VOL. V ✦ No. 1-2

JULY ✦ AUG. 1931

The SCOVILL STANDARD

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"WHEN WE SPEAK
OF A TENTH....."

JUL 22 1931
L. C. SANDERSON

SCOVILL

Editorial:

"Metal Prescriptions"

The story is told of a pharmacist who filled a prescription for a customer once, and then saw his customer no more for a long time. Forty years later the same man returned to the pharmacist and asked him if he could compound once more the original prescription brought in by him nearly a half-century before. The druggist could, and did.

Well, forty years is a long time when considered as a portion of the life-span of the average man. But it is less than one-third of the time during which Scovill Manufacturing Company has filled the metal prescriptions of its host of customers.

Formulae and prescriptions a hundred or more years old can be filled by Scovill. Kept securely in a vault at the Main Plant are thousands of "metal prescriptions," each of which was specifically planned to meet some definite need.

And never was a pharmaceutical prescription more carefully compounded than is a metal order filled at Scovill. A specification sheet accompanies each furnace charge: exactly so much of this metal, exactly so much of that metal. It is rigidly adhered to by the men who make up the charge, and carefully checked by men in authority. Then, throughout its course, from furnace to shipping room, every step in production is scientifically supervised. Scovill-made metal is correct.

That's why Scovill metal is specified by so many manufacturers who must *be sure* of the properties of their raw material; that's why Scovill manufactured parts and products are used by manufacturers who must depend upon definite action, definite results.

SCOVILL **WHAT IS MORE ENDURING THAN BRASS** SCOVILL

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THE SCOVILL STANDARD

A Magazine Exemplifying 129 Years of New England Manufacturing Ideals

Published by Scovill Manufacturing Company, Waterbury, Conn.

VOLUME FIVE | JULY-AUGUST, 1931 | NUMBER ONE-TWO

A BRASS BOAT AND A "PEWTER MUG"

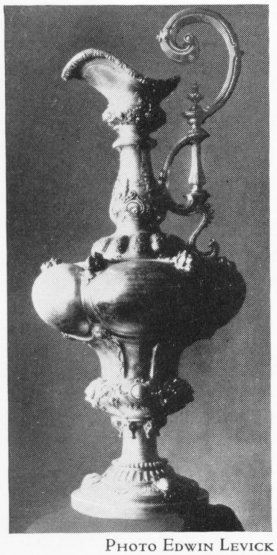


PHOTO EDWIN LEVICK

The America's cup—which Sir Thomas Lipton has been pleased to call "that pewter mug."

THE races of last summer between the cup defender Enterprise and Sir Thomas Lipton's challenger, Shamrock V, for what Sir Thomas has referred to as "that pewter mug"—the America's cup—bring to mind another race for the same cup in the 19th century. It is one of the races between the challenger, Valkyrie II, and the defender, Vigilant. The defender was the first large racing sloop ever built of bronze plates—a brass boat, it was called by yachting enthusiasts of the period.

At 12:27 P. M. on October 13th—Friday the 13th—1893, the starter's pistol sent Vigilant and Valkyrie II across the line to begin what was probably the most thrilling of all the America's cup races. Four times Valkyrie II and the American defender Vigilant had crossed the line.

THE FIRST RACE

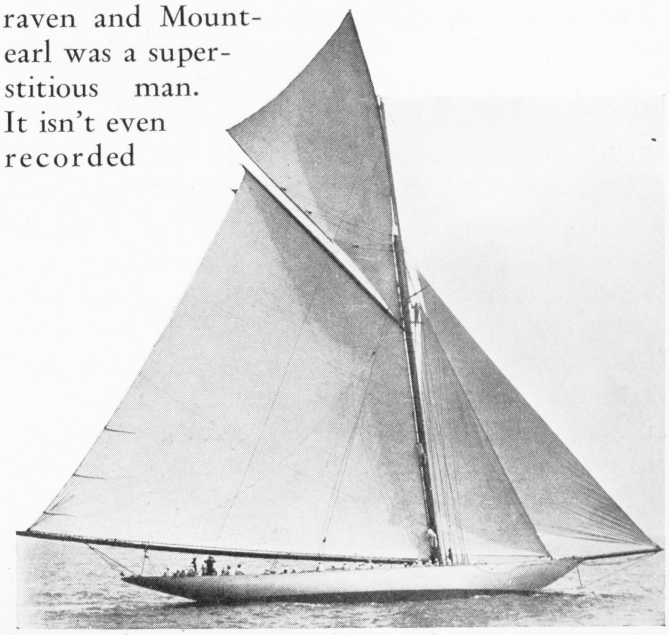
The first race, October 5, had been called off when the wind failed, with Valkyrie 26 minutes ahead. Vigilant had won the second race, October 7, by seven minutes, 36 seconds. The Vigilant had won the third race, October 9, by 12 minutes, 23 seconds. The fourth race, October 11, had been called off again when the wind failed, after Valkyrie had led half-way around.

Since, under the rules, one day must intervene before the next race when one had been called off, the deciding race—as far as Vigilant was concerned—would be sailed on a Friday the 13th.

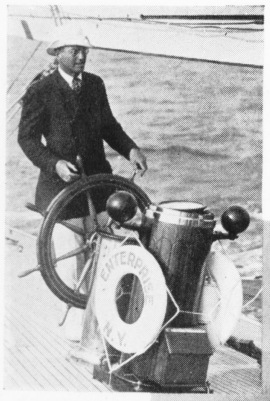
It is not hard to picture Wyndham Thomas Wyndham-Quinn, Earl of Dunraven, aboard his sloop Valkyrie, in the gathering darkness twenty miles at sea off Sandy Hook when the fourth race was called off at nightfall. Probably he stroked his black moustache thoughtfully as his eye wandered up the calendar column, and stopped. Perhaps his fine Celtic eyebrows elevated. The day for the next race was Friday, 13th.

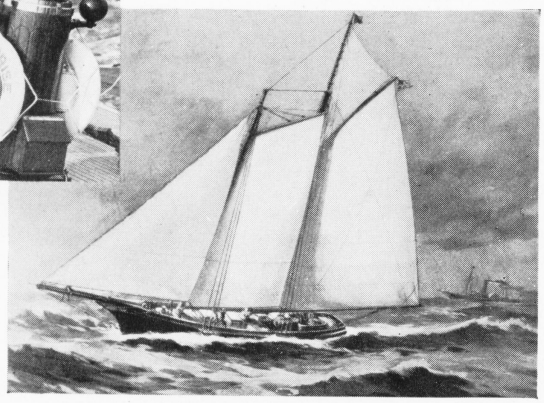
A SUPERSTITIOUS MAN?

It isn't recorded that the fourth Earl of Dunraven and Mountearl was a superstitious man. It isn't even recorded



Vigilant, first large racing sloop to be built of bronze plates. She successfully defended the "pewter mug" in 1893.





Commodore Vanderbilt, skipper of the Enterprise, photographed last summer during a practice run. Below, the America, first winner of the "pewter mug."

PHOTOS EDWIN LEVICK

that he said "Gad" as he pushed the calendar aside, or that he hastened his steward below for a reassuring tray of whisky and soda. Had he foreseen, however, what the future held that night, October 11, 1893, as a greasy tug towed his racing sloop back to Sandy Hook, he probably would have headed for England at once.

Anything might happen on a Friday the 13th. Dunraven prayed for a wind and got it. That fateful Friday came and storm flags went up for a gale. "Luckily it didn't come," recounts Herbert L. Stone in his *America's Cup Races,* "though many of the swivel-chair fleet and the parlor yachtsmen thought it was a gale they found outside Sandy Hook."

That Friday of sailing began properly. Just before the start there was a sagging of canvas on the Valkyrie. The sheave of the throat halyard had come away. The crew jumped to the job of removing the mainsail and repairing it on deck.

In the meantime the crew of Vigilant were laboring on a heaving deck to dislodge a recalcitrant centerboard. Finally the Americans managed to get their bronzed board partly pried loose and down 11 feet, and the race began. Aboard Vigilant sailed C. Oliver Iselin, August Belmont, O. H. Belmont and other New York millionaires. On Valkyrie sailed an equally notable group including the Marquis of Ormonde and Lord Wolverton.

"Both boats," recounts Stone in his *America's Cup Races,* "came down on the line trimmed flat for the hard 15-mile thresh to windward. The wind, due east, was blowing 25 miles an hour and soon increased to 35 miles. The two yachts raced away with lee rails buried. At the end of 40 minutes Valkyrie was about 200 yards ahead and 100 yards to windward."

Valkyrie rounded the stake raft on a port tack at 2:37 P. M., after two hours of drenching work. A thoroughly thrilled eyewitness recounts the turn thus:

"The cutter shot through the lee of the bobbing flag, came up with every thread flapping, filled away on the port tack, slashed the waves apart, rose on a huge roller to shake the spray from her bow and then up went her helm, away sagged the main boom over the rail, and the turn was done."

She had outsailed the American yacht all the way, pointing higher and footing at least as fast. The Vigilant was two minutes and 51 seconds behind in time, a third of a mile behind in space.

