubing used to be hand-soldered. With adhesive bonding, the end of the tubing is dipped in the adhesive and end-connectors are attached. Large quantities of the assembled parts are cured at the same time. Adhesive is Minnesota Mining & Manufacturing product.*



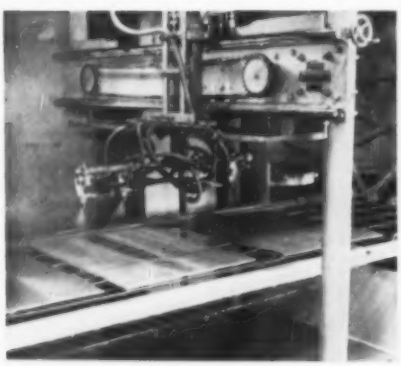
Metal laminations, *such as this one used in motor construction, depend entirely on the use of adhesives for their assembly into stacks of any desired thickness. Laminations are sprayed with a solvent-dispersed epoxy adhesive, are then laminated and heat-cured to produce laminated stacks. The structural adhesive used in this application is by the Rubber & Asbestos Corporation.*

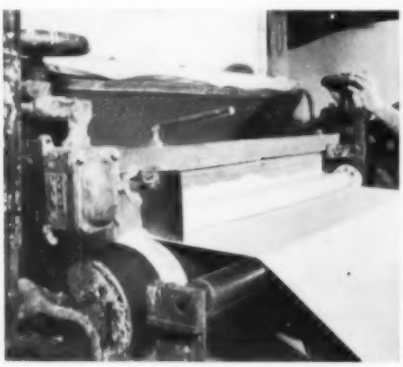
IN PRODUCTION, *adhesives can be applied simply, uniformly, and quickly, and the bonded joints do not require the elaborate finishing often necessary when parts are joined by welding or soldering. Structural adhesives are generally applied by hand, but standard machine equipment may be used when joining flexible materials. In either case, the characteristic advantage of adhesives is low cost due to speed and to the fact that skilled labor and expensive equipment are unnecessary. Some of the usual, as well as special, production methods are shown here.*



Simple manual application *of adhesives characterizes this method on the assembly line. When rigid materials are bonded, adhesives are generally hand-applied; in jobs requiring large surface areas a mechanized method is used (see below). Typical application processes, employed in aircraft part assemblies and others, use obvious implements seen above: brush, trowel, roller.*

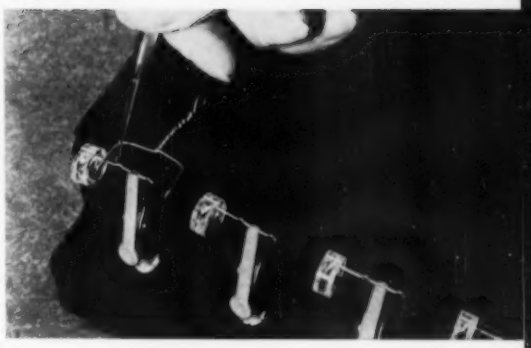
Machine application *is employed for flexible materials bonding (film, foil, paper, fabric) and for such rigid materials joining as curtain walls and other panel constructions. Spraying (below, left) is used in the mass-production of honeycomb sandwich panels; other mechanized methods are: knife coating (middle), and nip rolling (right) which provides tight contact in panel assembly once the surfaces have been coated with the adhesive.*





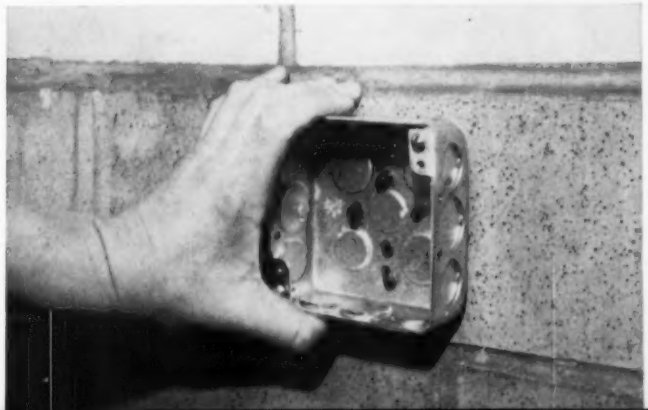
Flexible adhesive tape *is a recently introduced product which comes supplied in rolls 18 inches wide, and can be used to bond sandwich structures and other metal-to-metal joints. In production, the flexible adhesive can be cut to the shape of the areas to be bonded. Under some heat and pressure the adhesive forms a bond that will maintain strength at temperatures up to 200°F. Product by Narmco Resins & Coatings Company.*

Drop-by-drop application *of adhesive is necessary with assemblies in which the joint is either very small or somewhat inaccessible. In the production of this radiation monitoring dosimeter pen (by the Universal Transistor Products Corp.,) the sensitive element of the pen — a quartz fiber supported on a Y-shaped holder — is cemented to two pips on an aluminum wire with drops of adhesive (Eastman Chemical product).*



Putty applied by sealing gun *is one of many special adhesive application methods developed to meet assembly problems. The aluminum fastener (above) designed to accommodate steel attachment bolts in aluminum honeycomb doors of turboprop cargo-transport plane, is inserted and sealed into core plug with adhesive putty (Narmco product) by a sealing gun.*

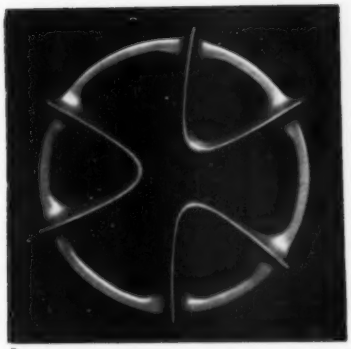
Junction box mount *is a newly developed adhesive which permits direct mounting of electrical junction boxes to masonry walls, tile, ceilings and floors, metal beams and wood panels. The epoxy adhesive (by Permacel, New Brunswick, N. J.) is supplied in putty form; it is coated on the surface of the box to be mounted, the box is pressed in place for five seconds. This is sufficient to anchor box; the adhesive fully cures in about three hours.*



DESIGN REVIEW

Major Appliances: Part II

Freshest of the 1960 kitchen appliances is the new Waste King Universal line, designed by Henry Dreyfuss. The new company, formed through the recent acquisition of the Universal kitchen line by Waste King, will ultimately incorporate Dreyfuss design in other products. Visual interest on these units has been developed by use of contrasting materials and subtle textural variations rather than through the application of extraneous buttons and chrome. Although many other kitchen appliance manufacturers are preaching Detroit's annual model change sermon this year, they are not practicing it. Result: a year of few design surprises but the usual "revolutionary-spectacular" ballyhoo.



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1 *Electronic oven (left), a completely new item for the line, features a simple, four control panel. Contour of the extruded aluminum panel is repeated in other ovens.*

2 *Cast-iron grid has been redesigned with a sculptured contour, practical in eliminating difficult-to-clean crevices. Coated with grey enamel.*

3 *Drop-in oven and range has control knobs on top for burners, on front for oven. Chrome-plated steel door handle stretches entire width of oven door, heightens sense of visual simplicity. Unit fits into two-foot-wide area and comes in variety of colors, like other products.*

4 *Built-in electric oven requires one more knob than gas oven (below); both knobs are tipped with the company's light and dark blue color scheme. Redesigned trademark carries same colors. Dial numerals are painted on skirt of fluorescent illuminated glass control panel for easy reading from above.*

5 *Built-in gas oven has satin-finish aluminum panel, but panel's outer trim and end-pieces are shiny-finished for textural variety. Elimination of the usual chrome border around oven's entire edge simplifies appearance. Lighter grey inside oven increases visibility.*

Built-In Ovens reflect a growing interest in simplified control panels; the panels on General Electric, RCA Whirlpool and Preway are all sensibly arranged, neatly lettered. In the way of innovations, Hotpoint offers an oven with burners which fold into its side; and the foldaway principle is used again by Dixie to create an extremely compact cooking surface. An expansion lock introduced by Preway this year cuts the tedious installation job down to a couple of minutes.

