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DU PONT

MAGAZINE



H. B. Smith '19



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J. R. SHULTZ, *Managing Editor*

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Profit-Sharing

THE tendency of well organized businesses and governments is to extend benefits to the individuals who compose them. Universal well-being is a product of democracy, and slowly but surely our political system has brought with it the disposition on the part of employers to give the employe a share in the responsibilities and benefits arising from industrial and commercial enterprise, through various methods of profit-sharing.

The question very naturally arises as to why any employer of labor should give anything more than the wages or salary agreed upon. Although at first glance it might appear that any additional grant to the employe would be actuated only by philanthropic motives, yet, after investigation, it proves to be profitable to both employer and employe.

Profit-sharing benefits the employer by anticipating a demand on the part of the employe to share in the wealth which he has aided in creating. A voluntary concession on the part of the employer avoids such a demand with a lower percentage of actual capital outlay than the ordinary demands on the part of the laborer would involve. At the same time, the saving effected by the stabilization of labor conditions in his organization enables the profit-sharing employer to give his workers much higher rewards than would otherwise be practicable. Thus the working and income conditions which profit-sharing produces go far toward eliminating discontent and preventing labor difficulties.

Cultivation of the individual workman's interest in his daily tasks is another desirable result of profit-sharing. Men and women work because necessity demands that they meet their daily needs. Nevertheless, there is no incentive to voluntary endeavor and the exercise of personal initiative so potent as a valuable consideration given in special recognition of service rendered. The best method for stimulating such personal interest is through the reward for meritorious services by means of a bonus or profit-sharing system.

Stabilization of labor is, perhaps, the most profitable phase of profit-sharing from the employer's viewpoint.

Every employer of labor realizes the tremendous loss sustained through the labor turnover due to replacing employes who leave on account of apparent advantages to be gained through a change. A bonus system obviates this difficulty, for it holds the higher grade of employe at a lower net cost than would be possible without such a system. The workman receives more money, but the total amount paid out by the firm is less, because the increase paid through the bonus or profit-sharing system is less than the loss sustained by continuously hiring and training new men.

Waste reduction and prevention constitute another profitable element of profit-sharing. Everyone working on a profit-sharing basis has a selfish interest in endeavoring to eliminate waste and in raising the standard of efficiency. This disposition, of course, tends to increase profits.

The development of good-will among the general public is another highly profitable outcome of profit-sharing. Purchasers have greater confidence in firms employing a bonus or profit-sharing system, for the maintenance of such a plan not only argues well for the stability of an organization, but also gives an assurance of fair dealing and satisfaction. A firm that deals fairly with its employes will certainly do the same with its customers. The contracts of such a firm, too, are more dependable, for there is but little risk of disappointment in deliveries through delays caused by labor difficulties.

The benefits of a bonus system or profit-sharing plan, of course, are by no means confined to the employer alone. Obviously, there is the immediate benefit of increased income achieved without resorting to drastic measures. Under such a system there is no need for strikes, whose cost is always paid by the workman.

Profit-sharing, moreover, tends to increase the individual worker's earning capacity insofar as it stimulates his interest in his work and thus leads him to the development of more efficient methods of performing his duties. The logical outcome of such interest and development, of course, is greater ability with consequent, greater rewards.

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Recognition of such progress is necessarily swift under a profit-sharing system, for careful supervision and scrutiny of the work of every individual constitute an integral part of the plan. Consequently, the efforts of the energetic and ambitious worker are sure to be noticed. The incompetent workman is spurred on to meet the standard set by the competent workman, and the energetic workman is spurred on by the knowledge that service rendered will receive recompense in just proportion.

In most profit-sharing systems, the pecuniary advantages accumulate by arithmetical progression, and are thus cumulative in the later years of a man's active life.

Profit-sharing systems give the employe assurance of continued employment, and such assurance permits him to formulate definite plans for the thrifty management of his affairs. As soon as a man feels that he is permanently employed, he can establish himself by buying his home, thereby beginning the accumulation of an estate.

What plan is most desirable and most adequate in a given establishment depends largely upon the nature of the business and its organization. Any system, however, based upon the fundamental principle of reward for service, will prove mutually profitable and advantageous to employer and employe. It is possible to accomplish the desired results, for instance, by giving to the employes a percentage of the gross or net profits of the company.

Another method, and one employed by the Du Pont Company, is to grant bonus stock after service of several years. In the Du Pont Company this stock is given, after

two years of service, to those deserving, on the basis of 1/60th of a share per month. The total stock share, therefore, becomes the property of the employe at the end of a period of five years after it is granted, but, in the meantime, the recipient, or grantee, receives the full dividend income.

A number of other stock bonus grants for meritorious service prevail. The Du Pont Company has also insured the lives of all its employes, in favor of the employes' dependents, for sums ranging from one thousand to one thousand five hundred dollars, according to length of service, without cost to the employe.

In April, 1915, the Du Pont Company gave a bonus of 20% on all salaries. This continued in force until January, 1917, when it was raised to 30%. In July, 1917, the basic salaries were advanced and a bonus rate of 20% established. Another change in the bonus rate was made in March, 1918, when a "sliding scale" was put into effect. A bonus of 35% was granted on the first \$100 of every employe's monthly salary. On amounts over \$100 the bonus rate graded down, the larger salaries drawing, proportionately, the smaller bonuses.

A system of flat rate bonuses was established for payroll employes not in the salaried group. The bonus rate increases with the years of service.

Such are the principal features of the Du Pont profit-sharing plans. Founded upon the basis of fair dealing and equitable division of profits, they have worked out, in actual practice, to the mutual advantage of both employer and employe.

Promotions Among Du Pont Executives

SEVERAL promotions were made on June 1, 1919, among the Du Pont executives. C. W. Phellis, formerly Director of Explosives Sales, became General Director of Sales. Mr. Phellis was succeeded as Director of Explosives Sales by L. P. Mahony, formerly Manager of the Columbus Composite Office. Mr. Mahony's place in Columbus was taken by Giles McDaniel, formerly Manager of the Chicago Paint Sales Office. G. G. Barber, formerly Manager of the Minneapolis Paint Sales Office, was placed in charge of the Paint Sales Office in Chicago, and was succeeded, in Minneapolis, by G. M. Breinig, formerly a salesman reporting to the Philadelphia Paint Sales Office. All these promotions are in recognition of exceptional merit in the Company's service.

Mr. Phellis, now General Director of Sales, entered the Du Pont organization as a shooter salesman January 1, 1901, and was transferred to Explosives sales work January 1, 1903. On June 1, 1906, he was made Manager of the Huntington, West Virginia, Office. On September 1, 1916, he became Manager of the Denver Office, where he continued until November 4, 1918, when he was promoted to the position of Director of Explosives Sales. His recent promotion to his present position is thus the outcome of a truly excellent record.

Mr. Mahony, now Director of Explosives Sales, entered the Company's service as a clerk, February 2, 1895.

Eighteen years later, on February 1, 1913, he was appointed Assistant Director of Explosives Sales. He continued in this position until June 1, 1918, when he became Manager of the Composite Office at Columbus, Ohio, where he remained until his recent promotion to his present position as Director of Explosives Sales.

Mr. McDaniel entered the service of Harrison Bros. & Co., Inc., January 15, 1908. When the Harrison organization was taken over by the Du Pont Company in 1917, Mr. McDaniel was appointed Manager of the Chicago Paint Sales Office, which position he held until promoted to his present position, that of Manager of the Columbus Composite Office.

Mr. Barber was also originally of the Harrison organization, which he entered March 1, 1911. When the Harrison interests were absorbed by the Du Pont Company, he was made Manager of the Minneapolis Paint Sales Office, where he continued until promoted to his present position of Manager of the Chicago Paint Sales Office.

Mr. G. M. Breinig, another member of the original Harrison organization, which he entered August 1, 1907, continued with the Du Pont Company as a salesman reporting to the Philadelphia Paint Sales Office. It is from that position that he has been promoted to his present one of Manager of the Minneapolis Paint Sales Office.

The American Commercial Woods

This is the second of a series of authoritative articles on woods and wood finishing appearing exclusively in the Du Pont Magazine. Subsequent articles, discussing specific woods and methods of finishing, will appear in early issues of the magazine

MAGNIFICENT is the beauty of the forest. The gorgeous canopy of leaves and branches, the rich carpet of shrubs and mosses and the glint of sunlight through the green are the fragments of beauty that nature has woven into the spell of sylvan scenery.

Such is the glory of the forest. "Woodman, spare that tree," is the appeal that rises, instinctively, in the heart of every lover of nature. The forest's greatest contribution to human progress, however, lies in its utilitarian possibilities. Some day, the ax must fell those lofty trunks, and, after a time, the erstwhile monarchs of the forest will become homes for the families of other generations, and beds and chairs and tables to minister to those families' comfort. Commerce will have given the former trees a beauty of a different sort, but none the less attractive.

That is the destiny of all American woods that have commercial utility—birch, cypress, fir, gum, oak, North Carolina pine, Southern pine, California redwood, ash, chestnut, hemlock, walnut, larch, white pine, cedar, spruce, basswood, elm, poplar, beech, cherry, mahogany, sycamore and maple.

Widespread popularity has long characterized the American commercial woods. The reasons are not hard to find. Availability, adaptability, strength, beauty and decorative possibilities at once suggest themselves as factors which make these woods highly desirable as structural material. Moreover, there is a wide variety for selection—any purpose, any taste and any decorative scheme can be suited.

The value of the American commercial woods, from a practical view-point, is greatly enhanced by their general availability. They are more widely distributed and more easily obtainable than any other structural material in existence. The geographical distribution of American forests arises from the special needs and adaptations of the different species of trees.

The geological structure of a region, the character of the climate, the nature of the soil, the moisture and the sunlight all have an influence upon tree growth. A tree, it would seem, selects its natural home in a place best adapted to its own peculiar nature. Thus it is that certain families of trees are found grouped, in greatest abundance, within certain areas.

The eastern part of the United States is, in general, the home of broadleaf trees. Coniferous forests are found principally in the North and West. Even within these general areas the distribution of specific trees is more or less well-defined.



A Forest Trail

The eastern broadleaf forests extend from southern New England along the Appalachians and spread westward to the Mississippi and beyond. South of this area, in the States bordering on the Gulf, east of the Mississippi, pines flourish. These pines supplement the so-called "white pine belt," which extends through Minnesota, Wisconsin, Michigan and parts of New York, Pennsylvania and New England. Coniferous trees are in enormous preponderance in the vast territory of the

Rockies. The States that border the Pacific are the home of red fir, hemlock, cedar, redwood, bull pines and sugar pines.

The same differences of climate and soil that cause the geographical isolation, as it were, of the various tree families, have the effect, also, of producing trees possessing entirely different characteristics. Cypress, for instance, forms forests in swamps and, as a result, has strong moisture-resisting qualities. Similarly, the different woods are characterized by varying degrees of strength, durability, softness, elasticity, toughness, moisture resistance and, in some cases, by unique, special qualities. From the innumerable differences of characteristics arise the adaptability and suitability of certain woods for certain uses. Knowledge of these distinctions in the use values of the



A Picturesque Log Jam

various woods seems to have guided the "Deacon," of "one hoss shay" fame, in constructing his "master-piece."

"So the Deacon inquired of the village folk

Where he could find the strongest oak,
That couldn't be split nor bent nor broke,—
That was for spokes and floor and sills;
He sent for lancewood to make the thills;
The cross bars were ash, from the straightest trees,

The panels of whitewood, that cuts like cheese,

But lasts like iron for things like these.
The hubs of logs from the "Settler's Ellum,"—
Last of its timber,—they couldn't sell 'em.
Never an ax had seen their chips,
And the wedges flew from between their lips,
Their blunt ends frizzled like celery tips."

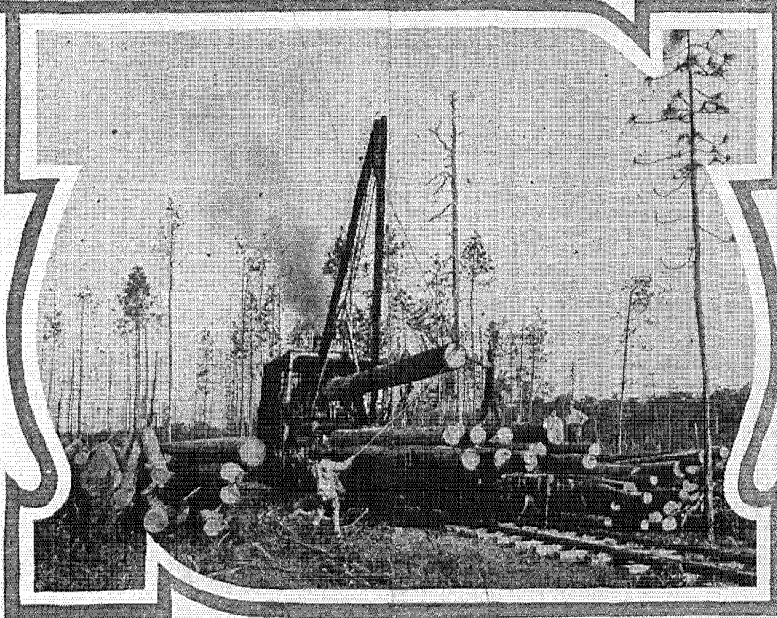
Sometimes there is a choice between two or more woods about equally well adapted to a particular purpose, but, as in the "Deacon's" case, there is often some one wood of outstanding fitness for a given use.

Strength is, of course, a fundamental consideration in judging and selecting any structural material. In this respect wood is exceptionally desirable, for, compared with other structural materials, it is extraordi-

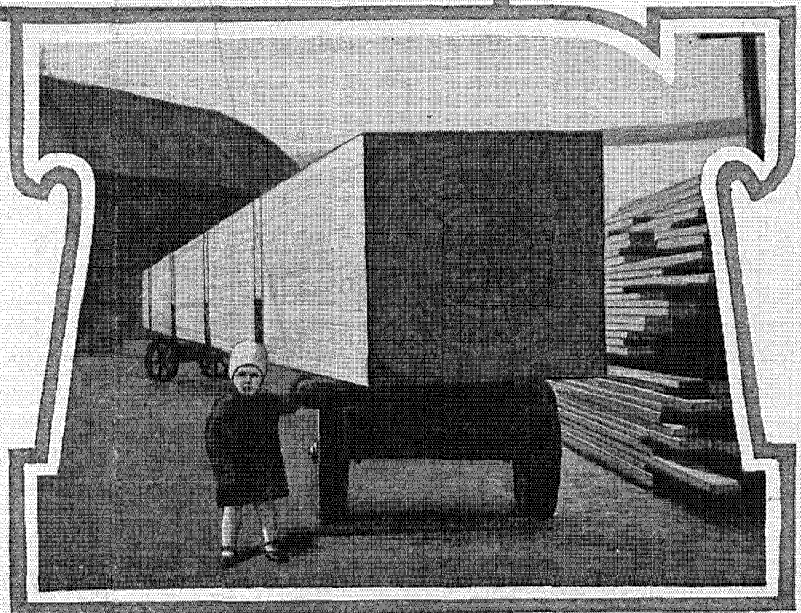
narily strong. Indeed, wood compares quite favorably with steel and iron of equal weight. A bar of hickory, for example, greatly surpasses in tensile strength a bar of steel of the same weight and length. Similarly, a block of hickory or longleaf pine will sustain a much greater weight in compression than will a block of wrought iron of the same height and weight. In fact, practically any piece of sound, straight-grained, dry wood is stronger than steel, weight for weight. This combination of strength with comparatively light weight both makes wood easy to handle and adds much to its desirability for structural purposes.

This does not mean, of course, that wood can successfully replace steel and iron for all structural purposes. A piece of wood, for instance, strong enough and heavy enough to do the work of a girder for a massive "sky scraper" would be too large to be practicable. Steel and other metals have a distinct and separate place in modern structural work. Wood and metal are not competitive, but rather supplement each other.

Wood possesses some, special, physical properties which give it certain advantages, for some purposes, over other structural materials. For instance, it is a non-conductor of heat and electricity. Moreover, wood will not conduct



Loading Logs on Cars



A Monster Specimen of Ship Timber

moisture. Another quality that has made wood popular for many uses is the fact that it does not expand and contract with heat and cold, and its tendency to shrink and swell under certain atmospheric conditions can be entirely overcome by proper seasoning and painting. In short, wood can be made to "stay put."

One very advantageous feature of wood, from the practical standpoint, is the ease with which it can be worked. In the hands of the skilled artisan, common tools are enough to fashion almost any structure out of wood.

Such are the utilitarian reasons for the continued use of wood. But the advantages of using wood in various kinds of structural work are by no means confined to utility and convenience alone. Wood, by reason of the beauty of its figured grain, possesses an esthetic appeal that no other structural material can ever hope to approach. It is, indeed, a thing of beauty and thus "a joy forever." In the exquisite appearance which the artistry of nature has given it, wood stands alone and unsurpassed.

There have been two distinct phases or stages of the development of the American commercial woods up to their present popularity and versatile utility. The first was utilitarian and the second, artistic.

In Colonial days, of course, little was known of the extent and variety of the New World's forest resources. The settlers simply selected what seemed to them to be the sturdiest and most serviceable woods. In their selection they were governed by the supply available in the immediate vicinity and guided by what they knew of the types of woods used for various purposes in Europe. To-day, in silent tribute to the judgment of those early colonists and to the enduring qualities of the woods they used, stand many sturdy wooden structures built even in pre-Revolutionary days. Numerous pieces of furniture, made by early Colonial cabinetmakers, are also to be found still in serviceable condition.

The first American builders and cabinetmakers apparently began, at a very early date, to study, systematically, the qualities and possibilities of American woods. The results and effects of their findings and conclusions can be very clearly and interestingly traced in the development of American homes and furniture throughout the various

periods of our national existence, from the Revolution to the Civil War and after.

