Prize designs for modern furniture from the International Competition for Low-Cost Furniture Design

By Edgar Kaufmann, Jr

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prize designs

FOR MODERN FURNITURE

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Prize Designs
for Modern Furniture

from the International Competition for Low-cost Furniture Design

BY EDGAR KAUFMANN, JR.

THE MUSEUM OF MODERN ART NEW YORK

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Many thanks are due to Miss Joan Lindsay, Assistant to the Competition Director, and to Mrs. Donald W. Hoagland, for help throughout this enterprise.

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New Design for Low-cost Furniture

Low-cost housing and home furnishings are among the most important factors in the national economy and the general welfare of the peoples of all countries. Governments and industry the world over are making every effort to find a solution for the housing problem but have as yet paid only scant attention to the design and the production of good inexpensive furniture.

To serve the needs of the vast majority of people we must have furniture that is adaptable to small apartments and houses, furniture that is well-designed yet moderate in price, that is comfortable but not bulky, and that can be easily moved, stored and cared for; in other words, mass-produced furniture that is planned and executed to fit the needs of modern living, production and merchandising.

The Museum of Modern Art and a group of leading furniture retailers have been greatly concerned with this problem. They are united in the belief that the means for its solution are available now. The spectacular advances of technology have given us new materials, tools and production methods that have already been successfully applied to other branches of manufacture. Individual progressive furniture designers in many countries have done brilliant experimental work but have found it difficult to find ways to translate their ideas into reality.

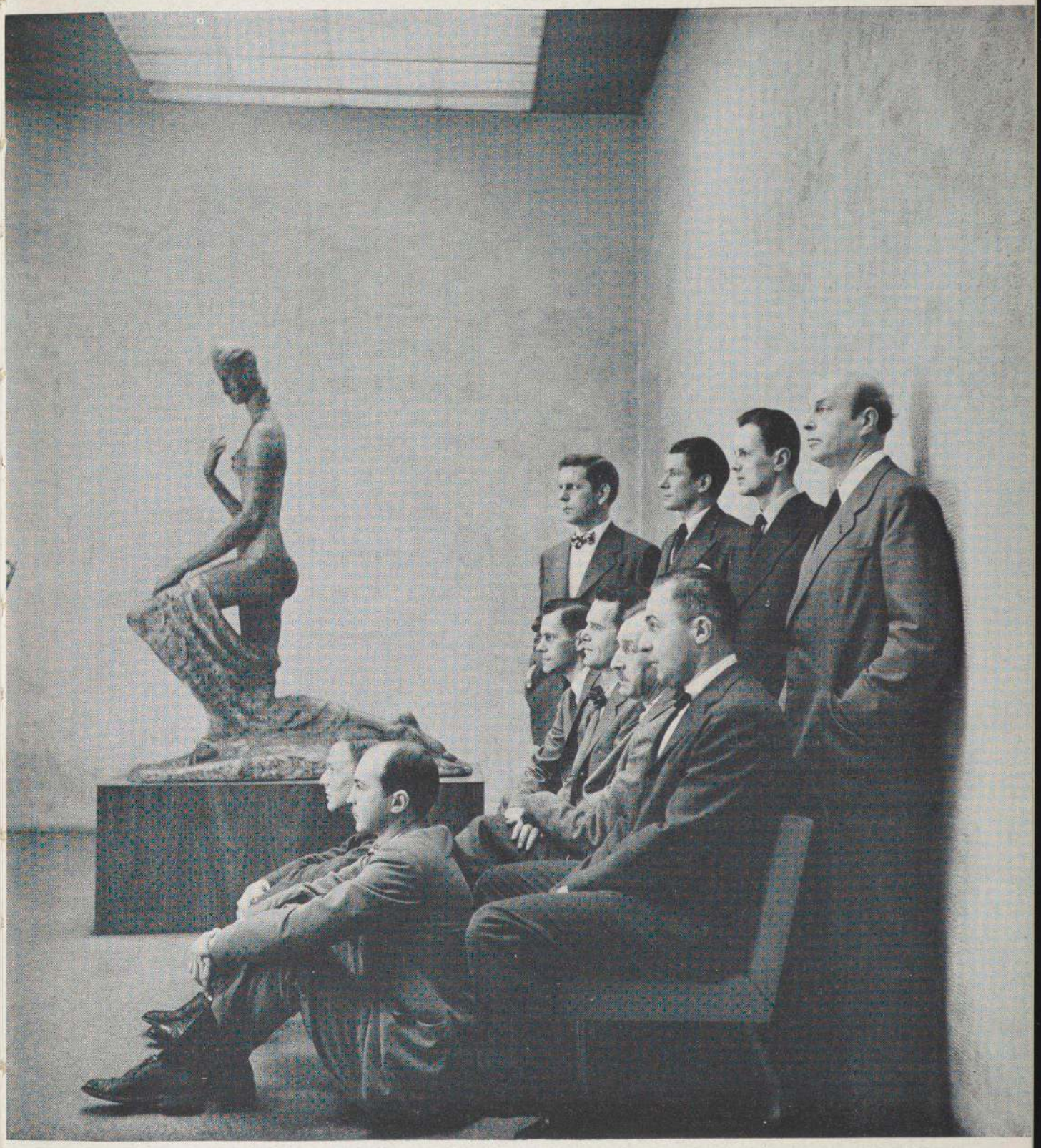
In order to break this deadlock and to provide a powerful stimulus for designers and technicians to increase their efforts, The Museum of Modern Art and Museum Design Project, Inc., a non-profit organization set up by representatives of the trade, are organizing an international competition for the design of low-cost furniture. This competition will be open to individual designers of all countries and to selected research teams consisting of technological laboratories working in collaboration with outstanding designers.

The sponsors of the project believe that this competition will draw the attention of technicians and designers from all over the world to this important problem and that it will produce new and fresh designs leading to the manufacture and wide distribution of a new type of furniture for today's new homes.

RENÉ D'HARNONCOURT

This statement was prepared on the occasion of the formal dinner inaugurating the International Competition for Low-cost Furniture Design, which was held in the Rainbow Room on October 23, 1947. Nelson A. Rockefeller, President of the Museum, announced the Competition, and Dr. Henri Laugier, Assistant Secretary General of the United Nations in charge of Social Affairs, was the principal speaker.

Winning designers in the International Competition for Low-cost Furniture Design: Left to right, standing, Don R. Knorr, Robin Day, Clive Latimer, and Professor Georg Leowald; seated, Davis J. Pratt, Charles Eames, Alexey Brodovitch, and James L. Prestini; on floor, John B. McMorran, Jr. and John O. Merrill, Jr.



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International Competition for Low-cost Furniture Design

At the end of the recent war American families found themselves faced with a tremendous housing problem. In part they had to make the best of existing accommodations by crowding them with far greater numbers than had been intended originally, or else they had to try to secure one of the new dwellings which were erected, though too slowly to satisfy the need. In either case families found themselves in smaller homes than had been usual. If these homes were to be in any sense livable or comfortable, their furnishings had to be efficiently planned and trimly scaled. Deeper than this lay the important question of cost. The market supplied furniture at many price levels, but serviceability and efficiency were not always directly related to these prices, and it was hard to find desirable furniture at low cost. American ingenuity and American technology had provided this country with an admirable standard of living, but seemingly in regard to the home and its furnishings these forces were not yet fully mobilized. In the hope that new ideas and better results could be found, a Competition was launched under the auspices of The Museum of Modern Art and an enterprising group of American retailers and manufacturers, organized as Museum Design Project, Inc.

The tremendous response to the Competition by designers is a measure of the urgency of the problem posed. The great amount of organizational effort which lay between the jury's judgment, November 28, 1948, and the presentation of manufactured pieces to the public is a measure of the difficulty of the problem posed. In presenting this exhibition of Prize Designs for Modern Furniture, The Museum of Modern Art is eager to make clear the urgency of the need for furniture that gives better values not only pricewise but also in the efficiency of its planning and in its fine appearance. It may be hoped that this exhibition represents only the first stage on the road, an early moment in a chain reaction which will lead to the simpler constructions, the greater comforts and the more varied expressions of good living which seem predicted by the work presented here.

The International Competition for Low-cost Furniture Design was held to develop ideas for low-cost furniture suited to the living rooms, bedrooms and dining areas of present-day small homes. In tracing the course of the Competition and examining its results an understanding of its organization will be helpful.

To begin, entries were requested under two headings; a third was added soon after.

1. Designs for seating (including upright and lounge chairs, sofas, daybeds, benches, etc.)
2. Designs for storage pieces (units which contain household or personal effects or both, chests, bureaus, etc.)
3. Designs for upholstered dual-purpose living-bedroom units

In any category designs could represent pieces adaptable to more than

one use. Competitors could submit any number of entries in any or all of the categories.

The Competition opened January 5, 1948 and closed at midnight on October 31 the same year. It was open to designers in all countries regardless of training or professional status (employees of the sponsoring organizations, The Museum of Modern Art and Museum Design Project, Inc., were not eligible).

It was required that a design "be the original creation of the competitor and his exclusive property." Designs previously produced for sale or designs in which any distributor, manufacturer or person other than the competitor held rights were not eligible. Nevertheless, it was explained that a design remained eligible if a designer had been working on it and had shown it privately before entering it in the Competition.

Technically explicit plans, sections and so on, to scale, sufficient "so that the piece can be built from these drawings" were required, as were indications of the principal dimensions and materials. A colored perspective or isometric drawing large enough to give an accurate idea of the appearance of the finished piece was an important requirement. Further, American competitors were required to submit their drawings in a standard size, 20″ by 30″, accompanied by a model of their entry not less than one-quarter full size. These last conditions were not required of entrants outside of the United States because of mailing and shipping costs. Many competitors took advantage of the encouragement to submit additional material such as photographs of models or of real furniture, sample constructions, etc. Because no limitations were announced, entries were received in many media and in most diversified presentations. All entries, of course, were required to be anonymous, marked only with a Competition entry number.

Judging of the Competition entries: front row, René d'Harnoncourt, Catherine Bauer, Luis de Florez, and Ludwig Mies van der Rohe; back row, seated, Hugh Lawson, Alfred Auerbach, and Gordon Russell; standing, Edgar Kaufmann, Jr., Director of the Competition.

All material submitted to the International Competition for Low-cost Furniture Design remained the property of the designers, with certain limitations on prize-winning designs and related entries. In the case of the prize winners, the material submitted to the Competition became the property of the Museum although all design rights remained vested in the designers. The Museum agreed to return non-premiated entries if this was requested.

The following prizes were announced:

For the best design of a seating unit: First prize $5,000; second prize $2,500; third prize $1,250.

For the best design of a storage unit: First prize $5,000; second prize $2,500; third prize $1,250.

Two weeks after these prizes were announced an additional prize of $5,000 was contributed by the Simmons Company for the best design for a new, low-cost convertible living room-bedroom piece.

It was further stated that Museum Design Project, Inc., co-sponsor of the Competition, would "endeavor to arrange for the manufacture and sale of the prize-winning designs in the United States." To facilitate this, Museum Design Project, Inc. reserved a period of six months after the awards during which such arrangements could be negotiated. Furniture manufactured from the prize-winning designs had to be approved both by the designer and by The Museum of Modern Art if it was to be designated a Prize Winner in the International Competition for Low-cost Furniture Design. Foreseeing that the prize-winning designs would undergo an inevitable process of adaptation in order to reach the market, the Museum undertook the task of arbitrating whatever controversies might arise from suggested changes.

A special feature of the Competition was a series of six grants of $5,000 each awarded early in the Competition to assist the work of "Design Research Teams." Each team was composed of one or more designers well known to the Museum and a group of technologists, staff members of nationally recognized research institutions. These teams were established with the hope that this unusual combination of designers and technologists could provide systematic exploration of techniques which had resulted in low-cost products in many fields of everyday use but which had not yet been applied to furniture manufacturing. Despite the advantage of their grants, these teams competed under several effective handicaps. Design by committee is inevitably laborious and cumbersome, particularly so when team members have not previously worked together and, as in these teams, were used to very different procedures. Besides, each team was required to submit a thorough report of its objectives, activities and achievements, reports which proved to be of the greatest interest. A special prize of $2,500 was set up for the best of these reports. (A description of each team will be found on pp. 19-23, 44-57.)

The jury invited to award these prizes consisted of:

ALFRED AUERBACH, design and merchandise consultant, head of Alfred Auerbach Associates, New York City. Mr. Auerbach was Editor-in-Chief of *Retailing* magazine for 15 years. For many years he has

contributed articles in behalf of modern design to periodicals here and abroad, and is a frequent lecturer on the subject. During the war he was Director of the Consumer Goods Division of the Office of Price Administration.

CATHERINE BAUER, housing expert, Vice-President of the National Public Housing Conference of Washington, D. C., since 1942. Author of *Modern Housing*, published in 1934, and a Guggenheim student of housing and planning abroad, Miss Bauer was instrumental in the promotion of basic social legislation in the housing field and in the passage of the U. S. Housing Act of 1937. She has been a professor and lecturer in a number of the larger universities in the country, a consultant to several government housing and planning boards. She now lives in Cambridge, Mass., where her husband, William W. Wurster, is Dean of Architecture and Planning at Massachusetts Institute of Technology.

LUIS DE FLOREZ, President of the de Florez Engineering Co., New York City, former Deputy Chief of Naval Research. Active in engineering research for naval aviation in both World Wars, Rear Admiral de Florez received among other honors the Legion of Merit and the Distinguished Service Medal. In civil life he has been granted scores of patents for his inventions, particularly in the oil refining industry.

RENÉ D'HARNONCOURT, recently appointed Director of The Museum of Modern Art. Mr. d'Harnoncourt has been Chairman of the Indian Arts and Crafts Board of the Department of the Interior, and also Chairman of the Committee on Manual Industries for the Inter-American Development Committee. In addition to his Museum work, he has been active in UNESCO affairs since its establishment.

HUGH LAWSON, Divisional Merchandise Manager of Home Furnishings, Carson Pirie Scott & Co., Chicago, since 1938.

LUDWIG MIES VAN DER ROHE, Director, Department of Architecture, Illinois Institute of Technology. Mr. van der Rohe first practiced architecture in Berlin where he directed architectural exhibitions and was the First Vice-President of the Deutscher Werkbund. 1930-1933 he was Director of the Bauhaus in Dessau and Berlin. He came to this country in 1938. A large retrospective exhibition of his work was held in The Museum of Modern Art in 1947.

GORDON RUSSELL, Director, The Council of Industrial Design, Great Britain. As early as 1919, after his demobilization, Mr. Russell established his own furniture manufacturing firm where some of the best-known designers in Britain received part of their training. He has studied design extensively in Europe and America and has written, lectured and broadcast for many years. He was Chairman of the Board of Trade Design Panel, 1943-1947, and a member of the wartime Utility Furniture Advisory Committee and the Furni-

ture Production Committee. Besides numerous other honors bestowed on him, he was elected one of the 40 Royal Designers for Industry in 1940 and is at present Master of the Faculty; in 1945 he was elected a First Fellow of the Society of Industrial Artists.

The jury's decisions were final.

From the beginning the Competition aroused great interest. In Europe and elsewhere in the world designers responded to the challenge. In the United States over 250 entrants competed, principally from New York and California. Almost twice as many competitors entered the Competition from 31 foreign countries. The greatest number of these was from Germany, followed by France, Austria, Britain and Holland. In all, almost 3000 different designs were submitted. Indicative as these figures may seem, they do not reveal the full scope of designers' enthusiasm. Many competitors submitted an astonishing variety of entries and put many hours of patient, often expert labor into the presentation of their ideas.

This extraordinary response made the task of the jury a particularly heavy one. Their responsibility was conscientiously accepted with humor, patience and rewarding mutual respect, over a series of prolonged sessions. In reaching its conclusions the jury decided that none of the entries eligible for the Simmons prize was sufficiently in advance of convertible bed-living room units already on the market and this prize was not awarded.

In the field of seating both the first and second prizes were divided between two entrants. The first prize was awarded to the entries of Don R. Knorr, a young graduate of Cranbrook Academy (pp. 13-15), and of Professor Georg Leowald of Berlin (pp. 16-18). The second prize was divided between a team entry from Charles Eames and U.C.L.A. (pp. 19-23), and one from a young Chicago designer and teacher, Davis J. Pratt (pp. 24-25). The third prize was awarded to a design of Alexey Brodovitch, well-known art director in New York City (pp. 26-31). An Honorable Mention was also awarded to a design by two young students then at M.I.T., John B. McMorran, Jr. and John O. Merrill, Jr. (pp. 32-33).

In the field of storage units only the first prize was awarded: to the entry of Robin Day and Clive Latimer of London (pp. 34-41). And the jury further designated the entry of Ernest Race of London (pp. 42-43) as an Honorable Mention, unanimously agreeing on its unusual merit and the excellence of its appearance, yet finding its solution too limited in terms of American usage to warrant a prize.

The Museum agreed to exhibit winning entries and manufactured furniture whenever this became available to the purchasing public if the designs were realized in a form satisfactory to the designers and the Museum. Additional entries of merit which did not win prizes were planned as part of this exhibition from the start. This is the exhibition now presented.

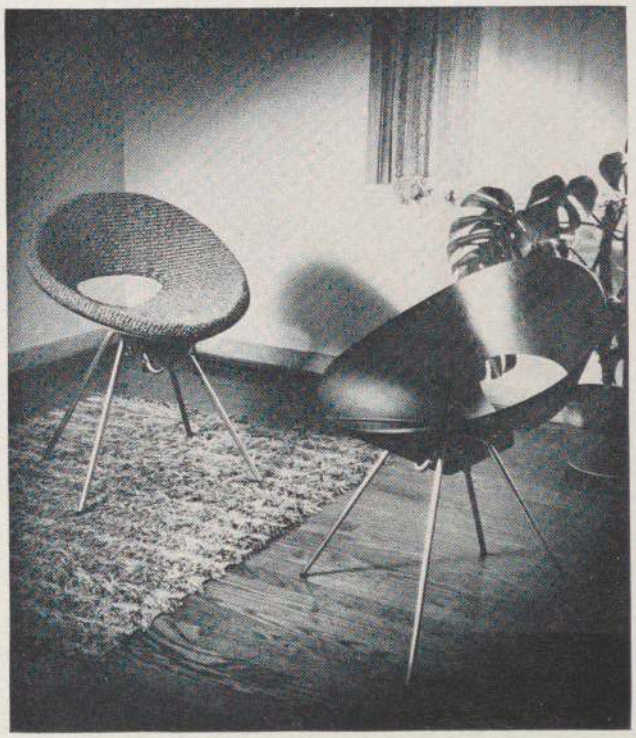
EDGAR KAUFMANN, JR.
Director of the Competition

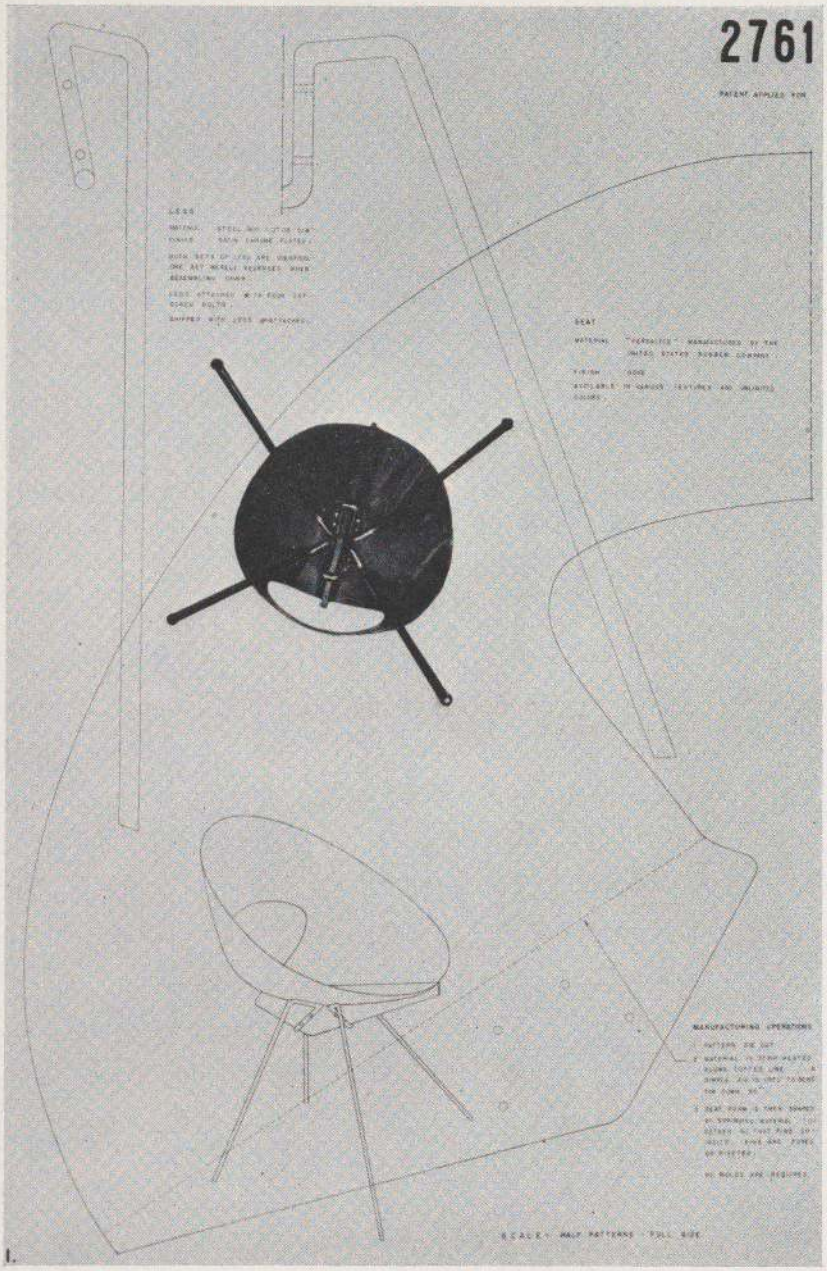
Co-winner of First Prize, Seating Units

Chair Designed by **Don R. Knorr,** San Francisco;
Manufactured by Knoll Associates, New York

Light, flexible and elegant, this chair develops one of the most ingenious structural schemes seen in modern furniture today. In order to provide the complicated curves which conform to human anatomy, a piece of flat sheet metal has been cut to the proper shape and bent around to meet itself in a seam in the seat of the chair. This structural feature and the simple shape and attachment of the legs facilitate the manufacture and storage of the piece. A special flexible paint is used that will not spring when the sheet metal bends in usage.

A simple rubber pad may be added to this chair for increased comfort, allowing a wide variety of upholstery material to be used. The legs of the chair are rubber tipped to provide stability and to prevent undue wear of floor coverings. The chair is available in red, black or yellow enamel with black legs.

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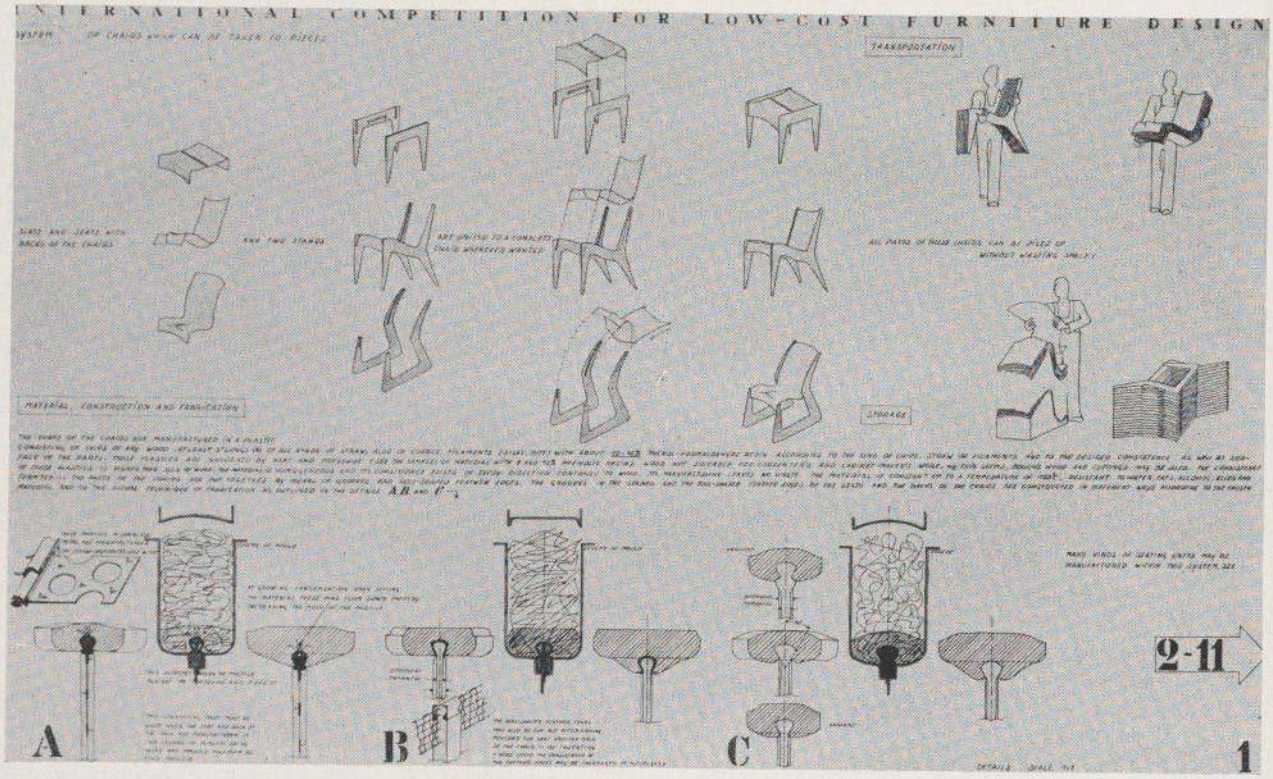
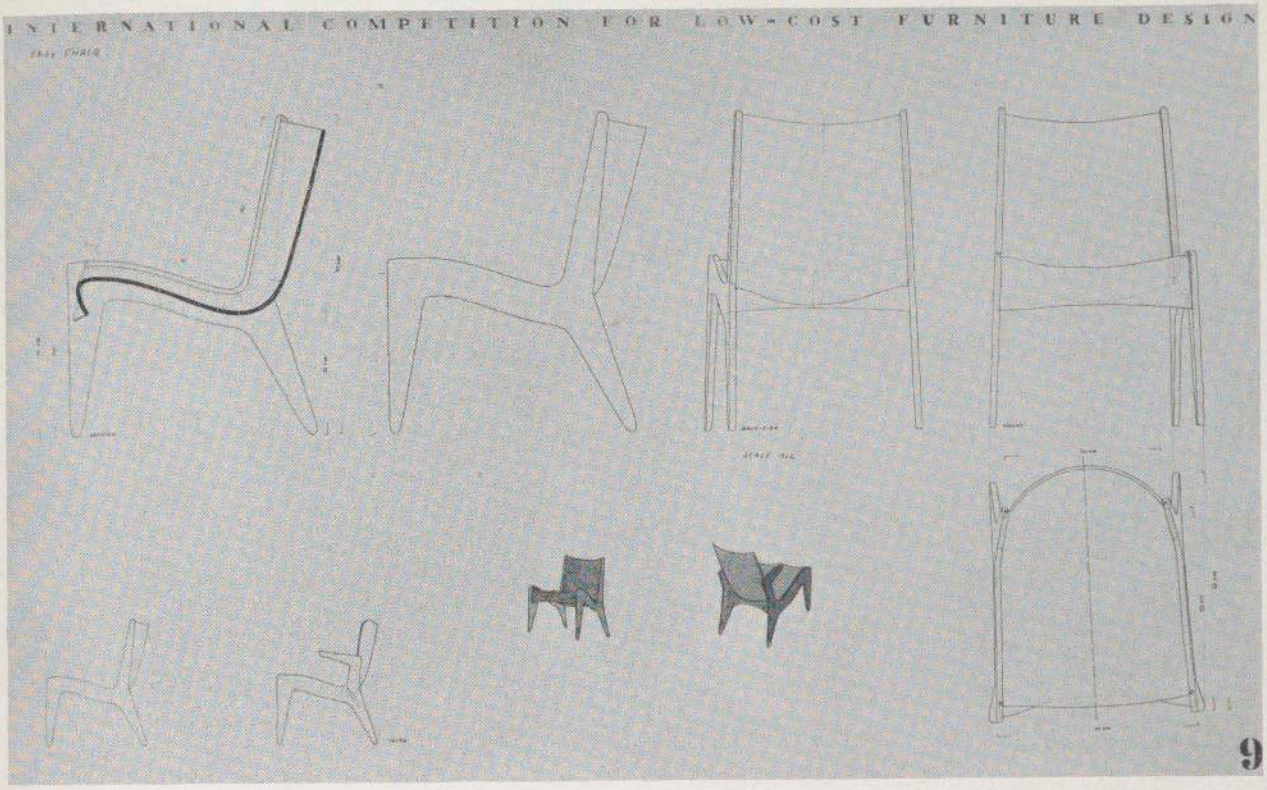
PATENT APPLIED FOR
LEGS
SEAT
MANUFACTURING OPERATIONS
SCALE: HALF PATTERNS - FULL SIZE

Co-winner of First Prize, Seating Units

Chair Designed by **Georg Leowald,** Berlin-Frohnau

Among the many German entries in the competition, this one by Professor Leowald presented a most advanced concept of technology. He has envisaged a continuous seat and back formed of molded plastic sliding in metal grooves into a variety of slab-like plastic side elements. The parts would thus become interchangeable, and shipping space could be reduced. Many technological details could not be solved with the limited facilities available in post-war Germany and would require further investigation along lines which have not yet been undertaken in this country. Professor Leowald envisaged his chairs in integrally colored plastic.




