The Shoes You Wear

Why They are Moderate in Price and Good in Quality

By George Brockholst

The Goodyear welter, which has been the leading factor in revolutionizing shoemaking and which has done much to reduce the price of shoes.

This lasting machine is provided with wipers for toe and heel, which draw the leather from all directions so that no wrinkles show on the shoe.

A rounding and channeling machine is employed in cutting the outsole to conform with the shape of the bottom of the last with any desired extensions.

Goodyear improved sole-laying machine, which fastens the cemented soles to the shoe-bottom without tacks so as to leave a clean bottom.

The first fact that everyone should know about shoes is this:

SHOES ARE BETTER IN QUALITY NOW THAN THEY EVER WERE AND VERY NEARLY AS CHEAP. Every other necessity of life has increased much more in cost.

Another fact:

SHOES ARE NOT MADE BY A TRUST. No less than 1,200 factories are keenly competing with one another.

There must be some reason why shoes have not increased very much in price and why there is no shoe trust.

There is just one and only one reason and that is: THE EFFECTIVE SERVICE POLICY OF THE UNITED SHOE MACHINERY COMPANY.

HOW THE UNITED SHOE MACHINERY COMPANY WAS STARTED.

The United Shoe Machinery Company was organized in 1899. It was formed for the purpose of enabling shoe manufacturers to make better shoes than they made before and to sell them to the public at the smallest possible expense.

Before the United Shoe Machinery Company was organized, three important companies were supplying manufacturers with shoe machinery. THE COMPANIES WERE NOT COMPETITORS, because each made a class of machines for a special purpose.

Thus, the Goodyear Shoe Machinery Company made machines which produced what are known as "welt" shoes, like those once sewn by hand. In sewing a shoe by hand, a thin and narrow strip of leather called a "welt" is first stitched to the insole and upper. The heavy outsole is then sewed to this welt, so that the stitches fall outside and do not touch the foot, the insole being left entirely smooth. The welting and stitching machines of the Goodyear Company—named after Charles Goodyear, who developed the original invention and who was a son of the inventor of the Goodyear rubber-vulcanizing process—completely displaced hand sewing. The welt shoe made on the Goodyear machines is the most comfortable shoe sold to-day—the finest product of the American shoe industry.

Besides the Goodyear Shoe Machinery Company, there were in the field the Consolidated and McKay Lasting Machine Company and the McKay Shoe Machinery Company. The Consolidated and McKay Lasting Machine Company made machines for lasting a shoe, a totally different operation from that performed by the Goodyear machines. The McKay Shoe Machinery Company made machines for attaching soles and heels by metallic fasteners.

These three companies did not sell their machines to shoe manufacturers, but leased them and charged a royalty for their use. So long as the machines were in use they earned money for their manufacturers and for shoe makers. It was very necessary that they should not remain idle for a long time. Hence each of these companies established a repair service to keep its leased machines in good running order.

Here were three NON-COMPETING companies dealing with the same shoe manufacturers and sending out three sets of repair men to the same factories. Clearly,

there was an unnecessary duplication of expense, for all of which the shoe manufacturer and ultimately the public paid. One set of repair men could easily keep all the machines of the three companies in order. One factory could easily make all three NON-COMPETING types of machines, so that the shoe manufacturer could obtain his equipment from one source, just as housewives can obtain non-competing carpet sweepers and gloves or non-competing washboards and linen from a single department store.

This reproduction of an ancient decoration shows that, thousands of years ago, the Egyptian made shoes very much as the modern cobbler did before the invention of American shoe machinery.

From Dooley's "Manual of Shoemaking" by courtesy of Little, Brown & Co.

An interval of thousands of years separates this picture from the Egyptian hieroglyphics above. Yet the method of shoemaking disclosed is the same. More progress has been made in the last generation, because of the systematic development of machinery in this country, than in the preceding fifty centuries.

So, in order to lessen the expense of making shoes AND IN ORDER TO ENABLE THE PUBLIC TO BUY THE BEST SHOES AT THE LOWEST PRICE the three NON-COMPETING firms mentioned were consolidated in 1899 to form the United Shoe Machinery Company.

THE BENEFITS OF THE LEASING SYSTEM.

Because the old leasing system has been continued by the United Shoe Machinery Company, there is no shoe trust. You will understand why if you consider the way most manufacturers must start in business.

Suppose that you had decided to engage in a manufacturing enterprise. You would have to raise money not only for the purpose of acquiring a factory, but also of purchasing machinery. Indeed, you would spend much money on machinery—so much that when you sold your goods, you would have to make a proportional charge for the interest on the money invested in the machinery—about six per cent a year—and another ten per cent a year for depreciation, repairs and the like. Because these fixed charges are large, because it takes much money to buy expensive machinery, many important industries—textile manufacturing, for example—are concentrated in the hands of a few companies. COMPETITION IS LIMITED.

This applies to nearly every industry EXCEPT SHOE MANUFACTURING. The United Shoe Machinery Company's leasing method renders it possible to obtain the most modern equipment for a small outlay, so that the manufacturer can use his money over and over again in buying raw material and selling shoes. He does not have to make a charge for interest on money invested in shoe machinery or for the depreciation of the machinery.

THAT IS ONE OF THE CHIEF REASONS WHY YOUR SHOES ARE SO CHEAP. THAT IS ONE OF THE CHIEF REASONS WHY THERE IS NO SHOE TRUST.

THE SHOE MANUFACTURER PAYS ONLY FOR THE WORK THE MACHINE DOES, just as he pays only for the work that a man does.

WHY THERE IS NO SHOE TRUST.

THE UNITED SHOE MACHINERY COMPANY DEALS WITH ALL SHOE MANUFACTURERS ALIKE. It matters not whether a man has a capital of a million dollars or only ten thousand dollars.

Big shoe manufacturers have tried to obtain what they call "better terms" from the United Shoe Machinery Company, because they use so much more machinery than the small manufacturer. If the United Shoe Machinery Company had listened to this argument there would be only a few large factories engaged in shoe manufacturing to-day, AND NO SMALL FACTORIES. As it is, the man with only a few thousand dollars capital is able to compete with the millionaire.

THAT IS ANOTHER REASON WHY THERE IS NO SHOE TRUST.

ONE AND ONE-THIRD CENTS A PAIR.

Of the three hundred machines made and installed by the United Shoe Machinery Company, more are sold outright than are leased. But in order to use their money in making shoes, most shoe manufacturers prefer to lease machines when they can.

Here is a table of royalties per pair paid by shoe manufacturers who lease machines:

Goodyear welts, men's work	\$0.05694
Goodyear welts, women's work	0.04694
Goodyear turn shoes, women's and misses'	0.005
Men's and women's McKay shoes	0.01746
Children's McKay sewed shoes	0.01391

The average royalty received, based on the foregoing table, is about two and two thirds cents per pair. In reality IT IS LESS THAN EVEN ONE AND ONE THIRD CENTS A PAIR for most of the shoes worn, because Goodyear welt shoes constitute less than one third the annual production of the United States.

SINCE THE ORGANIZATION OF THE COMPANY THE SAVING IN COST OF PRODUCTION OF MEN'S GOODYEAR WELT SHOES EFFECTED BY NEW AND IMPROVED MACHINES AND LOWER ROYALTIES HAS BEEN NEARLY 9 CENTS, OR NEARLY DOUBLE THE TOTAL ROYALTY NOW PAID.