A quarter-century of experience with the different woods then in common use was probably sufficient to afford definite data upon the basis of which the best woods for specific purposes could be determined. The next step, presumably, was the tabulation, in some enlightening form, of statistics covering the supply of the different woods and their accessibility. With this information in hand, it would then be possible to formulate some definite, practical policy with respect to the wood or woods to be used in the various lines of construction.

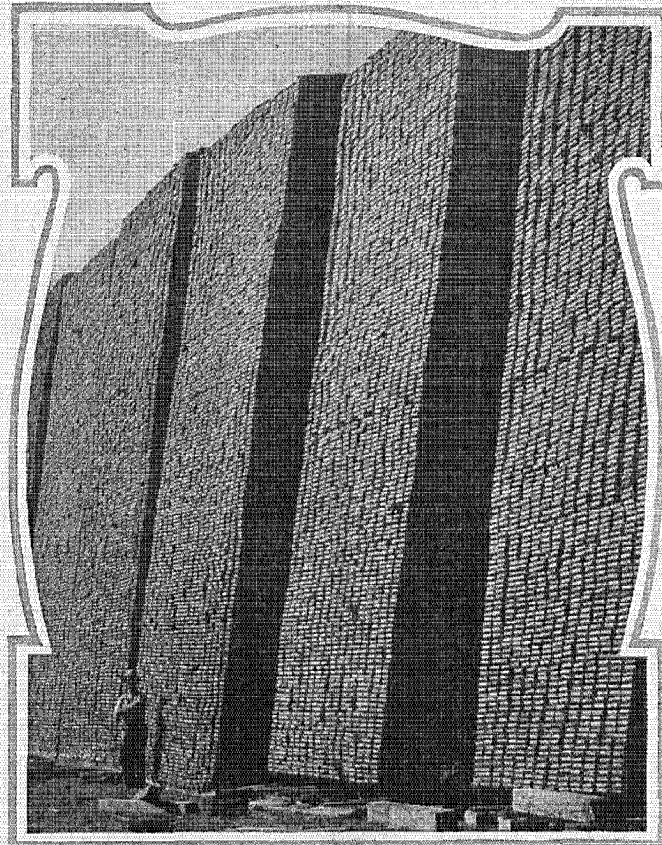
In the early days little thought was given to the artistic side of woods. White paint was practically the only finish used on the woodwork of Colonial homes, and the surfaces

thus finished possessed a quaint, dignified beauty of their own. The varnishes used on mahogany and other furniture finished in the natural, in Colonial days, were applied as protective coatings and polishes rather than as real beautifying agencies. Indeed, it would appear that the rich beauty of many of these Colonial pieces was due, in large measure, to the rare quality of the wood rather than to the finish.

Later in our history came the definite development of the esthetic values of the natural grain beauty of the different woods. The period of strict utilitarianism had passed. The struggle for mere existence in the New World was no longer so pressing. Men had time to pause and give thought to the higher, more beautiful things of life. In the field of wood construction, the trend of thought

began to turn toward the problem of enhancing the natural beauties of the woods by finishing methods. The practical uses and values of the principal American woods had now been more or less definitely determined and classified. Decorative possibilities offered an opportunity wide in scope and rich in potentialities. Such was the inception of the art of wood finishing in America.

The manufacturers who first took up wood finishing methods as a definite line of work devoted their efforts largely to developing the best and most practical ways of heightening the natural effects of the different woods. For this work they had some basis in what had already been done with varnishes. Gradually they developed a more or



Courtesy "American Lumberman"

Lumber Stacked for Air Drying

less coherent body of knowledge relating to the finishing of woods. Thus wood finishing became a recognized art.

The results of the work done by those pioneers can be seen in the wood finishing methods in general use even today. To those early experimenters with American woods we owe, for instance, much of our ability to obtain different effects, through different methods of finishing, on the same woods.

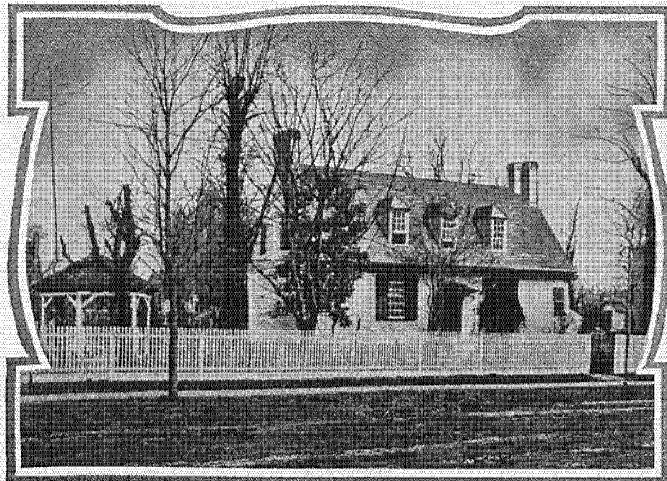
This development continued until after the Civil War. At that time the general method in practically all wood finishing was to apply numerous, successive coats of shellac and varnish to a surface and to rub each coat as applied. Thus a solid finish was built up. Obviously, this method had its limitations, from the labor standpoint at least. A tremendous amount of hand labor was required on each piece of work.

Recognition of this enormous labor cost as the principal obstacle to the commercial adaptation and exploitation of wood finishing, on a large scale, led Dr. D. E. Breinig, in the early '70s, to undertake a series of experiments whose object was to develop some process which, with little labor outlay, would fill the pores of the wood and furnish a sufficient foundation over which the final, finishing coats of shellac or varnish could be applied without risk of "sinking," or absorption by the wood. The result of his investigations was a preparation which could be applied with a brush and which accomplished, with one application, all the results its inventor had set out to obtain. His discovery revolutionized the wood finishing industry. The first commercial application of the new process was on the cabinet work of Wheeler and Wilson's sewing machines, and the preparation, which is now a staple commodity in the wood finishing business, is known today as Wheeler's Wood Filler.

Since then the art of wood finishing has grown by leaps and bounds. The comparatively recent development of practical acid stains has introduced a new era, as it were,

in the wood finishing industry. The crude stains of former days have been supplanted by modern penetrating and acid stains, by means of which it is now possible to obtain clear tones and shades on all woods.

The present day trend in wood finishing is toward the soft, subdued effects. Natural and imitative finishes, of



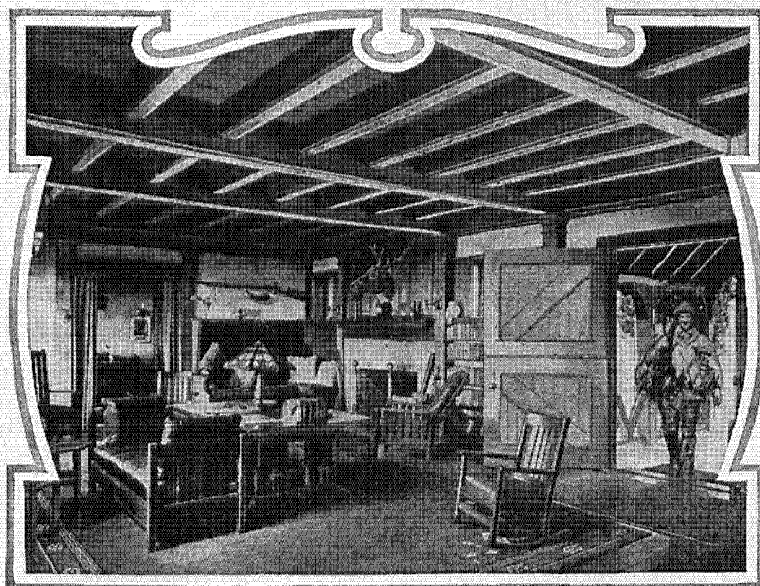
The Galt House, Williamsburg, Virginia, in Which the Virginia Assembly Met in 1677. The House is Still in Excellent Condition—a Splendid Tribute to the Durability of the Wood of Which it is Built

course, will always have their place, but the soft, delicate grays and browns mark the present phase of the evolution of the wood finishing art. Today the home builder, the architect, the interior decorator and the cabinet-maker, in selecting woods and choosing finishes, are able to reap the full benefit of all that their predecessors have done throughout the whole course of the development of the American commercial woods. It is no longer necessary to endure an unattractive appearance in any piece of wood construction. It is possible, in these days, no matter what the limitations of the work, to obtain a

beautiful finish on any American commercial wood. Happy, indeed, is the combination of factors that the American public finds in its wood construction industry—the best woods in the world beautified by the best finishes in the world.

The wonderful effects that have been achieved on practically all woods by the use of modern wood finishing methods have been invaluable in enabling home owners and builders to give full expression to individual tastes and preferences in the development of decorative schemes. Choice is no longer limited to a few effects; indeed, the variety is practically unending, so that even a distinctively unique and most exacting taste can be satisfied.

Moreover, practical considerations need never be lost sight of in the development of a particular artistic effect. Among the large number and wide variety of American commercial woods, there always will be found one or more adapted to the production of the artistic effect desired and, at the same time, possessed of adequate utilitarian qualifications for the use intended.



Copyright "Good Furniture Magazine"

This Hunter's Den is Eloquent of the Strength and Serviceability of Wood

The Advantages of Electrical Blasting

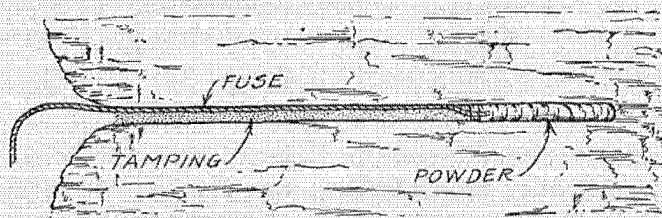
J. B. Stoneking

Technical Division, E. I. du Pont de Nemours & Company

THE potential energy contained in dynamite or any other explosive can be brought into activity only through the use of some intermediate firing agent. The ideal medium for this purpose should possess the following qualities:

First. It must secure the full energy from the explosive in the form of useful work.

Second. It should be absolutely free from misfires.

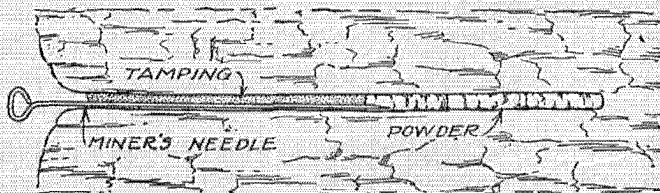


Fuse Permits Good Tamping, but Ignites the Charge in the End, and Requires an Open Flame to Light it.

Third. The blaster or user should enjoy maximum safety while using it.

Fourth. It should be able to resist adverse or poor storage conditions without deteriorating and thus becoming more or less useless.

Fifth. The cost should be low. The factor of a low first cost, however, is not a true criterion of the cheapness of any given method of detonating or igniting explosives. Though a method might be very cheap in first cost, it might not deliver the full energy of the explosive and would thus require the use of a greater amount of explosive than would otherwise be necessary. It might give rise to a large number of misfires, which are dangerous to the blaster and generally result in a total loss of explosives. It might also be unsafe or at least, comparatively unsafe, and one or more serious accidents would bring the expense far above the greater first cost of some safer method.



When the Needle is Removed for the Miner's Squib a Hole is Left Permitting the Escape of Gases.

Many methods have been devised to detonate, ignite, shoot, fire or set off blasts, as the process is variously called. Only those methods at present in use need be considered here. These may be divided into two classes: those used for igniting blasting powder, and those used for detonating dynamite and similar high explosives.

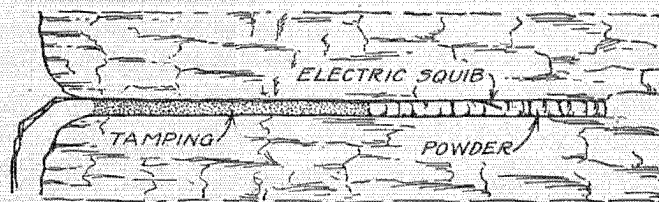
IGNITING BLASTING POWDER

In igniting blasting powder, the principal agents are miners' squibs, safety fuse and electric squibs. If the

characteristics of the ideal detonator, as given above, be taken as a standard, it will be found that miners' squibs are deficient in that they do not give the full energy of the explosive. In using miners' squibs, a passage through the tamping must be left so that the squib can "sky-rocket" back from the mouth of the hole to the explosive charge. This opening gives a vent for the gases generated by the explosive; hence some are wasted in useless whistling into the open air.

Safety fuse is much better than miners' squibs in this respect, for, when fuse is used, the hole may be tamped solid. This confines the gases. In bore holes where the charge of powder extends over several feet in length, however, safety fuse is faulty in that the ignition may occur at the point nearest the tamping. The first gases generated may start the tamping or open up a seam. Thus a considerable portion of the energy of the gas may be wasted before the explosive in the back of the hole has burned.

Electric squibs are more satisfactory than either of the other two, for the hole may be tamped solid and the squib placed in the center of the charge. This eliminates the possibility of any gases' escaping through a seam or blown-out tamping.



Electric Squibs Permit Good Tamping, Ignite the Charge in the Center and Do Away with Open Flames for Lighting.

In frequency of misfires, miners' squibs are undoubtedly the worst offenders, for any small obstacle in the passage or blasting barrel may stop them and cause a missed hole.

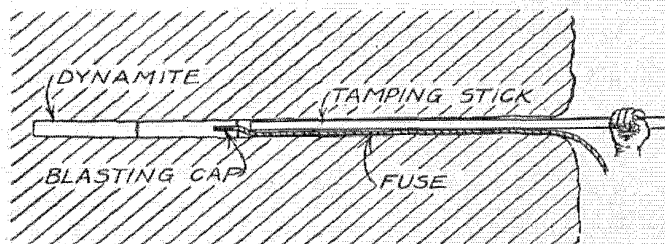
Safety fuse is better in this respect, but it, too, leaves something to be desired. Such things as a kink in the fuse due to careless tamping, cuts caused by using sharp rock particles as stemming material and the absorption of moisture from the tamping, are frequent causes of misfires.

Electric squibs are superior to the others in freedom from misfires, because the igniting material fired by the electric current is imbedded in the charge of explosives, and, if the proper current is applied through the squib, no misfire can occur.

Safety in the use of these materials is extremely important, for an accident is probably the most costly thing that can happen in explosives work. In this respect, also, miners' squibs are at the bottom of the list, for their rate of burning is uncertain, and the sky-rocket-like jump from the front of the hole to the charge of explosive obeys no rational law. The charge may explode before the blaster can get away from the breast.

Safety fuse is better than miners' squibs from a safety standpoint, because its rate of burning is comparatively uniform. Nevertheless, this rate varies somewhat even in the same grade of fuse. Moreover, the character of the stemming material and the comparative compactness of the tamping also have an effect on the burning speed. Thus it is easy to see that a blaster might miscalculate the length of fuse required to allow him to reach a place of safety. Both miners' squibs and safety fuse require an open light for their initial ignition, and this in itself is a hazard in coal mines containing gas or dust.

Electric squibs offer the greatest factor of safety for the blaster in that he can be at a point of safety before he applies the current or operates the blasting machine to fire the shot. He knows that if he has made his connections properly, the charge will explode the instant the current is



Fuse May Sometimes Be Bent and Broken by the Tamping Stick.

applied. If it does not explode, he is perfectly safe in returning immediately to investigate the trouble. This would be a most unsafe proceeding with either safety fuse or miners' squibs. No sparks or open lights are required to set off electric squibs, so they are quite safe to use in the presence of gas.

As far as resistance to poor storage conditions is concerned, miners' squibs very easily absorb moisture and are useless in such a condition. Safety fuse will also absorb moisture if subjected for too long a time to moist conditions. It also requires a moderately cool place, for too much warmth has a tendency to cause asphaltum or similar water-proofing material to liquefy and penetrate the powder train. Excessive cold, on the other hand, will cause fuse to become stiff and hard, and in this condition fuse may break when uncoiled unless warmed beforehand. After long storage, fuse becomes dry, stiff and hard. Electric squibs will withstand bad storage conditions much better and for a longer period of time than either of the others.

In first cost miners' squibs are the lowest, with safety fuse next, and electric squibs last. It must be kept in mind, however, that, as has already been said, the first cost is not a true indication of what the ultimate cost will be. The other four factors are all in favor of electric squibs.

DETONATING DYNAMITE

Four methods are at present in use for detonating dynamite: the blasting cap in combination with safety fuse, the electric blasting cap, the delay electric blasting cap, and the delay electric igniter in combination with the blasting cap. To these may be added Cordeau, which is a

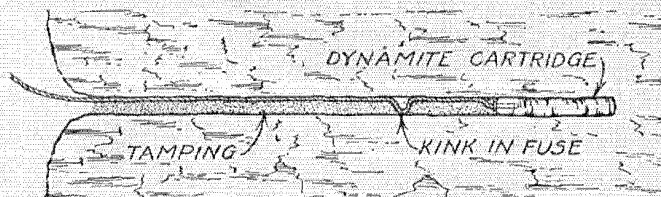
"detonating fuse," but whose cost is so high as to preclude its use in anything except deep well drill holes or similar projects where very large charges of explosives are contained in a single hole. Hence it will not be considered in this instance.

Consideration of these different methods on the points constituting the ideal, reveals the fact that, with the same strength of blasting cap, they are all about equal in securing the full energy from the charge of dynamite in the hole.

With the blasting cap and fuse, it is possible to fire almost any number of holes in succession or rotation. This is a most desirable feature in sinking shafts or driving tunnels, but it is impossible with this method to explode a number of holes simultaneously so that the charge in one hole will aid that in the next. With electric blasting caps, however, it is possible to fire a large number of holes simultaneously and to have each charge aid the other. This reduces, to a certain extent, the amount of explosives necessary. Furthermore, in using either electric blasting caps or delay electric blasting caps, it is possible to fire three successive series of holes in rotation, with one application of the current and without coming back to the breast or scene of the shooting. By using delay electric igniters with blasting caps crimped to the end in combination with electric blasting caps, almost any number of holes may be fired in rotation.