INTERNATIONAL COMPETITION FOR LOW-COST FURNITURE DESIGN
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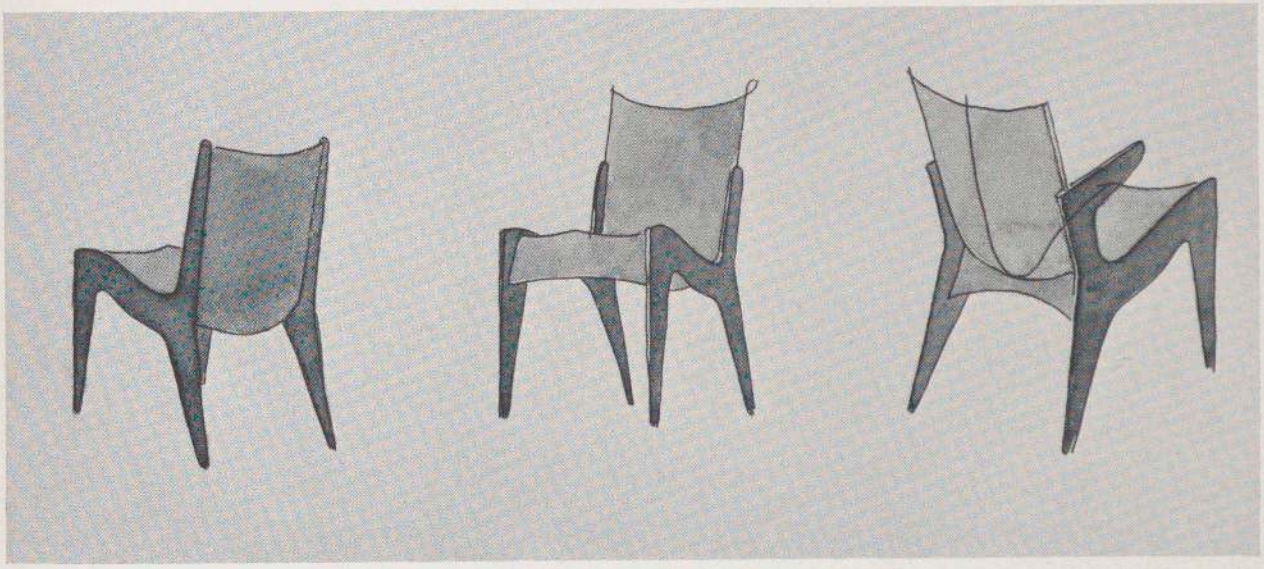

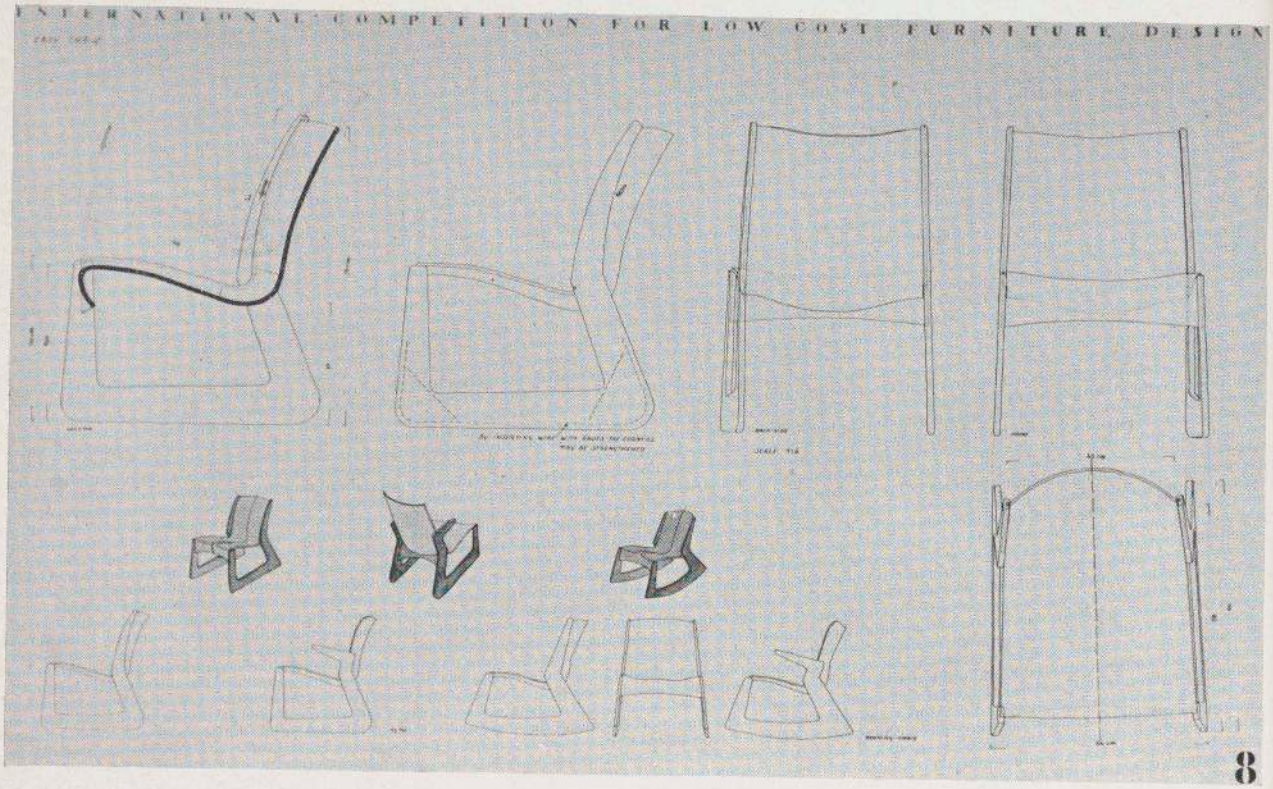
INTERNATIONAL COMPETITION FOR LOW COST FURNITURE DESIGN

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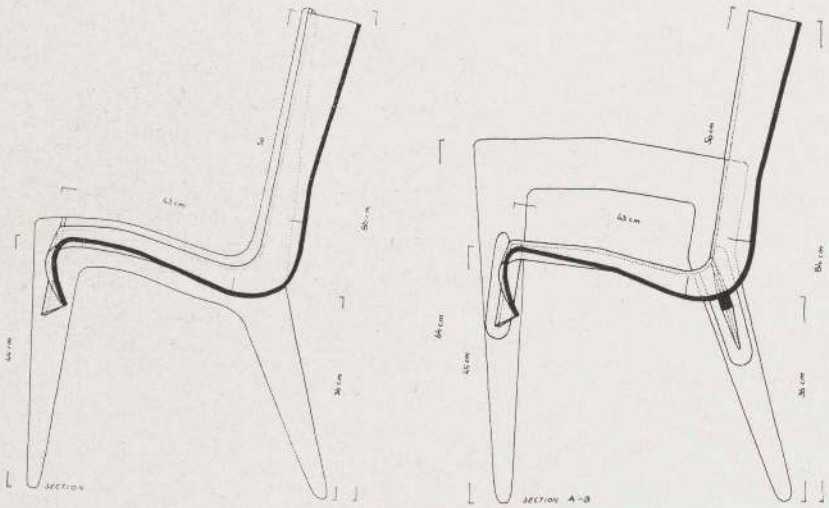

SECTION
SECTION A-B

Co-winner of Second Prize, Seating Units

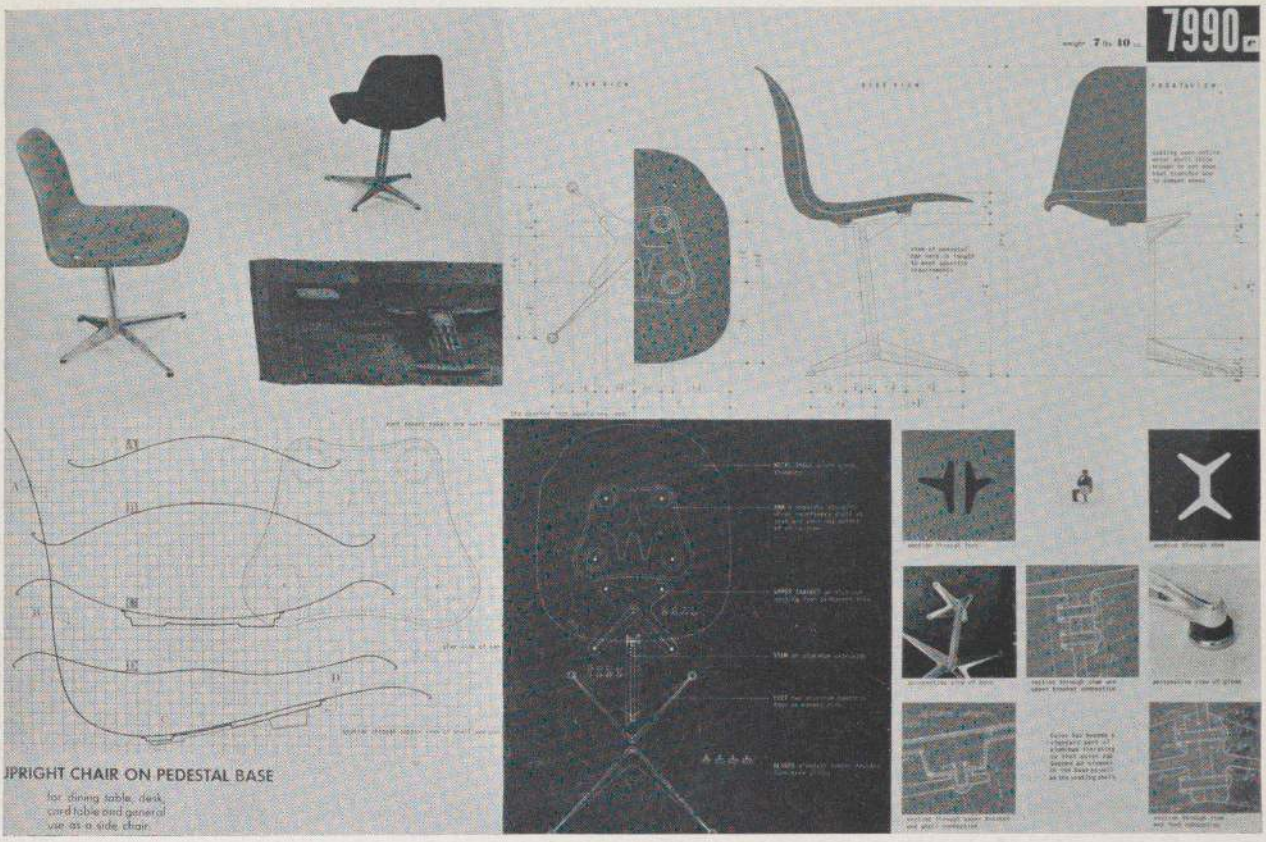
Chair Designed by **Charles Eames,** and the
University of California, Los Angeles Campus;
Manufactured by Herman Miller Furniture Company,
Zeeland, Michigan

Members of the team: Eames design group: Charles Eames, Ray Eames, Don Albinson, Frances Bishop, James Connor, Robert Jakobsen, Charles Kratka, Frederick Usher, Jr.; University of California, Los Angeles Campus, Department of Engineering: L. M. K. Boelter, Dean; Morris Asimow, Don Lebell, Wesley L. Orr.

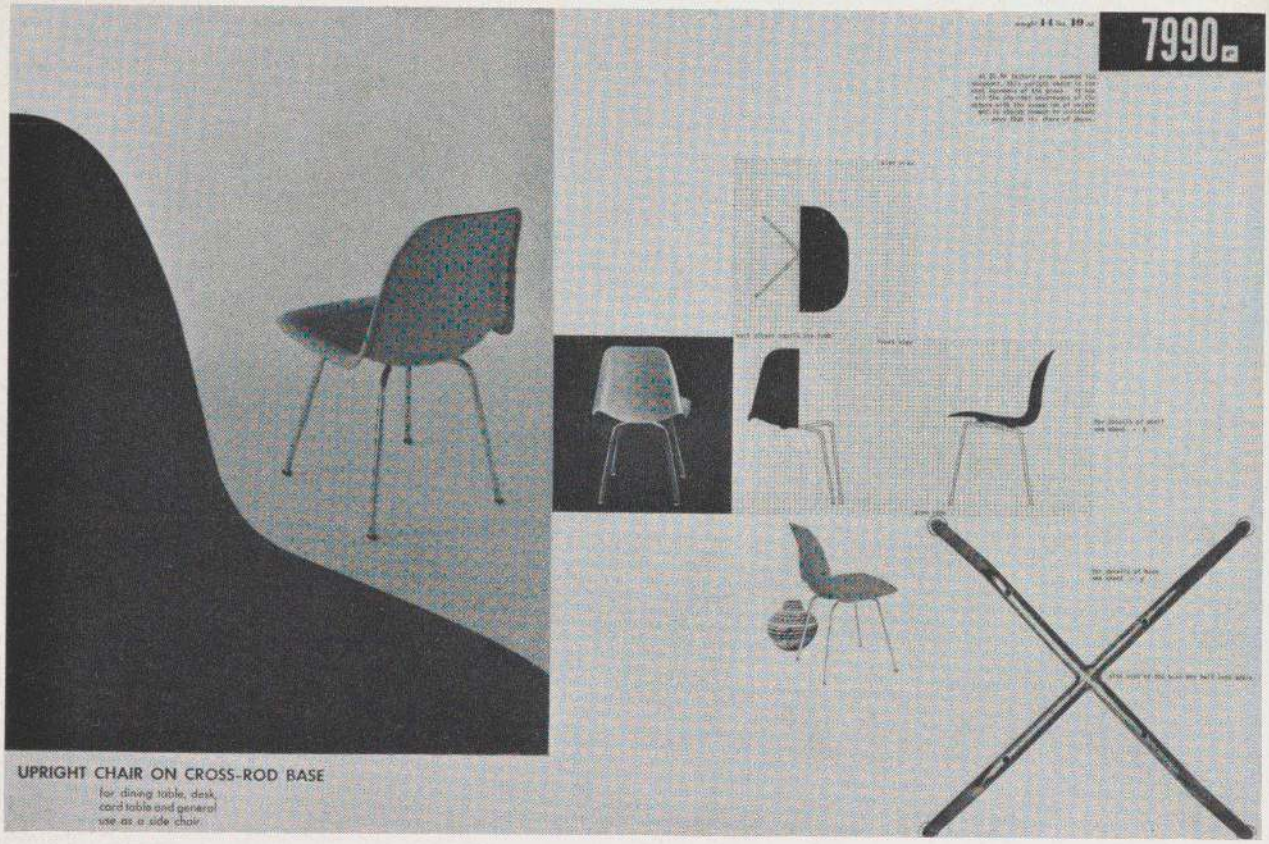
This molded fibre glass chair is in many respects an astonishing fulfillment of the ideas developed by Charles Eames and his occasional associate Eero Saarinen in 1940 when similar designs of theirs won first prize in The Museum of Modern Art's Organic Design Competition. The 1940 chairs produced in laminated plywood were the point of departure for many interesting designs by both these men, which are now on the market, but the chair presented here is closer to the original concept than any of the variations they have carried out during the 10-year interim. Now it has been possible to find a plastic substance and a molding process

which allow this kind of shape to be produced economically. Chairs with complicated molded curves like this have always presented a special problem in the attachment of legs, but this time the problem has been solved with unusual directness and neatness.

Perhaps the greatest advantage of this chair is the extraordinary lustre and soft, smooth surface of the plastic which, strengthened by the silky threads of glass imbedded within it, quickly absorbs room temperatures. Never before used in furniture, this airplane plastic is virtually indestructible and withstands stains and mars. Both to the eye and to the touch this plastic is a most desirable addition to the gamut of materials available for modern rooms. Unlike similarly shaped chairs, this one permits many shifts of position which, it has been discovered, is a necessary characteristic of a chair that is to be comfortable. The chair is available not only with four metal legs but also with a central supporting pedestal, with a cat's-cradle base and with rockers. The plastic is integrally colored off-white, medium grey, gun-metal or a soft light grey-brown.

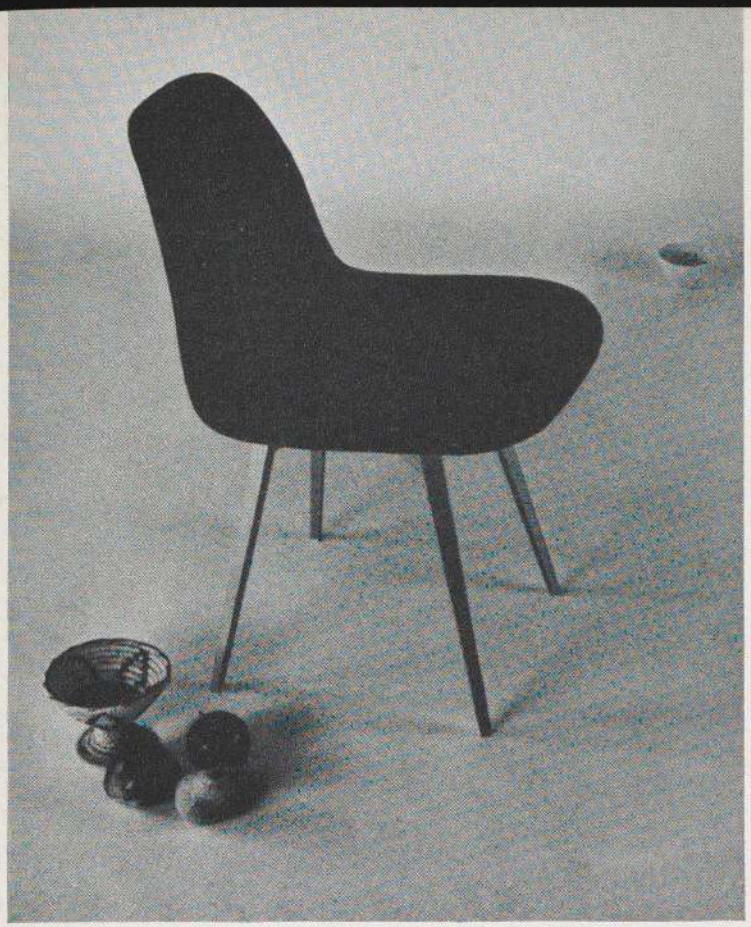


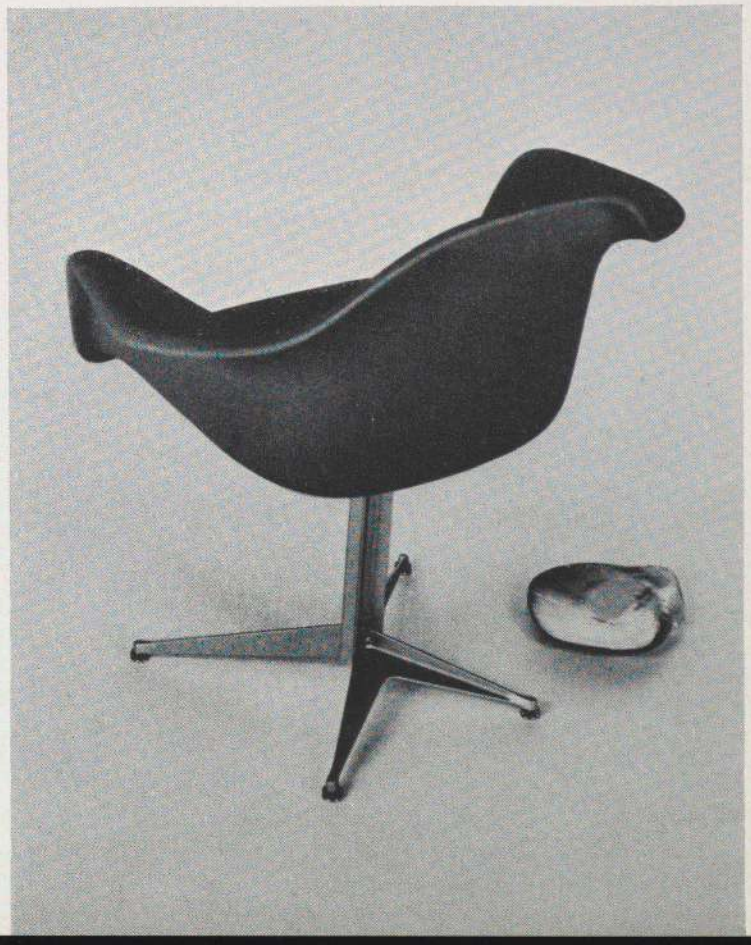
The form of these chairs is not new nor is the philosophy of seating embodied in them, but they have been designed to be produced by existing mass production methods at prices that make mass production feasible and in a manner that makes a consistent high quality possible.



UPRIGHT CHAIR ON CROSS-ROD BASE

for dining table, desk, card table and general use as a side chair



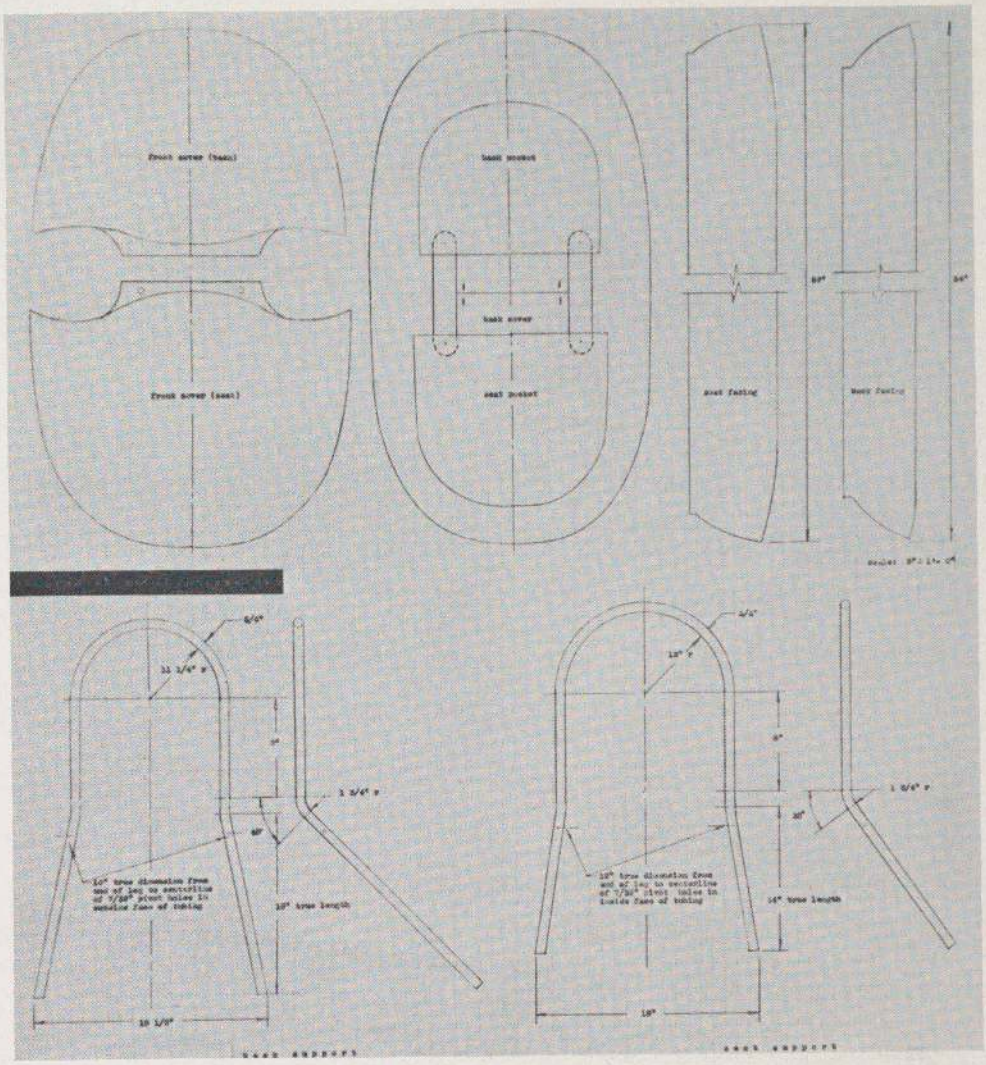


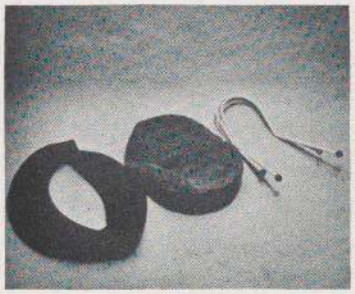
Co-winner of Second Prize, Seating Units

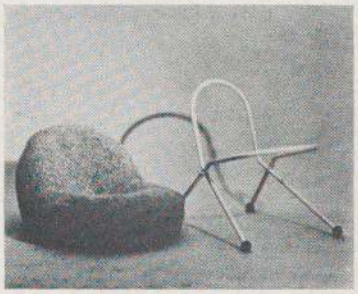
Chair Designed by **Davis J. Pratt,** Chicago

One of the most important problems in furniture design is that of a really soft, comfortable chair. Few modern designers until now have chosen to try their hand at it. Davis Pratt went to one of the forms of cushioning most available in modern life—an inflated tube, particularly because the technical problems had in large part been solved by the automobile tire industry. After some experimentation, Mr. Pratt determined that maximum comfort could be secured by containing an inflated ring within a fairly heavy envelope which distributed resilience over a large surface. He later determined that by separating the ring into two parts, one for the seat and the other for the back, comfort could be considerably increased. These procedures have allowed him to avoid the unnecessary uniform resilience provided in air mattresses, for example, as well as the somewhat personal touch which anyone will remember who has sat within an inflated inner tube on some summer picnic.