At last Vigilant rounded the flag and faced the hard task of "making up some third of a mile in a run down the wind, with the cutter going like a scared cat," as Stone puts it. And now the 75 men stretched along the weather rail of Vigilant to form a human ballast on the thresh to the windward, jumped to a spectacular task. It

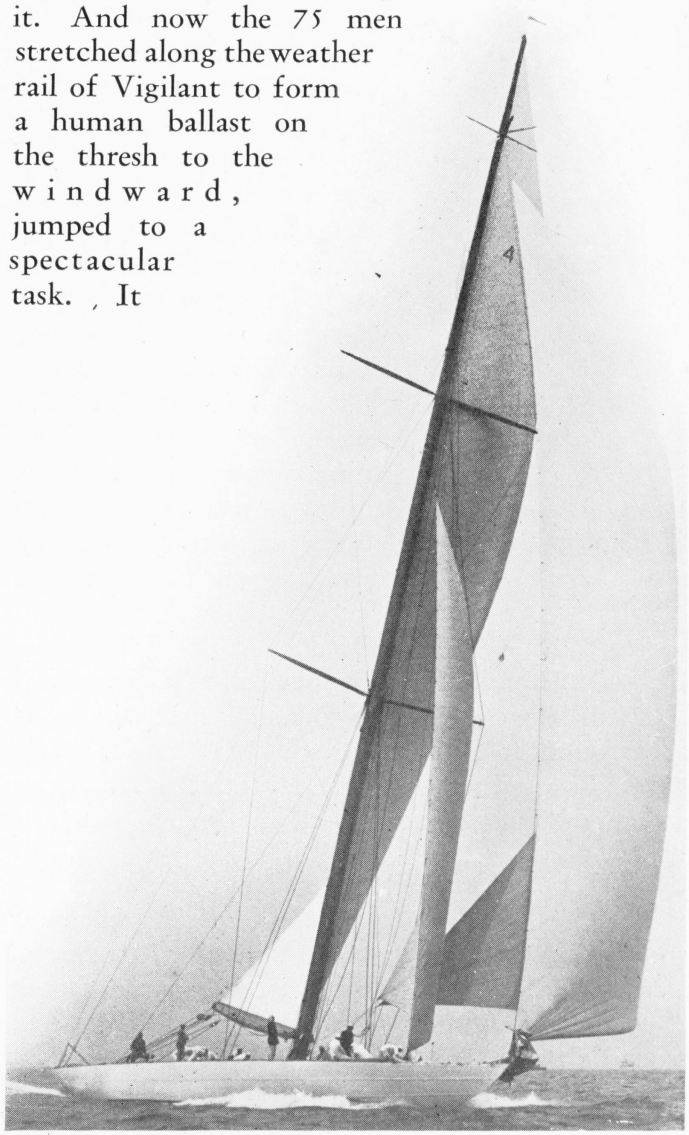
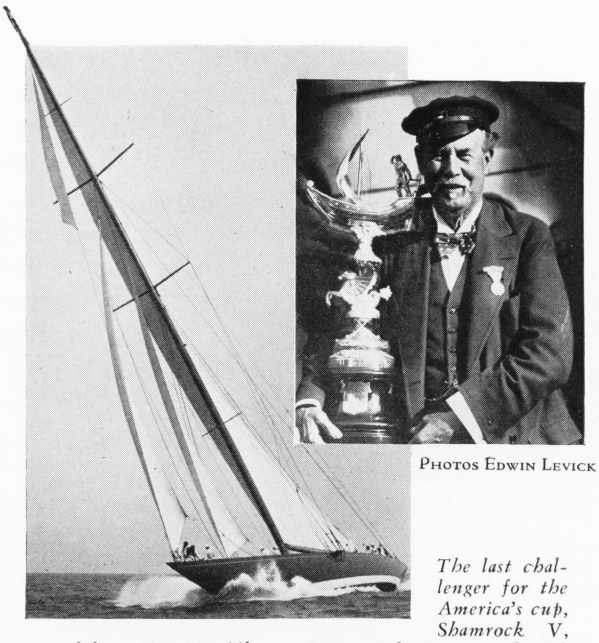


PHOTO EDWIN LEVICK

The Enterprise, last winner of the America's cup.

was sailsetting such as had never before been witnessed in a yachting race.

The spinnaker was sent up in stops in a long compact rope, was broken out to port and sheeted home. Now up went a balloon jib-topsail in stops. It fouled in the hoisting and the excursion steamer watchers saw a seaman, a dangling speck in a tumbling ocean, climb to the topmast head, thence down the topmast stay, to clear the cloth. Out along the boom went another seaman to cut the reef points. A gantline attached to the masthead was his only safety.



PHOTOS EDWIN LEVICK

The last challenger for the America's cup, Shamrock V, and her owner, Sir Thomas Lipton, who is pictured with the consolation cup recently given him.

"Meanwhile," wrote W. P. Stephens in American Yachting, "a man at the topmast head was lashing the working topsail, clearing the topsail halyard and sending it down to deck, while another man at the gaff end was doing the same with the topsail sheet. With the working topsail still in place, the whole mainsail was shaken out, the halyards sweated up, and the small club-topsail sent aloft."

It was a dint of work, Stephens assured his landlubber readers, "such as was never before witnessed in yachting."

At 2:55 P. M. the mainsail was swayed up and belayed and the club-topsail, sent up in stops to the windward long before, was sheeted home at 3:30 P. M. Under a mountain of rounded and hardened canvas, the Vigilant raced after the flying Valkyrie.

(Continued on page 19)

THE "SHOCK TROOPS" OF INDUSTRY

No. 2—THE LABORATORY

CLOSELY akin to industry's growing desire to produce better merchandise, thoroughly tested and proven, is the desire for newer—and better—products and processes. From this particular viewpoint the laboratory and the chemist are the "Shock Troops" which bear the brunt of the industrial attack upon progress.

There is a story told that years ago, in Berlin, a group of learned scientific men sitting around the dinner table became fanciful and expansive, and asked one another to name a perfectly legitimate problem which Science *could not hope* to solve.

They tried, one after another. And at last one of them, who doubtless was both serious and profound, proposed the composition of the stars, which all agreed would forever remain a challenge.

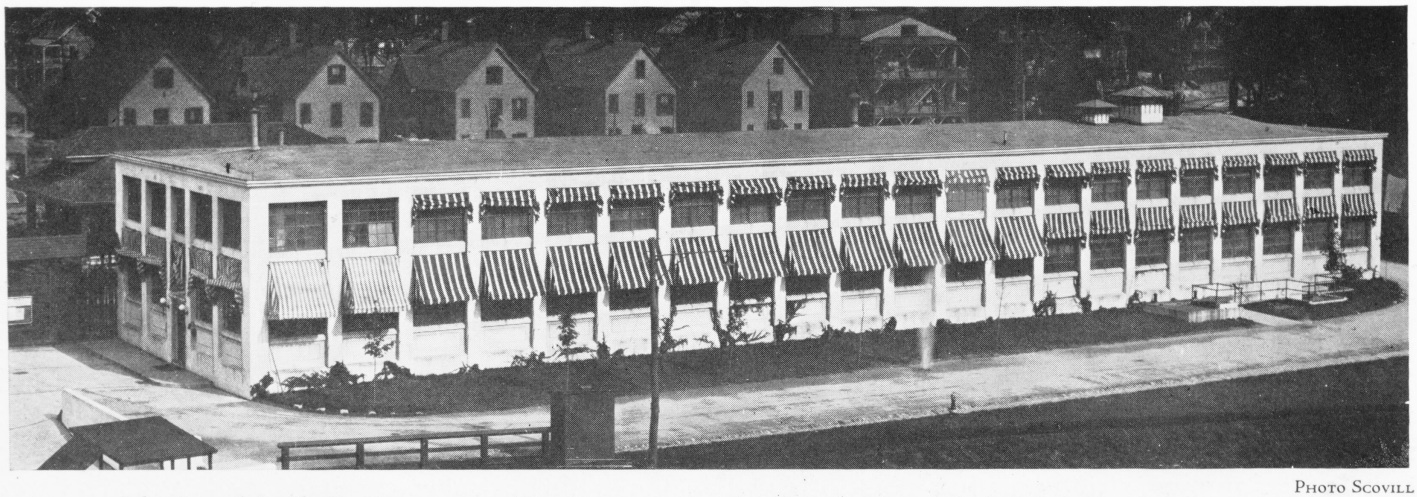


PHOTO SCOVILL

Laboratory of Scovill Manufacturing Company, where research and testing "prove" Scovill products before they are shipped.

But two years later Bunsen and Kirchoff, by inventing the spectroscope, made it possible for us to know at least as much about the composition of the stars as we know about the inner composition of the earth!

This incident is cited merely by way of showing that to Science, at least, nothing is impossible. Obviously we cannot hope in this article to summarize the things Industrial Science has accomplished to date. That would require many volumes, which would be out of date before they were off the press. It is our intention, however, to relate a few of the interesting incidents where the laboratory has come to the aid of companies and industries, not only through the constant research and checking of materials and products, but in many cases by actually saving the industry or company through the perfection of new processes and products.