The blasting cap and fuse method is undoubtedly lowest in freedom from misfires, for in addition to the possibility of a misfire due to the fuse alone, there is the added risk that some moisture may enter the cap and cause a misfire. This possibility could be eliminated by water-proofing the crimp.

Electric blasting caps are as free from misfires as are electric squibs. The delay electric blasting caps, which are self-contained units, are of equal value in this respect.



Careless Tamping May Kink the Fuse and Cause a Misfire.

The delay electric igniter to which a blasting cap has been crimped probably ranks, with respect to freedom from misfires, between the electric blasting cap and the blasting cap and fuse, for there is a possibility of water's entering the crimp and causing a misfire.

As far as the blaster's safety is concerned, the blasting cap and fuse method is the most unsafe of those mentioned, because it sometimes happens that fuse will smoulder along for a considerable time and then reignite the powder train, turning what appeared to be a misfire into a serious accident. Again, when lighting a considerable number of shots in rotation, the blaster sometimes fails to make allowance for the time required to do the lighting and get to a place of safety. An accident is often the result.

Another disadvantage is that the blasting cap must be crimped to the end of the fuse. This in itself presents an element of danger. The same thing is true of delay electric igniters, to which a cap must also be crimped. The electric blasting cap and the delay electric blasting caps are complete in themselves, and are, therefore, free from a similar hazard.

With the electrical method, the blaster can be in a place of safety before attempting to fire the blast. If, upon the application of the current, the blast does not follow, he can safely return and investigate the trouble, allowing, of course, a few minutes if any delay electric igniters are used in the blast.

As far as the effect of poor storage is concerned, blasting cap and fuse and the delay electric igniter and blasting cap are about on a par.

Blasting caps themselves require protection from moisture, and the fuse in both cases requires similar protection. Electric blasting caps and delay electric blasting caps, being better protected from moisture by the filling in the

copper shell, are not open to as strong objections on this point. They are also not affected by ordinary atmospheric warmth or cold weather. In first cost, the blasting

cap and fuse would probably be the lowest, although there is a point at which a given length of fuse would equal the cost of electric blasting caps under certain conditions. The electric blasting cap is a little

more costly than cap and fuse. The delay electric igniter comes next, and the delay electric blasting cap is the most expensive of all in first cost.

Summarizing the points mentioned above, the electrical method would undoubtedly be placed first, both for igniting blasting powder and detonating dynamite, in everything except first cost, and as the first cost might very easily be increased a hundred-fold by the

amount of explosives lost through misfires or the cost of a single major accident, the conclusion is irresistible that the electrical method of setting off blasts is far superior to any other yet devised.

CHOICE OF METHODS FOR FIRING BLASTING POWDER

Points to be Considered	Miners' Squibs	Safety Fuse	Electric Squibs
Full energy from explosive.....	3d	2d	1st
Freedom from misfires.....	3d	2d	1st
Relative safety to blaster.....	3d	2d	1st
Relative resistance to adverse storage.....	3d	2d	1st
First cost.....	1st	2d	3d

CHOICE OF METHODS FOR FIRING DYNAMITE AND HIGH EXPLOSIVES

Points to be Considered	Blasting Cap and Fuse	Electric Blasting Cap	Delay Electric Blasting Cap	Delay Electric Igniter and Cap
Full energy from explosive.....	1st	1st	1st	1st
Freedom from misfires.....	3d	1st	1st	2d
Relative safety to blaster.....	3d	1st	1st	2d
Relative resistance to adverse storage.....	2d	1st	1st	2d
First cost.....	1st	2d	4th	3d

"Hardwood" Floors of Soft Wood

BEAUTIFUL wood floors, approximating in effect and finish the oak and maple floors found in the best type of homes, can be developed, with the aid of proper finishing methods and materials, in such woods as pine, fir and cypress. These so-called "soft" woods are very durable and possess not a little natural beauty of grain.

Hardwood effects are secured on soft woods by staining with an oil wood stain, consisting of a permanent color pigment in an oil vehicle. These stains are particularly adapted to use on the soft woods. The effect is completed by applying a thin coat of shellac and finishing with two coats of prepared wax or floor varnish.

The first step toward obtaining the desired finish is to

sandpaper the wood smoothly. The stain should then be applied freely with a brush and, after being allowed to stand for about five or ten minutes, buffed off with a cloth. When the stain has dried for twenty-four hours, the shellac and wax or varnish may be applied as described.

A deeper effect than that secured by the method outlined may be obtained by the use of a varnish stain over the oil wood stain. Both should, of course, correspond in color.

Often it is difficult to determine upon the best finish for a floor in the absence of expert advice. A letter setting forth any wood finishing problem and addressed to Advertising Division, E. I. du Pont de Nemours & Company, Wilmington, Delaware, will bring detailed information and advice from the company's wood finishing experts.

The Career of the Comb

Romance and adventure abound in the history of the comb. The beautiful, modern comb is the outcome of centuries of evolution. This development, from the crude, tediously contrived combing devices of pre-historic ages to the skillfully manufactured combs of the present day, is interestingly traced in the accompanying article

A ROMANTIC cross-section of the history of the race is the story of the comb. The thrill of danger, the call of chivalry, the research of science, the onward march of commerce and the ever-changing modes of human adornment—all have figured in the development of primitive man's toothed stones, strings of thorns and similar crude devices into the modern comb.

Countless incidents of romance and adventure cluster about its ages-old career. Many a swain of bygone centuries has risked life and limb to secure an ivory tusk from which to fashion a comb for the lady of his heart; many a craftsman of ancient days has spent a lifetime striving to acquire skill and fame as a carver of combs; and many a doughty sea captain has risked his vessel in storm and gale in order to fetch from distant lands a cargo of precious ivory to be made into combs.

In the early ages but little attention was given the comb and its development. As civilization advanced, however, the comb grew steadily in importance and became, in time, an integral part of the personal equipment of the race. Men began to study its possibilities for improvement and modification. The result of that effort is seen in the wide diversity, both of styles and materials, that has characterized the development of the comb from century to century.

Almost every sort of

material which could be adapted to the purpose has been used for making combs. Ancient combs made of wood, bone and horn have been found in the prehistoric Swiss lake dwellings. Boxwood combs were popular among the Greeks and Romans, although combs made of metal seem to have been used in Central Europe in an earlier age. The ancient Egyptians, whose strong esthetic sense sought constantly to combine beauty with utility, carved exquisitely grained ivory combs out of the tusks of elephants.

These ivory combs of the Egyptians seem to have taken a stronger hold on the human fancy than any other combs the world has seen. This attraction, it would appear, was due more to the beauty of the material than to the craft of the makers. The exquisite coloring and delicate grain of ivory distinguished it, early in the history of the race, as one of the precious things of earth. Its appeal as a thing of beauty made its impression even upon

the untutored fancy of mankind in the early ages—an impression all the more notable when it is remembered that the struggle for mere existence in those days made the utilitarian value of a thing the fundamental measure of its worth to man.

The popularity of ivory grew with time and has endured into the present age; indeed, the demand for



Tapering Teeth



Saw Cutting Machines



Polishing Wheels

ivory, even at tremendous prices, long ago passed far beyond the normal available supply. The source is limited, and the annual production is, of course, correspondingly so. But the heart of womankind, traditionally fond of "pretty things," still craves ivory, and that craving has had a very direct and definite influence upon the career of the comb.

The genuine ivory comb of centuries ago is no more, but in its place, today, upon the dressing table of the modern woman of refinement, rests its exact replica—a comb that reproduces to a nicety the beauty of color, the grain and the daintiness for which ivory is noted. The resources of science and the skill of man have overcome nature's parsimony in the production of ivory by bringing into being an exquisite "sister product"—Ivory Py-ra-lin.

The modern Ivory Py-ra-lin comb originates in the cotton fields. Raw cotton of the very best grade is made into tissue paper, which is then treated with nitric and sulphuric acids. The purpose of the acid treatment is to make the cotton paper soluble in alcohol and camphor.

The paper is next washed to remove any free acid and then put through a dehydrating process for the removal of the water.

The resultant substance is compounded with camphor, alcohol, the desired dyes or pigments and stabilizing material. These ingredients are all thoroughly and carefully ground together to produce a plastic, colloidal mass, which is worked and kneaded between massive rollers until it is of the proper smoothness and consistency. This material is formed into "cakes" from four to six

inches thick, and these "cakes" are sliced into sheets of the thickness desired for the kind of comb to be made. It is possible to cut the sheets in any thickness from 5/1000 of an inch up.

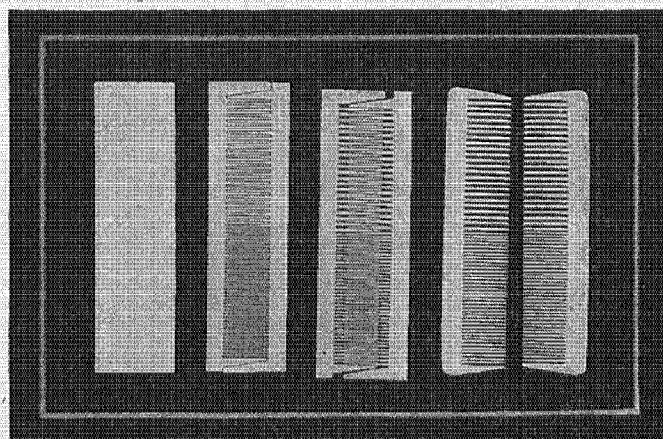
The sheets are hung in seasoning rooms, where the solvents slowly evaporate, until thoroughly seasoned, after which they are ready to be made into combs or other articles.

Ivory Py-ra-lin combs are made either by saw-cutting or "twinning," each process being particularly adapted to the making of certain types of combs. In the saw-cut method, a solid piece, of the exact size and shape of the

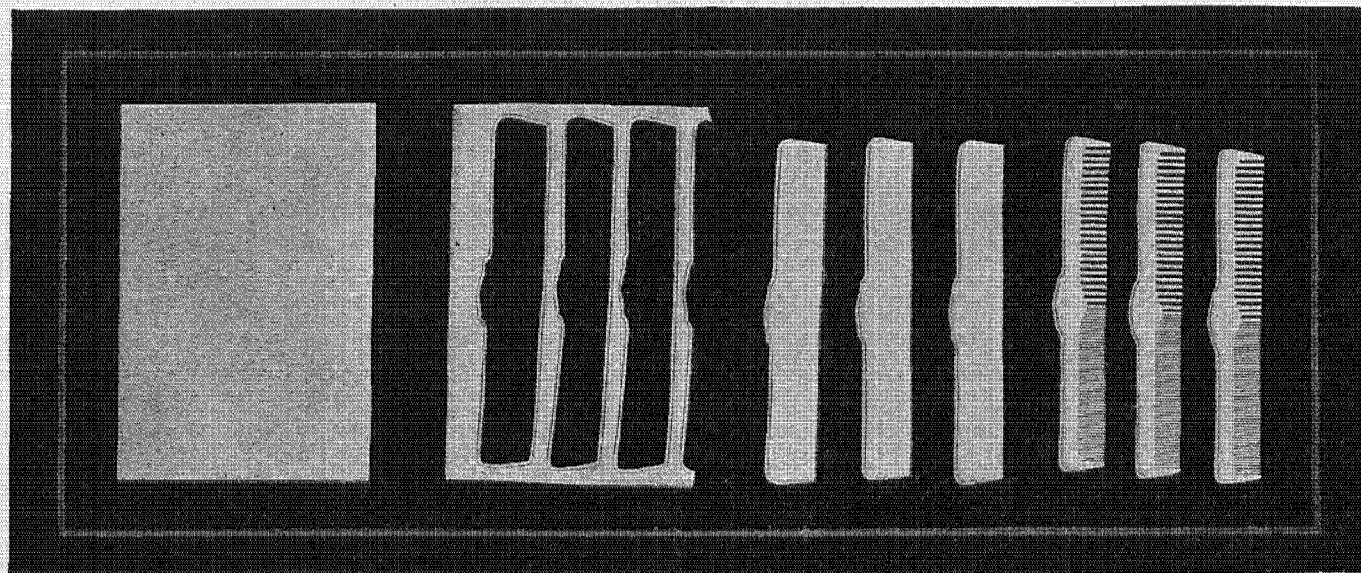
comb to be made, is cut from an Ivory Py-ra-lin sheet. Sheets of different thicknesses, of course, are used for different kinds of combs.

Out of the "comb plate" thus formed, the teeth are cut by a saw. The edges and corners are then smoothed and finished by use of an abrasive wheel working at high speed. The traces of the finishing tools are removed and the edges further smoothed by buffing the combs on a buff roller. Finally, the combs are polished on a buff made of soft cloth, on which a specially compounded paste has been spread. When polished, the finished comb is ready for inspection.

The "twinning" or "parting" process is so called because two combs are cut, at the same time, out of the same piece, and "parted." There is cut from the Ivory Py-ra-lin sheet a solid piece whose size and contour are like those of two combs which have been laid, with interlocking teeth, upon a flat surface. The plate is placed on the carriage of a "twinning" machine, where it is automatically cut



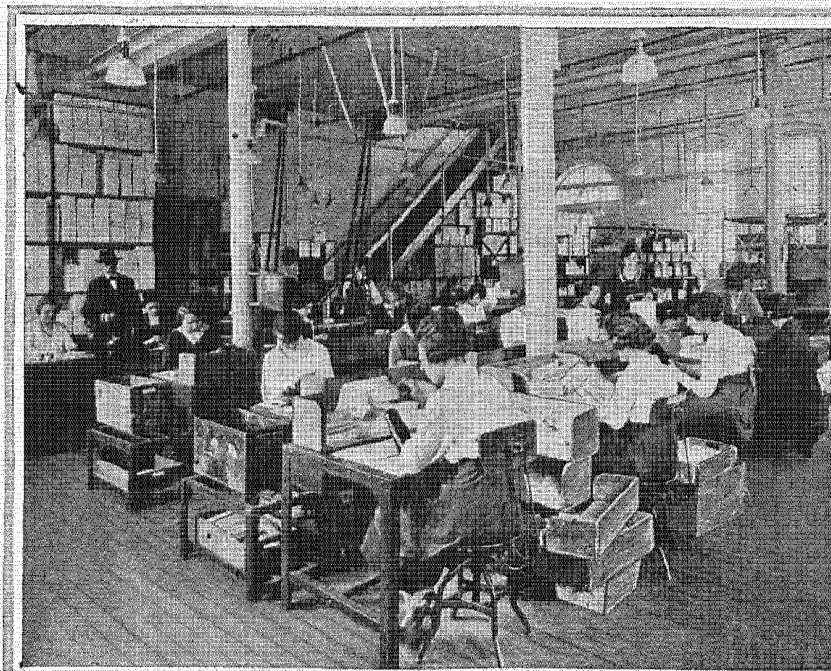
Ivory Py-ra-lin Combs Made by the "Twinning" Process



Ivory Py-ra-lin Sawed Teeth Combs—From the Blank to the Finished Comb

so that, by one operation, two combs with interlocking teeth are produced. The combs are "parted," and, from that point in its manufacture, each comb is handled and treated separately, practically as if it were a saw-cut comb.

Ivory Py-ra-lin combs, whether formed by saw-cutting or twinning, represent the very best, both in material, manufacture and design, in the present day development of the comb. They reproduce all the beauties of the



Every Ivory Py-ra-lin Comb Is Individually Inspected in This Spacious, Well-Lighted Room.

real ivory combs of long ago, and, at the same time, mark the very furthest advance in modern comb making, from the viewpoints both of design and sanitation. Beauty and cleanliness, however, are not the only considerations that figure in the selection and judgment of a comb. Proper care of the hair demands that the comb be smooth and the teeth properly tapered. In these respects the Ivory Py-ra-lin comb meets every requirement. It is, in short, the ideal comb.

Put the Soldier in His Right Job

THE return of the soldier into the economic scheme of things is not simply a matter of putting him in a job. It is an intricate problem of human adjustment: the man must, in a very real sense, be "fitted" to his occupation. He must be placed where, considering his qualifications and the nature of the work, his chances for success seem most promising. Any reconstruction policy that fails to take into consideration that phase of the re-employment question is both unfair to the soldier and harmful to the general, economic good of the country.

Army service has not necessarily qualified the soldier for a line of work radically different from that which he previously followed. Some soldiers, it is true, received special technical training in the army; but, on the whole, the most practical and most successful adjustment will be one which returns the erstwhile warrior to a position similar to the one he held before the war. There he will feel "at home," and the transition from military to civilian habits will be much easier than if he were, at the same time, trying to adapt himself to a new line of work.

To put the soldier in a position in which he has had no previous experience and for which he has not been trained, is little short of a crime. He cannot succeed and cannot last. In competition with more experienced workers he is outclassed and soon looking for another job. Discouragement dogs his steps, and it is not long before he becomes disgruntled and embittered against his fellow-citizens and the country for which he has sacrificed so much. And such embitterment is the seed of anarchy and Bolshevism.

Aside from the effect of such conditions upon the civil morale of the former soldier, the general economic result would be most deplorable. The rate of labor turnover and, of course, labor costs would be greatly increased, and the whole labor situation would be characterized by confusion and lack of stability.

The notions of the men themselves may, in many cases, run counter to the proposition of placing them in their old line of work. These men have traveled and "seen things." To them the desk and workshop of former days seem drab and uninteresting. They want to try something new; but those ambitions, in a great many cases, spring from a desire to be near new and more attractive scenes rather than from definite, soberly-made decisions on vocational changes.

The great majority of the returned soldiers have to meet a bread-and-butter, dollars-and-cents situation. They have to face fundamental, economic facts. It is not the time either for them or for the country to experiment with new, unaccustomed lines of work. Let each man, in peace as in war, be assigned to the place he is best qualified to fill. That is the quickest and most practical way of getting both the men and the business and industrial community on their feet. There will be plenty of time and plenty of opportunity later for the exercise of newly-found talents and the gratification of newly-formulated ambitions.