The rubber-tipped metal legs devised by Mr. Pratt may be folded nearly flat for convenient shipping, which is also aided by the other collapsible features of the chair. The retail price has been estimated at $30.


Front cover (back)
Front cover (seat)
back pocket
back cover
seat pocket
seat facing
back facing
back supports
seat supports

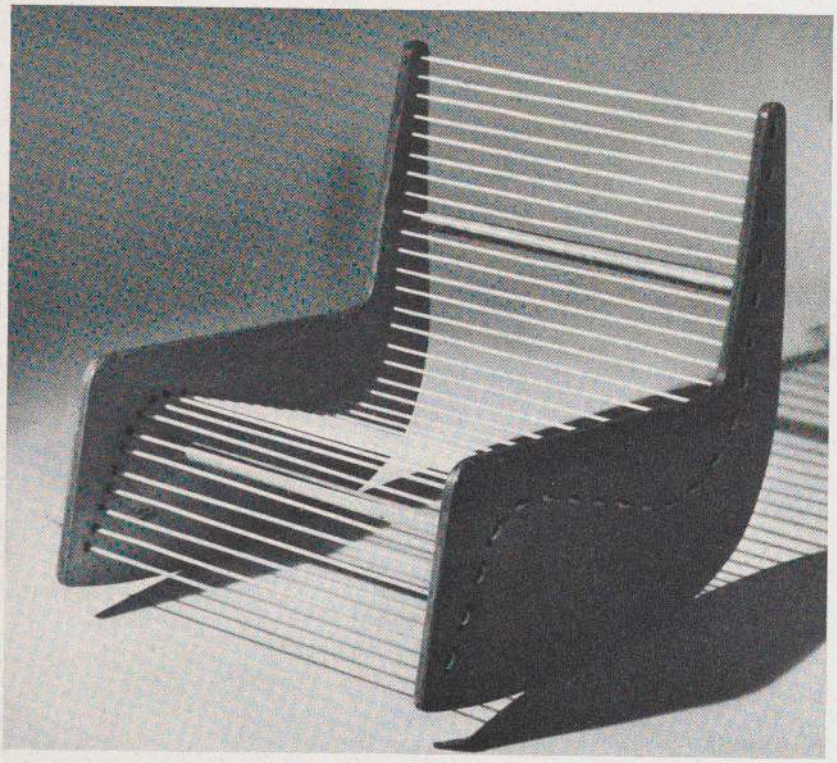


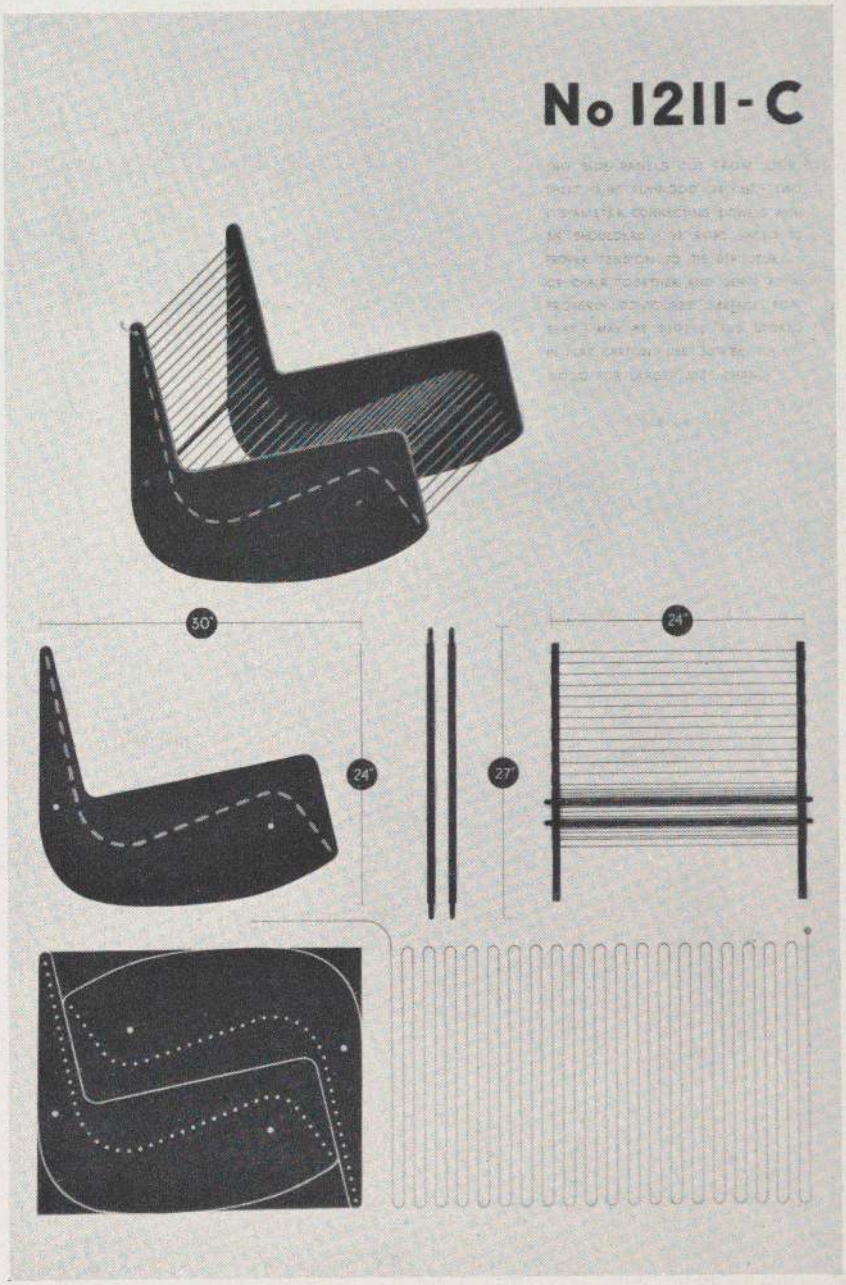


Third Prize, Seating Units

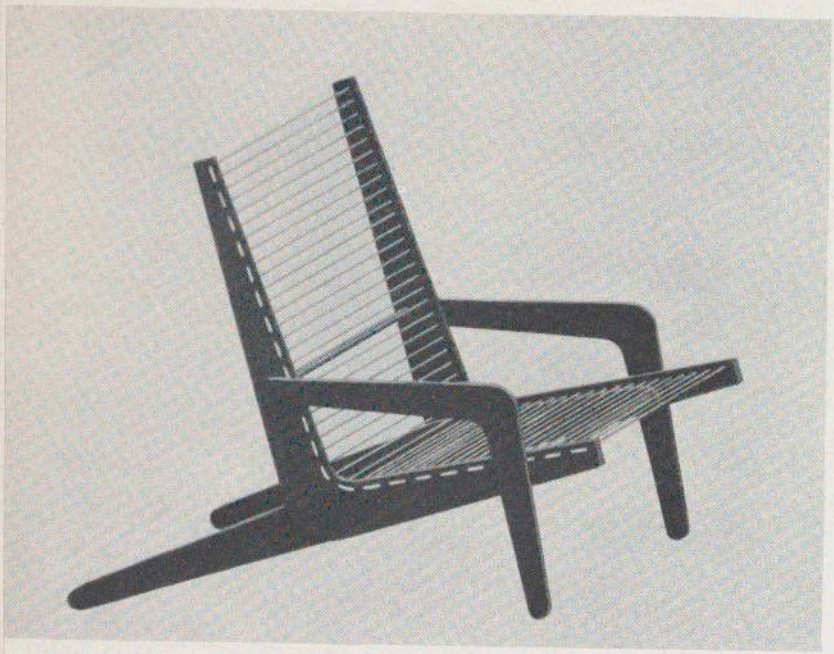
Chair Designed by **Alexey Brodovitch,** New York City

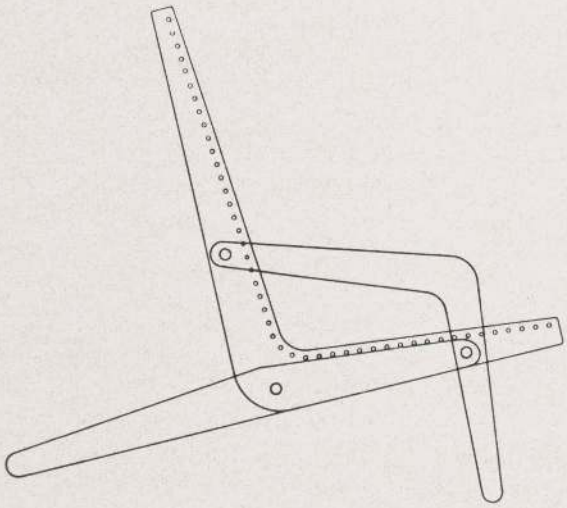
For many years Mr. Brodovitch has been working on the problem of inexpensive knock-down furniture with plastic-covered resilient cord, flat plywood and dowel pins as the main ingredients. The plywood parts are shaped to be cut from standard sheets with a minimum of waste. Besides the exceptionally simple and comfortable rocker which was awarded third prize in this competition, Mr. Brodovitch submitted a variety of models showing different side-supports. His presentation also indicated the possibility of weaving some sort of tape at right angles to the cord, thus providing a less transparent surface, and the possibility of using detachable pads for those who do not like the idea of sitting directly on the cord. Out of these simple elements many of the pieces of furniture needed in the home could be supplied, and it is indeed Mr. Brodovitch's system, as well as his individual designs, which seems worthy of attention.

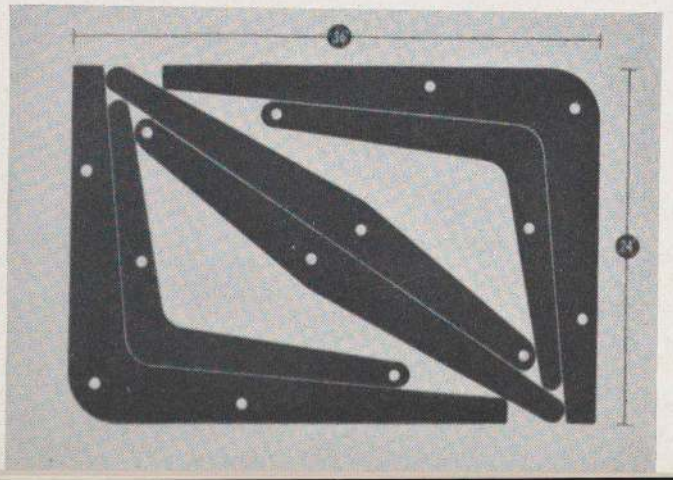


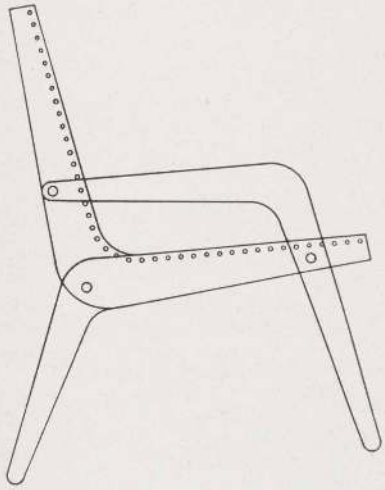


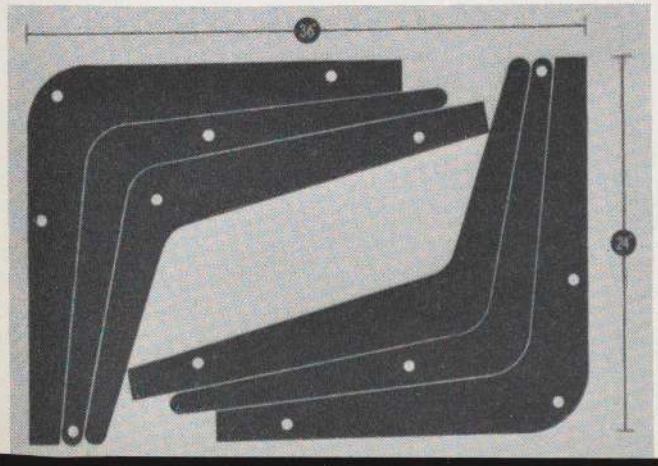
Two side panels cut from one sheet 13/16" plywood, 24 x 36". Two 1" diameter connecting dowels with 3/4" shoulders. A 92-foot rope laced to proper tension to tie structure of chair together and serve as a properly contoured surface for seat. It may be shipped and stored in a flat carton. For a larger chair size, 30 x 36" plywood should be used.

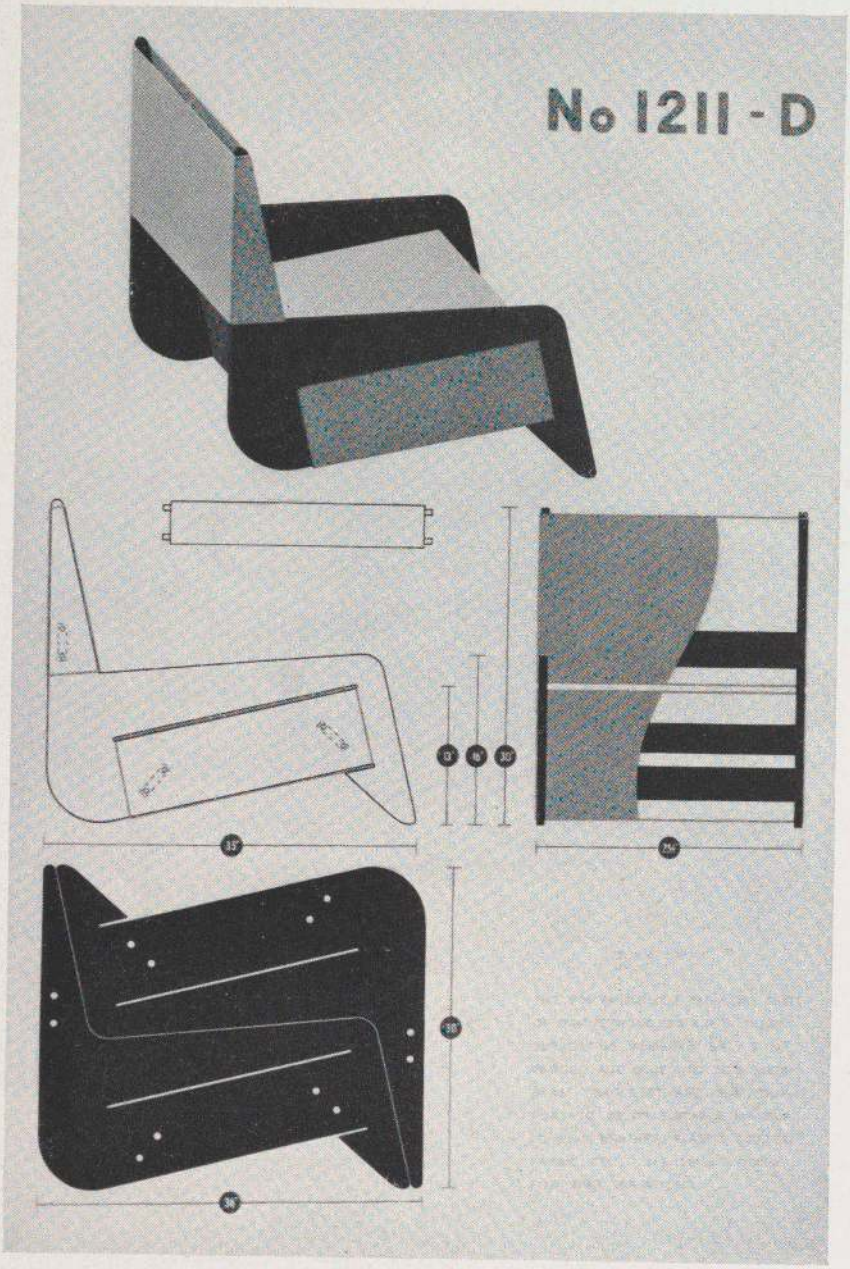




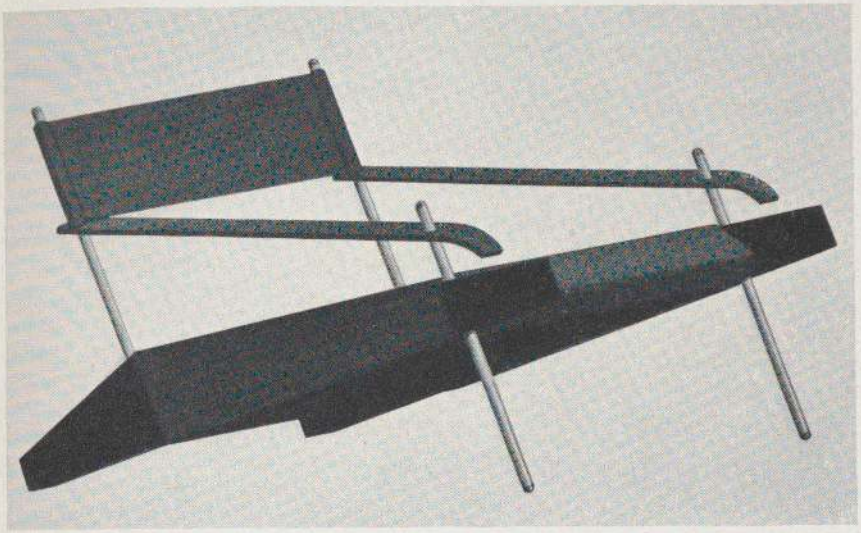


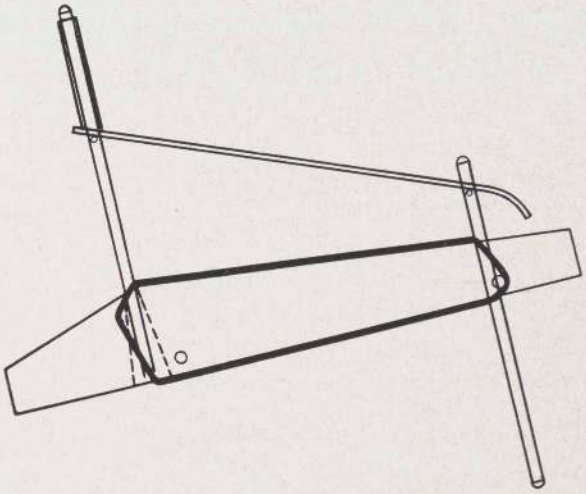


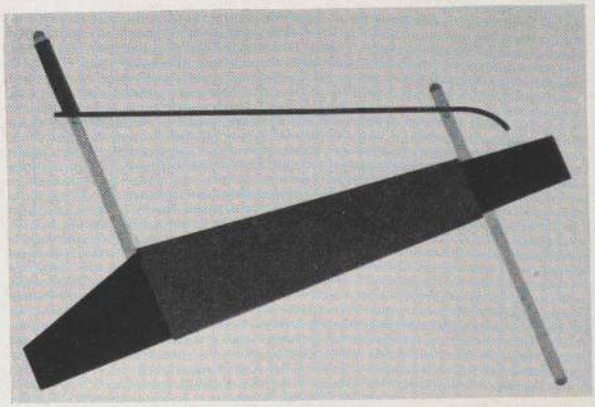

36
24



Two side panels cut from one sheet of 13/16″ plywood, 30 x 36″. Three supporting members 3/4 x 3 1/2″ pegged and glued to side members. Backrest and seat support to be of suitable material (canvas, leather, plastic-coated fabric, etc.).



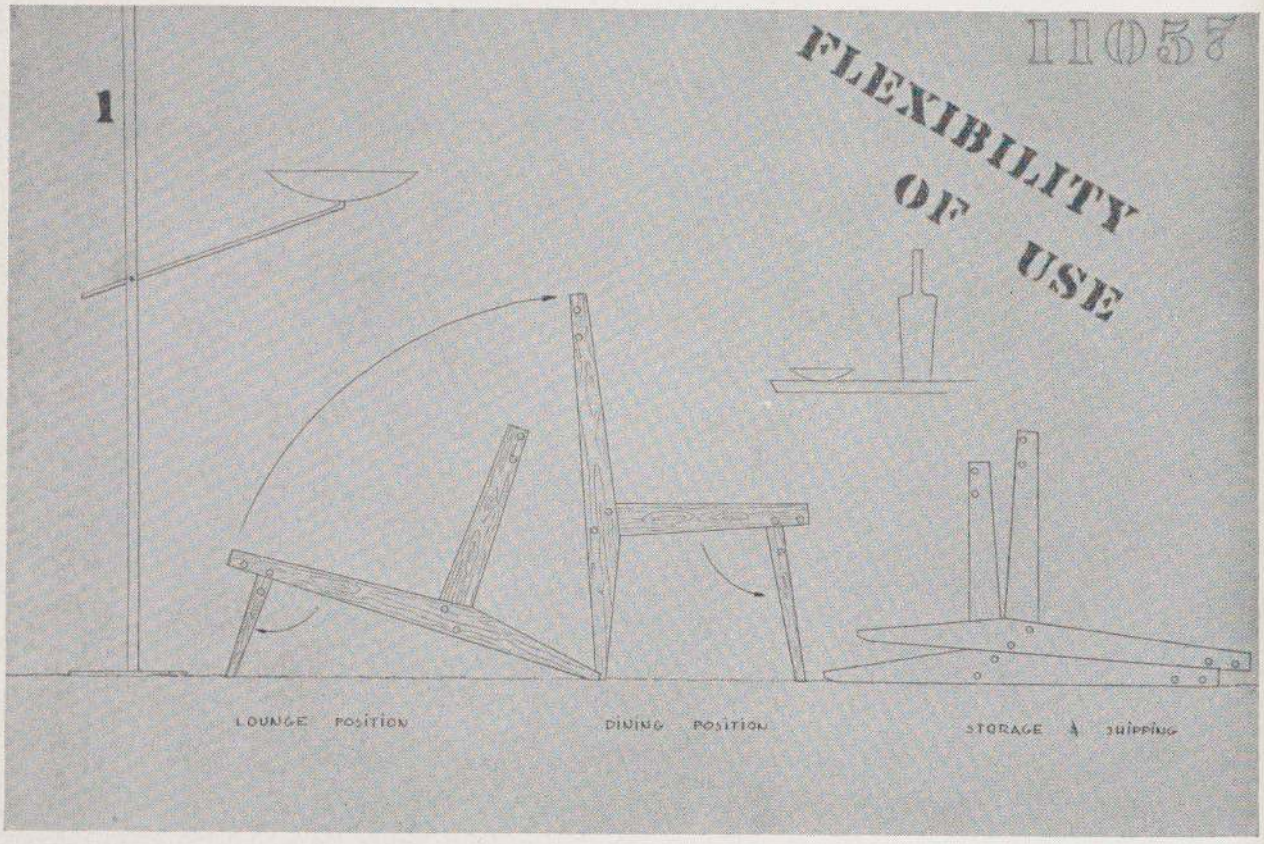


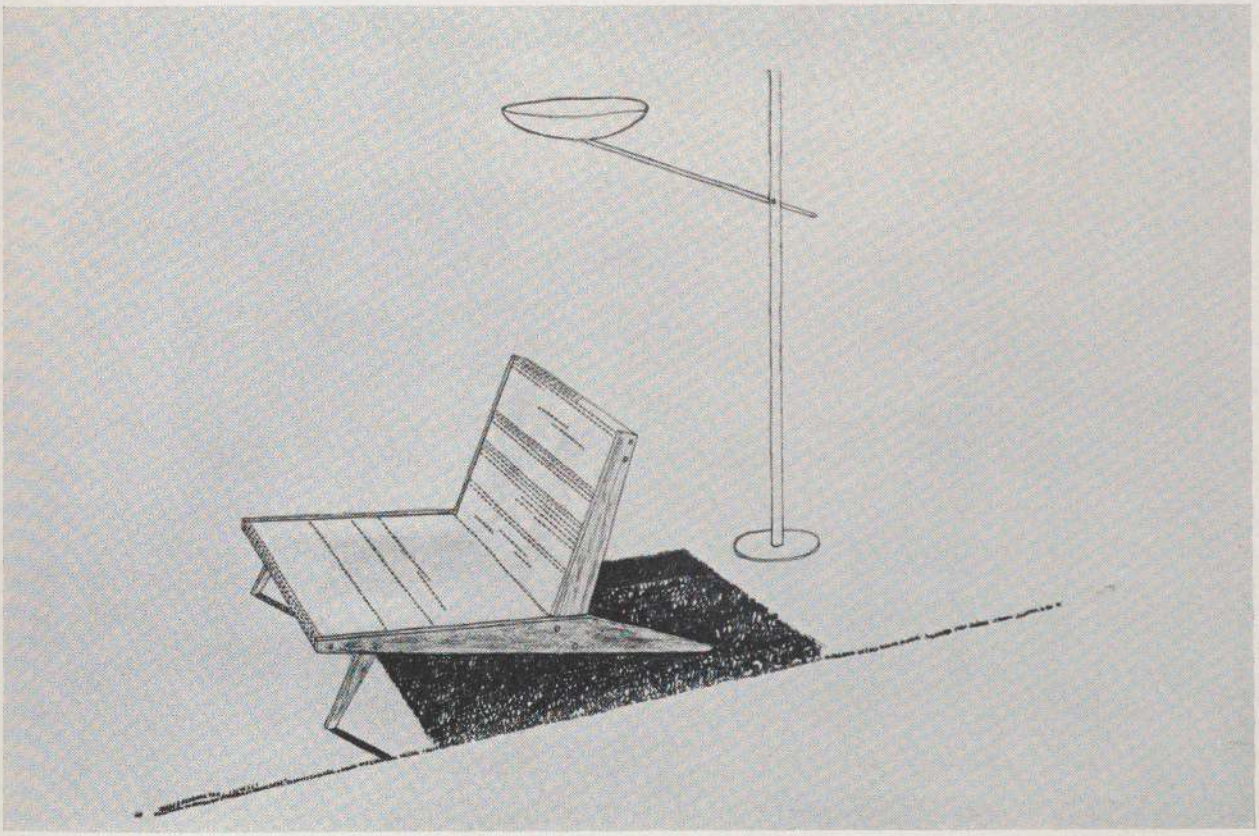


Honorable Mention, Seating Units

Chair Designed by **John B. McMorran, Jr.,** and **John O. Merrill, Jr.** of the Massachusetts Institute of Technology

The ingenious little chair developed by these two M.I.T. students would seem to be one of the handiest yet devised for the small home. A single unit provides a chair suitable for use at a table or, after making an extremely simple adjustment, for relaxed conversation. The basic idea could be developed for almost any materials. A wide variety of appearance and effects could be achieved.