1

1 **Dixie** *Fold-Away occupies less than one square foot when closed. Brushed chrome unit is counterbalanced to raise or lower at a touch. Thermostatically controlled burner, automatic lighting, automatic gas shutoff. Harold Moss, chief engineer; Walton and Assoc., consultants.*

2 **Hotpoint** *countertop range is the second Custom Trend product to enter market. Four Calrod heating units are mounted on a hinged stainless surface which folds into the side of the oven when not in use. Mirrorized window hides inside of oven, but flick of switch makes it transparent. Raymond Sandin, manager of design.*

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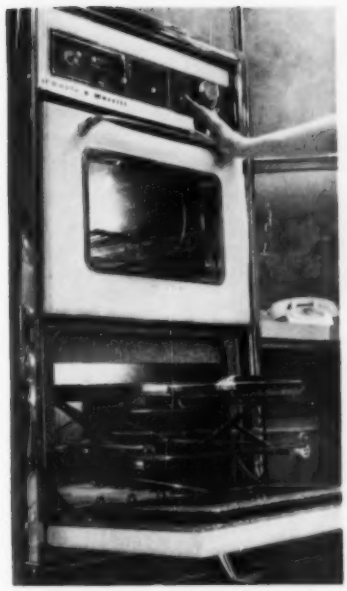

3 **Preway** *built-in gas oven features a redesigned control panel of illuminated glass backed by textured aluminum. Brushed aluminum door with walnut handle. Built-in electric oven (top) requires extra control knobs. Both use a new expansion lock which radically reduces installation time. Staff design.*

4 **O'Keefe and Merritt** *features an electronically controlled "grillevator" on its built-in gas oven. Button elevates and lowers broiler rack, eliminating need for opening door. Staff design.*

5 **RCA Whirlpool** *electric oven has two-set clock which starts and stops cooking process automatically. Thin-top design of adjacent range permits installation above cabinet drawers. Lift-off door. Sundberg-Ferar Inc., consultants.*

6 **General Electric** *master oven has automatic timer, focused radiant heat broiler. Comes in several colors and metal finishes. Accompanying cooktop comes with integral pushbuttons or remote control panel. Arthur N. BecVar, manager of industrial design.*

5

6

Production Models and Experimental Projects both utilize the "fragmentation" concept. Built-in ovens, separate from the range, have been pace setters for some time. Now outdoor barbeques and charcoal grills move into the kitchen to form a third major cooking center. Recent experimental work (opposite page) makes the kitchen almost unrecognizable: one treatment does away with conventional appliances altogether; another combines them in a single unit, then transforms it into furniture.

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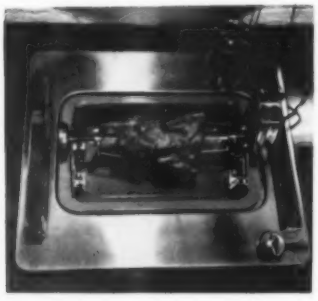
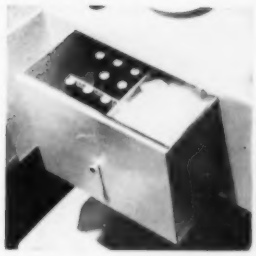


1. **General Electric's** *new version of its recessed-top range has front-mounted controls rather than remote controls as in previous model. The 27-inch-wide unit comes in mix-or-match colors or white. Arthur N. BecVar, manager of design.*
2. **Sunray Stove Company** *follows GE with a gas version of the recessed-top range. L-top burner arrangement leaves room for hot pans on the range itself. Aluminum foil roll in bottom of oven may be cut off as soiled. Vic Design Studios.*
3. **Caloric** *gas cooktop is only 3½ inches deep, allowing for storage space under burners. Secondary air source is provided by louvers at base of sloping control panel. When front buttons are released, entire top tilts back for cleaning. Robert A. Clark and Peter Helgeson.*
4. **Roper** *moves the barbeque inside, adding a third cooking appliance to the kitchen. Metal mesh radiants in front of gas burners intensify heat. Vertical broiler. Satin chrome finish.*



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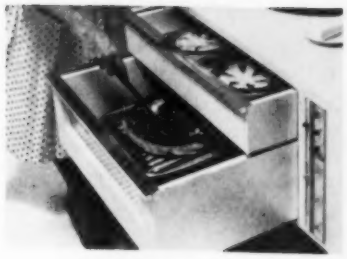


5. **General Electric's** *experimental kitchen, by Latham, Tyler, Jensen, is based on the concept of fragmentation suggested by George Nelson's "industrialized house" (ID, Jan. '58), an expansible modular home meant to be manufactured and sold like a major appliance and available in a limitless variety of floor plans. The new kitchen for this house completely eliminates major appliances in favor of localized sources for cold, heat, and water. The Omnipole, an extruded aluminum furniture mount with wiring raceways, provides convenient random power sources. Elevator storage cabinets keep dry cereals and canned goods. Two drawers contain the oven, and the top one turns upside down to form the top half of a single larger oven. Other drawers are specially treated for ice storage, fresh vegetables, and dishwashing.*

6. **Hotpoint's** *Gourmet Center combines a walnut and leather freestanding refrigerated unit with a range and storage unit. Like GE's design, this one houses refrigeration in drawers, one for cold hors d'oeuvres, the other for ice and frozen food. The range section contains three Pyroceram glass cooking surface units and a full-size oven. It was designed by Brooks Stevens in collaboration with Raymond Sandin of Hotpoint.*

6.

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

Ultra speed camera

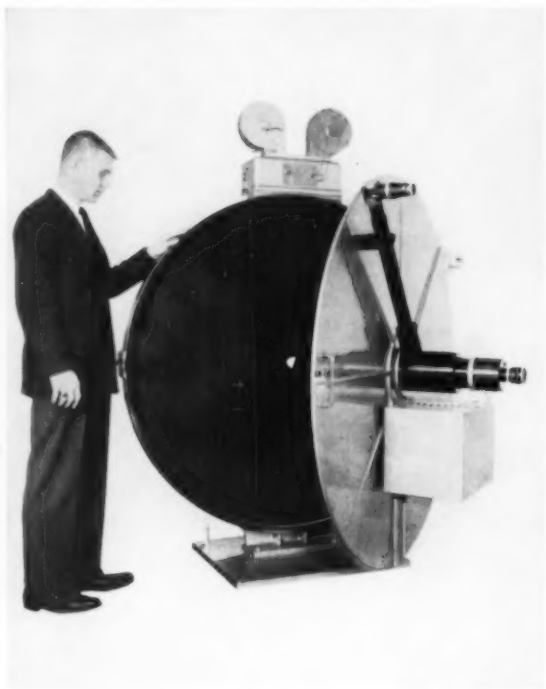
A camera that combines optical, electrical, and mechanical principles to take pictures at speeds of from 480 to 1,600,000 pictures per second now makes it possible to stretch the events within a second into 28 hours; i.e., the events of one second if projected at the standard rate of 16 frames per second would continue for 28 hours. This amazing development has been achieved through the use of the Ellis Ultra Speed Camera, originally designed by Dr. Albert T. Ellis of the California Institute of Technology.