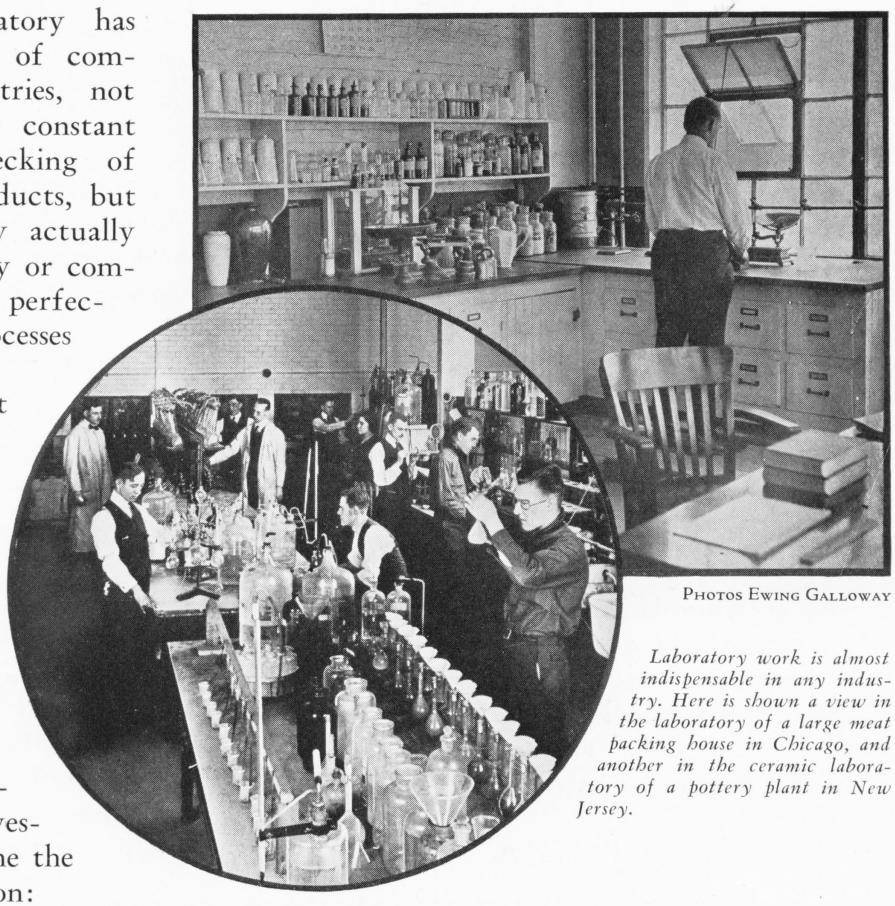
Once a Vermont manufacturer engaged with making water paint, found that his paints did not "stick," because of course, they were soluble in water. He turned to the laboratory. After extensive research and investigation, back came the following suggestion:

"You are in New England's dairy land. Skim and sour milk are plentiful there. Why not use casein?"

He wanted to know how it could be done, so Science went to work. The result was the Casein Company of America. This manufacturer got its start in making plastic compounds opportunely. For today the demand for plastic compounds is approaching 40,000,000 pounds a year—high-priced and invaluable pounds at that.

In Louisiana one of the largest lumber mills in the world rebelled at the sheer labor and cost of sending up in smoke and otherwise getting rid of ever-increasing piles, already mountainous, of sawdust and other waste of wayside materials. The chemist went to work. By and by this company, to its own surprise, started operating its own paper mill, producing around 500 tons of paper a day, making more money from the sale of its paper than from the sale of its lumber. It lead the way in establishing a wholly new industry of vast importance to the renaissance of the South.

In the laboratories of an Erie, Pennsylvania, paper manufacturer ceaseless vigil is carried on day and night. Virgin raw material is carefully selected. Hourly the pulp is checked for quality, strength, color, cleanliness; the finished sheet is tested for writing qualities, finish, tearing and tensile strength, folding, fastness to light, two-sidedness, color, and weight.



PHOTOS EWING GALLOWAY

Laboratory work is almost indispensable in any industry. Here is shown a view in the laboratory of a large meat packing house in Chicago, and another in the ceramic laboratory of a pottery plant in New Jersey.

Why this endless testing? Simply because every sheet of its paper must live up to the company's reputation. It must have the surface for clean, fast, easy typing, printing and handwriting. It must withstand rough handling. It must have the appearance, the "feel," that add importance to the written message so frequent in today's business.

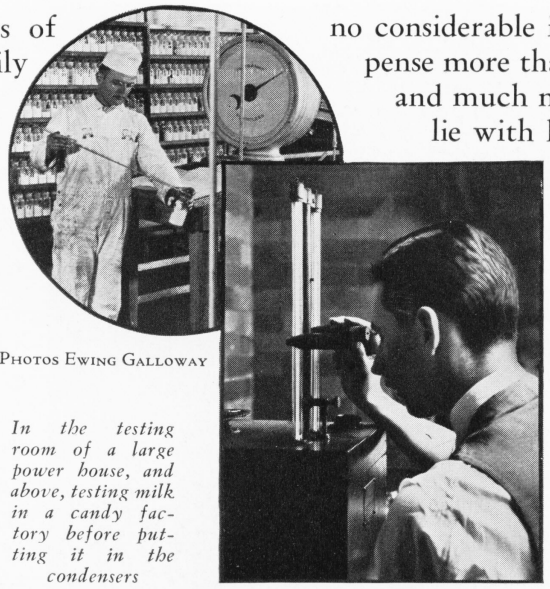
And it calls upon the laboratory to insure these qualities!

A kindred illustration of chemical aid deals with the distant Hawaiian Islands.

Pineapples and sugar-cane are the major crops in this tropical climate. But weeds, if given half a chance, cut the maturity almost overnight in the sugar-cane and pineapple beds and the labor of keeping them "down" used to be almost prohibitive. It isn't any more, because the planters turned to the laboratory.

Chemists took bagasse, the waste fibre left after the milling of sugar-cane, and made a mulch paper duly impregnated with asphalt. When this paper

was laid down between the rows of sugar-cane plants, they grew readily through it leaving the weeds behind. Also when this paper was used the moisture in the fields did not dry up in the light of one long stare from the noonday sun. Sugar plantations produced nearly a third more sugar and the pineapple growers virtually doubled their crops. Whole miles of mulch paper are used in Hawaii and a new local industry is thriving.



PHOTOS EWING GALLOWAY

In the testing room of a large power house, and above, testing milk in a candy factory before putting it in the condensers

In the paint and varnish industry, which for generations has been generally deemed extremely conservative, the advent of lacquers caused one company to pass its dividends for the first time. This company sought chemical aid. Chemists worked out the formulae of a wholly new line of lacquers. Then, in short order, this old-line company was back on its feet and paid its yearly dividend. Now with no considerable increase in merchandising expense more than half of its total products—and much more than half of its profits—lie with lacquers.

Sometimes the economies recommended by the laboratory and chemist have to do with waste products. Sometimes they have to do with processes. Sometimes they have to do with machines, because it is a singular thing that frequently even an otherwise up-to-date manufacturing concern may be totally unaware that the machines it is using for a given purpose are not nearly so efficient as machines used in another industry for a like purpose or machines that could readily be adapted to that purpose. And often these recommendations have to do with material, but in every case the laboratory and the chemist have proved

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"WHEN WE SPEAK OF A TENTH ....."

By CHRISTOPHER MORLEY

I SUPPOSE nothing is so uneven and disorderly as Time. We have known hours that masqueraded as minutes and vice versa. A long summer day, measured only by the hairspring pulsation of the mind, can seem almost infinity. A poet once said, "A day is a baby year, and it looks like its father."

But what can be done to regulate and discipline so spiritual a matter the watch-engineers of the Hamilton Watch Company of Lancaster, Penna., seem to have done.

I was looking at a large-scale plan of a watch. It was an up-and-down section just about the proportions of a Pullman car but a hundred times larger than the actual watch.

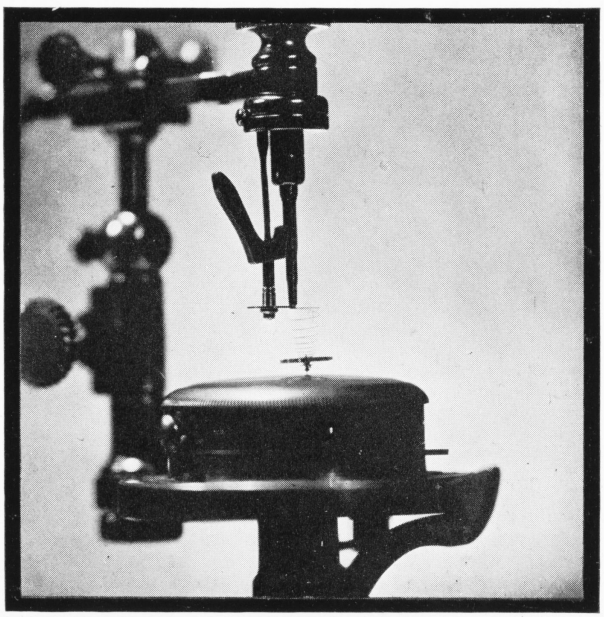


PHOTO KEPPLER

"The hairspring is the mother; she controls it. . . ."

Have you any idea what the inside of a watch looks like? Its up-and-down blue print is like an architect's drawing of an apartment house. In each of these little wafers of space lives a family of wheels or spindles or jewels going about its intricate affairs.

"Gosh," I said, "those little fellows don't have much leeway, do they?"

"We have to calculate to a tenth," said some one.

A tenth of an inch, I thought; yes, that's working rather fine. Then the Research Engineer said something that ruined me for the day.

"When we speak of a tenth we mean a tenth of a thousandth. Those clearances"

"Whenever there is impact or friction, it is lessened by jewels (another analogy for Father to meditate)."