In return for this trifling royalty, the United Shoe Machinery Company provides American shoe manufacturers with a service that is unrivalled and unique. This service means the assumption of the whole cost of invention, experimental work, development, manufacture and depreciation of machines; the cost of ceaseless care of machines to keep them at the highest point of efficiency; the purchase of patents and the cost of administration. President Winslow of the United Shoe Machinery Company has repeatedly said: "IT ASSUMES ITEMS OF EXPENSE AND RISK WHICH, UNDER ANY OTHER SYSTEM YET SUGGESTED, THE SHOE MANUFACTURER WOULD BE COMPELLED TO ASSUME HIMSELF, THUS SUBJECTING HIS BUSINESS TO A GREATER MACHINERY COST PER PAIR THAN THE AVERAGE ROYALTY HE NOW PAYS."

Is it any wonder that shoes are so cheap?

KEEPING SHOE MACHINERY UP TO DATE.

Nearly all the modern machines to be found in the bottoming department of a shoe factory were either invented or perfected by the United Shoe Machinery Company. Some of them were invented by outside inventors who were not connected with the United Shoe Machinery Company, but who sold their patents to the United Shoe Machinery Company at a fair price. But most of them were *deliberately created* by a highly paid staff, to meet the needs of shoe manufacturing. No really good mechanical idea is lost or abandoned for lack of mental or financial support. FROM \$500,000 TO \$900,000 A YEAR ARE SPENT IN IMPROVING OLD MACHINES OR DEVISING NEW MACHINES.

If the inventors of the United Shoe Machinery Company are once convinced that some step in the making of a shoe can be accomplished in a simpler, cheaper, and speedier way, all the resources of the company are placed at their disposal.

It used to be the practice, for example, to fit the parts of a shoe upper to the wooden last by hand. This operation was expensive. It required so much skill and patience that few thought it possible to carry it out by machine. Finally the lasting machine was invented which cared for a part of this operation. It was still necessary, however, by means of pincers to pull the leather over the nicer curves of the last before tacking it in place, and the inventors of the United Shoe Machinery Company were confronted with the problem of contriving a "pulling over" machine. This problem was solved by them at a tremendous cost. They worked for years and they spent over one million dollars. When they had at last finished their task the famous "Rex pulling over" machine was produced. *Despite all the time, all the money, that was expended on this machine, the shoe manufacturer pays a royalty of only three eighths of a cent for each pair of shoes made by its means, and this small royalty also covers the use of several other machines used in the pulling over process.*

IT IS THIS POLICY OF CONSTANTLY IMPROVING MACHINERY THAT HAS KEPT THE PRICE OF SHOES DOWN.

SCRAPPING MACHINES.

Many manufacturers in other industries CANNOT AFFORD TO DISCARD OBSOLETE MACHINES. They have invested too much money in them. Their manufacturing costs are often high because their equipment is out of date.

Every new invention produced by the United Shoe Machinery Company means the "scrapping" of hundreds of machines at the United Shoe Machinery Com-

The "Rex" pulling-over machine, which was developed at a cost of over \$1,000,000, and which fits the parts of the shoe upper correctly to the last.

pany's expense. In a single year no less than four thousand machines have been withdrawn to make room for machines embodying the latest improvements. It does not matter if the shoe factory is large or small. All factories receive the latest improved machines. United shoe service is rendered to all on equal terms.

THAT IS STILL ANOTHER REASON WHY THERE IS NO SHOE TRUST.

THAT IS WHY EVERY SHOE FACTORY IN THE UNITED STATES, LARGE OR SMALL, ALWAYS HAS AN EQUIPMENT ABSOLUTELY MODERN—THE LAST WORD IN MECHANICAL INGENUITY.

THAT IS WHY THE PUBLIC IS ABLE TO BUY SHOES WHICH ARE CONCEDED TO BE THE BEST IN THE WORLD, AT A PRICE TO MEET EVERY PURSE.

THE REPAIR SERVICE.

Whenever a shoe machine is disabled, the telephone or the telegraph will bring the nearest United Shoe Machinery expert to the shoe factory. Machines are thus maintained in perfect condition without charge.

Over five hundred repair experts are kept constantly on duty at the beck and call of shoe manufacturers. This expert service means that 100,000 catalogued machine parts must always be kept in stock in the Beverly plant of the United Shoe Machinery Company. Over twenty-one million parts of machines are sent out from the stock room annually to various branches of the United Shoe Machinery Company.

AS A RESULT OF THIS REPAIR SERVICE, EVERY SHOE MANUFACTURER CAN COUNT ON HIS MACHINERY, AND HENCE ON HIS PRODUCTION. His profits are assured.

THERE IS NO MONOPOLY.

THE UNITED SHOE MACHINERY COMPANY

DOES NOT MANUFACTURE OR CONTROL ALL THE MACHINERY USED IN SHOE MAKING. Its service is confined largely to supplying the machines for lasting and bottoming shoes. In most factories machines for stitching, treeing or finishing shoes, and for working sole leather can be found, which were supplied by other companies, and which are installed side by side with United shoe machinery.

No shoe manufacturer need deal with the United Shoe Machinery Company if he does not choose to do so. He can equip his entire factory with machines which are not made by the United Shoe Machinery Company. If, therefore, the United shoe equipment is to be found in nearly all the 1,200 shoe factories in this country, it must be because it is so highly efficient, and because the manufacturer obtains not merely machines, but SERVICE—a service that enables him to fulfill his contracts to the day and TO SELL SHOES TO THE PUBLIC AT A LOW PRICE AND A SMALL MARGIN OF PROFIT.

The only monopoly which the United Shoe Machinery Company enjoys is the legal monopoly granted by the patent laws of this country to every inventor. Any one who takes out a patent enjoys exactly the same kind of a monopoly. After the expiration of seventeen years—the term for which patents are granted in this country—any one is free to make, use, and sell the invention disclosed in the patent.

The patents on many United shoe machines have expired. Others are free to appropriate the ideas disclosed in them, and others have done so.

The existence and success of the United Shoe Machinery Company depend not only on effective service, but also on the invention of new shoe machines, which will improve factory methods and which will improve the quality of shoes and keep the price down.

HOW THE SHOE INDUSTRY HAS PROSPERED.

The liberal business policy of the United Shoe Machinery Company has made shoe manufacturing one of the leading industries in this country.

Before 1899, when the United Shoe Machinery Company was formed, the products of American shoe factories were worth \$258,900,000. Ten years later they were worth \$442,600,000—an increase of seventy per cent.

THE WAGES of those employed in American shoe factories INCREASED FIFTY-SIX PER CENT between 1900 and 1909, or from \$59,176,000 to \$92,359,000.

Our shoe exports were very small in 1899. They amounted to only \$1,816,538. In 1912 the value of imported shoes was \$17,380,634, an increase of more than 850 per cent.

This wonderful growth is due chiefly to the liberal business methods and the factory service policy of the United Shoe Machinery Company. The wealth of this country has been increased by millions because the United Shoe Machinery Company has systematically invented new machinery to lessen the cost of shoe manufacture and to improve the quality of shoes. AS A RESULT, THE SHOE INDUSTRY OF THE UNITED STATES LEADS THE WORLD.

SHOES ARE NO LONGER LUXURIES.