The camera, which uses standard 35 mm film in black and white or color, will have wide application in problems of visual analysis such as the study of solid-state behavior under high speed impact, shock waves, explosions, and fatigue in metals. It has already contributed to a revision of existing concepts in hydrodynamics by demonstrating that cavitation bubbles have a non-spherical shape, and are greatly influenced by nearby solid boundaries at the time of their collapse.

The unit consists of camera, camera control unit, light control unit, and flash lamp, which are all constructed in lightweight aluminum alloy. The camera employs a Kerr cell shutter to control the passing of light. The speed of the shutter is determined by the speed at which the electric field is applied and removed. The Kerr cell consists of two polaroid filters, one on either side of a cell containing nitrobenzene, and two nickel electrodes. The plane of polarization of each filter is placed 90 degrees in relation to the other so that light cannot pass through while the electric field is off. When the current is turned on, the nitrobenzene in the cell causes an additional 90-degree rotation in the polarization vector to allow light to pass through the second filter.

Two optical lenses then transmit the image to a rotating, wedge-shaped mirror located in the center of the film box. The mirror is driven at speeds up to 100,000 rpm by a compressed air turbine. The mirror directs the image to the film which is held stationary along the circular periphery of the film box. The film box is large enough to allow 240 full frame 35 mm pictures to be exposed on each run.

To provide the required synchronization between shutter and lighting operations, a pulse system is linked to the lighting system by delay, duration, and triggering circuits. Lighting is provided by a flash lamp which has a peak output of 400 million lumens at 3 milliseconds duration. Manufacturer: Benson-Lehner Corp., Santa Monica, California.



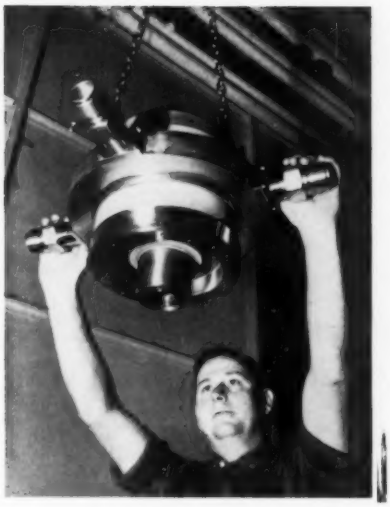
Camera with circular film box opened. Right, picture of bullet shot into plastic.

Machinable carbides

A recently developed carbide, known as Ferro-Tic S, can be machined quickly and easily in the shop, eliminating the need for special castings or costly diamond grinding to form carbide parts. It is produced by the powder metallurgy technique of embedding tiny crystals of titanium carbide in a relatively soft matrix of stainless steel. The resultant composite retains the machinability and resistance to heat and corrosion of the stainless steel, and the ultra hardness of the titanium carbide.

The carbide, supplied in rectangular blocks and round bars, is available in two grades. The difference between the grades is in their relative machinability, one having a hardness of Rockwell C 45, and the other of Rc 55. Both may be ground, and joined to other metals by welding or brazing. According to the manufacturer, the carbides are ideal for valves, gages, nozzles, bearings, seals for pumps, knives and choppers, and for many other items where previously cast alloys or carbides had to be used.

The same company also produces Ferro-Tic C, a machinable carbide using a low-alloy tool steel as the matrix, which can be heat-treated to almost any desired degree of hardness. However, it does not have the heat and corrosion resistance of the other carbides. Manufacturer: Sintercast Div., Chromalloy Corp., Yonkers, N.Y.



Most powerful electron tube

In contrast to the current miniaturization trend, RCA has announced an "oversized" electron tube that weighs 150 pounds. Described as the world's most powerful, the 17"-by-14" tube has an average output four times greater than any existing tube at its frequency (450 megacycles). It was developed to meet the power requirements for communication to outer space, missile guidance, and super-power radar, and can provide enough power to transmit a television picture halfway around the world. To accomplish this, the signal is directed to a metallic balloon, or other object, in outer space, which can receive and retransmit it to a desired point on earth. Its potential industrial applications include electronic heating, radiology, and sterilization.

The tube is the result of new design concepts. Its double-ended cylindrical structure is composed of 96 identical triode units with terminals at both ends, permitting higher frequency than the conventional single-end connection. It operates at an average power level of 300,000 watts. Manufacturer: RCA, New York, N. Y.

Jet flame stone carver

Stone-carving, a traditional construction craft that has fallen into disuse partly because it is costly, slow, and wasteful of material, may come back into favor as the result of a new cutting tool. Ever since ancient times, stone workers have carved and shaped monuments and building materials by tedious, manual chipping methods. The new tool, designed to rectify this, is a jet flame enclosed within a small, manually-operated torch that can be used to spall, i.e. chip, stone both economically and efficiently.

The Oxweld FSJ-6 torch, which weighs slightly over 7 pounds and is 37 inches long, combines oxygen and kerosene to produce a flame of 5500 degree temperature and 7000 feet per second nozzle velocity. The outer torch body is made of aluminum, and the burner and injector of copper for maximum heat dissipation. The torch is cooled by a continuous supply of water that enters the back of it along with the fuel and oxygen. The water stream can be directed onto the working area where it is used to protect the stone from overheating and cracking, and to protect that part of the stone which is not to be cut from the spalling path of the flame.

The new process is expected to find widespread use in the construction industry as well as in sculptural stoneworking. It offers, in addition to speed, the possibility of working with much thinner slabs, and the advantages of utilizing the crystalline nature of stone. In customary carving techniques, the slab must be thick enough to withstand the stress and shock of hammer blows, but the jet flame, since it exerts no pressure, can be used to carve and shape slabs as thin as ⅝ of an inch. When a 3-to 4-inch slab of granite is wire-sawn into thinner slabs, the sawing produces very dull and rough surfaces unsuitable for fine veneer work. However, the torch can be used to erase the saw marks, and to produce a textured and lustered surface because it splits the feldspar and quartz crystals in the granite along their natural cleavage lines. Surfaces produced in this way are not glassy smooth like polished granite, and are not dull in appearance like granite finished by mechanical methods. The use of thinner stone is also economical because it reduces the total weight needed to surface a building and also reduces freight costs. Manufacturer: Linde Company, Division of Union Carbide Corporation, New York, N. Y.

Ultra-precise ball bearings

A team effort involving M.I.T., the Barden Corp. of Danbury, Conn., and the U. S. Air Force, has produced ball bearings with a tolerance of 20 microns for use in gyroscopes in the inertial guidance system of a ballistic missile. These gyroscopes must, of course, be of the greatest accuracy so that the missile may be correctly directed to its target, and the ball bearings that carry the spinning wheel of each gyro must perform to a degree far surpassing standards in commercial apparatus.

The production of the new bearings illustrates the "leap-frog" technique in science. Ten years ago, bearings were more accurate than the parts that enclosed them. However, by 1955, the machining of the other parts had been improved to an extent that they were dimensionally superior to the bearings. The bearings were brought up to par by improvement of the gaging equipment, and by employment of handcrafting to modify existing tooling methods and machine tools. The geometry of the new ball bearings is not expected to be improved upon for some time; new developments, it is said, will probably be in materials, design and operational testing. Source: Massachusetts Institute of Technology, Cambridge 38, Mass.

