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TRAFFIC FILM—Oily, sticky dust and grime, baked by the sun into a hard film which soap and water can't remove. Speed Blend takes it off—quickly—easily—safely.

The fast-working *new* No. 7 Duco Polish

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Clean out rust and scale with No. 7 Radiator Cleaner. More power, better engine performance.



KEEP BRIGHTNESS BRIGHT! with No. 7 Nickel Polish for radiator, lamps and hardware. Made by du Pont.

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Restore the lustre, waterproof the top with No. 7 Auto Top Finish. You can brush it on in half an hour. It dries overnight. No. 7 is made by du Pont, the world's leading maker of auto top materials.



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After polishing car, use du Pont No. 7 Super-Lustre Cream to preserve gloss and protect finish against weathering. Much easier to use than ordinary waxes.

UNDER the ugly, soap-and-water-resisting Traffic Film, the Duco finish of your car is as bright and smooth as when the car was new. SPEED BLEND whisks off the film with amazing ease. From drabness to gleaming elegance with little effort. Skilled du Pont chemists who discovered wonderful Duco perfected SPEED BLEND. They go together. SPEED BLEND never harms as do acid polishes or strong abrasives. Don't let Traffic Film shame you. You paid a good price for car beauty—enjoy it. Try SPEED BLEND.

SEND FOR BEAUTY KIT— 3 GENEROUS SAMPLE CANS

The coupon at right (with 10 cents to partly cover mailing cost) will bring you the du Pont Beauty Kit, including 1 sample can of Speed Blend No. 7 Duco Polish; 1 sample can of No. 7 Super-Lustre Cream; 1 sample can of No. 7 Auto Top Finish.



E. I. DU PONT DE NEMOURS & COMPANY, INC., Desk D.M., General Motors Bldg., Detroit, Mich. Canadian Industries Ltd., Paint and Varnish Division, Toronto 9, Canada.

Send me your Sample Beauty Kit for my auto. I am enclosing 10 cents (coin or stamps) to help pay the mailing cost. (Good only in U. S. and Canada.)

NAME.....
ADDRESS.....
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THE DU PONT MAGAZINE

VOL. XXV

MARCH, 1931

No. 3

COSTLY INDIUM NOW OBTAINED BY ELECTROLYSIS

THE world's first pound of indium, one of the rarest of metals, has been made in Cleveland, Ohio, by The Grasselli Chemical Company, a subsidiary of E. I. du Pont de Nemours & Company, Inc.

It is worth \$7,000, nearly ten times the value of platinum, we are told.

An interesting product is indium, with an interesting history that dates back to the 60's, when a number of elements of this old earth were first discovered under unusual circumstances. In March, 1861, Crookes, in England, extracted selenium from a substance obtained in a sulphuric acid factory. The residue was supposed to contain tellurium, but when examined under a spectroscope, a bright green line was observed, indicating the presence of a new element. It was named thallium.

In the summer of 1863 F. Reich and T. Richter were working with some specimens of zinc blende ore from the Freiberg mines in Germany. Examining a residue resulting from some of their chemical processes with a spectroscope to find thallium indicated by a green line, they observed an indigo-blue line instead. Thus another metallic chemical element was discovered, and it was named indium from the characteristic color lines of its spectrum.

Incidentally, helium, too, was discovered in 1868 by means of the spectroscope. Janssen and Lockyer

observed and identified this element in the solar spectrum before anyone thought of terrestrial helium and its now common use in aircraft of the dirigible type. And coincidence or not, the same Mr. Lockyer also found indium lines present in the solar spectrum.

But to get back to that pound of indium in Cleveland. What are its properties—its uses? Answering the first question briefly, it is a white, lustrous metal, very soft and ductile, slightly heavier than zinc, and you can melt it with a match. Uses? Well, as Shakespeare said, "There's the

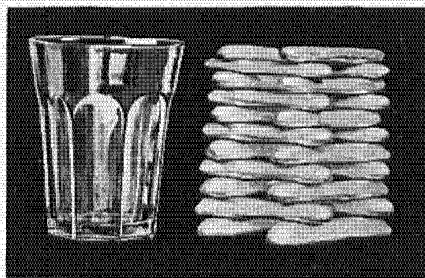
within reach of experimental use. The indium is obtained by electrolysis. A current runs through a solution containing indium and causes it to segregate and deposit. Success depends upon very accurate temperature controls and the use of the proper kinds of electrodes.

Whether this discovery will unlock Nature's storehouse of indium depends on whether its uses prove important enough to justify the price, according to a report to the American Electro-Chemical Society by Dr. L. R. Westbrook.

He believes commercial uses will be developed, and says: "Like many other rare metals which only a few years ago were mere laboratory or scientific curiosities, and which today have a definite field of usefulness, indium undoubtedly has a definite field of application."

There already is a British patent covering its use as a bearing metal. It has been mixed with another metal, gallium, to produce an alloy for fused quartz thermometers measuring temperatures up to about 1,800 degrees Fahrenheit.

The first pound of indium came from many carloads of crude ores. Dr. Westbrook says this element is rather widely distributed in minute amounts in the majority of zinc blendes, in some tin ores, pyrites, siderites and tungsten. Helium got a job. Maybe indium will.



Speaking of indium ingots, here are twenty-two small ones beside a common water tumbler to show comparative size. These ingots are worth \$17,000

rub." So far, commercially, it has remained a laboratory curiosity, too expensive for much experimenting.

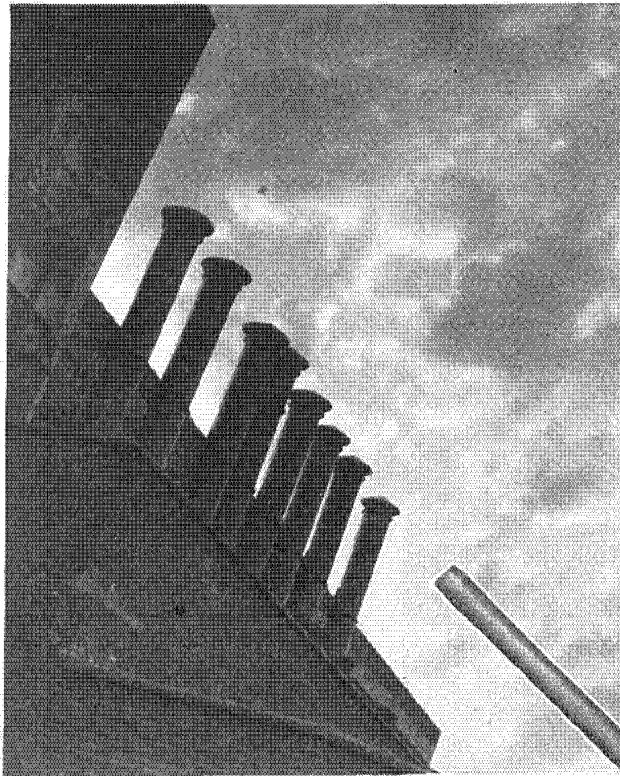
Discovery by The Grasselli Chemical Company of a method of producing it electrically puts the metal

THEN AND NOW

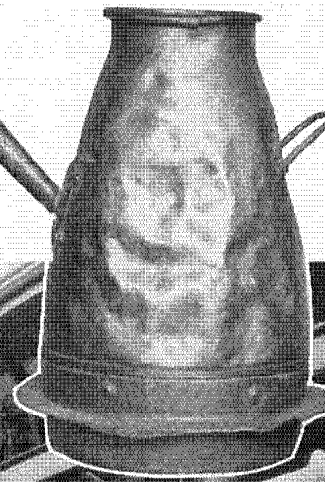
A CENTURY ago itinerant varnish makers traveled in wagons from town to town soliciting business from shop to shop. Did anyone need varnish? Well, it could be made right on the premises—preferably in the back yard. Oils, gums, solvents and the kettle? All in the wagon. The only requirement was a place to work and a fire.

Today, varnishes of a superior type are made in great factories, where processes are scientifically controlled to insure both quality and uniformity of products designed for particular uses.

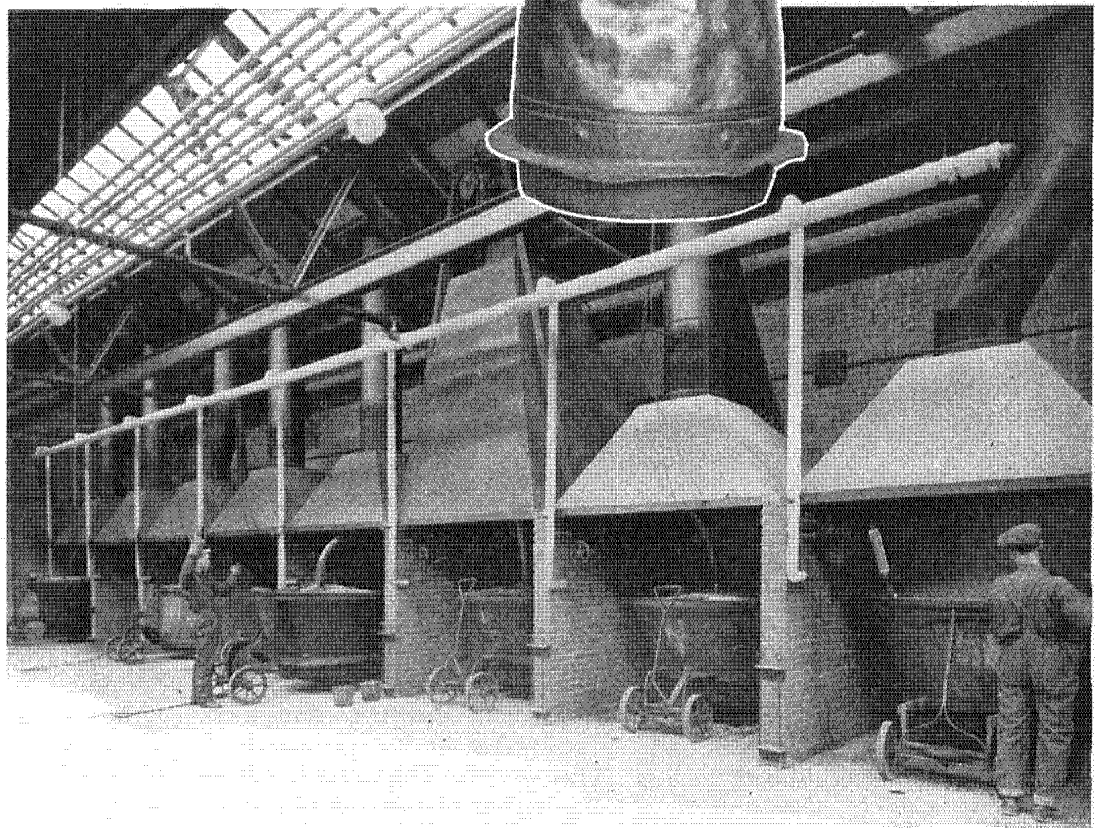
The illustrations on this page tell a story of progress. Chemical science has wrought many transformations in the methods of manufacturing products of every kind.



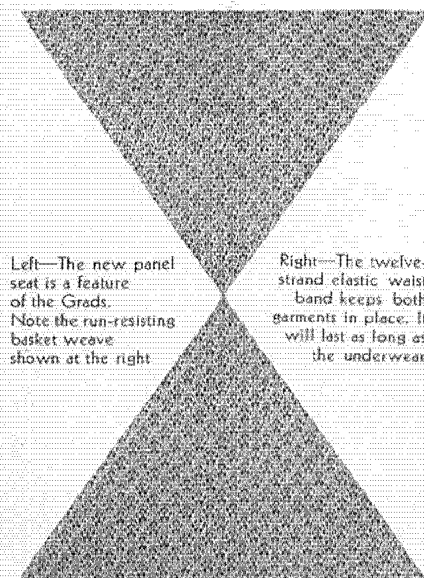
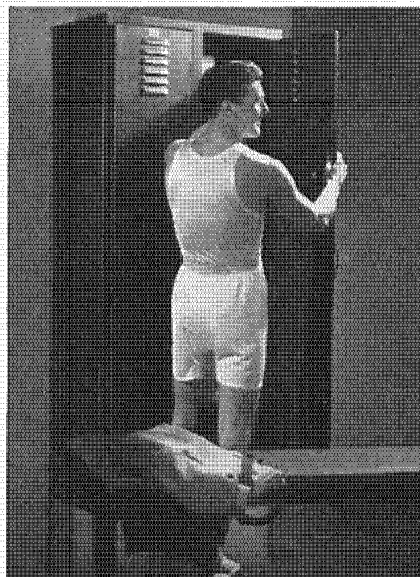
This late-afternoon view of the new varnish plant makes a picture even if it shows only the eight stacks silhouetted against the sky



The type of varnish kettle used in Colonial days in New England. This relic is now a part of the du Pont Museum collection at the Wilmington office

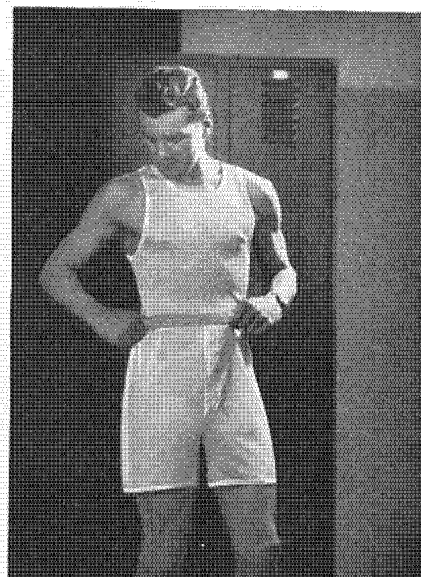


The varnish cooking room at the Philadelphia plant of the du Pont Company. Note the huge kettles in place over the fire. This plant is one of the most modern of its kind in the country. Here many types of varnish are produced, including some of the new Dulux finishing materials



Left—The new panel seat is a feature of the Grads. Note the run-resisting basket weave shown at the right

Right—The twelve-strand elastic waist band keeps both garments in place. It will last as long as the underwear



“MADE BY MEN FOR MEN”

WHEN S. Claus made his 1930 rounds, he left with discerning men's wear merchants the country over a brand new line of men's underwear knit of pure Du Pont Rayon by Arrow and named "Arrow Dyvateen Grads." The "Grads" part of the name tells you that this new underwear is athletic underwear. The "Dyvateen" part of the name comes from the fact that every rayon thread is vat-dyed before it is knit into fabric.