PHOTO KEPPLER

(he pointed to the plan) "are 55 ten-thousandths of an inch."

That large-scale plan was dated December, 1929. That was when they decided to make that particular new model. It won't be on the market until autumn, 1931. That gives an idea of how long it takes to design, perfect and test a high-grade watch, from Model Room to wrist or pocket.

In a darkened corner of the Model Room they have a projector which throws up on a screen, 300 times enlarged, the individual parts in motion. I saw the pallet oscillating, controlling the escapement wheel. To and fro, like a mother rocking her baby from one knee to the other, the pallet checks and then releases the swan's-neck teeth of the wheel—letting Time "escape," five ticks a second. A little family picture! In fact they speak of a watch being "familied" when the various major parts are put together for time-keeping.

A watch is just a tiny power-plant but it has its domestic analogies. The mainspring is the Father; he provides the power. The hairspring is the Mother; she controls it. There is something deliciously feminine about those hairsprings, dainty as the tiny curl of a single brunette strand. Extraordinary little tendril, it pulses in and out like breath. A Hamilton hairspring must vibrate 18,000 times an hour. Not 18,001 or 17,999. How few wives would be so exactly computable?

On each knee of the pallet, where the mother rocks the baby seconds, she wears a blue sapphire (the old symbol of fidelity). Wherever there is impact or friction it is lessened by jewels (another analogy for Father to meditate).

I had to struggle hard not to find out too much about innumerable fascinating details; I wanted to keep a mental picture of the story as a whole. Fortunately if you go through the works in logical order you begin with operations comparatively visible to the naked eye. If you began at once with some of the more fantastic oddities of Lilliput your mind would quit in disbelief. The foundation-piece of a watch is called the pillar-plate, and you encounter first such relatively believable miracles as the multiple drill which puts in this plate (at one go) 28 holes of 6 different diameters; or the profiling machine which gouges out the recesses (of varying depths and shapes, and each

CHRISTOPHER MORLEY

Christopher Morley, American essayist, columnist and writer of fiction, was born in 1890. Some of his best-known books are *Parnassus on Wheels, The Haunted Bookshop, Shandygaff, Where the Blue Begins,* and *Plum Pudding.*

"When We Speak of a Tenth . . ." is a story written by the noted author in which he describes a trip through the Hamilton Watch Company factory, in Lancaster, Pa., and published in booklet form by the company. The story is so skillfully and delicately handled that the editor of THE SCOVILL STANDARD has decided to publish it, with permission of the company, just as written by Mr. Morley, except that it has been slightly shortened.

Readers of THE SCOVILL STANDARD will be interested to know that many of the parts mentioned in the story are made of Scovill metal. Hamilton Watch Company purchases from Scovill the following metal for watch parts:

Copper: round wire for dial feet, and strip for enamel dial blanks; brass: round wire for jewel settings and screws, and strip for dial blanks and wheels; hardware bronze: for dial blanks and wheels; gilding metal for inlaid enamel dial blanks; 12% nickel silver: round wire for steady pins, and strip for plates and bridges; phosphor bronze: not used in watch parts, but used as laps in cutting tools.

The outstanding one of the above alloys from the standpoint of its importance to the watch is the 12% nickel silver strips used for plates and bridges which are the frame work or skeleton of the watch movement itself.

one correct for that clearance of a tenth . . .) and does in one operation what used to require 18. They are so high-spirited and proud in Lancaster, particularly proud of the fact that they make their own gauges, precision tools and machinery.

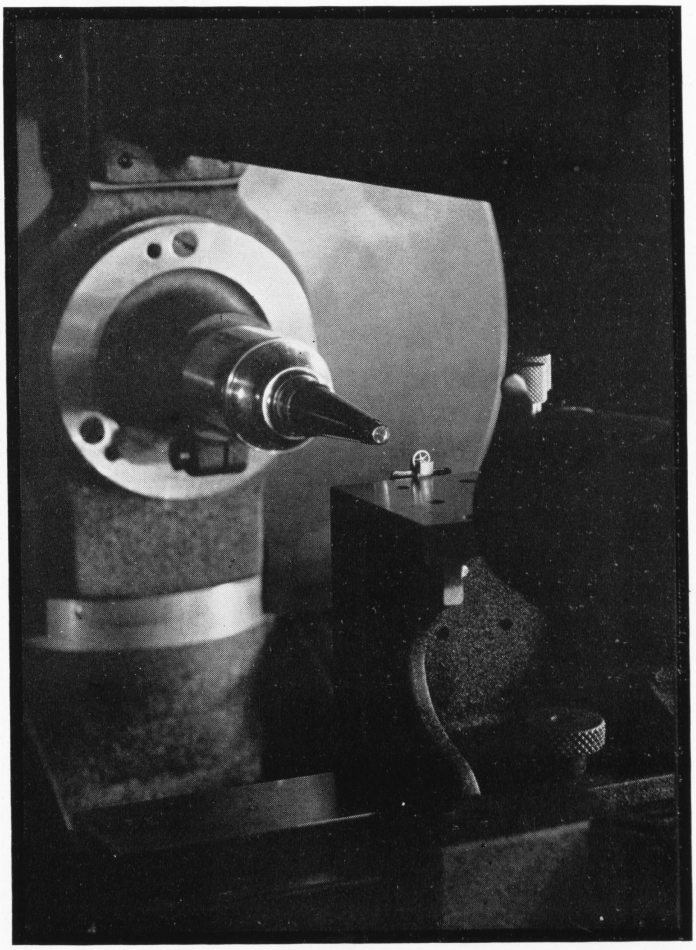
". . . tiny wheels like infant starfish"

In the Gilding Room (picturesquely like a great kitchen, with steaming cauldrons alluringly marked Red Gold and White Gold) the pillar-plates are nickled; then damaskeened, which puts on the metal that wavy water-mark of little silvery stripes. It is done with an ivory buffer. I wonder if this damaskeening (nice old romantic word, going all the way back to Saracen swordsmen) has any practical value. Said the Damaskeening Foreman, "Its just to remind people that a watch is a thing of beauty."

The whole wheel-system of a watch is called the Train. The long hall where the Train Department works is a huge spider web with its cross-weave of belting. Here is some one truing tiny brass wheels. They are held in delicate calipers and he spins them with prudent finger, conning through an eyeglass. He is dissatisfied with a small twirler that looks to me perfectly true. Apparently it fibs just a little, and he is fixing it. "They dursent be dished up like a saucer," he observes.

On chairs that roll to and fro on a little track girls are watching machines that chew midget cogs on gold wheels in a spray of oil. Then they (the wheels) lie in a tin of benzine to recuperate. Now we begin to see some of the real miniatures. "Pallet arbors" like a fairy's rolling pin (they told me you can put 4,000 of these on a dime, but I had nothing less than a quarter). They look like lice as they

PHOTO KEPPLER

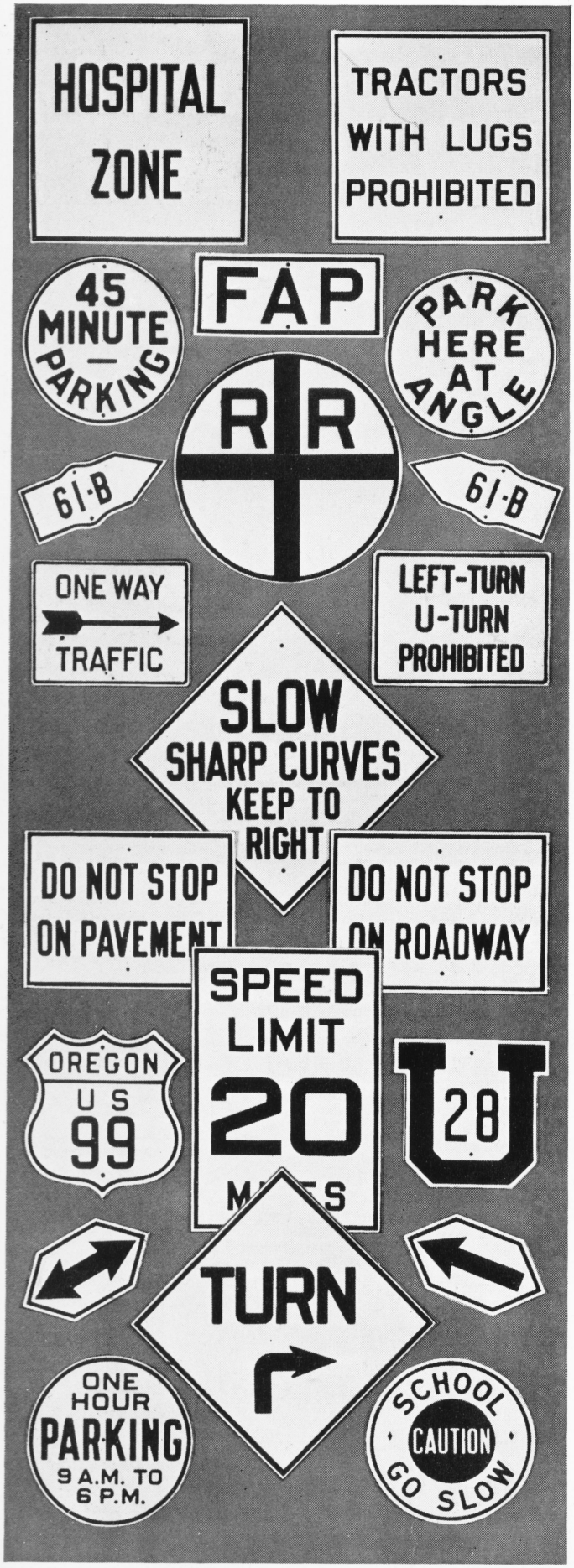


swarm in a pan, clotted together in oil like spawn. Each is about the size of an i in this type, perfectly modelled out of steel with a spindle on the end. Perhaps the balance staff is more exciting still; it's a little bigger (like a capital I) but a much more complicated shape. The cutting machinery cheeses them into shape and they swim off in a pour of

(Continued on page 19)

PHOTO AERO SERVICE CORP.