The workshop, the office, the factory and the farm, spurred by the intensive development of reconstruction plans, are clamoring for capable help. There is a "right job" for every returned soldier.

Longer Life for Leather

SHABBY leather is an eyesore. The beauty of its lustrous finish and mottled grain is supplanted, after long wear, by an ugliness most disagreeable to behold. The same is true of leather substitutes.

Ordinarily, when an article made of or covered with leather or leather substitute has undergone several years' usage, its possessor is obliged to make a choice between two unpleasant alternatives. He may try to reconcile himself to the shabby appearance of the material and continue using the article until its full utilitarian value has been extracted; or, if his craving for the attractive be stronger than his sense of thrift, he may discard the offending article before it is outworn, thus losing a part of its use value.

Today, when the price of leather has reached unheard



Hard Usage Need Not Send Small Leather Articles to Premature Discard

of heights and promises to soar still higher, the person of moderate means can ill afford to discard, prematurely, anything made of leather. At the same time, the increased cost of the material by no means tends to reconcile the owner of a leather article to its shabbiness after long wear.

The ideal would be a leather that would retain its rich appearance as long as its usefulness. The dressing and finishing requirements of both leather and leather substitutes, however, are such as to render that ideal impractical of achievement—at least under present conditions. All leather and leather substitutes are coated with a finishing solution to give certain, texture, graining effects. It is this finishing coat which gets the actual wear and eventually cracks off, long before the leather itself



The Ugly Marks Caused by Scruffing Patent Leather Shoes Can be Hidden



Leather Upholstery Can be Made to Retain Its Beauty Until Outworn

has given its full measure of service. A choice between waste and unsightliness in the use of leather products, however, is no longer necessary. A simple, practical means of renewing the finishing coat, at home and at trifling cost, is easily available. It is a dressing of the same composition as that used to produce the original finish on leather and leather substitutes.

Du Pont Leather Renewer is the name of this preparation. It is not a paint or varnish, but a pyroxylin compound that will not rub off, crack or peel. It produces a glossy, black, waterproof finish.

The leather or leather substitute surface to be coated should be thoroughly clean and free from grease and oil. This can be insured by rubbing the surface well with a cloth dampened with gasoline. The Leather Renewer should then be applied quickly with a soft brush. This will dry in about twenty minutes, when another coat may be applied, if

desired. The article thus treated should not be used for about an hour. Any article of leather or leather

substitute, no matter how discolored or shabby, can thus be made to regain its original beauty. Du Pont Leather Renewer is ideal for use on automobile and carriage upholstery, tops and curtains, furniture upholstery, harness, traveling bags, patent leather dancing pumps—in fact, on anything made of or covered with leather or leather substitute. It should *not* be used, however, on rubber or rubberized fabrics.

Du Pont Leather Renewer is sold by dealers almost everywhere. If your dealer does not have it, a remittance direct to Advertising Division, Du Pont Chemical Works, Wilmington, Delaware, will bring a can, charges prepaid, to any address. Prices are as follows: one

quart can, \$2.00; one pint can, \$1.10; half-pint can, 65c.



Shabbiness Will Not Curtail the Usefulness of This Bag

Paint Specialty Sales in Hot Weather

THE care of cooking and heating equipment in hot weather offers an excellent field for the sale of paint specialties during the summer season. Any enterprising dealer who will take the trouble to bring to the attention of the people in his vicinity the value of paint in keeping unused stoves and furnaces in good condition until winter can build up a considerable volume of sales.

Stoves and furnaces, after their usefulness has terminated, for the time being, with the advent of warm weather, are likely to be forgotten. Carelessness in this respect, however, may lead to serious damage to the heating equipment of a house during the summer, particularly during the humid, August days.

Pipes and other metal parts will rust to an unbelievable extent during the late summer. In fact, the stove or furnace may suffer enough damage from rust during the summer to cause considerable expense for repairs when the time comes to start the fires.

All such expense and inconvenience can be avoided by a little attention now, while the stoves and furnaces are inactive. A coat of Harrisons Stove Enamel to the heavy

metal parts will give a glossy, black surface impervious to rust and unaffected by the heat, even when the furnace is in operation.

The galvanized iron heat conductors of a hot air furnace should be given a coat of Harrisons Galvanized Iron Primer and finished with a coat of Harrisons Roof and Barn Paint. The use of Galvanized Iron Primer is necessary because ordinary paint will not adhere to galvanized iron. The Roof and Barn Paint will insure a moisture-proof coating and thus prevent rust. If the heat conductors are of tin, one coat of Harrisons Stove Enamel will be sufficient to give a protective, glossy, black finish. If color is not a consideration, however, Harrisons Roof and Barn Paint will serve the purpose just as well at less expense. Harrisons Stove Enamel will meet all requirements for gas and coal stoves. The lustrous, black finish that this enamel gives is easily kept clean.

An attractive window display featuring these specialties, or even a neat card calling attention to the necessity of painting heating equipment, will draw a surprising number of sales for the alert dealer.

Testing Your Auto Top

E. B. Benger, Ph. D.

*Chief of Research and Testing Laboratory for Leather Substitutes, Experimental Station,
E. I. du Pont de Nemours & Company*

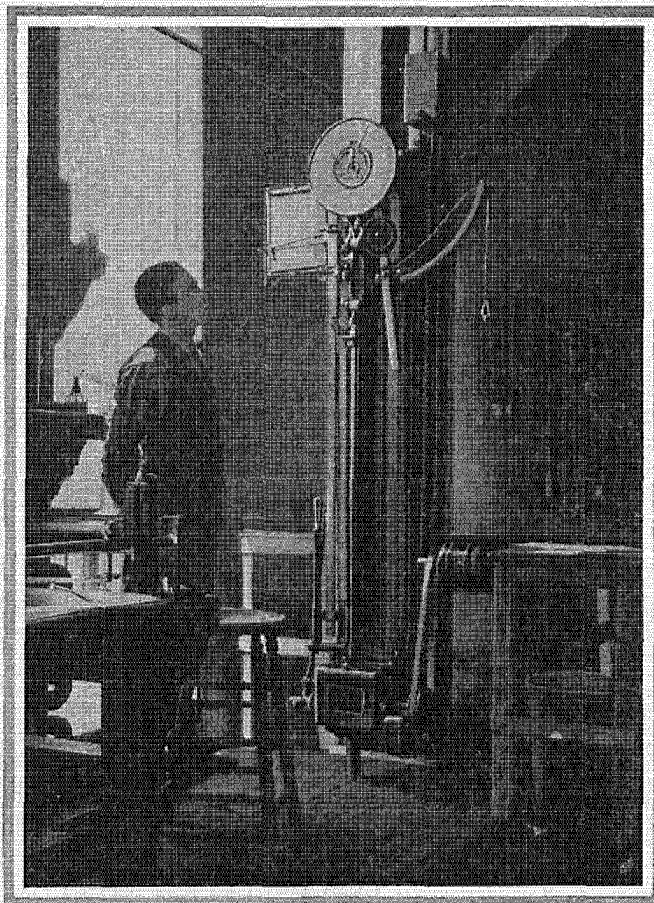
YOUR automobile top is not perfect, but the manufacturer knows its imperfections even better than you do and is continually working to eliminate them. His salesmen have brought in reports showing how the different materials withstand use in different sections of the country and under varied conditions of service. This information, when passed on to the scientists in the chemical, physical-testing and research laboratories, has been applied in devising new tests to determine just what kind of service a certain top material will give and in developing new and improved goods. The chemists to whom are assigned the tasks of devising methods for testing, of improving current production and of developing new types of top materials must be men of good fundamental training in chemistry and physics. They must understand the processes employed in the manufacture of modern fabrics for tops; they must know the action of atmospheric agencies upon the raw materials used in making the goods and how these raw materials are best put together to give the most satisfactory product. These chemists must invent and apply tests which show, preferably in a short time, what will happen to a given material after it has been applied to the top of a car. They must be able to take a piece of goods and, in a very short time, subject it to a concentrated form of use and abuse which will do it as much damage as the wear ordinarily given it in the course of two or three years. These chemists must also determine whether the material will be as satisfactory on the dry, cloudless, western plains as in the humid, hot atmosphere of Florida or the blizzards of our northern States and Canada.

You may not know whether your top consists of two separate fabrics cemented together with a flexible waterproof cement, or of a coated single cloth; you may not care whether the coating on your top is rubber, pyroxylin or oil, but the chemists who are employed to test top mate-

rials know that these things are of fundamental importance, and that the character of the raw materials used and the care and skill with which they are put together make a great deal of difference in the wearing qualities of the top. These things determine whether, after a few months' service,

your top will look bright, clean, free from wrinkles and dignified, or dull, gray, leaky, sagging and shabby.

The wise manufacturer realizes the importance of knowing beforehand what service will be obtained from a given class of goods, and he depends for this information upon his development and testing laboratory. His scientific experts, as a result of tests carefully developed and applied, can tell him how his materials stand in competition with other materials on the market, control the quality of the output of his factory and advise him promptly if the products deviate from his standards of quality. Moreover, they can warn him of weaknesses in his goods and determine how to remedy them. In short, they are always studying and experimenting to bring out a better material—the ideal covering. The degree of satisfaction to be derived from an auto top



Testing Elasticity and Tensile Strength of Rubber Compounds. Every Rubber Composition Intended for Use on Auto Tops Is Subjected to Severe Tests

depends largely upon the raw materials used. Everything that enters into the finished goods must withstand careful examination. The fabrics must be uniform and free from knots, loose threads and mis-weaves. This insures a smooth foundation for the coating. The tensile strength must be such as to withstand the strain of applying the top tightly, the air pressure generated at high speed of the car and the wrenching, stretching and swaying caused by rough roads or careless driving. The dye used in the fabric must not fade, and the cloth should not shrink nor sag when in use. Specific tests are required to insure against such defects, and constant watching and testing are required to avoid such failures of the goods.

The rubber, pyroxylin, oil or other basic substance in the coating, together with the color pigments and other

ingredients, must be tested with unflinching regularity to assure a uniformly satisfactory product. In the case of a double texture fabric, the nature and general character of the cement are also the subject of careful investigation. Often the cement determines the waterproof quality of the top more than the coating itself, and, in any case, the adhesive used very largely determines the pliability of the goods.

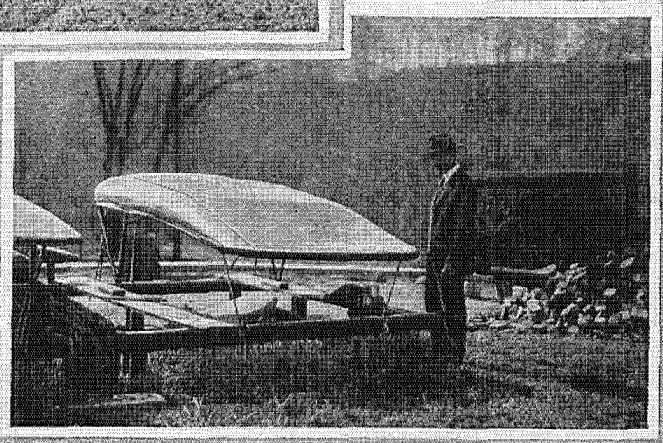
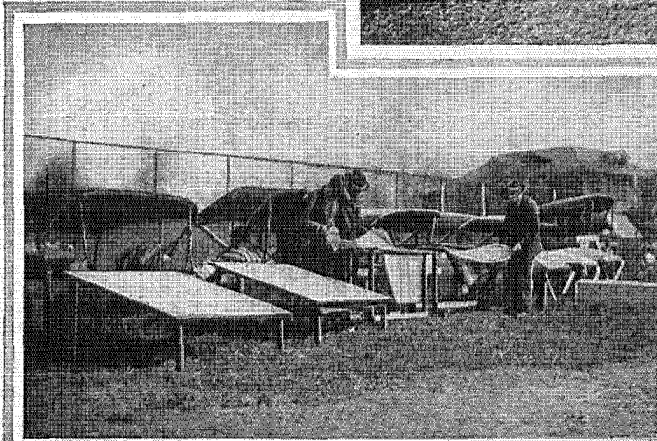
All these considerations are, of course, preliminary. No matter how much care is given to the control of the ingredients, the finished goods must also be carefully examined and thoroughly tested, for, obviously, it is necessary to know accurately how a given top covering will "stand up" in actual service.

Three classes of tests are carried out on the completed material.

The first class comprises observation tests. For these only the most experienced men are employed. Only an expert can grade top materials as to general appearance, uniformity of coating, absence of streaks, blotches, and "pin holes," "feel" to

goods are put through a test which mechanically simulates repeated lowering and raising. The pressure applied in folding the material and the tension employed in straightening it out have been carefully calculated from observations and measurements of tops in service. The results of this test show whether the goods will lose the wrinkles formed by folding and present a flat, even surface, or acquire a permanent crease. This test also shows whether or not the coating is strong enough to withstand the continued flexure without cracking, and whether or not the coating is united to the cloth well enough to prevent peeling under severe conditions of use and wear.

Waterproofness is a matter of degree, and resistance to water cannot be carried to the point where other qualities, such as lightness, flexibility and tautness, would be sacrificed. The chemist-tester must know the degree of water resistance required and be able to determine whether or not a given material will shed rain in a violent and long pro-



Upper: Eleven Auto Tops Undergoing Exposure Test. Some Are Raynite and Some Fairfield Rubber. The Others Are Competitive Materials. Lower left: Three Types of Exposure Tests—Material on Auto Top Frames, Fabric Stretched on Wooden Frames Sloping Toward the South to Get Full Effect of Sun's Rays, and Goods Hung Loose in Frames so that the Effect of Wind May be Seen.

Lower right: Auto Top Frame Covered with Fairfield Rubber Top Material. The Fabric is Here Under the Same Tension as in Actual Service.

the hand, etc. Some of these qualities, however, which for years were determined solely by personal judgment, are now tested with mathematical exactness by the aid of mechanical appliances. Among these qualities are pliability of the goods and hardness or resistance to abrasion of the coating.

The second class includes those tests which are designed to show the effect of a particular kind of wear, such as constant lowering and raising of the top, standing for hours on the street with the thermometer at 125° F., or exposure to the alkali dust of the plains.

Some owners lower their tops frequently. To insure satisfactory service, even in spite of this hard usage, the

tracted storm, and whether or not it will leak, if, as occasionally happens, a pool of water lies in a depression on the surface.

These questions are solved by means of the shower and hydrostatic tests. In the former, a strong spray of water is driven against the surface of the material for many hours. A well proofed top covering will stand this treatment for a long time. The hydrostatic test is more conclusive. A piece of the coated textile is clamped over the lower end of a vertical pipe, which can be filled with water to any desired height. The water is allowed to flow slowly into the pipe while the observer watches the cloth for the first sign of moisture. When this appears, the water is

shut off and the height of the column of water in the pipe noted. This test, though simple, is of great value, especially when applied to goods which have been subjected to other tests, such as the folding, sunlight and cold tests.

Extremes and sudden changes of temperature are severe on any top material, but the results of these conditions are readily determined in the laboratory. Ovens and cold chambers, maintained at constant temperatures, are extensively employed. The best top materials are made to withstand all extremes of temperature in the United States without cracking, softening, or loosening of the coating, and, in the case of double texture coverings, without separation of the fabrics. These tests are quickly and accurately carried out and, taken together, give a great deal of information about the serviceability of the goods.

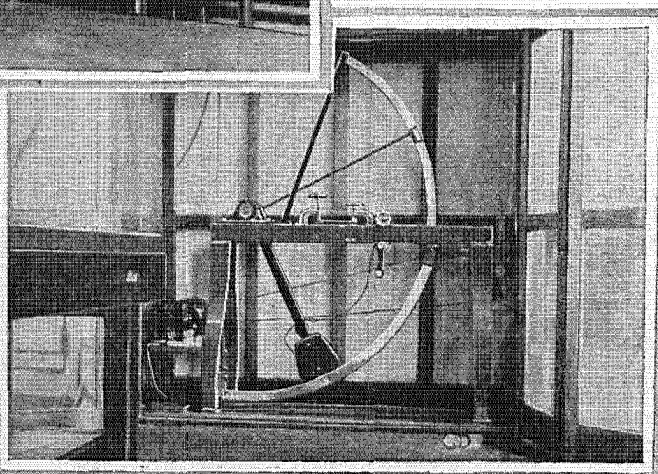
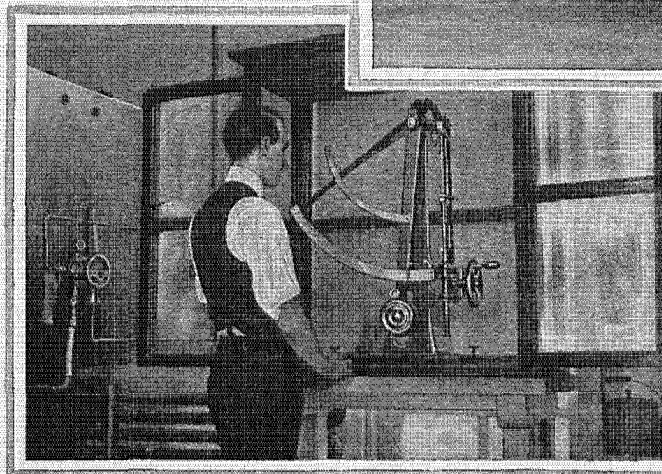
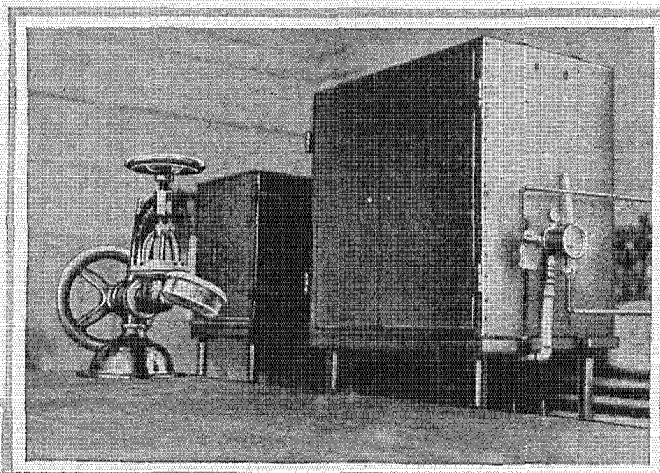
The strength of the film applied to the fabric and the security of its adhesion to the cloth are very important considerations because they determine, very largely, the amount of wear that a piece of leather substitute will withstand. It is, therefore,

the scrub test. If the film has been broken by scrubbing, it is customary to peel it from the cloth to observe the degree of resistance to separation of the film and fabric. This is, of course, a rather crude way to test the security of the anchorage of film to cloth, but machines are now in use which show accurately the pull in pounds required to separate the film from the fabric, when a strip of coated goods of given width is employed.

