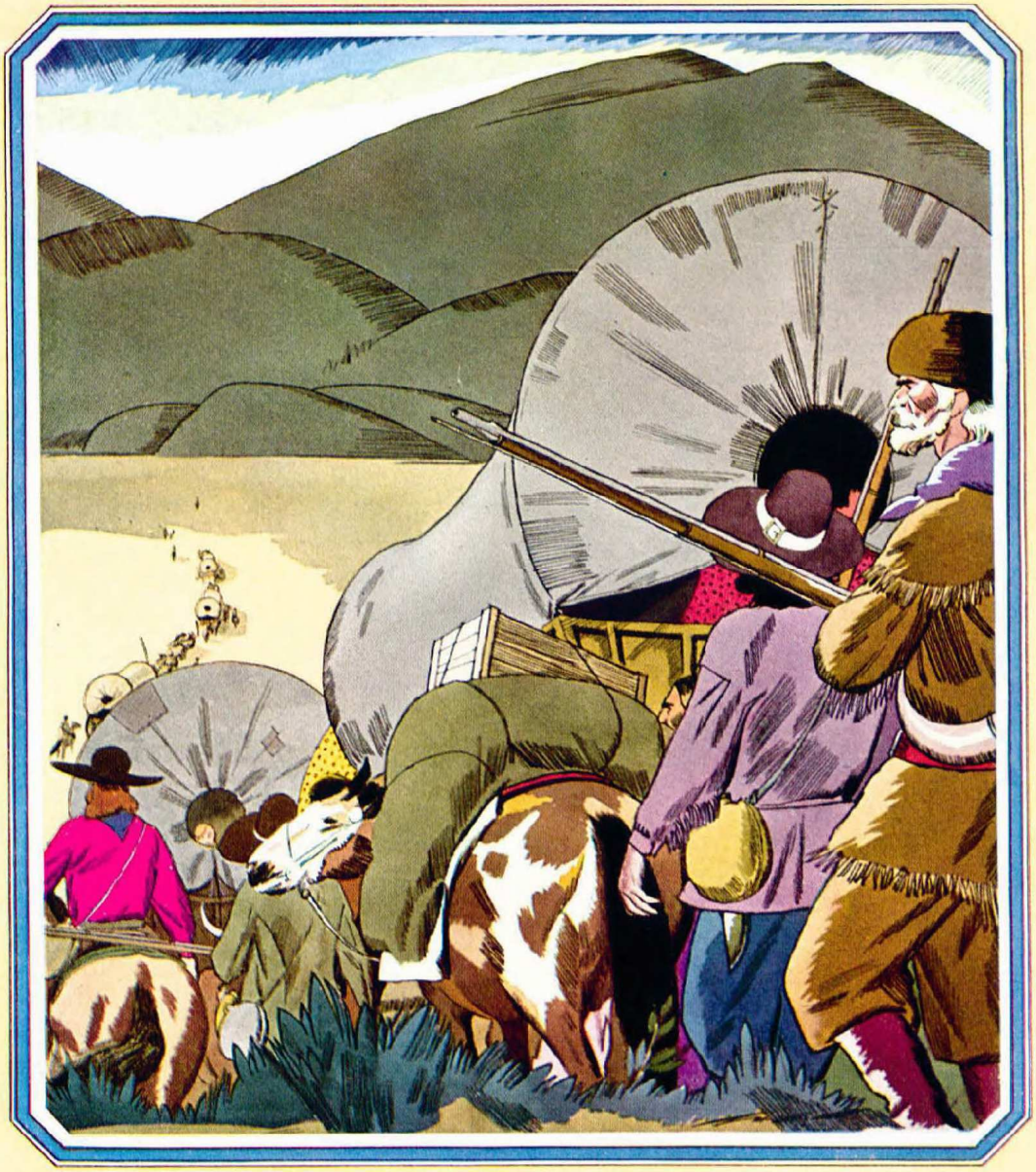
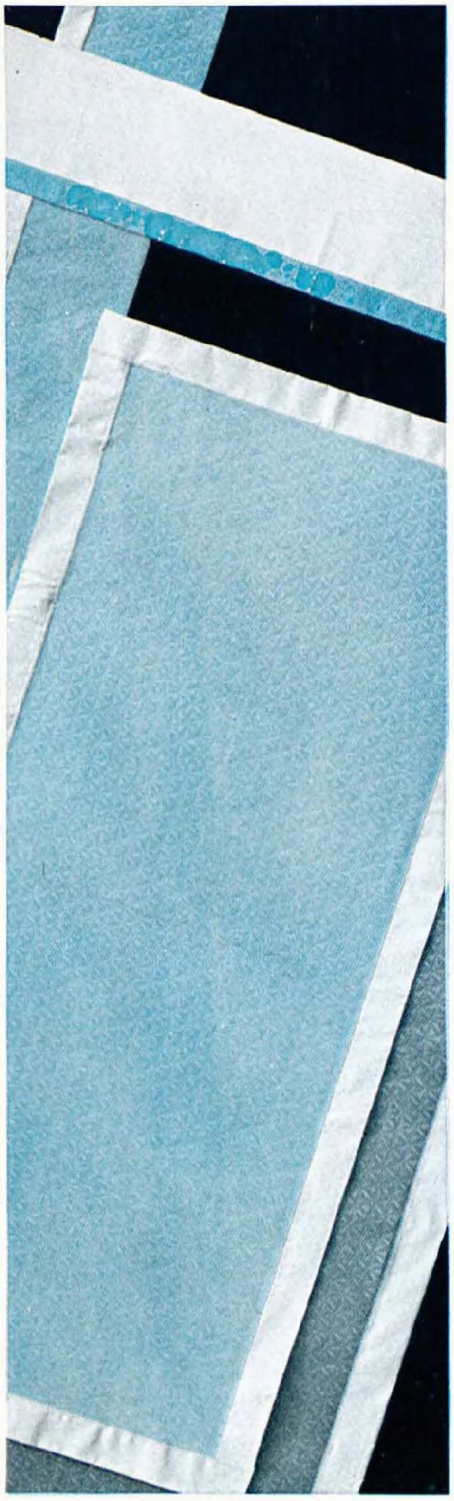
THE DU PONT MAGAZINE



MAY 1929

WDT

These Lovely New Fabrikoid Fabrics Will *Lend Additional Charm* To Your Home



To the modern home, where color reigns unchallenged, du Pont has contributed this most versatile material—Fabrikoid Fabrics, now ready for you in leading department, housefurnishings and hardware stores. You may buy Fabrikoid Fabrics in a wide variety of shapes, sizes, colors and patterns . . . . made into table-cloths, bridge table covers, doilies, luncheon sets, scarfs and runners . . . . in charming colors . . . . in permanent patterns, impressed right into the Fabric . . . . in stenciled and airbrushed designs. Even the edges give you a wide choice, for some are hemstitched, others pinked, some bound in contrasting color, and still others plain.

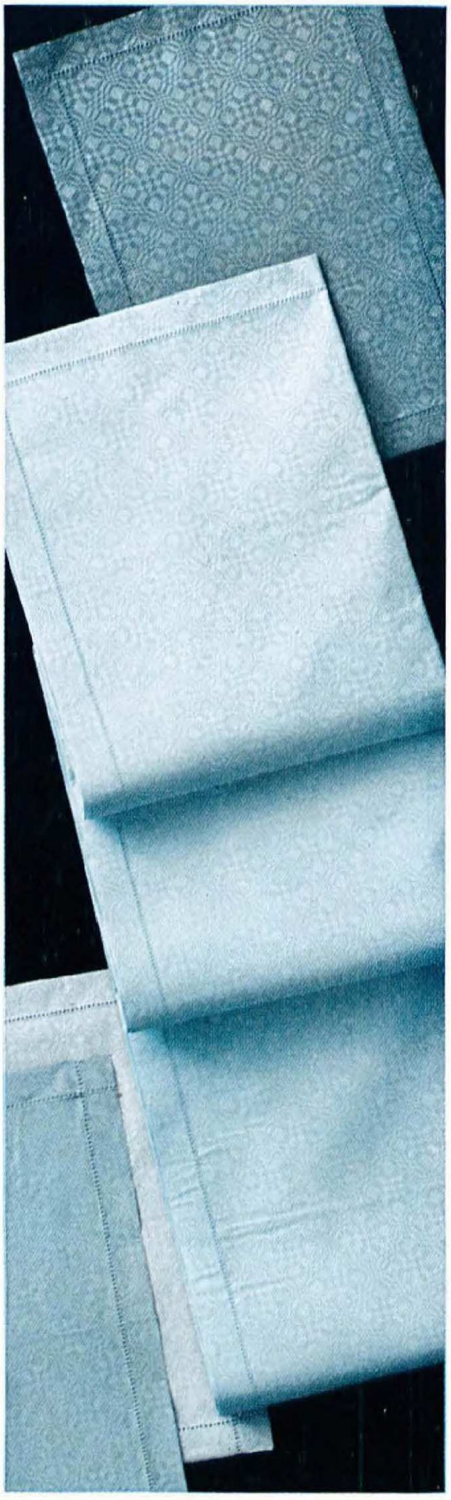
In the modern home, beauty must always combine with utility. And Fabrikoid Fabrics combine with their smart appearance the feature of being washable and cleanable. You may clean them easily with a cloth, soap and water, or scrub them with a soft brush.

For breakfast nook, kitchen, pantry, bedroom, or sunporch —for the entire house, Fabrikoid Fabrics fill a host of needs —attractively, colorfully.

Retail merchants or jobbers interested in the sales possibilities of Fabrikoid Fabrics are invited to write to Fabrikoid Division, E. I. du Pont de Nemours & Company, Inc., Newburgh, N. Y.

DU PONT

Fabrikoid Fabrics



E. I. DU PONT DE NEMOURS & CO., INC. ***Fabrikoid Division*** **NEWBURGH, N. Y.**

The DU PONT MAGAZINE

VOL. XXIII MAY, 1929 No. 5

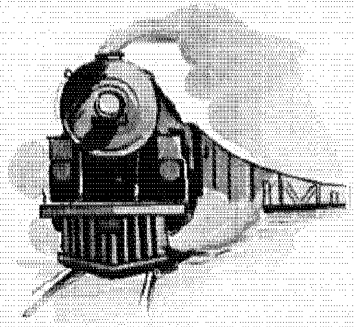
AN ENVIABLE RECORD

Enormous quantities of dynamite and black blasting powder were transported last year without a single fatality or personal injury

AMERICAN and Canadian railroads moved more than five hundred million pounds of black powder, dynamite and other high explosives during 1928 without the loss of a single life or a personal injury, according to the recently published report of the Chief Inspector of the Bureau for the Safe Transportation of Explosives and Other Dangerous Articles.

It is true there were twelve accidents recorded during the year, but all of them involved what might be termed "luxury" explosives—such as toy torpedoes, toy caps and the like—and the property loss altogether amounted to only $77, which Chief Inspector Dunn says is "significant by virtue of its very insignificance."

The safety record for the industrially useful explosives—black blasting powder and dynamite—was perfect. No accident resulted in death, personal injury or property loss! And this is all the more noteworthy because it duplicates the 1927 experience as recorded by the Bureau. As a matter of fact, American and Canadian railroads have carried explosives for four straight years without an accident causing a fatality. For two years past not a single injury has been recorded and during that time the property damage has amounted to only $122. Yet more than 1,000,000,000 pounds of explosives have been moved over the rails.



This record reflects great credit upon the Bureau and the employes of the railroads and explosives manufacturers who manifestly exercised care in packing, loading and transporting products that are potentially very hazardous to handle.

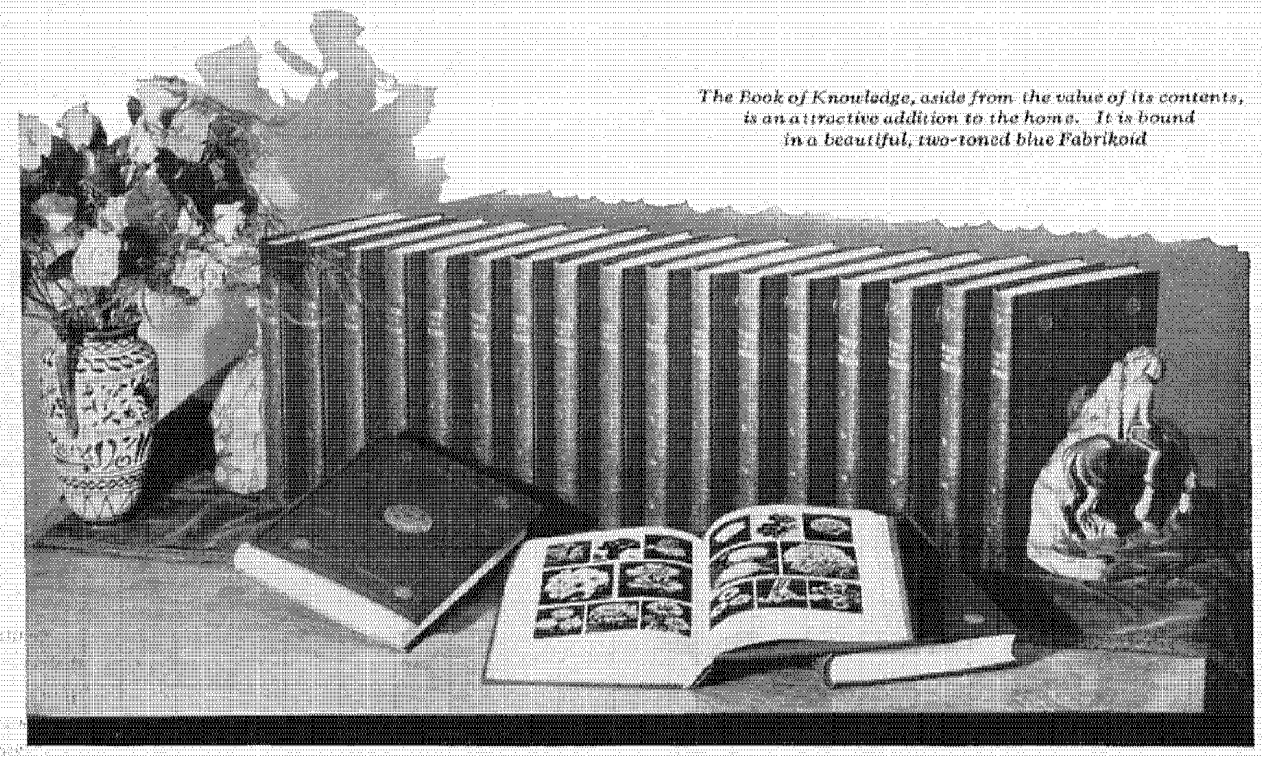
Many readers of this magazine can distinctly remember when dynamite was thought to be too dangerous to be carried in freight cars. In fact, in the early days the hazards of handling and transporting dynamite were so greatly misunderstood that the Repauno Chemical Company, which was largely owned by du Pont interests, published and distributed a pamphlet on this subject.

While railroad officials were not anxious to transport dynamite, they did sponsor an investigation which was made by Professor Charles B. Dudley, a chemical expert, early in 1881. He visited the Repauno works, saw how the powder was made, witnessed a series of thrilling demonstrations to prove that the product was reasonably safe to carry, and then he wrote a letter to T. N. Ely, an official of the Pennsylvania Railroad. It was published in the pamphlet referred to.

His mission was to find out whether or not the product made at this plant was safe enough for rail transportation. Spontaneous combustion, its behavior with sparks and fire, the effect upon it of jars incident to hauling, loading, unloading, coupling cars, and the hazards involved in the event of smash-ups—all of these contingencies were carefully studied. What he learned at Repauno apparently convinced him that the risk was not so great as that connected with carrying ordinary gunpowder, for he concluded his report with this statement: "I see no reason, therefore, why, under proper regulations . . . 'Atlas Powder' should not be taken as freight freely."

This product, although termed a powder, was straight nitroglycerin dynamite, and was sold under this name for many years by the du Pont Company.

This sidelight on the early history of the explosives industry reveals the conditions in 1881, and the excellent safety record for 1928 shows what progress has been made. The enforcement of proper regulations plus efficiency and coöperation has yielded results that must inspire all who are engaged in accident prevention work.



The Book of Knowledge, aside from the value of its contents, is an attractive addition to the home. It is bound in a beautiful, two-toned blue Fabrikoid

HOW? WHAT? WHERE? WHY?