Dyvateen Grads were welcomed by merchants and by consumers for several very good reasons. In the first place, they're made by men for men. There's nothing sister-like about their five fast colors (plus white). They've been given a new and individual "color tone" by alternating one bleached thread with one dyed thread. And the fabric itself. You've never seen anything like it because there's never been anything like it. A new, run-resisting basket knit does the trick, gives Dyvateen the chamois softness and elasticity of cotton, plus the richness of pure rayon. That elasticity, that softness gave Dyvateen Grads a good start on the field.

And that's not all. Arrow's business is the making of things for men

The new Arrow underwear, knit of pure Du Pont Rayon, offers style and comfort to the most discriminating wearer

By E. C. HARRINGTON

to wear. Arrow told its tailors to give this new underwear masculine style and masculine comfort. They did. They cut each shirt with full length for comfortable snugness of fit; they put a new "panel seat" in each short and said farewell forever to all binding at the crotch; they equipped each short with a new twelve-strand elastic waist band, which will last the life of the garment and will actually keep both shirt and short in place without making you feel as though you had a steel tape riveted around your midriff. And as a parting shot, they flat-stitched all edging to help each garment hold the style they had tailored into it.

"There!" they said, "Now every man has a chance to dress from the

hide out in a scheme of color and comfort that is as thoroughly masculine as it is practical and smart."

That line was used in advertising the garments. It seemed to tell the whole story, except for the fact that this Rolls Royce underwear is in the Chevrolet price class, so to speak—a dollar a garment, and every shirt and every short wrapped individually in Cellophane.

There you have it. Remember a few years back when the boys came home from collegewearing running breeches and shirts? They started the style of sensible athletic underwear. They had the right idea. And young men today are the ones who are buying the most Arrow Dyvateen Grads. It's young men's underwear, free, easy and smart. Older men wear it because their sons almost always are the ones to show them how foolish it is to wear anything old-fashioned when new things are a hundred per cent better.

In locker rooms at colleges and at country clubs during 1931 you're going to see more and more men slipping into their crisp linen and their custom-made clothes over a foundation bearing the label "Arrow Dyvateen Grads. Pure Du Pont Rayon." They're that good.



Part of a group of thirty-five Blood Indians brought down from Canada to Lake McDermott at Glacier National Park, posing for Mr. Reiss

A MODERN CELLINI— WINOLD REISS

*Who stands in the front ranks of the contemporary school
of interior architecture and design*

By P. W. SAMPSON

WINOLD REISS will not be classified. Name him one of the foremost interior decorators and you discover that he has gone to the Southwest to paint American Indians. Name him painter, and you find him designing a piece of furniture that you will live with later. Call him designer, and you find him busily illustrating a story for one of the quality magazines. If you look for him at his easel, you'll probably find him with his pupils.

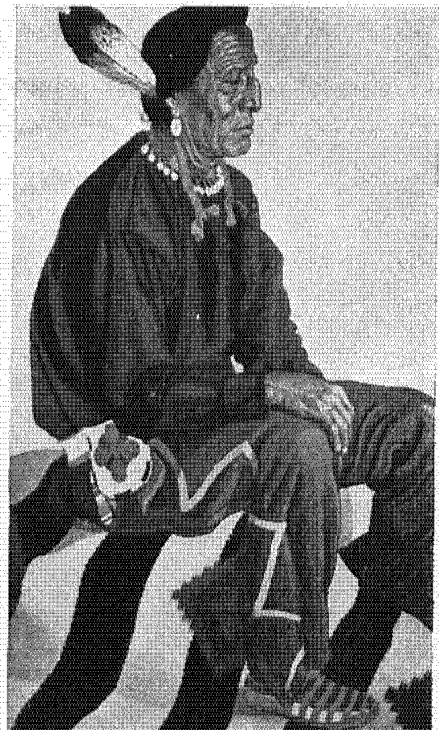
His studio is on the ground floor on West 16th Street, New York City, and is painted an ultramarine blue—the name of which is probably known to Reiss alone. His name is boldly lettered above the door in vermillion.

Inside, work is everywhere. In one

of the studio rooms a group of students stand, palettes in hand, before their easels, working under the guidance of Winold Reiss and his brother. It is another world from the one of automobiles, concrete, adding machines and nervous people that the door has just closed on. It is a small firmament, revolving about Winold Reiss, who seems untroubled by the avalanche of work that threatens to engulf the studio.

Winold Reiss is a product of the Kuntsgewerbe Schule, in which the young Continental art student is given a thorough training in all the fields of artistic endeavor. This is unlike the American art schools, in which the student receives specialized training.

Two Guns White Calf, son of the last Blackfoot chief, was the model for the Indian head on the buffalo nickel



As we talk, there are half a dozen finished illustrations for the Crowell Publishing Company, fresh from Reiss' hand, waiting to be picked up. Before him on the desk of his own design is a specification chart he is making up which will show the subtle range of colors going into the Muralart-covered walls of a new show place in New York.

This inner room is given over to finished studies of Mexicans, Negroes and Indians.

The range of his work is bewildering, until the Kuntsgewerbe Schule is remembered, and its aim to make each pupil Benvenuto Cellini-like in his grasp of all the tools of his art.

From the Kuntsgewerbe Schule and his father's studio, young Reiss went to the Royal Academy of Fine Arts in Munich, where he studied under Franz von Stuck.

It had always been his ambition to paint the American Indian on his native heath; so it seems logical to see the young artist hopefully disembarking in New York in 1913. But the West was a long way from the seaboard and Indians were not to be painted with oils, palette and easel alone. It was some years before he could satisfy his original ambition.

In 1915 we meet him in the columns of the *Modern Art Collector*, a magazine of the new art edited by O. W. Wentz. This was the voice of the small but vigorous group of designers and artists who interpreted the new

Winold Reiss, artist, designer, interior decorator, teacher. How shall we classify him?



age in a new manner in their art.

The movement was born with the century in the studios of Vienna. During the World War its rising clamor was muted, until the mob horror of anything with a German accent had died away. But there was merit in the art and design of these people, and when the United States could look tolerantly on what they were doing, the public saw how thoroughly they had caught the new spirit and had set the rhythms of their hands in the same breathless tempo.

Winold Reiss was one of the prime movers, and he still remains in the forefront of the contemporary school of interior architecture and design.

His dream of painting American Indians was delayed, but not abandoned.

After some earlier trips into the Northwest, he was commissioned by Louis W. Hill, president of the Great Northern Railway, to make Indian studies in this country. All the Indian portraits shown were painted in Glacier National Park, Montana, and in Waterton Lakes Park, Alberta, Canada, in the summer of 1927. Altogether he did eighty-three, all of which are owned by Mr. Hill.

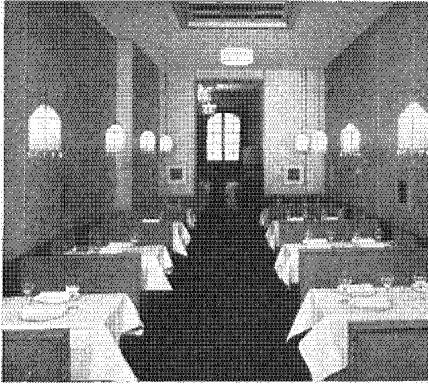
These have been on exhibition in the art centers of the United States, were shown in Munich, and of the one hundred examples of contemporary American art requested by the Swedish Government for the Stockholm Exposition held during the past year, two were of these Indian studies by Reiss.

"This work I have done for Mr. Hill," Mr. Reiss said, "is part of my plan. It is my dream and desire to paint full-blooded representatives of every American Indian tribe. Altogether there will be three hundred and fifty when I have finished, and it will be the only accurate gallery of these people when they have suffered extinction, or lost their blood lines."

Early in January Reiss left for the Southwest to paint the Apache and Papago Indians. Many of these oils



Reiss' portrayals of the American Indians:
Left—Yellow Head, a magnificent specimen of a full-blooded member of the Blackfoot tribe
Center—A family scene among the Blood Indians
Right—Heavy Breast, a Blackfoot squaw



The Crillon Restaurant in New York, where Winold Reiss first used Fabrikoid in decorating a public place.



The grand foyer leading to the ballroom of the Hotel St. George in Brooklyn. Here gold and vermillion Muralart is used effectively.

have gone into the new Steuben Club of New York, and show against a background of du Pont Muralart.

This product has entered into the decorative scheme of many well-known clubs, restaurants and hotels that have felt the magic touch of this man's hand. In the Hotel St. George in Brooklyn, for example, where the interior—a beautiful symphony of brilliant hues—had to withstand the wear and tear which is usual in a hotel, we find it used as a wall covering in the more important public rooms and lounges. As Mr. Reiss once said:

"Du Pont Muralart is the most valuable material for interior decoration because of its wonderful surface, which lends itself so well as a background for ornamentation. It is easily cleaned and does not chip off the walls."

Mr. Reiss was the first to see the decorative possibilities of Fabrikoid. In the first example of the new art in decorating in a public place in the United States—the Old Crillon Restaurant in New York—he used Fabrikoid on the benches. "It is an actual fact," he said, "that these lasted for eight years before replacement was necessary."

"A very interesting thing happened on my 1927 trip to Glacier National Park," Mr. Reiss went on, "I took along with me a number of pieces of

Fabrikoid which I gave to the Indians. When they had proved to their satisfaction that it was waterproof they made it up into jackets and trousers, and used it for no end of things in their tents. I did not have half enough of it."

To ask Winold Reiss what he has done brings a helpless light to his eyes. At random he plucks interesting things out of his crowded memory. There is so much done—so much to be done. Another expedition to the West. Unfinished illustrating commissions from the art editors of magazines. There are color schemes, fabrics, paints, original designs for the public rooms of a new hotel.

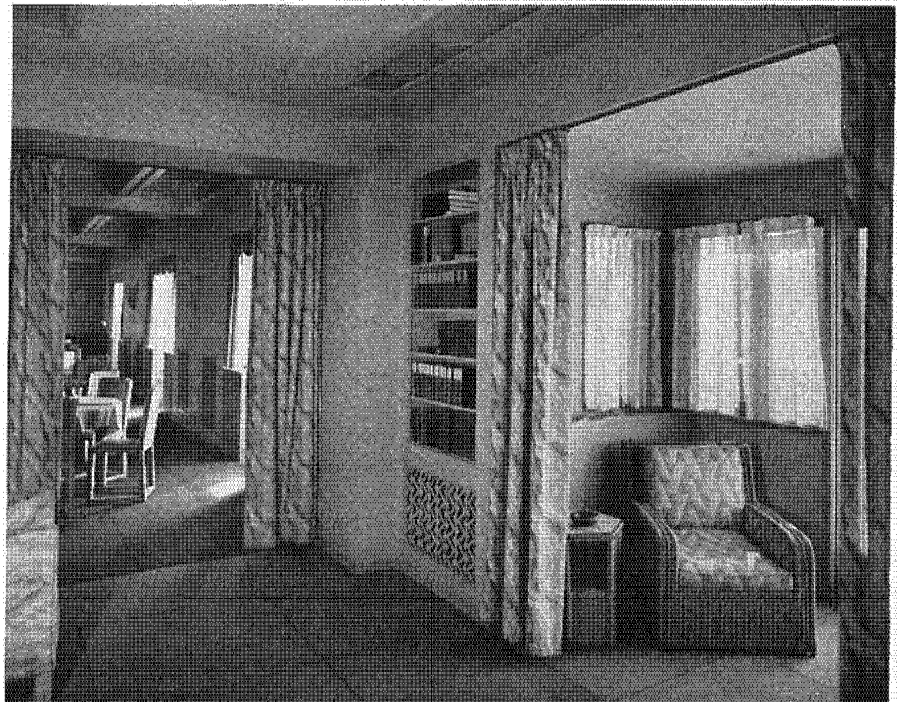
Mrs. . . . is on the wire. Reiss answers it. He explains laughingly

when he is through that a woman had come to him for a design for a restaurant. "I gave it to her," he says, "lovely pastel tones, delicate, fine. Now she says: 'Mr. Reiss, I didn't want it in pastel tones, I want it blue, like Mrs. . . . dining room'."