Particle cleaning facilities

A cleaning system originally designed to clean flexible metal hose has now been adapted for use in cleaning parts assemblies in aircraft and missile manufacture. It has been found that particle contamination often causes missile failures and malfunctions. Consequently, stringent standards of cleanliness must be observed in assembling their parts.

In this new application of the cleaning system the entire laboratory is enclosed in an airtight three-room complex with an airlock entrance. The first room is used for clothes changing, the second for the cleaning processes, and the third for final inspection and packaging. The high-pressure, high-velocity spray which is employed is supplemented by a simultaneous vacuum scavenging action in the spray zone to insure that particles are not redeposited on clean surfaces. The cleaned part is passed, by conveyor, to a tunnel-type drying oven which uses electrically heated air. Then the part is discharged into the inspection area, where, following inspection, it is completely sealed. Source: Dunbar Kapple, Inc., Batavia, Ill.

Teletypewriter

The recently developed Olivetti T2PN Printing Reperforator is the first teletypewriter that can produce punched and printed tapes simultaneously. The standard reperforators now in use produce partially perforated tapes which are unsuitable for use in high speed computing and communications equipment. In both sending and receiving messages, it prepares a conventional, fully-perforated, 11/16 inch, five-channel tape. At the same time it can also print a typewritten message between the feed holes of the perforated tape. The tapes can be used with both optical and electronic readers, and can be stored in the same way as uninterpreted tapes. The T2PN is a self-contained unit which is fully compatible with existing teletypewriter circuits and machines. It can be used for 60 or 75 words-per-minute operation. Distributor: The TELautograph Corp., Los Angeles 45, California.

Tire testing machine

Goodyear has installed a tire testing system which will enable them to learn what causes a tire to fail at ultra-high speeds. The system utilizes a 8,600 hp machine, built by the Adamson-United Company of Akron, to duplicate all of the operational conditions of plane taxiing, takeoff, and landing. At present, the machine is specifically designed for the testing of aircraft tires; however, the company believes that the results gained from the experiment may lead, in the future, to improved automobile tires.

The machine is designed so that both ends of the motor shaft can be used as drivers. One side presses two tires together, tread to tread, and can be driven up to 500 mph. The second side has a ten foot diameter flywheel, with a tire carriage on each end, which can be speeded up to 320 mph. Loads of better than 80,000 pounds and tire sizes from 16 inches to six feet in diameter can be accommodated.

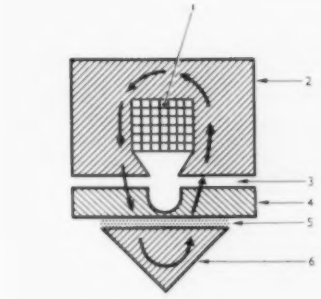
Landing conditions are simulated when a tire touches the moving flywheel, and take-off when a tire, in contact with the flywheel, is accelerated from zero to take-off speed. Because of the dangers to personnel in running tires at such high speeds, the actual testing is viewed on closed-circuit television mounted on control panels in an adjacent room. Source: Goodyear Tire & Rubber Co., Akron, Ohio.

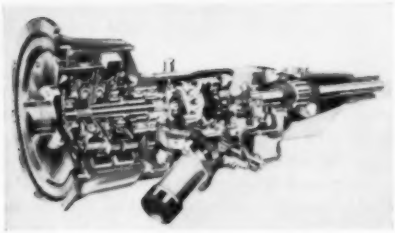
New automatic transmission

A new automatic transmission, known as "Easidrive," is soon to be installed on the Hillman Minx. It has been developed to provide small cars with the convenience heretofore available only on standard high horsepower cars. Small cars had been unable to use an automatic transmission because such a transmission requires a surplus of horsepower (which they do not have) to overcome loss of power due to slippage between the driving member of the engine and the shaft (output) that drives the wheels.

The diagram which shows the radial path of the magnetic flux around the coupling illustrates the principle of Easidrive. When electric current from the coil (1), which is housed in the stationary field member (2), crosses the air gap (3) and is passed through the powder gap (5), a special ferric powder in the gap is instantaneously magnetized and forms a solid connection between the driving (4) and the output (6) members. In this way, the rotating motion of the driving member is transmitted directly to the driven member; thus there is no slippage. The amount of torque, or drive, transmitted is directly proportional to the current supplied.

The supply of current is automatically controlled by an electromechanical system guided by a governor that responds to variations in road speed. The driver-operated selector on the steering wheel has positions for neutral, reverse, drive, and second





(used for braking action on steep hills). The gearbox is of a conventional design.

It is estimated that the new transmission will offer 60,000 miles of driving under ordinary conditions before requiring service. At that time the ferric powder may need to be replaced (at a cost of about six dollars).

The new transmission offers several advantages besides the elimination of slippage. There is no creep when the car is standing still. Fuel consumption is the same as with standard shift transmissions. If there is a battery failure, the car can be started with a push of only eleven mph. Manufacturer: Smiths Motor Accessories Ltd., London, England. American distributor: Nisonger Corp., New Rochelle, N. Y.

Spray gun for plastic coating

Most plastic and chemical coating materials are formed when an activator and catalyst are brought in contact with a base element, such as a resin. However, when these components are brought together, they harden very quickly, and in the past such materials have had to be prepared in small quantities and used immediately. But now a new development does away with this limitation by using a spray gun to mix the essential elements at the moment of application. This makes possible continuous, fast, and efficient spray application of multiple component materials used for linings, coatings, structural resins, and plastic foams.

The gun provides instantaneous mixing by forcing the elements through high-speed rollers driven by an air motor built into it. The end material may be atomized for spray applications, or poured for foaming and resin applications. The gun weighs 4.5 pounds and has a capacity of ten pounds per minute.

It is attached by rubber hoses to a formulator consisting of two pairs of controlled volume pumps connected to an electric motor with variable speed drive, a heating system, and reservoirs for the component.

Once preset, it automatically proportions and controls the volume rate delivery of the fluid streams. According to the manufacturer, a one per cent accuracy per component per volume delivered at maximum viscosity and volume is maintained. The formulator also includes a tank for solvents to be pumped through the gun to clear it after use. Manufacturer: Binks Manufacturing Co., Chicago 12, Ill.

Coating to reduce turbulence

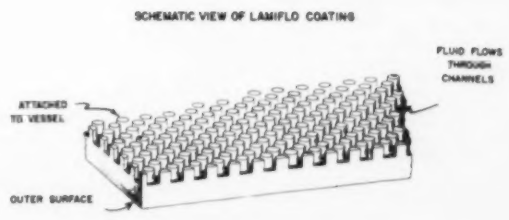
Research at U. S. Rubber has indicated that by placing a rubber coating on objects being propelled through water, it is possible to reduce drag due to turbulence by more than 50 per cent. Such objects use from 70 to 90 per cent of their propulsive energy to overcome drag. The new development will permit vessels to travel faster without any increase in power, or at the same speed with less power than is now required.

The idea was developed by Dr. Max O. Kramer, vice-president of Coleman-Kramer, Inc., Los Angeles, as the result of a study of the porpoise, which has only about one-tenth the drag that normally would be expected from an object of its size and shape. Known as "Lamiflo," the coating consists of a 1/16 inch thick layer of rubber textured on one side with a multitude of tiny studs (1/16 inch high). The stud side is attached with adhesives to the object; the outside, or water side, of the coating, is smooth. The interconnecting channels between the studs contain a freely flowing viscous liquid. At present, a silicone fluid is being used, although experimentation is continuing. The effect of this ducted and elastic coating is to provide a flexible, undulating surface that damps, or moves with the pressure of the water, instead of resisting it.