The cement used for combining double-texture fabrics must be strong and pliable; otherwise, in hot weather or after severe use, the fabrics may separate, with consequent shabby appearance and leakage during rainstorms. The tests on the cement are carried out in somewhat the same

way as the test for the anchorage of the film; that is, by determining the pull in pounds required to separate two fabrics of given width.

These latter tests are illustrations of important developments enabling the testing and research laboratory to pass, very accurately and quickly, on the comparative value of auto top materials. They also serve as guides



Upper: The Wheel-like Device Tests the Breaking Strength of Films. The Large Boxes in the Foreground Are Ovens Used to Accelerate the Ageing Tests. Lower left: Measuring the Elasticity and Tensile Strength of a Rayntite Film. Strips of Film Five-eighths of an Inch Wide Are Used for This Purpose. Lower right: A Motor Driven Fabric Testing Machine.

essential that tests be devised to accurately measure these properties.

One of the oldest and almost universally applied tests is called the "scrubbing" test. Although difficult to describe, it is very simple and easily carried out. It resembles rather closely the motion of washing cloth between the hands. This motion is continued until the film breaks. The number of forward and backward motions required to produce a break in the film is the index of the quality of the goods. Previously, this test depended, to a very large degree, upon the strength and personality of the operator, but recently a machine for carrying out the rubbing process has been devised.

The strength of the adhesion is determined partly by

for the investigator who is studying new compositions or new processes of manufacture.

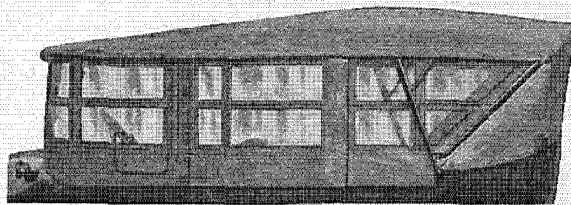
The third class of tests is slower, but gives more precise information. No laboratory test, no matter how thoughtfully planned and carefully manipulated, can show the effect of atmospheric agencies on top materials, and these agencies cause more deterioration in a properly used top than any other factor. Of course, materials known not to resist oxidation, sunlight, heat or cold are never considered as ingredients for coatings of auto top coverings, but the exact degree to which the chosen materials will resist weathering can be determined only by subjecting them to exposure and actual use in all conditions of weather.

For this purpose the laboratory covers automobile top,

frames and sets them in an exposed place where they receive sun, rain, dew, frost, snow and wind during the twelve months of the year. The tops are raised and lowered about as frequently as a top might be expected to be raised and lowered in actual service. If it is considered advisable, pieces may be taken from the exposed tops, from time to time, to be tested in the various ways described above. This procedure shows how the material is standing the exposure, without necessitating the discontinuance of the test. After the pieces for these observations have been removed, the hole left in the top is carefully covered with another piece of material in order that the degree and distribution of tension on the goods will remain the same as before.

An exposure test continued for a year

gives results which could not be expected within three, or possibly four, years of actual service, so far as the effect of weathering is concerned. For this reason, an exposure test of twelve months generally suffices to show the effect of weathering or oxidation which



A Well Made Top With Side Curtains

might be expected in a top worn out by actual service.

The final test of an automobile top material must be an actual service test. For this purpose, numbers of cars are covered with the top material on which

information is sought, and these cars are used without any special precautions, in order to show just how the materials will withstand actual service. As many as two or three hundred cars may be covered with experimental material, in order that conclusions from the test may be very definite and show, without any question, whether or not it is advisable to market a given material. As a result of this extensive service test, the manufacturer knows that his material will give satisfaction before a yard of it is sold to the consumer.

The automobile top is not yet perfect, but skilled chemists are keeping in mind the qualifications of the ideal top material, and every year sees a closer approach to that ideal.

Group Insurance

THE value of group insurance for organizations which employ large working forces has been investigated and approved by the Du Pont Company, which has adopted the plan for its 25,000 employees. Each has been offered, free, after six months continuous employment, a policy ranging from \$1000 to \$1500, according to length of service. This has met with hearty appreciation from all the employees.

The ink was hardly dry on the papers when the first claim for insurance developed. Harry Carey, an employee who had been ill for some time, died the same day this insurance was issued and his claim was sent promptly to the insurance company. In the minds of some of his friends there was doubt whether such a claim would be paid, but the insurance company, having taken in all employees under the blanket plan, made settlement as soon as the proper proof of death was submitted.

Three days later Alfred C. Lingo, another Du Pont employee, died and in his case, too, the insurance was paid as quickly as the formal documents could be prepared.

The first actual payment was in the case of the third employee who died after the placing of the insurance. The beneficiary in this case was the widow of Dr. Stanley Steele, who died May 5th.

Notice of the payment was given in the following letter from the insurance company: "The Proofs of Death have been approved as satisfactory.

"Enclosed please find check for \$125.00 to the order of the beneficiary, Anna W. Steele, wife of the deceased.

"The total amount of this claim is \$1500.00, and the plan provides that it be payable in monthly installments. The balance will be paid in 11 monthly payments of \$125.00 each, commencing on June 5th, 1919."

These three cases tested out, in a most satisfactory manner, the workings of the plan, and the results were very gratifying to the Du Pont Company officials as well as to the beneficiaries.

Placing insurance in this manner is one of the forward steps taken by present day employers in working out the problems of the relations between management and workers. Such a plan does not seek to relieve the employee of his duty to his family. In this connection the announcement of the adoption of the plan said:—

"It is the common duty of each of us to provide for those who are dependent upon us. This insurance does not relieve you of your own responsibility to your family, but is a means of tiding them over in case of your death and should free you to that extent from worry.

"In effecting this arrangement, the company is not actuated by any false notion of philanthropy or paternalism, but rather by a desire to take advantage for you of an opportunity to secure insurance which might otherwise be expensive or even impossible for you to obtain.

"We appreciate that the success of our business depends very largely upon the spirit of loyalty existing and the co-operation extended by every member of the organization, and it is our desire that you should feel that we are at all times eager to do our utmost towards maintaining such a relationship." The amount of protection is graded according to length of service as follows:—

Employees more than 6 months and less than 1 year in the company's service: \$1000

Employees more than 1 year and less than 2 years in the company's service: \$1100

Employees more than 2 years and less than 3 years in the company's service: \$1200

Employees more than 3 years and less than 4 years in the company's service: \$1300

Employees more than 4 years and less than 5 years in the company's service: \$1400

Employees more than 5 years in the company's service: \$1500

This insurance is issued without any expense to the employee, the entire cost being borne by the company, and is in addition to any compensation to which the employee might be entitled under State Compensation Acts. No medical examination is required and no one is prevented from securing protection by reason of the nature of his occupation.

Hunting in Manchuria

MR. PETER F. HOLOHAN, a well known Du Pont shooter salesman in western territory with headquarters at Portland, Oregon, recently received a letter from his friend, Major Guy F. Egbers, U. S. A., who is on special service at Harbin, Manchuria. Major Egbers, who is an enthusiastic hunter and trapshooter, writes interestingly of his game shooting experiences in that far-off land. The letter, minus several references of a personal nature, follows:

Harbin, Manchuria, Asia.

April 7, 1919.

"Mr. Peter Holohan,
78 East 39th St. North,
Portland, Oregon.

Dear friend Peter:—

Sometime ago I received from you a fine bundle of shooters' magazines for which I want to thank you. They were a source of a great deal of pleasure to me. I was very glad and much interested to read of Troeh's success in the East; while I was disappointed in his being defeated by Herr, I note that your dope on the match was correct.

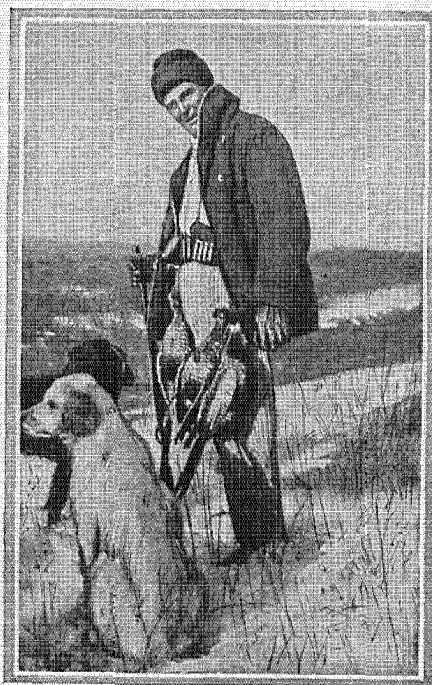
I have had some very interesting experiences in this section of the country during the shooting season of 1918, as we are living a rather idle life. I have spent much of my time in the surrounding country with my gun and dogs. The bird shooting, both water fowl and upland birds, is wonderful. On my last trip, which I made just before Xmas, we went into the mountains about 150 miles east of Harbin, for big game. We had a most delightful trip, killing one elk and five wild boar. I must say the wild boar hunting is the best of sport as they are very alert, can run like a deer and fight like hell. They grow to quite an unusual size, two of those we killed weighing 400 pounds each. The meat is very fine and is preferable to elk meat. The elk was a seven point buck, weighing about 400 pounds. I have the horns and a nice set of teeth from it.

The country in which we were hunting has plenty of bear and, occasionally, a tiger, and, also occasionally, a band of Chinese bandits, known in this country as Honhoozies. We were

unfortunate in not running across any bear owing to the lateness of the season, and we possibly were fortunate in NOT running into either of the others.

I had with me on this trip Mr. Moser, American Consul at this point, who is a very enthusiastic sportsman, and, was at one time, a writer for the San Francisco Examiner.

Concerning our work in this country, one can hardly realize the magnitude



Major Guy F. Egbers on the Mongolia Plain

of the work to be done in our line. It is going to be very slow as conditions in Siberia do not seem to adjust themselves in a way that will make it possible to accomplish much. However, it seems to be the ambition of our Government and our leaders to stand to and be ready to offer assistance when possible. I would like very much, of course, to be back in the old U. S. A. and participate in some of those interesting old trap-shoots.

I have my eye on a Smith trap gun, and, on my return, I think I will have to look them over and see if I cannot dig up something that will make a Lorensen or Troeh out of me. Speaking of guns, I did quite a business in the gun line over here before I got one that was satisfactory to me. I eventually picked up a 20 gauge, August Lebeau, which I think is the greatest

little gun that I have ever found. In tests I made before I purchased it, the left barrel with No. 4 shot averaged 82 per cent. These tests were made with exactness, and I think I have never seen as even a spread of shot, and am positive have never known such a density of pattern with that gauge of gun. The gun, which is hand-made, has a beautiful finish, straight stock and fine workmanship throughout.

It is very hard to get satisfactorily loaded ammunition. I succeeded, however, in getting a good supply of 20 gauge French shells, which have given good results.

I have not, so far, found any of your powder on sale, but I presume it will be only a short time until we have an abundance of American goods throughout this country, as, without doubt, the conditions will warrant it, and there is a great field for sporting goods. It is impossible to buy a sporting rifle. I have with me a 22-Savage, which I used on my last trip. I have used up my little stock of ammunition for this gun, however, and don't know when I will be able to get any more.

We are located very pleasantly—good warm quarters, plenty to eat and some entertainment. Have weekly dances in the barracks, moving pictures and an artificial ice pond just outside my window. This ice pond got my goat. I tried to come back as a skater and fell, spraining my right arm very badly, in fact, to such an extent that I have not been able to handle a gun since it happened one month ago. Consequently, I had to cut out my hunting trips, and, it goes without saying, I have disposed of the skates.

Trusting that this will reach you enjoying good health and happy as usual, I remain,

Yours truly,"

Major Guy F. Egbers.

Casting Reflections

"Shine yer boots, sir?"

"No!" snapped the man.

"Shine 'em so's yer can see yer face in 'em," urged the bootblack.

"No, I tell you!"

"Coward!" hissed the bootblack.

The Grand American Handicap

Peter P. Carney

THE 1919 Grand American Handicap Trapshooting Tournament will be held on the grounds of the South Shore Country Club, Chicago, Illinois, beginning August 11th and concluding August 15th.

This event is to trapshooting what the world's series is to baseball. It is the tournament to which every follower of the traps looks forward, the "blue ribbon event," as it were, of trapdom.

This year's will be the twentieth Grand American Handicap, and while the handicap event from which the shoot derives its name will be retained, all other handicap shoots, which have been part of the program in previous years, have been dropped. Many new events, however, are scheduled in place of the discarded numbers.

The opening event, on August 11th, will be a 100 target shoot known as the "South Shore Country Club Special." That will be the "tuning up" event. Real action will commence on the 12th, when the "American Amateur Championship" at 18 yards and the "Professional Championship" at 18 yards will be shot.

The "National Amateur Championship" at singles and doubles will be shot on the 13th, as will the "Junior Trapshooting Championship" for boys

under 18 years of age. The "National Amateur Championship" at singles will be at 200 targets from 16 yards; the doubles championship, at 50 pairs from 16 yards, and the boys' contest, at 100 targets from 16 yards. In the national championship events only the winners of the various state championships, or the runners up, are eligible to shoot. This event, therefore, brings to the Grand American tournament the

Numerous trophies will be awarded in each class.

The East versus West team event also will be shot on the 14th. Last year this event was conducted for the benefit of the American Red Cross and was one of the most spectacular events in the tournament. The teams will be selected from those who make the highest scores in the 18 yards championship match on Tuesday. The highest

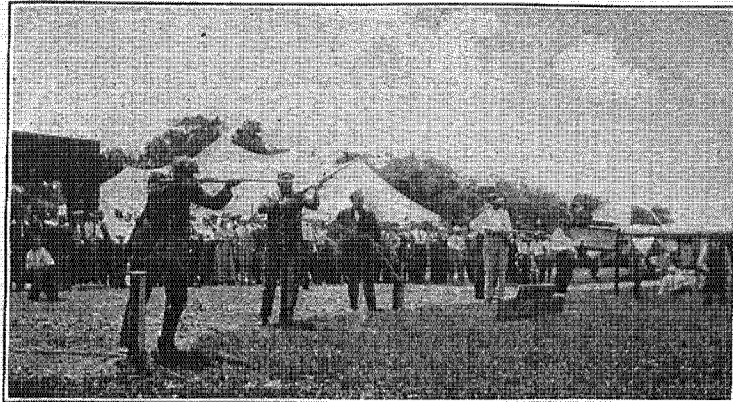
scoring ten from the East and the West will comprise the respective teams. Each team will shoot at 100 targets, and trophies will be awarded to the winning team.

The Grand American Handicap will be shot on August 15th. In addition to the regular winners' trophies, special trophies for women will be awarded in this event.

Two traps will be set aside for beginners during the week of the

tournament. Anyone who wishes to learn to shoot will be able to obtain excellent instruction by skilled instructors upon presenting himself at the beginners' traps. This is a new development and represents a notable advance in the progress of trapshooting.

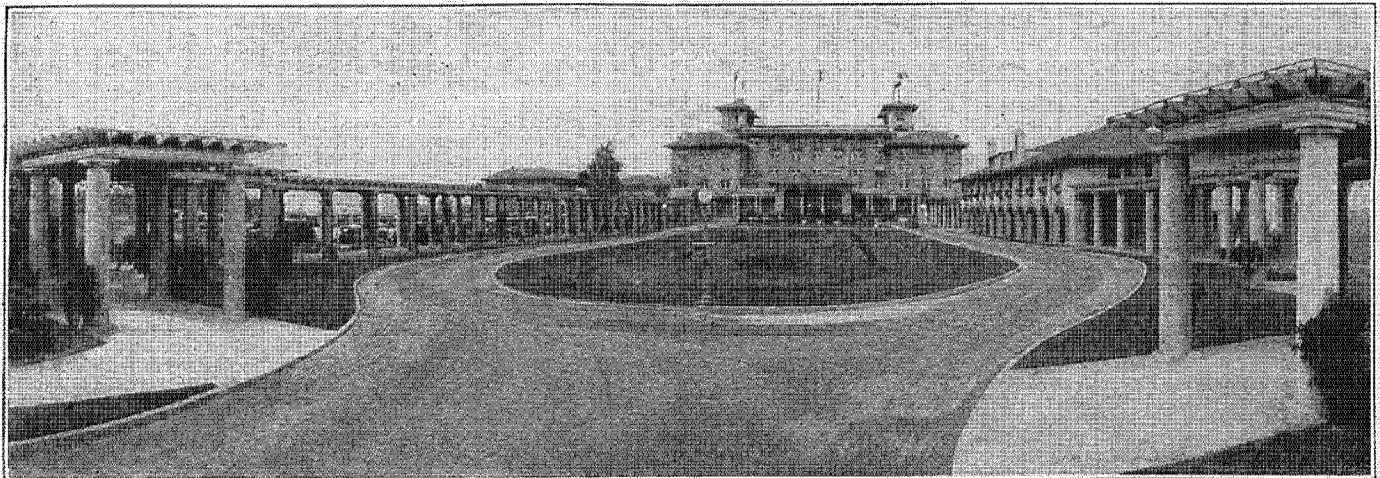
The Grand American Handicap at clay targets is the outgrowth of the Grand American Handicap at live



*Scene at the Grand American Handicap, Chicago, Illinois, 1910.
The Winner's Score was 100*

best shooter in each state and the eastern and western districts of Canada. This championship will be shot over the four central traps.