He looks at his work, shrugs, turns his palms outward. So much to do—two hands to do it with, only.

As I go out, the students are still at their easels, working. The spirit of the studio is work.

Before leaving, I turn to look at the lettering on the door. There are a few particles of dust caught in the hardened vermillion paint of the name. Winold Reiss must have painted that himself on a windy Sunday morning when everybody else was at church.



A cozy corner in the Tavern Club, Chicago, of which Mr. Reiss is architect and decorator. In the background may be seen the dining room.



Cellophane keeps products fit for use by retaining or excluding moisture from them as the manufacturer may require.

WHY YOU PAY GOOD MONEY FOR MOISTURE

Because you realize that the condition of commodities purchased determines their fitness for use

By B. C. ROBBINS

YOU rarely think of buying moisture and paying a price for it. It is usually considered as free as air. And yet you demand moisture; in fact, put a premium on it. This is true with practically every purchase you make in your daily contact with all manner of retail establishments.

You insist on eleven per cent of moisture in cigars, forty-two per cent in chipped beef and twenty per cent in lady-fingers. Why? Because those figures represent the average moisture content in smokable cigars, savory chipped beef and fresh lady-fingers. Let any one of these dry out and what happens? They are no longer fresh and appealing to the taste. They have become stale and undesirable.

On the other hand, there are prepared foods, such as graham crackers, which must remain crisp to be fresh. If they pick up too much moisture,

they are no longer appetizing. So you insist on a minimum of natural moisture, lest they become soggy and lose their crunchy crispness, which is a sure sign of freshness in crackers of almost all kinds.

There is an old saying about trying anything once, but let the manufacturer beware who does not deliver a satisfactory product for the price paid for it. He has lost a customer.

Therefore, makers of prepared foods have taken great precautions in times past to keep moisture in or out of their products as required, on their journey to the consumer's home.

But with the natural tendency of every one to want to see what he or she buys, there has developed the need of showing the product as well as protecting it.

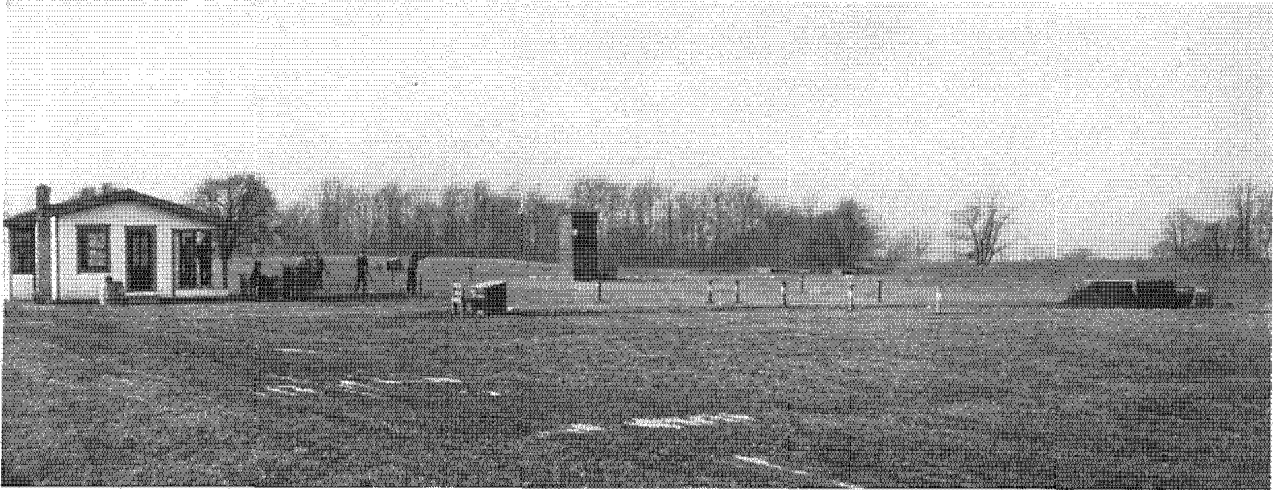
Since the buying public has proved to be "from Missouri," the producer

wants to show his goods so that no one can doubt their goodness. He is bringing them right out in the open. One of the most interesting methods at his disposal is by the use of transparent moistureproof Cellophane.

This unusual and virtually waterproof material has been received enthusiastically by bakers, cigar manufacturers, candy makers and other manufacturers concerned with the problem of moisture. The accompanying illustration shows actual examples of only a few among the many uses for this remarkable wrap. But it indicates effectively the visible "open" packages that retain the right amount of moisture.

The public demands visibility, and the manufacturer has supplied it. No longer does one need to wonder what a product in a sealed package looks like when it is wrapped in moistureproof Cellophane.

Cigars now come moist and crackers crisp in this material that keeps the good things in and the bad things out. Pick out those light-colored, mild-looking cigars, if that is the kind you prefer. Choose the particular food product that looks most appetizing to you. And remember, moistureproof Cellophane has made it possible to see what you are buying.



Facilities for trapshooting and skeet are combined at the du Pont Shooting Park, near Wilmington, Delaware

SKEET—A YEAR-ROUND SPORT

SKEET, the new all-season sport, is so well known to the American shooting public that it needs no extended introduction. It is fast becoming a popular form of artificial target shooting and numbers among its devotees thousands of people who never before pulled a trigger to break a clay bird flying over a regulation trapshooting field. Skeet is different. Therein lies its appeal.

It has a closer tie-up with hunting and more nearly simulates actual hunting conditions than trapshooting does. Hundreds of skeet fields now

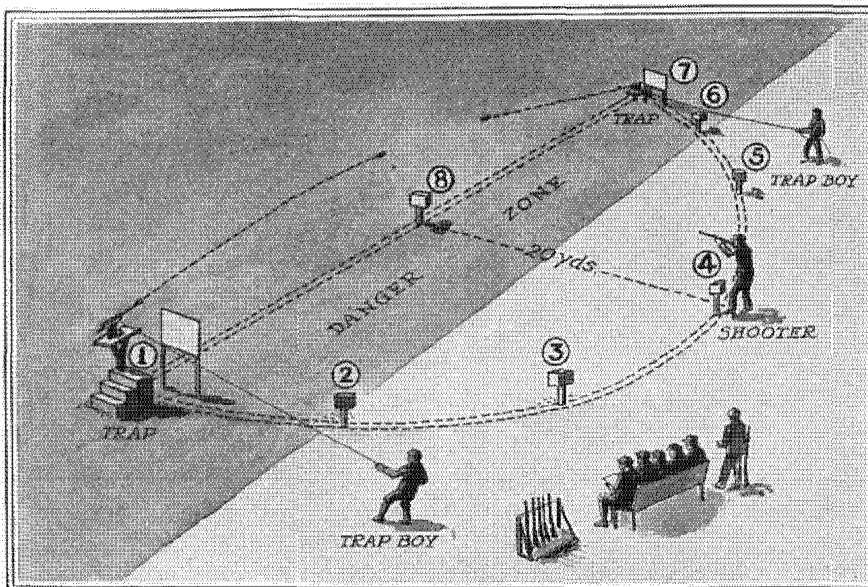
There is no closed season on clay birds. If you like wing shooting, you will like this new game

By J. H. OTTERSON

in use are developing quick and accurate wing shots. Already there are more than 600 recorded skeet-shooting organizations in this country and probably as many more unrecorded.

This sport is easy enough to give the beginner pleasure and valuable practice in field shooting; difficult enough to give the veteran hunter a thorough test of his skill. It appeals particularly to men interested in shot-gun shooting in that it does not call for special equipment. Any gun that fits the user and is suitable for field shooting will do. There is no limit as to size of gun or size of shot. Good scores have been broken with guns ranging all the way from the 10-gauge down to the little .410. The 20-gauge is practically on a par with the popular 12-gauge, inasmuch as ease of handling the former compensates for the greater number of shot pellets of the latter.

To those who arrange skeet-shooting matches or take part in them, this discussion may seem elemental. But there are many novices in the game, and with the idea of rendering them some service and making the sport more enjoyable to its older devotees, the following suggestions are offered:



The layout of a skeet field
Note the location of the two traps
and the stations numbered
in sequence



Mr. Eugene du Pont loads his gun at station 3. According to rule, no gun may be loaded until the shooter is standing in the firing position.

SKOOT PSYCHOLOGY

Confidence is probably the greatest asset of a good skeet shot. Unless the shooter feels sure when he pulls the trigger that the bird is going to be broken, he will never become expert at this game. Confidence, of course, comes with practice in "calling his shots." If he misses one, he seeks the cause. Did he overshoot, or was his "lead" or "swing" insufficient to catch up with the bird? The answer is, more practice to remedy the fault, whatever it was.

Concentration is as important as in regulation trapshooting. The skeet shooter should have only one thing in mind when he steps to the firing line—to break the particular targets he will receive at that position. Those broken or missed at other stations should be forgotten for the moment. This mental attitude, while difficult to develop, makes for high scores.

START SQUADS WITH A GOOD LEAD-OFF SHOT

A squad of skeet shooters may consist of any reasonable number. Our experience, however, indicates that with novices not more than five can conveniently shoot around the course, due to delays which always occur with beginners. With experienced shooters, a larger number can safely be accommodated in one squad. Much can be done to facilitate procedure by arranging the shooting order of each squad. For example, it is always

well to let a man who is a good, quick shot and who knows the rules start the program. Then, with a little coaching, the others can easily be taught to stand in their regular order, one behind the other, and step into position with the least loss of time. The only objection I have ever heard voiced is that with many shooters in line and only one set of traps, there is considerable waiting for turns. This is decidedly irksome during the cold months, particularly if there is no club house nearby.

TARGETS FROM THE HIGH TRAP

Frequently we all miss the first target at the No. 1 position by overshooting. This target starts directly overhead and descends rapidly during its entire flight. It should be seen well above the barrels before pulling the trigger in order to place the shot load below and ahead of it.

A majority of right-handed shooters miss targets thrown from No. 1 traphouse at stations 2, 3 and 4 by overshooting them. While "lead" or "swing" is important in breaking these targets, the factor of elevation must also be considered. To swing below and ahead of the "bird" is the correct procedure to score a "dead." Those from the high trap always descend.

THOSE FROM STATION 8

Incoming targets from the high and low traphouses at this station seem most difficult for the novice who has not yet acquired the correct technique. He should stand naturally at the shooting position, face the

traphouse from which the target will be thrown, and before calling "ready," he should bring his gun to his shoulder at least once, swinging ahead of an imaginary target to the approximate point where he expects to break it.

When the real target appears he should shoot as quickly as possible, for after it reaches a point almost directly over his head, it is very hard to hit. The practice of throwing the gun to the shoulder at least once or twice has improved many a skeet score at station 8. The range is short and the pattern small; so hold close to the target, and once more—shoot quickly.

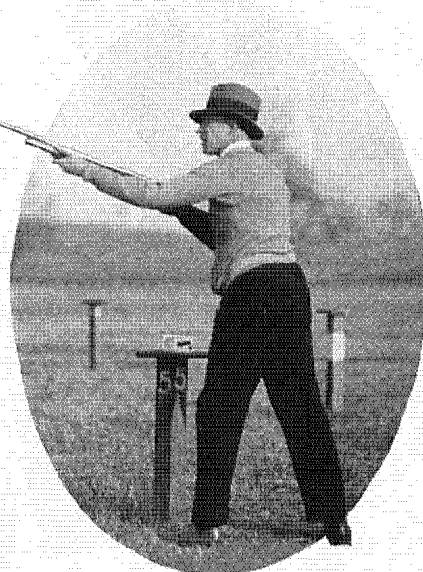
THE DOUBLES

Skeet double targets are not hard to break if the shooter bears certain things in mind. There is plenty of time to break both "birds" within bounds. The outgoing one is shot first from all "doubles" positions, unless the shooter declares otherwise, and care should be taken to make this first shot good. The incoming target, meanwhile, is moving slower and is therefore easier to bring down; but remember, the nearer the object, the smaller the area of the shot pattern. Make sure of the outgoing target, hold directly on the incomer, and you will score a "both dead."

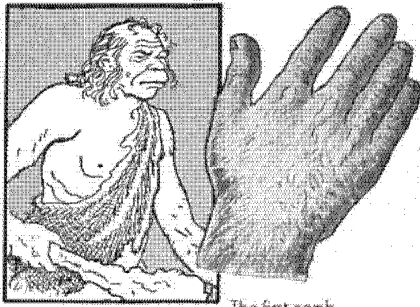
THAT OPTIONAL TARGET

It is easy to shoot a round of skeet, make a good score, and then at station

(Continued on page 21)



"Ready!" Captain Paul A. Curtis at station 5 indicates to the trap boy that the target may be released at any time within the next five seconds.