It is believed that this new advance will offer unusual possibilities for underwater craft, as well as for pleasure boats. Large surface vessels are less likely to benefit, since the large bow waves they generate create so large a drag that surface drag is of no matter. According to the developer, future research might lead to applications in flight, and to the passage of liquids through pipes. Source: U. S. Rubber Research Center, Wayne, N. J.

Puncture-proof wall covering

A wall covering material is being marketed which consists of a ¼-inch-thick sheet of cork that has been permanently bonded to 18-gage vinyl. Known as Cork-Tex, it can be punctured again and again and show no trace of the "wound." This is because the cork backing contracts when a pointed object is removed, and the contraction closes the laceration, giving the vinyl surface an unscathed appearance. Cork-Tex, which is also washable, was designed primarily for tackboard installation in classrooms, or it may find application in a child's room, den, or kitchen. It will be marketed in a choice of eight different vinyl colors in a linen finish, and will be available in standard rolls of 4 by 72 feet. Manufacturer: Bond Crown & Cork Division, Continental Can Company, Chicago 39, Illinois.

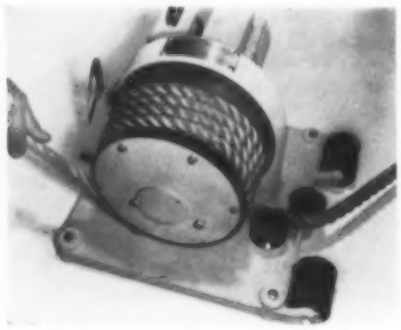


High-frequency transistor

A new high-frequency transistor has been developed to make possible the operation of feedback amplifiers in the narrow-band and wide-band frequency range. Previous transistors could not operate in the low microwave frequencies needed for this type of signal amplification. The transistor—of the germanium mesa type—has vastly reduced dimensions, which accounts for its high-frequency operation. In fact, the dimensions have been cut down to such an extent that the active region of the transistor is smaller than the cross-section of a human hair.

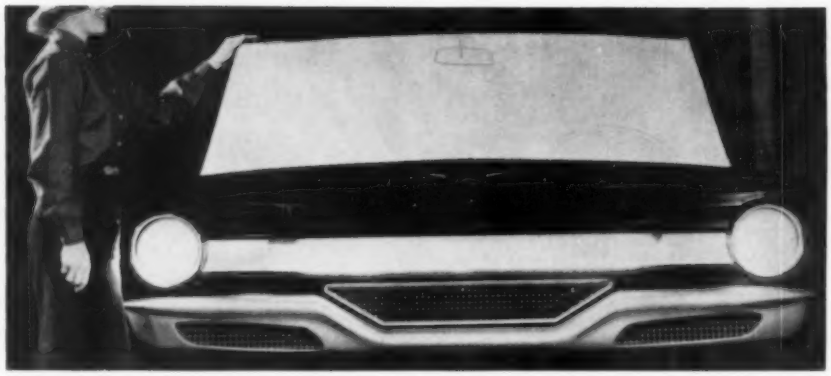
Another design factor contributing to the particular performance of this new mesa transistor is the way it is mounted. With gold wires 2/10 of a mil in diameter for making circuit connections, the unit is mounted in what is called a coaxial shell. This method replaces securing of the unit by the conventional encapsulation which introduced too much electrical interference to permit full utilization of the unit.

Specifically, the performance and frequency levels for which the new mesa unit was designed are as follows: as an oscillator at 3 kmc, as an amplifier at 1 kmc. The amplifier circuits in which the new units are included are three-stage amplifiers with a gain of 18 db, flat within 1 db over a frequency band that extends across 1 mc to over 750 mc. Unit was developed by Bell Telephone Laboratories, New York 14, N. Y.



Cargo rope winch

A new rope winch (above) that weighs only 67 pounds is capable of moving skid cargo of 2½ tons, or rolling-loads of 75 tons, on a single line. With the winch, the operator maintains complete control of both the tension and speed of the pull. For every pound of pull by the operator on the rope, approximately 50 pounds of pull is transmitted to the rope that is attached to the cargo. Cargo movement can be accelerated up to 26 feet per minute. Rope guide-rollers permit any pull-off angle and prevent rope-lock. The winch, Model 51, is available with either 28 volts dc, or 400 cycle ac motors. Manufacturer: Air Cargo Equipment Co., Glendale 5, California.



New fluorescent lighting system

A fluorescent lamp has been developed which has a brightness level of 22,000 foot lamberts, a 338 per cent increase over the most powerful existing fluorescent lamp. This is achieved through the use of a reflective coating which covers 330 degrees of the inside circumference of the lamp, leaving only a precise 30-degree aperture for the light to be emitted. The fixture for the lamp is also designed with a special reflector that focuses the light on the desired area. Because the new lamp reduces glare to a minimum, it is expected to find application in car headlights (above) and low-level highway lighting. Manufacturer: Sylvania Lighting Products, Salem, Mass.

Ultrasonic gaging

An ultrasonic resonance gage, the Vidigage, is being used to check the many exacting dimensions of reinforced plastic nose cones and radomes (above). Previously, shops had to build a separate checking mechanism to check each dimension; this process, which took several days, can now be done in only a few hours with the Vidigage, and the manufacturer claims that the product can be held to tolerances as close as 0.001 inch.

The problem of obtaining precise measurements had been further complicated by the flexing of relatively thin areas. But since the Vidigage requires access to only one side of an object to measure its thickness, it can check the dimensions of the nose cone while it is still on the mandrel, or over a mold. The Vidigage, which is mounted on a wheeled dolly, can handle parts of any size or shape, and is said to be able to measure metals, plastics, and glass.

Measurements are obtained by a continuously varying frequency, produced by an electronic sweep oscillator, which is changed into mechanical vibrations and transmitted into the material to be measured. Harmonic resonances set up in the material appear as one or more traces on the cathode ray tube on the dolly. Thickness is read by placing calibrated scales in front of the tube. Manufacturer: Branson Instruments, Inc., Stamford, Conn.

Universal measuring instrument

A Dutch firm has marketed an electrical measuring instrument (below), with 31 measuring ranges, that is especially designed for the electrical engineer or repairman to check radio and television equipment. The unit employs a patented core magnet system which is shock-proof, and it includes a resilient sapphire bearing to guard against severe shock. It is fused against a 100-fold overload. The internal resistance is 20,000 volts dc, and 2,000 volts ac. The dimensions of the instrument, which weighs only 2.2 pounds, are 7¾ by 5 by 3 inches. It is made of impact-resistant polystyrene, and has a polystyrene window that has been treated to resist static charges. Manufacturer: NIEAF, Utrecht, Holland. Information: Netherlands Trade Commission, New York, N. Y.

Manufacturers' Literature Supplement

A bibliography of currently available technical brochures dealing with materials, methods, components and machines

Materials — Metals

1. Aluminum Screw Fastenings. Reynolds Metal Company. 48 pp. Ill. Technical handbook describes various types of standard and special fasteners used to join aluminum assemblies. Includes list of manufacturers of screw fasteners, and recommended hole sizes for various types of self-tapping screws.

2. Spring Materials. Riverside-Alloy Metal Div., H. K. Porter Company, Inc. 8 pp. Ill. Handbook discusses spring properties of copper-base, nickel-base, and stainless steel alloys.