August 14th will be Classification Day. In the 100 targets event, to be held on that day, there will be four classes. Everyone will shoot from 16 yards, but the entrants will be so classified that no one will be obliged to shoot against men of superior ability.



The Drive and Entrance of the South Shore Country Club, Chicago, Ill.

birds, the first tournament of which was held at Dexter Park, Long Island, in April, 1893. The clay target competition was inaugurated in 1900 and for the first two years was held in conjunction with the live bird tournaments on Long Island. In 1902, the final year of the live bird event, the bird shooters contested in Kansas City, while the clay target breakers continued in New York. In 1903 the trapshooters moved to Kansas City.

The clay target tournament was next taken to Indianapolis for three years, thence to Chicago, to Columbus, back to Chicago for two years, thence to Columbus again, to Springfield, to Dayton for two years, across the Mississippi to St. Louis and once more back to Chicago.

Steady, healthy growth has characterized the Grand American Handicap Trapshooting Tournament since its institution in 1900. It has both stimulated the development of the sport as a whole and accurately measured that development. Within the last year or two the war has, of course, interfered somewhat with the progress of the sport, but the general feeling now is that trapshooting is on the threshold of far greater expansion and popularity than it has so far enjoyed. The statis-

tics given herewith of the Grand American Handicap, from 1900 to 1918, inclusive, are interesting as indicative of the progress both of the tournament itself and of trapshooting in general.

This year will be the seventh time the Grand American Handicap has been held in Chicago, and the third

and covers an area of 90,000 square feet. At the southern end of the grounds is another club house for swimmers, golfers and tennis players, and toward the northern end is a shooting lodge. A nine-hole golf course, numerous tennis courts and a fine swimming beach are other features of the grounds.

At this magnificent place, then, will the trapshooters assemble on the eleventh of August to "blaze away" at the elusive targets. If attendance in previous years may be taken as a guide, men and women from every part of the United States and Canada will be found at the trapshooting classic.

The Grand American Handicap this year possesses an added significance by reason of

the fact that it is the first to be held since the termination of the war. The millions of men who have become skilled in the use of firearms in the army will doubtless retain their interest in marksmanship in civil life. The trapshooting fraternity, therefore, may well expect tremendous accessions to its ranks from this source from now on. It will be quite natural for the erstwhile warriors to turn to the traps for much of their sport, and the Grand American Handicap this year will no doubt reflect such a trend.

The South Shore Country Club is reputed to be the largest city and country club in the world. The club property represents an outlay of \$2,000,000, comprises some 67 acres and has a frontage of three quarters of a mile on Lake Michigan, along which the trapshooting tournaments are held. The targets are thrown over the water and drop into the lake.

The main club house is 550 feet long

GRAND AMERICAN HANDICAP STATISTICS

Year	Winners	Where Held	No. of Entries	Targets Thrown	Yards	Score
1900	R. O. Heikes	New York	74	No record	22	91
1901	E. C. Griffith	New York	75	No record	19	95
1902	C. W. Floyd	New York	91	No record	18	91
1903	M. Diefenderfer	Kansas City	192	No record	16	94
1904	R. D. Geytelle	Indianapolis	336	No record	19	96
1905	R. R. Barber	Indianapolis	352	184,500	16	99
1906	F. E. Rogers	Indianapolis	290	132,700	17	94
1907	J. J. Blanks	Chicago	495	132,440	17	96
1908	Fred Harlow	Columbus	362	142,800	16	92
1909	Fred Shattuck	Chicago	457	160,430	18	96
1910	Riley Thompson	Chicago	383	127,600	19	100
1911	Harve Dixon	Columbus	418	153,940	20	99
1912	W. E. Phillips	Springfield	377	150,500	19	96
1913	M. S. Hootman	Dayton	501	190,500	17	97
1914	W. Henderson	Dayton	514	186,000	22	98
1915	L. B. Clarke	Chicago	884	282,470	18	96
1916	J. F. Wulf	St. Louis	683	227,250	19	99
1917	C. H. Larson	Chicago	808	303,258	20	98
1918	J. D. Henry	Chicago	620	214,700	16	97



The Shooting Lodge of the South Shore Country Club. This Lodge Will Be Used as the Headquarters of the Executive Committee of the Grand American Handicap, 1919

Du Pont Vice-President Wins Distinguished Service Medal

COLONEL WILLIAM C. SPRUANCE, Jr., vice-president of the Du Pont Company in charge of the production departments, has been awarded the distinguished service medal for his conspicuous services to the government during the war. He is one of the men who, because of their special knowledge and skill, were called upon to take up important work at Washington.

In December, 1917, Mr. Spruance resigned as Director of the Explosives Manufacturing Department of the Du Pont Company to accept a commission as Major in the Ordnance Reserve Corps. He reported for duty at Washington December 5, 1917, serving on the engineering staff of the Gun Division of the Ordnance Department.

Probably no man in the service was better equipped to deal with the government's needs in the matter of high explosives than Major Spruance. He knew not only the details of explosives manufacture from his long experience with the Du Pont Company, but throughout the entire period of the war, prior to America's participation, he had kept in close touch with the war departments of Europe. After the United States entered the war and while he was still a civilian, he rendered valuable service to our own Ordnance Department by virtue of his experience and knowledge of conditions.

His work while he held the rank of Major was so immediately effective that he was promoted to Lieutenant-Colonel, Ordnance Department, National Army, to rank from January, 1918. On August 17th, he was appointed Special Assistant to the Chief of Ordnance, in charge of chemicals, propellants and explosives. Within a short time he was promoted to the rank of Colonel, dating from October 19, 1918. He became Chief of the Explosives and Loading



Col. W. C. Spruance, Jr.

Division of the Ordnance Department.

During his term of service at Washington he occupied the following positions:—

Chairman of U. S. Army Commodity Committee on Powder and Explosives.

U. S. Army Member of Commodity Section on Explosives, War Industries Board.

Chairman, Board of Officers to Formulate Safety Rules for Loading and Explosives Plants.

Colonel Spruance is one of the best-known of the younger generation of Wilmington, Delaware, business men. He is the son of the late Judge William Corbitt Spruance and was born in Wilmington September 26, 1873. He was graduated in 1890 from the Friends' School and in 1895 from Princeton University, where he received the degree of electrical engineer.

Immediately after graduation Mr. Spruance joined the engineering forces of the Westinghouse Electric & Manufacturing Company at Pittsburgh, leaving them later to become associated with

the Wilmington City Electric Company. Subsequently he was employed in Boston and New York and devoted three years to private practice as a consulting engineer.

His success in his special line of work was so marked that the Du Pont interests sought his services and made him engineer in charge of the Light, Heat and Power Division of the High Explosives Operating Department. His activities here soon brought him new responsibilities, and he was made assistant director and then director of the department, which position he held until he resigned to enter the military service.

Colonel Spruance is a member of the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the Princeton Engineering Association, and of the Franklin Institute, of Philadelphia.

Colonel Spruance is prominent also in Wilmington social affairs. He is a member of the Wilmington Club, the Wilmington Country Club, and of the Princeton Club of New York. In 1907 he married Miss Alice M. Lea, daughter of the late Governor Preston Lea. They have three children, Preston Lea, Louise Spotswood and William Willing Spruance.

After his release from the Army, February 1st of this year, Colonel Spruance returned to the Du Pont Company and, in the recent reorganization, was made a Vice President and put in charge of the production departments.

GET SOMEWHERE

Don't be sitting 'round all day;

Get somewhere!

Make a stab at it some way;

Get somewhere!

Sameness sort of drives you mad;

Get a hobby or a fad,

Yes, and get it pretty bad,

Till you make the neighbors sad—

Get somewhere!

Don't get rooted on one spot,

Get somewhere!

Strike it rich as like as not,

Get somewhere!

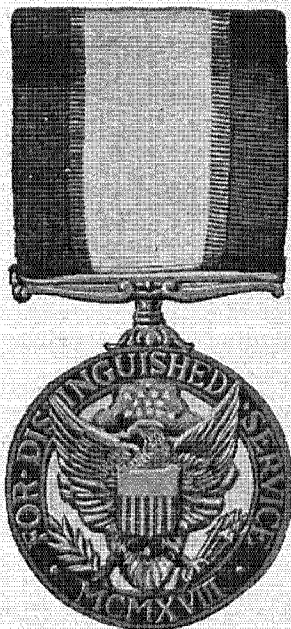
At the risk of seeming blunt

Break away from use and wont,

Get a move on—do a stunt;

See what things are like in front—

Get somewhere!



The Distinguished Service Medal, which is presented for exceptionally meritorious service in a duty of great responsibility in the Army.

The Air Brush in Industrial Work

SPLENDID results achieved and tremendous savings effected, both in labor and material, are fast convincing contractors, master painters, manufacturers and building owners of the merits of the spray method in industrial painting and finishing. The growing use of the air brush is largely due to the fact that the spray method combines uniformity and durability of coat with low cost of application.

The use of the spray method has been found particularly advantageous in painting large wall surfaces and ceiling areas in manufacturing plants, and in the finishing of furniture.

Painters and finishers using the brush method find the use of the air brush an interesting phase of their work, permitting full exercise of their skill in manipulation. In the hands of the skilled workman, it permits of just as much individuality as the brush method, and, even in the hands of the apprentice or layman, produces smooth, uniform surfaces.

The durability and uniformity of the finishing coat applied by the spray method are made possible through the automatic regulation of the spray, resulting in a coat of the same thickness over the entire surface. Sags and runs, and "fatty edges," so often ruinous to an otherwise perfect job, are thus avoided.

The enormous saving in time—and, consequently, money—effected by the spray method is probably its greatest claim to consideration. Much speedier work can be done by spraying than by brushing, but it must be remembered that spraying has its limitations in that it is not as advantageous as brushing for certain kinds of work.

It is estimated, in general, that one spraying machine can do the work of five or ten men, according to the nature of the work done. One enthusiastic advocate of the spray method states, for example, that, in a certain factory,

one man with a spray "gun" put on thirty-six gallons of paint in nine hours. This was contrasted with the previous record in the same factory of four gallons put on by one man, in the same time, by the brush. This estimate, of course, applies to the application of paint, but the relative saving in application of varnishes and enamels in furniture finishing is just as great.

Typical of practical results and costs is an interesting job done by the spray method at the motor plant of the Jackson-Church-Wilcox Company Di-

The entire job was given two coats, using fifteen barrels of oil paint. From the floor up to the five-foot line an olive green was used, as this color does not show discoloration from spilled or spattered oil or grease. Everything above the five-foot line, including pipes and structural steel, was painted a light cream color.

Two complete outfits with two spray "guns" each were used on the job, which was finished in twelve 10 hour days. Four men were required to operate each outfit, and, at the same time, ten men were kept busy re-touching and painting the base by brush. In other words, the machines, in 960 man-hours, did the bulk of the work and kept pace with the brushes, which consumed 1200 man-hours on re-touch and finish work.

The spraying outfits now on the market consist, in general, of a "gun" or atomizer, paint tank and compressor. Either a gasoline engine or motor may be used to supply power. The "gun," so called from its resemblance to an automatic revolver, comprises two hose connections, one for the liquid paint and the other to supply the compressed air, a handle and a needle valve, the latter being operated by a trigger. The compressing apparatus consists of an air receiver, compressor, strainer and automatic governor.

The outfits come in small, compact, portable form and can be very conveniently moved around to meet the needs of the job. Such an outfit, using paint products of the Flint Varnish and Color Works, of

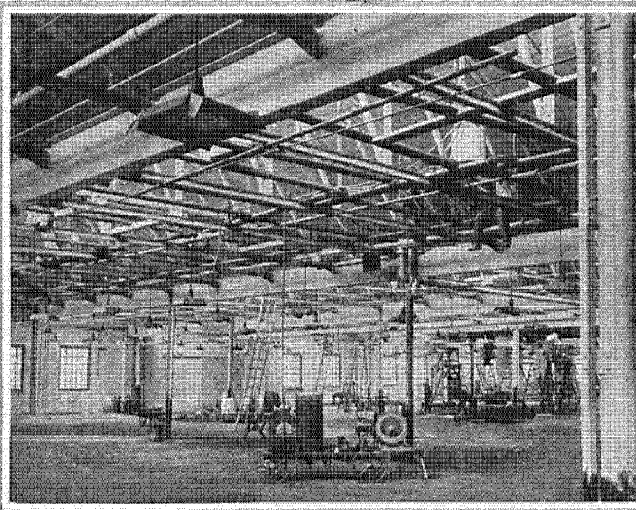
Flint, Michigan, was employed on the Jackson-Church-Wilcox job, described above.

The spraying outfit for the use of manufacturers in the application of varnishes, enamels, etc., to furniture and novelties, differs only from the "general purpose" outfit in that the "gun" is a more delicate instrument,

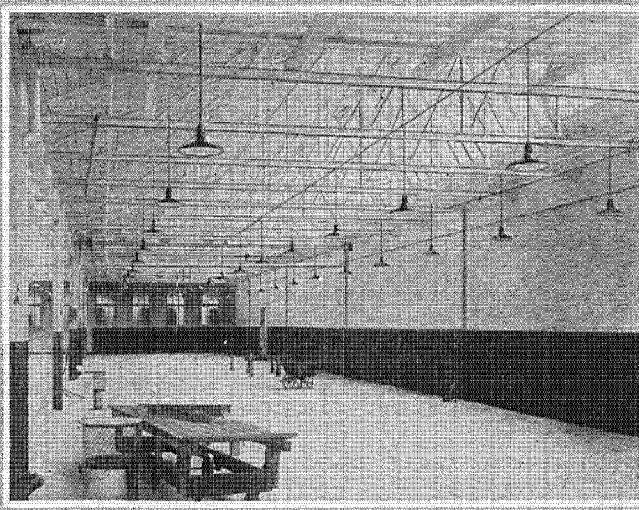


Upper: Air Brush in Operation. Lower: Complete Spraying Outfit with Two "Guns"

vision of the General Motors Corporation at Saginaw, Michigan. The job comprised the painting of a building of the "saw tooth" type, 480 feet by 158 feet, and included considerable structural steel in the upper part of the building. The building consists of seventeen sections, each 158 feet by 28 feet.



Spraying Structural Steel



Complete Job Done by the Air Brush

permitting a wider degree of variance in the fineness of the spray. The whole outfit is stationary, and the spray is used in a metal compartment or "room" equipped with a high speed ventilating fan, which carries the fumes and minute particles of the product away from the operator.

As in every painting or finishing job, the kind and quality of paints used are of primary importance in spray work. In general, paints and finishes for this type of work are not as heavy bodied as for brush work and are supplied ready for use by many of the paint manufacturers. Paints for general use may be made satisfactory for spray

work, however, by simply reducing them to the proper consistency.

In this connection, it is felt by many that one of the chief advantages of spraying, from the standpoint of final results, is the fact that the immense saving in labor expense, through quicker work and greater production, makes it possible to use a better quality of paint or finishing material and still keep the final cost far below what it would be by the brush method. In other words, the use of a higher grade of paint or finishing material applied by the spray method would not equal the cost of applying a cheaper, less durable product by brush.

This, of course, means not only greater protection, but still greater economy. In the case of the furniture manufacturer, for example, it means a finished product of higher quality, with greater service to the ultimate consumer.

When the economy, uniformity and speed of the spray method become more generally known, it will no doubt become common on building and structural work generally, just as it has already become an important factor in many manufacturing plants, in the finishing of furniture, automobiles, toys and various kinds of novelties.

Playing the Other Fellow's Game

A FARMER with thousands of bushels of corn to sell cannot afford to spend his time finding a market for a hundred tons of hay a neighbor may have on his hands. Selling the hay will not help to sell the corn.

But suppose a manufacturer or dealer has tractors or other heavy farm machinery to sell and cannot sell it because the cultivated fields in his territory are so choked with stumps that such machinery cannot be used—what then?

Obviously the manufacturer and dealer must talk dynamite and do everything possible to induce farmers to clear their land, even if in so doing they are primarily playing the dynamite manufacturer's game. It's simply paving the way to a market for their

own line—a market that cannot possibly be created until the stumps are eliminated.

North and South Carolina, Tennessee, Georgia, Florida, Alabama and Mississippi are looming up mightily as diversified farming states. It is said less than twenty-five per cent of their cultivated lands is cleared. Wisconsin, Michigan, Minnesota, Montana, Idaho, Washington, Oregon, California, etc., also have immense tracts of stump land.

That means the tractor and heavy implement manufacturer and dealer are shut out of markets that would be very profitable to them if the land were cleared.

What's the answer? Talk dynamite. Urge land clearing. Yes, do it even if you are playing the other fel-

low's game to begin with, for remember, your game cannot even start until his game has been played and won.

Viewing the proposition in a narrow way, the tractor and heavy implement man may feel that it is scarcely his task to boost the dynamite manufacturer's game, but the tractor and heavy implement man can console himself with the thought that he will be the biggest winner in the long run. Conversely, if he doesn't do it, he shuts himself out of highly profitable markets in the stump regions.

Why is it that manufacturers in allied lines or lines one of which must necessarily serve as a leader or paver of the way for another do not co-operate with one another better than they do? Business all around would be better if they did.

School Days at the Traps

A STRONG revival of interest in shooting as a sport is at least one desirable feature of the war's aftermath in America.

The desire to shoot is almost instinctive with the average red-blooded American. Perhaps this trait has been inherited from those early American colonists who depended upon their skill with rifle and shotgun for food and safety. Be that as it may, the fact remains that even those of us who know nothing about firearms secretly wish we could boast of being "a good shot." The onward march of civilization has, of course, removed, in large measure, actual necessity for the use of firearms, but the love of the chase remains and finds expression in hunting as a sport and in shooting at the traps or at the range.