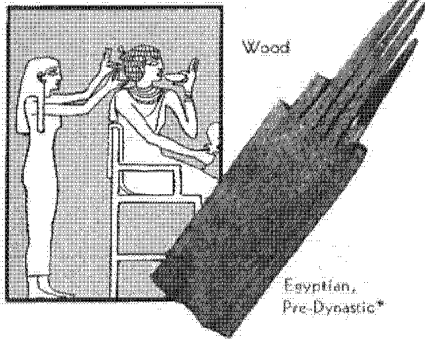


The first comb

THE HUMAN HAND WAS THE FIRST COMB

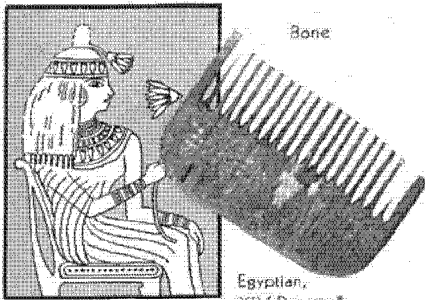
Since then man has learned how to make better ones. Millions of today's combs are made of du Pont Pyralin

By MAX ROSEDALE



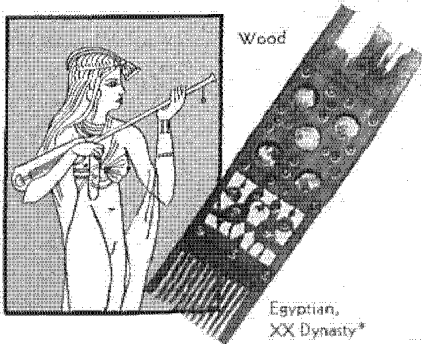
Wood

Egyptian, Pre-Dynastic*



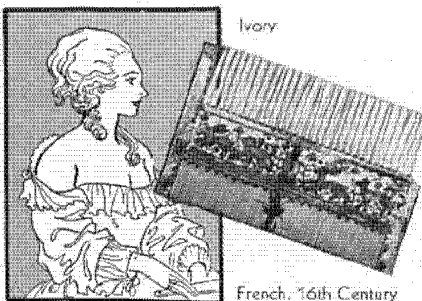
Bone

Egyptian, XIV Dynasty*



Wood

Egyptian, XX Dynasty*



Ivory

French, 16th Century

Do you ever run your hands through your hair to smooth it down? Of course you do. It is a common practice among both men and women, and actually an instinctive habit handed down to us by primitive man. To keep his shaggy locks in order he used his hands, each finger representing a single tooth of a comb that was at least handy, if not perfectly designed for the purpose.

Later on, man contrived something better. The earliest known comb was made of wood in Egypt and resembled closely the shape and form of the human hand. As centuries rolled by combs were simplified in structure for greater utility. Genuine ivory was used in making them, and the ancient Egyptians were very adept in constructing elaborately decorated ones for their "Shebas" to use.

The history of comb-making in the United States also has many interesting chapters. The first American combs were made in the 18th century from such materials as bone and horn. Later, in searching for substances that were not so brittle and that would withstand long usage, Pyralin

was tried and used with great success.

Pyralin, a plastic, is well adapted for making combs and thousands of other useful and ornamental articles. It can be fashioned into almost any form with the greatest ease. Formerly Pyralin was made in ivory, shell, amber and mottled colors only. But in line with the present vogue it is being produced in many new and novelty colors comparable in variety only with those found in the rainbow.

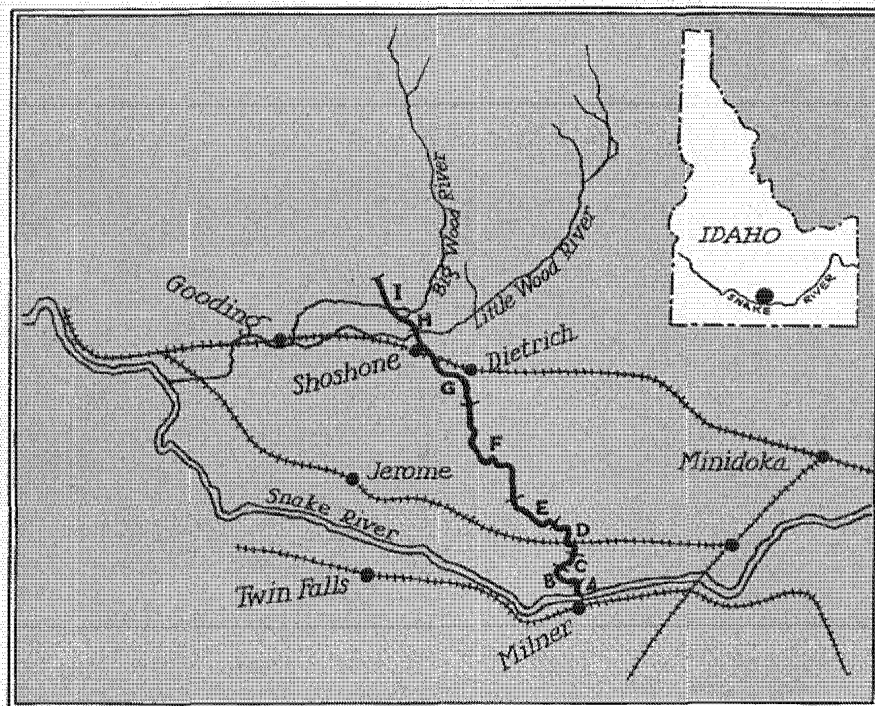
The Leominster, Massachusetts, plant of the Du Pont Viscoloid Company distributes in this country some 15,000,000 combs each year. They are of every imaginable color, style and size—pocket combs, dressing combs, water-waver combs, decorative combs and many other types.

One of the company's popular display case assortments, together with a few styles and sizes that have proved to be ready sellers, is shown on this page. Each comb is enclosed in a Cellophane envelope to insure cleanliness. More information about Pyralin combs is easily obtainable. Write to the Du Pont Viscoloid Company, 330 Fifth Avenue, New York City.



Pyralin

*Courtesy, Metropolitan Museum of Art



The heavy line from Milner to above Shoshone indicates the route of the Minidoka canal. The division lines indicate the work of the various contractors. See inset map for general location of the project.

- A—Derbon Construction Company. Completed
- B—Winston Brothers Company. Completed
- C—John Phillips Company. Completed
- D—Mittry Bros. Construction Co. Completed
- E—John Phillips Company. Completed
- F—Mittry Bros. Construction Co. Blasting completed. Trimming to be finished April 1
- G—Haas, Doughty & Jones. Blasting completed. Trimming to be finished April 1
- H—Morrison-Knudsen Company. Blasting completed. Concrete work to be finished August 1
- I—To be let some time during 1931

TO IRRIGATE 80,000 ACRES OF IDAHO'S DESERT

The Minidoka canal will insure a water supply for large areas of undeveloped farm land

By J. H. McGRATH

IRRIGATION farming in the Wood River Valley of Idaho has long suffered for lack of water. In localities where the supply is adequate, agriculture has flourished, for the soil is fertile. Large crops of alfalfa hay, wheat, barley, oats, potatoes and sugar beets have been produced. But thousands of acres are idle or partially so. They need only water.

The building of the American Falls Reservoir on the Snake River, with its large storage capacity, made possible favorable consideration of plans to improve this situation. In 1925 a district was formed to embrace 115,000 acres of irrigable land, and later a contract was negotiated between the district and the Federal Government, for the construction of an extensive irrigation system, known as the Minidoka Project.

As part of this work, the Bureau of Reclamation is constructing, by contract, a seventy-mile canal extending from Milner to Shoshone and beyond that point. It will supply Snake River water to about 80,000 acres of irrigable land. More than half of it, between Dietrich and Gooding, already has a partial supply; the rest, between the Snake and Little Wood Rivers, is new land now without water right. The complete project, of course, also includes laterals, distribution ditches and various structures required to deliver water to the farms.

It is estimated that this additional water supply will cost approximately \$52 an acre for the land now partially supplied, and \$92 an acre for the new land. The payments covering the construction costs—figured at \$5,000,000

—will be distributed over a forty-year period, with no interest required from the farmer.

For construction purposes the work on this canal was divided into eight sections. The map shows the route. Letter designations along the line indicate the respective sections, and brief references to them will be in order here.

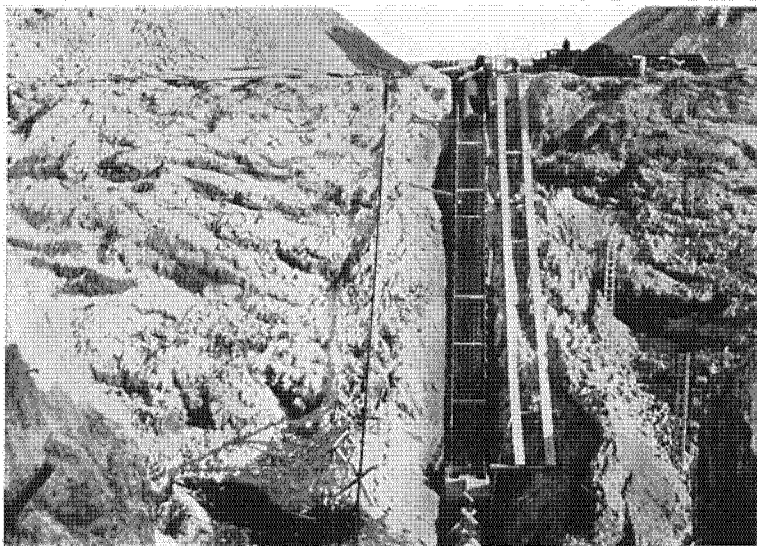
Section A, beginning at Milner, was built by the Derbon Construction Company, of Seattle, Washington. Although it was only a mile and a half long, nearly 160,000 cubic yards of lava rock were excavated in cuts up to forty-five feet in depth. Here the bottom width of the canal ranged from twenty-five to thirty-four feet.

Winston Brothers Company, of Minneapolis, Minnesota, constructed section B. This was an earth-moving job for the most part, involving the removal of about 643,000 cubic yards of material, with comparatively little hardpan and rock to interfere with progress. The maximum depth of the cut on this section was thirty-five feet.

Sections C and E were constructed by the John Phillips Company, of San Francisco, California. In this region the canal line crossed a sagebrush desert in which were found many large lava fields, so that it was impossible to avoid making cuts through several rock ridges and outcrops. The material excavated in these sections amounted to more than a million yards, and 10 per cent of it was rock.

Mittry Brothers, of Los Angeles, California, had the task of building

UNDER CONSTRUCTION—THE SEVENTY-MILE



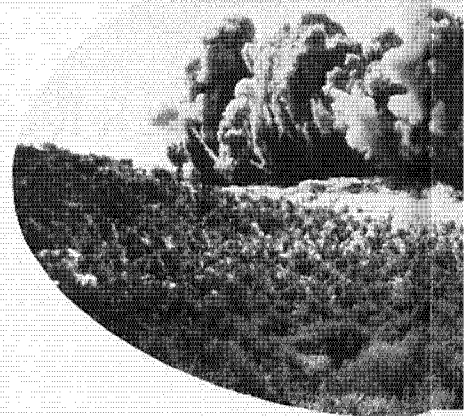
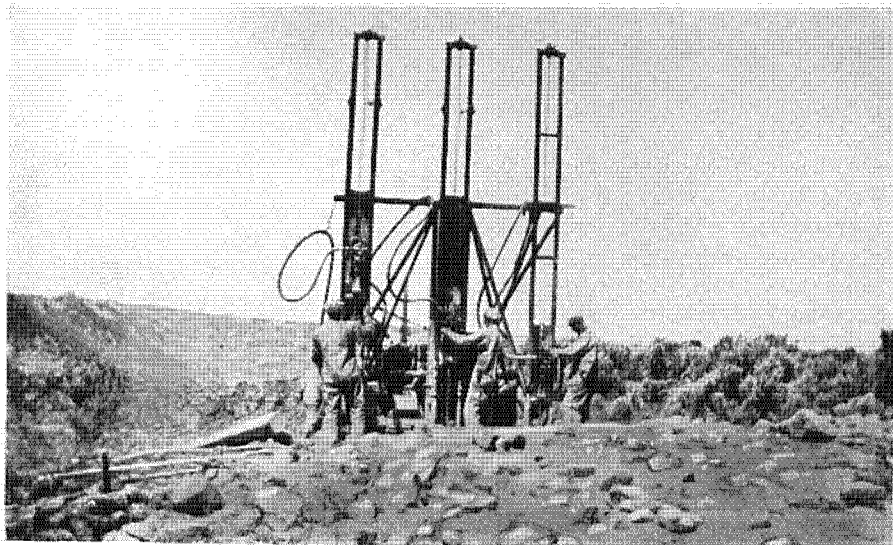
Twenty-eight and one-half tons of dynamite were set off in one day by Mittry Brothers to break up rock formations

Above—Where the John Phillips Company built a 30-inch concrete siphon to carry a lateral under the main canal in a 38-foot cut