3. Aluminum-Bronze Alloys. Ampco Metal, Inc. 20 pp. Ill. Booklet describes chemical and physical properties of aluminum-bronze alloys, produced under the trade name Ampco Metal. The alloy is said to possess high resistance to metal-to-metal wear, abrasion, fatigue and corrosion. Also, it is non-magnetic and non-sparking.

4. Stainless Steel Tubing. Posen & Kline Tube Company, Inc. A guide to selection and use of stainless steel tubing ranging from 33-gage needle sizes to ⅝ inch OD.

5. Round Drawn Cases. Olympic Products Company, Inc. 4 pp. Lists more than 200 sizes of standard round drawn cases made from various metals. The cases are especially designed to house electronic components.

6. Expanded Metals. Designers Metal Div., North American Cement Corp. 4 pp. Folder describes Micromesh®, small expanded metal meshes of ductile materials including precious metals. Tolerances are said to be extremely close.

Materials — Plastics

7. Polycarbonate Resin. Mobay Chemical Company. Technical bulletin describes the physical and electrical properties of Merlon®, a linear polyester of carbonic acid. The new thermoplastic is said to have high mechanical and dielectric strength, low water absorption, high heat stability, transparency, and cold strength.

8. Industrial Films. E. I. du Pont de Nemours & Company. 8 pp. Ill. Brochure describes various preformed plastic films which have wide application to engineering problems.

9. Epoxy Resins. Chemical Div., General Mills, Inc. 24 pp. Ill. Technical bulletin describes properties and applications of epoxy resins.

10. Polystyrene Foam Board. General Foam Plastics Corp. 12 pp. Ill. Brochure describes properties and applications of Genafoam, a competitively priced foam plastic which is said to have versatile applications in construction, marine, and packaging industries. It is available in both rigid and flexible form.

11. Plastic Laminates. Synthane Corp. 2 pp. Two engineering bulletins describe two new high-temperature industrial phenolic laminates; one has an asbestos mat, and the other has a glass fabric reinforcement. Both are available in sheets, strips, and tubes.

12. Lens Panel Area Calculator. K-S-H Plastics, Inc. Calculator designed to determine quickly and accurately the lens panel square footage necessary for any lighting job.

13. Compression Molded Insulation Materials. Fiberite Corp. Folder describes line of high temperature, compression molded insulation materials of various plastics that are designed for heat and erosion resistance as well as mechanical strength. They are presently being used in rocket motors.

14. Decorative Laminates. Laminated Products Department, General Electric Company. 12 pp. Ill. Four-color brochure describes Textolite® decorative surfaces. Illustrates the various patterns, colors, and fabrication techniques.

15. Coatings for Vacuum Metallizing. Bee Chemical Company. 45 pp. Ill. Booklet describes in detail the application and use of vacuum metallizing coatings which are applied by spraying, dipping, and flow coating to thermoplastics, thermosetting plastics, metals, and glass. Base coats, top coats, and back-up coats for use after metallizing are also discussed.

Methods

16. Ultrasonic Cleaning of Metal Filters. Aircraft Porous Media, Inc. 22 pp. Ill. Report describes ultrasonic equipment capable of cleaning flat and convoluted metal filter element surfaces. The equipment is said to produce the maximum ultrasonic cleaning intensity that can be created in a liquid.

17. Assembly Line Cost-Savings. Tinnerman Products, Inc. 18 pp. Ill. Brochure describes a variety of assembly cost-savings case histories through the use of fasteners.

18. Organic Heat Transfer Fluids and Pumps. Chempump Div., Fostoria Corp. 9 pp. Technical bulletin #6 describes organic heat transfer fluids which are used in industrial controlled heat processes. The leak-proof pump to handle these fluids is also described.

19. Fatigue Control of Threaded Fasteners. Elastic Stop Nut Corporation of America. 32 pp. Ill. Manual discusses findings related to the basic nature and causes of fastener fatigue. It describes the Equa-Stress modified UNF-3 thread form which, it is said, will double the fatigue endurance of a standard high tensile bolt.

20. Cabinet File Assembly. Remington Rand Div., Sperry Rand Corp. 4 pp. Folder illustrates use of Record-Stack,

a device which provides a wide choice of files, drawers, and shelves all completely interchangeable for rearrangement of file sections within a cabinet at any time.

21. **Printed Circuit Grid Boards.** Corning Glass Works. 2 pp. Sheet describes Fotoceram material, a non-organic glass-ceramic, with a grid of holes for mounting components that may be used by design engineers to make prototype printed circuits in their own labs.

22. **Automatic Drilling, Tapping, and Fastening Tools.** Buckeye Tools Corp. 8 pp. Brochure defines and contrasts automation tools with other air-powered tools made by the firm, and summarizes the features of new line of linear-motion-plus-rotation 21K and 21L automation tools.

23. **High Potential Testing.** Associated Research, Inc. 12 pp. Ill. Bulletin discusses practical considerations for setting up both ac and dc high voltage test stations used in wiring harnesses, motors, cables, solenoids, etc.

24. **Glassed-Steel Reactor Maintenance.** Pfaudler Permutit Inc. 12 pp. Ill. Manual describes installation, operation, and maintenance procedures for glassed-steel reactors. Contains information on proper gasketing, jacket-cleaning techniques and repair procedures for severe and mild chemical service.

Miscellaneous

25. **Wire Mesh Heating Elements.** Electrofilm, Inc. 16 pp. Ill. Catalog describes wire mesh heating element that utilizes parallel circuits and is said to be extremely reliable because current and voltage are distributed over the whole element. Maximum uniform surface temperature is obtained. Extremely flexible, light-weight, and thin, it is said to be easily adaptable to fit most hard-to-fit surfaces.

26. **Studless Metal Lath and Plaster Partitions.** Metal Lath Manufacturers Association. 4 pp. Technical bulletin #2 illustrates and discusses how studless partitions can be used in different ways. Includes recommended construction techniques and specifications.

27. **Electronic Buying Guide.** Directories of Industry, Inc. Electronic/Sources 1960, a comprehensive guide to the electronics and allied industries lists more than 6,000 manufacturers and their representatives throughout the U. S. The guide includes a Products and Service section, and a roster of the U. S. Missile and Rocket Program.

28. **Industrial Radiant Heaters.** Plant Equipment Sales Department, Corning Glass Works. 14 pp. Ill. Brochure contains detailed information on a tubular heater and a panel heater, both of which emit infrared heat energy. It is said that up to 90 per cent of this energy is absorbed by the products.

29. **Standby Electric Plants.** D. W. Onan & Sons, Inc. 8 pp. Ill. Brochure discusses selection and installation of emergency electric generating plants. Includes information on manual or automatic starting, type of fuel, air or water cooling, etc.

30. **Lubrication Systems.** Farval Div., Eaton Manufacturing Company. 24 pp. Ill. Revised brochure contains information on complete line of centralized systems of lubrication that disperse oil or grease under pressure to a group of bearings from one central station in exact measured quantities.

31. **Concrete Flooring.** Master Builders Company, Div. of American-Marietta Company. 24 pp. Ill. Brochure discusses Masterplate, an iron aggregate combined with a cement-dispersing agent, that can be laid on the surface of concrete, and is said to last six times longer than ordinary concrete floors.

32. **Optical and Instrument Benches.** The Gaertner Scientific Corp. 28 pp. Ill. Bulletin offers descriptions of complete line of optical and instrument benches such as lathe bed type, double rod, and single rod benches.

33. **Tap Selector.** Hanson-Whitney Company. 26 pp. Ill. Catalog lists, by number, correct taps for all purposes, regardless of type of material.