A youngster's curiosity is easily satisfied when the Book of Knowledge is at hand as a source of information

By C. F. Theisen, Jr.

"How do we see things? What makes us stop growing? Where do thoughts come from? Why do the stars twinkle at night?"

The child is a walking question-mark. His expanding, eager intelligence has little in the way of experience to guide it. Everything is new. What may seem to us the simplest commonplace is to him a source of awe or wonderment. So naturally he wants to know all about everything that goes on around him; wants the how, what, where and why of things both simple and intricate.

Because the child's small universe is centered in those —to him—superlative beings, Mother and Father, it is to them he turns for the ready solution of all those myriad childhood wonderments. And for the sake of his development Mother or Father must have the answer or, better still, must have at hand a source from which that impressionable young mind can for itself answer its own thousand-and-one questionings.

Such a source is the "Book of Knowledge," now in the homes of 2,500,000 children all over the world. This twenty-volume work contains the answers to questions which all intelligent, growing children are bound to ask. Geography, history, civics, natural history, physiology, hygiene, science—general and applied—literature, art and music are some of the eighteen major departments covered in the set. A further idea of its magnitude is gained by consulting the index volume, where 31,000 alphabetically-arranged references are listed.

To the child the Book of Knowledge is truly a modern version of Aladdin's lamp. A question flashes out, the pages of the proper volume give the answer, which is simply told and pictured in a way children can understand, and is made so interesting that they love to read on and on. The Grolier Society of New York, publisher of the Book of Knowledge, has realized that pictures can and should tell the story of the world's knowledge, and 15,000 illustrations add greatly to the value of the text.

As a corollary to the child's education, the Book of Knowledge finds its greatest usefulness. It aids the youngster in his school work, making it easy for him to find the answer to questions arising from his studies. It also promotes a desire for knowledge. Of it, Angelo Patri has said, "I should like to put the Book of Knowledge, the best reference book for children that I have ever seen, in the homes of thousands and thousands of little and big and young and old searchers after truth."

At the Sesqui-Centennial Exposition, the Book of

(Continued on page 16)

THRILLS?—ASK A CAMERAMAN

Making motion pictures furnishes plenty of excitement for the men who are called upon to "turn the crank"

By O. H. Briggs

PICTURE making, like most other occupations, seems easier than it really is. Back of the studied continuity lie the efforts of skilled experts. The duties of the director, of course, are well known. Less is generally known concerning the cameraman. A better acquaintanceship with pictures tends to bring this craftsman to the foreground. With the demand for better photography, more economical lighting equipment, more startling and realistic portrayals, the cameraman has been called upon to find ways to make these things possible.

Extracts from a diary of a veteran cameraman give an idea of the versatility and courage necessary to deliver the film story for some well-known pictures.

In making *The Air Mail*, with Warner Baxter and Billie Dove, much of the action was staged and photographed in the air. During the course of this picture the cameraman was flying over Rhyolite, Nevada, near Death Valley. Suddenly, while soaring over the canyon, a crash announced a shattered propeller. With less than one minute to find a landing place amid the boulder-strewn slope of the desert approach to the canyon, the landing was safely made.



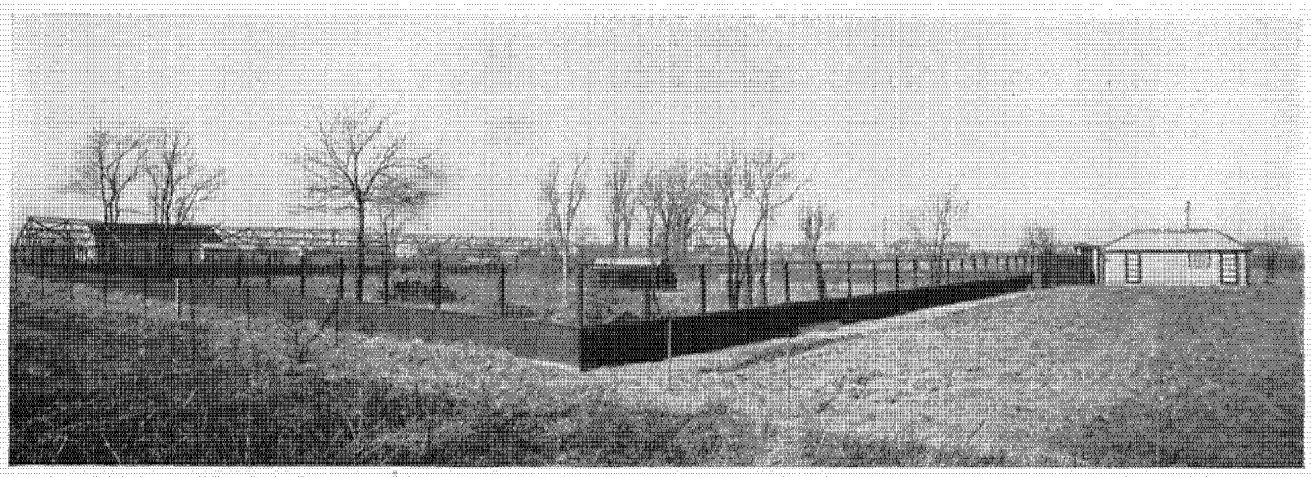
In the studio where Jeanne Eagels, screen star, Jean De Limur, director, and Alfred Gilks, cameraman (right), are working on a new production called "Jealousy"

During the filming of *North of '36*, with Jack Holt and Lois Wilson, near Houston, Texas, this same cameraman was required to get "shots" of a herd of some 2,000 wild longhorn steers stampeding through a narrow-mouth draw. A barrier consisting of the stub of a dead tree was used to support a platform on which the cameramen were placed. Realizing that when the herd hit the tree, something might give way, the supporting members were well braced with planks. The whole structure was then camouflaged with brush. The stampede started when a plane with motor wide open swooped over the cattle from the rear. The result was a wild charge through the draw, against and around the barrier. In less than a minute the brush and part of the supports were swept away, exposing the platform. In this case serious consequences were avoided by the cattle themselves. Some of them hit the tree so hard that they were thrown, and the pile-up at the base of the platform tended to split the herd. The cameramen got their shots, and good ones, too. On this same picture a cowboy, who lived to tell the story, fell in front of a charging herd, which passed over him like a wave.

The making of *Old Ironsides* also furnished plenty of thrills. Shots had to be taken from the topmost part of the masts; there were narrow escapes from falling rigging when the ship met its first heavy seas, and finally an anxious night was spent off Catalina Harbor when the towing tug was unable to handle the heavy ship. By early morning it was dangerously near the breakwater, with the tug's fuel supply getting low and the tow rope almost worn through. Finally, by frantic signaling with flares to the naval base, help was sent and the *Constitution* was brought into harbor.

These extracts are from the diary of Alfred Gilks, prominent cameraman of Paramount-Famous-Laskey Corporation. Mr. Gilks, a native of Riverside, California, was formerly connected with Paramount Hollywood Studio. He is now organizing the camera department at Paramount's New York Studio, where Jeanne Eagels' newest picture *Jealousy* is in the course of production.

Mr. Gilks says that until the advent of talking pictures, which were introduced to the public comparatively recently, the biggest advances in motion pictures had been made in photography. We are proud of the fact that for the past year Gilks has been using Du Pont-Pathé panchromatic negative exclusively in his work.



General view of the experimental game farm where pheasants are being raised. The accompanying sketches, by the author, show details of the fence construction for permanent and semi-permanent pens

THE CARNEY'S POINT GAME FARM

The du Pont Company is operating an experimental game farm within the fenced-in area of its smokeless powder plant in New Jersey

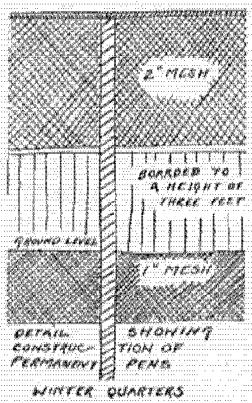


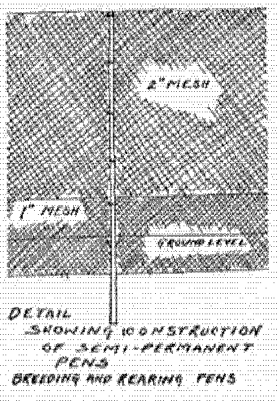
The author

By C. M. PALMER, JR.

THE natural increase of game is slow and uncertain. In many localities it will never be able to keep pace with the growing demands made upon it. If future generations are to enjoy the privileges we do today, individual interest and effort among sportsmen must be centered on the maintenance of an adequate supply.

Our forefathers gave little thought to this vital question. They did not need to. Game in their day was so plentiful that it was wasted and "shot out" with no thought for the future; its very abundance fostered the idea that this resource was inexhaustible. In recent years this same attitude has persisted on the part of many hunters and fishermen. Season after season they go afield with rod and gun to find only a moderate supply of game or fish. When they purchase the required state or county license, they have discharged their legal obligation. But the moral obligation to help put back in streams and coverts an amount of fish and game equal to what they take does not occur to them. They leave that part of the work to state fish and game departments, the Bureau of Biological Survey, or some other organization whose business it is to keep the woodlands and streams well stocked.



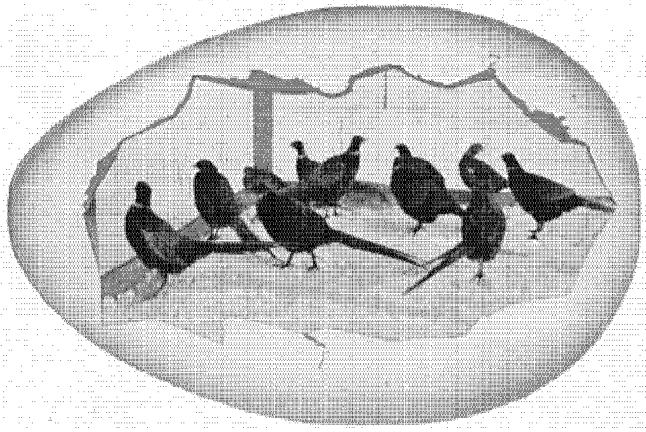


Now the Federal Government, through the Bureau of Biological Survey, is prepared to investigate conditions and collect valuable information. It can lend aid to restoration projects, but no government agency alone can hope to maintain a supply of fish and game in every locality. The Bureau of Fisheries, for example, may hatch millions of fish eggs, but to liberate fingerlings in local streams or even to care for them until they reach adult size is and must be a local responsibility. The maintenance of satisfactory fishing or hunting conditions is the business of the sportsmen in each vicinity.

Can the state fish and game commissions keep the sportsman's home coverts supplied with game and his local streams with fish? They can and do help, but only so far as their funds permit—and no farther. And even if more sportsmen raise more money for game restoration work under state auspices, there will always be people out to take more game and fish than the extra revenue will buy for restocking needs. Commissions, however efficiently organized, cannot overcome this handicap unless they receive more active coöperation from sportsmen and all others concerned.

RESEARCH ACTIVITIES

Probably more misinformation exists about game and fish management than about any other branch of human endeavor. This may be attributed to the fact that only in recent



Whether the hen or the egg came first is less important than the problem of producing more birds of the kind shown here—ring-necked pheasants

years has scientific research been undertaken by men who have studied the life and habits of the various species with a view to increasing their productivity.

Game exists in rural districts almost by accident—wherever nature provides suitable food and shelter. In the future we shall have game where agriculturists, by deliberate investment in land, time and skill, will produce suitable food and coverts for game as a salable by-product.

Certain researches, such as the Stoddard Quail Investigation[1], the New England Grouse Investigation[2], the New Mexico Wild Life Survey and certain projects within the Biological Survey, present at least a partial picture of what may be expected from game research. The recent passage of the McSweeney-McNary Bill definitely commits the Federal Government to coöperative leadership in a program of coördinated conservation research.

A large number of manufacturers of outdoor equipment and the like have recently become interested in game conservation; they realize that the fascination of outdoor life is largely due to the presence of game birds and animals in the woodlands.

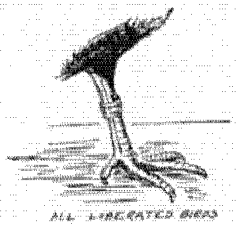
[1] Report on Quail Investigation may be obtained by writing to the Superintendent of Public Documents, Government Printing Office, Washington, D. C.

[2] Report of N. E. Ruffed Grouse Investigation can be secured from the Massachusetts Fish and Game Association, 41 Mt. Vernon Street, Boston, Mass.

The Sporting Arms and Ammunition Manufacturers Institute—the name is amply descriptive—is making a careful study of existing game conditions in the United States, and has employed a trained personnel to conduct research work in a scientific manner. The object is, of course, to determine ways and means of increasing the natural supply of game when all the facts are known about its productivity and the conditions necessary to promote the welfare of game in native haunts.

Industrial concerns are also active in this work. For example, it may interest you to know that all du Pont explosives plant areas that are suitable for the purpose are game sanctuaries and have been for some years past. A system of vermin-control is in operation. Winter feeding during periods of bad weather is employed to help conserve the native game stock, and it is customary on some plant areas to sow a considerable acreage of grain the year before the land is seeded down to grass, so that wild game may have an abundance of summer food.

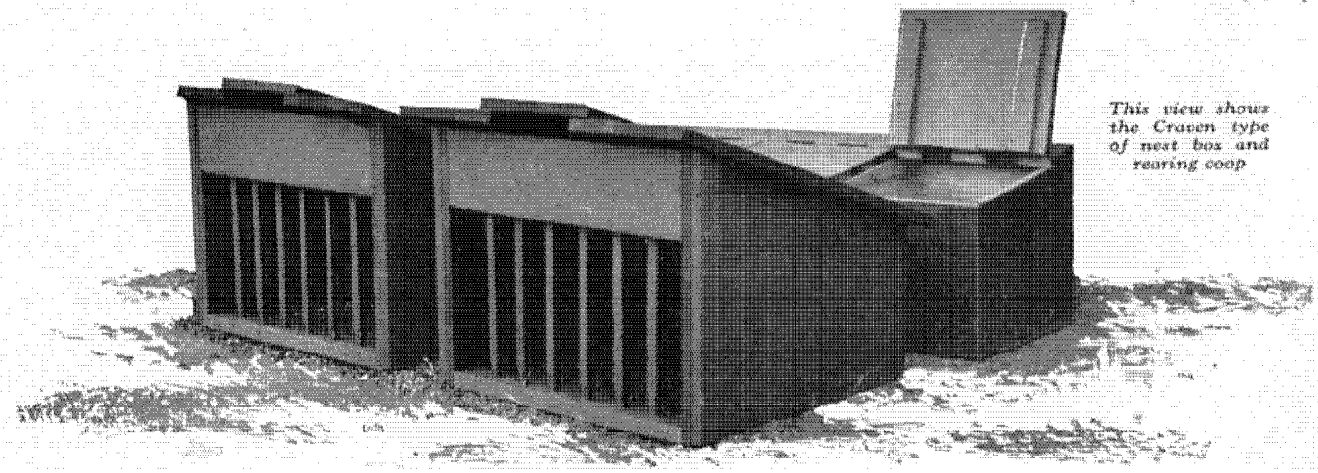
At the Carney's Point smokeless powder plant of the du Pont Company, in New Jersey, there are about 1,800 acres fenced in, and much of this area is low, marshy ground with a thick covering of small trees and the like. Pheasants and quail are numerous, and ducks frequent the small ponds from time to time. So it was decided to use this area for experimental pheasant and quail raising, both artificially in pens, and also by using a modified "Euston" system to safeguard the nests of the wild birds, and to control the vermin. Thus another du Pont experimental station has been established.



ALL LIBERATED BIRDS ARE BANDED FOR IDENTIFICATION

Through the courtesy of the New Jersey Fish and Game Department a number of ring-necked pheasants have been secured for the pen breeding, and we have recently added a small breeding stock of Bob-White quail. For the present we expect to devote our attention to these game birds, possibly adding a few species of ducks later on.