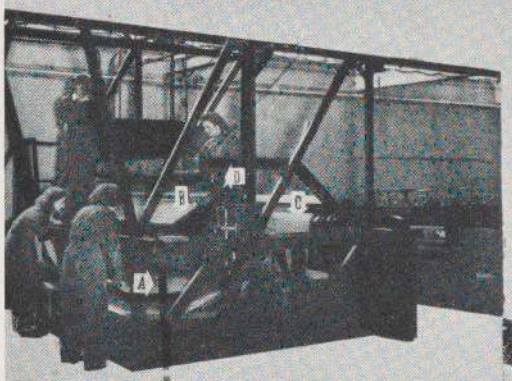
First Prize, Storage Units

Storage pieces Designed by **Robin Day** and **Clive Latimer,** London; Manufactured by Johnson-Carper Furniture Co., Inc., of Roanoke, Virginia

The photographs on these and the following two pages represent prototypes made in Britain according to the designers' original concept. Later pages (38 and 39) show these designs as altered to accord with American manufacturing needs. These alterations were confirmed by the original designers.

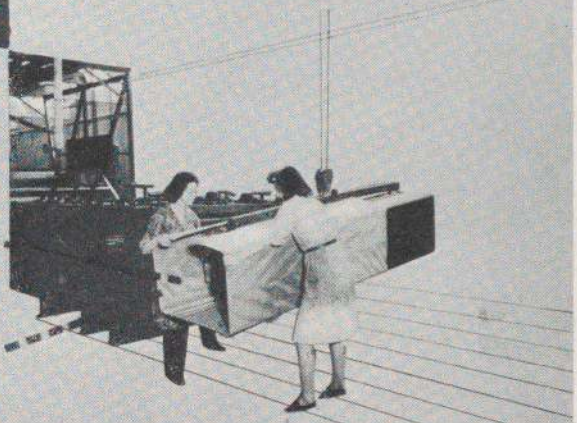
2 storage units

manufacture and basic units



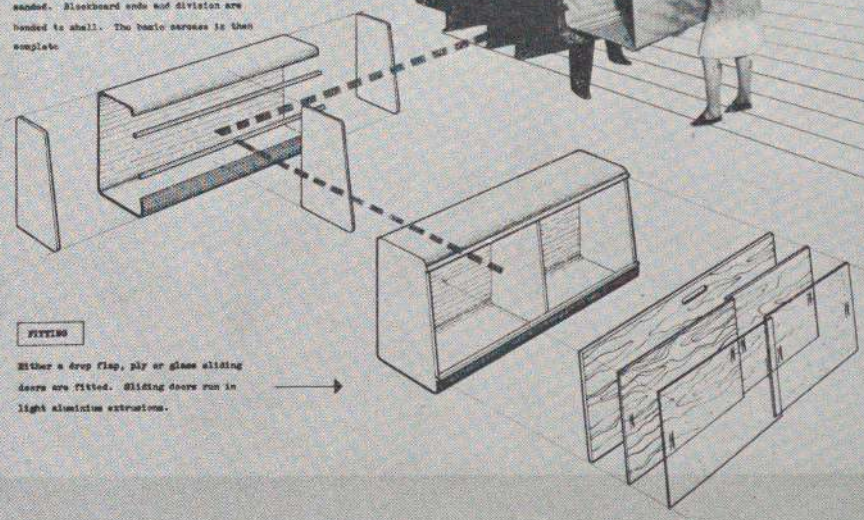
FORMING

This process uses veneers jointed on a tapeless jointer, coated in a glue spreader and made up into a pack as in normal plywood manufacture. The veneer pack A is slipped to the edge of a steam heated former B which rotates and winds on the laminae. Pressure is applied by a canvas band C in constant tension and by a heavy roller D which rides on the canvas during rotation. The ply-wrapped former is removed by a gantry and put into a small press for 15 minutes to complete curing. The use of 3 formers gives a production rate of 20 shells an hour per machine



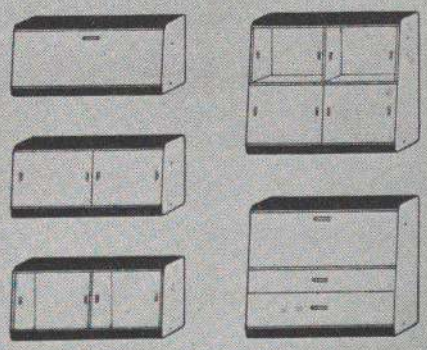
ASSEMBLY

Edges of shell are trimmed and the outside sanded. Blockboard ends and division are bonded to shell. The basic carcass is then complete

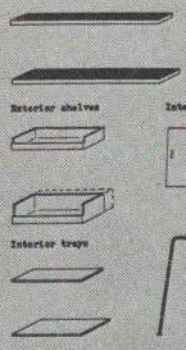


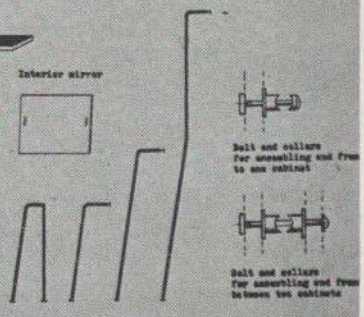
FITTING

Either a drop flap, ply or glass sliding doors are fitted. Sliding doors run in light aluminium extrusions.

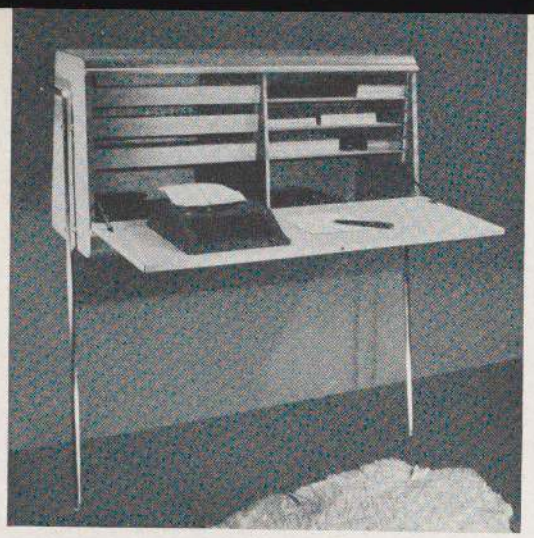


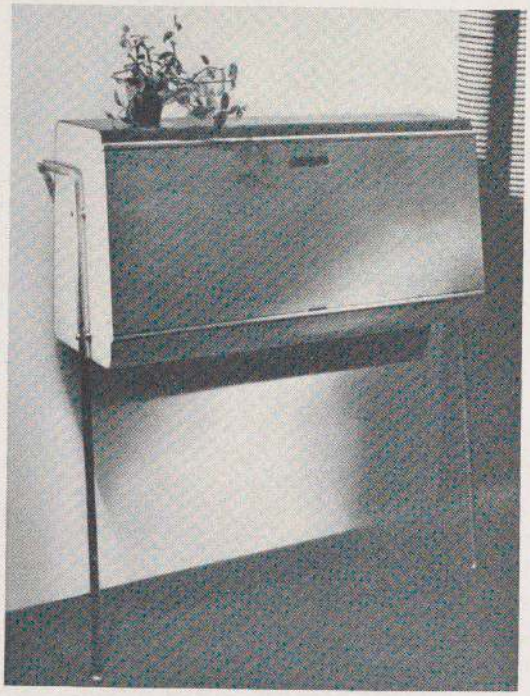
Above are typical units. Further variation can be made from these parts.

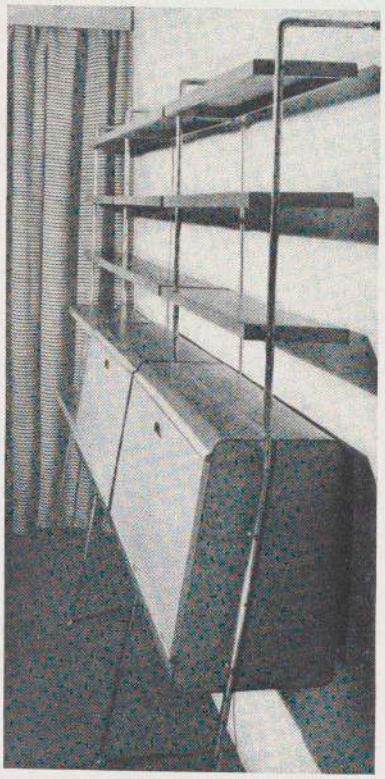


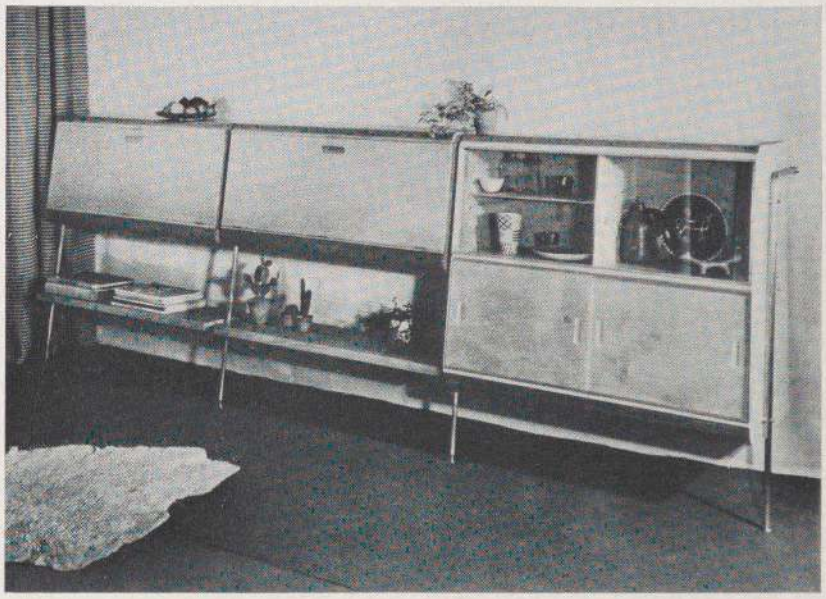


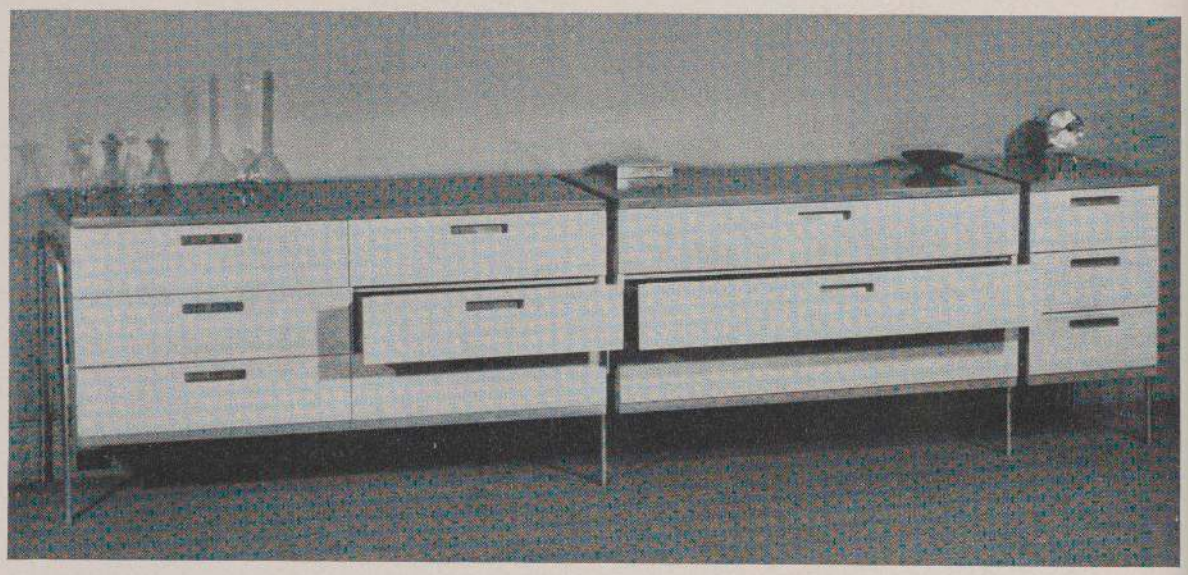
Four types of end frames







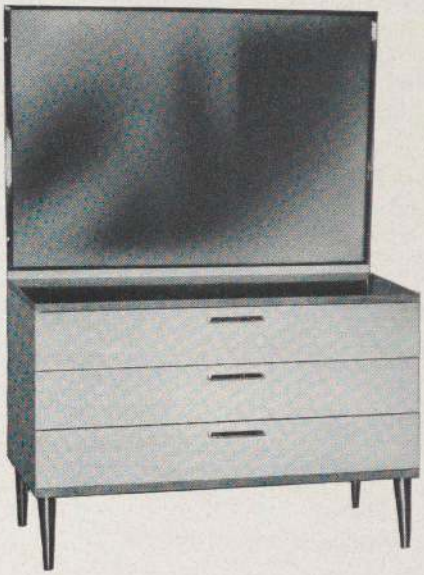


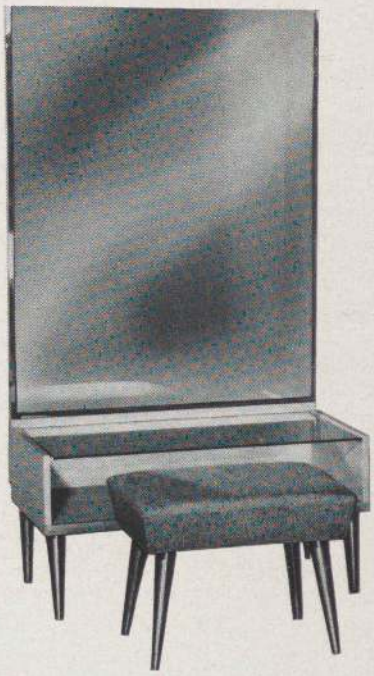


Two outstanding features give this Prize Design its special value: first, the peaceful, uniform horizontal lines of the drawer faces, accented but not interrupted by finger recesses backed with brushed brass-finished plates; second, the tubular metal supports from which the cabinets hang at a height which makes for easy access and cleaning. Another unusual feature is the way in which both the cabinets and their supports taper back from a wide base to a narrow top. This line gives an air of great stability to the pieces and increases available storage space while seeming to occupy less space at the noticeable table-top level. Besides an ingenious variety of drawer units, a "highboy" with a drop-leaf front has been provided. Behind the drop-leaf, which supplies desk space, a number of simple, removable partitions are available which can be omitted if desired. Also, a special high side-support has been designed to allow open book shelves on top of the 5-drawer chest or desk. Besides emphasizing the unity of the storage space, the system of brass-finished tube supports permits units to be rowed up in an orderly fashion and yet, because of the rhythmically repeated breaks, eliminates all sense of massiveness and avoids the difficulty of matching wood colors.

Standard adaptations of the design were made by Edmond J. Spence, American consulting designer. These enjoy two features which the average American consumer seems to find desirable: a projecting handle on each drawer, in this case gently tapered to provide a comfortable finger-hold; and separate recessed legs on each cabinet. These legs are reminders of the days when the main framework of the cabinet was exposed in order to raise the storage space off the ground. For generations, however, this has not been the practice, and the exposed legs are extra pieces rather than a part of the framework. This system of supporting the cabinets from underneath rather than on the sides allows them to be lined up cheek by jowl, which in some cases would be advantageous. Accessory pieces of furniture have been supplied also: a variety of suitable mirrors, a dressing table and bench, a bed table.

Both the Prize Design and the Standard Adaptation are made with a gentle two-toned effect; the tops are of light grey walnut and the face and ends are of light cream Korina.

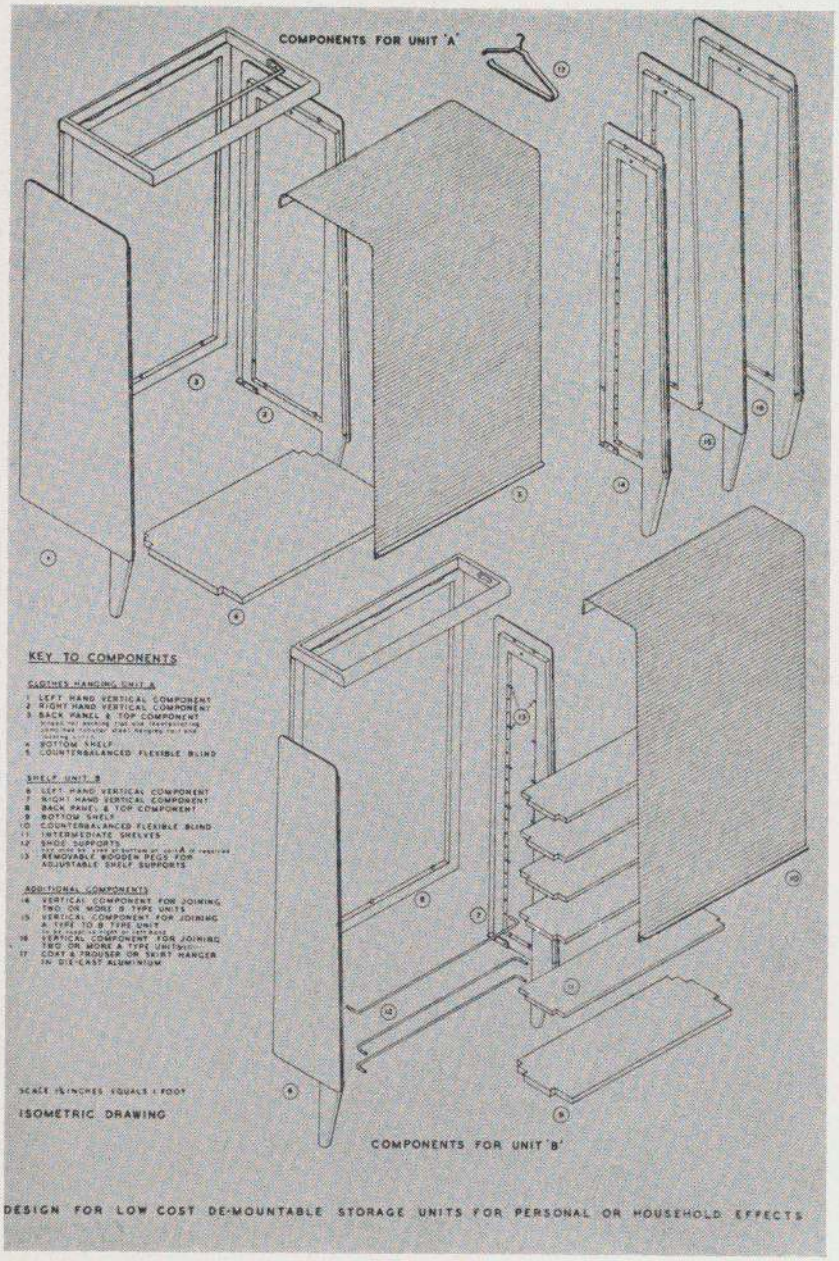


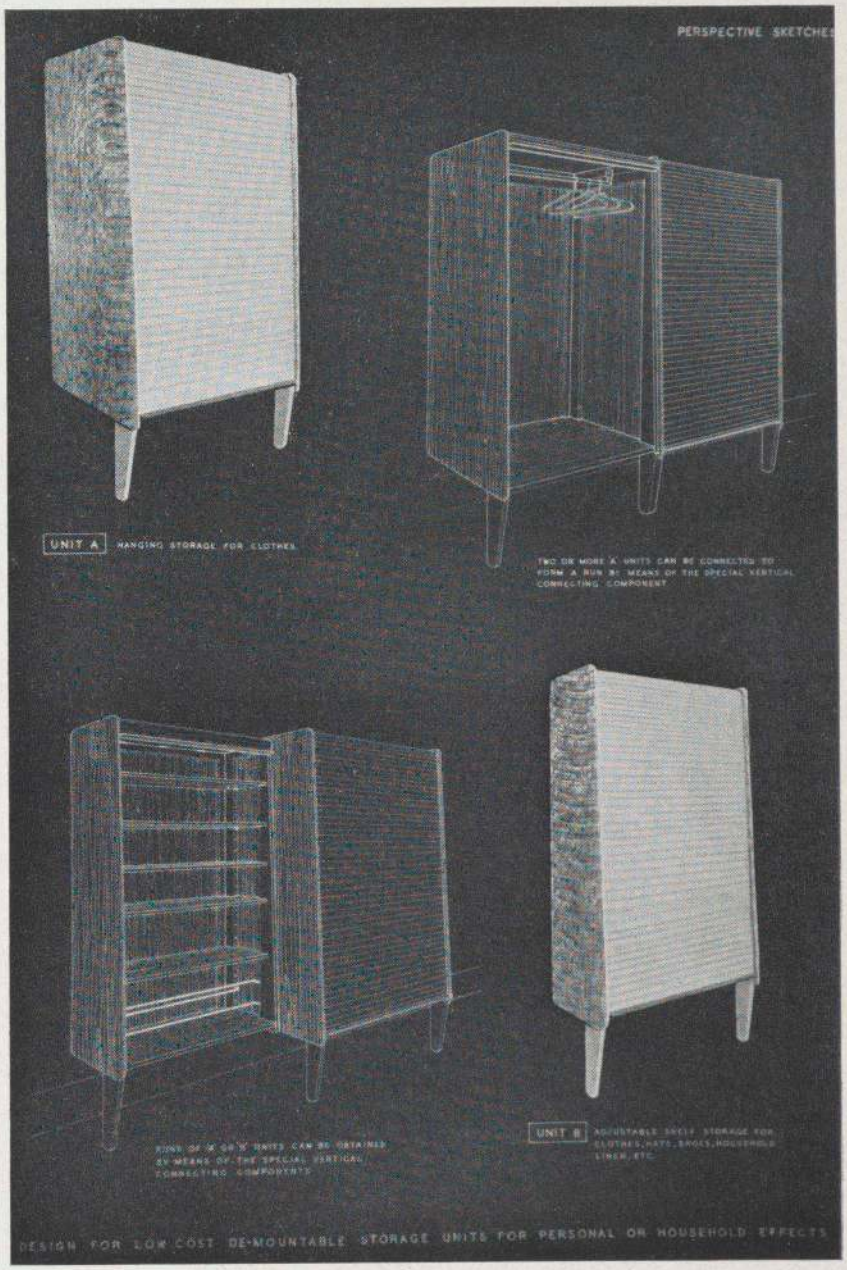


Honorable Mention, Storage Units

Storage Piece Designed by **Ernest Race,** London

Ernest Race's simple scheme for a wardrobe impressed the jury because of its neat structure and good looks. The fact that it did not present a solution to the storage problem that would be widely acceptable in this country did not make it suitable material for a prize. But the jury was unanimous in its desire to call attention to its virtues.