Nowadays everybody wears shoes. Yet there was a time within memory when shoes were luxuries. A pair of handsewed welt shoes once cost from \$10.00 to \$16.00. Only the rich wore them every day. Yet now you pay from \$3.50 to \$5.00 for a pair of Goodyear welt shoes, much more comfortable and much better in quality than the \$10.00 handsewed shoe your father or your grandfather wore. What is more, *you, as an average American, buy three pairs of shoes a year.* Shoes are no longer a luxury.

JUDGE FOR YOURSELF HOW MUCH OF ALL THIS IS DUE TO THE POLICY OF THE UNITED SHOE MACHINERY COMPANY.

Advertisement.

Outsole rapid lockstitch machine of the latest type, used to fasten the outsole with a lockstitch to the welt in making a Goodyear welt shoe.

Part of a museum in which two thousand types of shoe machines are preserved, which were once in use, but which have been superseded by better types. Four thousand machines have been "scrapped" in a year by the United Shoe Machinery Company to make room for more efficient types.

A loose nailing machine. This apparatus is used in fastening the "heel seat" of the shoe preparatory to attaching the heel.

It Heals Tire Cuts

You want to cut out tire repair waste—then you need this self-vulcanizing tire repairer—it does, itself, the extra work you've had to do yourself with the ordinary tire repair mastic. All you have to do is to apply it—it does the rest. Fills the cuts and holes, solidifies quickly and *becomes like a part of the tire*. No car owner can afford to be without it. Reduce tire expense 30 per cent—use

NARCO TIRE CUT FILLER

Requires No Kneading

a non-shrinking, rubber compound, heavy in rubber; a combination cement, cut filler and mastic. Refills and unites the torn place in the tire with a permanent plug of rubber more resilient than the tire itself. Welds the loosened tread to the canvas body. Supplied only in patent, collapsible tubes, with tapering spout.

Easy to Use

All you have to do is to clean the cut thoroughly with gasoline—remove all oil, sand and other foreign matter; insert the tapering spout into the cut and compress the tube, smooth off the cut filler and the repair is completed. Allow it to heal over night; in the morning it will have become *like a part of the tire*. Rivets itself to the walls of the cut, forming a union so perfect no road abuse can remove it.

This is the logical manner of tire repair. Every automobile owner in America should make Tire Cut Filler a part of his repair outfit and begin saving in tire cost now.

Very Large Tube, \$1.00. \$1.50 in Canada.
Money refunded if not satisfied.

On Sale at All Dealers.

If yours can't supply you, we will.
Send dealer's name and \$1 00;
in Canada, \$1 50.

TIRENEW

waterproofs the outer rubber casing of the tires and penetrates down into the inner fabric, protecting it from oil, air and moisture. Preserves the tires and prevents decay. Spread it over the surface of your tires after mending with Tire Cut Filler. **Makes tires look like new.**

There are imitations which paint but don't protect—insist on Tirennew.

NATIONAL RUBBER COMPANY
4405 PAPIN STREET, ST. LOUIS, MO.

Notes for Inventors

Film for Moving-picture Machine.—George W. Bingham of Brooklyn, N. Y., assignor to Bingham-Cameron Company of New York, has patented, No. 1,045,502, a film for moving-picture machines which comprises a disk of celluloid or like transparent material provided with a series of pictures arranged progressively on the disk, the disk having an opening located in advance of the series of pictures and of sufficient size to permit free passage of the beam of light emanating from the projection apparatus of the machine.

The Patents of the Bath Trust.—The patents owned by the Bath Trust, recently dissolved by order of the Supreme Court of the United States, cover principally enameling processes. The major patent of the trust was that granted September 26th, 1899, to James Arrott, Jr. Prior to his invention, the enameling powder was applied by a sieve, attached to a long handle, which was held by the workman with one hand and the sieve made to vibrate by the workman striking the handle with the other hand, thereby sifting the powder over the surface of the iron ware. The instrument was an imperfect one, not easily handled, and by its use the workmen were subjected to intense heat and physical strain. Besides, the flow of the powder was not continuous; it was cast upon the metal in intermittent puffs, causing in many instances an unequal distribution of the powder and producing defective articles, which either had to be thrown away or sold as "seconds." With Arrott's invention these evil results are lessened or disappear. The sieve is mechanically vibrated very rapidly, causing, instead of an intermittent flow of the powder as in the hand process, a practically continuous flow. Both hands of the workman may be used to guide and direct the sieve. The advantages of the instrument over the hand process are decided. It is more efficient and more economical. It makes a better article and in less time. There is no waste in "seconds." The workman is relieved to some extent from the fierce heat. Other patents owned by the Bath Trust are those granted to E. Dithridge for a pneumatic sieve, and a patent to William Lindsay for an enameling powder distributor. These are improvements on the Arrott invention.

Protecting Moving Picture Films.—In a patent, No. 1,042,801, Isidor Kitsee, the Philadelphia inventor, suggests that he has found that if a nitrated material is embedded in a carbonate compound, the gases given off by said material are neutralized, the temperature remains stationary and no deterioration is ascertainable. When two films, each inclosed in a receptacle, are subjected to a higher temperature, one film embedded in a carbonate, the other film minus the carbonate, then the film without the carbonate will inflame at a far lower temperature than the film embedded in the carbonate, for the reason that the gaseous products of the film embedded in the carbonate are neutralized as soon as they are given off, whereas the gaseous products of the other film tend to raise the temperature and explode. To protect, therefore, a film used for cinematographic exhibition, he embeds the same in a carbonate of ammonium compound, such for instance as a bi-carbonate of ammonium, sodium, etc., and the container for the storage of films has a lining impregnated with a neutralizing agent for the gases given off by the film.

A Running Support for Flying Machines.—Michael A. Parisano of New York city, in a patent, No. 1,049,521, shows a flying machine with trucks pivotally mounted on opposite sides of the main frame so they can swing transversely and having wheels at their opposite ends and springs connected with the trucks on opposite sides of their pivotal points.

A Convertible Tank Vessel.—A novel construction of convertible freighter and tank vessel is shown in the patent, No. 1,049,490, to Charles P. M. Jack of New York city, and includes a ship's hull and a number of removable cylindrical tanks which are placed vertically in the hold so they can be raised from and inserted

therein and adjustable means are provided for connecting the tanks together and to the sides of the hold.

Resignations from the Patent Office Examining Corps.—Notwithstanding the increase in salary accorded the assistant examiners of the U. S. Patent Office, resignations still continue frequent and during the past year the examining corps has suffered by twenty-four resignations. One of these was a principal examiner. During the same period several members of the corps have died, including one principal examiner.

Preventing Thumb Sucking.—Jessie May Mitchell of Clayton, Miss., has procured a patent, No. 1,048,569, for a thumb and finger-sucking preventer in which there is a stall fitted on the thumb or finger and a round disk, too large to be inserted in the mouth, is held by the stall on the end of the thumb or finger so the latter cannot be put in the mouth.

Vermin Trap.—A patent, No. 1,048,479, the invention of Joseph Andel of Chicago, Ill., has issued for a vermin trap in which a hollow body has perforated walls and a honeycombed structure within the body for the reception of vermin, and the perforated end walls are controlled by slides which have openings registrable with the openings and movable so the slides can be adjusted to close the wall openings.