(*Continued on page 24*)

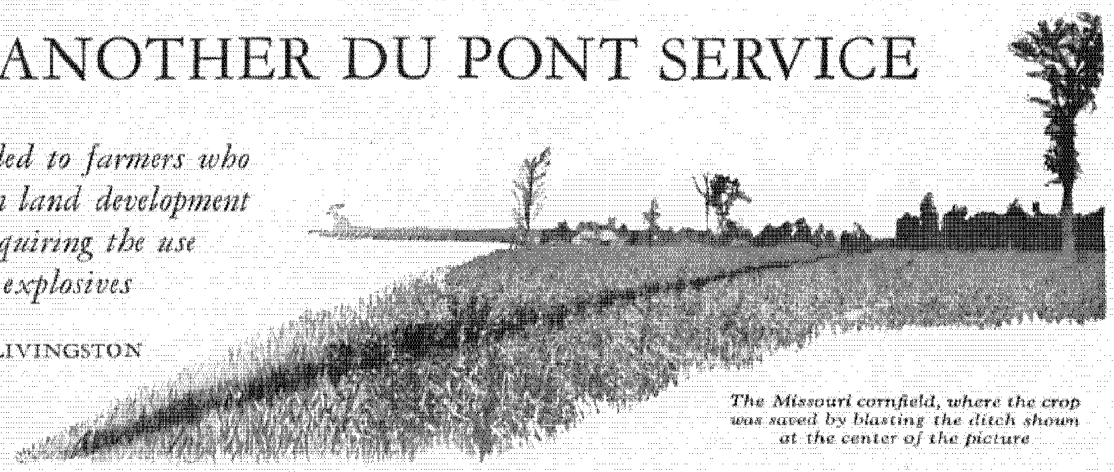


This view shows the Craven type of nest box and rearing coop

ANOTHER DU PONT SERVICE

It is extended to farmers who need help in land development work requiring the use of explosives

By L. F. LIVINGSTON

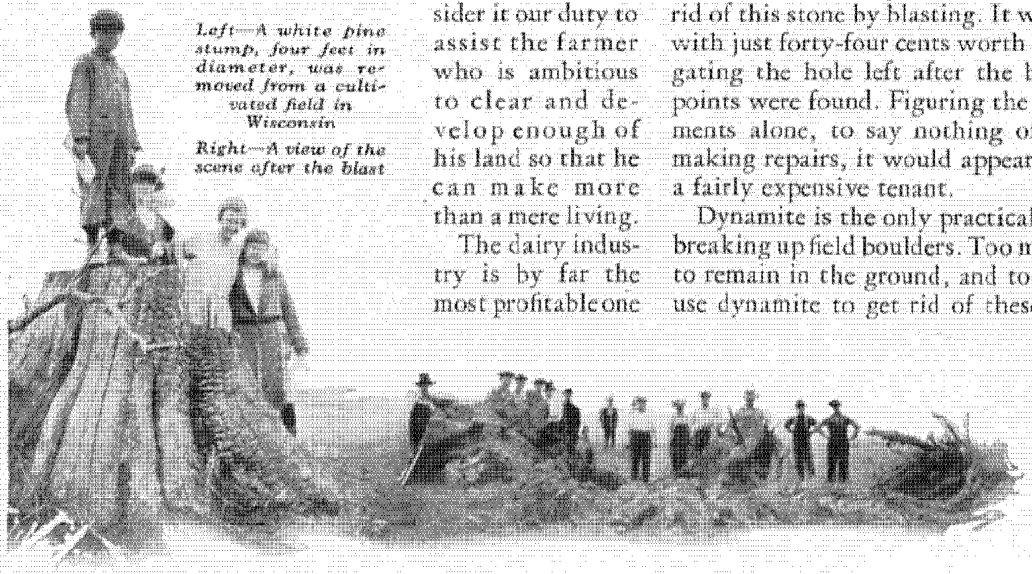


The Missouri cornfield, where the crop was saved by blasting the ditch shown at the center of the picture

THE Agricultural Extension Section of the du Pont Explosives Department has been formed with a service ideal in mind. That ideal is to help remove obstacles that stand in the way of efficient farming.

Governor Gardner, of North Carolina, has said that "the agricultural problem is one of construction rather than one of relief." We propose to show the farmer how to use a relatively low-priced constructive agent to help him overcome some physical handicaps of his calling.

No farmer can compete with his neighbors if he has to plow and cultivate the soil between and around stumps in order to get his land under cultivation; for under such conditions it costs him more to produce less, and that cannot be tolerated long in any going business. No farmer who owns eighty acres of land, with only twenty-five acres cleared, can expect to make much of a success on that farm until he has a greater acreage under the plow and is producing crops of some kind that will yield a satisfactory revenue. Eminent agriculturists estimate that the cultivated area must range between forty and fifty acres. We consider it our duty to assist the farmer who is ambitious to clear and develop enough of his land so that he can make more than a mere living.



Left—A white pine stump, four feet in diameter, was removed from a cultivated field in Wisconsin

Right—A view of the scene after the blast

The dairy industry is by far the most profitable one in the cutover districts of the country. And it is almost a legend that the success of this industry depends largely upon an adequate supply of cheap feed, which means home-grown feed. A survey of conditions in the cutover districts shows that altogether too large a volume of hay is shipped in from remote sources, whereas it should be produced locally. It is our job, as we view it, to help in the clearing and development of sufficient land to make these farmers efficient.

To make clear what I mean by development work, let me cite one or two illustrations. They are not drawn from imagination, but from the writer's own observations, attested by photographic evidence.

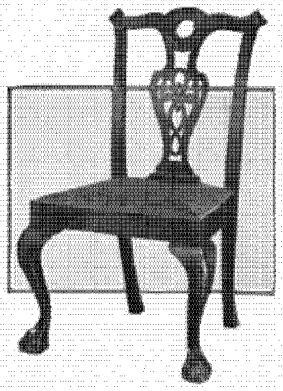
A large stone lay near the center of a ten-acre field which had been cultivated for twenty-five years. The stone was deeply embedded, so that only a comparatively small part of it was exposed above the ground. On account of its size and weight, the farm owner made no effort to remove this obstacle, which could not be broken up and removed with ordinary farm tools without a great deal of labor. Eventually, however, he decided to try to get rid of this stone by blasting. It was broken and taken out with just forty-four cents worth of dynamite! On investigating the hole left after the blast, five broken plow-points were found. Figuring the cost of machine replacements alone, to say nothing of the time consumed in making repairs, it would appear that this old stone was a fairly expensive tenant.

Dynamite is the only practical agent for removing and breaking up field boulders. Too many farmers permit them to remain in the ground, and too few know just how to use dynamite to get rid of these molars of the soil and breakers of plow-points. It is our ambition to show them how easy and economical it is to remove boulders with high explosives.

Yesterday, a five-acre field was a nice size to

(Continued on page 24)

FINE CHAIRS ARE MADE AT GRAND LEDGE



A forty-six year old Michigan company, owned and operated by a woman, finishes all its products with du Pont Duco

By J. A. Porter

SINCE its beginning, nearly five decades ago, the Grand Ledge Chair Company, located sixty miles east of Grand Rapids, has grown and flourished until today it is doing a capacity business, and is furnishing employment to more than three hundred persons.

A feature of the company is its experienced personnel. It is unique in that it is believed to be the only chair factory in the country owned and operated by a woman. Mrs. George E. Martindale has been in complete control since 1916. Mr. C. S. Porter, with a forty-three year service record, has headed the finishing department for twenty-seven years. Mr. C. M. Maris, the general manager, has been with the organization since 1912, having been formerly connected with the Luce Furniture Company of Grand Rapids, Michigan, and the Crawford Chair Company of Grand Ledge. Some of the workmen have served for thirty years.

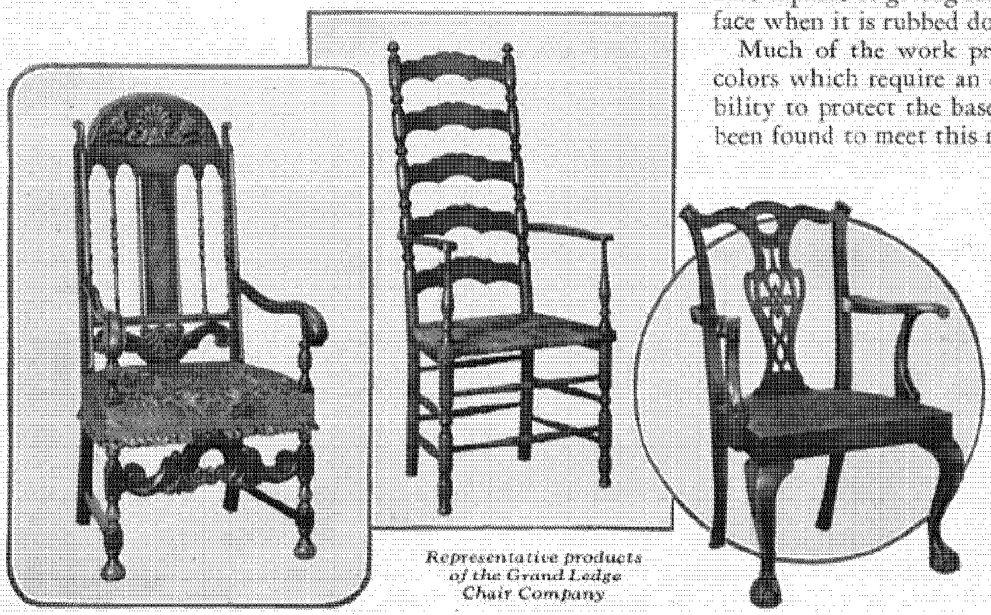
Grand Ledge chairs have always been synonymous with good chairs. Charm of design, sturdiness of construction, and beauty of finish have been contributing factors in placing this Michigan product high in the chair world.

The present plant is comprised of two units providing 100,000 square feet of floor space. The first is devoted entirely to a machine plant, a cabinet room, and auxiliary departments connected with the construction of chairs. The second is given over to the finishing, upholstering and shipping departments.

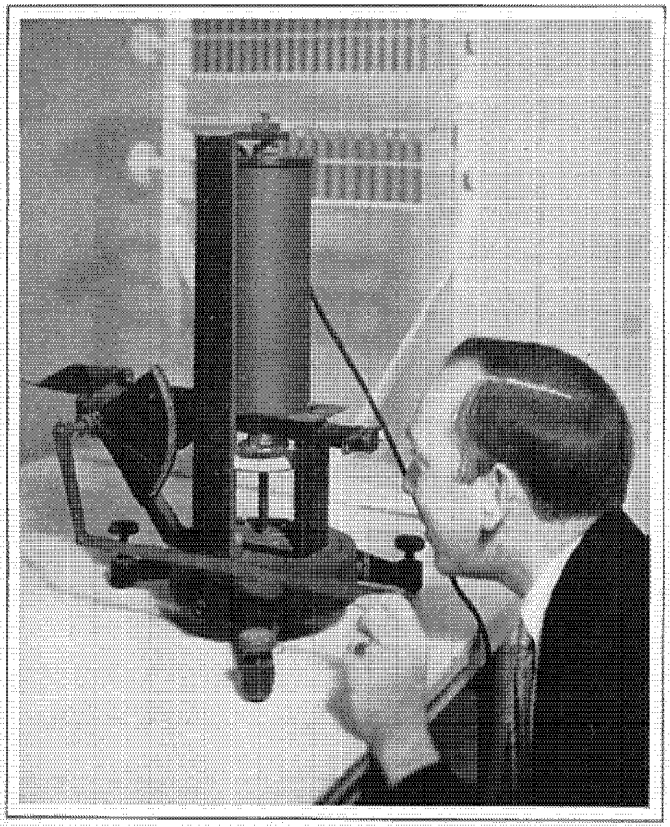
The company was a pioneer in the field of box seat construction, and it has made sturdiness one of the features of its products. All wood used is native timber, with the exception of mahogany from Cuba and Mexico. American black walnut and mahogany are used in chairs of solid construction. Oak, birch and gum woods of native growth are used to some extent in the combination pieces. All woods are thoroughly treated in drying kilns before being cut into many different shapes and patterns. Much stress is laid on this phase of the work to insure durability of the final products.

The finishing department is a model among chair shops. All chairs produced here are finished with genuine du Pont Duco, several coats being applied. The pieces are then oil-rubbed or waxed by hand. Duco furnishes a fine, hard base capable of giving long wear and a beautiful surface when it is rubbed down to an egg-shell gloss.

Much of the work produced is in delicate-hued colors which require an outer surface of great durability to protect the base. The du Pont product has been found to meet this need perfectly. Several coats of Duco applied at short intervals have the property of "knitting" into one another to form a firm, tough, beautiful surface that not only retains its own fine luster, but also affords lasting protection. High-quality woods, fine workmanship and a durable, beautiful finish have earned for Grand Ledge chairs the excellent reputation they enjoy today in the furniture marts of the country.



Representative products of the Grand Ledge Chair Company



A scene in the constant temperature and humidity room of the Central Technical Laboratory at Philadelphia

This instrument is used to measure the reflectivity of paints and enamels after the accelerated yellowing test

FACTORY ECONOMY AND LIGHTING

The use of Du-Lite on interior surfaces will insure increased illumination from natural or artificial sources

By JOHN W. ILIFF

AN interesting feature of modern factory construction practice and maintenance is that considerable importance is now being attached to the lighting of buildings for manufacturing processes. A well-illuminated factory, in comparison with one of the older type, will show a distinct economy from the standpoint of operating costs. Good lighting increases the output of manufactured materials. This is due to the fact that the workers can operate more efficiently and with less effort under good lighting conditions. For the same reason the percentage of defects and spoilage in a well-lighted factory is lower than in a poorly illuminated one. These two items automatically reduce the unit cost of production.

In addition, satisfactory lighting possesses an indirect value which shows up in reduced operating costs: The accident rate is lowered and the workers have less eye fatigue and better health. Moreover, improved morale results from improved environment, and this, in turn, reduces labor turnover and makes less supervision necessary.

A well-lighted factory possesses a distinct advertising value; it indicates prosperity and good management.

Obviously, daylight is the cheapest source of light. But whether the source is daylight through large and well-cleaned windows or artificial illumination from incandescent lamps, it is evident that only a small portion of the light coming directly from either of these sources falls on the workbench. The remainder falls on the walls, ceilings, furniture, and so on. If this light is totally absorbed, as it is with black surfaces, the efficiency of the lighting system will be very low. On the other hand, if the walls and ceiling of the room are painted with a brilliantly white finish, the greatest proportion of the light falling on these surfaces will be reflected and this will throw additional light on the workbench. In this way the efficiency of the light source is greatly increased. Moreover, the diffused light obtained by multi-reflection from white surfaces accomplishes its purpose much more effectively than a direct though powerful glare from windows or lamps alone.

Consequently, if a factory is to be well lighted, the most efficient utilization of the light source will be obtained by painting the walls and ceiling white. Finishing the interior of a factory also has a direct bearing upon the general appearance of the place and upon the morale and efficiency of the workmen.

The effectiveness of the light-reflecting surface necessarily depends upon the brilliancy of the color and its ability to maintain its initial whiteness. Therefore, a mill white, the enamel used for this purpose, must dry quickly to a smooth, hard surface that will not collect dirt. It must also be highly resistant to after-yellowing.

Untreated drying oils "yellow" rapidly in a paint film, especially in dark corners and under reduced illumination —and the most intense brightness is desired at these particular places.

In order to produce a satisfactory enamel, the du Pont Company has developed a special vehicle which, with its balanced pigments and drier, makes possible a product possessing the desirable characteristics of a mill white.

(Continued on page 23)

WHAT HAPPENS TO POWDER KEGS?

A du Pont technical representative observes that they are used in many interesting ways

By S. C. Jones

"Mister, what happens to tin cans and things after people use what's inside of them?" This was quite a normal question for any youngster to ask and since he was so insistent my curiosity was also aroused. Just what did happen to containers of various articles after they had served their original purpose?

After some investigation the final destination of many articles was discovered. It appears that large tin cans of certain types are sold to salvage companies whose business it is to remove the solder, if any, straighten out the tin and resell the metal to various industries. We all know that paper boxes and old newspapers eventually find their way back to the paper companies to be remade into new paper products; but in most cases discarded articles are either completely destroyed, left in some dump to rot, or follow a circuitous path back to the company which first produced them, to be remade into new materials. Although most of the articles fall into one of these divisions, there is one which does not.

Before the introduction of pellet powder there were some eleven million metallic powder kegs produced in the United States each year. These kegs are required by Federal regulation to be of substantial construction and those of the ordinary type are not reused for the packing of explosives. During the past fifty-eight years it is estimated that there have been approximately 500,000,000 of these kegs emptied. The question is, where have they all gone, and, if existing, what are they being used for?