The Lincoln Highway runs right past the Hamilton Watch Factory—the very small wheels of its watches travel the mysterious highway of Time.



A few of the highway markers and traffic signs which Irwin-Hodson Company of Portland, Oregon, have made. Hardly anyone needs to be reminded of the safety, the convenience, and the comfort which these markers afford the motoring people of this country.

HIGHWAY MARKER

By F. H. Bronner

Not long ago a story in the Scovill Standard told its readers of the great strides made in marking the highways that criss-cross throughout this country. Highway route numbers, stop signs, slow signs, curves, hills, hospitals, turns, railroad crossings, narrow bridges, speed limits, and various other road warnings are some of the valuable information imparted to motorists by the metal markers which guide them along the highways. Improved roads, adequately marked by sturdy, visible signs, have made our national, state, and local roadways a regular tourists' paradise.

Now comes the story of one of the great headquarters for these metal markers, the story of The Irwin-Hodson Company, Portland, Oregon, home of highway signs.

Actually, although the embossed steel sign department is an active one doing a great volume of business each year, it is but one division of this company which was founded before the era of the automobile. To go back to the beginning, one must look beyond the turn of the century—to 1892.

On August 27, 1892, The Irwin-Hodson Company was organized. Its business was printing, book binding and paper ruling. Later a steel die and copper plate division was installed. Next, the company installed its own lithographing plant; and in the fall of 1904 the first unit of its marking device, embossed steel sign, and license plate departments was begun.

From Humble Beginnings

When The Irwin-Hodson Company was first organized, the floor space covered by the plant was about 7,500 feet. Later on this was increased to 12,500 square feet. Another increase, about 1904, brought the total number of square feet up to 17,500. Today the floor space covered by the plant, offices and stores of the company is approximately 50,000 square feet.

To give the actual growth of the employees of the company, it may be stated that the first pay-roll carried the names of nine employees. The pay-roll for the present staff is about 150. Traveling men cover the states of Oregon, Washington, Idaho, Montana, Utah, Nevada, Northern California and Alaska and the company is shipping its products to the Atlantic Coast and along the Gulf Seaboard, as well as into Dominion of Canada.

EADQUARTERS

ging Director, The Irwin-Hodson Company

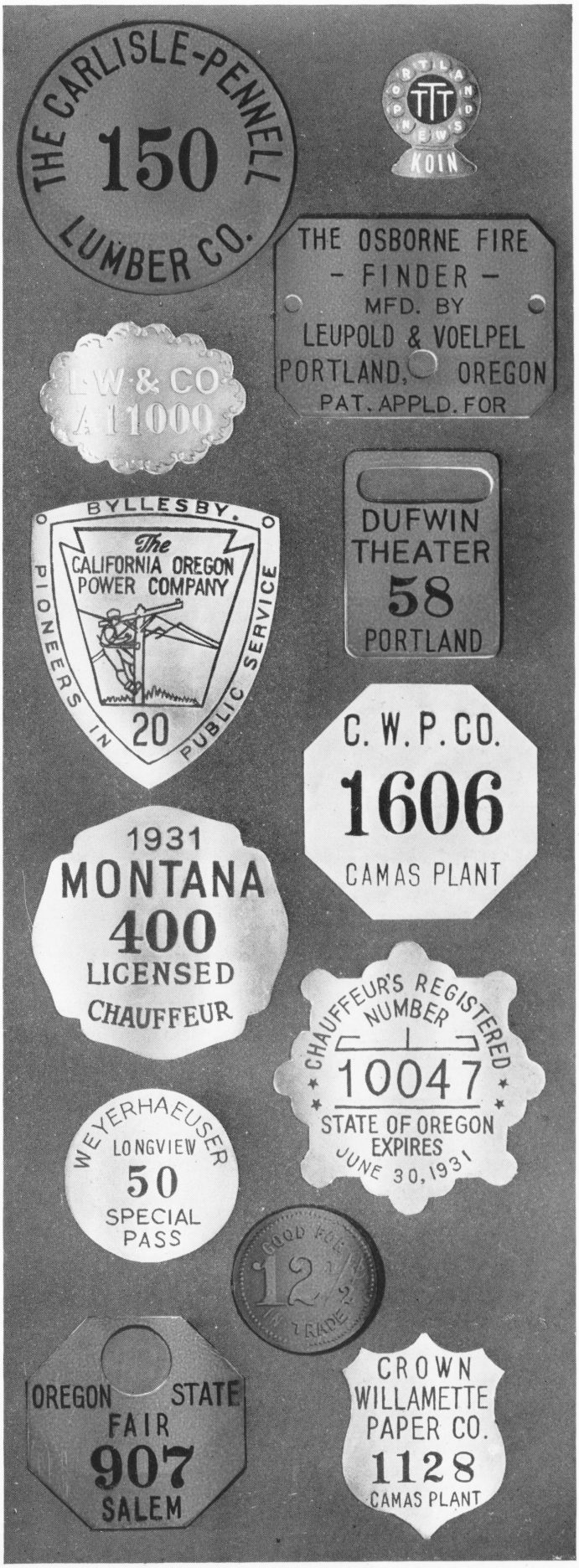
The license plate and embossed steel sign department of The Irwin-Hodson Company was installed in 1915. At that period automotive manufacturers of this country had already begun the mass production which was later to flood our country and other countries of the world with automobiles. Some idea, however, of the rapidly increasing production in automobiles may be gathered from the fact that in 1915 the Irwin-Hodson Company handled approximately 45,000 pieces of steel in the manufacture of license plates and signs. Last year the company handled approximately 1,600,000 pieces of steel for the same purpose.

As stated before, however, license plates and signs are not the only things made by this company. County supplies, lithographing, steel die embossing, stationery, and office furniture are some of the lines manufactured. There are many other items, manufactured of brass, which includes etched plates, etched brass signs, trade checks, tool checks, time checks, key checks, soap dies—in fact almost anything in the way of seals and badges and signs, as well as name plates, ticket punches, and various other machines for perforating, canceling and numbering are manufactured by this company and distributed from Portland, Oregon, to a great part of the United States.

Scovill Brass Used

The Irwin-Hodson Company uses Scovill brass wherever possible, because of the satisfaction which this product has always given it. Since 1904 when the first unit of the marking device, embossed steel sign and license plate department was installed, brass has been purchased from Scovill. The first purchases were stencil brass and were very small in quantity, but it has developed a great deal at the present time and in addition to Scovill brass the company also uses Scovill Gold and Scovill nickel silver for badges such as police officers' badges, industrial badges, chauffeurs' badges, etc. All the chauffeur badges used by the State of Oregon, State of Idaho, State of Montana, and State of Utah, are manufactured by The Irwin-Hodson Company from Scovill nickel silver.

One of the main reasons we have always used Scovill brass is that we have always liked, in particular, Scovill soft brass. It is uniform and always seems to dip about the same color, and we have always found the service very good. Our contact



Some examples of tokens, badges, etc., made in brass, nickel silver, and Scovill Gold. The 12½¢, Carlisle-Pennell, Osborne, Dufwin and Oregon State Fair were made of brass. TTT Koin was of Scovill Gold and all the rest were of nickel silver.

with Scovill has always been very pleasant, and the personnel of Scovill's west coast representative has been such as to make us entirely satisfied with our association with the Scovill Manufacturing Company.

In our catalogues are illustrated many articles made from brass, nickel silver and Scovill Gold, and each of these is from metals furnished us by Scovill. On page 8 of this issue of the SCOVILL STANDARD are shown a few of the highway signs made by this company; and on page 9 some of the items made from Scovill metals.

Of especial interest to the readers of this magazine will be a few words from the pages of our catalogue describing bronze signs:

"Bronze, even in the early ages, always excited much awe, reverence and admiration. The wisdom of this esteem is substantiated in modern times, for bronze is now chosen in many lines of art, not only for its rich coloring, but also because of its permanence and durability. Age always improves the appearance of anything made of bronze. Therefore, nothing could be used for a memorial tablet or a sign that would better perpetuate the memory of the name or names of those for whom the memorial is erected, or add more significance to a sign carrying the name of a firm."

FREDERICK HENRY BRONNER

Frederick Henry Bronner was born in Kansas City, Missouri, October 29, 1886. In 1898 he entered the employ of the Charles E. Potter Company as an apprentice. From 1902 to 1904 he was in the employ of Busby & Lesh Company.

On March 1, 1904, he entered the employ of The Irwin-Hodson Company, installing their first equipment for the manufacture of rubber stamps and seals, since which time, as explained in this article, he has added the different Departments referred to.