A Trap Set by Foot.—Maurice F. Richardson of Southington, Conn., has secured a patent, No. 1,048,586, for a spring trap which has a pan and a latch to hold the jaws open and is provided with lateral foot engaging extensions at the opposite sides of the jaws so that the trap can be set by the feet pressing upon the extensions.

An Improved Beehive.—Francis Dandenbaker of Norfolk, Va., a well-known inventor of beehive improvements, as assignor to Robert Johnson, has secured patent No. 1,048,950, for a beehive, the body of which has a ledge for supporting frames or holders and a filling rail for the spaces above the ledge and provides a strip of treated material between the filling rail and the adjacent hive members.

An Electric Rat Trap.—Michal Morawiecki of Pittsburgh, Pa., has secured a patent, No. 1,048,995, for an electric rat trap which has a tilting platform and a pair of electrodes below the normal plane of the platform with the free opposing ends of the electrodes spaced apart and forming a mouth and operating to control and cooperate with the tilting platform.

A Novel Form of Brake Head.—Frederick R. Cornwall of St. Louis, assignor to Chicago Railway Equipment Company, has secured a patent, No. 1,045,261, for a brake head which has an opening of such size as to permit the introduction of the brake beam with overlying means for securing the brake beam in order to hold the head on the beam in suitable adjustment.

A Gas-chain Fixture.—Frederick DeWitt Pitcher of Rochester, N. Y., assignor to Welsbach Light Company, in patent No. 1,046,489 shows a gas-chain fixture in which the gas-supply pipe extends adjacent to the links with its ends extending into socket members provided on the end links of the chain and connected thereto so that suitable connections may be made with said socket members to communicate with the gas-supply pipe carried by the chain.

Heating Hosiery Electrically.—The General Electric Company as assignor of Frederick M. Vogel of Pittsfield, Mass., has secured patent No. 1,046,514 for a device for drying hosiery in which there is an electrically heated metallic form corresponding generally to the shape of a stocking and having interchangeable toe portions with a resistance conductor extending into the form and the toe portions so that the form may be heated throughout.

Horseshoes by Centrifugal Casting.—Reasoning from the dental practice of taking impressions of cavities and then casting by the aid of centrifugal action fillings to fit the cavity, the writer heard it suggested recently that some one might invent a means of producing well fitting and suitable horseshoes by taking impressions of the prepared hoof and then casting in a centrifugally operating apparatus a shoe to fit the hoof.

Trade-mark Notes

"Ritesize" Held Registrable Trade-mark for Knit Goods.—Mr. Commissioner Moore in *ex parte* Ritesize Underwear Company has held the word "ritesize" as applied to underwear is not descriptive of such goods and is registrable as a trade-mark therefor. In the decision the Commissioner says "in the case of underwear, however, there can be no particular size which could be described as 'ritesize,' whether this expression is considered to refer to absolute size or to the proportion of one part to another, since there is no given size or proportion in underwear which could be considered a right size any more than any other."

"Brilliant" Not Registrable for Flour.—In the case of Sauers Milling Company v. Kehloe Flour Mills Company, the Court of Appeals of the District of Columbia in holding that the word "Brilliant" as applied to flour is descriptive and not registrable as a trade-mark for flour, said: "The testimony shows that it indicates bright flour that shows up well and is of a superior quality as distinguished from the darker brands, and that the bright flour is considered of greater value, and more sought after by purchasers than the darker brands."

Chamber of Commerce in its Relation to Patents, Trade-marks and Copyrights.—The Chamber of Commerce of the United States of America, with general offices in the Riggs Building at Washington, D. C., has appointed its committee on patents, trade-marks and copyrights in several groups located at Rochester, N. Y., Detroit, Mich., and Washington, D. C. The groups have individual chairmen and are composed of follows:

Rochester, N. Y.

James G. Cutler, Rochester, N. Y., chairman (President Alliance Bank; President Cutler Mail Chute Company and Realty Company.)
George Eastman (President of the Eastman Kodak Company.)

Henry W. Morgan (University Avenue, Rochester, N. Y., Vice-president and General Manager Morgan Machine Company, box making machinery and nailing machines.)

George W. Todd (G. W. Todd & Co., manufacturers of protectographs, Rochester, N. Y.)
Edward G. Minor (President and General Manager the Pfaunder Company, Rochester, N. Y.)

Detroit, Mich.

James Whittemore, Detroit, Mich., chairman. (Patent Attorney, Whittemore, Hulbert & Whittemore, Wayne County Savings Bank Building, Detroit.)

John Trix, Detroit, Mich. (President American Injector Company.)

Henry M. Leland, Detroit, Mich. (President Cadillac Motor Car Company.)

Howard E. Coffin, Detroit, Mich. (Vice-president Hudson Motor Car Company.)

C. A. Strelinger, Detroit, Mich. (Dealer in machinery supplies, the Charles A. Strelinger Company.)

Washington, D. C.

Gen. Ellis Spear, 9th and Grant Place, chairman. (Former Commissioner of Patents and well known patent attorney.)

W. W. Kincaid, Meadville, Pa. (President the Spirella Company.)

Perry B. Turpin, 625 F Street, Washington, D. C. Represents SCIENTIFIC AMERICAN also Munn & Co.)

Joseph R. Edson, (Washington Loan and Trust Building, Washington, D. C., patent attorney.)

William G. Henderson, 501 F Street, Washington, D. C., patent attorney.)

It is not the purpose of the Chamber of Commerce to have one general committee, but rather to have each group consider the subjects and reach its conclusion and possibly correspond with the other groups with a view to securing reports from the several groups which instead of being sectional will be in a way national and at the same time give recognition to the different viewpoints of the various sections of the country in which the groups are located.

A Trade-mark Decision.—In deciding the case of *ex parte* Callahan & Sons, First Assistant Commissioner of Patents Billings, in holding that a combination of non-registrable words is not registrable, quotes the answer of the Examiner of Trade-marks, stating that he has correctly stated the law relating to this type of marks. In his statement the Examiner of Trade-marks says: "It is true that a surname if distinctively displayed is registrable; . . . a geographical term and descriptive words, even if distinctively

displayed, are not registrable;" and refers to the decision of the Court of Appeals of the District of Columbia in *re* Meyer Brothers Coffee and Spice Company as directly ruling that the combination of non-registrable words does not produce a registrable mark.

Legal Notes

High-tension Insulator Case.—In the interference case of Hewlett v. Steinberger, involving an important feature of high-tension insulators, and referred to in the SCIENTIFIC AMERICAN of April 19th, the Court of Appeals of the District of Columbia has rendered a decision affirming the award of priority to Steinberger.

Designs Must Involve Invention.—Mr. Commissioner Moore in the case of *ex parte* Mygatt has held that in order that a design be patentable it must not only be new and ornamental, but there must have been an exercise of the inventive faculty in its production, citing the Court of Appeals case of *in re* Schraubstadter, 26 App. D. C., 331.

Adjudication of Cracker Package Patent.—In *Peters v. Chicago Biscuit Company et al.* in 200 Fed. Rep., 774, the District Court, N. D., Illinois, E. D., speaking by Justice Kohlsaat, Circuit Judge, has held that the Peters patent, No. 621,974, for a method of and means for packing biscuits, crackers and the like, the package consisting of a carton having an interfold lining of wax or paraffin paper to exclude the dust and moisture, is void for lack of patentable novelty in view of the prior art. The court refers to the object sought being the approximate exclusion of air, moisture, dirt and insects, and to this end being in practice further accomplished by complainant's exclusive licensee, the National Biscuit Company, by the use of an outer sealed wrapper or envelop entirely inclosing the package and contents, which wrapper the patentee asserts is mainly for advertising purposes by the licensee.