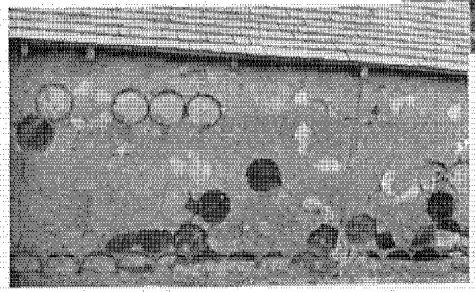
The largest user of black blasting powder is the coal mining industry, so a great many empty kegs are used in the mines as containers for sand, oil, carbide waste and water; after being filled with mud, sand or fireclay, to wall up crosscuts and stopes; and in a flat condition, to strengthen doors and drain the roofs of underground haulage roads.

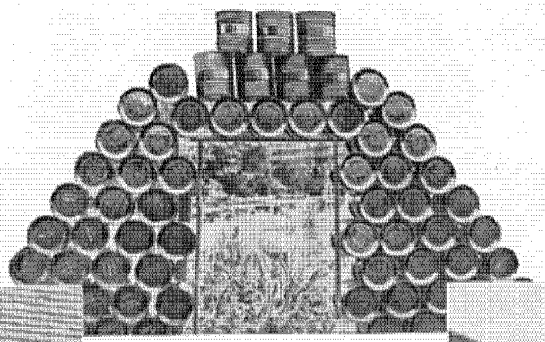
The kegs are also used in the household and garden. Kegs with the tops cut out are used as coal scuttles, water buckets, wastepaper baskets, and as pails to carry seeds and bulbs. It is interesting to note that they may be transformed into admirable flower pots by the application of a few coats of Duco.

In the coal fields of Wyoming these containers find a unique use. Because ordinary building materials are costly, the residents construct homes from cast-off powder kegs filled with adobe mud. This dries and hardens in the container which is then ready for use in the outer walls. The inner walls are plastered smooth and papered. In some localities the roof is covered with flattened kegs, which produce a corrugated effect, although in the illustration the common wood shingles are used. This provides a home which is as comfortable and substantial as one built of stone. Another of the illustrations shows the first step in constructing a garden wall with empty kegs, at Lewisburg, Alabama.

This is not a complete list of all the uses, for one would have to go far to account for the present total keg output of five and one-half million per year. However, this information may serve to suggest other ways in which these empty powder kegs may be utilized to advantage. And, in any event, it may be helpful in quieting some inquisitive youngster, provided he is not too insistent about getting all the details.

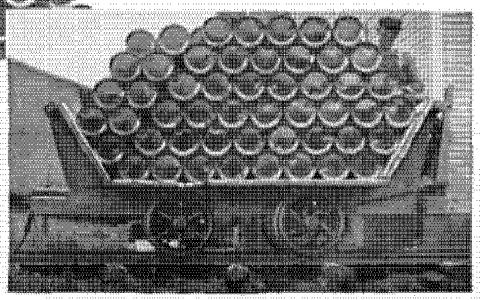
Below—Residence at Superior, Wyoming, built of powder kegs filled with adobe mud by an employe of one of the coal companies





Above—An early stage in the construction of a garden wall built of powder kegs. This picture reveals an unusual use for these containers

Below—A truckload of kegs at the Connable Mill en route to the packing house. A year from now who knows what use will be made of them?



BRIGHT COLORS FOR OTTOMANS

Informal furniture is increasingly popular today. Fabrikoid-upholstered seats of the kind shown here are both comfortable and colorful



The ottoman at the left is of medium blue with piping in Chinese red. The center one is black, red and jade green, with gold piping. The square one is black, Chinese red and cream, with piping of gold

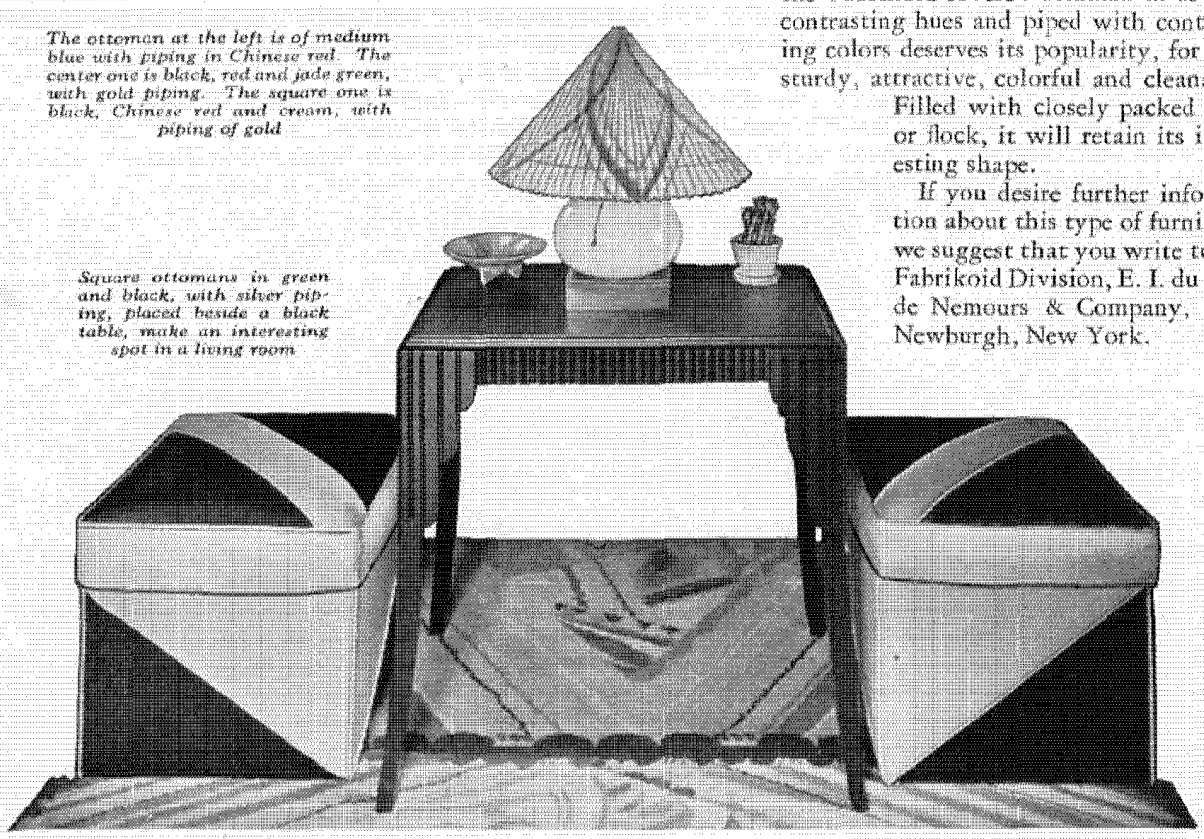
MORE and more the tendency in modern home appointments leans toward informality, which is just another way of saying that homes today are not only more cheery but also more livable. And of all informal furniture the ottoman is perhaps the most charming and interesting addition that can be made to living room, bedroom, sun porch or den. It adds a touch of completeness to almost any grouping of furniture. There is something about it that attracts everyone.

Have you ever watched a group of people come into a room? Almost invariably, there is a certain hominess about the ottoman that draws the eye and makes the guest feel on more intimate terms with host or hostess.

The accompanying pictures quite clearly indicate that the Fabrikoid-covered ottoman in several contrasting hues and piped with contrasting colors deserves its popularity, for it is sturdy, attractive, colorful and cleanable. Filled with closely packed fiber or flock, it will retain its interesting shape.

If you desire further information about this type of furniture, we suggest that you write to the Fabrikoid Division, E. I. du Pont de Nemours & Company, Inc., Newburgh, New York.

Square ottomans in green and black, with silver piping, placed beside a black table, make an interesting spot in a living room



CONTEMPORARY DECORATIVE ART LINKS WITH INDUSTRY

The du Pont Company collaborated with architects in presenting the eleventh exhibition of American industrial art at the Metropolitan Museum

By F. R. PRICE

THE exhibition at the Metropolitan Museum of Art under the title "The Architect and the Industrial Arts" is another evidence of the fact that the bonds between art and industry are strengthening.

The Museum has secured the enthusiastic coöperation of nine architects of outstanding ability and distinction, who have worked together in planning and designing every detail in the preparation of the twelve rooms and the garden feature, which compose the exhibition. A community of sympathetic interest between the architects and a company of collaborating manufacturers, designers and craftsmen has made it possible to present a truly American showing of contemporary styles in design.

> "THESE exhibitions are in effect the Museum's contribution toward the formation of a style of design, for under its ægis moot points will find decision and trends be given direction, without too many concessions to the exuberance of novelty and with never too strong a regard for sales value. The Museum is neutral ground, and all other considerations must yield before that of a sincere effort in favor of contemporaneous design."
>
> —*From the foreword in the exposition catalogue by Richard F. Bach, director of industrial relations, Metropolitan Museum of Art*

Contemporary design hopes to interpret the practical life of our day and in so doing to reflect something of the dominating influences which affect our thinking, our actions and our tastes. Concrete, steel, skyscrapers, motor cars, airplanes, radios, railroads and telephones are products of our crowded lives. The architect has felt the strength, both physical and æsthetic, of these forms of mechanics. Yet he has not allowed the machine to dictate the artistic form in its entirety, else the machine would become a monster destroying beauty and harmony.

The amazing resources of industries offer real potentialities in products capable of expressing sincere object lessons in good design. Industry offers new materials, new processes and new inventions with which the artist may create what he considers most appropriate for our present-day ideas of comfort, beauty and utility.

The remarkable turn of the industrial world toward the artist is not really a new thing; it is merely the size of the movement that is startling. The exhibition entitled "The Architect and the Industrial Arts" is the first real effort to initiate, promote and develop a demonstration of collaborative effort in design and production, without too strong a regard for commercialism and sales effort.

Whatever we may conjure as to the future of the so-called modern art movement and its position of importance in our art periods, modern art is perhaps one of the chief factors in the new consciousness of design. American business has almost universally discovered the sales value of color and because of this happy discovery, it is now receptive to any improvement in the appearance of its products. Today, as never before, changes in design are receiving important executive consideration. New or modern design offers a relief from monotony in the appeal of a product. It offers the manufacturer a new advertising and sales angle upon which to base his appeal to the ever-increasing sense of taste in the consuming public.

Out of the chemical laboratories of the du Pont Company have come new synthetic products which possess those fundamental characteristics of utility combined with ease of adaptability to modern standards of beauty and good taste. Important contributions to a new era in merchandising may be found in rayon, Cellophane, Pyralin, Fabrikoid, Fairfield rubber products, paints and varnishes, lacquers, Duco, dyestuffs—products lending themselves admirably to the dexterity of the creative artist.

It is gratifying to note the acceptance of du Pont products as mediums of expression in this exposition in New York City. Du Pont products were represented in seven of the group exhibits created by the architects—Raymond M. Hood, Ely Jacques Kahn, Eugene Schoen and Joseph Urban—participating in the exposition. These prominent architects collaborated with the development bureaus conducted by the Fabrikoid Division of E. I. du Pont de Nemours & Company, the Du Pont Rayon Company, and the Du Pont Viscoloid Company, in producing the necessary materials for the execution of various details in their completed group schemes. The names of these schemes indicate their variety: Backyard garden, man's study in a country house, conservatory, show window, woman's bedroom, central garden feature, man's den, child's nursery and bedroom, dining room, bath and dressing room, apartment house loggia, sales room and business executive's office.

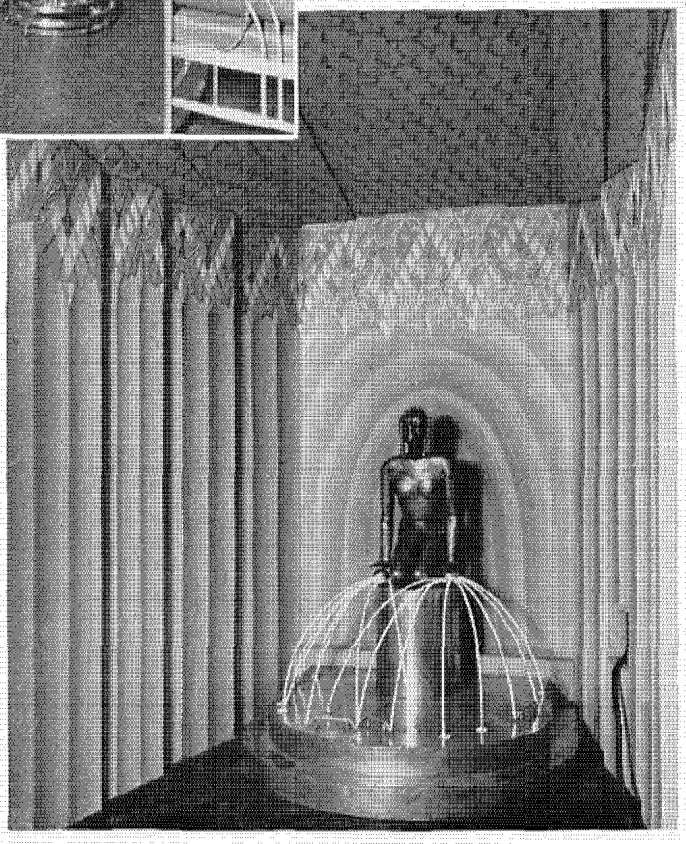
In the apartment house loggia, by Raymond M. Hood,

BEAUTY AND UTILITY ARE COMBINED IN

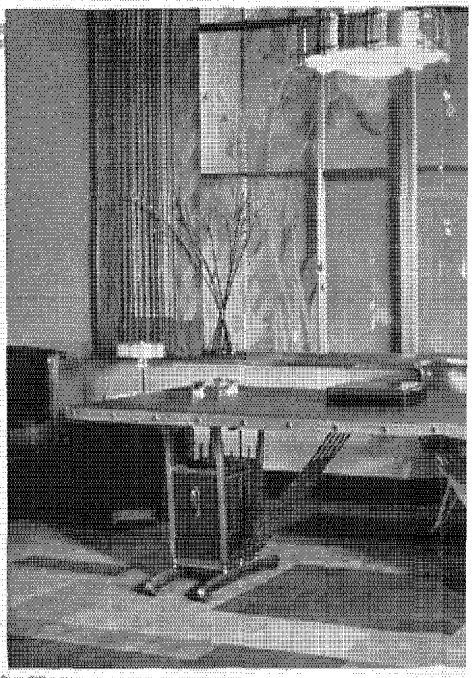


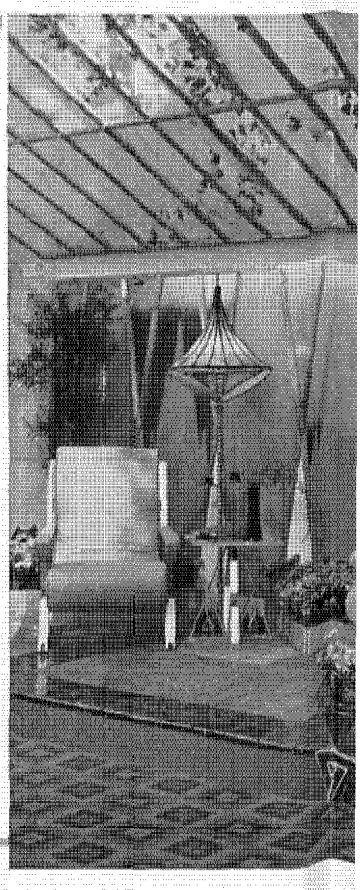
Above—An apartment house loggia designed by Raymond M. Hood. The adaptability of materials to the open air was a controlling factor in its creation. The cast concrete on the walls is more solid than marble, and the ceiling and overmantel are of chromium. The aluminum furniture is covered with Fabrikoid

Right—The sales room designed by Ralph T. Walker. Painted Fabrikoid appears on the ceiling and the walls. The fountain of light was designed by Egmont Arens, and the kneeling figure was created and executed by Otto and Lora Webster