This innate desire to shoot manifests itself most noticeably in the normal, healthy boy, and the ability to handle firearms is no less desirable for him than for the grown-up boys we call men. Certainly it is safer and better to encourage the boy to learn, under proper guidance and supervision, how to use a shotgun or rifle than to deny him such training and run the risk of an accident the first time he happens to get a gun in his hands. The father who knows how to shoot can himself guide his boy's desire to acquire the same ability, and few stronger bonds of companionship and mutual understanding between father and son can be found than common interest in wholesome sport.

The same thing is true of women and girls. The ability to shoot is just as valuable to the mothers and sisters as it is to the fathers and brothers. Shooting is a healthful, invigorating sport and means more self-reliance and greater safety.

The man or woman who wishes to learn how to shoot, or to teach the young son or daughter the sport,

should experience no difficulty in finding the facilities near at hand. There are thousands of gun clubs throughout the country; many well-known summer and winter resorts now feature trapshooting as one of the attractions offered to guests; and many golf and country clubs have their own shooting lodges. Any sporting goods dealer or any hardware dealer who handles guns and ammunition will be glad to put the embryo shooter in touch with the near-

Trapshooting School. With the exception of some army camps, more people have learned to shoot at that school than anywhere else in the country. In the three years of the school's existence, over ten thousand men, women, boys and girls have discovered there, for the first time, the fascination of "the sport alluring." Experienced instructors are always on hand to lend a properly fitting gun to the visitor and to help him learn to break the clay targets as they fly out over the water. Here the novice can learn to shoot under the most favorable conditions. The exhilaration of the sea breezes together with the thrill of the traps will add much to the pleasure of an outing at the shore.

Trophies are offered at the school, each week, for the best beginner's score, the best woman's score and the best regular's score. Special trophies are given for long runs. These awards, by injecting an element of competition, add greatly to the interest. Among the many excellent scores made at the school during the past year, the outstanding performance was the record established by Mr. E. F. Voelker, who, in his second season of trapshooting, made successive long runs of 50, 75, 107 and 136 without a miss. The figures in the accompanying table tell the story of the growing popularity of the Du Pont Trapshooting School and of the splendid work that it is doing in teaching people, of all ages and from all parts of the country, to shoot.

A CERTAIN newspaper that made a practice of answering inquiries from readers received this one:

"Please tell me what is the matter with my chickens. They go to roost apparently well. The next morning we find one or more on their backs on the floor, stiff, combs white and feet in the air."

It was the editor's busy day, and this was the answer his reader received: "Dear sir, your chickens are dead."

Atlantic City Trapshooting



Instructing a Beginner at the Trapshooting Game

est gun club or with the source of helpful information for organizing a sociable, little, shooting club among friends. A hearty welcome and the loan of a gun await the beginner at practically any gun club.

Atlantic City, among its other attractions, offers a splendid opportunity to "would-be" shooters. There, at the ocean end of Young's Million Dollar Pier, is located the only school of its kind in the world—the Du Pont

	1916	1917	1918	Totals
Attendance.....	5,202	5,386	6,810	17,704
Male Shooters.....	4,852	5,384	5,895	16,131
Female Shooters.....	350	502	721	1,573
Novice Shooters.....	2,806	3,144	4,058	10,008
Male Novices.....	2,483	2,994	3,478	8,955
Female Novices.....	323	450	610	1,383
Targets thrown.....	249,125	338,373	380,050	968,550

Dynamite Erases Penny Hill

James F. McIvor

Delight in Motor Travel, Whether for Business or Pleasure, Consists in Traversing Good Roads. Modern Road Construction Eliminates Roadbed Annoyances, Dangerous Grades, and Turns. The Penny Hill Project Represents the Removal of Another Menace to Motoring

IN building the Lincoln Highway through the state of Delaware, one of the most difficult problems that faced the State Highway Commission was the elimination of the steep and dangerous Penny Hill, located north of the city of Wilmington, toward the Pennsylvania state line. This hill was a half mile in length and had a twelve per cent elevation at the summit. Drivers of motor vehicles of all descriptions dreaded the traveling of Penny Hill and avoided it by detouring whenever possible. A great many cars were wrecked on this steep incline, especially in the winter season, and the powerful government trucks, which experienced little or no difficulty in negotiating other hills on the route between Washington and Philadelphia, often had to be assisted to its top.

The work of leveling this hill was begun last year. Contractor Hopkins, who was placed in charge of the work of erasing this obstacle in the path of progress, knew that Du Pont dynamite would play havoc with the solid bed of hard Brandywine rock, so he employed it unsparingly and efficaciously in completing one of the heaviest rock cuts ever made in an eastern locality. Almost 5000 cubic yards of rock were taken from this cut, which reached a maximum of 12½ feet in depth and 45 feet in width at the top of the hill.

Today, Penny Hill is a thing of the past, a vitrified brick highway of greatly reduced grade now occupying its place and making the northern link of the Lincoln Highway in Delaware

a route that will meet every requirement of automobile travel. General T. Coleman du Pont, who is generously building a state road in Delaware at his own expense, is president

The removal of Penny Hill by the use of dynamite is just another instance of the potency and efficiency of explosives in construction work, for it would have been virtually impossible to remove the obstruction by any other means.

In this instance, moreover, dynamite served another important and patriotic purpose. About the time Contractor Hopkins began blasting operations, the demand for stone for foundations of houses that were to be constructed for shipyard workers became very great. It was impossible to get stone delivered by the railroads on account of war-time regulations. The problem was solved

by the use of Brandywine rock from Penny Hill, which was transported by trucks to the scene of the building operations.

The accompanying illustrations show the effect of Du Pont dynamite on the hard Brandywine rock, and, also, the blasted rock broken for building purposes.

Thus this obstruction, which has long been a menace to motorists, passes into oblivion, but, thanks to dynamite, not into uselessness. The rocks that threatened the lives and safety of thousands of riders have now, through their conversion into building material, been made to add their contribution to human comfort. The Penny

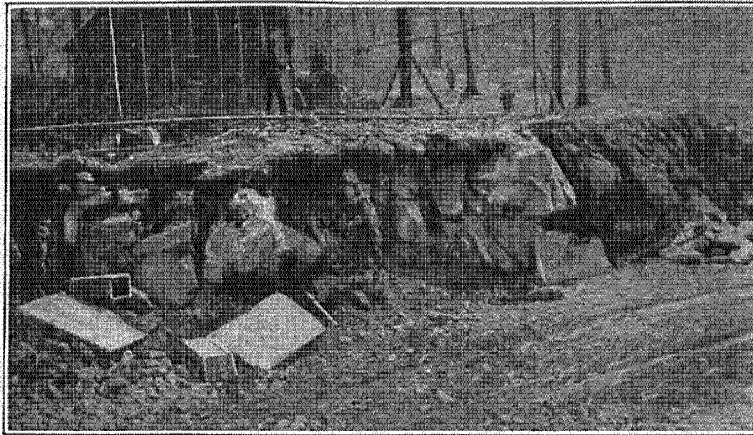
Hill project is but one of many instances of the value of dynamite in modern road engineering, as well as being one of the many ways in which it materially aided in working out the country's gigantic shipbuilding program.



Scene on Penny Hill After a Blast

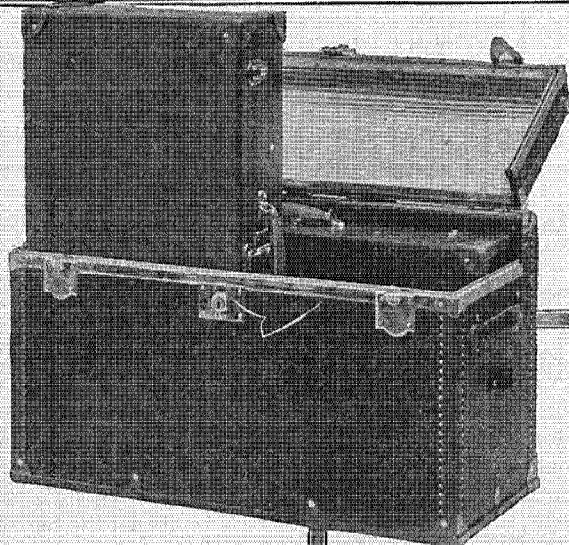
of the commission which has charge of the Lincoln Highway construction between Wilmington and the Pennsylvania line.

The Levy Court of New Castle County hopes to have the remaining



How Du Pont Dynamite Tore the Blue Rock on Penny Hill

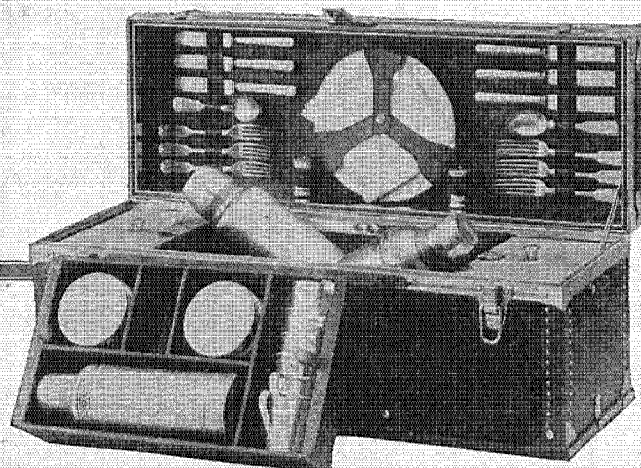
sections of the National highway between Wilmington and the Maryland state line completed before winter. Work on the sections under contract is being pushed rapidly, and, as there is plenty of labor available, there is little doubt that the hope will be realized



No. 429 D

This finely finished Running Board Trunk is of 3-ply Basswood veneer, covered with Craftsman Quality Du Pont Fabrikoid, bound with black fibre. Has heavy nicked lock and two catches. Bottom is protected with a hardwood binding secured by steel corners and clamps. There is a strong handle on each end, also fixtures and bolts for fastening to running board. Inside are two good size suit cases to match. We also furnish this trunk with tray only.

Size: 29½" x 11" x 16"



No. 3008 D

This exceedingly fine Luncheon Set is constructed of 3-ply Basswood veneer, covered with Craftsman Quality Du Pont Fabrikoid and bound with black fibre. In closing of case we utilize our patent tongue and groove channel moulding. This important feature makes the case dust and waterproof. Inside of case are the necessary fittings for six persons, including two large food boxes. Spaces are provided for carrying two one-quart and a pint Thermos bottle.

Size: 27" x 9" x 11"

Motor Luggage—Plus

Bergrade motor car luggage may now be had covered with Du Pont Fabrikoid, Craftsman Quality.

We have added distinctive elegance to skilled design and workmanship. We have clothed strength and stability with beauty undeniable—and we have gained all the advantages of a practical covering that is water, dirt, grease-proof and stainless. A covering that will not crack, peel, scuff or grow shabby, and one that can be readily washed when soiled.

We invite inquiries for prices and literature.

Berg Auto Trunk and Specialty Co.

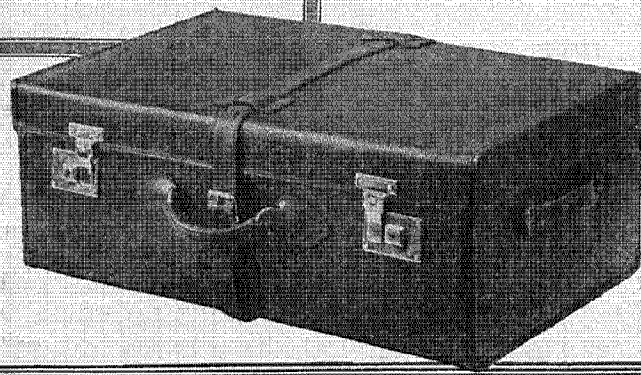
400 Lafayette St. - New York City

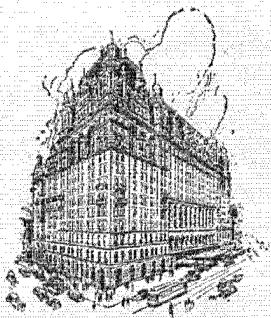
No. 1700 D

This beautiful piece of Luggage is constructed of the finest quality board over steel frame and is covered with Craftsman Quality Du Pont Fabrikoid. Is bound with leather, hand sewed, lined with a checked linen Bonnie cloth. It contains a tray and folding shirt pocket—has two very fine locks and solid leather handle and 1½" strap is provided to go all around center of case. The case is made with round edges and is 9½ inches deep.

Made in three lengths:

24" - 26" - 28"





THERE is nothing spectacular about the Waldorf-Astoria. It is an hotel where comfort and luxury are unassuming—yet unmistakable.

The Waldorf-Astoria
Fifth Avenue 33rd and 34th Streets, New York
L. M. Boomer President

Concrete Floor Paint

THE concrete floor offers a peculiar painting problem. Being of a porous nature, the use of paint alone would entail considerable expense, and due to the free alkali in such surfaces the paint coating would soon be destroyed.

The proper treatment for such surfaces is to first apply a coat of Concrete Floor First Coater, which effectively seals up the pores and prevents suction. Over this foundation two coats of Concrete Floor Paint should be applied. The nature of this product is such that it is not affected by alkalis, and the resultant paint film will be found exceptionally durable.

Concrete Floor Paint is made in five colors, which are shown in a color card on this product, together with full directions for use.

Write for color card today to Advertising Division, E. I. du Pont de Nemours & Co., Wilmington, Delaware.

There is a great deal of good that can be done in the world, if we are not too careful as to who gets the credit.

It Pays to Sell

Belber
TRAVELING GOODS

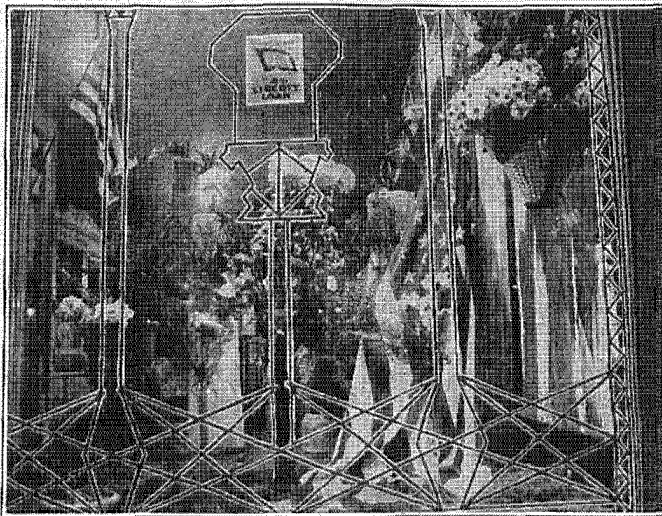
PRODUCED BY
The Belber Trunk & Bag Co.
PHILADELPHIA, PA.

Factories
Philadelphia New York Chicago Oshkosh, Wis.

A Transplanted War-Time Idea

AMONG the innumerable publicity aids employed in floating the several Liberty Loans, none offered a wider field for exploiting originality and ingenuity than window displays. Thousands of storekeepers, from the largest to the smallest, used their windows in this promotion work,

Of course, when a shell made a direct hit, unless it was a "dud," everything in its vicinity was wiped out. But, the concussion of these shells also caused damage, which made the conduct of business by the merchants exceedingly trying and difficult. The shock of the mighty explosions shattered



An Artistically Taped Window

the big plate windows used in the high class stores and threw the fragments back into the store itself. The danger of injury to owner, customers and clerks, to say nothing of merchandise, from this source was so great that means of prevention were eagerly sought. Finally, some one hit on the happy idea of gluing strips of ordinary paper or tapes lengthwise

and some very attractive and, in some cases, absolutely unique, displays resulted.

The window display shown in connection with this article was used by a Cincinnati florist in helping along the Fourth Liberty Loan. Its interest, aside from the artistry and beauty of the interior arrangement, lies in the unusual tape decorations on the surface of the window. The idea was borrowed from a wartime expedient resorted to by French merchants in the war zone.

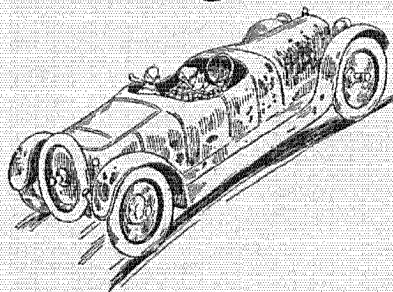
Despite the fact that many French towns in the back areas from the fighting lines were subjected to periodical, daily bombardments, the inhabitants refused to leave for safer regions, but obstinately remained in their homes until German approach or German shells made the territory positively untenable. During the intervals between shelling, these brave people conducted their affairs the same as usual.

and crosswise of the windows. This idea worked out successfully, for, although the concussion broke the glass as formerly, the paper or tapes held the splintered fragments together and prevented them from flying.

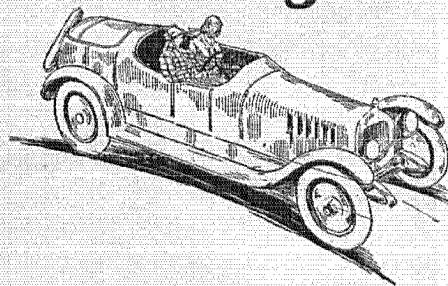
Once its utility was proved, it was only natural that the French storekeepers would recognize the artistic possibilities of the idea. They made the widest use of this new system of window trimming and achieved some very beautiful, unique and artistic effects with the paper tapes. The countless variety of designs and arrangements possible with this material made the task a very simple one. American travelers in these sections also recognized the excellence of the idea from a window trimming standpoint and transplanted it across the Atlantic. It has been used with great success in many of our larger cities, and its novelty is still sufficient to attract large crowds whenever it is strikingly used.

DU PONT AMERICAN INDUSTRIES

On Again!



Gone Again!



PONTOKLENE!