PERSPECTIVE SKETCHES
UNIT A HANGING STORAGE FOR CLOTHES
TWO OR MORE 'A' UNITS CAN BE CONNECTED TO FORM A RUN BY MEANS OF THE SPECIAL VERTICAL CONNECTING COMPONENT
RUNS OF 'A' OR 'B' UNITS CAN BE OBTAINED BY MEANS OF THE SPECIAL VERTICAL CONNECTING COMPONENTS
UNIT B ADJUSTABLE SHELF STORAGE FOR CLOTHES, HATS, SHOES, HOUSEHOLD LINEN, ETC
DESIGN FOR LOW COST DE-MOUNTABLE STORAGE UNITS FOR PERSONAL OR HOUSEHOLD EFFECTS

Design Research Team Entries

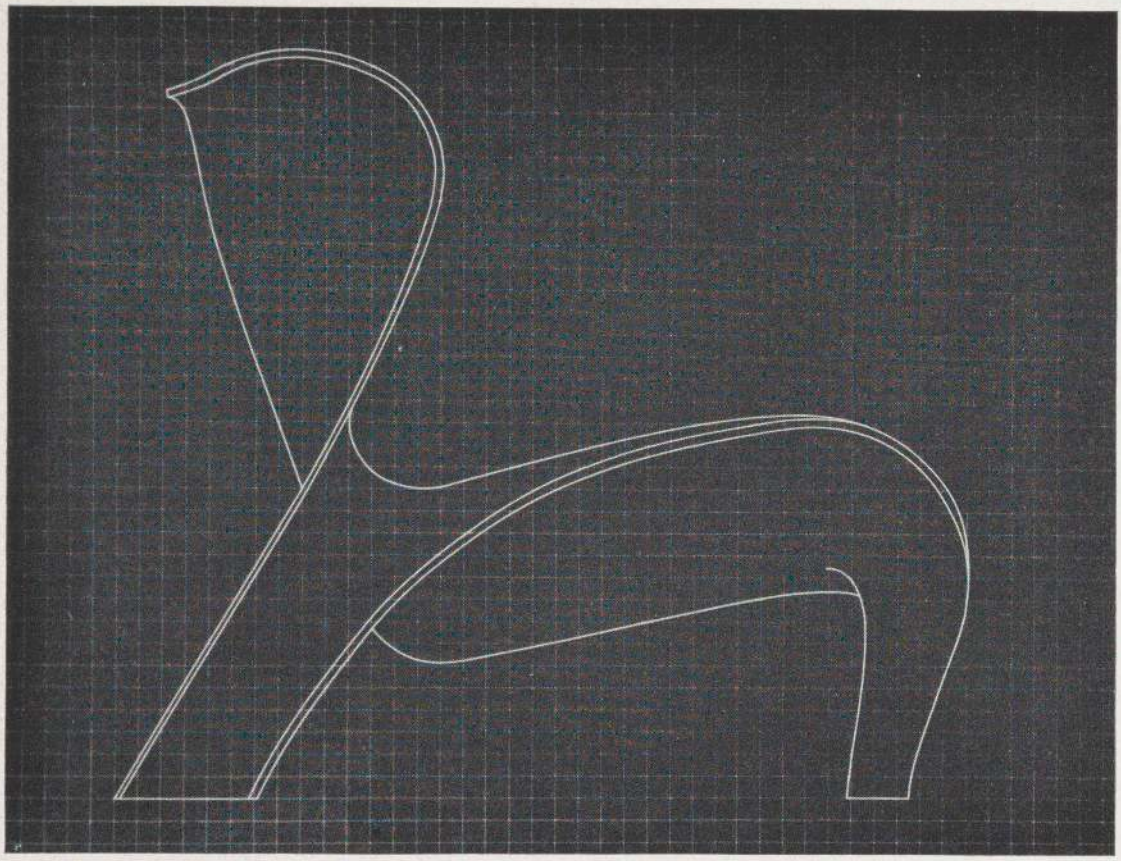
In addition to the prize-winning pieces, a notable feature of the exhibition is the work presented by five design research teams (the sixth, the Eames-U.C.L.A. team, has already been discussed as a second prize winner).

Robert E. Lewis, James L. Prestini, and **Armour Research Foundation**

Members of the team: Armour Research Foundation: Daniel Brenner, W. A. Casler, R. W. Fox, A. James Speyer and C. E. Barthel, N. Bartley, H. T. Betz, B. B. Bruhn, E. E. Burger, E. Cortelyou, A. J. Durelli, G. G. Ference, M. Fink, C. A. Fischl, H. Gausebeck, L. Glover, L. V. Griffis, J. Hildebrand, J. E. Hobson, T. Kingsley, L. C. Kinney, L. Koenig, H. A. Leedy, E. B. Mason, R. E. Miller, M. M. Neigh, R. H. Nelson, E. R. Nielsen, N. Pearson, E. L. Perrine, R. H. Roberts, W. T. Savage, F. Schubert, G. A. Simpson, C. E. Thorp; General American Transportation Corp.: John LeBolt, John Michel; Robert J. Brinkema of Egmont Arens Associates; Elmer C. Maywald.

This team won the special $2,500 prize for the best Research Report. The jury was impressed with the scope and thoroughness of the inquiry and with the clear presentation of material.

In its entry this group concentrated its effort on the development of a large, comfortable one-piece chair in molded plastic designed to issue from its mold fully finished with integral coloring and perfect surface. This ambitious program was carried out with a wealth of carefully checked devices resulting in an armchair which seemed somewhat over-scaled for the average small home, a factor which in no way diminished its many other virtues.

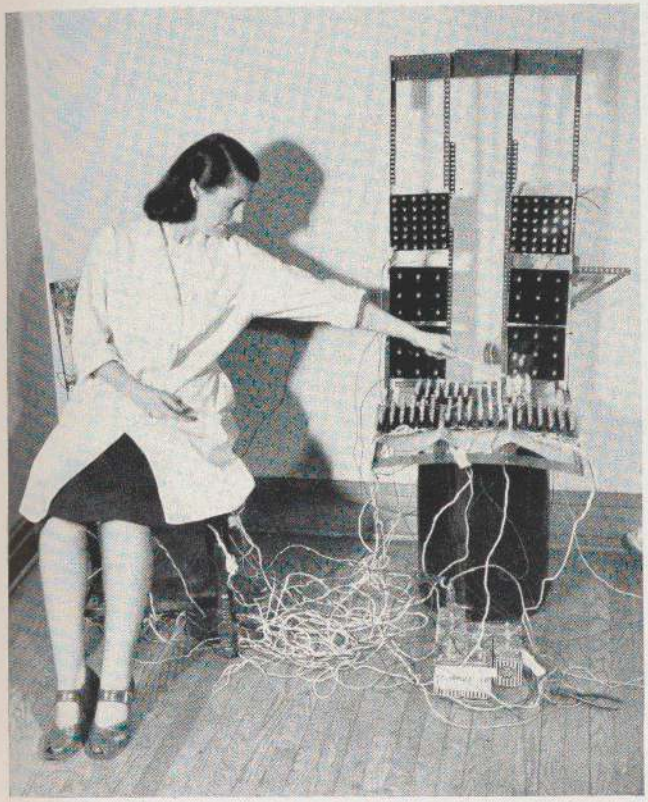


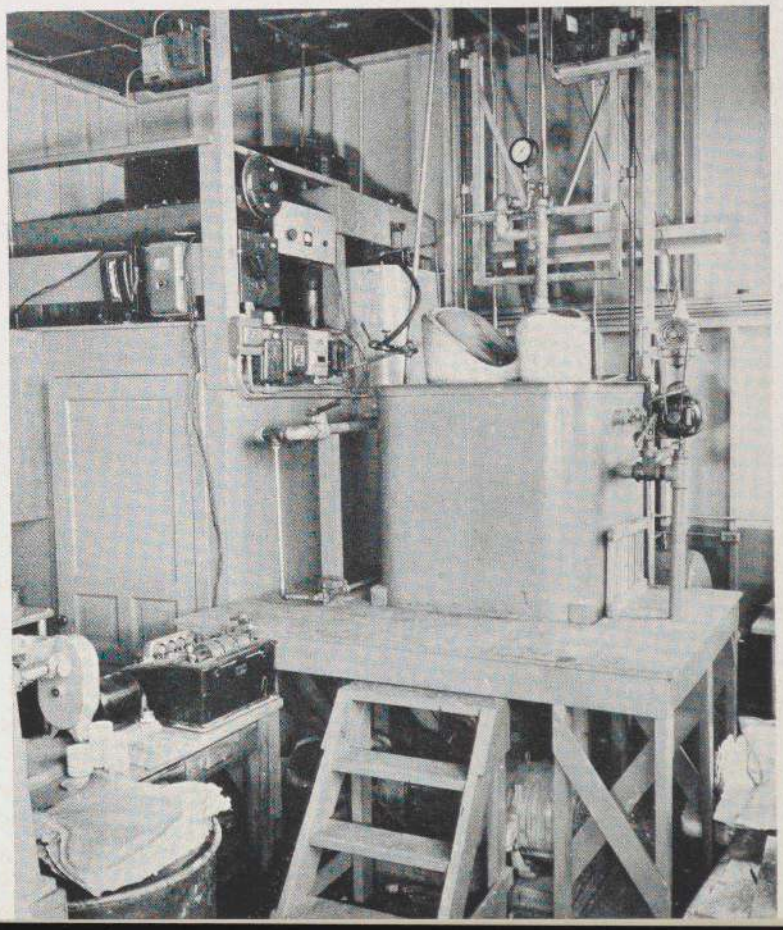
Three illustrations from the prize-winning Design Research Team Report. Above, a drawing showing the precise curves and angles deemed comfortable. On the facing page, two laboratory experiments.

TESTING FOR COMFORT

An electric indicator blanket is placed over a chair. Pressures are indicated on a corresponding grid composed of small lamps which glow most where the pressure is greatest.

The first step in the molding process recommended by this Design Research Team. Wood pulp has been deposited on a mesh screen in the tank. The molded shape is here being removed to receive its final smooth surface.





Donald A. Wallance, and **Midwest Research Institute;** and **Yale University School of Forestry**

Members of the team: Wallance design group: H. C. Barton, Jr., Hubert Leckie, Donal McLaughlin, Jane Perry; Midwest Research Institute: August Bartsch, David Bendersky, Joseph Boyer, Martin Goland, William K. Jentsch, Herbert M. Ramsey, Wallace M. Yocum; Yale University School of Forestry: Martin Chudnoff, Robert W. Hess.

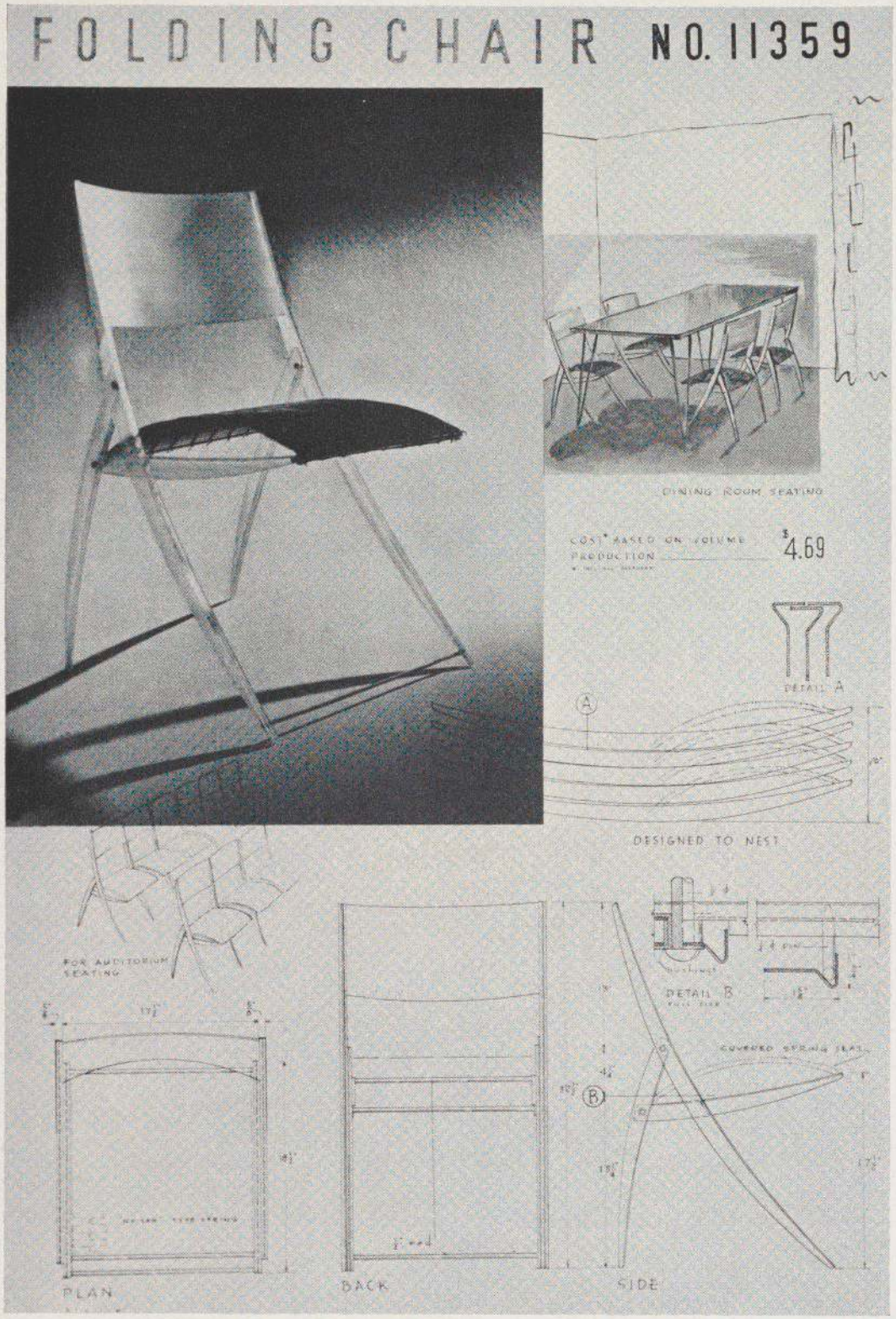
Donald Wallance had an unusual record of experience in mass-production furniture, having been engaged in research in these matters for the U.S. Army for some time. As long ago as 1938 Mr. Wallance won a prize awarded by The Museum of Modern Art for the best design for a chair to be used in its new building, then in the process of construction. Midwest Research Institute, which worked with him in further technical investigations, is one of the youngest organizations in the field, having been established in Kansas City in 1948. Much of its personnel had considerable experience before joining the new venture. Their study of the problem of logical construction of a storage unit was accepted as a brilliant piece of work by the jury who felt that only the brief time allotted for research hindered an even more complete analysis. The sample cabinet presented was most handsome and neatly turned out. It is a pleasure to report a strong likelihood that this research will lead to the production of actual pieces of furniture in the near future.

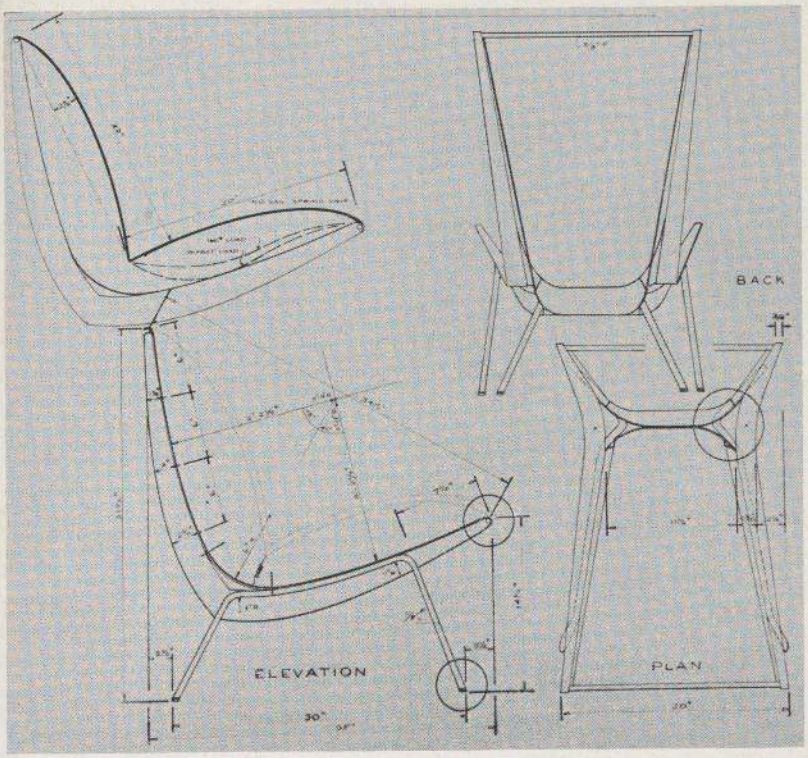
Carl Koch, and **Massachusetts Institute of Technology**

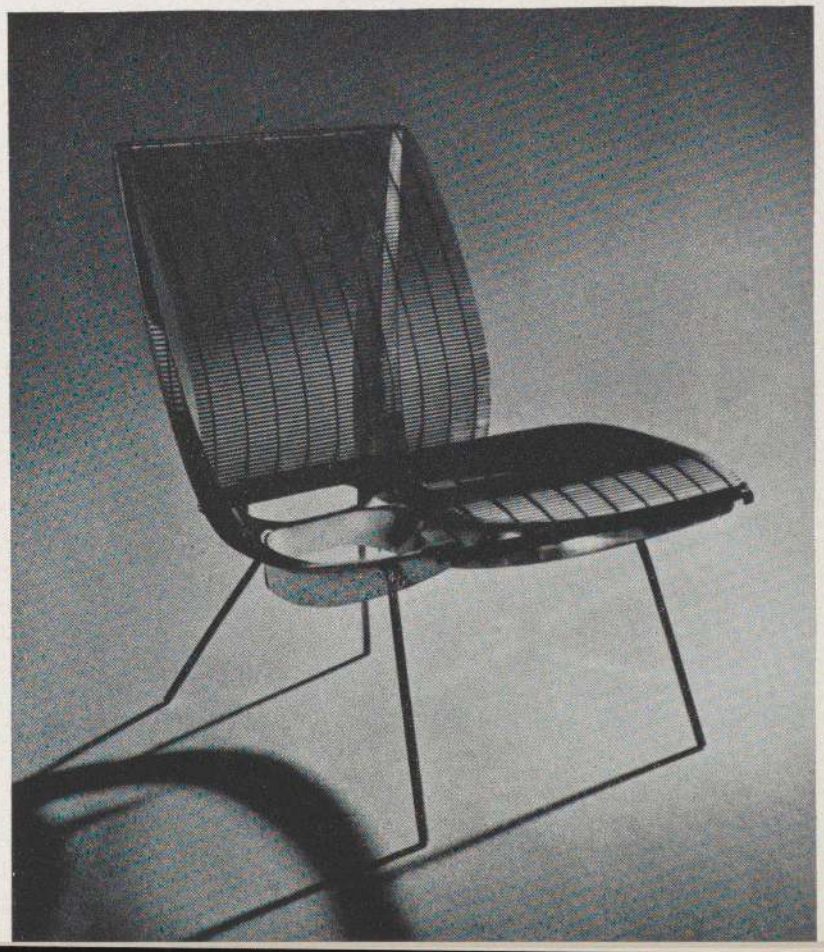
Members of the team: Massachusetts Institute of Technology: Albert Dietz, Burnham Kelly, John Wulff.

This was the most inclusive submission by any of the Design Research Teams. Problems of seating and storage were well presented in extensive models and drawings. Besides a fine sense of design, the report made clear an exceptionally keen appreciation of manufacturing and marketing problems.

Especially interesting is a folding chair with frame in T-shaped sections, designed to be made in some lightweight rigid material such as metal or plastic. A comfortably resilient seat constructed of flat metal springs creates a simple and slim effect quite unlike the usual thick box shapes which conceal coil springs.

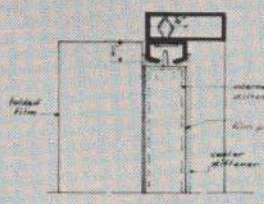

FOLDING CHAIR NO. 11359
DINING ROOM SEATING
COST* BASED ON VOLUME PRODUCTION
$4.69
DETAIL A
DESIGNED TO NEST
FOR AUDITORIUM SEATING
DETAIL B
COVERED SPRING SEAT
PLAN
BACK
SIDE


BACK
ELEVATION
PLAN

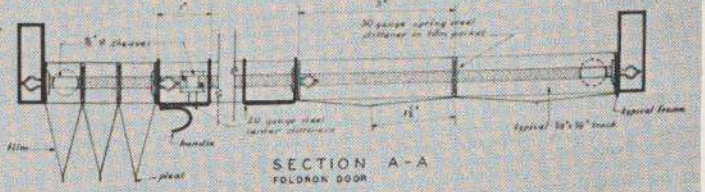


STORAGE SYSTEM NO. 11359

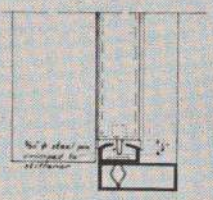
CLOSURE



SECTION B-B
FOLDRON DOOR

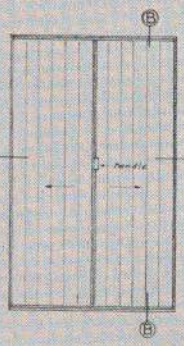


SECTION A-A
FOLDRON DOOR

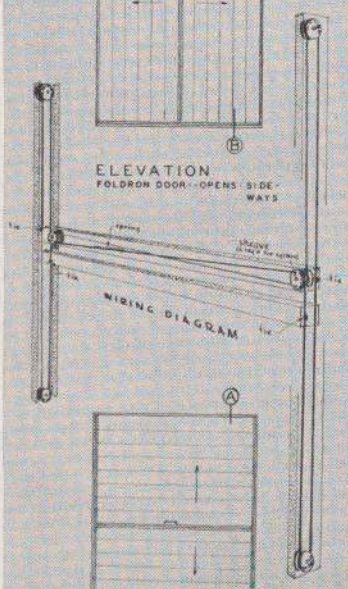


COST DATA
FOLDRON DOOR

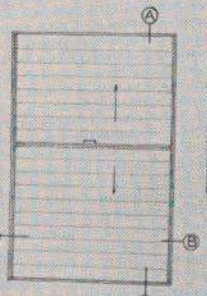
ITEM	UNIT COST IN PLACE	COST FOR TYPICAL PAIR OF DOORS IN 6.6 X 3.0 OPENING
STIFFENERS	60¢/POUND	$1.48
SHEAVES	68¢ APIECE	.37
WIRING	50¢/FOOT	.18
8 MIL POLYVINYL CHLORIDE FILM	10.5¢/50 FT	2.05
	TOTAL	$4.00



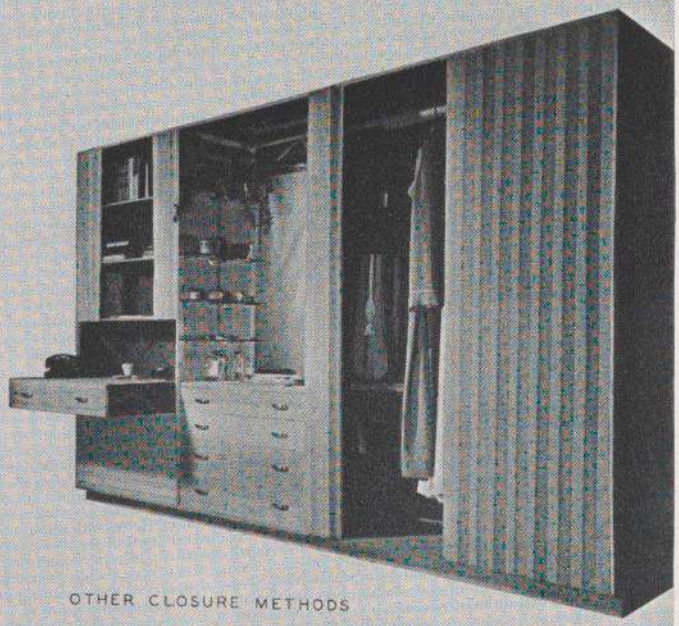
ELEVATION
FOLDRON DOOR--OPENS SIDE-WAYS



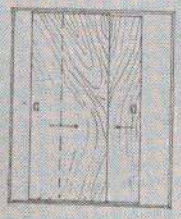
WIRING DIAGRAM



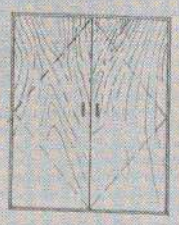
ELEVATION
FOLDRON DOOR--OPENS UP & DOWN



OTHER CLOSURE METHODS



SLIDING



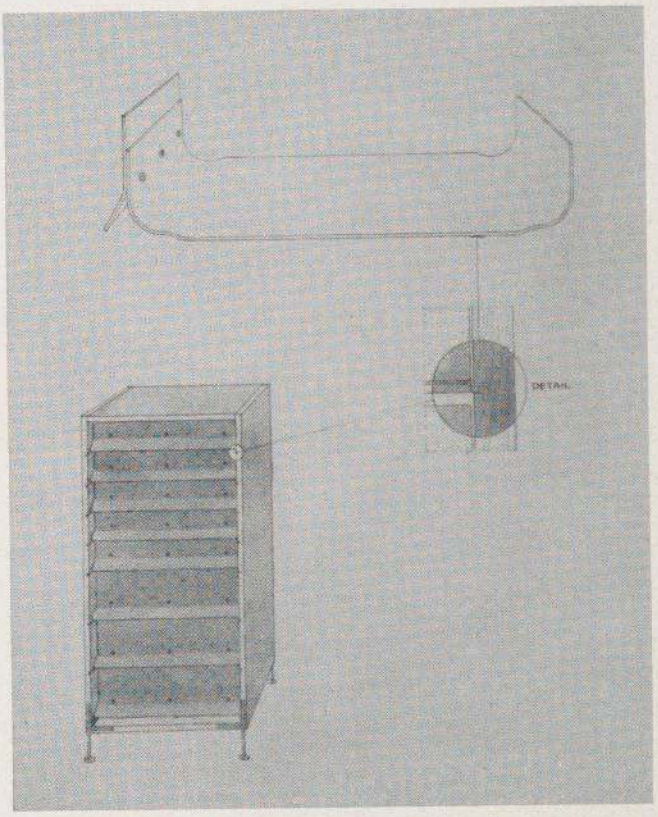
HINGED

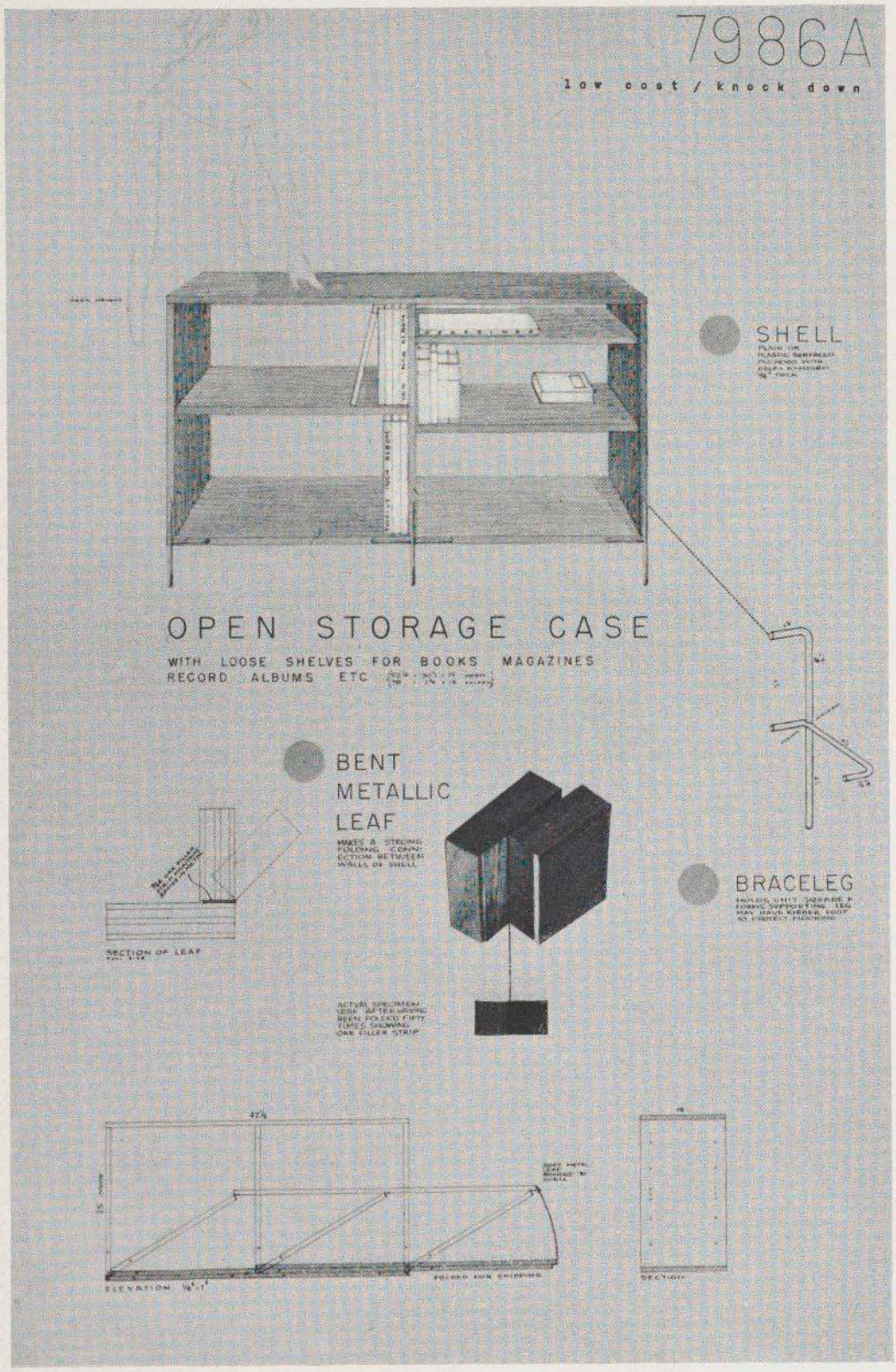
ROLLING

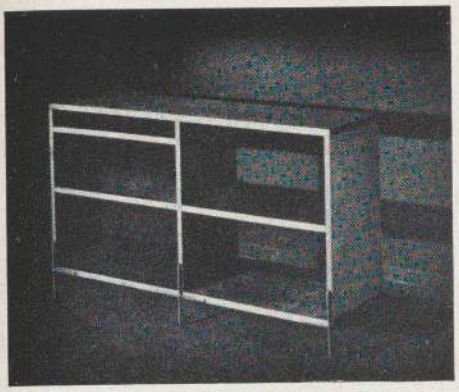
Harry M. Weese, and **Armour Research Foundation**