Outstanding Licenses Disregarded in Issuing Patents.—In *ex parte* Dudley, the Commissioner of Patents has decided that "Hereafter, therefore, in issuing either original or reissue patents, grantees of interests therein shall not be considered to be other than assignees because of any outstanding license or licenses, whether exclusive or not, and the patents shall issue to the same parties as they would if such licenses did not exist."

The question arose in connection with the issue of a reissue patent, the Revised Statutes specifically pointing out to whom reissue patents shall be granted, whereas original patents are issued under the general provisions of the statute which leaves it discretionary with the Commissioner whether the patent shall issue to the inventor or the assignee.

Decision in Interference Case.—Assistant Commissioner Tennant in *Bump v. Reasoner* has decided that where, in an interference involving an application and a patent, the applicant filed a concession of priority to the patentee, judgment rendered upon this concession will not be set aside upon an allegation that the applicant was deceived as to duration of a license granted by a patentee. It appears from the statement of the case that a party acting on behalf of Bump obtained from Reasoner an assignment of his right, title and interest in the patent involved and that Bump was informed that a license had been granted, but understood that the license was for but a year and had expired, whereas it seems the license has not expired.

Intervening Rights in Reissue Applications.—Assistant Commissioner Tennant in the case of *Perkins & Requa v. Weeks* holds that where in an interference involving an application for a reissue of a patent, a motion is brought to dissolve upon the ground that intervening rights accrued in favor of the opposing party by the issuance of a patent between the date of the original patent and the date of filing the application for reissue, such motion was properly refused transmission, since the mere grant of a patent between the issuance of an original patent and the filing of application for reissue thereof does not constitute an intervening right.

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19 to 36 per cent. by not wasting the light you already have

If your ceilings and walls absorb instead of reflect light, you are wasting light—the artificial light for which you pay good money as well as the daylight which comes in through your windows. Paint your ceilings and walls with

RICE'S MILL WHITE

It will reflect *every ray of natural or artificial light* down on to your machinery and into the dark corners of your plant. It will enable you to utilize floor space now useless for fine work. It will lengthen your daylight day at both ends.

RICE'S Mill White will not crack or craze under the jar of machinery. It will not scale or flake like a cold water paint. Its firm, tile-like surface affords no lodgment for germs and odors.

RICE'S Mill White is economical to apply. It flows evenly with no brush marks under a 4-inch brush. Its great covering power and intense body make *two coats equal to three of lead and oil*. It remains white longer than any other gloss paint.

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RICE'S Mill White can be applied to wood, concrete, brick—practically any surface over Rice's undercoats. It was the pioneer "Mill White" Paint. It made the reputation of the name "Mill White." The *special process* by which Rice's Mill White Paint is made *cannot be used by any other paint manufacturer*.

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How Patented Inventions Have Increased the National Wealth

IN these days when great industrial dragons of capital guard every door of business opportunity, it is grateful to know that there is one open sesame left.

During the past spring, after a bill was introduced to restrict the rights of inventors in their inventions, Congress had the opportunity of hearing from the largest corset manufacturer in the United States, the biggest manufacturer of carpet sweepers, the best-known manufacturer of inexpensive watches, the manufacturer of the most advertised alarm clock in America, the two best-known safety razor manufacturers in the country, the largest manufacturer of cameras and photographic supplies in the world, all the phonograph and talking machine manufacturers in the United States, and most of the manufacturers of the specialties that newspaper and magazine advertising have made household words. Besides these, Congress also heard from the leading inventors of the country, the members of the Inventors' Guild, most of the engineering and electrical and commercial associations, and, finally, from Mr. Thomas A. Edison himself.

What these men had to say about the calamities which would follow if the rights of inventors were restricted so astonished the Committee on Patents, that the Committee decided not to press this Bill for the present. For all that, it will probably be presented at the coming session, for which reason its objectionable provisions should not be lost to view.

These manufacturers and inventors all told one story: to-day invention, protected by patent, is in all commercial activities the chief, and often the only way by which business independence may be attained.

All this explains why Americans lead the world in invention; why the patents taken out in the United States average nearly 40,000 a year and now aggregate nearly 1,100,000; and why the patents issued by the United States are nearly equal, in annual output and in aggregate amount, to all the patents issued by Great Britain, Germany and France combined. Laid end to end, the patents which have been issued by the United States Patent Office would reach three times around the world. Placed in a pile 10 feet square they would form a mass twice as high as the Washington Monument.

How tremendously patented inventions have contributed to the prosperity of the United States appears from the growth of industries depending entirely on inventions.

In the generation between 1880 and 1910, the value of our iron and steel manufactures leaped from \$207,000,000 to \$1,377,000,000, an increase of 566 per cent. Between 1860 and 1910 the output of sewing machines grew from less than \$4,500,000 to over \$28,000,000, an increase of 522 per cent. Between 1850 and 1910 the production of agricultural implements increased from less than \$21,000,000 to over \$146,000,000, an increase of 595 per cent. In the generation from 1880 to 1910 the output of photographic apparatus increased from \$142,000 to nearly \$16,000,000, an increase of 1,117 per cent.

Coming down to more recent examples of manufactures covered by patents:

In the decade between 1899 and 1909 the output of automobiles leaped from less than \$5,000,000 to over \$249,000,000, an increase of 4,880 per cent; the production of wire increased from less than \$9,500,000 to nearly \$90,000,000, an advance of 847 per cent; the output of phonographs from about \$2,000,000 to nearly \$12,000,000, a growth of 500 per cent; the production of cash registers and calculating machines from about \$5,500,000 to nearly \$24,000,000, an increase of 336 per cent; the output of patented food preparations from \$39,000,000 to \$125,000,000, a growth of 220 per cent; the production of fountain pens from a little over \$1,500,000 to over \$4,500,000, an increase of 200 per cent; the output of photo-engraving from \$4,000,000 to over \$11,500,000, an increase of 188 per cent; the output of photographic products from less than \$8,000,000 to over \$22,500,000, an increase of 181 per cent; the pro-

PATENT ATTORNEYS

INVENTORS are invited to communicate with Munn & Co., 361 Broadway, New York, or 625 F Street, Washington, D. C., in regard to securing valid patent protection for their Inventions, Trade-Marks and Copyrights registered. Design Patents and Foreign Patents secured.

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FOREMAN, with experience and ability, where efficient and economical result in auto motor work is appreciated, desires change. Address Foreman, Box 773, New York.

MISCELLANEOUS

SEALED PROPOSALS, endorsed "Proposals for Two 300 ft. Steel Towers," will be received at the Bureau of Yards and Docks, Navy Department, Washington, D. C., until 11 o'clock a. m., June 14, 1913, and then and there publicly opened, for the construction of two steel towers at the Naval Radio Station, San Juan, Porto Rico. Estimated weight of structural steel work, 100 tons. Plans and specifications can be obtained on application to the Bureau. Wm. M. Smith, Acting Chief of Bureau, April 19, 1913.