34. **Metal Windows.** Albro Metal Products Corp. 20 pp. Ill. Catalog describes company's line of custom-made metal windows, designed for all architectural treatments. Window types covered include reversible, sliding, projected, awning, single and double hung, casement, security and hopper combinations.

35. **Commercial Filters.** Commercial Filters Corp. 8 pp. Ill. Catalog describes complete line of filtration equipment for obtaining continuous micro-clarity of all types of industrial fluids.

36. **Inch and Metric Dimension Ball Bearings.** Hoover Ball and Bearing Company. 4 pp. Bulletin describes new series of ball bearings which are said to facilitate shaft and housing design because all dimensions are in inches; 15 sizes are offered, from ⅛ to 1½ inches in diameter.

37. **Rubber Bumpers.** Cooper Tire and Rubber Company. 4 pp. Folder discusses Cooper Clip, an assembly consisting of a rubber extrusion and a spring steel clip which retains the rubber as well as acting as a fastener. It is said to have wide application to commercial users of feet, bumpers, shock absorbers, vibration dampeners, etc.

38. **Engine Air Filters.** Fram Corp. 48 pp. Ill. Catalog lists complete size and performance characteristics of more than 110 different types of dry-type air filters. The filter, made of pleated paper, is said to have a 99 per cent filtering efficiency.

39. **Index of Transistor Reports.** Lansdale Div. Philco Corp. Index lists 84 Application Laboratory Reports on important and practical applications of transistor circuitry.

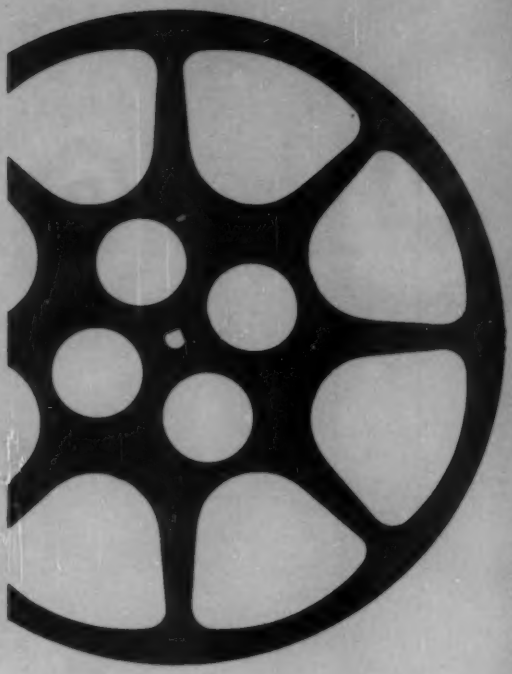
40. **Precision Tools.** L. S. Starrett Company. 48 pp. Ill. Catalog illustrates and describes company's line of precision tools such as tapes, venier height gages and calipers, micrometer calipers, inside micrometers, dial bore gages, and many others.

41. **Air Diffusion.** Anemostat Corp. of America. Set of eight catalogs with tables and illustrations describing air diffusion equipment. Titles are: Circular Air Diffusers, Square Air Diffusers, Straight Line Air Diffusers, Perforated Air Diffusers, Diffus-A-Plate, Air Diffuser Accessories, All-Air High Velocity Units, and Constant Volume Turbulators and LPL Valves.

42. **Control Panel Design.** Fuller Company. 4 pp. "Fact File" discusses facts to be considered when designing any type of production control panel to solve a materials handling problem. Noted are strategic location, electrical and mechanical practices, enclosures, codes and standards, and safety precautions.

43. **Conveyor Chain.** Moline Malleable Iron Company. 38 pp. Ill. Comprehensive reference manual discusses selection of chain for conveying and elevating. Comparison

(*Continued on page* 123)



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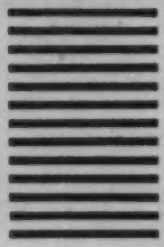

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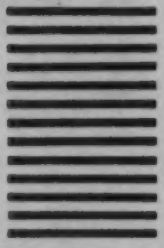

Manufacturers' Literature

(*Continued from page* 120)

charts containing principal features of various types of chains, graphs of friction coefficients, a trouble-shooting chart, and other data are also included.

44. Proper Grouting Practices. The Master Builders Company. 16 pp. Bulletin describes grouting techniques with Embeco non-shrink grout and outlines and illustrates common methods of grouting different types of equipment, the mixing and placing of grout, and cold and hot weather grouting. Information on recommended mixes and estimating tables, plus actual installations are also included.

45. Microfilming Engineering Drawings. The Filmsort Company, Division, Minnesota Mining and Manufacturing Company. 8 pp. Manual details how the Air Material Command of the USAF, has microfilmed engineering drawings and data and mounted them on aperture cards.

46. Standard Merc Thermostats. Vap-Air, Division of Vapor Heating Corp. 18 pp. Catalog describes three standard merc thermostat groups: the well-type for sensing case temperature, the duct-type for gas or fluid temperature sensing, and the surface-type for "area contact" temperature sensing.

47. Engineering of Lighted Fountains. General Electric Company. 10 pp. Bulletin gives details on color selection, nozzle velocity, pump and motor sizes, and circuitry and controls.

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INSTRUCTOR IN PRODUCT DESIGN—*Rigorous college program in prominent design school requires technical competence in addition to design training. Imagination and experience with materials and processes essential. Submit resume and salary requirements to Box ID-287,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22, New York.*

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Index to Advertisers

For Your Calendar

April 3-8. Sixth nuclear conference sponsored by the Engineers Joint Council and the Instrument Society of America. New York Coliseum, New York.

April 4-7. Twenty-ninth national packaging exposition sponsored by the American Management Association. Convention Hall, Atlantic City, New Jersey.

April 4-7. Atomic Exposition. New York Coliseum, New York.

April 5-7. 1960 spring conference of the Building Research Institute. Statler Hilton Hotel, New York City.

April 5-7. Third national chemical and petroleum instrumentation symposium sponsored by the Instrument Society of America. University of Rochester, Rochester, New York.

April 5 - June 5. Victoriana Exhibition. Brooklyn Museum, Brooklyn, New York.

April 7-8. Seventeenth annual conference of the Society of the Plastics Industry, Western Section. New Riviera Hotel, Palm Springs, California.

April 8-9. Annual meeting of the Industrial Design Education Association. University of Cincinnati, Cincinnati, Ohio.

April 9-16. Third annual exhibition and awards dinner of the Dallas-Fort Worth Art Directors Club. Sheraton Dallas Hotel, Dallas, Texas.

April 11-12. Twenty-ninth annual meeting of the Inter-Society Color Council. Philadelphia Museum College of Art, Philadelphia, Pennsylvania.

April 16-24. Fourth International Automobile Show. New York Coliseum, New York.

April 18-19. Third annual conference on automatic techniques sponsored by the ASME, IRE, and AIEE. Cleveland-Sheraton Hotel, Cleveland, Ohio.

April 18-23. Annual convention of the American Institute of Architects. Masonic Memorial Temple, San Francisco, California.

April 20. "Plastics in the Petroleum and Chemical Industries." Conference sponsored by the North Texas Section of the Society of Plastic Engineers. Hotel Texas, Fort Worth, Texas.

April 20. Sixteenth annual quality control clinic sponsored by the Rochester Society for Quality Control. University of Rochester, Rochester, New York.

April 21-28. 1960 tool show sponsored by the American Society of Tool Engineers. Artillery Armory, Detroit, Michigan.

April 22. Workshop on trade shows and exhibits sponsored by the Association of National Advertisers. Hotel Plaza, New York, New York.