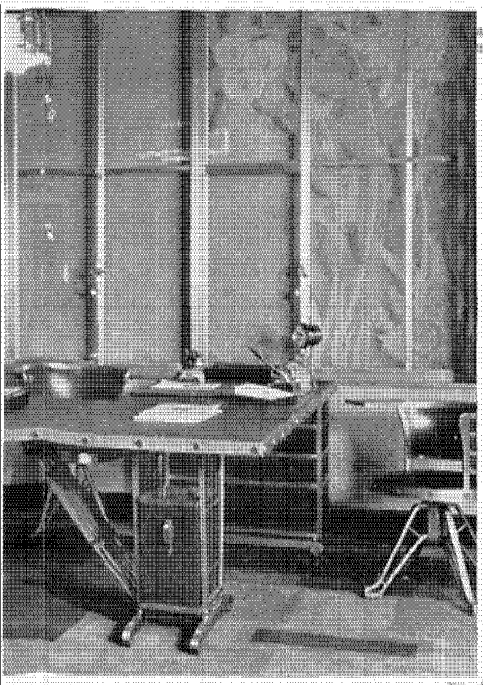


Right—A remarkable combination of beauty and utility is shown in the executive's office designed by Raymond M. Hood. The walls and ceiling are of Fabrikoid. Among the desk accessories are a cigar-cigarette box, made of green Lucite, with burnt orange handles, a letter file and desk set with pens in the same color scheme

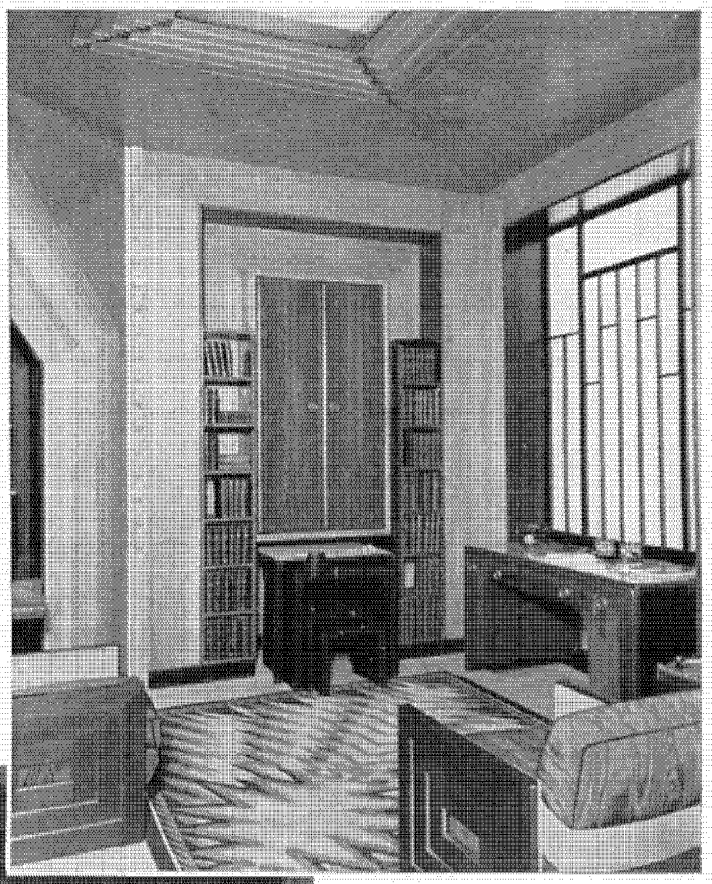




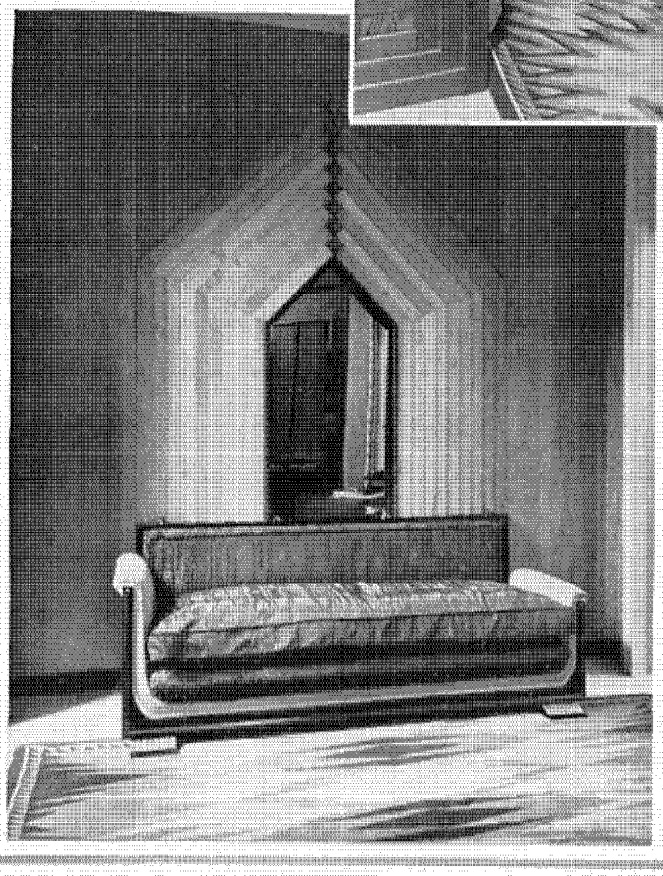
IN DESIGNS FOR THE HOME AND OFFICE



Center, below—The conservatory by Joseph Urban is conceived as a semi-outdoor room where one may lounge in sunlight surrounded by flowers and small shrubs. With the etched glass of the windows, shades and curtains are not necessary. In keeping with the highly reflective finishes of the room, Fabrikoid is used to cover the chairs







Above—In the man's den, by Joseph Urban, a warm background is achieved with dull, almost natural finishes. The low chairs, wide desk, shelves for pipes and accessories, nest of tables, all contribute to the comfort of this really beautiful room

Left—A detail of the same den, showing the sofa, which is upholstered in deep brown rayon moire of a decidedly new type. It carries out the color scheme of browns, tans and black, which gives the room its individuality. The same material is used to cover the chairs

a new type of room for the city home or the terraced apartment house is presented. One side of the loggia is open to the air, while the other opens off the salon of the apartment. Here the adaptability of materials to the open air was a controlling factor in the design of the decorations and furniture. Because of the semi-exposure to the weather, cast concrete and non-corrosive chromium metals have been used for the walls, ceiling and overmantel. The furniture is of aluminum, and Fabrikoid—a modern product peculiarly ideal for the purpose—has been chosen for the upholstery material because of its lasting beauty and resistance to wear and weather. The architect has achieved a new type of beauty with materials chosen for their practical utility.



Bath and dressing room designed by Ely Jacques Kahn. The manicure box, pin and jewelry boxes, mirror and brush are made of du Pont ebony-finished Pyralin with sterling silver line inlays and ball feet

Mr. Hood's own declaration best expresses the thought behind the creation of the business executive's office:

"If I were asked if I could build a more beautiful business office than Michelangelo, I should say, 'No, but I can build a better business office.' My office would be better lighted, better heated, have furniture better suited to its needs, and so on, all for the simple reason that I have new materials, new processes and new inventions at my command, of which Michelangelo did not dream. The office might not be so beautiful, but it would certainly be more convenient, more comfortable and better suited to its purpose. But it would not be as good, and would undoubtedly be less beautiful than Michelangelo's, were I to limit myself to the materials, the craftsmanship and the relatively simple contrivances of his period."

In the layout and design of the different elements of the executive's office, selections of materials were based on their peculiar fitness for their purpose, with regard to economical upkeep and sanitary qualities. In the words of Mr. Hood, "The walls and ceilings are covered with Fabrikoid, a machine product which far excels in durability, cheapness, quality of surface, sureness of effect and variety of expression, the old methods of plaster and wood paneling." The silvery hue of the aluminum used in the framework of the furniture strikes a subtle color note against the surrounding tans and browns used in the Fabrikoid walls, ceilings and coverings. The large window floods the room with a great area of subdued light, and the amount of light and air can be regulated by so-called "louvred" curtains made from rayon fabrics.

Pyralin is used effectively in the execution of the desk accessories, and furnishes interesting color notes in the combinations of green and burnt orange, and burnt orange, black and silver, used in making up the letter tray, cigar box, blotter corners and desk set.

Ely Jacques Kahn glorifies the backyard and develops the architectural possibilities with a garden seat in mosaic and a tile fountain with metal sculpture. Rayon is used for covering the guest chairs in the backyard garden. Interesting color contrasts are achieved in the handling of large masses of color in the flowers against the orange tile of the fountain wall.

In the bath and dressing room, Ely Jacques Kahn produces a setting for an important element in the house, in a harmony of black and rose. Glass, tile and rubber are used to make up an interior which is at once free from superfluous decoration. It is an interesting study in color and texture, and practical, too, in that it can be cleaned easily. In the execution of the accessories, black ebony-finished Pyralin with sterling silver inlays was effectively used. Manicure box, hairpin box, jewel case, comb, brush and mirror of Pyralin are details of the dressing table which are in harmony with the spirit of the room.

The child's nursery and bedroom, by Eugene Schoen, has an appeal based on the needs of a growing youngster. The dominating color is the lemon chartreuse Fabrikoid which covers the walls. Fanciful decorations executed on the Fabrikoid are designed to stir the child's imagination. Of these wall coverings Mr. Schoen remarks that they "permit the child to experiment with decorative colors

that can be removed easily if desired." There are numerous cupboards in which toys can be stored in an efficient manner to build an instinct for orderliness. An illuminated blackboard, an aluminum desk, a low play table, and furniture of aluminum, upholstered in red Fabrikoid, complete the furnishings. Lighting is entirely concealed and designed in an endeavor to simulate sunlight. Among the interesting toilet accessories of Pyralin are a square clock in red, blue and yellow, a clothes brush, a hair brush and a comb in white, decorated in red, blue and green painted designs. Pyralin is also used in executing an amusing ink and pen set in the shape of a yellow slice of pie, surmounted by a red apple with a brown stem and green leaves. The pen groove is painted to represent a knife—fanciful things to appeal to the child's imagination.

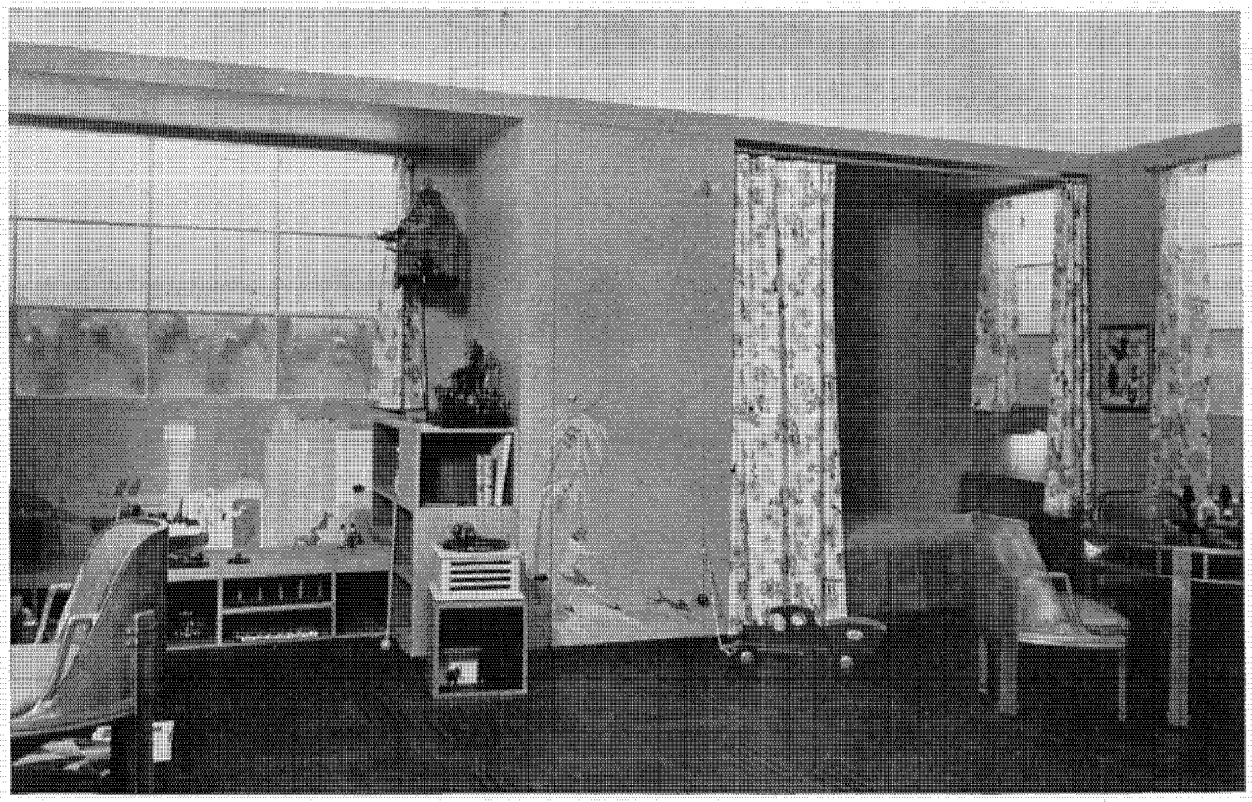
Joseph Urban's conservatory presents a semi-outdoor room where the rectangular forms of glass so often used are replaced by large angular-shaped panes that have an etched pattern for protection against unnecessary glare. Cadmium-plated steel, highly glazed tile and highly lustrous finishes are used to augment the effect of the flowers through shadowy reflections. Fabrikoid was chosen for the upholstery material in keeping with the permanent, highly-reflective finishes of the decorative scheme.

In the man's den, Joseph Urban has developed the ensemble feeling and has carried it out in every detail—a truly masculine creation. Browns, tans, and black make up the major color scheme, and dull, natural finishes provide a warm background for the vitality and spirit of the room. Simple built-in furniture makes ample provision for books, pipes and accessories. Simple designs and the decorative qualities of the materials themselves achieve a quiet dignity in the furniture consisting of three chairs, a desk, a nest of tables and a sofa. The floor covering in a dynamic design of chocolate, yellow and black helps to give the room an air of individuality. The chairs, square in design, are made of Macassar ebony and are upholstered in a deep brown rayon moire of a distinctly new type. This same fabric is also used in upholstering the sofa. Rayon fabrics possess unusual qualities of utility and permit unlimited effects in color and texture—an important contribution to contemporary decorative art.

EDITOR'S NOTE: We desire to acknowledge the courtesy of the Metropolitan Museum of Art in permitting us to reproduce the accompanying illustrations and to reprint quotations from the exhibition catalogue.

THE Du Pont Viscoloid Company has announced the release of its new one-reel motion picture, "Authentic Art in Milady's Boudoir." This film shows the development of style trends, especially in the toiletware field. Part of the picture appears in natural colors.

The film may be obtained free of charge upon application to the Motion Picture Bureau of E. I. du Pont de Nemours & Company, Inc., Wilmington, Delaware.



Eugene Schoen designed the child's nursery and bedroom, specifying lemon chartreuse Fabrikoid for the walls. The chairs are upholstered in the same material in red. Pyralin appears in numerous toilet accessories

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Vol. XXIII MAY, 1929 No. 5

FACES AGAINST THE WILDERNESS

"TIRELESSLY, beyond the remotest outposts of civilization, crawled the covered wagons, into the setting sun.

"Hardship! Indians! Desert thirst! What did it matter? In the rays that painted the canyons, gleamed the faces of conquerors—builders of the greater nation.

"They were the pioneers of yesterday—the men who *looked out*.

"Behold the pioneers of today—the men who *look up*—builders of a mighty empire.

"Forests of smokestacks grow in their wake; where they stop to live, towering cities rise. Winged chariots hurl them through the sky.

"From open hearths, from lathes and forges, from chemists' retorts, the new pioneers wring progress and advance.

"With a corporate existence dating back to 1802, du Pont knows, as few can know, the value of the pioneer spirit—why and how it must be fostered." Because there still are pioneers, many products have been born in the laboratories of du Pont for use in modern industry.

Our cover subject portrays the old pioneers who blazed the trail for the industrial builders of today. It is from a painting by Floyd M. Davis, well-known illustrator, and is one of a series of current Duco advertisements.

AN INTERESTING SURVEY

AT the request of the du Pont Company, an independent engineering company recently made a number of extensive surveys of various coal mining properties to determine the savings that have resulted from the use of modernized mining equipment which utilizes flexible tubing as a means of auxiliary ventilation.