PATENTS, THE RECORD OF MAN'S ACHIEVEMENTS

Two hundred and ninety years ago, when the first code of laws was established in New England, recognition was given to the inventor. In the Massachusetts "Body of Liberties," compiled by Nathaniel Ward and established by the Massachusetts General Court in December 1641, was the following:

> "No monopolies shall be granted or allowed amongst us, but of such new Inventions that are profitable to the Countrie, and that for a short time."

This was, in effect, a sort of guarantee of the rights of an inventor, though our present patent law was not established until 1790, more than a hundred years later.

It is interesting to note a point of similarity in the paragraph in the "Body of Liberties" and the present law. In the former it is expressly stated that such new inventions must be profitable to the country, and today an invention, to be protected by a patent, must not only be capable of being used but its use must confer a benefit on mankind. It may be assumed that "profitable to the countrie" meant for the common good of the colonists.

When the patent law was first enacted it was intended to promote the industrial development of the country. The act of 1790 secured to the inventor of "any useful art, manufacture, engine, machine or device, or any improvement therein not before known or used," exclusive monopoly of the sale of such patent for a term not exceeding fourteen years. Thus, although an inventor has no natural rights to the exclusive control of his invention, this right is given by law as a reward for his ingenuity, and as an inducement to encourage all to make discoveries. The government, in giving a patent, enters into a contract with the inventor, that in return for giving his discovery to the public at the end of a certain

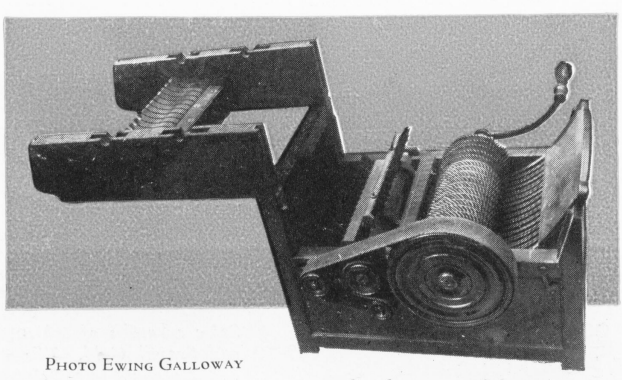


PHOTO EWING GALLOWAY

Whitney's Cotton Gin, an immediately successful invention patented in 1794.

period (now seventeen years) the government gives him the exclusive control of his patent during that time and protects him to this exclusive right against all others.

The first patent issued by the Patent Office was for the making of potash for the manufacture of soap. Among the first to apply for a patent monopoly was John Fitch, the designer of a steam engine adapted to the propelling of a boat. The patent was allowed, and Fitch's steamboat, (illustrated below) propelled by paddles, made her first voyage on the Delaware in 1790. Regular trips were made from Philadelphia to Trenton, Wilmington, Gray's Ferry and return for four months of that year, but the experiment was soon abandoned.

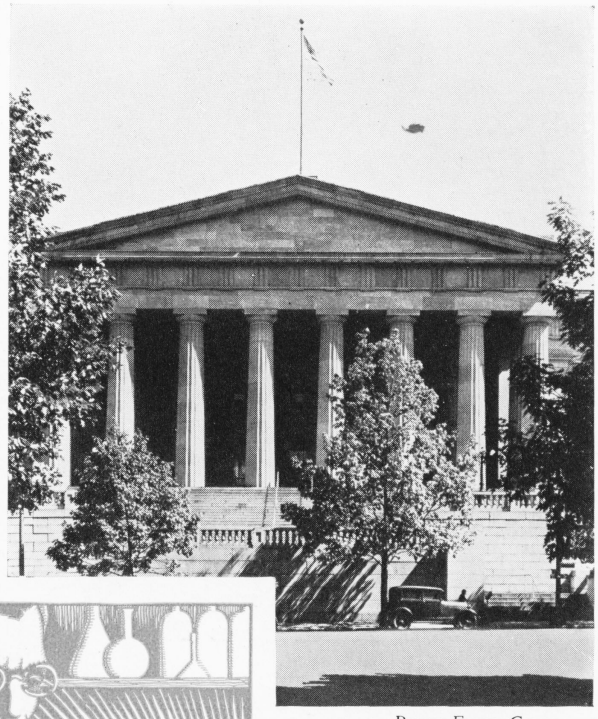


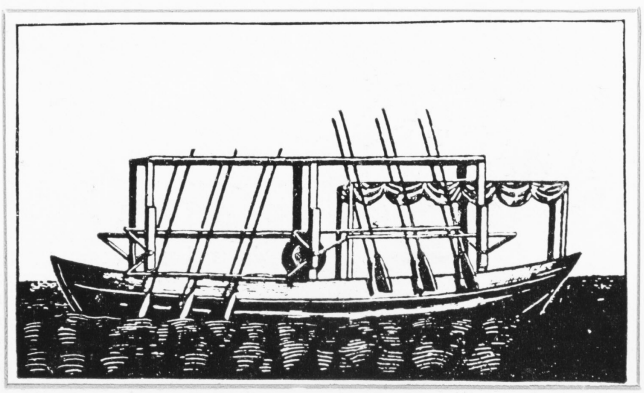
PHOTO EWING GALLOWAY

The Patent Office in Washington, D. C., where nearly fifty thousand patents were issued during the last fiscal year.

A more immediately successful invention was Eli Whitney's saw gin for removing seeds from the cotton ball, patented in 1794. Other inventions proposing labor-saving machinery for agricultural processes secured protection under the patent law. A machine for the threshing of grain was patented in 1799, and another for cutting grain in 1803. A plow with a mold board of iron cast all in one piece was patented in 1797.

In the spring of 1891 the Patent Office at Washington celebrated its hundredth birthday. By this time it had issued 450,000 patents. These show that American genius had entered every field which thought and skill could occupy.

The new country was well on its way to the front rank of nations in the matter of inventions and discoveries. With the beginning of the 20th century patent applications increased. During the last fiscal year, the twelve-month period ending June 30, 1930, inventors established a record for all time in their dealings with the Patent Office. Nearly fifty thousand — 49,599 to be exact—patents were issued. Application for mechanical patents totaled 91,430 and applications of all kinds, including trademarks, reached a total of 117,789, of which 68,801 resulted in the actual issuance of patent papers, including 19,202 trademarks.



Fitch's boat, for which he applied for a patent monopoly in 1790.

Although the United States leads the world in the number of patents issued, a selection of the five greatest engineers of all times includes an Italian, a Frenchman, a Scotchman and two Americans. These men are respectively, Leonardo Da Vinci, Ferdinand De Lesseps, James Watt, Thomas A. Edison and James B. Eads, who were selected by the Deans of American Engineering School as the five greatest of all times.

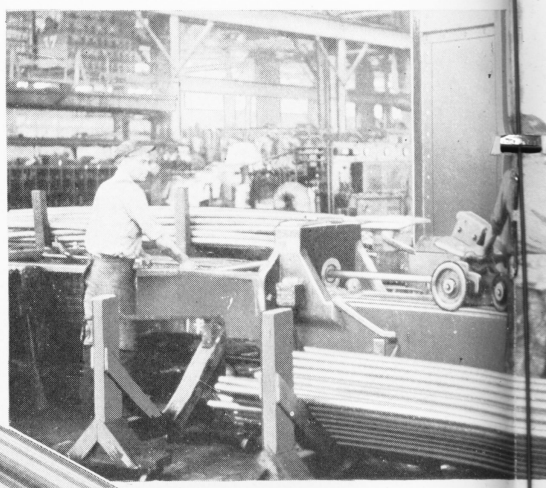
Study of the lives of these men lead to the conclusion that to be a great engineer is to be a prodigious worker. With the exception of Da Vinci, all these men can be counted as belonging to modern times—and even he saw the dawn of our era if not the age of engineering as we know it. It was James Watt, who, when he harnessed steam, ushered in the machine era.

Watt was a nervous, highly-strung lad, who early showed mechanical ability. He was a master of mathematical instruments and in addition to the invention of the steam engine, he also built an organ, invented a machine for reproducing copies of sculptures, a letter-copying press and an apparatus for the manufacture of glass. He worked out the principle of chain-speed gearing and what was then called a "spiral oar"—the propeller—for use on steamships. Moreover he was a good chemist.