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For hours the rubber parts of Waterman's Ideals are locked in these ovens. The enormous heat liquefies, then mixes the rubber and sulphur, giving the basic strength and necessary elasticity, which is found only in Waterman's Ideals. The rubber parts are *not* blown. They are moulded and hand-turned, hence the accuracy of fit, size, shape and beautiful finish. You never heard of the barrel of Waterman's Ideal breaking or chipping. The more you take the time to learn of the careful scientific manufacture of this pen, the more impressed you will become with its general utility. It's a long but useful journey from the rubber fields of South America to your vest pocket.

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You can purchase the size, shape and pen point of Waterman's Ideal which you prefer, from most every reliable dealer, everywhere.

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duction of rubber goods from \$52,500,000 to \$128,500,000, an increase of 145 per cent; the production of typewriters from less than \$7,000,000 to nearly \$20,000,000, an increase of 185 per cent; the production of electrical machinery from \$92,000,000 to \$221,000,000, an increase of 140 per cent.

The increase in our national wealth produced by commercial inventions is recorded in staggering figures:

In 1905 our manufactures of iron and steel products aggregated \$2,177,000,000; our manufactures of textiles amounted to \$1,387,000,000; our production in the printing and publishing trades was \$597,000,000, and our manufactures of petroleum products totaled over \$175,000,000. During the five years between 1905 and 1910 these manufactures increased, on an average, nearly 30 per cent.

During the two generations from 1850 to 1910 the production of cotton manufactures jumped from less than \$62,000,000 to over \$628,000,000, an increase of 913 per cent. In the same period the production of woolen manufactures leaped from about \$48,600,000 to over \$507,000,000, an increase of 946 per cent. Over the same years the production of silk manufactures increased from less than \$2,000,000 to nearly \$197,000,000, an increase of 9,750 per cent. In these three industries alone, each of which owes its very existence to machinery made possible by patented inventions, the amount of wealth produced in 1910 aggregated the enormous sum of nearly \$1,333,000,000.

How widely this enormous wealth is diffused among independent manufacturers and their employees appears from the figures of several representative industries:

Between 1850 and 1910 the capital engaged in the manufacture of agricultural implements grew from \$3,500,000 to \$256,000,000, affording occupation in 640 individual establishments to nearly 60,000 employees, who received in the aggregate nearly \$40,000,000 annually in wages. During the same period the capital engaged in making sewing machines grew from \$1,500,000 to \$33,000,000, affording occupation to 21,000 employees, who received annually \$12,500,000 in wages. In the generation between 1880 and 1910 the manufacturers engaged in the making of electrical machinery grew from 76 concerns with \$1,500,000 capital to 1,009 concerns with \$268,000,000 capital, affording occupation to nearly 106,000 employees, who received in the aggregate about \$70,000,000 in wages.

Coming down to more recent examples: What can be more impressive than the growth of the automobile industry? During the decade from 1899 to 1909 the automobile manufactures grew from 57 establishments with \$5,500,000 capital to 743 establishments with nearly \$174,000,000 capital. The number of employees, meanwhile, increased from 2,509 to 85,359. The wages paid to these employees increased during this period from \$1,500,000 to \$58,000,000.

Between 1899 and 1909 the establishments engaged in wire manufactures increased from 29 to 56; their capital grew from \$4,000,000 to over \$60,000,000; the number of their employees increased from 1,700 to 20,000; their aggregate wages rose from less than \$1,000,000 to \$12,500,000.

During the same period the establishments engaged in the manufacture of typewriters increased from 47 to 89; their capital grew from less than \$8,500,000 to over \$26,000,000; the number of their employees increased from 4,800 to over 12,000; their aggregate wages rose from \$2,750,000 to nearly \$9,000,000.

Over the same period the establishments engaged in the manufacture of patented food products increased from 645 to 1,213; their capital grew from \$21,500,000 to \$64,500,000; the number of their employees increased from 9,700 to 21,000; their aggregate wages rose from \$4,500,000 to nearly \$13,000,000.

In the same decade the establishments engaged in the manufacture of optical goods increased from 91 to 217; their capital grew from \$60,000,000 to \$104,000,000; the number of their employees increased from 12,300 to 22,000; their aggregate

*New concrete building of the
Crownell Pub. Co., at Springfield, O.*

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Concrete and Cement Coating on
ceiling lightens the entire room.*

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Authorities agree that concrete work should have a water-proof surface. For this purpose the proper finish is

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So we said to our Engineers:

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They did—and they also added the No-Pinch Safety Flap for inner tube protection in

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Perfect 3-Point Rim Contact

Here is a No-Clinch tire that appeals to the hard-headed, shrewd tire buyer—the man who insists on easy riding comfort and a good, liberal mileage.

Each point of rim contact in a tire is a point of support. Where the points of rim contact are not perfect, undue pressure is brought to bear at an unsupported point of the tire.

Then what happens? The result is a terrific strain on the tire that results in rim troubles, breaking above the bead and separation of the tread from the carcass.

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Add to this the No-Pinch Safety Flap for inner tube protection, the Vitalized Rubber advantage, the famous Diamond Safety (Squeegee Tread) and you have bought rubber shod mileage that has no equal at any price.

So this time buy Diamond Vitalized Rubber Tires—

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wages rose from \$10,000,000 to \$18,500,000.

Throughout the same period the establishments engaged in the manufacture of phonographs increased from 11 to 18; their capital grew from \$3,000,000 to \$14,000,000; the number of their employees increased from 1,400 to 6,000; their aggregate wages rose from \$3,750,000 to \$30,000,000.

Over the same years the establishments engaged in the manufacture of fountain pens increased from 43 to 65; their capital grew from \$1,000,000 to over \$3,000,000; the number of their employees increased from 742 to 1,820; their aggregate wages rose from \$500,000 to \$1,125,000.

During the same decades the establishments engaged in the printing and publishing business increased from less than 21,000 to nearly 32,000; their capital grew from \$333,000,000 to over \$588,000,000; the number of their employees increased from 136,000 to 389,000; their aggregate wages rose from \$139,000,000 to \$268,000,000.

The value of American manufactures attributable directly or indirectly to patented inventions is stupendous. In 1909 it amounted to nearly \$21,000,000,000—one fifth of all the wealth of the United States; six times the total money in circulation; twenty times as much as would be required to pay the national debt; and two hundred and sixteen times the value of all the gold produced in the United States. The amount of wages which these industries paid out in 1910 amounted to nearly \$5,000,000,000—more than half as much as the total wealth of the United States in 1850; about two thirds as much as the total money in circulation in 1910; seventeen times the total wages paid in the United States in 1850; and seventy-one times the total amount of money coined in 1910. To invention, more than to any other cause, is due the fifteen-fold increase of wealth in the United States from \$7,135,000,000 in 1850 to \$107,104,000,000 in 1909. Human comprehension is inadequate to grasp such figures.