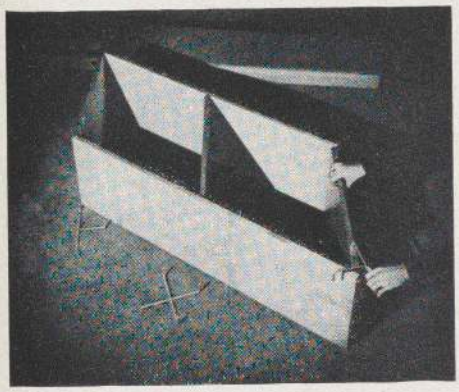
Members of the team: Armour Research Foundation: W. A. Casler, R. W. Fox, M. G. Kinnavy, J. T. Nichols; Ancraft Products Co.: A. W. Ahmer, E. W. Nyberg.

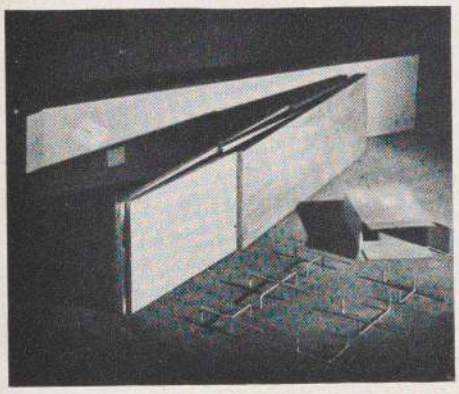
In this team entry the jury particularly admired the intelligent analysis of the problem. A number of directions were indicated which could lead to fine results. In addition to a bureau, this group presented an idea for a bookcase which folds flat for transportation but its various members are already joined at the corners by flexible sheet metal inserts acting as hinges. This device eliminates much labor and many of the unsatisfactory results that can occur when knock-down furniture is assembled by inexpert owners. Opened to its full size, this shelf unit is held rigid and true by means of welded metal rods prolonged to form the supports. These welded rods were considered with less enthusiasm by the jury than the soft metal which replaced hinges and corner joints.

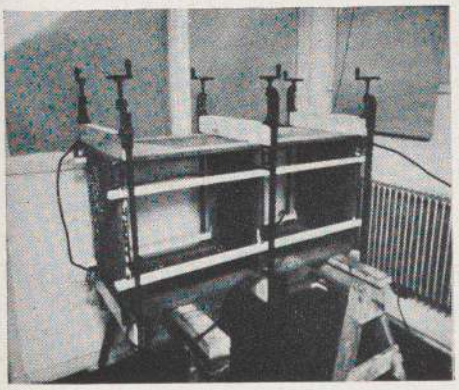



7986A
low cost / knock down
SHELL
OPEN STORAGE CASE
WITH LOOSE SHELVES FOR BOOKS MAGAZINES
RECORD ALBUMS ETC
BENT
METALLIC
LEAF
MAKES A STRONG FOLDING CONNECTION BETWEEN WALLS OF SHELL
SECTION OF LEAF
BRACELEG
ACTUAL SPECIMEN LEAF AFTER HAVING BEEN FOLDED FIFTY TIMES SHOWING OAK FILLER STRIP
ELEVATION
FOLDED FOR SHIPPING
SECTION









MINIMUM MATERIAL

This case including its three shelves requires less than 27 square feet of slab material. The material may be anything from fir plywood to veneered core stock or papreg sandwich. The metal bracelegs are fusion welded in mass production and effectively brace and support the unit at low cost. The finish is conventional in the case of the wood shell. Where papreg or hardboard is used, no finish is necessary.

WHY IT FOLDS

A uniform factory packaged article shipped knocked down will effect savings in the costs of shipping, stockroom operations, double handling, repacking, delivery, damage, and returns. Profitable telephone and mail orders are made more feasible. Savings in factory and distribution costs are double savings to the retail buyer in a free market.

HOW IT FOLDS

The case is designed to be knocked down, not only for shipping but also for subsequent storage or moving by the user. The parts of the shell are joined with a continuous hinge, a metallic leaf of inexpensive steel having the desired softness and thinness to allow many flexures (upwards of 40). This is adequate for the purpose and forms an inconspicuous rigid joining of the folding parts.

HOW IT OPENS

The case is not removed from its factory package until it reaches the home of the purchaser. Here the shell is withdrawn from its paperboard carton, opened on its side and the bracelegs tapped into place. This is a matter of minutes and requires no imagination or skill.

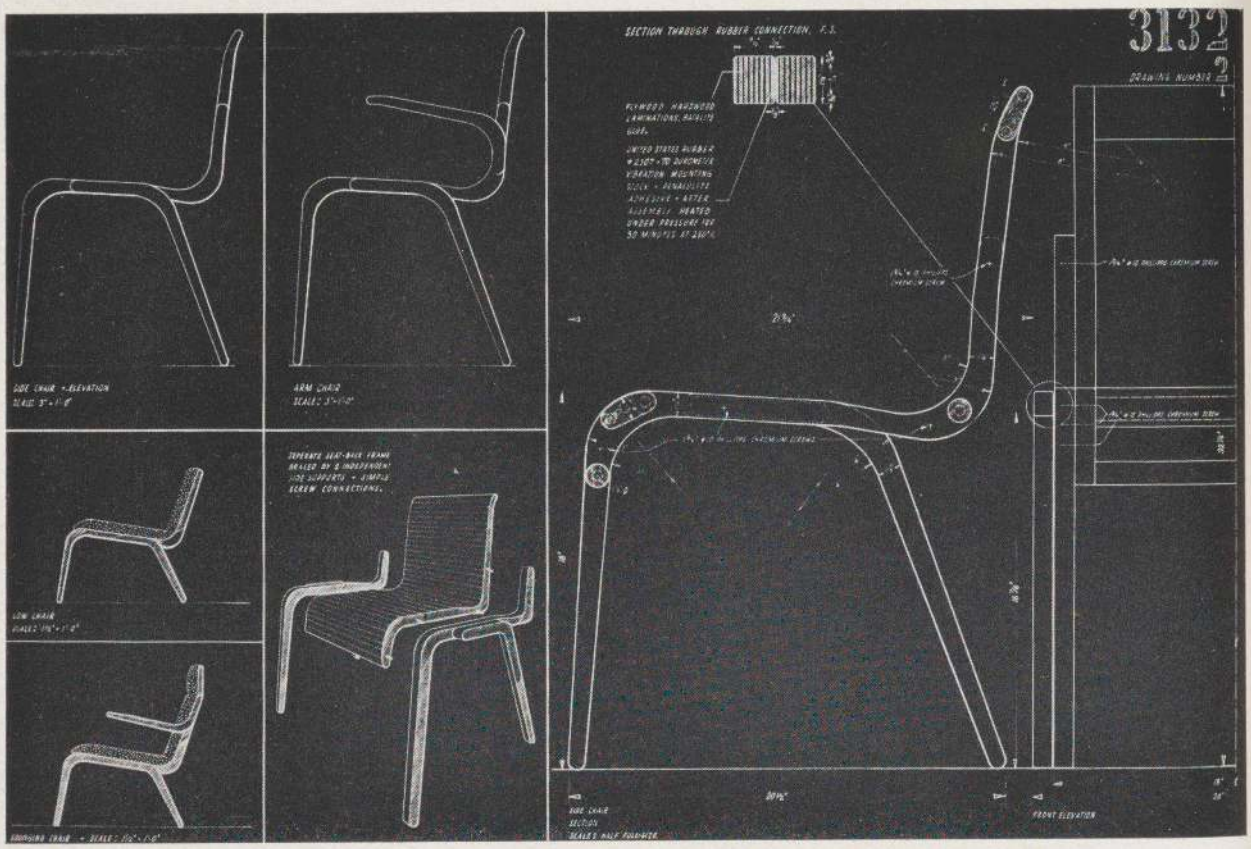
HOW IT WAS MADE

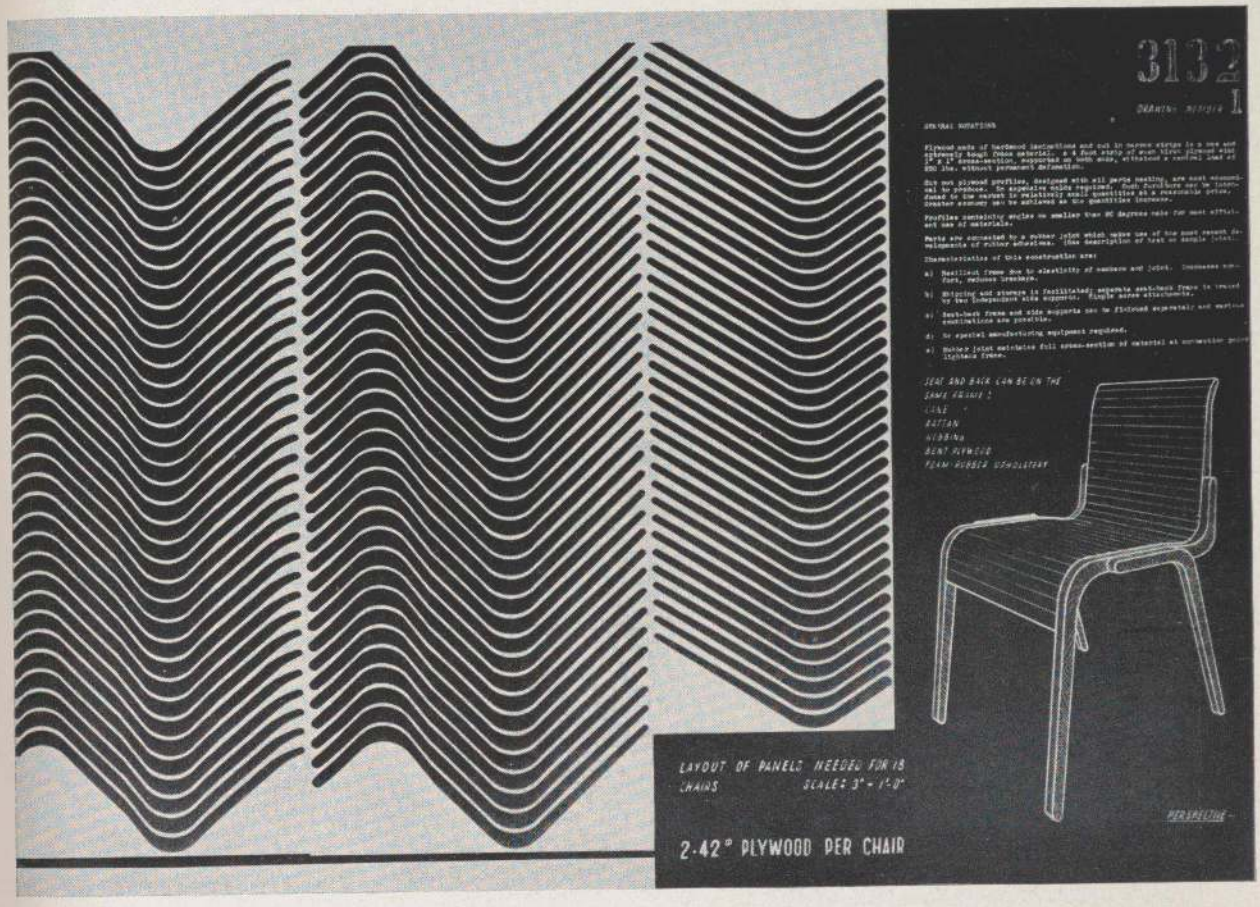
The fabrication is as simple as it looks. The prefitted parts are clamped in a suitable jig, the metallic hinges are electrically connected in series and a heavy low-voltage current is passed thru the thin metal developing a controlled heat which polymerizes the bonding agent (Cycleweld) in very few moments. The joint is immediately made strong and permanent. The process is well adapted to mass production and calls for moderate equipment.

Marcel Breuer, and **U.S. Forest Products Laboratory**

Members of the team: Wilhelm V. Von Moltke; Schuster & Geiger, Inc.; U. S. Rubber Co. Research Laboratory; U. S. Forest Products Laboratory.

The principle of a resilient chair frame ranks among the great achievements of modern furniture design, and Marcel Breuer is justly named among its earliest and best proponents. It is now some 15 years since Breuer began experimenting with the resilient frame principle in plywood in contrast to his earlier designs for tube and strip metal. The





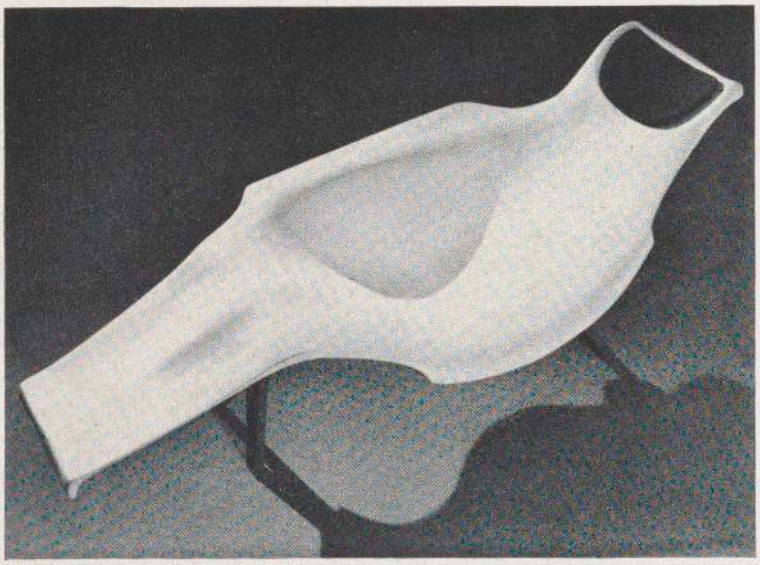
ingeniously articulated chair shown here was developed by Breuer on the basis of factual information supplied by the U. S. Forest Products Laboratory. He combined his own accumulated knowledge of previous experiments with recent developments in high frequency glueing. Rubber connections between frame parts were also used to increase resilience. Breuer's eager interest in new technology is balanced by the clear design articulation; each part is crisply outlined. In the course of time the materials and procedures employed by Breuer in this design should become available at costs which will permit a proper selling price for the chair.

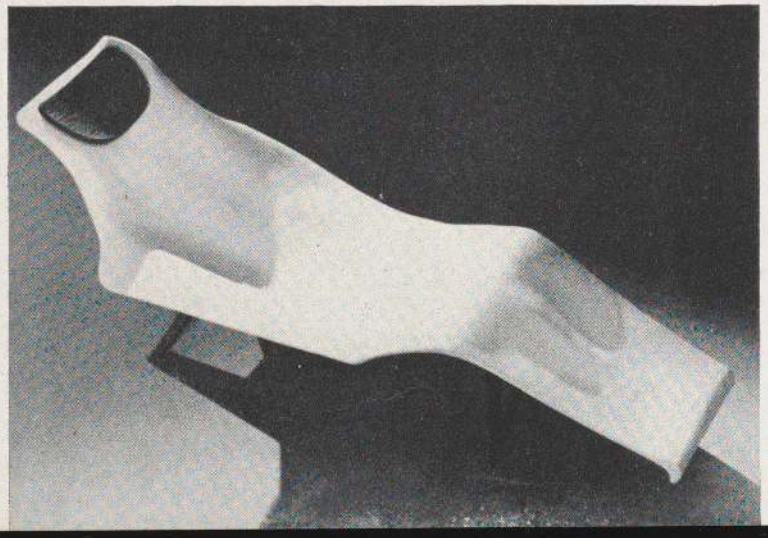
Other Entries

In addition to the prize-winning and team entries already described, many interesting entries by competitors from this country and abroad are striking, good-looking and inventive. Among these drawings, many represent an extraordinary skill and freedom of draftsmanship, introducing human figures in lively fashion to demonstrate the utility and adaptability of their concepts. Many techniques were employed, from strict mechanical drawing to brilliant Kodachromes.

Chair Designed by **Willy** and **Emil Guhl,**
Zurich, Switzerland

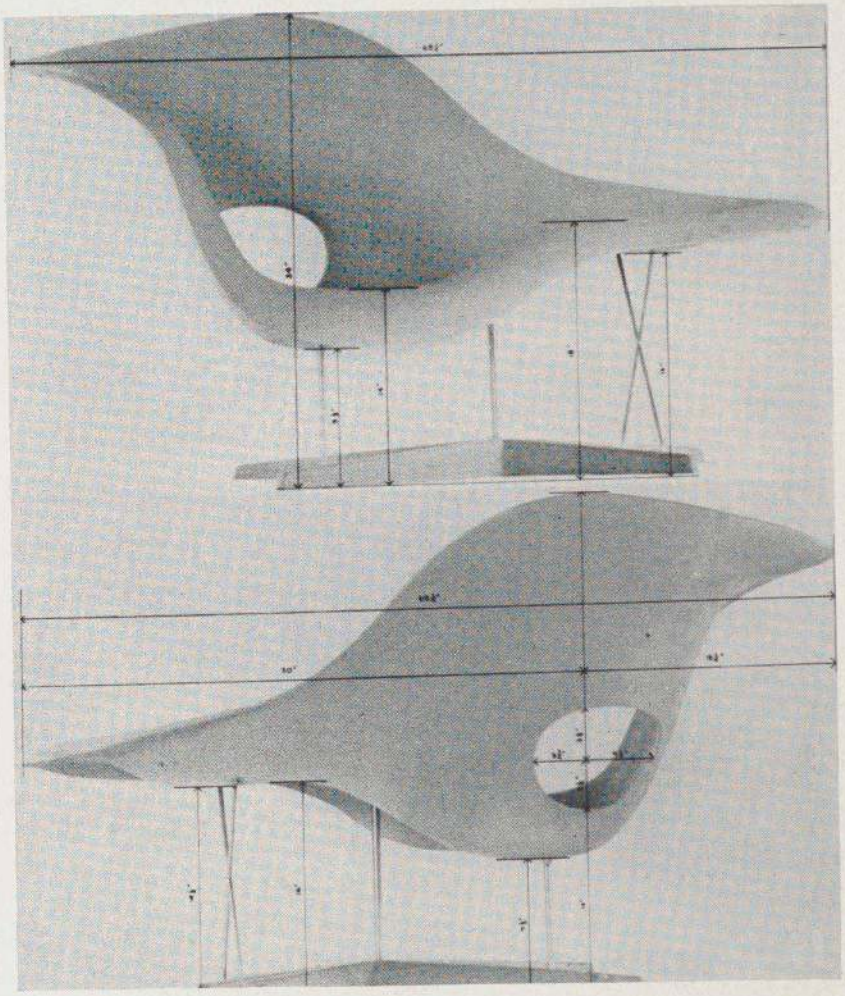
An interesting example of parallel thinking on both sides of the Atlantic is presented by the reclining chair by Willy and Emil Guhl of Switzerland and that by Charles Eames, both developing the theme of a large molded shell.



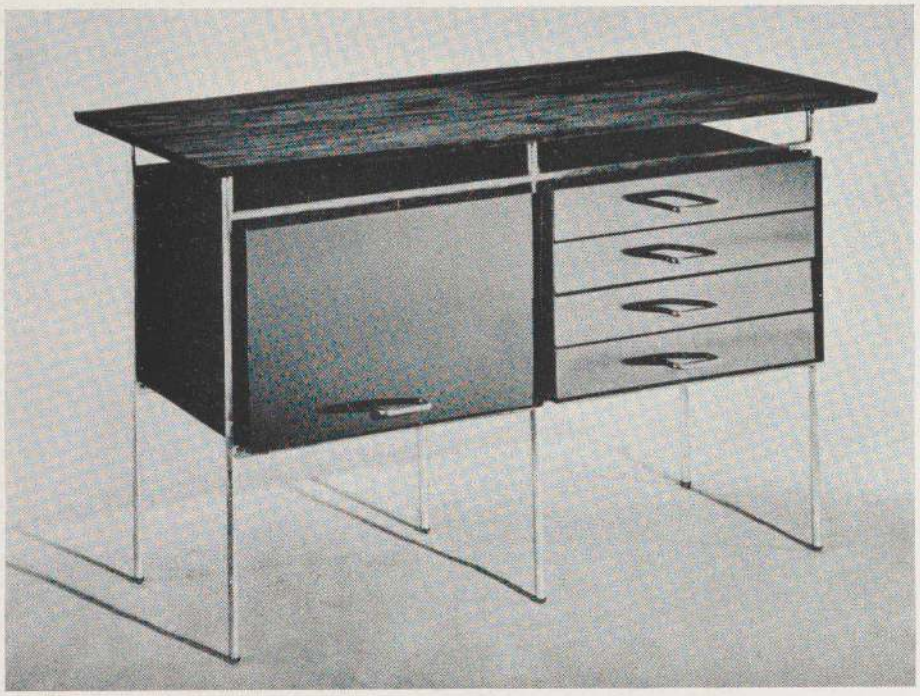


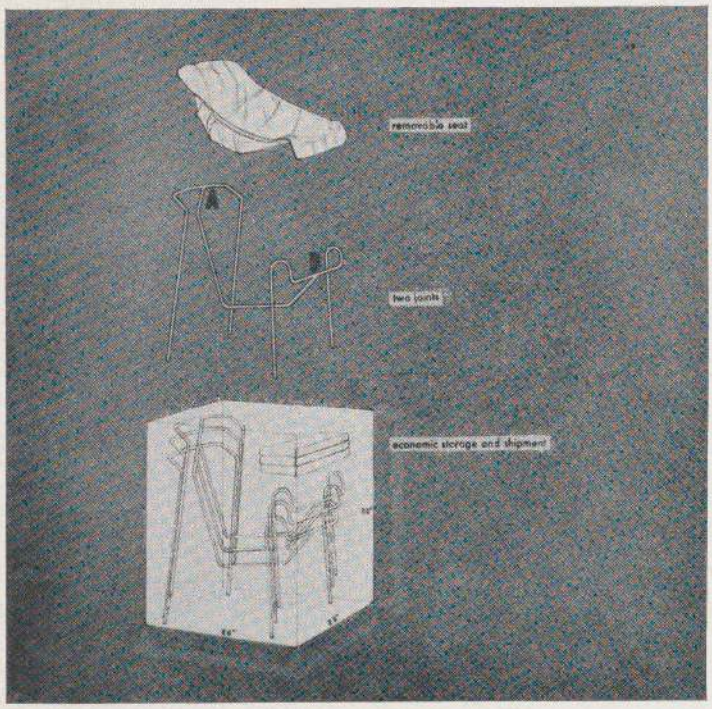
Chair Designed by **Charles Eames,** Venice, California

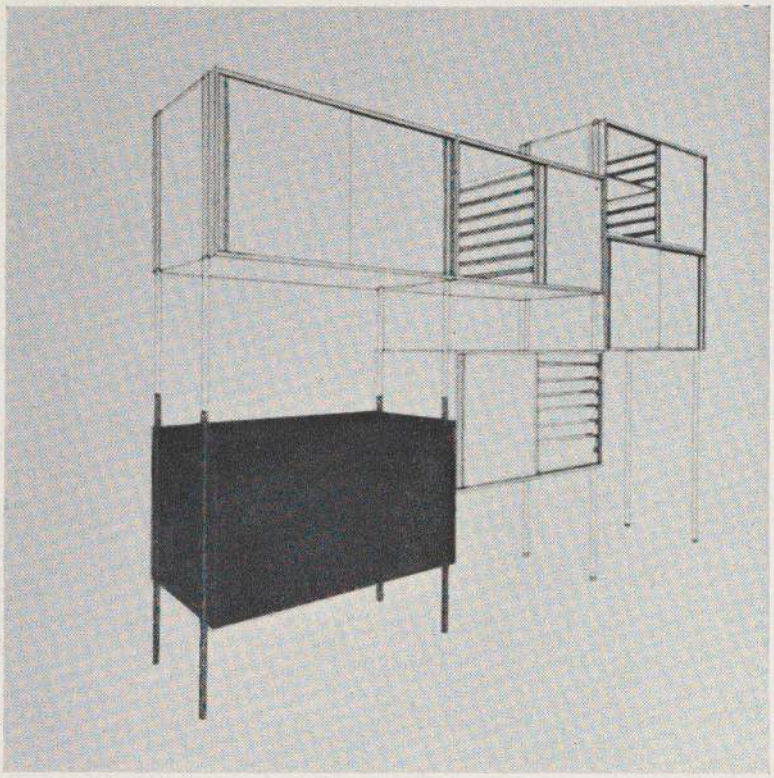
Although specialized in use, this lounge chair was admired for its elegant shape and most interesting construction. Two extremely thin molded plies meet in a feather edge but are separated by as much as an inch of space in the central portions of the form. The cavity is filled by heat-expanded vermiculite which gives great rigidity and strength, yet preserves an exceptional lack of weight.