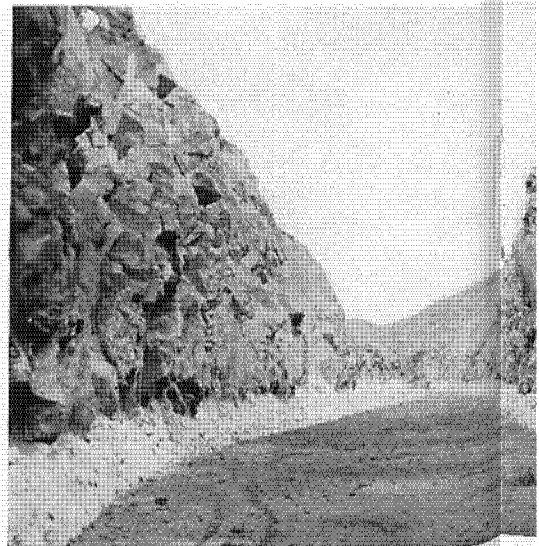
Right—On the Haas, Doughty & Jones section, where the shovel is making a fill for an embankment



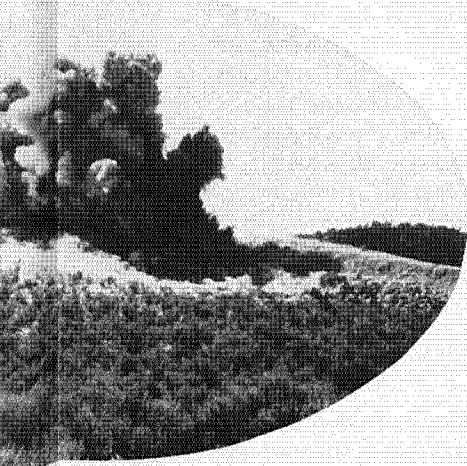
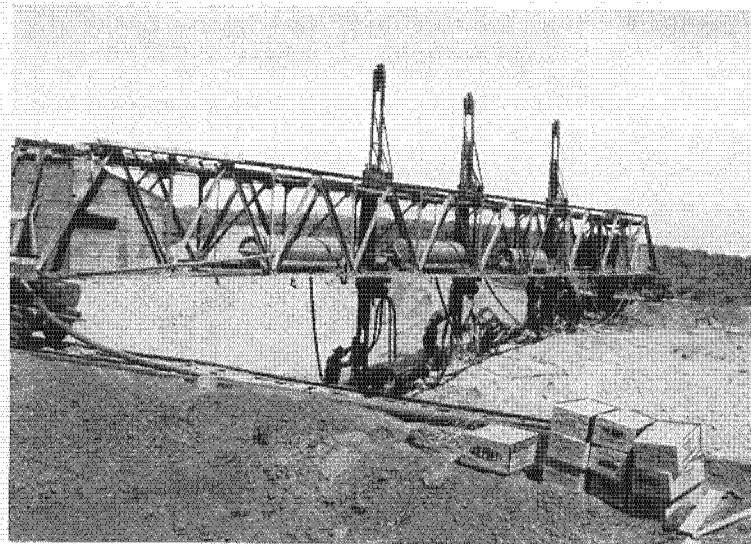
Below—Drills mounted on a caterpillar, ready for use on the Mittry Brothers contract



In the oval—Another large blast on the Mittry Brothers contract. In this shot 15,000 cubic yards of rock were broken



THE MINIDOKA IRRIGATION CANAL IN IDAHO

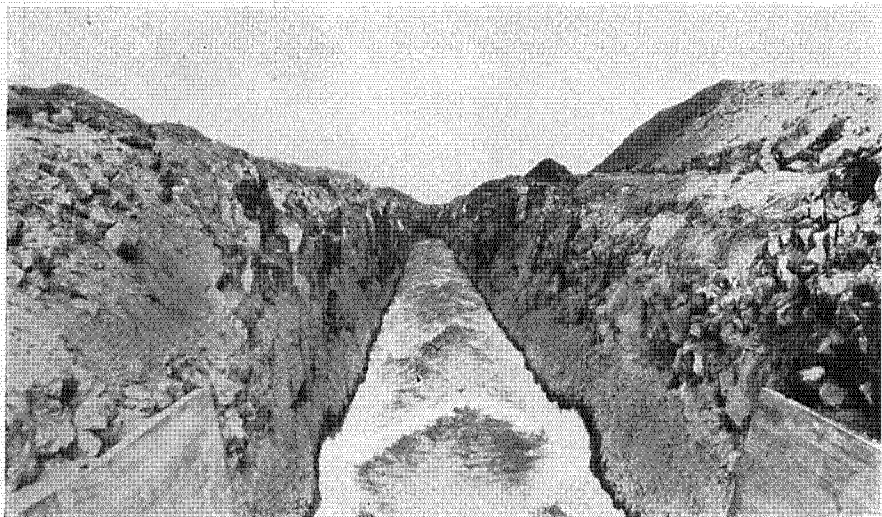
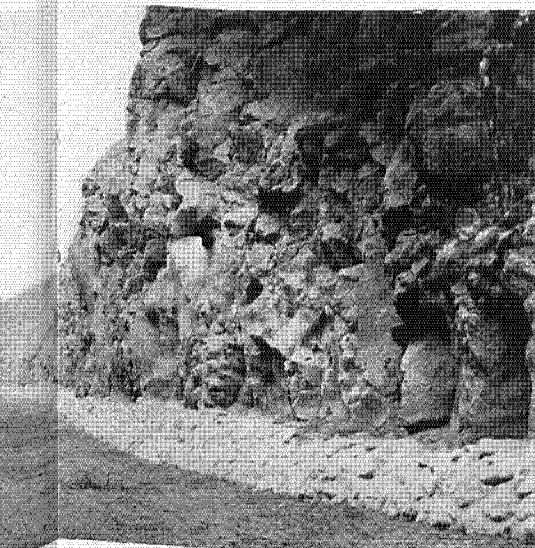


Below—A rock cut on the Derbon work, where seams of soft material had to be protected from the water to prevent erosion



Above—A steel-truss drilling bridge spans the canal in the Mittry Brothers section. The frame mounts three drills

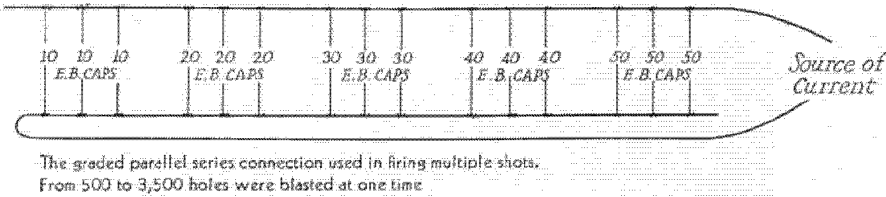
Left—A dragline excavator at work for the Derbon Construction Company



Below—Water flowing into the upper part of the Minidoka-gravity extension main canal

the two sections D and F. To expedite the work, they maintained two construction camps seventeen miles apart. Altogether it represented more than 2,671,000 cubic yards of earth, hard-

pan and rock, including 761,000 yards of rock. As this is written, some trimming remains to be done, but it is scheduled for completion by the first of April.



pan and rock, including 761,000 yards of rock. As this is written, some trimming remains to be done, but it is scheduled for completion by the first of April.

Section G, representing 1,141,000 cubic yards of excavation, was undertaken by Haas, Doughty & Jones, San Francisco contractors; 250,000 yards of it were rock.

The Morrison-Knudsen Company, of Boise, Idaho, has the work on section H between Little and Big Wood Rivers, where 53,000 cubic yards of lava rock were encountered. The con-

crete work will probably be completed August 1. The contract for section I has not been let, but the job may be started some time this year.

Construction work on the main canal was begun in the summer of 1928. By April 1, this year, fifty-seven miles of it will be completed—a creditable record considering that the contracts have involved moving more than 5,780,000 cubic yards of material, classified roughly as 75 per cent earth, 2 per cent hardpan and 23 per cent rock, and that much of the rock was a lava formation. Lava is naturally porous, and when sandwiched between other layers of volcanic ash and vegetable matter, blasters have their troubles. In such

materials powder gases cannot easily be confined to do effective work.

An interesting blasting practice was developed to fire multiple shots connected in what is termed graded parallel series; see the sketch on this page. By this means, using power-line current with appropriate transformers, from 200 to 900 electric blasting caps were detonated at one time.

To complete this canal will require the use of approximately 4,000,000 pounds of dynamite. It is one of the toughest rock jobs any group of contractors has ever tackled. More than 2,000,000 pounds of du Pont explosives—40 per cent quarry gelatin and Red Cross Extra—were used last year. But they will have served a good purpose if this arid region of Idaho can be made to bloom like the rose.

Acknowledgment is due to Mr. E. B. Darlington, superintendent of the Minidoka Project, and his engineers for information supplied and for the photographs which have been reproduced to illustrate this article.

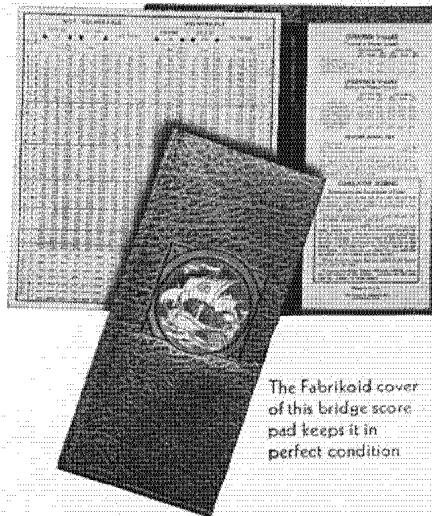
FOR CONTRACT BRIDGE PLAYERS

Those who have the job of keeping score will find this card especially helpful

WILBUR WHITEHEAD has worked out a bridge score card for contract and for auction that will cause his name to be thrice blessed among the unfortunate victims who have to keep score.

It used to be bad enough at auction, what with pleadings of a sore thumb, poor arithmetic, and a vehement protestation of the pain that the burden of scoring put upon one. Then contract came in, with its difference in values for vulnerable and not vulnerable, for undertrick and overtrick values, and the alibis came so thick and fast that it was nothing unusual for the pad and pencil to go around the table twice until by process of elimination the most weak-willed one—or the most courageous—was ferreted out.

But this new contract bridge scoring card will change all that. You determine how many tricks were



made, how much was bid, vulnerable or not vulnerable, and believe it or not, there is the score ready to put down.

These cards are covered with handsome, cleanable Fabrikoid, gold

stamped and embossed, and are well equipped to withstand the ravages of the bridge player who bites his nails and crushes things in his hands to relieve his feelings.

They reveal the scoring key when opened up, and contain all necessary information on the bidding and scoring of contract.

In passing, it may be well to mention that they are published for both kinds of bridge and give the score of any possible hand that can be played.

Pads that go with the automatic scorer are made in the form of refills so that a new one can be inserted quickly when necessary.

No bridge playing home should be without one of these cards. Write to the Bridge Specialties Company, in the Leader Building, Cleveland, Ohio, if you wish to make things easy for the scorer who needs such an accessory and will appreciate its aid.

MULTIPLE-SHOT BLASTING MACHINES

*Last month "baby" electric firing devices had their innings.
Now it's only fair to give the "adults" their turn*

By ARTHUR LA MOTTE
MANAGER, TECHNICAL SECTION, EXPLOSIVES DEPARTMENT

WHEN electric blasting was first thought of, nearly 100 years ago, fuse had not reached its present-day perfection, and about the safest method of firing a blast was to fill a straw with fine black powder, stick one end of the straw in the charge and light the other. The blaster took a sporting chance as to whether he would be able to beat the straw and reach a place of safety before the charge would fire. Naturally, electric blasting, with almost an indefinite length of wire between the blaster and the charge, took a firm hold on the imagination of those who were interested in safety first.

One of the first blasting machines of which we have any knowledge is shown in picture No. 1. This consisted of a circular disc which was rotated between two silk or chamois-skin pads, connected in the base of the machine to a series of Leyden jars, which were discharged through the wires to the blasting circuit. The firing device used with this machine consisted of two sparking points with grain powder between them. As dynamite had not yet been invented, a detonating cap was not necessary. These high tension firing devices had to be connected in parallel; they could not be depended upon to fire in series.

With the development of dynamo electric generators a very much more dependable and convenient arrangement was possible and a different type of firing device was evolved, consisting of a thin wire imbedded in some easily ignited substance. This could be used with a comparatively weak current—that is, weak in po-

tential or ability to jump across an air space—and was known as a low tension electric blasting cap.