Many worth-while facts were secured; for instance, a prominent Pennsylvania bituminous coal mining company reported a saving of from twenty to twenty-five cents a ton through the use of modern equipment.

This survey presents a complete picture of how one mine is reducing its operating costs to meet present-day competitive conditions. Any interested mine official may secure a copy by addressing E. I. du Pont de Nemours & Company, Inc., Fairfield, Connecticut.

HOW? WHAT? WHERE? WHY?

(Continued from page 2)

Knowledge won highest awards, not only for educational value, but also for printing, illustration and *binding*. It is interesting to note that the binding is of du Pont Fabrikoid in a beautiful two-toned blue, carrying an exceptionally attractive gold-stamped design on the back-bone of each volume. Thus the Grolier Society, at 2 West 45th Street, New York City, has assured the permanency of a work deserving a place in the library of every home.

DU PONT ON THE AIR

THE du Pont Company is broadcasting extensively this month. General programs are scheduled for Friday evenings at 9.30 P. M., Eastern Standard Time, from Station WPG, Atlantic City. The dates are May 3, 10, 17 and 24.

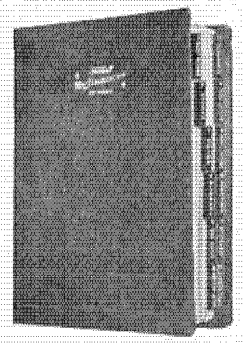
Station WFI, Philadelphia, will broadcast Duco programs consisting of musical numbers and short talks by Miss Katharine Crumbaugh, director of the Du Pont Home Decoration Service, at 10 A. M., Eastern Standard Time. These programs are scheduled for May 2, 9 and 16.

Other Duco programs will go on the air from WJZ, New York City, and thirty-two associated stations each Tuesday morning from May 7 to June 11, inclusive. The programs begin at 10.30, Eastern Standard Time, and at 11.30 Pacific Coast Time for mountain and West Coast states. They will include music by the "Duco Decorators" and brief talks on interior decoration and the use of Duco.

"MY FINANCES" REVISED

"I OUGHT to keep track of my personal finances. I'll start a record tonight." Haven't you often made such a promise with the best of intentions? But unless you have studied accountancy or are one of those fortunate people to whom figures are child's play, you have probably lost heart after starting this business of record keeping.

An ingenious system that does all the planning and complicated detail work in keeping accounts has recently been marketed. *My Finances*, a revised edition, enables you to determine quickly the condition of your financial affairs. Provision is made for keeping a record of insurance premiums, real estate and other transactions pertaining to stocks, bonds, notes, mortgages and the like. There are also separate sections for daily records of income and expenditures.

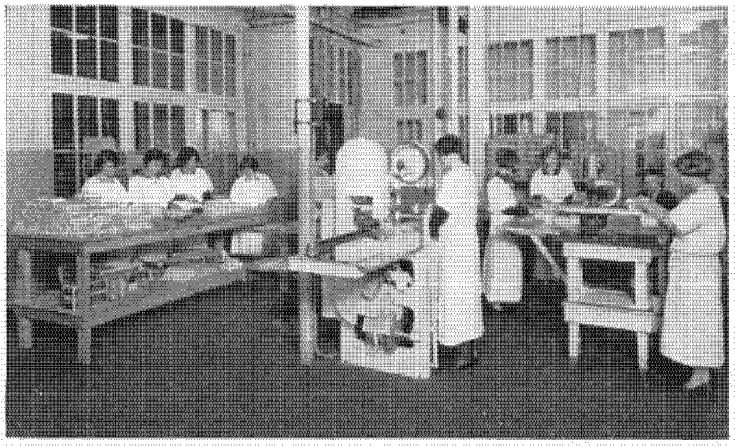


The Trussell Manufacturing Company, 211 Cottage Street, Poughkeepsie, New York, publishers of the work, claim that it is the most complete and flexible system of its kind ever devised. The book is sold through stationery stores. Its binder is genuine du Pont Fabrikoid.

CAKES THEN AND NOW

The up-to-date products sold in stores are fresh and appetizing when enclosed in moisture-proof Cellophane wrappers

By Buckley C. Robbins



Courtesy of *Baker' Weekly*

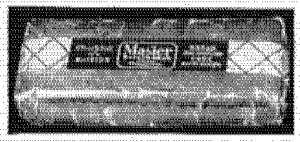
A view inside a modern commercial bakery where cakes and other products are prepared under almost ideal conditions

RUDE tools unearthed by archæologists teach us that primeval man made bread, but we're pretty sure that he never baked a layer cake.

Even ten years ago a trip to the corner grocery store revealed little or no sign of any baked goods besides bread, and but very little of that. The corner bakery—probably Schneider's—had cakes, and delicious-looking ones, too; and many a childish nose flattened against its cool window-pane testified to their appeal.

But go into the corner grocery store today, look around and the chances are that you'll see, among the many good-looking things, a particularly appetizing cake, and you'll take it home just as thousands of others are doing in their own neighborhoods. Why is it? Why does every grocery have a cake counter today that's literally covered with dozens of varieties to tempt us? An eminent authority explains it humorously in these lines:

"Grandma knew how to bake—and did;
Mother knew how—but didn't;
Sister doesn't know how—and can't;
And daughter doesn't give a darn about learning."



The commercial bakers who first prepared cakes didn't turn out products that tasted much like grandmother's. We were all prejudiced against machine-made food anyway. We were accustomed to seeing pastries come out of the home oven. We lacked confidence in the other fellow's ability to produce a superior brand. Baking methods and selling methods had to be improved, and Mrs. Average American had to be shown that the big bakeries could turn out as good cake as she could, saving her money, and a lot of fuss and fuming in the bargain.



Improvements in the technique of baking, wrapping, packing and delivery have made possible today a widening of the market area that can be reached by individual baking plants. These great, modern plants, with their immaculate interiors, white-clad workers and tremendous traveling ovens, are supervised by expert bakers and scientists. They turn out hundreds of thousands of cakes for every purse and palate, cakes whose preparation, in every step of manufacture, has been so careful that purity is taken for granted. In addition to using the very best of milk, flour, eggs, sugar and shortening, the wide-awake company adorns its cakes with nuts, raisins and frosting to attract our interest by the pleasing effect created and to stimulate our appetite for the product.



When the commercial baker prepares his cakes for display on grocery counters, he faces still another problem. He must make his products clearly visible to the prospective buyer. Also, he must keep them clean, palatable and fresh. The last requirement is especially significant considering that a loss of $15,000,000 in "stales" must be absorbed each year by the bakers of the United States. The best solution is to use moisture-proof Cellophane, which is as transparent as glass, keeps the cake free from dust and dirt, and prevents it from becoming dry and stale. It holds moisture in the frosting and filling, too, as well as in the body of the cake itself.

From the standpoint of appearance, also, this wrap may be used advantageously. The sparkle of the material quickly attracts our attention as we enter the grocery store. We see through it delicious fillings, nuts and raisins, or other garnishments, and our sweet tooth fairly aches for closer companionship with such tempting morsels so interestingly displayed. Thus does the baker accomplish his purpose. We take the cake home, eat it, enjoy it, and then buy the same brand next time because we appreciate its freshness and deliciousness.

DUCO—A CONTRIBUTION TO THE HOUSEHOLD REFRIGERATOR

The durable finish used on the new cabinets fulfills exacting demands of service and harmonizes with the colorful kitchens of today

By R. C. PETER

HOUSEHOLD mechanical refrigeration, one of the newest protégés of industry, has in five years changed from a scientific speculation into a much-advertised everyday necessity.

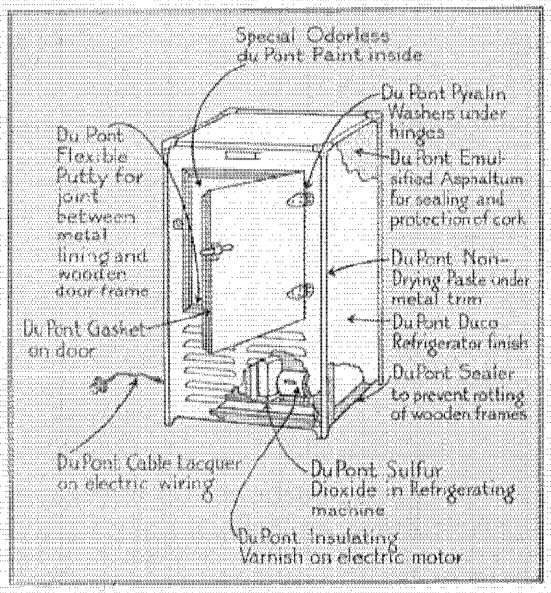
Merely to state that in this time the mechanical refrigerator has stepped out of the test tube into hundreds of thousands of kitchens is impressive enough. But to appreciate fully this latest gift of science to our everyday life and comfort, we must consider that a tremendous amount of skillful technical work has preceded this development. It is hoped that a review of the du Pont Company's special contributions to this recent achievement may be of interest.

In developing a new product the first step is to determine exactly what requirements it must meet. This is not always easy to do, particularly when the product is as new as the household mechanical refrigerator was five years ago. After a thorough survey and study comes the task of developing a product to meet the specifications.

It was clear from the first that Duco finish on mechanical refrigerators would meet quite different conditions of service and abuse than when used on automobiles, or even on ordinary ice-boxes. After making and testing hundreds of formulations, joint experimental work was begun with the laboratory and production departments of several large manufacturers of mechanical refrigerators. In looking back at this development work, it can be said that we have traveled a long road in perfecting a finish suited to the needs of this industry.

The manufacturer has been supplied not only with a Duco to make his refrigerators white, but with quite a number of other materials as well.

Present-day industry looks to the smallest details and does not overlook any opportunity to render the public the best and most complete service. The du Pont Company's coöperation with the manufacturers of mechanical refrigerators affords an interesting example of this fact.



Showing the du Pont products used in the manufacture of a modern household refrigerator

The du Pont Style Service assists the manufacturer in selecting colors and the motif which will appeal to the housewife and harmonize with the modern, colorful kitchen.

The Dyestuffs Department has developed a special refrigerating sulfur dioxide, which is a remarkably pure product, free from water, sulfur trioxide and other impurities. Du Pont cable lacquer is used on the electric cord, making it waterproof, easily cleaned, and protecting the cloth-braid covering from fraying.

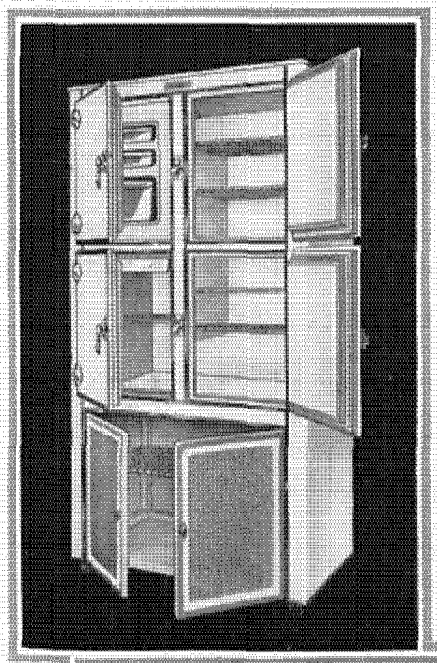
The Rubber Products plant at Fairfield, Connecticut, supplies a high-grade gasket to prevent warm air from leaking in around the edges of the door. To keep the doors absolutely firm, the refrigerator hinges have to be screwed unusually tight. In doing this, the metal hinge cuts through the finish on the refrigerator, allowing moisture to reach the metal. The possibility of rust is, of course, highly undesirable. With Pyralin washers placed under the hinges, this condition is much improved.

To complete the service to our customers and to their customers, we have instructed each of the more than 3,500 Authorized Duco Refinishing and Service Stations as to the proper method of repairing the special du Pont Duco finish used on refrigerators. Should the finish on a box be marred in unpacking, or through some other accident, it can be restored at the nearest Duco Service Station. This obviates the necessity of returning the cabinet to the factory or trusting the repair work to inexperienced hands, and avoids delay and trouble.

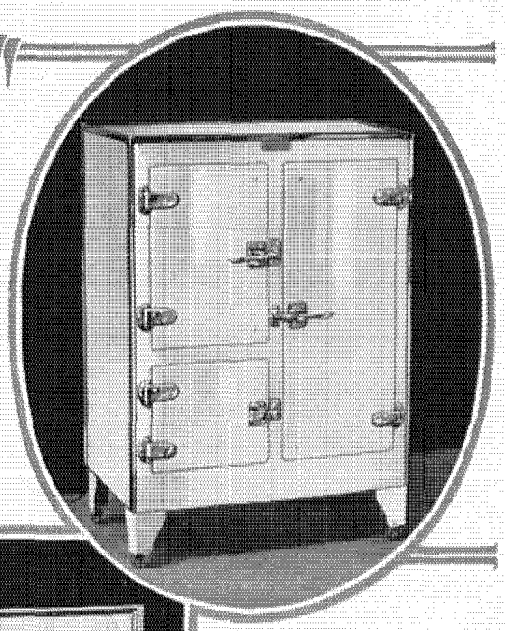
Technical service combined with the unusual merchandising appeal of Duco has raised this product to the same supremacy in the field of mechanical refrigeration as it enjoys in the automotive industry. Some of the well-known users are: Frigidaire Corporation, Kelvinator Corporation, Servel, Incorporated, Iron Mountain Company, Crystal Refrigerator Company, Holmes Products, Inc., and the Cold Storage Refrigerator Company.

GOOD LOOKS AND LONG SERVICE

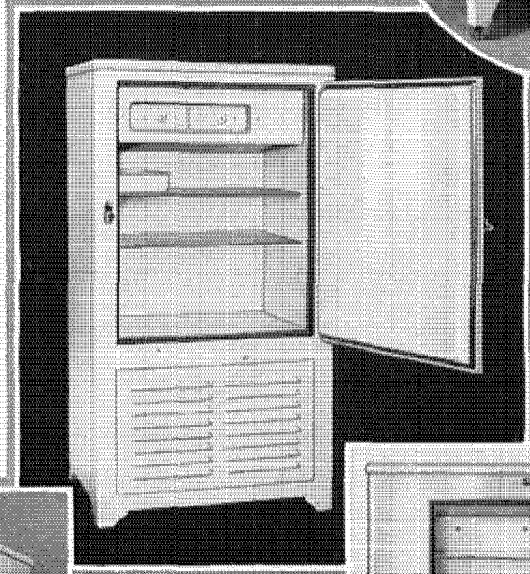
This combination is found in the cabinets illustrated here, for the finish on them is beautiful and lasting



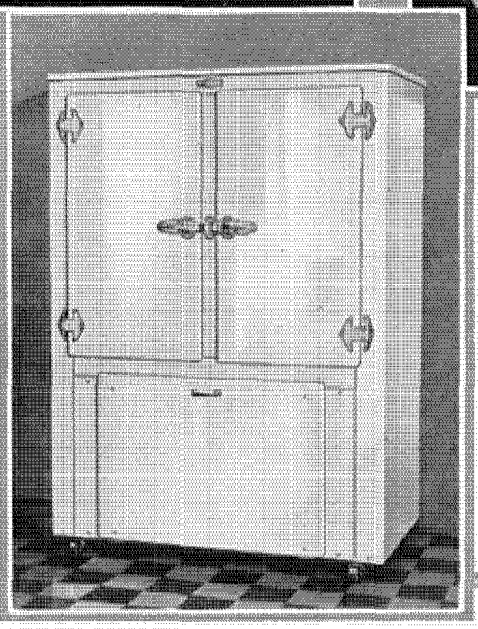
Left—A conveniently arranged "Kelvinator" manufactured by the Kelvinator Corporation