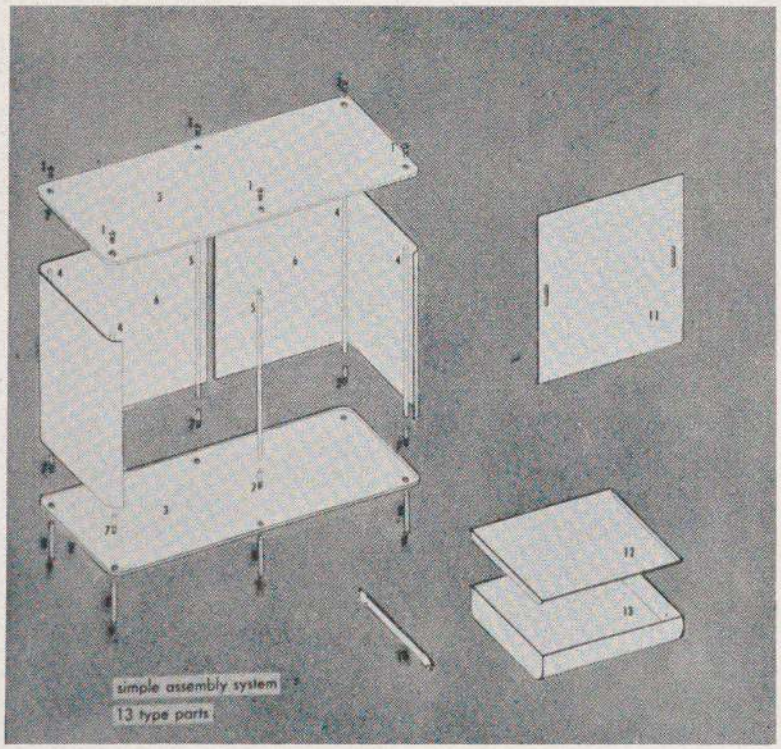


Designs by the **Institute of Design,** Chicago



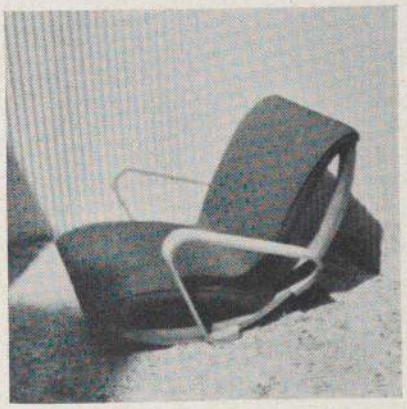




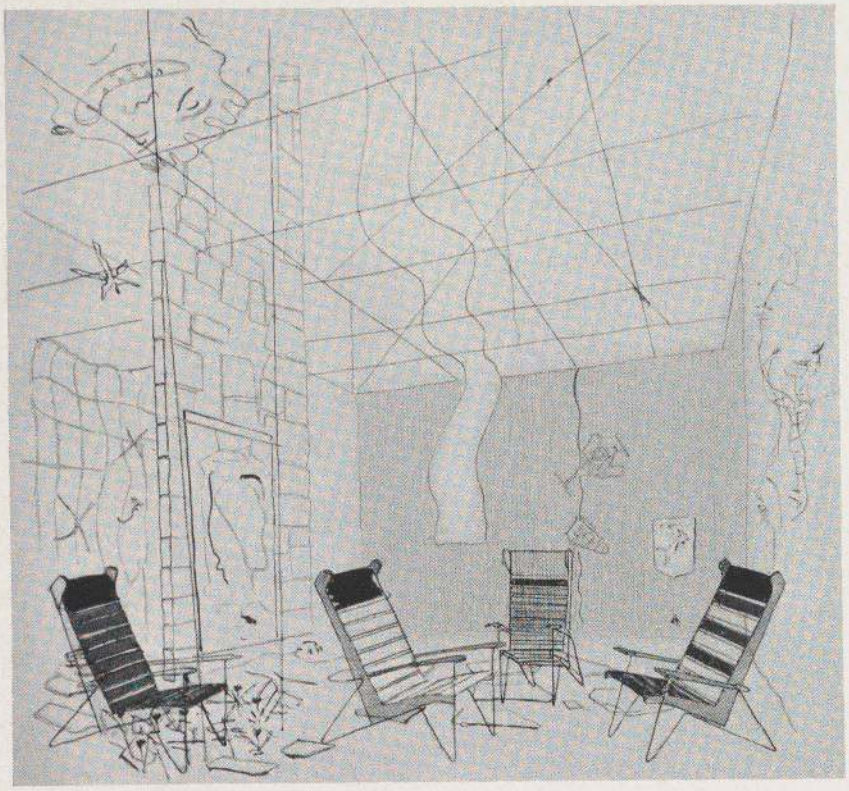

simple assembly system
13 type parts

A Series of Chairs Designed by **Theodore Luderowski,**
Pontiac, Michigan

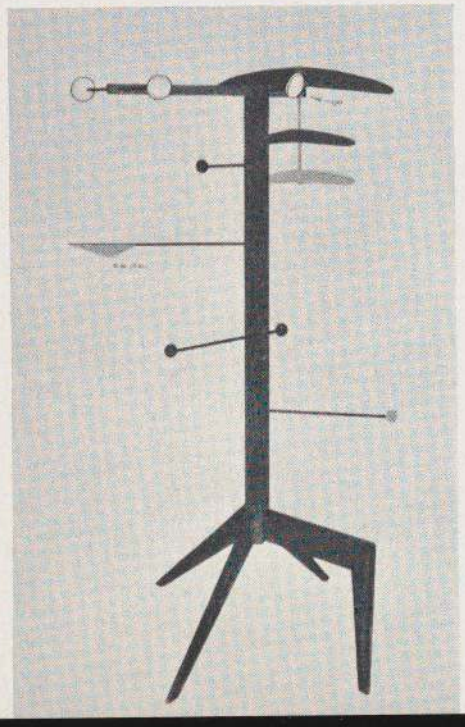
This entry uses bent laminated frames and convex flat springs. In the full scale model of one armchair, submitted to the jury, the seating element glides back and forth within the supporting framework, combining the principles of the rocking chair and the Morris chair with unusual directness and success. This seemed perhaps the best of the variations shown and, as to comfort and economy, one of the most satisfactory chairs presented.



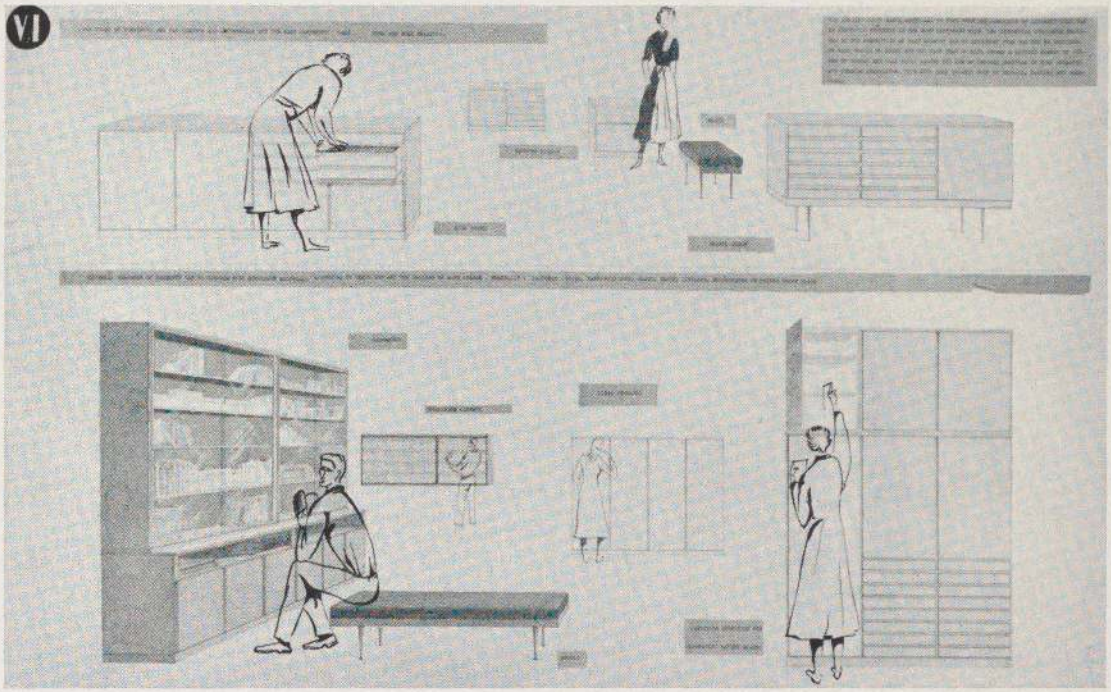
Chair Designed by **Guido Gai,** Milan, Italy



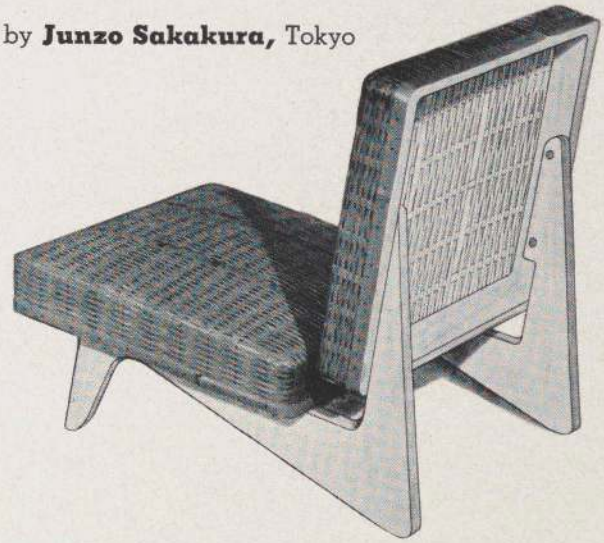
Clothes-tree Designed by **Pierre Faucheux,** Paris



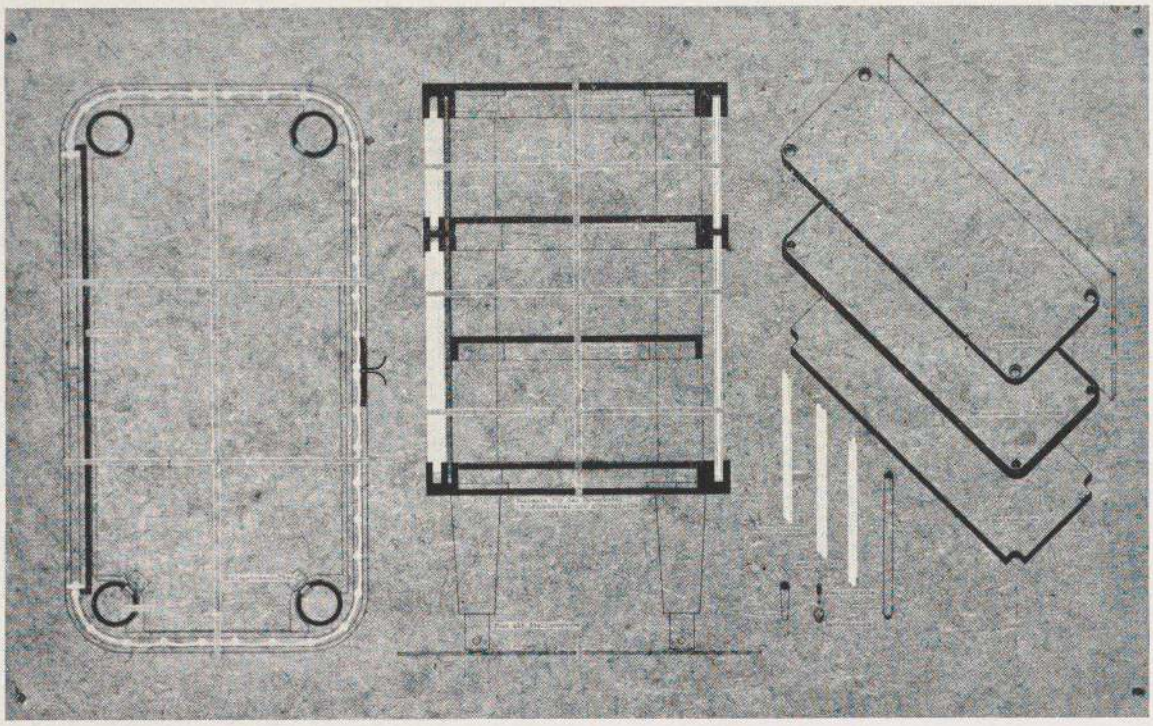
Storage Unit Designed by **Augusto Romano,** Turin, Italy



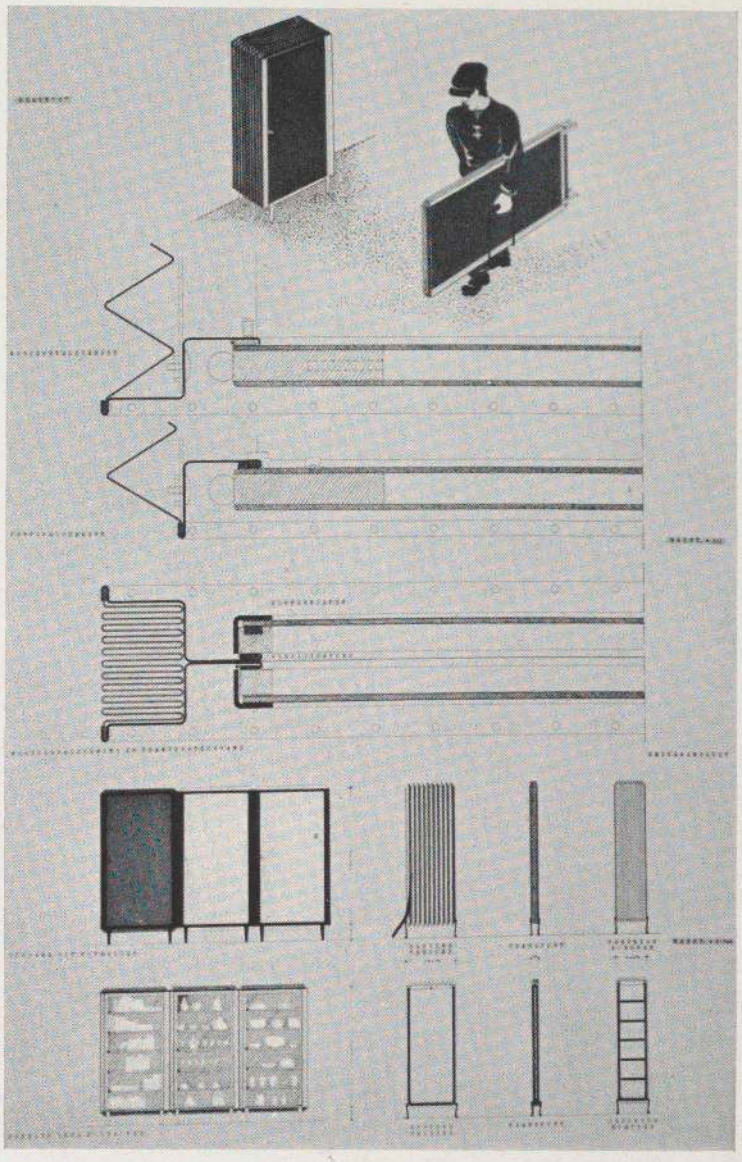
Chair Designed by **Junzo Sakakura,** Tokyo



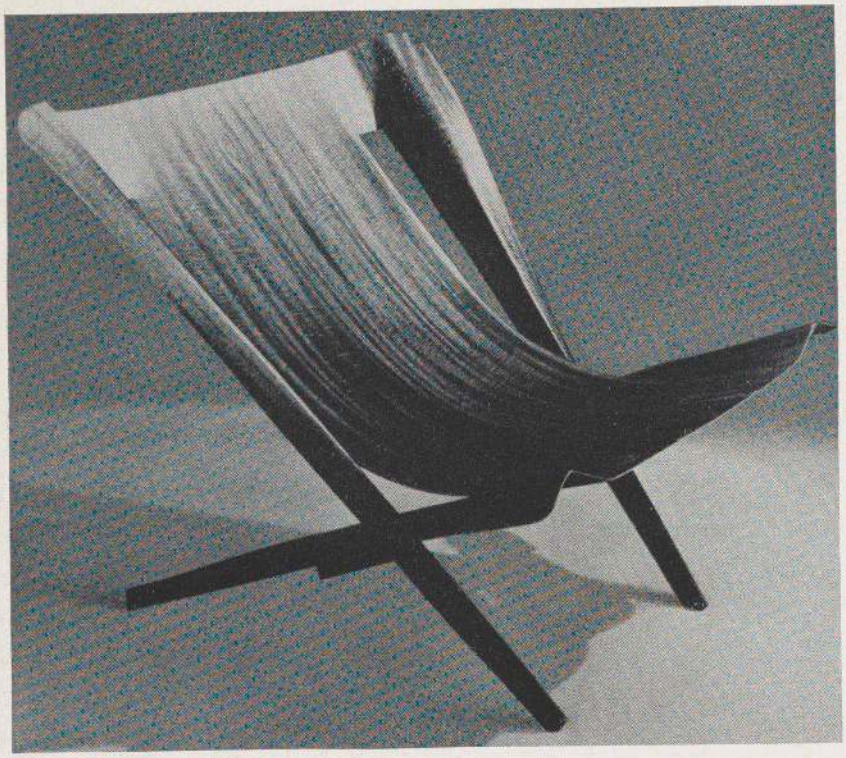
Storage Unit Designed by **Alfred Boenecke,** Wendlingen-on-Neckar, Germany and **Günther Gottwald,** Frankfurt-on-Main, Germany



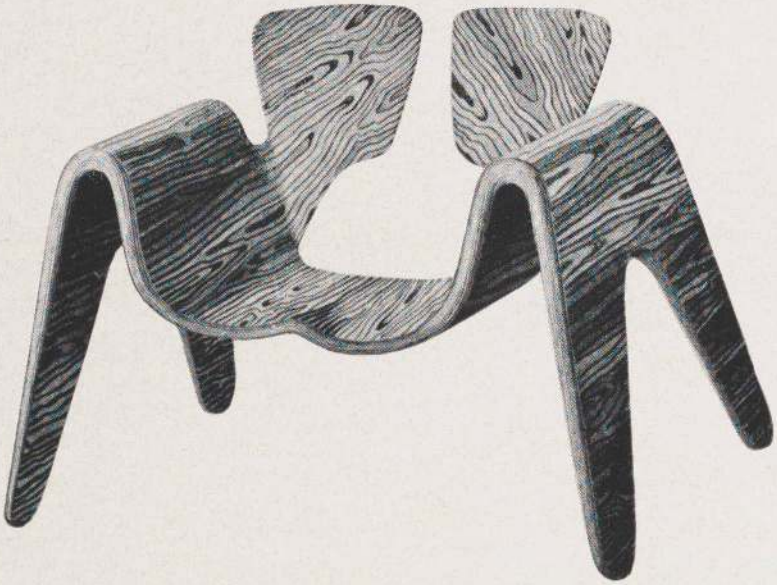
Storage Unit Designed by **Gerhard Weber,**
Frankfurt-on-Main, Germany



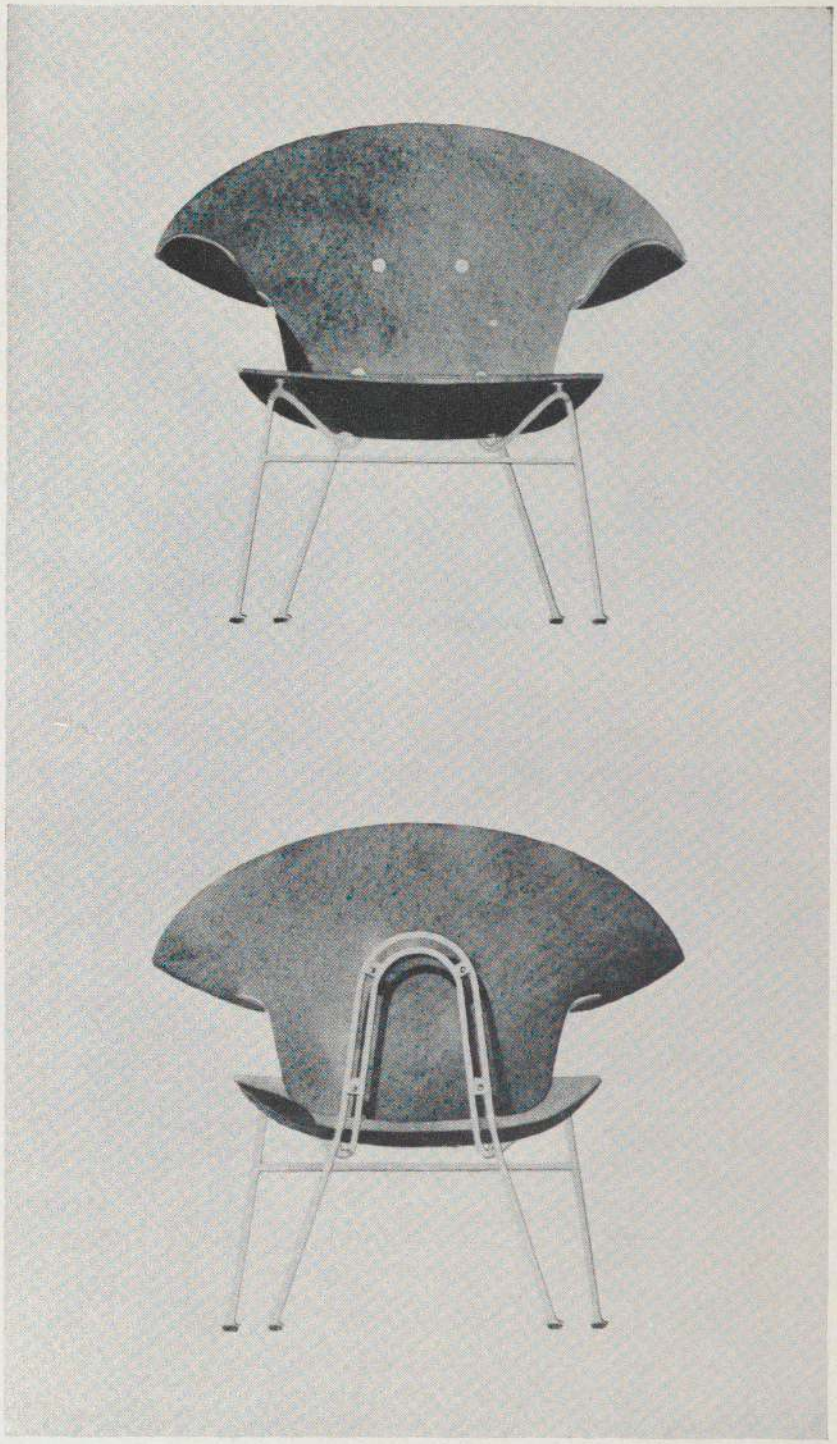
Chair Designed by **Ernst Pollak,** London



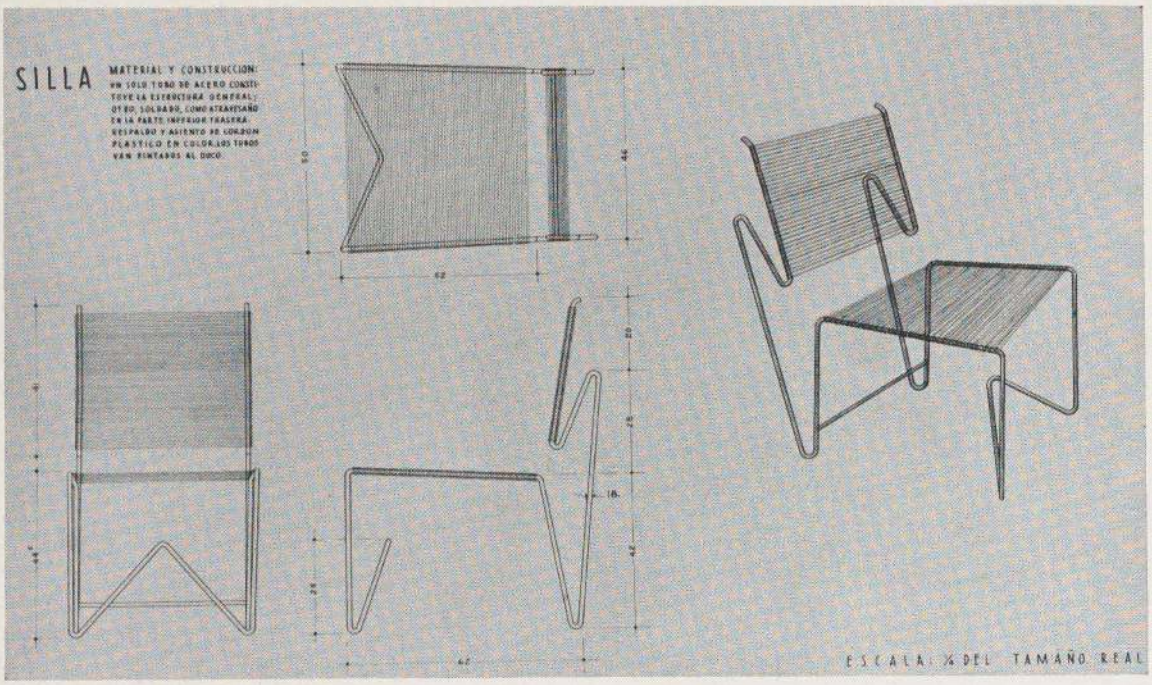
Chair Designed by **Ivo Pannaggi,** Ulnes, Norway