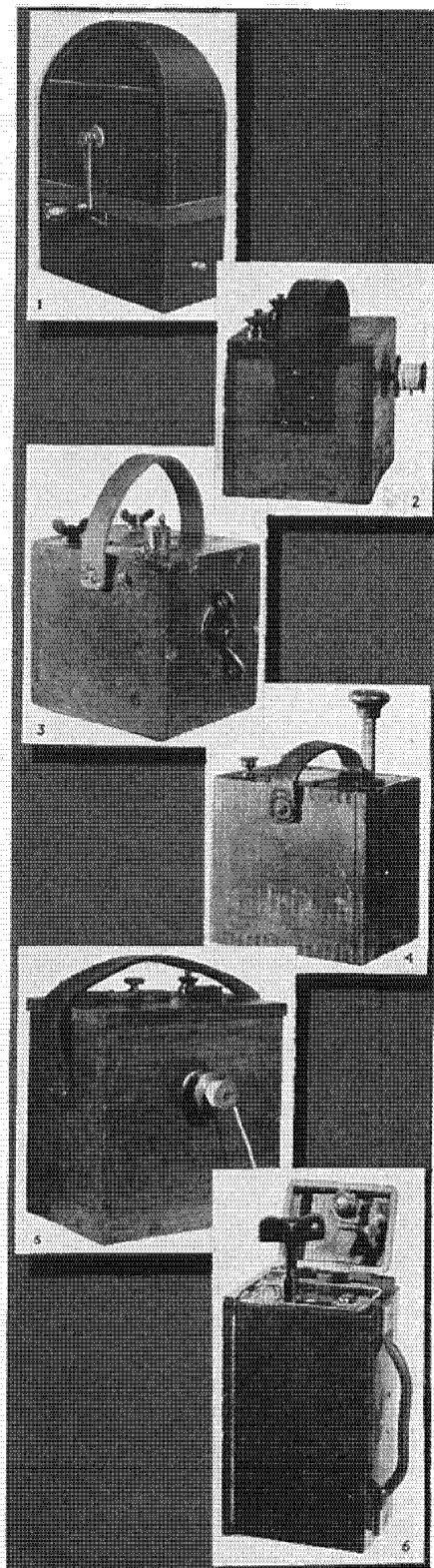
In 1876, Mr. H. Julius Smith exhibited at the Centennial Exposition in Philadelphia the first successful low tension blasting machine made in this country. It was a series-wound dynamo generator actuated by turning a crank which engaged a train of gears to rotate the armature. The current was short-circuited through the field coils and at completion of the rotation of the crank the short circuit was broken and the current sent out on the firing line. Unfortunately, we have no specimen of this machine at present in our collection.

No. 2 is a machine somewhat along this line, in which the armature is rotated directly by the unwinding of a cord around a spool. This is a series-wound dynamo without the breaking switch, so that the current starts to flow out immediately the spool is revolved, and the machine is therefore not dependable for multiple-shot firing.

No. 3 was known as the du Pont No. O. It was actuated by means of a flat coil spring which was wound up with the key and sprung by pressing a button. It was supposed to be good for three to five electric blasting caps, but the mechanism was too complicated to stand up under the rough usage that blasting machines are likely to receive.

No. 4 is an experimental machine of unknown manufacture which had one advantage in common with No. 3; that is, the blaster could put his fingers in his ears when he operated

(Continued on page 22)



THE DU PONT MAGAZINE

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VOL. XXV MARCH, 1931 No. 3

1930 IN REVIEW

It is one of the functions of *The Du Pont Magazine* to keep the customers and friends of the company informed about the activities of the organization. And so with President du Pont's annual report for 1930 before us, it may be interesting to sketch briefly some of the development items making up part of the log book of progress during an eventful year.

Unfavorable economic conditions in this country and abroad during the entire period adversely affected business volume, income and earnings of many industrial organizations, including the du Pont Company. "Some of the departments and subsidiaries," to quote from the report, "encountered substantial reduction in volume, which was counteracted to an important extent by increase in others." The ability of the company to manufacture and sell a great variety of chemical products proved a stabilizing factor.

Despite the general dullness of business, the company continued its policy of expansion and widened the scope of its activities by acquiring new industries, developing new products and constructing new plants.

Through the acquisition of the Roessler and Hasslacher Chemical Company in May, a large number of chemicals were added to the list of products. These chemicals, not heretofore manufactured in du Pont plants, are widely used in the chemical industry.

Among new products of interest to explosives consumers may be men-

tioned a new type of delay electric blasting cap; also lead azide and a new ignition mixture, both of which are raw materials for the manufacture of electric detonators.

The Dyestuffs Department developed about forty additional dyestuffs which more nearly complete the company's line of these products, along with a number of chemical specialties of value in the lumber, steel, rubber and oil industries.

Resulting from research work on synthetic resins, new types of paint finishes under the name "Dulux" were produced. These finishes are faster drying and more durable than ordinary paints based on vegetable oils.

Isobutyl and other solvent alcohols were developed by high-pressure synthesis.

Approximately \$28,000,000 was expended to increase manufacturing facilities of several of the newer industries, to modernize older plants and to build a new section to the home office building in Wilmington. About half of this amount was required for the newer industries. The Cellophane plant at Old Hickory, Tennessee, was enlarged and a new Cellophane plant was built at Richmond, Virginia. Additional capacity was provided at Belle, West Virginia, for the manufacture of synthetic ammonia and methyl and solvent alcohols. And two new tetraethyl lead units were built at Deepwater Point, New Jersey, making four units now available for the manufacture of that product.

The company's policy of maintaining large chemical and engineering research organizations in order to maintain and improve its position in the chemical industry has not been altered. In addition to approximately \$1,750,000 expended for chemical control to maintain quality and yields, approximately \$4,250,000 was expended to improve present processes and products, to develop new ones and to accumulate fundamental information which serves as the basis for developing new industries. As a result, the company's plants and processes are being constantly improved.

At the end of the year there were approximately 31,000 people employed

The DU PONT Magazine

by the du Pont Company and its controlled subsidiaries.

On December 31, 1930, there were 10,692 holders of debenture stock and 34,643 holders of common stock. During the year the number of common stockholders increased by 9,173, or 36 per cent.

Regular dividends were paid during the year to holders of the company's debenture stock and common stock, the latter class also sharing in an extra dividend of 70 cents a share, paid January 4, 1930.

DUPLATE OWNERSHIP

THE Du Pont Viscoloid Company, a subsidiary of E. I. du Pont de Nemours & Company, Inc., has withdrawn, as of February 3rd, from participation in ownership of the Duplate Corporation, the complete control of which has been acquired by the Pittsburgh Plate Glass Company.

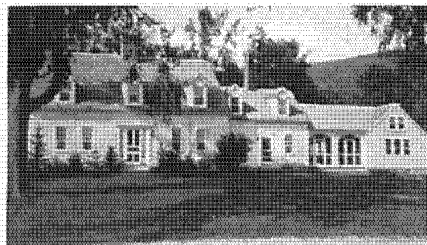
According to a statement made by C. K. Davis, president of the Viscoloid Company, "this action has been prompted by the fact that our principal business is the manufacture and sale of Pyralin and we now feel that our maximum service to the safety glass industry can best be rendered by concentrating our efforts in this particular field. We have the utmost confidence in the continued success and growth of the safety glass industry, as great progress has already been made by manufacturers in perfecting this product and in having it accepted as an important contribution to public safety."

THE FRONT COVER

VARNISH making, an ancient art, has become an industry of magnitude in this country. Chemical science has modernized the manufacture of finishing materials by substituting for rule-of-thumb methods plant processes that insure quality control at every stage of production.

The cover picture this month shows some of the equipment in the thinning room of the new du Pont varnish plant at Philadelphia.

Sunny Meadows,
the Dreier farmhouse
in New Hampshire,
where the notes on
this page were written



SUNNY MEADOWS FARM PHILOSOPHY

By THOMAS DREIER
MELVIN VILLAGE, NEW HAMPSHIRE

It Is Fun to Live a Double Life

MANY of the most successful books about living in the country have been written by men who were forced to leave the cities because they lost either their health or their money. They became country lovers by becoming city haters. I cannot qualify for membership in their fraternity. There is nothing wrong with my health and there is no threat of lack of money for food, clothing and shelter. I am a lover of both the city and the country. My wife and I move from one to the other when the spirit moves.

This is being written in January in our farmhouse in New Hampshire. For weeks down in the city we had rushed from one engagement to another. There were no loafing moments. When an invitation came to attend a New Year's party at a Boston club, we said, "Let us run up to the farm and burn brush, and snow-shoe, and read and loaf with our neighbors."

So, here we are—Snug and I, Katherine, our maid, and Robbie, the Airedale. This is Saturday and tonight six of our neighbors are coming in for a supper of baked beans. The Hunters, the Thurrells and the Hatches are all keenly interested in agricultural extension work, in the Farm Bureau, and in whatever makes life on the farm richer and more successful. We will enjoy talking about what can be done to make the community and the state better.

A Farm as an Insurance Policy

FIVE years ago we had no intention of buying a farm. The desire for a place in the country was planted by Frank Palmer Speare, president of Northeastern University, who lunched in our suburban home one day and showed us photographs of an old farm he had bought. He argued that every city dweller, especially those in the professions, ought to own a small place in some country village, or a farmhouse. This place should be owned outright, with no mortgage or other indebtedness. Then, if one's income in the city stops, or one's health goes wrong, the place in the country is ready for one. Expenses certainly do drop when one no longer has to "keep up with the Joneses."

We spent a week-end with "Prexy" Speare in September of that year. He showed us the old Asa Thompson place. We fell in love with it instantly. The sun was lying in the meadow across the road from the house. The breeze in the pines was music. The waterfall had a magic of its own. Well, before another week had gone by we were owners of this place with its four hundred-odd acres. At first it was just another "insurance policy." We thought of treating it as a camp.

But the farm itself had something to say about that. As the years have slipped by, we have found ourselves more and more interested in the life

up here. Last fall we became voters. I conduct a department in the local weekly paper just for the fun of it. In it I can praise those who have done good work.

And the curious thing is that our life in the city has also become richer.

We Went Punting at Henley

It is only fair to tell you now that you are not going to find anything brilliant in this department. It is to be a sort of journal. It will tell about people and books and things that interest me for one reason or another. Usually it will be about simple living.

One time in England we were the guests of a multimillionaire for six weeks. Every luxury was ours. Even our theater tickets were provided in London, and in Scotland we had salmon fishing, golf, motors—what we pleased. It was great fun.

But when we finally left our hospitable host we went up to Oxford, loafed for a time in the college yards, and then took that little puffing steamer down the Thames. We had lunch at Wallingford, at the Old George Inn, and reached Henley at nightfall. The Catherine Wheel Inn where we lodged was representative of the candle-light period. There were, as a matter of fact, no electric lights in all Henley. But the room, with its high bed, was clean, and the meals were piping hot and of excellent quality. The next day we got a punt and floated here and there, enjoying the glorious luxury of simplicity at a cost in money that was insignificant. How we relaxed! It was great to be free, to be paying our own way, to be living the life that was ours naturally.

One does not need much money in order to have a good time. Good times always depend upon one's thinking and feeling.

Most of us are so impatient. We have so little faith. We rush forward and grab when we ought to wait and receive gifts graciously. Margaret Fuller, driven by her powerful mind, used to exclaim: "Oh, why cannot I lay more to heart the text 'God is never in a hurry?' Let me be more patient and confident."

QUAINT USES OF DUCO HOUSEHOLD CEMENT

FOR several years we have indulged the hobby of keeping a record of some of the quaint and unusual uses of Duco Household Cement. Each new one was catalogued for future reference. Recently, while going through the file, we came across these notes, which may be of some interest to you.

This adhesive got off to a start as a household package more than a decade ago. The circumstances? A chemical show in New York City was in the offing. The du Pont company had leased space for an exhibit of its products, and a committee was delegated to collect, arrange and display a variety of them, to greet visitors at the booth, answer questions, distribute advertising literature, and so on. While laying out the program of work, one of the members pointed out that exhibitors at this show customarily gave to visitors some little souvenir in addition to advertising literature. He cited cases and aroused enough interest in the plan to bring to a head the question, "What shall we give?"

Several suggestions were made—and turned down. Finally, when seemingly every suitable sample of product was negatively considered, somebody said: "Let's fix up some small tubes of our waterproof cement. It can be used by every one for some purpose, and the fact that it is transparent and waterproof will recommend it for many uses where ordinary adhesives will not fill the bill."

To make the story short, this advertising novelty was selected, little tubes of the cement were filled and

A peep into our records shows that this adhesive is not restricted to household applications

labeled appropriately, and so great was the demand at the booth for them that the supply was soon exhausted.

After the chemical show was over, letters began to arrive at Parlin. Folks wanted to buy more of that cement; in fact, the demand so far exceeded any expectation that it was decided to produce and sell larger tubes for household use. Thus a chemical product developed originally for industrial use was adapted for individual consumers' needs as a result of its "pinch-hit" performance as an advertising novelty.

Du Pont Household Cement, or Duco Household Cement as it is now called, was brought to public notice almost by accident. And the fact that it is now sold by dealers from one end of the country to the other confirms the judgment of the committeeman who spoke in its behalf when the one big problem was to find something suitable to give away at a New York show.

In comparison with other du Pont products, this one has not been advertised extensively. Nevertheless it continues to make new friends in an ever-widening circle; and it seems to have the faculty—if we may say so—of holding fast to trade friendships, as befits a truly good adhesive. Dealers who sell Duco Cement tell us that their customers usually buy a tube of it because they have some one mending job in mind. The cement does its work well, and they recommend it to their friends who do the same thing. Personal advertising by its users has given this adhesive its widespread popularity.

In what ways do people use this product? One would be bold to attempt enumerating them. And anyway, this is not the place for a catalogue presentation. But it may interest you to learn some of the unusual uses. You know enough about the common uses yourself. Here's the first one in the folder:

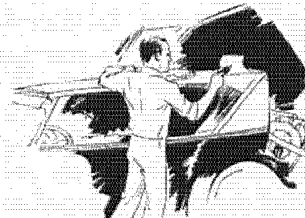
In the Louisiana salt mines blasting is done by the cap and fuse method of detonation. A special type of fuse is used because the ordinary kind has a tendency to discolor the salt. To avoid this trouble, pyroxylin cement is employed to bind together the covering material which protects the powder core.