That wealth produced by patented inventions is more widely distributed among employees and independent manufacturers than wealth produced in any other fashion is strikingly shown in the boot and shoe industry. Between 1900 and 1905 the capital invested in the industry increased from about \$99,000,000 to \$122,500,000, an increase of over 23 per cent; and during the five years from 1905 to 1910 the capital leaped to over \$197,000,000, an increase of 61 per cent. Between 1900 and 1910 the commercial ratings of the shoe manufacturers in the United States jumped from less than \$61,000,000 to nearly \$99,000,000, an increase of nearly 62 per cent. Between 1905 and 1910 the salaries and wages of all persons employed in shoe factories in the United States leaped from less than \$78,000,000 to nearly \$110,000,000, an increase of 41 per cent. Salaries alone increased 99 per cent, and wages alone increased 34 per cent. During the same period the number of salaried employees expanded from 8,811 to 14,513, an increase of 65 per cent; and the average number of wage earners increased from less than 150,000 to over 185,000, an increase of 23 per cent. From 1900 to 1905 the product of American shoe manufacturers increased from less than \$259,000,000 to over \$320,000,000, an increase of nearly 24 per cent. During the five years from 1905 to 1910 the output grew to nearly \$443,000,000, a gain of 38 per cent. Between 1899 and 1910 the value of the exports of boots and shoes jumped from less than \$2,000,000 to nearly \$14,000,000, an increase of over 600 per cent. According to the last census this prosperity is shared by 50,000 independent retail shoe dealers and 1,343 separate shoe manufacturing establishments, all independent, who employ in the aggregate nearly 200,000 people and have an individual output of from 300 pairs to 25,000 pairs a day. "This industry," states the Massachusetts Commission on the Cost of Living, in its recent report, "is one of the few great lines of industrial enterprises in the United States in which the trust form of control has not made headway."

These figures all show that, possessed of the control of a valuable invention, the

To the Man with a Ventilating Problem

You remember what hot weather meant last summer—stifling rooms full of bad air, dulled brains, lagging hands, part of your office or factory unusable during the summer months.

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Ventilating Fans

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Write us giving size and location of room, whether you wish to drive the fan by belt or electricity, and if by electricity what current you have—voltage, cycles, phase, etc.

Our nearest engineer will advise you of the proper fan to use. There is no obligation or expense to you.

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The Propeller Type Fans are for use where large volumes of air are to be handled without piping. They are usually placed in top sash of window or in wall or partition, and force the foul air outdoors or into another room.

Booklet No. A-P-5 describes these Fans.

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FIRST, let us analyze friction. Friction is the resistance or retarding force set up by two surfaces rubbing against one another. Each surface exerts an almost constant pull on the particles making up the other surface. The surface of the two which can the better withstand this frictional pull will be the surface to remain unworn. The bearing metal should be so designed as to give way before the steel. But the bearing metal should not give way to this pull too easily. That would mean quick bearing wear.

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THE interlocked, cohesive, fibrous structure of NON-GRAN makes it almost impossible for the shaft to pull away the particles making up the surface which is presented to this pull. In NON-GRAN, the particles forming the bearing surface are all knit to, and therefore held down by the particles beneath the surface.

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FRICITION is friction, and that metal which best withstands friction in motor duty, also best withstands friction in any other duty.

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inventor, although backed by a small concern, still has the magic "open sesame" that unlocks the door to the best markets of the world; and that in developing his own business and adding to his own wealth the inventor adds a hundred-fold to the wealth of the whole community.

Some Old Sewing Machine Patents

IN an interesting memorandum published in the consular and trade reports of the Department of Commerce, Dr. Darby of the Patent Office tells of the development of the sewing machine; how the earliest attempt at sewing by machinery of which there is any authentic record was in 1755, in which year a machine was patented in England by Charles F. Weisenthal, in which machine the stitch was formed by a needle having two points with an eye at mid-length, which passed completely through the goods in imitation of hand sewing.

Following this came an English patent dated July 17th, 1790, granted to Thomas Saint, for a machine that embodied several features employed in the modern sewing machine, namely, an overhanging arm, a horizontal cloth plate, a vertically reciprocating needle, and a feeding device. The needle, notched at its lower end, pushed a loop of thread through a hole previously made by an awl. The loop thus formed was held beneath the goods, and the next loop was passed through it, thus making what is known as the "chain stitch."

An Englishman named Duncan in 1804 made a chain-stitch machine that employed two hooked needles, and in 1830 a Frenchman named Barthelemy Thimonier invented a machine which embodied the same principles with the exception that the loop of thread was pulled instead of pushed through the fabric.

The first American patent for a sewing machine was issued to a man named Lye in 1836. A fire, which occurred that year, destroyed all the Patent Office records, so that the construction of this machine is not known.

It is said that in the years 1832 to 1834 Walter Hunt of New York city built what was probably the first lock-stitch machine. This was provided with a curved needle (with an eye near the point) mounted on a vibrating arm. A loop was formed beneath the cloth by this thread-carrying needle, and a shuttle carrying an additional thread was passed through the loop thus formed, making a lock stitch. Hunt, however, did not apply for a patent until after the granting of the Howe patent, and his application was refused.

On February 21st, 1842, patent No. 2,466 was granted to John Greenough, which was the first United States patent for a sewing machine of which there is any existing record. This machine employed two needles, pulled entirely through the cloth by pincers, and the stitch was formed with two threads, the machine being used principally on leather work.

March 4th, 1843, patent No. 2,982 was granted to B. W. Bean; December 27th, 1843, patent No. 3,359 was issued to G. H. Corliss; and July 22nd, 1844, patent No. 3,672 was granted to J. Rodgers. In all of these machines a thread-carrying needle was pulled entirely through the cloth by pincers or clamps, forming what is known as a basting or running stitch.

Elias Howe patented his machine September 10th, 1846, patent No. 4,750.

The patent No. 6,439, granted to Bachelder May 8th, 1849, had a spiked, endless belt passed horizontally around two pulleys. This constituted the first practical continuous feed.

The Singer patent, No. 8,294, August 12th, 1851; the A. B. Wilson patent, No. 9,041, June 15th, 1852; and the Wilson patent, No. 12,116, December 19th, 1854, followed. The last named patent included a feed device comprising a horizontal bar furnished with a serrated surface, which bar was given an up-and-down motion in addition to a forward-and-back motion to feed the goods. This feed, known as the four-motion feed, is present in practically all modern domestic machines.

Tarvia

Preserves Roads
Prevents Dust

Dudley Avenue, Westfield, N. J.

A Tarvia Town

THERE are many towns in this country which began with Tarvia years ago and finding it successful have extended its use on their roadways year by year as a matter of fixed policy. Such a town is Westfield, N. J., which now has 19 miles of tarviated streets.

Mr. A. W. Vars, the town engineer, reports that the "Tarvia B" treatment on all these streets averaged 1 3/4 c. per square yard for the season of 1912; compared with the cost of keeping down the dust and maintaining the road surface by any other method, this is a very low figure.

The roads have been free from dust and have not been seriously impaired by automobile traffic.

Tarvia acts as a binder and cements the road surface firmly together in a plastic matrix. Automobiles do not hurt such a surface, but roll it down smoother.

The amount of new stone screenings needed for surface maintenance is greatly reduced by the Tarvia treatment and the road keeps in better condition. The longer the Tarvia treatment is maintained, the less the annual cost.

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In 22 years it has paid out over ten millions in accident claims, and in 14 years, over one million in health claims. Its 110 millions of assets and its great reputation for prompt and liberal settlements gives the AETNA the leading place in the accident insurance business, and it is the largest Company in the world writing Life, Accident, Health and Liability Insurance.

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Sixty Years of Successful Manufacturing.