Of the five men selected as outstanding engi-

PICTURES TELL The STORY of No. 3 The Tube Mills

The Scope



Cup Drawn Cond
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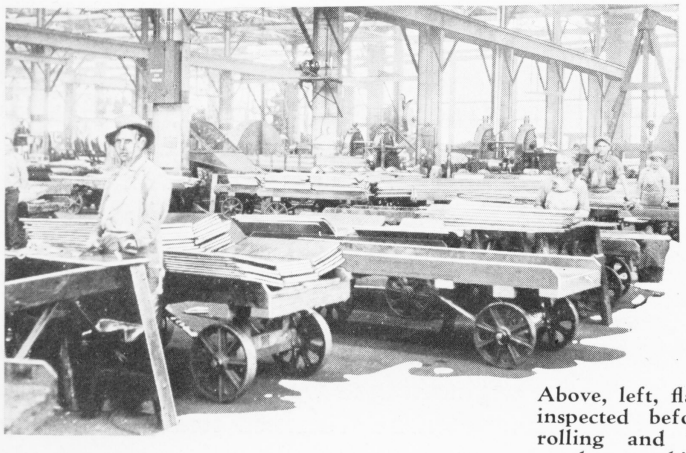
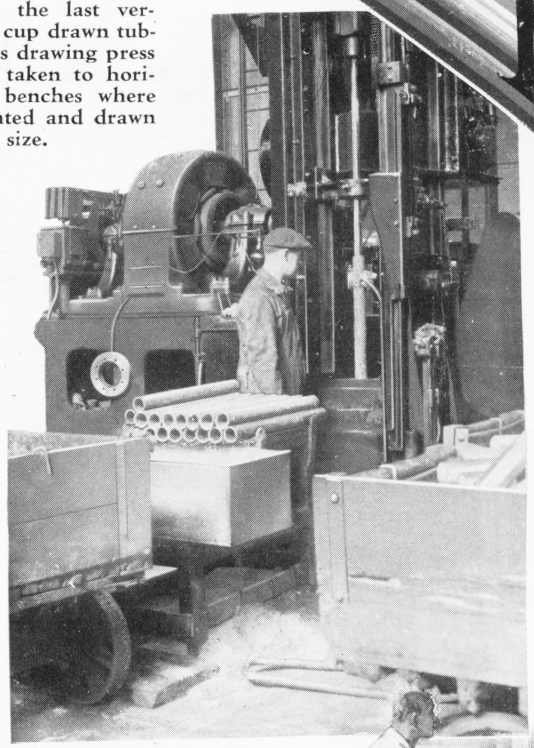
ONE OF THE most interesting, and most accurate, steps in the manufacture of Scovill products takes place in the Tube Mills. Here are made Scovill Cup Drawn Condenser Tubing and Scovill Brass Pipe in various sizes.

Brass pipe is made from red hot solid billets by the Mannesman hot piercing process. A round pointed shaft is held against a billet which is rotated rapidly between two small steel rolls with curved surfaces.



Above, left, flat brass being inspected before the final rolling and blanking for condenser tubing. Any imperfect metal is discarded.

Below, right, the last vertical draw on cup drawn tubing. From this drawing press all tubes are taken to horizontal draw benches where they are pointed and drawn to size.



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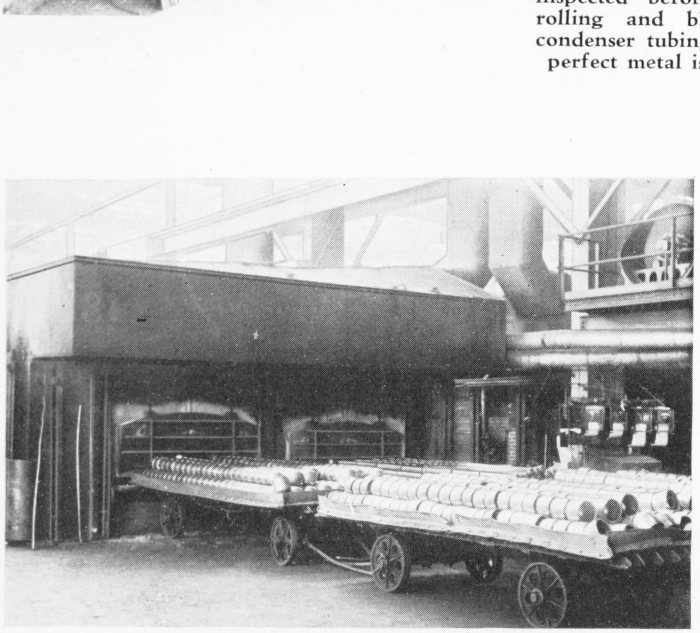
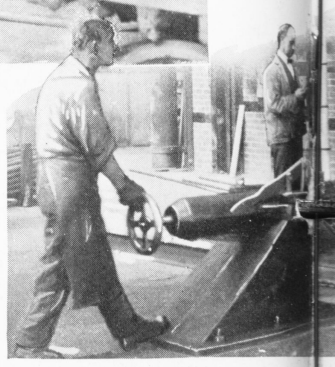
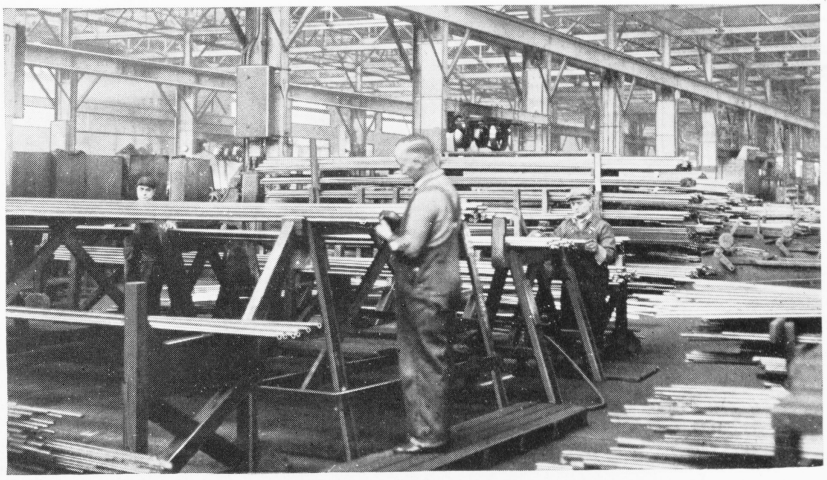


Annealing between cupping operations. At left, cupped shells in front of annealing furnace. Frequent and carefully supervised annealings relieve the metal of strains caused by drawings.



One of the horizontal draw benches in Scovill's tube mills. After leaving the cupping press, tubes are placed on the draw bench and expertly drawn to the required size.



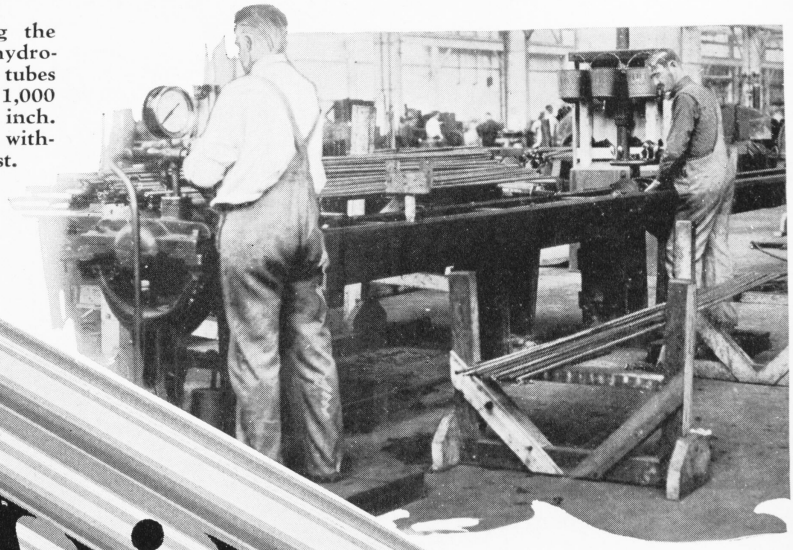
At right, gauging and visually inspecting tubing. A strong light is placed at one end of tube and a keen-eyed inspector makes sure that it is perfect before it is passed as "okay."

denser Tubing is made from large discs. These discs are placed on powerful presses and cupped. After inspection and ese cups are then redrawn on huge drawing presses. Next they go to the drawing benches where they are pointed and until the desired dimensions are obtained.

comes another example of Scovill thoroughness, an important step in manufacturing and one which has gained for Scovill products an enviable reputation: inspection and testing.

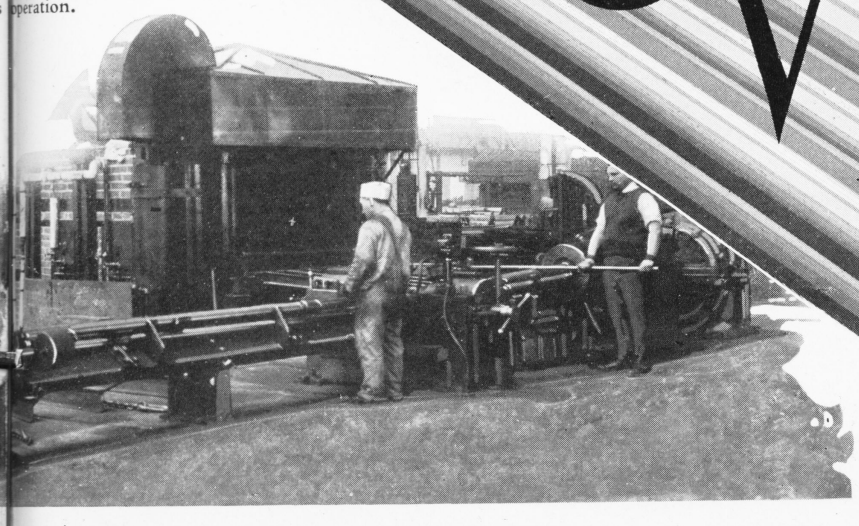
Scovill tubes are inspected, inside and outside, under a strong light; they are submerged in water and air forced in under pressure; they are submitted to an hydrostatic test of 1,000 pounds per square inch; and samples go to the Chemistry and Test Department for analysis and various physical tests.

Water pressure testing the finished tubes. This hydrostatic test submits the tubes to a pressure of 1,000 pounds per square inch. Only perfect tubes will withstand this rigid test.