Pebbles thrown by careless boys and hailstones often make small holes in greenhouse glasses. These places are difficult to re-glaze, and some florists repair the damage by cementing in place a glass large enough to fit over the edge of the hole. When a

At the office,
in the factory,
on your car, or
in the home—



this handy tube
is useful to make
or mend—well,
almost everything





pane is cracked, a small seal of cement in the center will hold the glass intact and prevent it from shattering. The ease with which the adhesive may be applied permits such repair work to be done from the inside of the greenhouse even in the most severe weather.

A small piece of wood, when written on in lead pencil and covered with Duco Cement, is used as a label for identifying plants, flowers or shrubbery. The label will withstand weather conditions well and remains legible for a long time.

In the archaeological field there are many uses for Duco Household Cement. It has been carried to all parts of the world on various expeditions.

Many fragile relics are broken either by the excavators or because burial in the ground for several centuries has partially disintegrated them. It is in the work of reconstructing beads, bowls and human skulls that the cement is invaluable. One rare vase, found in seventy pieces, was restored beautifully to its original form.

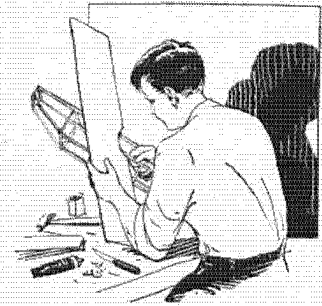
In our own country many pieces of Indian pottery, pipes and other relics once used in the teepees of the early American inhabitants have been dug out of mounds in Lancaster County, Pennsylvania. These relics are regarded as rare finds, because of their exceptional state of preservation. Of course, many of the fragile ones are found broken, and it is in piecing them together that Duco Cement has proved its worth.



A manual training teacher in a West African town uses the product to construct various articles in his class room. He finds it to be the most satisfactory cement for withstanding the extreme conditions of the African climate.

Many people are interested in the little things of life. We know of two gentlemen who specialize in microscopic chirography. One of them has a record of writing forty-six complete alphabets and four letters more, which a comparatively simple calculation reveals to be exactly 1,200 letters, all on one grain of rice! His writing, it is said, constitutes a world championship performance. The previous record for rice-writing was held by a Hindu penman; it was but 400 letters. Duco Cement comes into use for attaching the grains of rice to name-cards for display purposes and for general distribution.

With the help of the adhesive, many ingenious people in Florida use tobacco pipe cleaners and sea shells to make the quaintest novelties. Curios of this sort, in the form of birds, animals and reptiles, are found on sale in many gift shops. The cement is also used by taxidermists for various kinds of work in their shops.

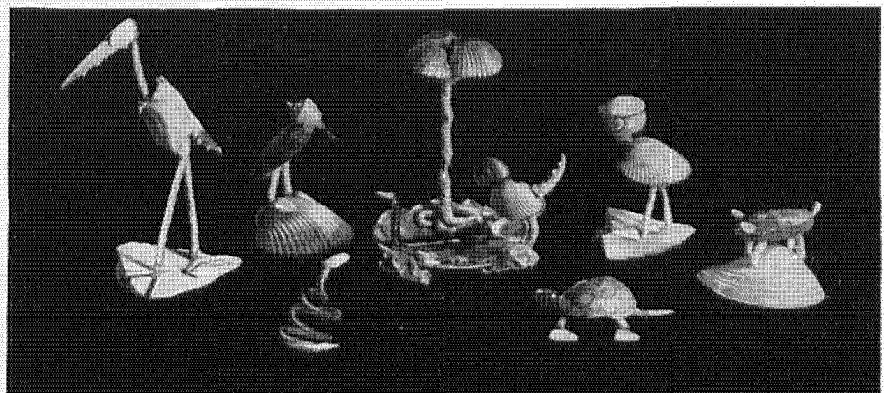


Entomologists, too, use Duco Household Cement to mount minute insects on celluloid wedges for their permanent collections. The transparency of the product gives a perfect vision at all angles for microscopic observation.

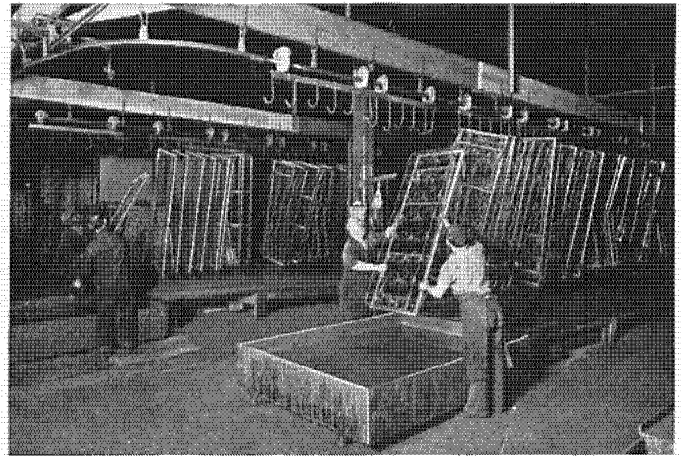
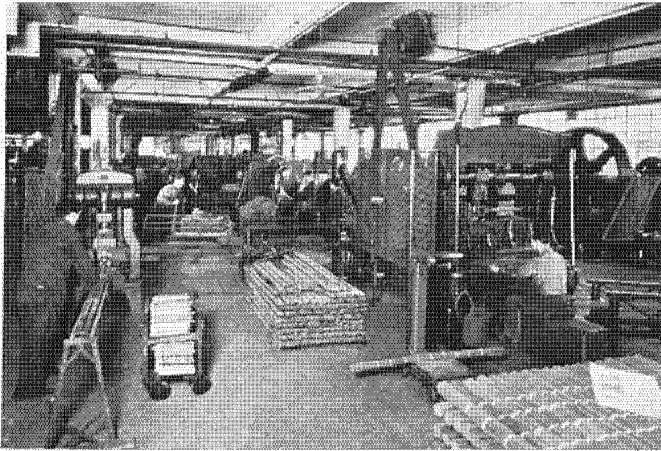
Turning over a few more sheets in our folder, we read that Duco Cement has been utilized by boys in making boat and plane models; by a nurse to mend the porcelain part of an electric water heater; to patch stone in the Indiana limestone industry; to repair the rims of glasses, and to mend bathtubs and furniture. Others have used it to apply prints to novelty boxes and to parchment shades; to mend cast-iron radiator caps; to retread an insulator that goes inside a magneto plug for an oil lead; to replace false teeth in broken bridges and to patch the tops of automobiles, tents or canoes.

If space permitted, we could continue the list indefinitely. But let us add just this—

One man has been patching his shirts for a number of years with the product. Evidently a disconsolate bachelor, he writes, "Duco Household Cement mends most everything but a broken heart."



A few sea shells, some pipe cleaners, Duco Household Cement and a little ingenuity are all you need to make these attractive novelties



Left—The metal working shop of the J. R. Bunting Company, so arranged that production is maintained with the minimum movement of stock.

Above—Dipping the frames in du Pont enamel. Note the overhead conveyor system.

MASS PRODUCTION IN A SMALL PLANT

An example of its success is offered by the world's largest manufacturer of gliders

STEEL mills furnish the J. R. Bunting Company of Philadelphia, manufacturers of gliders, with 4,500 tons of raw material. Out of the cotton fields of the South come hundreds of bales of the "southern ermine." The du Pont Company supplies enamel for frames and waterproof, cleanable Fabrikoid for upholstery. From somewhere else comes special steel for spring coils.

In a manufacturing sense these are raw materials. They must be fabricated into glider parts. Not a piece goes into the final finished product that the Bunting Company does not fabricate in its own plant.

This modern factory is organized on the continuous chain plan. Steel parts of the glider frame move from the machines to an assembling point. Here expert workmen rivet them together with air hammers. Next, the frame is picked up by an overhead conveyor, which brings it to the enameling room, where it is dipped. Then it continues its journey to the baking room.

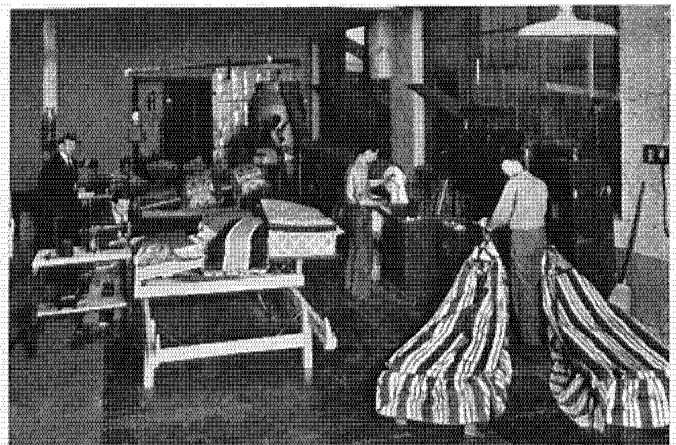
After baking, the frame, still on the conveyor, moves into another assembling room where it meets cushions and upholstery sent down from the complete upholstering plant on

an upper floor of the building. When this assembling has been done, the gliders move out on the conveyor track to the shipping room, where they are boxed and packed into freight cars standing on the siding.

This efficient method of production has been a main factor in making the J. R. Bunting Company the largest manufacturer of gliders in the country.

The ball bearings shown on the opposite page are one of the exclusive features of the Bunting product. They bear the stress of the forward and backward movement of the glider,

Left—A corner of the stitching room, where the Fabrikoid pillows are sewn together. Below—In the upholstering department. Note the ventilating equipment near the windows.



and entirely eliminate all squeaks and noises while it is in motion.

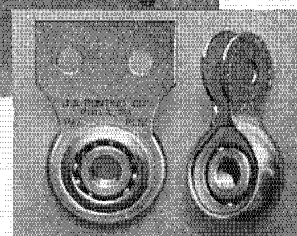
In recent years the popularity of the glider has so grown that it is now found both inside and outside the home.

Its use in gardens and on open porches made a waterproof material imperative. With Fabrikoid-covered upholstery, it becomes an all-weather article of furniture. The cushions can remain out in a driving rain, and, after the weather has cleared, can be wiped off without the slightest sign of damage. The same thing applies to the frame, which is weather-proof, for du Pont baked enamel is used on all the steelwork.

Different glider sizes and various fabric changes make possible a choice of one hundred styles. The J. R. Bunting Company, 58th and Grays Avenue, Philadelphia, Pennsylvania, will be pleased to answer any inquiries pertaining to its products.



Above—The Bunting glider is an attractive piece of furniture in a sun room
Insert—These ball-bearing hangers make its action easy and noiseless. There are four pairs of them in each glider



SKEET—A YEAR-ROUND SPORT

(Continued from page 9)

7 blaze away at a target from the trap behind you—and miss it by four feet. Why? Because what seemed an easy "straight-away" actually was not. The target may have veered to the right or left due to the wind. You fired quickly and directly at it, failing to consider its slightly deflected angle of flight. The range was short, and the shot pattern had not opened to its fullest extent. Result—"lost bird." However, that is one of the things that makes skeet fascinating.

KEEP BOTH EYES OPEN

In skeet, as in trapshooting, the expert does not take deliberate aim. He simply looks at the target with both eyes open, concentrates on breaking it, instinctively swings his gun along the line of flight and at the right instant, without a pause, pulls the trigger.

The exact spot to place the shot load can only be learned by experience. Nearly all skeet targets require a slightly different "holding" and "swing," just as rising birds do in actual field shooting experience.

THAT NEW RULE THREE

Referring to the shooting position, the following is quoted:

"The shooter shall not raise his gun to the shoulder to shoot until the target is seen in the air. When ready to shoot he shall take his position at the shooting station with his gun in an informal field position. He shall then order the target. The puller shall release the target at any time after the order is heard, during an indefinite period of about five seconds. The referee shall count any target as lost where the shooter places his gun-butt on his shoulder to shoot before the target appears."

This rule, put in effect the first of this year by the National Skeet Association, is designed to make the sport conform more closely to actual field shooting conditions in which the birds themselves furnish the element of surprise. Mechanical timing of shots never exists in field shooting, and should not be present in skeet. We all have a tendency to "get a little edge" on competitors by raising the gun in some cases before the target appears, and the new rule will do much to place competition on a more

even basis. Let's observe it carefully to make a good game better.

Generally speaking, the novice should avoid shooting too quickly without a definite view of the target in flight. On the other hand, deliberating too long usually loses the bird. With patience and practice almost any normal person can become a good skeet shot. Some of the country's best-known experts did not display even average skill at first. Regular practice, a well-fitting gun and careful study of the effect of each shot will enable anyone to give a good account of himself in any company.

NOTE: The Trapshooting and Skeet Handbook, giving all detailed instructions necessary for the layout of a skeet field with drawings and dimensions, as well as blue prints, covering the construction of traphouses for both skeet and regulation trapshooting, may be obtained by applying to E. I. du Pont de Nemours & Company, Room 5085, du Pont Building, Wilmington, Delaware.