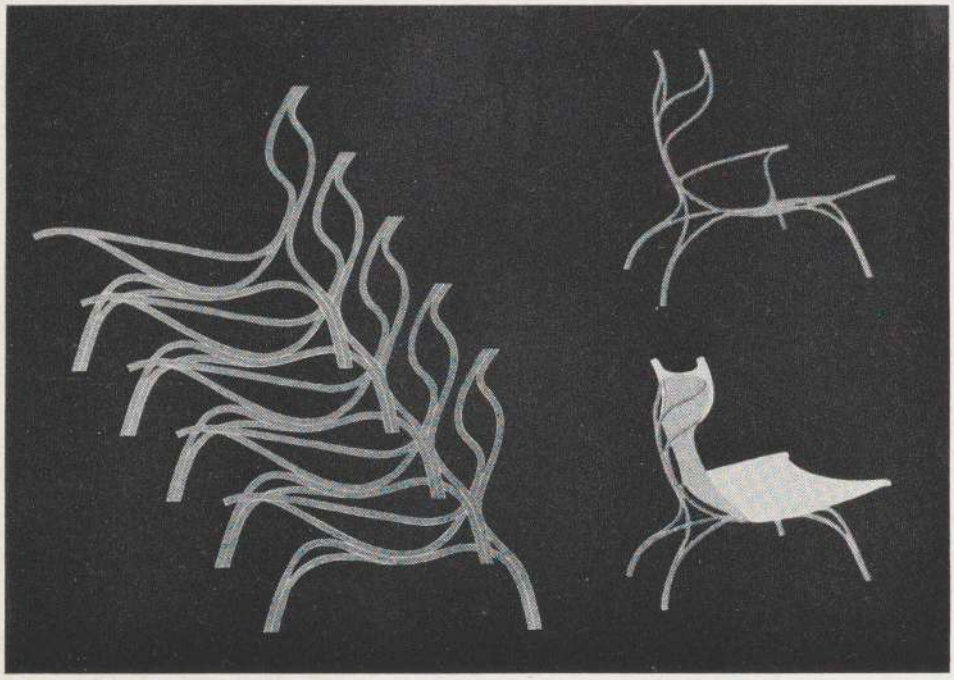
Chair Designed by **Hans J. Wegner,** Charlottenlund, Denmark



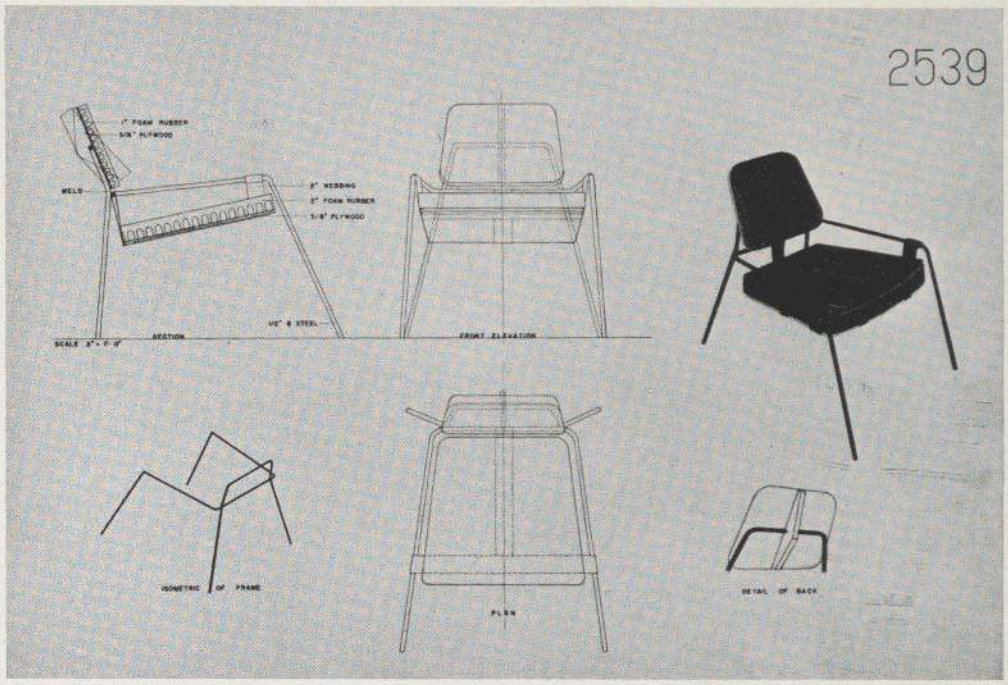
Chair Designed by **Xavier** and **Clara Porset Guerrero,**
Mexico D.F.



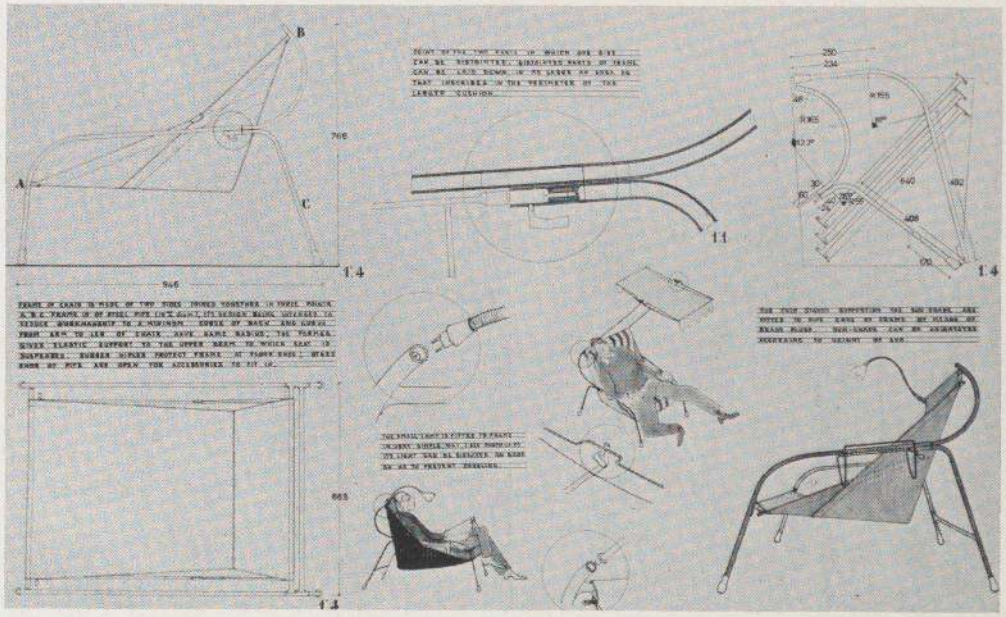
Chair Designed by **Arne Korsmo,** Oslo, Norway
and **Jorn Utzon,** Copenhagen, Denmark



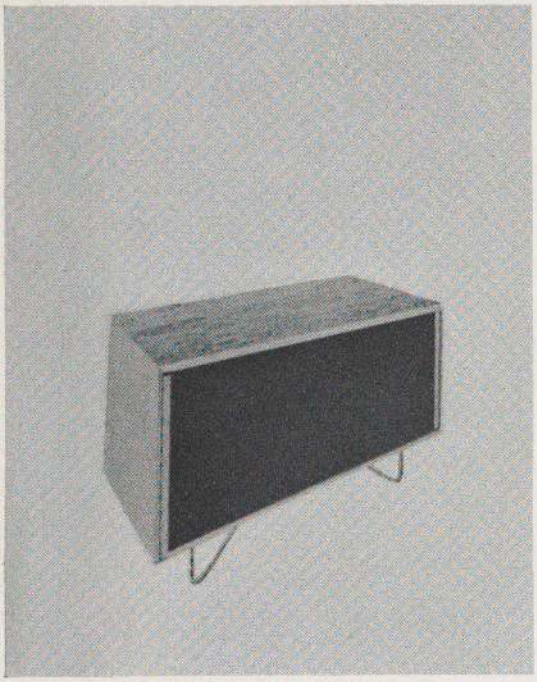
Chair Designed by **Henry Kibel,** New York City
and **C. E. Stousland, Jr.,** Houston, Texas

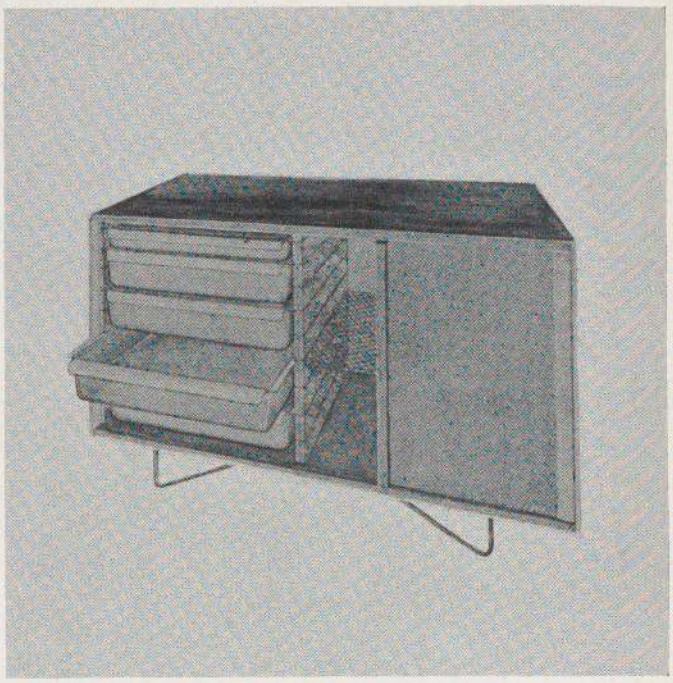


Chair Designed by **Marco Zanuso,** Milan, Italy

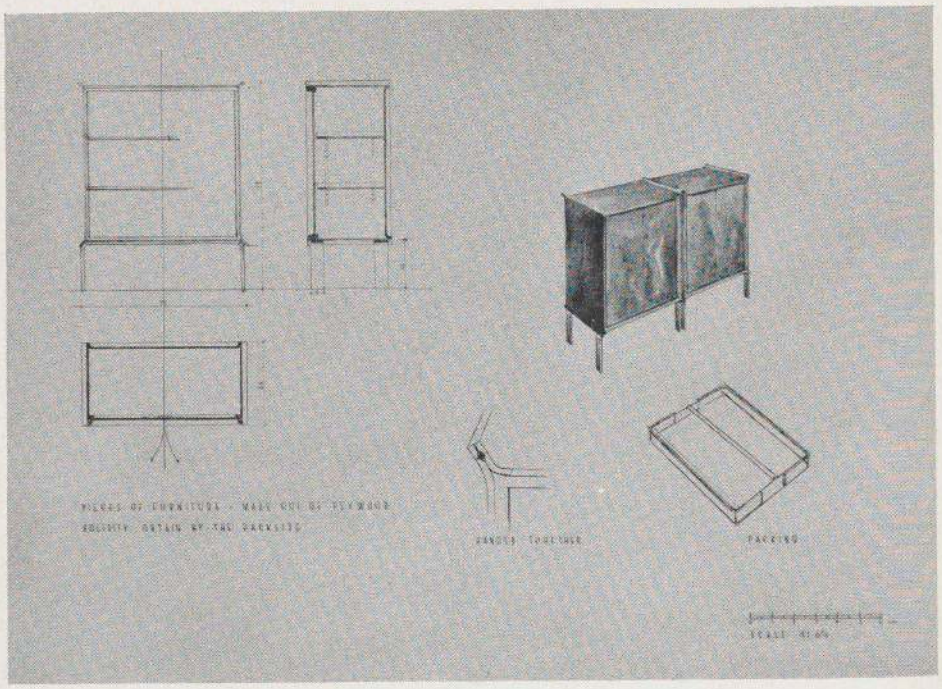


Storage Unit Designed by **Huson Jackson,** New York City

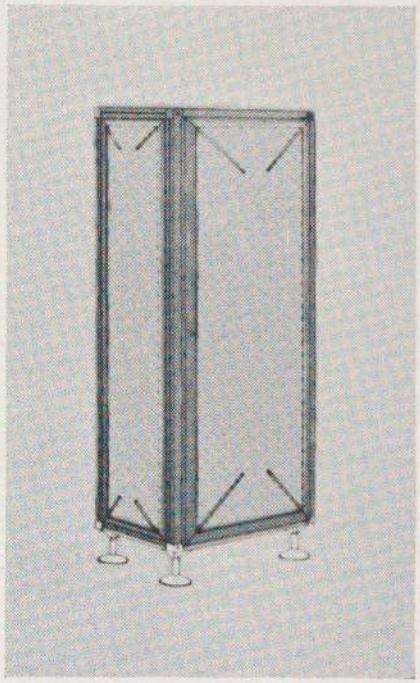


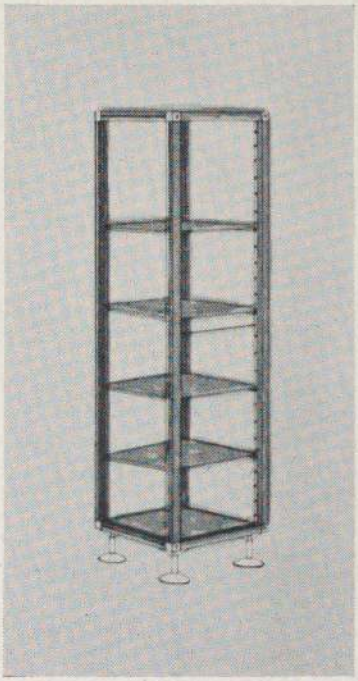


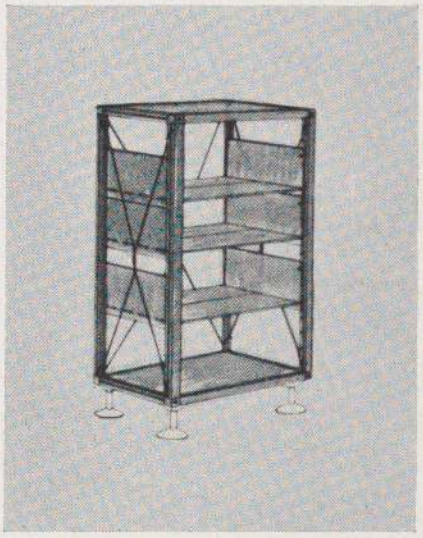
Storage Unit Designed by **Werner Blaser,** Basel, Switzerland

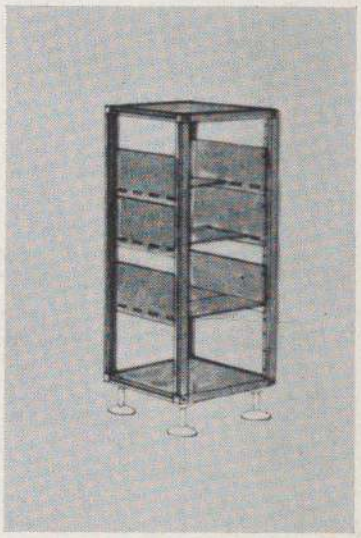


Storage Units Designed by **Franco Albini** and **Luigi Colombini,** Milan, Italy









Biographies of the Prize-Winning Designers

Alexey Brodovitch

Born in 1898 in St. Petersburg, Russia

1921–30 Paris: active as artist, art director, decorator and fashion designer for many leading firms

1930–34 Philadelphia: classes in advertising and design at the Pennsylvania Museum's School in Industrial Art, and private classes

1930–40 Independent advertising, designing and decorating

1934 Moved to New York City

1937 Published book on the Russian ballet

1940 Active in New York World's Fair; Art Director for Saks Fifth Avenue

1934– Art Director and Art Editor of *Harper's Bazaar*. Evening classes at The New School for Social Research

1938– Began design of the knock-down furniture presented in this exhibition

1940–50

1940–42 Art Director for American Red Cross; posters for many war-time enterprises

1941 Art Director for I. Miller Shoes

1945–47 Art Director of *Junior Bazaar*

1949– Art Director and Editor of *Portfolio*

Continued private classes, both in Philadelphia and New York

Mr. Brodovitch won many awards at the International Exposition of Decorative Arts, Paris, 1925, and has been honored 11 times by the Art Directors Club at their annual exhibitions. Besides other honors, Mr. Brodovitch has been a member of many distinguished design juries, and his work has been the subject of articles and publications all over the world

Robin Day

Born 1915 in High Wycombe, Buckinghamshire

1931 County scholarship to local Art School

1934–35 Designer for local furniture manufacturer

1935 National scholarship in furniture design to the Royal College of Art, London. Studied interior design, mural decoration, display design

1939 Taught industrial and exhibition design at various schools of art

1945 Taught furniture and interior equipment design at Regent Polytechnic School of Architecture, London

1946– Designing of general industrial products and exhibitions, many of which were commissioned by the Imperial Chemical Industries, Ltd. and government departments. Also posters and typographical design, including a series of posters for a nation-wide recruiting campaign for the Royal Air Force

Extensive work in radio cabinet design. Experimental work on metal chair construction during period of timber shortage

Member of the Council of the Society of Industrial Artists

Charles Eames

Born 1907 in St. Louis

1925 Scholarship to study architecture at Washington University

1928–38 Worked for architects in St. Louis, travelled and practiced independently

1938 Architectural fellowship at Cranbrook Academy of Art, Bloomfield Hills, Michigan

1939–40 Worked in the office of Eliel Saarinen with Eero Saarinen, Bloomfield Hills, Michigan

1940–41 Taught design at Cranbrook Academy of Art

1941 With Eero Saarinen, won two first prizes in the Organic Design Competition conducted by The Museum of Modern Art

Moved to California and during the war designed splints for the armed forces in asso-

ciation with the Molded Plywood Division of the Evans Products Co. After the war continued to work with the Evans Products Co. which manufactured the chair exhibited at The Museum of Modern Art in 1946

An exhibition, New Furniture Designed by Charles Eames, was held at the Museum of Modern Art in 1946

Practices architecture and design in Los Angeles

Don R. Knorr

Born 1922 in Chicago, Illinois

1940–43 Studied architecture at the University of Illinois

1943–46 Lt. (jg) in the Naval Photo Intelligence Group, Pacific Area

1946–47 Student Instructor, Department of Architecture, University of Illinois

1947 B. S. Degree in Architecture from University of Illinois. Appointed full-time instructor upon graduation

1947–48 Graduate work in design, Cranbrook Academy of Art, Bloomfield Hills, Michigan

1948–49 Office of Saarinen, Saarinen & Associates, Bloomfield Hills, Michigan

1949– Moved to California. Practicing architecture in San Francisco

Clive Latimer

Born 1915 in London

1938–39 Production organizer of small experimental printing press initiated by the Artists' International Association

Studied publicity design at the Central School of Arts and Crafts, London

1941–42 Taught typography and lettering at various art schools. Free-lance book design work

1943–45 Scholarship in furniture and industrial design at Central School of Arts and Crafts

1945–47 Heal & Son, London. Planned and designed aircraft equipment. Designed furniture in veneered aluminum sheet for "Britain Can Make It" exhibition. Designed household equipment

1947–48 Member of the Design Panel of the Board of Trade, the design agency set up by the furniture industry to meet conditions caused by the timber shortage

1948–49 Teacher of furniture design at Central School of Arts and Crafts. Course based on *a*) analysis of functional and social requirements and *b*) principles of structure and nature of manufacturing techniques.

Georg Leowald

Born in 1908 in Düsseldorf in the Rhineland

1928–31 Worked in an architect's office

1932 Honor student at the State Art Academy in Düsseldorf under Professor Fritz Becker

1934– Went to Berlin to work on industrial building. Worked there throughout the war and since as a free-lance architect, with special emphasis on industrial plants and hospitals

1947– Appointed to teaching position in the Architecture Division of the *Hochschule für Bildende Künste* of the City of Berlin

John B. McMorran, Jr.

Born 1925 in Syracuse, New York

1944 Attended Colgate University under the V-12 program of the U.S.M.C.R.

1949– Graduated in architecture from Massachusetts Institute of Technology

1950– Graduate student at M.I.T. and assistant to Gyorgy Kepes

John O. Merrill, Jr.

Born 1923 in Evanston, Illinois

1940–42 Studied civil engineering at the University of Wisconsin

1942–45 Pilot, Army Air Forces

1946 Studied architecture at the University of Minnesota

1949 Graduated in architecture from Massachusetts Institute of Technology

1949– At present with the San Francisco office of the architectural firm of Skidmore, Owings, & Merrill

Davis J. Pratt

	Born 1917 in Marion, Indiana
1934–37	University of Chicago
1938–41	Member of the charter class of the School of Design in Chicago (later known as the Institute of Design)
1941–45	Worked with Presentation Branch of the Office of Strategic Services, in Washington, D. C., later in Ceylon
1945–47	Free-lance designer in New York
1947–	Returned to Chicago to teach at Institute of Design; classes in the Product Design Department and the Foundation Course. Also active as a free-lance designer in the fields of architecture and display

Mr. Pratt's entry in the Museum of Modern Art's Organic Design furniture competition of 1940–41 was displayed in the Art in Progress exhibition at the Museum in 1944

Mr. Pratt's wife, Elsa Kula, and his brother John assisted in the design of the prize-winning chair

Ernest Race

	Born 1913 in Newcastle-on-Tyne Educated at St. Paul's School, London
1932–35	Studied interior design at the London University School of Architecture
1935–37	Worked in design department of firm of lighting engineers, London
1937	Studied hand weaving at Ikkadu Village Industries, near Madras, South India
1937–39	Own business as interior decorator in London, specializing in Indian fabrics and rugs made to order
1945	After the war joined a South London engineering firm, and became Director of Design of a newly-formed associate company, Ernest Race Ltd. The company was set up to carry out research into alternative materials for furniture construction in view of the timber shortage. A range of designs including chairs, cabinets, desks, etc., is now in production, based mainly on light alloys and laminated plastics.

Designs by Ernest Race have been selected by the Council of Industrial Design for the "Britain Can Make It" exhibition, and by the Board of Trade for a number of overseas exhibitions of British products

Fellow of the Society of Industrial Artists

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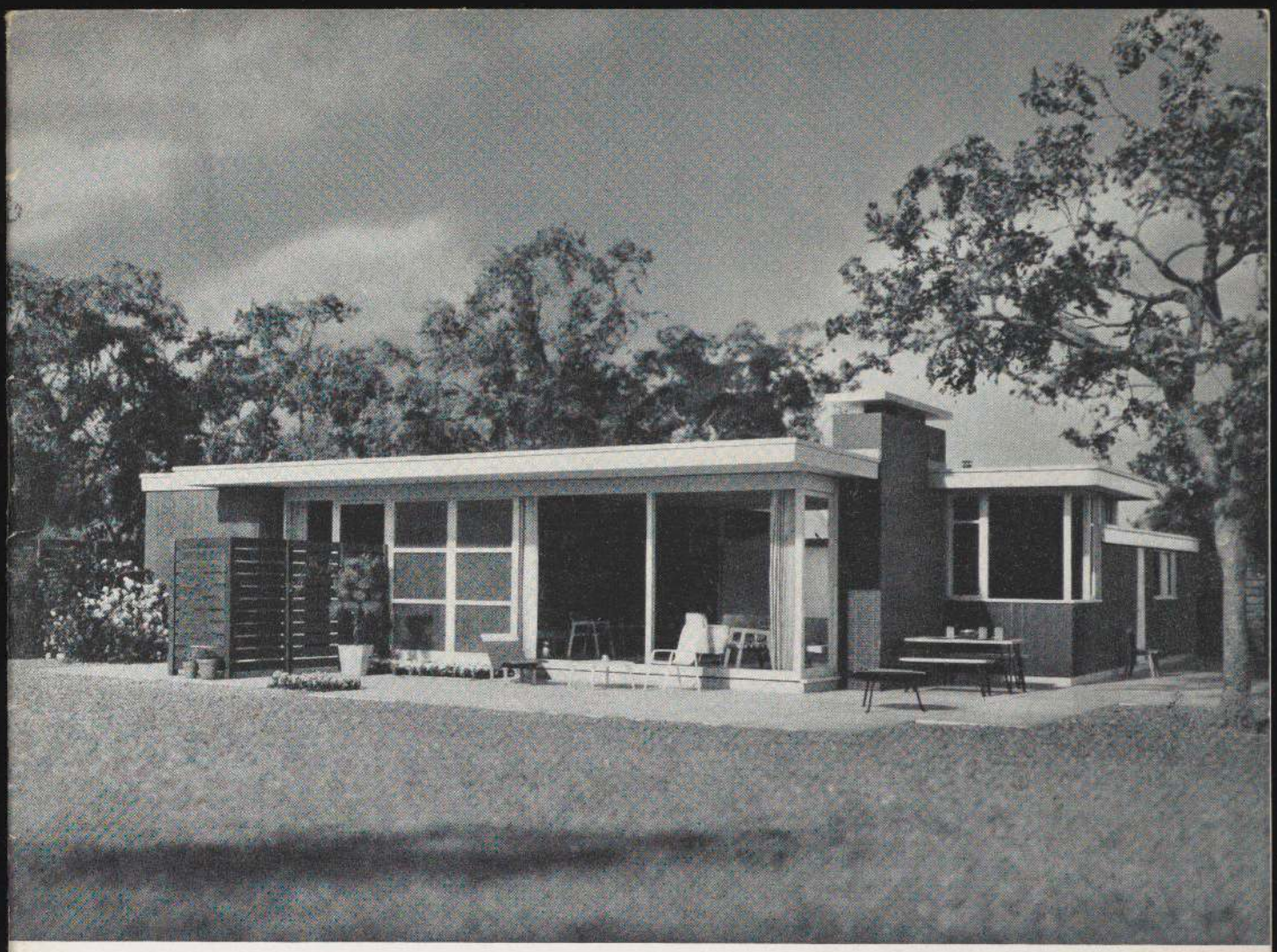

The Museum of Modern Art—Woman's Home Companion

Exhibition House

14 West 54 Street *New York*

Gregory Ain *Architect*

Joseph Johnson and Alfred Day *Collaborating*