*Removes Tar
Grease, Grime
Oil and Dust*

Send for a free sample today

DEALERS!

Pontoklene is actually selling itself. Get in touch with us today, let us send you a sample and our attractive dealer's proposition, including free samples, display cards, circulars, road signs and electros.

GARAGES!

Every garage should have a supply of Pontoklene for its own use. Saves time and labor; makes a spick and span job; means more and satisfied customers. Send for a sample can TODAY.

Address Advertising Division

Du Pont Chemical Works

Owned and operated by E. I. du Pont de Nemours & Co.

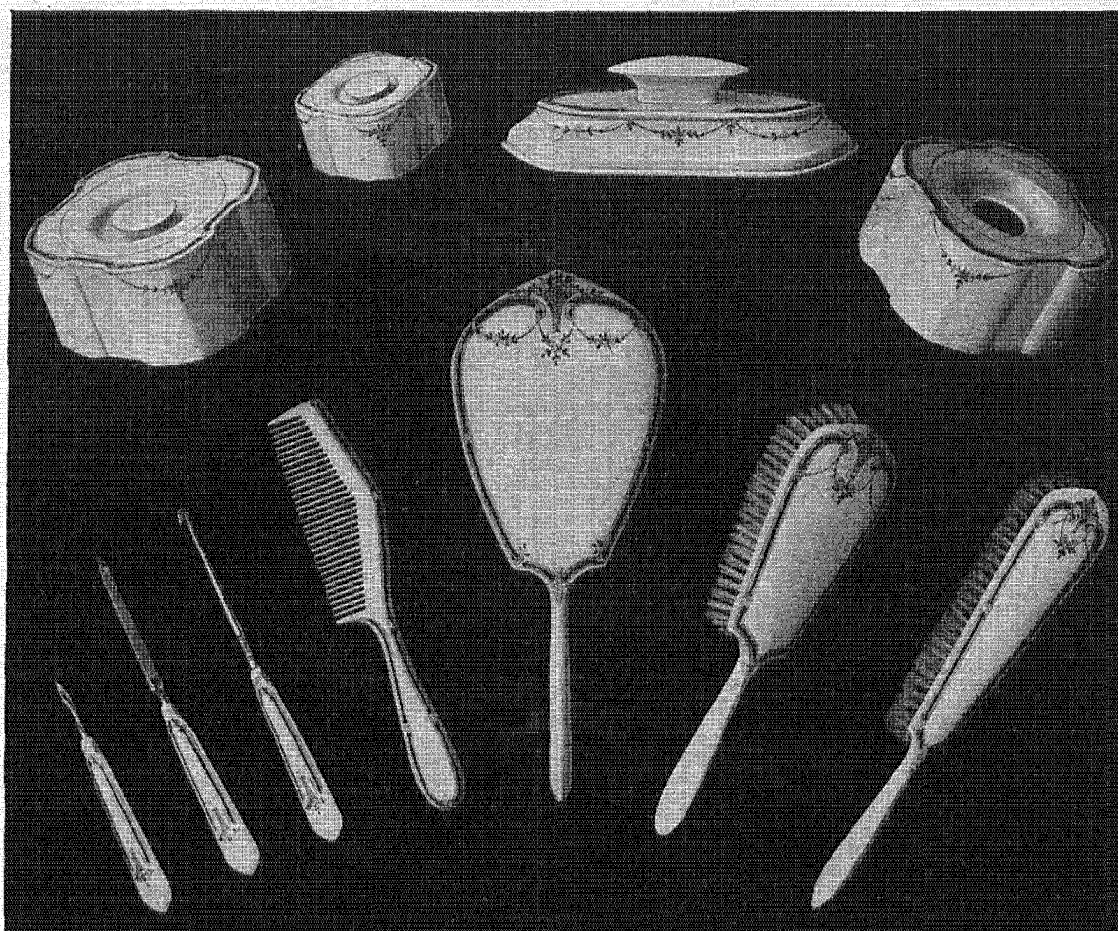
Wilmington, Delaware

BRANCH OFFICES:

NEW YORK, BOSTON, CHICAGO, COLUMBUS, SAN FRANCISCO

DU PONT

DU PONT AMERICAN INDUSTRIES



La Belle Pattern Ivory Py-ra-lin

This illustration, being in one color, inadequately expresses the real charm of the decorated La Belle Pattern Ivory Py-ra-lin

TASTEFULLY decorated in dainty colors, in a French design, harmonizing with the beautiful lines of the La Belle Pattern, with transverse handles to the brushes and mirror making them exceptionally easy to hold, this, the latest achievement in Ivory Py-ra-lin toileware, is offered our customers with the knowledge that its addition to their toileware line will be found a most advantageous and profitable one. La Belle Ivory Py-ra-lin is also made in plain pattern without decoration.

Write for prices and full details.

THE ARLINGTON WORKS

Owned and Operated by

E. I. DU PONT DE NEMOURS & CO

Wilmington, Delaware

Branches: New York, Boston, Chicago,
St. Louis, Columbus, San Francisco

The Arlington Co. of Canada, Ltd., Toronto, Ontario
Branches: Montreal and Winnipeg

DU PONT

DU PONT AMERICAN INDUSTRIES

For the convenience of buyers considering the purchase of any Du Pont product, and desiring specific information, this coupon is printed. Upon receipt, it will be forwarded immediately to the proper office for attention

Fill In, Cut Out and Mail This Coupon

(Du Pont Magazine, August, '19)

Sales Promotion Division
E. I. du Pont de Nemours & Co.
Wilmington, Delaware

Date

EXPLOSIVES

- ☐ Blasting Powder
- ☐ Blasting Supplies
- ☐ Charcoal
- ☐ Clay Mining
- ☐ Farm Explosives
- ☐ Industrial Dynamites
- ☐ Land Clearing
- ☐ Permissible Explosives
- ☐ Refined Nitrate of Soda
- ☐ Road Building
- ☐ Saltpetre
- ☐ Tree Planting
- ☐ Wood Pulp

SPORTING POWDERS

- ☐ Black Sporting Powder
- ☐ Hand Trap
- ☐ Hunting
- ☐ Pistol Smokeless Powder
- ☐ Resort Shooting
- ☐ Rifle Smokeless Powder
- ☐ Shooting in Colleges
- ☐ Shooting on Boats
- ☐ Smokeless Powder
- ☐ Trapshooting

PAINTS

- ☐ Automobile Finishes
- ☐ Barn and Roof Paint
- ☐ Colors in Oil
- ☐ Concrete Floor Paint
- ☐ Concrete Paint
- ☐ Enamels
- ☐ Flat Wall Finishes
- ☐ Floor Paints
- ☐ Floor Varnishes
- ☐ Floor Wax
- ☐ House
- ☐ Industrial Paints
- ☐ Japans
- ☐ Marine Paints
- ☐ Metal Preservative Paint
- ☐ Mill White
- ☐ Railway Paints
- ☐ Red Lead
- ☐ Shellac

- ☐ Shingle Stain
- ☐ Smokestack Paint
- ☐ Structural
- ☐ Varnishes
- ☐ Varnish Stain Finishes
- ☐ Wagon and Implement Paints
- ☐ White Lead in Oil
- ☐ Wire Screen Paint
- ☐ Wood Filler
- ☐ Wood Finishes
- ☐ Wood Stains

PIGMENTS

- ☐ Artificial Vermilion
- ☐ Dry Colors
- ☐ Litharge
- ☐ Lithopone
- ☐ Pulp Colors
- ☐ Rubber Makers White
- ☐ Tolidine Toner
- ☐ White Lead
- ☐ Zinc Chromate

CHEMICALS

- ☐ Acids
- ☐ Alums
- ☐ Barium Chloride
- ☐ Belt Cement
- ☐ Benzol Products
- ☐ Bronze Powder
- ☐ Bronzing Liquids
- ☐ Carpolene (Wood Preservative)
- ☐ Carpo (Metal Paint)
- ☐ Coke
- ☐ Creosote
- ☐ Dead Oil
- ☐ Distilled Water
- ☐ Ether
- ☐ Heavy Chemicals
- ☐ Household Cement
- ☐ Leather Renewer
- ☐ Leather Substitute Solutions
- ☐ Mantle Dips
- ☐ Metal Lacquer
- ☐ Nitre Cake
- ☐ Parlodion
- ☐ Patent Leather Solutions
- ☐ Pegamoid Aluminum Paint

- ☐ Pitch
- ☐ Pontar
- ☐ Pontoklene
- ☐ Py-ra-lin Enamels
- ☐ Pyroxylin Solutions
- ☐ Salt Cake
- ☐ Shingle Oil
- ☐ Solvents
- ☐ Split Leather Solutions
- ☐ Waterproof Cement
- ☐ Wood Lacquer

PY-RA-LIN

- ☐ Brushes
- ☐ Challenge Cleanable Collars
- ☐ Colored Sheeting
- ☐ Combs
- ☐ Desk Sets
- ☐ Manicure Sets
- ☐ Mirrors
- ☐ Novelty Sheeting
- ☐ Py-ra-lin Rods and Tubes
- ☐ Py-ra-lin Specialties
- ☐ Py-ra-lin Toilet Goods
- ☐ Toilet Sets
- ☐ Transparent Sheeting

COATED TEXTILES

- ☐ Auto Truck Special Fabrikoid
- ☐ Book-Finish Fabrikoid
- ☐ Buggy Aprons
- ☐ Craftsman Fabrikoid
- ☐ Fabrikoid for Baggage
- ☐ Fabrikoid for Home Uses
- ☐ Fabrikoid for Railroad Upholstery and Vestibule Curtains
- ☐ Fabrikoid for Upholstering
- ☐ Fabrikoid Sheeting
- ☐ Fairfield Rubber Coated Cloth
- ☐ Hat Sweat Material
- ☐ Marine Special (U. S. Standard) Fabrikoid
- ☐ Motor Fabrikoid
- ☐ Rayntite Fabrikoid Auto Top Material
- ☐ Rug Anchor
- ☐ Shoe Fabrikoid

Name Position

Your Address (If Personal)

Name of Concern (If Company)

Address of Company

BUSINESS: ☐ Manufacturer; ☐ Producer; ☐ Jobber; ☐ Dealer;
☐ Consumer. (Check which)

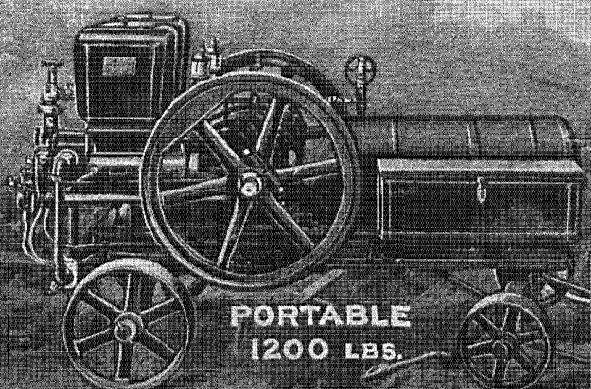
What Du Pont Products do you sell?

If a user, for what purpose does the product checked, or that which you now use, interest you?

SPECIFIC QUESTIONS SHOULD BE ASKED IN AN ACCOMPANYING LETTER

DU PONT

ROCK DRILLING AT 1/10 COST



CHRIS D. SCHRAMM and SON, Inc. HOME OFFICE: 709 ARCH STREET, PHILADELPHIA

The Inside of the Silo

UP-TO-DATE farms nowadays are equipped with one or more silos, for that is the farmer's only effective means of keeping a supply of fresh fodder for his cattle during the winter months.

To get the best results the silo must be air tight—and above all the inside must be clean. Paint is the natural solution of the problem, but not all paints will fill the requirements.

Harrisons Silo Compound is specially prepared for this purpose. Its ingredients are such that it will not foul the ensilage; neither is it affected by the fermentation which takes place. It produces a smooth surface, ensuring a sanitary interior necessary to the proper preservation of the ensilage.

This product will be found particularly adaptable for use on the interior of the silo which has just been erected, as it will not only assist in making the interior air tight, but the work can be done much more economically as the interior surface will not have to be cleaned. It will also prevent wood decay due to contact with moisture.

The proper care of the silo is fully covered in "The Silo—The Proper Care of the Inside", which should be of unusual interest to the dealer supplying the farm trade, and to the farmer or silo owner himself. A copy of this folder will be furnished on request to the Advertising Division, E. I. du Pont de Nemours & Co., Wilmington, Delaware.

Write for FREE Explosives Sales Record Book

We will mail free, to any dealer in explosives, a book for keeping records of sales of explosives, as required by the Federal law.

The form used will be that approved by the United States Bureau of Mines.

Dealers in dynamite, sporting powder, blasting supplies and blasting powder may get the record book by mailing request to

E. I. du Pont de Nemours & Co.

Wilmington, Delaware.

OR ANY BRANCH OFFICE:

Birmingham, Buffalo, Chicago, Columbus, O., Denver, Duluth, Huntington, Joplin, Kansas City, Mo., New York, Portland, Ore., Pittsburgh, Pa., St. Louis, San Francisco, Seattle, Scranton, Spokane, Springfield, Ill., Juneau, Alaska.

CANADIAN BRANCHES

OF THE



American Industries

E. I. du Pont de Nemours & Co.

Ed. G. White, Representative
Sporting Powder Division
OTTAWA, ONTARIO

Du Pont Fabrikoid Co.

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FAIRFIELD RUBBER CLOTH
W. A. Cotton, Manager
NEW TORONTO, ONTARIO

Du Pont Chemical Works

PYROXYLIN AND COAL TAR
CHEMICALS

W. A. Cotton, Sales Representative
NEW TORONTO, ONTARIO

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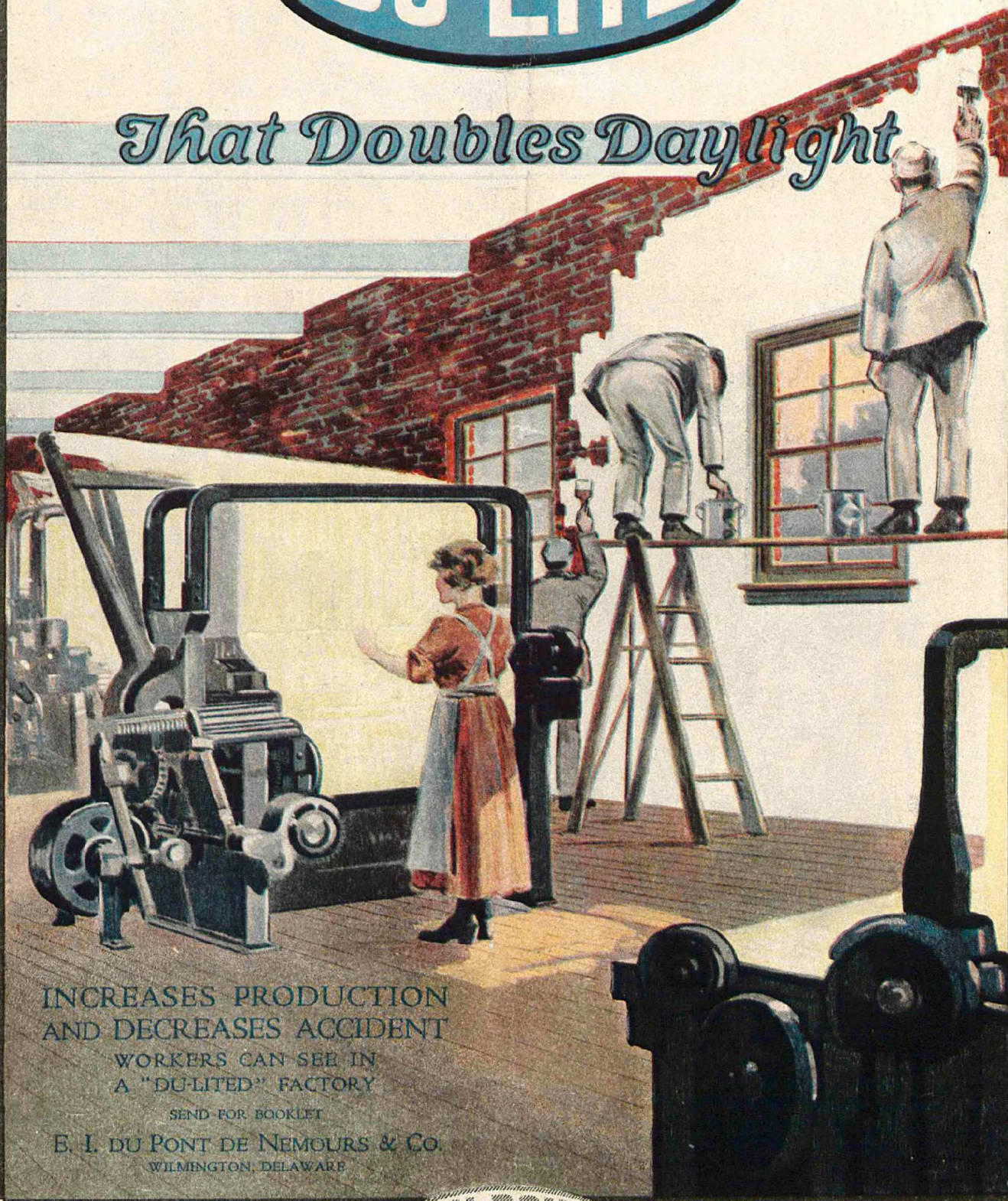
How to Apply Insecticides

TO demonstrate to farmers methods of fighting insects injurious to important crops and domestic animals has been a part of the year's activities of the Bureau of Entomology, United States Department of Agriculture. An average of 57 specialists of this bureau has been maintained in the field to instruct groups of farmers, live-stock men, fruit growers, and others in the

preparation of spray mixtures, emulsions, poisoned baits, and in other methods of insect control. Persons in the communities where demonstrations are being made are induced, wherever it is possible, to assist in the work in order that each community may have one or more persons acquainted with the methods of assembling and applying insecticides.

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