Above—A gleaming white "Crystal" made by the Crystal Refrigerator Company

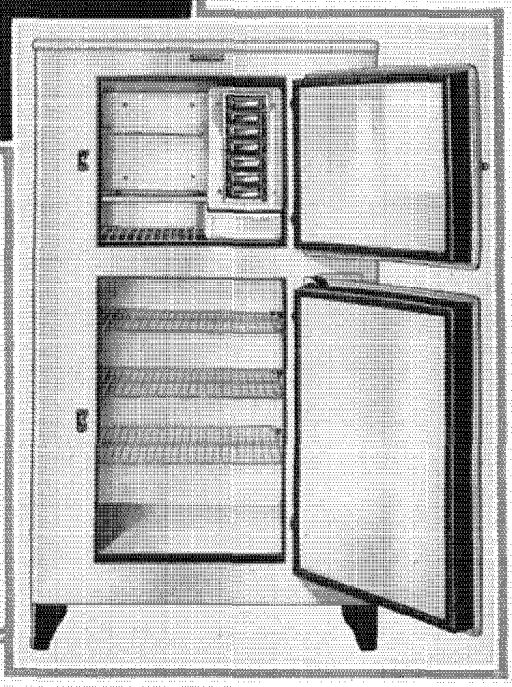


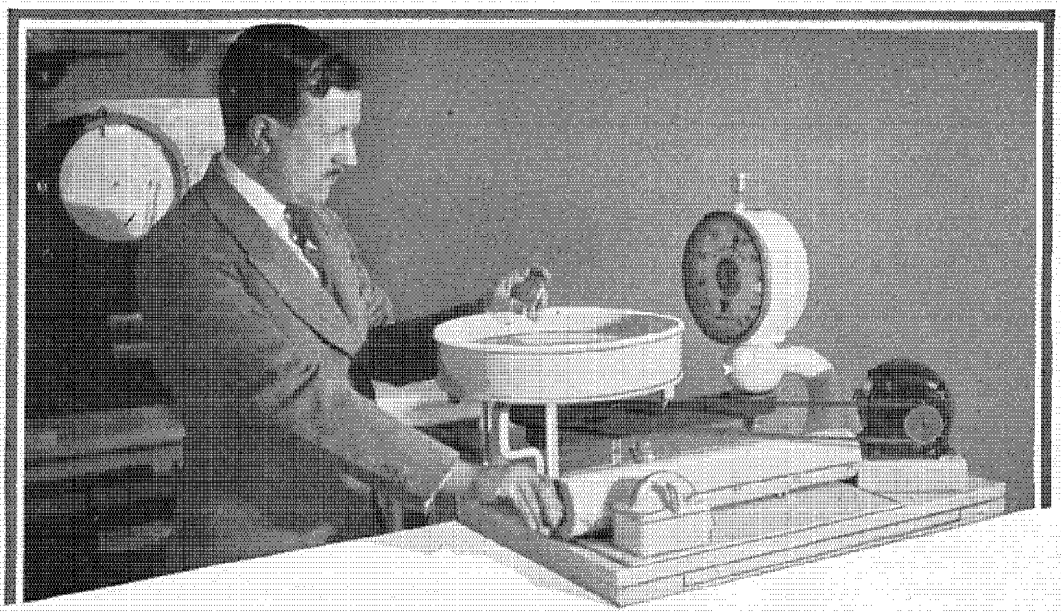
Left—The Iron Mountain Company makes the "Zero-zone" pictured here



Left—One of the many "Frigidaire" models produced by the Frigidaire Corporation

Right—"Electro-Lux" manufactured by Servel, Inc. This concern also makes the "Servel"





If you know the mechanics of a phonograph, you will understand how this equipment works. A glass disc is set spinning in the pan. Over its surface is poured a quantity of the product to be tested. Centrifugal force throws off the excess, leaving a film of uniform thickness. This view shows the author preparing a film for test purposes

ONE-THOUSANDTH OF AN INCH

This article deals with the instruments used in du Pont laboratories to measure the thickness of paint and varnish films

By D. V. Gregory
Central Technical Laboratory

THE average thickness of a varnish film is one-thousandth of an inch. If it were much thicker than this it would not dry, for ordinary varnishes dry by oxidation. Nitrocellulose films are even thinner. In the case of paints and varnish-enamels, as distinguished from clear products, a film thickness up to two- or three-thousandths of an inch is practical because of the pigment content.

One rather surprising thing about paint or varnish films is just coming to be realized since more exact methods of measuring thickness have been available. This is the effect it has on the properties of a film. Take, for example, hardness and drying time. Tabulated below are a few values of hardness, as determined by the Pfund Hardness Tester referred to in the March number. Films of the same product but of different thicknesses were used:

Film Thickness	Hardness Overnight	Hardness 4 Days
85 hundred-thousandths of an inch	25 grams	900 grams
79 " " "	50 "	1050 "
57 " " "	230 "	1200 "
52 " " "	330 "	1770 "
43 " " "	550 "	1950 "
35 " " "	770 "	2500 "
29 " " "	1100 "	2900 "
20 " " "	1550 "	3600 "

These figures show that thickness is of great importance in producing a hard film; in fact, it is often more important than the composition of the product.

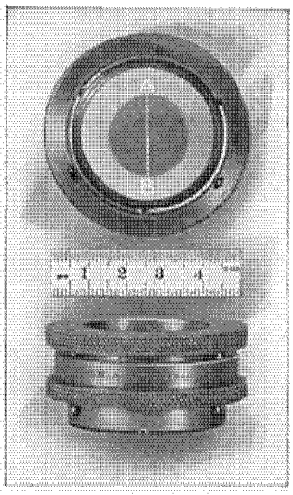
Now let us see what effect film thickness has on drying time, as determined by the McSanderson Drying-Time Meter described last month:

Film Thickness	Brush Free
219 hundred-thousandths	7 hours
56 " "	6 "
35 " "	5 "

The thick film dries more slowly. Thickness also affects other properties such as tensile strength, distensibility or elasticity, gloss, hiding power, and so on.

There are two methods of determining film thickness. The first involves making a scratch in the film and then focusing on the top and bottom of this scratch and reading through a microscope the difference on the vertical micrometer attached to the instrument. This method is not very satisfactory, because it is difficult, first, to make a scratch that does not distort the top of the film and, second, to determine when the top and bottom of the film are in focus.

The other method is much more satisfactory although still lacking somewhat in sensitivity. It consists of a very



Top—A front view of the Pfund Paint Film Gauge, with a spot of wet paint on the convex lens. Center—The scale used to measure the diameter AB, from which may be computed the thickness of the film. Bottom—The instrument in position for making the impression

accurate gauge ordinarily used for determining the thickness of paper. The film to be tested is inserted and the thickness is read off the dial. This instrument is accurate to one-ten thousandth of an inch and can be estimated to one-hundred thousandth of an inch. If the film is attached to a piece of glass, the combined thickness is first measured, whereupon the film is removed and the glass is measured alone.

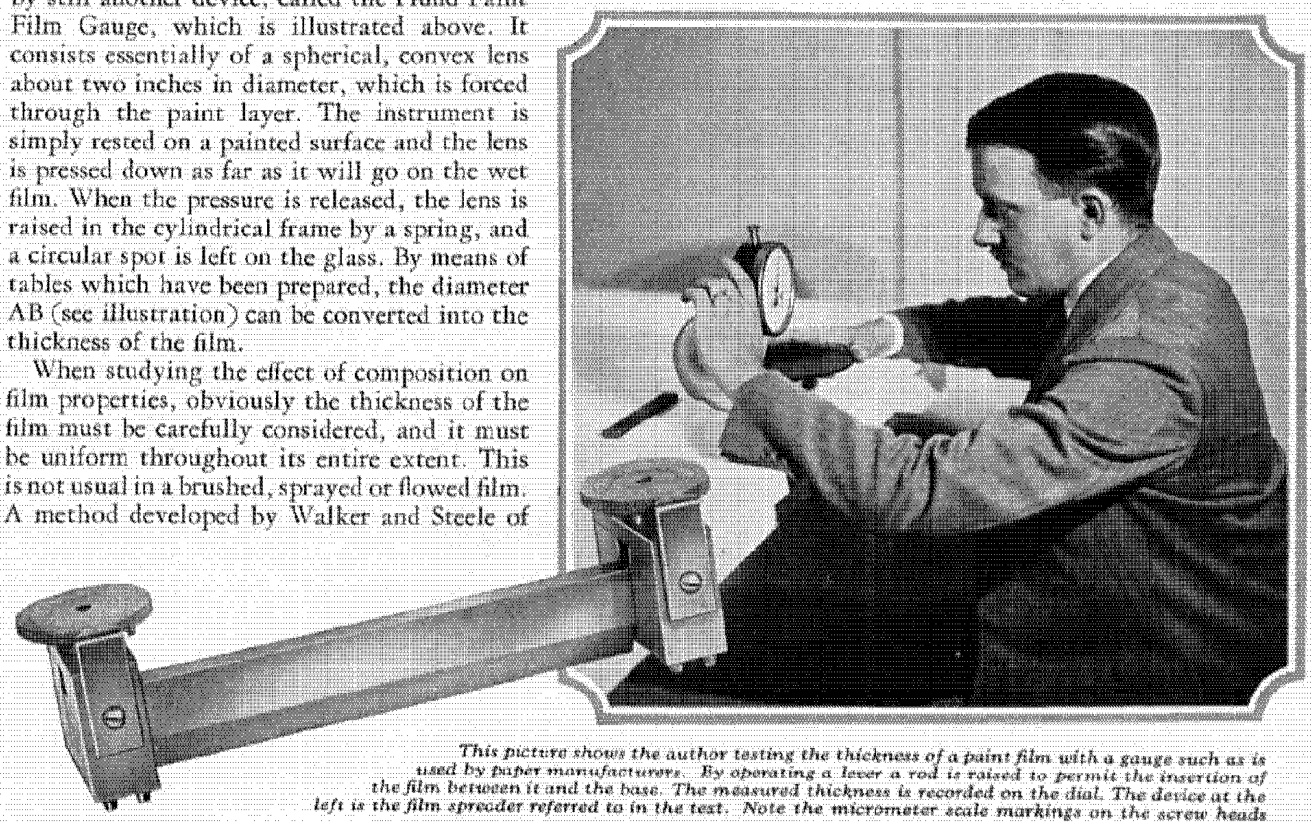
As a matter of interest, the sheet of paper from which you are reading, as determined by this gauge, is .0032 of an inch thick and the cover stock is .0043. As mentioned before, an ordinary varnish film is around .001 of an inch thick and a paint or varnish-enamel film is .002 to .003 of an inch thick.

Freshly applied films are examined while they are wet by still another device, called the Pfund Paint Film Gauge, which is illustrated above. It consists essentially of a spherical, convex lens about two inches in diameter, which is forced through the paint layer. The instrument is simply rested on a painted surface and the lens is pressed down as far as it will go on the wet film. When the pressure is released, the lens is raised in the cylindrical frame by a spring, and a circular spot is left on the glass. By means of tables which have been prepared, the diameter AB (see illustration) can be converted into the thickness of the film.

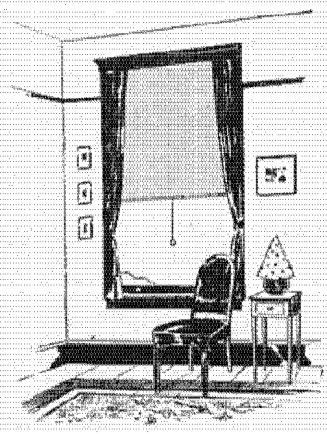
When studying the effect of composition on film properties, obviously the thickness of the film must be carefully considered, and it must be uniform throughout its entire extent. This is not usual in a brushed, sprayed or flowed film. A method developed by Walker and Steele of the U. S. Bureau of Standards, however, prepares a uniform film very satisfactorily. A plate glass disc, not unlike a phonograph record, is made to spin several hundred revolutions per minute. Then paint, varnish, Duco or any other material to be tested is poured on this spinning surface and the excess liquid is thrown off by the centrifugal force. There remains a uniform film except for perhaps one-half inch around the edge. A speed of 200 revolutions per minute yields a film as thick as the average brushed film. This speed is adjusted by means of a carbon rheostat in the motor circuit. In the illustration across the page you will observe that the operator is adjusting the rheostat with his right hand, while watching the tachometer.

Circular discs of plate glass six inches in diameter for the hardness test and ten inches in diameter for the drying-time meter have been found to be most satisfactory for preparing these films.

When thicker films are desired—providing they will dry satisfactorily—another device is used. This is the film spreader, which was developed in the nitrocellulose industry. It consists of a brass straight edge which can be regulated by micrometer screw devices on each side, so that the lower edge can be set a definite height in steps of .001 of an inch. A film is prepared by placing this instrument on a level surface, pouring an excess of the material in front of the spreader and then moving the device horizontally over it so that the edge will spread a film of uniform thickness.



This picture shows the author testing the thickness of a paint film with a gauge such as is used by paper manufacturers. By operating a lever a rod is raised to permit the insertion of the film between it and the base. The measured thickness is recorded on the dial. The device at the left is the film spreader referred to in the text. Note the micrometer scale markings on the screw heads



A NEW AND IMPROVED TONTINE

A heavier material with a smoother surface adds greater durability to this du Pont product

WHEN du Pont Tontine, the waterproof, washable window shade, was first produced by the Fabrikoid Division some eight years ago, it marked the most radical advance in window-shade cloth in fifty years. No other material possessed its unique properties. Yet in a comparatively short time Tontine has come to be accepted as the standard quality window shade. Nowadays all careful purchasers of these accessories ask: "Are they waterproof? Are they washable? Will they resist cracking, pinholing or fraying?"

Although Tontine still answers these questions to the satisfaction of the public, the research men in du Pont laboratories have not been content to stop their work. Instead, they have continually striven to make a better window shade, and only a few weeks ago an announcement was made of a new and improved Tontine. This product, in solid colors, now takes its place beside the figured Tontine—you will recall that it was introduced earlier in the year—as the latest contribution of the du Pont Company to the quality window-shade market.

The improved product retains all the characteristics of its predecessor, but has, in addition, some new features—the fruition of months of experimental work. Perhaps the outstanding advantage is the increased weight of the material. By impregnating the basic fabric with an additional amount of durable, water-and-wear-resisting pyroxylin, greater washability and longer life have been added to the finished product. Besides its heavier weight, the material has a much smoother surface, which greatly enhances its appearance; moreover it eliminates the necessity of frequent washing, for dust and dirt do not cling so readily to the improved Tontine. Rain or dampness will not harm it. Like the old product, its beauty and freshness can always be maintained with the aid of soap, hot water and a brush, and its freedom from cracking, pinholing, fading and fraying will assure dependable service for years.

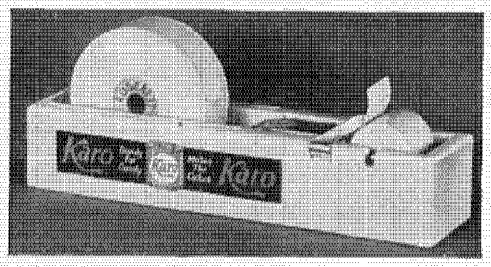
Although greatly improved, the new product is being marketed at no advance in price. Authorized du Pont Tontine dealers are prepared to submit samples to all who are interested. The name of your nearest dealer will be gladly supplied if you will write to the Tontine Sales Department, Fabrikoid Division, Newburgh, New York.

NEAT PACKAGES ARE SEALED

THE twine cage which hung over the wrapping counter was a familiar fixture in the store of several years ago. Children, waiting for a loaf of bread or an all-day sucker, slyly pulled the end of the twine just to see the ball revolve high above them.

The cage and its ball have passed, and in their place has come the Adsealit Sealer, which makes neater packages by substituting gummed paper tape for the twine.

It has many advantages, for the retailer can now seal packages three times as fast as he could tie them with string. And gummed tape is far more economical. A shoe manufacturer found that a pound of twine, costing sixty cents, will wrap 212 pairs of shoes at a cost of .00283 cents a pair; while a roll of tape, costing twenty-five cents, will wrap 500 at a cost of .0005 cents a pair. This means that it costs a retailer one cent to wrap three average packages with string. He can wrap thirty packages with tape for the same amount.