The Marmon "32"

A sensible, logical car—a car of moderate size and capacity, meeting every requirement for touring and city use with the economy in tires, fuel and upkeep so important to the majority of motorists. Four-cylinder 32-h.p., 120-inch wheel base, electric starting and lighting system, with body types to meet every requirement and corresponding equipment. Touring car \$3,000.00 f.o.b. Indianapolis.

The Marmon "48"

Six-cylinder, 48-50 h. p., 145-inch wheel base—a large car with small car advantages, a car with short turning ability which eliminates the old objections to long wheel base—a car of wonderful and surpassing riding qualities: electric starting and lighting system, with body types to meet every requirement and corresponding equipment. Touring car \$5,000.00 f.o.b. Indianapolis.

At the present time sewing machines are divided into two classes, one including those for household or domestic use and the other special machines, such for instance as the McKay shoe sewing machines.

The Big Aeroplane and Transatlantic Flight

THE offer of a prize of \$50,000 for a flight across the Atlantic Ocean in seventy-two hours, which was made recently by the *London Daily Mail*, has already brought forth about a dozen well-known constructors and pilots who are preparing machines for this flight.

Something over a year ago, we published in the *SCIENTIFIC AMERICAN* a very complete article on the transatlantic crossing by aeroplanes, together with a full-page illustration of a proposed biplane with five 50 horse-power Gnome motors by which Aviator-Mariner James V. Martin proposed to make the long flight. Recently a hydro-aeroplane has been constructed in England having three 50 horse-power Gnome motors arranged in somewhat the same manner as suggested by Mr. Martin, and having two floats in the shape of boats beneath the machine in each of which three passengers are carried. This machine, although only about half the size of the one designed by the American aviator, is built along the lines suggested by him. His idea was that after the machine was once in the air, one of the motors could be disconnected and the machine would run on the other four motors, or two hundred horse-power. As the fuel was used up and the machine became lighter, another motor could be cut out, and perhaps before the end of the voyage the machine would fly on but two motors, thereby making a great saving in fuel.

In order to cover the 1,800 miles from Newfoundland to Ireland, a speed of sixty miles an hour must be maintained for thirty hours. To maintain such a speed continuously on a machine large enough to carry sufficient fuel to make the flight without a stop, a motor of from 150 to 200 horse-power is necessary. A six-cylinder, water-cooled motor, such as is used on the German Zeppelin dirigibles, is the most economical and reliable motor for this purpose. Such a motor will consume only about one third of a pint of gasoline per horse-power hour, and very much less oil than will an air-cooled, revolving-cylinder motor like the Gnome. A 50-hour continuous run is nothing out of the ordinary for one of these airship motors; but in order to be absolutely certain of making the crossing, it would be well to have a second such motor in reserve.

The main point to be taken into consideration in the design of a transatlantic aeroplane is the reduction as far as possible of the head resistance. On this hangs the probability of crossing at the maximum speed and the minimum expenditure of fuel (that is, weight). As to the machine itself, this can hardly be constructed to weigh less than fifteen pounds to the horse-power. With fuel, powerful motors, men and supplies added, this weight may increase to as much as thirty or forty pounds per horse-power, which would mean a huge machine having 1,200 to 1,500 square feet of surface and weighing complete between three and four tons. At once the question will be asked, whether such a machine has ever been built and flown successfully.

The answer is, that some six months ago an aero-yacht biplane was constructed for M. Deutsch de la Meurth. This machine weighed complete with its live load over 6,000 pounds, and, propelled by a 200 horse-power motor, showed a speed of 68 miles an hour. Although a clumsy hull was fitted beneath the biplane, excellent speed was made with six or eight people. With the live load put into fuel, this machine would be capable of making perhaps one third of the distance across the Atlantic.

Another huge hydro-aeroplane that has recently been constructed, and that was sent to Monaco for the meet last month,

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Absolutely safeguards its contents against fire, wind, weather or thieves. It is positively fireproof. No wood. Absolutely weatherproof, too. Double thick joints keep out wind and rain. Sure proof against thieves and vandals. Windows are bar-locked. Doors have ingenious safety bars. Expansion joints take care of changes in temperature. Successfully used in any climate. Absolutely practical. Perfect in every detail. Write for catalog, stating name and model number of your car, or for what other purpose you need a building, so we can also advise size of building best suited to your needs. Immediate shipments from stock. Freight paid east of Rocky Mountains.

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is a huge following-surface biplane, consisting of two sets of biplanes mounted upon a single hydroplane hull, in which there are two 230 horse-power, six-cylinder motors geared by chains to drive a single propeller. This huge machine has a spread of nearly eighty feet and weighs empty 9,460 pounds. It is, therefore, comparable in size and weight to the Maxim machine which was built and flown in England in 1891, and which, had it been mounted upon floats and tried on the water as it was the intention of Mr. Maxim's chief helper, Henry A. House, to do, would have undoubtedly flown without mishap instead of being quickly smashed as it was when it ripped up the holding-down guard rail of the track upon which it was tried. This machine, by the way, had 363 horse-power, consisting of a steam engine and double propellers.

While neither of these two large hydro-aeroplanes just mentioned has been designed with the idea of cutting down the head resistance, there is no doubt that with all the experience obtained with dirigible balloons and aeroplanes having streamline bodies, it will be possible to design a machine having very much less head resistance than the usual weight-carrying biplane apparatus of the present day.

Obtaining Power from a Testing Plant

(Concluded from page 408.)

during the test for power purposes.

The tractors are belt connected to shunt-wound generators, running in parallel. This makes a very flexible outfit, as each engine load can be regulated by the rheostat of its generator and the load can be increased from small to full load as the engine warms up and works into the best condition. The fuel and water supply pipes run to each engine, making it an easy matter to keep the engine tanks filled. Each fuel pipe is provided with an individual meter. Suitable stacks are arranged for the exhaust gases, and easily adjusted blocks under the drivers hold the tractor in the belt.

The changing of a tested tractor is a matter of five minutes. Fuel and water pipes are removed from tanks, blocks knocked loose and the stack raised. The tractor is then run ahead and the belt removed. The operations are reversed when running a newly constructed machine into belt.

The dynamos are shunt-wound, direct-current 250-volt machines. This type is used because it is automatic, to an extent, in regulation. If there is any trouble with an engine the shunt machine can motor, thus often saving the trouble of starting an engine because of dirty plugs or some minor trouble. Also in case it is desired to so do, the rheostat can be adjusted to carry a very small load. Further, engines of 30, 40, 60 and 80 horse-power are often being tested at one time. This condition would be quite difficult to handle with any other type of dynamo.

All wires are run under the floor in conduits from each machine to the back of switchboard.

A balance set is used, as the plant furnishes current for both light and power. The balance set is started by means of two switches and a rheostat, the field being permanently connected to the busbars. The balance set consists of two 30-kilo-watt generators. The shafts are flexibly connected, and there has been no mechanical trouble whatever. The overload capacity is large, as a number of large motors have been constructed that run with 220-volt field and 110 to 220-volt armature current.

The power generated is used for running a machine shop, two foundries and various machines and lights about the plant. Two 20 and two 10-ton cranes, two 50 horse-power air compressors and large heating fan motors are some of the heavier motor loads. These machines and lights, of course, cause a great variation in the load, frequently varying it 100 per cent within a short time.

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