MULTIPLE-SHOT BLASTING MACHINES

(Continued from page 15)

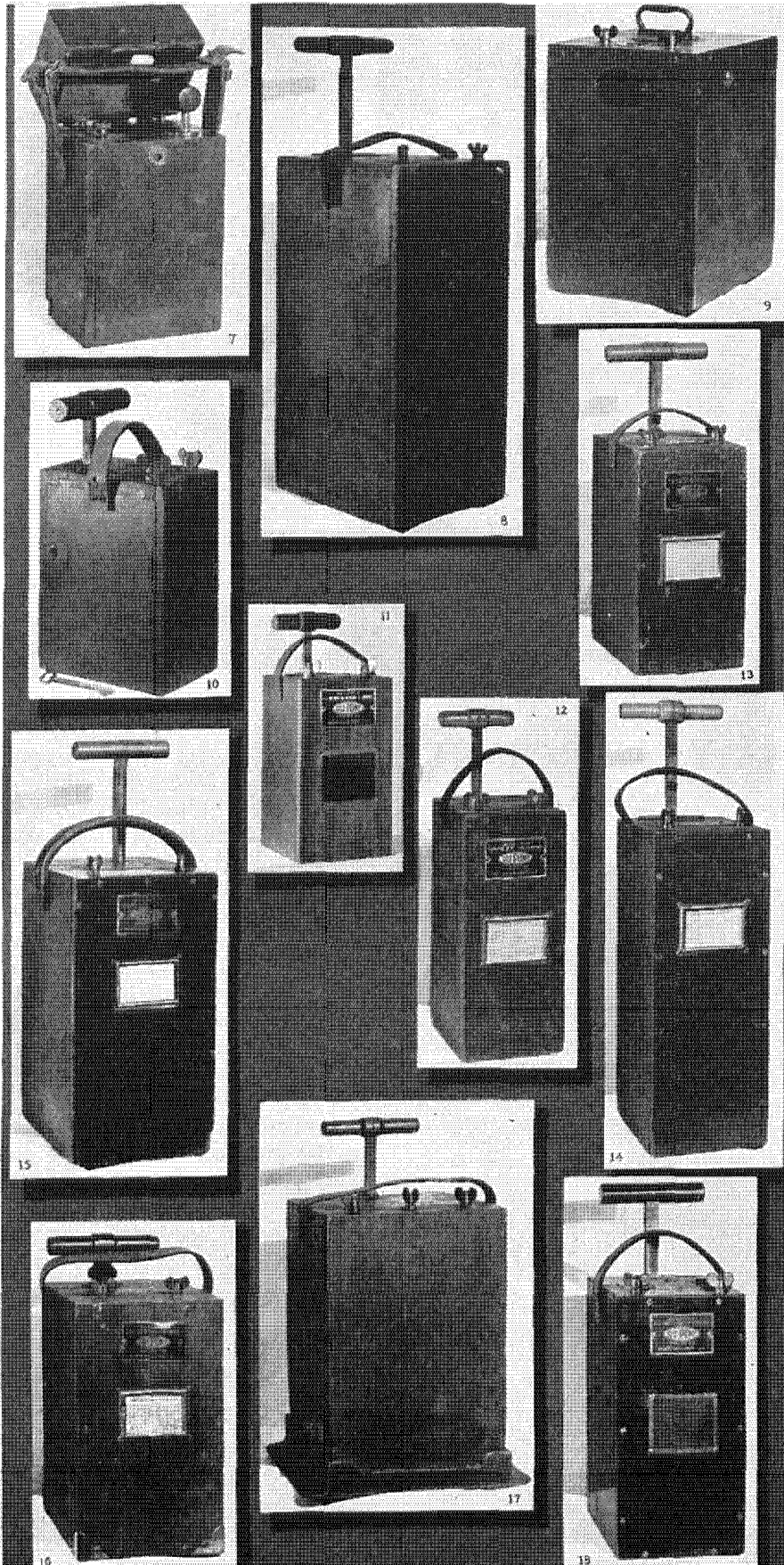
the machine. All that was necessary to fire it was to push down on the rack bar with his foot. With the No. 3, of course, he pressed the button with his foot and the machine did the rest.

No. 5 was a larger machine of the same type as No. 2, but possessed the same drawback; the current flowed into the blasting circuit as generated instead of being accumulated until the full power of the machine was developed.

No. 6 is another strong machine which was made by the Siemens-Halske Company, of Germany, for military purposes. This is a very interesting piece of mechanism, for it successfully employs the coil-spring method and a condenser coil for choking the current until it arrives at its maximum voltage. This particular machine was picked up on a battlefield in northern France during the war by Captain William J. German of the Engineer Corps of the American Expeditionary Force. When he found it, two wires led from it to a bridge head, under which was placed a large charge of T.N.T., which the enemy had delayed a little too long in blowing up. Captain German disconnected the wires and brought the machine home as a souvenir. It is good for about sixty caps, but is too expensive in its construction for commercial purposes. The case is made entirely of aluminum with very ingenious devices for making it waterproof.

No. 7 is a push-down machine made in England by the Siemens Company and is of about the same capacity as the present du Pont No. 3. An interesting feature about this is the device for rotating the armature, which is on a vertical axis, by means of a thread similar to the Yankee screw-driver arrangement.

No. 8 shows the Aetna No. 5 blasting machine, good for one hundred holes, but it is so heavy that it requires a giant to carry and operate it. It is a series-wound generator which builds up so strongly, and



resists the thrust so vigorously, that it requires about the limit of one man's power to operate.

No. 9 is of interest in that it is about the only machine which was invented specifically for firing blasts in deep oil wells. It was patented by Mr. Luke Broadwater of the American Glycerin Company in 1908, and consists of a compound-wound generator in which the armature is rotated by means of a train of gears and a crank on the outside of the case, which is not shown in the picture. At the top of the case is a red glass window; beneath it, a lamp in series with the machine. To operate, the crank is turned as vigorously as possible until a light is seen through the red glass. Then the button shown on the side of the case is pressed and this sends the current out on the line. It is a very powerful machine and designed to overcome the resistance of the long leading wires necessary for the type of work intended.

No. 10 was originally designated as du Pont No. 1 and, while no longer made, was interesting as one of the first in this country to employ a lock for safety in blasting in coal mines. This machine was supposed to have a capacity of from one to three holes, but being series wound and making a spark at the end of the stroke, it would not be considered permissible today for use in coal mines.

No. 11 is the du Pont No. 2 G. M., rated at ten holes, but good for nearly twice that number. It has a number of the improvements developed by the General Motors Research Laboratory for the No. 5 G. M. Blasting Machine. These include the two-point clutch, a condenser and an eight-point breaker switch. It is a modern, all-purpose blasting machine, series wound, easily operated, and of long life. While no machine can be called fool-proof, this one is about as near to it as is possible in the present stage of electric blasting.

No. 12 is an old du Pont No. 3 machine which has seen hard service. In principle it is very much like the machine devised by Mr. H. Julius Smith but it is rated at thirty electric blasting caps connected in series. It was, in fact, the first

machine designed for firing a large number of holes simultaneously and thus embodies the three main advantages of electric firing: ability to set off the shot from a safe distance, control of the exact moment when the blast is to fire, and the simultaneous explosion of any number of holes up to the capacity of the machine. The No. 3 as at present made embodies a number of the improvements suggested by the General Motors Research Laboratory along the same line as mentioned previously in describing the No. 2 machine, raising its former rating about fifty per cent.

No. 13 is known as the du Pont No. 3-A Blasting Machine, rated at fifty holes. It is a shunt-wound generator—one of the first of this type—and has proved a very satisfactory all-around machine for this rating.



Up with the rack bar and then down, hard.
The electric current generator fires the shot.
This shows the No. 2 du Pont blasting machine

No. 14 is the du Pont No. 4 Blasting Machine which was formerly widely used by contractors on construction work, but it has been largely replaced by the No. 3-A, which is somewhat lighter and quite as efficient.

No. 15 is the old du Pont No. 5, which had a generator similar to that in the Aetna No. 5 (see illustration No. 9) except that to render the

operation of the machine easier, a resistance coil was introduced in the short circuit between the armature and the field magnets to prevent oversaturation of the field magnets and the resulting drag or resistance encountered in shoving down the rack bar. The objection to this machine was that it was much too heavy to be carried around with any degree of comfort.

No. 16 is the du Pont No. 6, no longer manufactured for the reason that a machine better in every respect has been recently developed. This consisted of a shunt-wound generator of high voltage and a considerable volume of current, rated at one hundred fifty caps in series, but with amperage sufficient to fire twelve caps in parallel. This was designed to help overcome the electrical leakage which caused misfires in the center of a series circuit. It was an expensive machine and much in demand during the war, because it was the only American-made machine capable of firing foreign electric blasting caps under adverse conditions.

No. 17 is a still older du Pont No. 5 blasting machine. There were several points of interest about this. One was that it was a "pull-up" machine instead of a "push-down." To operate it the blaster stood on the base of the machine, grasped the rack bar with both hands and pulled up with all his strength. This rotated the armature by means of a lever and a train of gears. In addition, this three-post machine was designed to overcome misfires in the center of a series. One wire was supposed to run from the left hand post to the left hand end of the series of electric blasting caps, another from the center post to the center of the series, and a third from the right hand post to the right hand end of the series. When the circuit was properly connected, the machine had a rated capacity of one hundred fifty caps.

Unfortunately this method of connecting was a little bit too complicated for many blasters. Accustomed as they were to a two-post machine, they would try to fire it from the two outside posts only, and no current would pass through the circuit at all.

When they found that the center post had to be connected to either of the outside posts, they frequently took a hammer and knocked off one or the other of the outside posts. The cast iron base with the protruding sides was cunningly devised to connect with a very tender spot on the inside of a man's knee joint when he carried the machine. This was another disadvantage. Moreover, the machine was so heavy that it was frequently left out in the quarry or camp in rain, wind and weather instead of being returned to the office or shop after use.

No. 18 is the latest development of multiple-shot blasting machines. It was designed in the research laboratory of the General Motors Corporation in Detroit. Blasting machines representative of all the types described here were turned over to this laboratory for study in developing a thoroughly modern and efficient machine. All their advantages and disadvantages were analyzed and numerous experiments made with a device known as an oscillograph, which requires a post-graduate college education to understand. As a result of innumerable tests with series-wound,

compound-wound, shunt-wound, pull-up, push-down, spring-actuated, and other types of generators, the wizards in charge of the research laboratory decided that the series-wound generator actuated by a push-down rack bar had notable advantages over any other type for blasting machines.

A number of types of armatures were tried, and the laminated type was found to be superior, although the laminated field core was less efficient than the solid core. The clutch on the armature connecting the rack bar was reduced from four points to two points in order that the current would be sent out from the peak of the curve every time instead of from the valley about half of the time. A one-microfarad condenser in the circuit materially raises the capacity of the machine, but the most interesting innovation is an eight-point breaker switch. Its function is to utilize the current formerly lost in the formation of a large and brilliant arc during the break necessary to divert the current from the field coils to the firing circuit. This machine, while much stronger than any other machine

heretofore developed, is only a little heavier than the No. 3 (see illustration No. 12), and much lighter than Nos. 5 and 6 and even the No. 4.

It is not to be supposed that this collection represents all the multiple-shot blasting machines that have been invented or are in use at the present time. Possibly it does not include more than half of them; it only claims to represent those in our collection which have survived the hazards of moving from plant to plant and office to office.

PROGRESS

THE progress of the world depends upon the men who walk in the fresh furrows and through the rustling corn; upon those who sow and reap; upon those whose faces are radiant with the glare of furnace fires; upon the delvers in mines, and the workers in shops; upon those who give to the winter air the ringing music of the axe; upon those who battle with the boisterous billows of the sea; upon the inventors and discoverers; upon the brave thinkers.—Robert Ingersoll.



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... they're DU PONT TONTINE, you know"

THAT'S the cheering thing about Tontine window shades — they can be washed. When they get soiled, just lay them out flat on the kitchen table and scrub them with soap, water and a brush. They come out clean and fresh and new looking.

And window shades *should* be scrubbed. Think of the dust and dirt that collect on them. Dusting won't keep them clean. Neither will a damp cloth. It takes soap and water and a real scrubbing to do it.

Tontine shades are made differently from ordinary shades. That's why they're washable. They're impregnated with the same basic substance that goes into the famous Duco finish on your automobile. It makes Tontine shades extra strong and durable, too. They won't crack, or fray or pinhole. Sun won't fade them. Rain won't spot them.

Tontine shades come in a wide variety of plain tints, in

printed patterns, and in smart corded effects. When you buy them, ask to have them mounted on Tontine Guaranteed Rollers.



We have a booklet that shows a number of smart ways to decorate windows. Would you like to have a copy? Then just fill in the coupon, enclose 10c in stamps to cover cost of mailing — and the booklet will be sent to you by return mail.



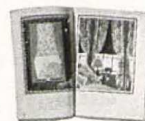
TONTINE

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THE WASHABLE WINDOW SHADE

E. I. du Pont de Nemours & Co., Inc.
100 du Pont Ave., Newburgh, N. Y.

Enclosed is 10c in stamps. Please send me a copy of "Artistic Window Treatments."



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ADDRESS.....

D. M.

Consult the Classified Business Directory of your telephone book for the authorized TONTINE dealer in your city, selected for his reliability.