This Adsealit device is a very useful store accessory, and the sign advertises a well-known syrup

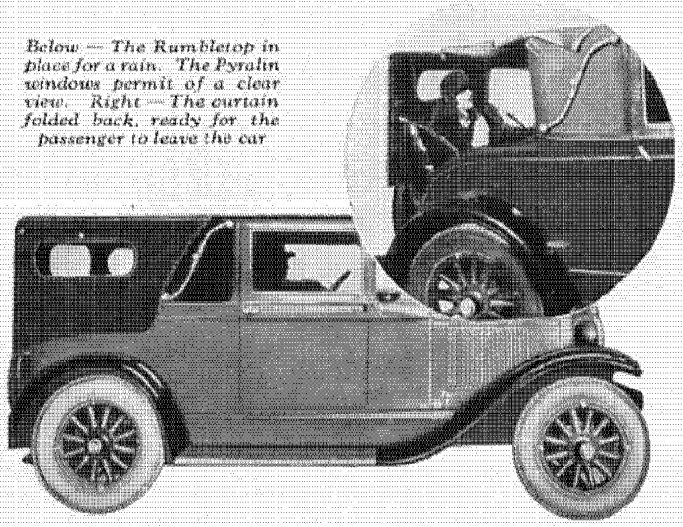
Manufacturers who sell their products through retail outlets are supplying dealers with this device. The Adsealit Corporation affixes to the side of the machine a color advertisement of the manufacturer's product. This sign is sprayed with du Pont lacquer which is as clear as crystal, will not drive the pigments of the printing inks into solution, and protects the sign so that it will not wash off, fade or blister. The sealer attracts the eye of the buyer to the product advertised, and is a valuable store accessory.

COMFORT IN THE RUMBLE SEAT

When you have a Rumbletop for your sport coupe, the rumble seat ceases to be a "grumble seat"

WHEN more than two people start out on even a short trip in a sport coupe, they are gambling with the weather. Someone is going to be uncomfortable if it should happen to rain, and even on clear days it is usually only the "good sports" who will ride in the rumble seat.

Since sport coupes are popular and convenient, there has developed a demand for some means of protecting the third and fourth passengers from sudden changes in the weather. This demand has been met by an ingenious device called the Rumbletop, which can be folded into its small container and stored in a corner of the car when not needed, and can be set up to afford complete protection the instant the weather threatens.



Below — The Rumbletop in place for a rain. The Pyralin windows permit of a clear view. Right — The curtain folded back, ready for the passenger to leave the car

When the side curtains are down, Rumbletop has all the advantages of the sedan. It is a dependable protection against rain, snow, sleet, wind or cold. For summer use, the side curtains may be folded into containers on the inside of the roof, so that the cool breezes are admitted and yet the passenger is protected from the hottest sun.

Getting in and out of the seat while the Rumbletop is in place is a very simple matter, for a pull on the "zipper" underneath the top folds it back, making entrance or exit easy and convenient.

Manufactured in tan, gray or black, this accessory is quickly attached to any car without using screws, bolts or tools of any kind.

Du Pont Pyralin Sheeting of the first quality has been selected for the windows, because it is completely transparent, strong, flexible, uniform in quality, easy to fabricate, and resists rough usage.

This most practical accessory for the coupe owner is manufactured by the Rumbletop Corporation, located at 36 Flatbush Avenue, Brooklyn, New York.

FACTORY ECONOMY AND LIGHTING

(*Continued from page 8*)

This product is known as Du-Lite and is sold extensively for factory upkeep finishing. It is enamel-like in quality, presenting a smooth, hard, though flexible surface which resists the collection of dirt and is easily washed. It is highly resistant to after-yellowing and possesses an intensely white color that reflects most of the light falling upon it. Du-Lite is a free-flowing product with high hiding power and exhibits practically no brushmarks. It is easy to apply by either the spray gun or brush and is not subject to sagging.

In order to accomplish these results, close and accurate control must be maintained during the entire manufacturing procedure. All raw materials are carefully scrutinized. The treatment of the vehicle is carried out under automatically controlled conditions, and graphic records are maintained throughout the entire process. Each vehicle is then made up into a finished enamel in the laboratory before it is permitted to go into plant production. This enamel is then examined for quality. Particular attention is paid to its color permanence. The enamel is applied to panels, allowed to dry and then subjected to an accelerated yellowing test. Following this test, which is always made in direct comparison with a standard, a check is made with the brightness equipment illustrated on page 8. This instrument measures directly the amount of reflectivity of the enamel after it has been subjected to the accelerated yellowing test.

Factory production is carried out under the same accurately-controlled conditions. The finished product is examined for flow, gloss, color, texture—fineness of grind—ease of application, hiding power and resistance to after-yellowing before it is released.

As the result of this type of factory control the consumer is assured an entirely satisfactory product which may be used to increase and maintain illumination and to protect the interior of his factory.

ANOTHER DU PONT SERVICE

(Continued from page 6)

work. Trees or hedges were planted in the fence rows. Today, the tractor needs a larger field in which to operate without meeting such obstacles as trees, hedges and the like that seriously handicap operations. They have no place in the scheme of modern farming, and they must come out. It is hard, tiresome and costly work to remove stumps, boulders and all the other trouble-makers by old-time methods. A little dynamite properly placed where it will do the most good will clear away such barriers quickly and at no great cost.

Sometimes farmers sorely need the help that only explosives can render in times of emergency. One instance of this comes to mind and will serve for illustration. Late in the spring, after a low-lying but fertile field had started a wonderful crop of corn, heavy and persistent rainstorms filled a crooked stream that ran along the edge of the field and caused it to overflow the banks. The crop was in a fair way to being drowned. Speedy removal of the water was necessary. A ditch was blasted to straighten the stream so that the water could be carried off more rapidly, and then another ditch was blasted through the lowest part of the field to connect with the stream. In this case ditching with dynamite was the thing that saved the crop, which was harvested a few months later, and presumably was sold at a profit.



Yes, boulders are bothersome. This one was a trouble-maker in a cultivated field for twenty-five years until it was blasted out with forty-four cents worth of dynamite. Five broken plow-points were found nearby

All occupations are more or less hazardous, but it remains to be said that mule drivers suffer more casualties from the hind legs of their charges than farmers do from dynamite, even though it possesses a great deal more potential energy than a mule ever dreamed of having.

We consider it one of our major jobs to show the farmer that dynamite is not dangerous when properly handled. Our demonstrations will stress the use of common sense in the handling and use of explosives; and, after all, common sense is the big factor in any work of hazardous character.

The Agricultural Extension Section is, as stated before, a service organization. Its staff recognizes that there is a broad field for the employment of explosives on farms; that farmers generally appreciate the fact but are a little diffident about using explosives because they are not familiar with the methods of using them for various kinds of farm development work. Our hope and ambition is to learn about their specific problems and, so far as we can, to help solve them. We believe that more farmers can have more efficiently operated farms, and we shall count it a privilege to make them better acquainted with the service explosives can render.

THE CARNEY'S POINT GAME FARM

(Continued from page 5)

During the past winter improvised shelters were constructed at various isolated places throughout the plant area so that the birds might have a refuge from the snow and a place where grain could be left to augment their natural food supply. But the season was comparatively mild with few heavy snowfalls, so that this equipment was not used much. It is certain, however, that feeding shelters of this kind will save much game during severe winter weather and every game sanctuary should be provided with them.

Considering the nature of the land—much of it had been previously occupied by powder plant structures, with the foundations still remaining—it was to be expected that vermin, both winged and two-footed, would be found there. Many destructive hawks, weasels, rats and stray cats were disposed of in the vicinity of the breeding pens and elsewhere throughout the plant area.

A number of nests of wild quail and pheasants were discovered and protected during the past nesting season, and with better organization this same work is being considerably extended.

We plan to liberate in New Jersey all our excess pheasants and quail, which will probably amount to a considerable number. This, of course, will be done subject to the approval of the state authorities and under their supervision. Any excess stock of pheasant and quail eggs will also be turned over to them for proper distribution.

All adult birds will be leg-banded prior to being set free. Bands similar to those used by the Bureau of Biological Survey have been procured and are being used. Each one bears a serial number. By this means we hope to develop some interesting information about the nomadic tendencies of all the birds we liberate; it may shed some valuable light on their range and habits.

In a later number we plan to tell you in greater detail about the methods used to propagate pheasants and quail on this reservation. The farm is open to public inspection and visitors are always welcome.

E. I. DU PONT DE NEMOURS & CO., Inc.

General Executive Offices, WILMINGTON, DELAWARE

All Inquiries Regarding du Pont Products Should Be Addressed to the Company—the Nearest Office

ACIDS, HEAVY CHEMICALS AND PIGMENTS

Grasselli Chemical Company, Inc.
Commercial acids and heavy chemicals. Chemicals for leather, textile, electro-plate, paper, etc., manufacturers. Chemically pure acids, electrolyte, filter alum, insecticides, silicate of soda, soldering fluxes, sulphur, zinc.
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Birmingham, Ala., Brown-Marx Building
Boston, Mass., 80 Federal Street
Brooklyn, N. Y., Morgan Avenue and Meserole Street
Charlotte, N. C., P. O. Box 959
Chicago, Ill., 2101 Canalport Avenue
Cincinnati, Ohio, Broeman Building
Cleveland, Ohio, Guardian Building
Detroit, Mich., 1530 E. Hancock Avenue
Milwaukee, Wis., Canal Street and 16th Street Viaduct
New Haven, Conn., 46 River Street
New Orleans, La., Godchaux Building
Paterson, N. J., Sixth Avenue and Waite Street
Philadelphia, Pa., 3500 Gray's Ferry Road
Pittsburgh, Pa., Farmers' Bank Building
St. Louis, Mo., 904 Planters' Building
St. Paul, Minn., 2303 Hampden Avenue

ANHYDROUS AMMONIA

Lazote, Incorporated
Anhydrous ammonia in car lots.
Wilmington, Del., Du Pont Building

AQUA AND ANHYDROUS AMMONIA

National Ammonia Company, Inc.
Anhydrous ammonia in cylinders. Aqua ammonia in drums.
New York, N. Y., 81 Fulton Street
Philadelphia, Pa., Frankford P. O.
St. Louis, Mo., 3600 N. Broadway

CHEMICAL PRODUCTS AUTOMOTIVE FINISHES

Duco for the Automotive Industry. No. 7 Duco Polish, No. 7 Auto Top Finish, No. 7 Nickel Polish, No. 7 Touch-up Black.
Chicago, Ill., 2100 Elston Avenue
Detroit, Mich., General Motors Building
Flint, Mich.
Parlin, N. J.
San Francisco, Calif., Balfour Building 351 California Street

INDUSTRIAL FINISHES

Bronze powders, collodion, Household Cement, leather belting cements, Duco, Split and patent leather solutions, pyroxylin preparations and solvents and a complete line of finishing materials for all industrial purposes.
Boston, Mass., Everett Station 49
Chicago, Ill., 2100 Elston Avenue
Parlin, N. J.
San Francisco, Calif., Balfour Building 351 California Street

CELLOPHANE

Du Pont Cellophane Company, Inc.
Cellophane—Sheets and rolls. Cellulose caps and bands (formerly Capes-Viscose, Inc.). Visking Cello-Tubing (Visking Casings).
New York, N. Y., 2 Park Avenue
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San Francisco, Calif., Balfour Building 351 California Street

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Philadelphia, Pa., 126 S. Front Street
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San Francisco, Calif., Balfour Building 351 California Street
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Kobe, Japan, No. 83 Kyomachi P. O. Box No. 384
Hankow, China, No. 23 Tung Ting Road
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Bluefield, W. Va.
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Cleveland, Ohio, 1221 Guardian Building
Denver, Colo., Midland Savings Building 17th Street and Glenarm Place
Duluth, Minn., Hartley Building 742 E. Superior Street
Huntington, W. Va., Suite 1004 Union Bank and Trust Company Building
Joplin, Mo., 816 Joplin Nat'l Bank Building
Juneau, Alaska, Room 503 Goldstein Bldg.
Kansas City, Mo., 210 Scarritt-Arcade Bldg.
Miami, Florida, 112 N. E. First Street
New York, N. Y., Graybar Building 420 Lexington Avenue
Pittsburgh, Pa., Clark Building Seventh Street and Liberty Avenue
Portland, Ore., American Bank Building
Pottsville, Pa., 516 Schuylkill Trust Company Building
St. Louis, Mo., 17th Floor, Arcade Building
San Francisco, Calif., Suite 1305 Balfour Building, 351 California Street
Seattle, Wash., Hoge Building 2d Avenue and Cherry Street
Scranton, Pa., 710 Traders Bank Building
Spokane, Wash., 721-22 Old Nat'l Bank Bldg. Riverside Avenue and Stevens Street
Springfield, Ill., 716 Reisch Building
Wilkes-Barre, Pa., Brooks Building

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San Francisco, Calif., Balfour Building 351 California Street

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Du Pont Rayon Company, Inc.
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Buffalo, N. Y., P. O. Station B
Greensboro, N. C.
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Old Hickory, Davidson Co., Tenn.
Philadelphia, Pa.
1209 Land Title Building
Providence, R. I., 941 Hospital Trust Bldg.
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San Francisco, Calif., Balfour Building 351 California Street

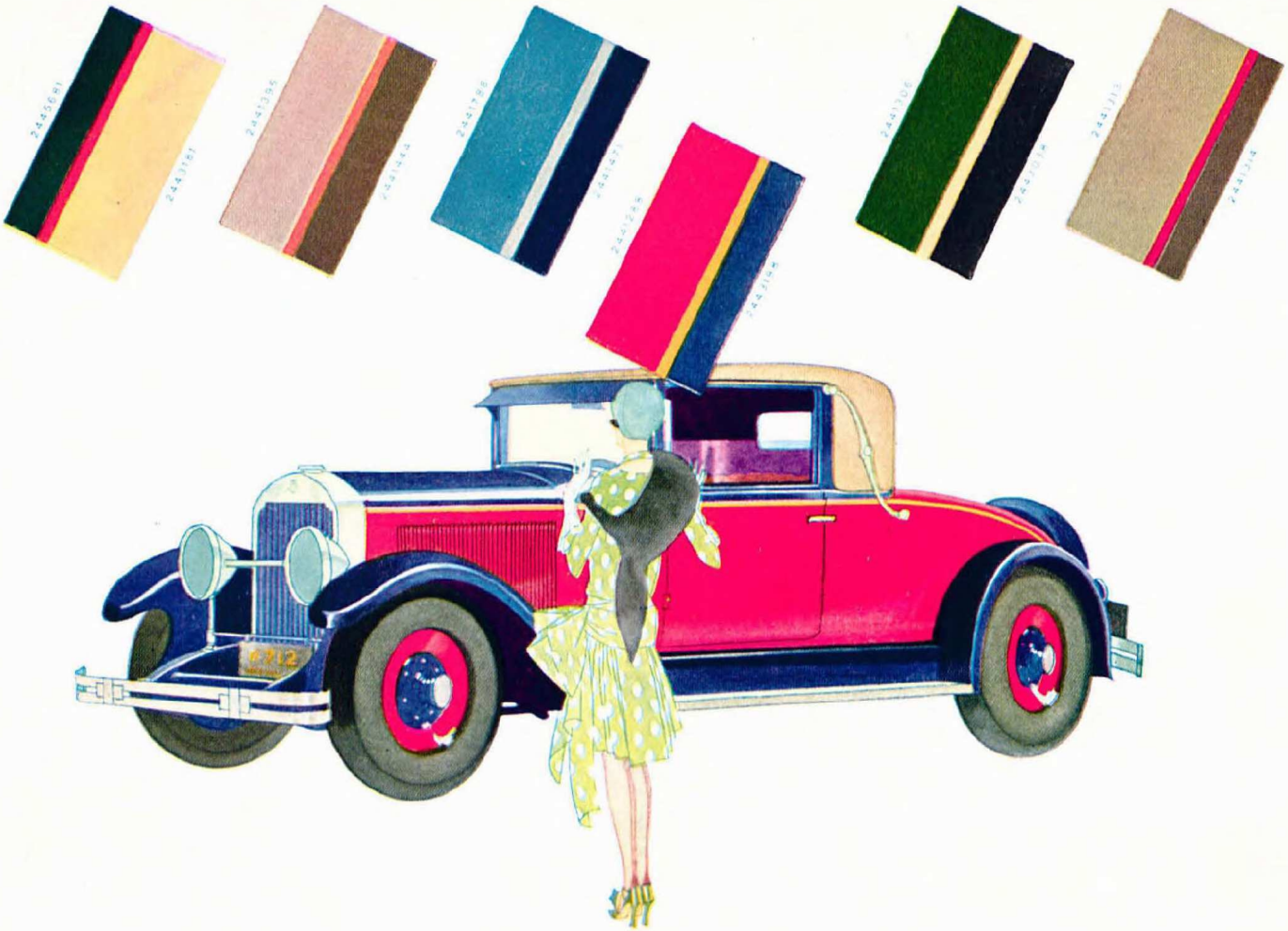
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