April 24-27. Annual convention of the Sales Promotion Division of the National Retail Merchants Association. Paradise Inn, Phoenix, Arizona.

April 25-27. 1960 convention of the Construction Specifications Institute. Rickey's Studio Inn, Palo Alto, California.

April 25-28. Forty-first annual convention and welding exposition of the American Welding Society. April 25-28, Convention, Biltmore Hotel, Los Angeles; April 26-28, Welding Exposition, Great Western Exhibit Hall, Los Angeles.

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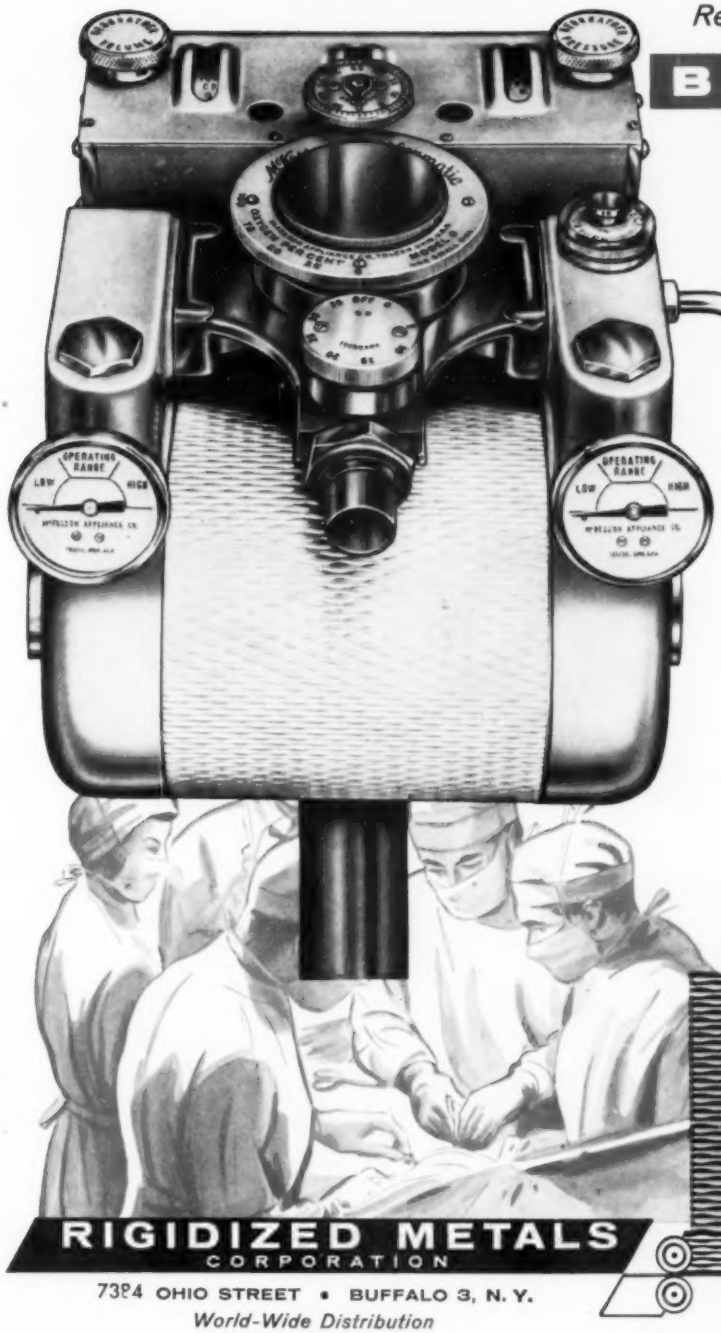
BEAUTILITY®



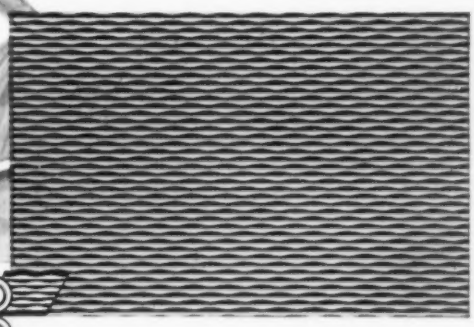
The beautiful McKesson Anesthesia Unit illustrated, is used in hospitals, clinics and dental offices throughout the country. The RIGID-tex Metal Cover encloses the delicate working mechanism.

In speaking of their choice of this metal for the cover, the manufacturer states . . . "the use of RIGID-tex Metal has proved very satisfactory, due to the fact that we can use a very light gauge of metal without having the cover easily distorted. The pattern of the metal makes the unit quite attractive and does not require the amount of finishing that other metals would."

Material used is .020 aluminum in pattern 2-WL. This pattern is especially designed to increase rigidity and buckling strength. For this reason the cover of this machine provides maximum protection. It is not easily dented and its mar-resistant surface hides scratches and scrapes to remain new looking always.

RIGID-tex Metal is available in all metals, all finishes, all colors . . . solid or perforated. There are more than 45 standard patterns from which to choose. Write for complete information.

See Sweet's Design File 11/Ri



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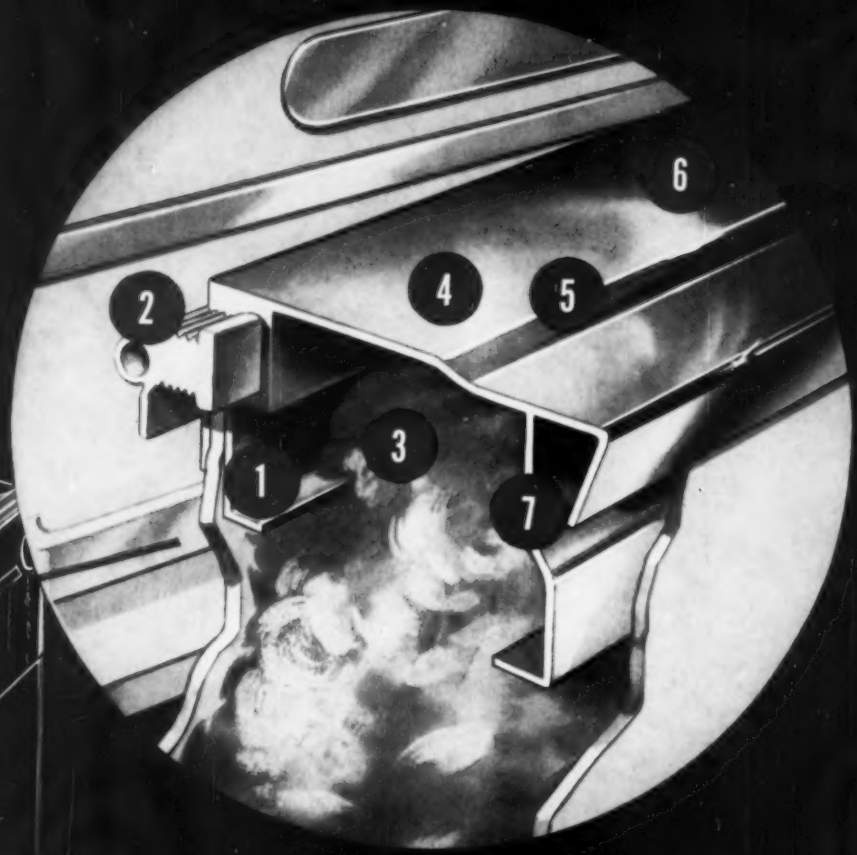

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6. SERVES AS HINGE MOUNTING
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