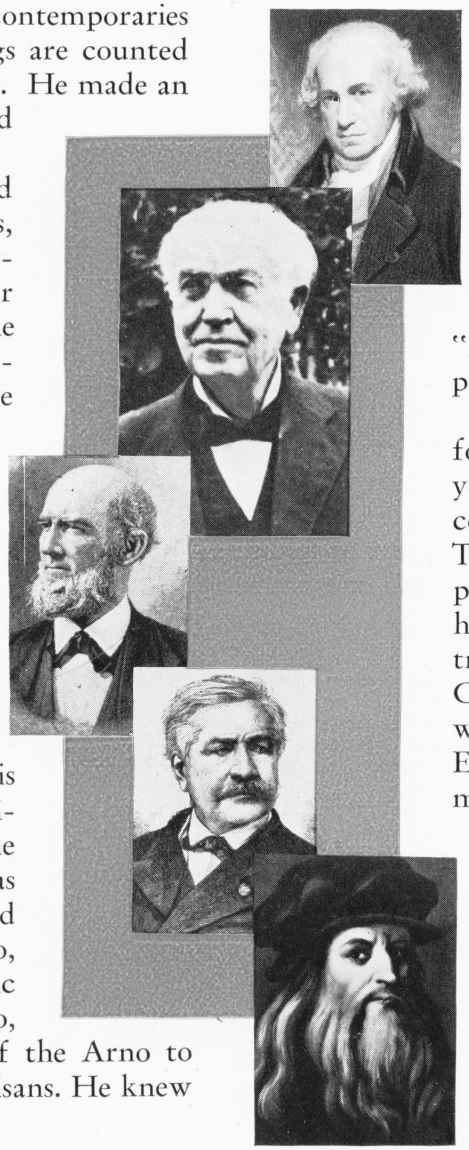
e of Scovill

own one of the nes for making e by the Man- piercing process. hot billets are a pointed shaft operation.



neers, none was so versatile as Leonardo Da Vinci. He was painter, sculptor, architect, engineer; and his writings reveal that he was a physicist, biologist, geologist and philosopher as well. In each line his excellence was such that even to his contemporaries he was a great figure. His paintings are counted among the masterpieces of the world. He made an equestrian statue of Sforza, acclaimed as a masterpiece.

The brain that could guide his hand to paint was to deal with "pontoons, scaling ladders, cannon, mines, chariots, catapults, smoke powders"—for such are the things he offered to make as military engineer. His vision penetrated so far into the future that he foresaw and prepared the way for many modern inventions. He wrote of under-sea devices capable of sinking war ships. He designed an armored wagon which could without danger to itself open a way through enemy lines. For naval warfare he proposed the use of poison gas, and even designed a protective mask. The flight of birds fascinated him. His studies in aviation range from the primary causes of flight in birds to the actual application of the principles as he understood them. Water appealed to his facile imagination. Leonardo, the artist, painted curving, mystic rivers in his backgrounds; Leonardo, the engineer, changed the course of the Arno to protect the Florentines against the Pisans. He knew the human body so well that his anatomical drawings caused it to be said of him recently that he was the greatest anatomist in the world of his day.



The five greatest engineers of all time: James Watt, Scotchman; Thomas Alva Edison and James Buchanan Eads, Americans; Ferdinand De Lesseps, Frenchman; and Leonardo Da Vinci, Italian.

Thomas Edison belongs to our time. He has given man-kind some of the things that add most to its joys and comforts. His life is a story of continual work. He was a butcher boy on a train, operating a printing press and keeping a laboratory in the baggage car, when an explosion hurled him into the business of becoming telegrapher. As a boy waiting for a job in the office of the Law Gold Indicator Company, he was the only one who could put the stock ticker in order when it broke.

Then followed a series of inventions for which the modest young man was paid more than what he thought they were worth: the improved stock ticker, the system of duplex and quadruplex telegraphy worked out in the Western Union Laboratory; the perfected carbon transmitter for telephone use, and the electromotograph instrument. In his Menlo Park Laboratory more of his ideas were developed. Just prior to the night on which the little incandescent globe shed its rays on Edison and his "insomnia group," as his workers have been called, he heard his own voice vibrating from a cylinder: "Mary had a little lamb." The phonograph was on its way.

In 1891 he got out his first patent for a moving picture machine and a year later saw the possibilities of combining it with a talking machine. The electric power, of which the possibilities had just been discovered, had to be manufactured and distributed. The Edison Electric Light Company was formed. It was the world's first central station. Next Edison's mind turned to one of its monumental undertakings — the magnetic separation of ores. So he has continued with his ceaseless work, proving his own statement that genius is 1% inspiration and 99% perspiration.

James Buchanan Eads' name conjures up a picture of the tireless waters of the Mississippi. His first intimate acquaintance with it was when he as a boy was employed as a clerk on a steamboat. It was not long before he was associated with a shipbuilding firm, and signed a contract to raise sunken craft. Upon one occasion he went to Washington and offered to contract with the government to clean the channels of the Mississippi, Missouri, Ohio and Arkansas Rivers, and to keep them clean for a term of years. A bill was drawn in favor of his suggestion and passed the House, but was defeated in the Senate.

When the Civil War came he went to Washington and laid before the government a plan to build iron-clad ships. His bid was accepted and seven boats were built by 4,000 men working day

and night. They carried Admiral Foote to victory at Forts Donaldson and Henry, and at Island 10. Eads continued to build ships for the government until the war was won. It was his next work that brought him lasting fame as engineer. He built the great bridge that spans the Mississippi at St. Louis. It took seven years, and required the deepest submarine work undertaken up to that time.

A Brilliant Beginning

The fifth engineer mentioned among the great ones, Ferdinand De Lesseps, was less fortunate in life than the others. His career, which began with brilliance, ended in disgrace. De Lesseps was a builder of canals. The Suez Canal was dug by his persistence. His success in the East led to his undertaking of the building of the Panama Canal which ended disastrously. De Lesseps' life however, was one of great activity. Undaunted by Britain's opposition and the discouraging prophecies of engineers and laymen, he labored for ten years before the waters of the Mediterranean and the Red Seas met in Bitter Lake. As the years passed he promoted other engineering projects, such as that of the Corinth Canal. He was interested in Rondaire's study for the creation of an inland sea in Africa, and advocated the building of a railway that would connect Europe with Bombay.

Withal, the lives of these great men and the thousands of others who give us the inventions and discoveries that make life more livable, are irrefutable proof that the "world does move." Patents are merely the rewards, in a measure, for genius and hard work. And they constitute a thrilling record of man's achievements.

THE STORY OF SCREWS

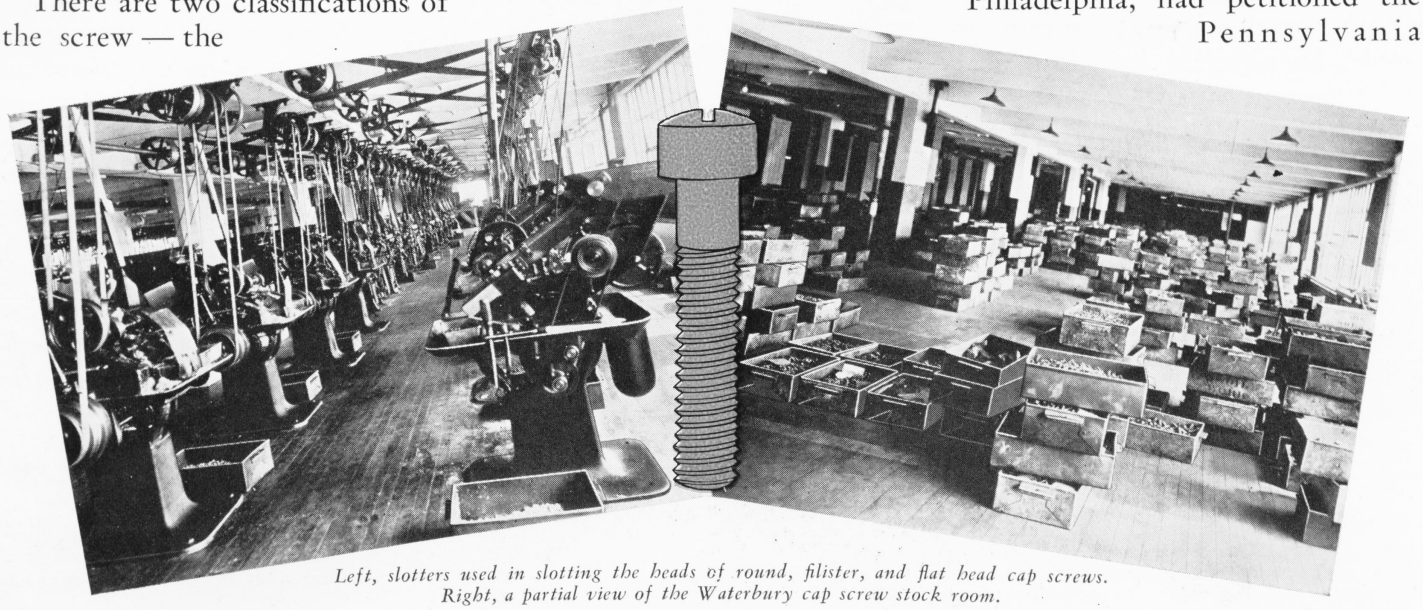
By Glenn H. Wayne

Scovill Manufacturing Company

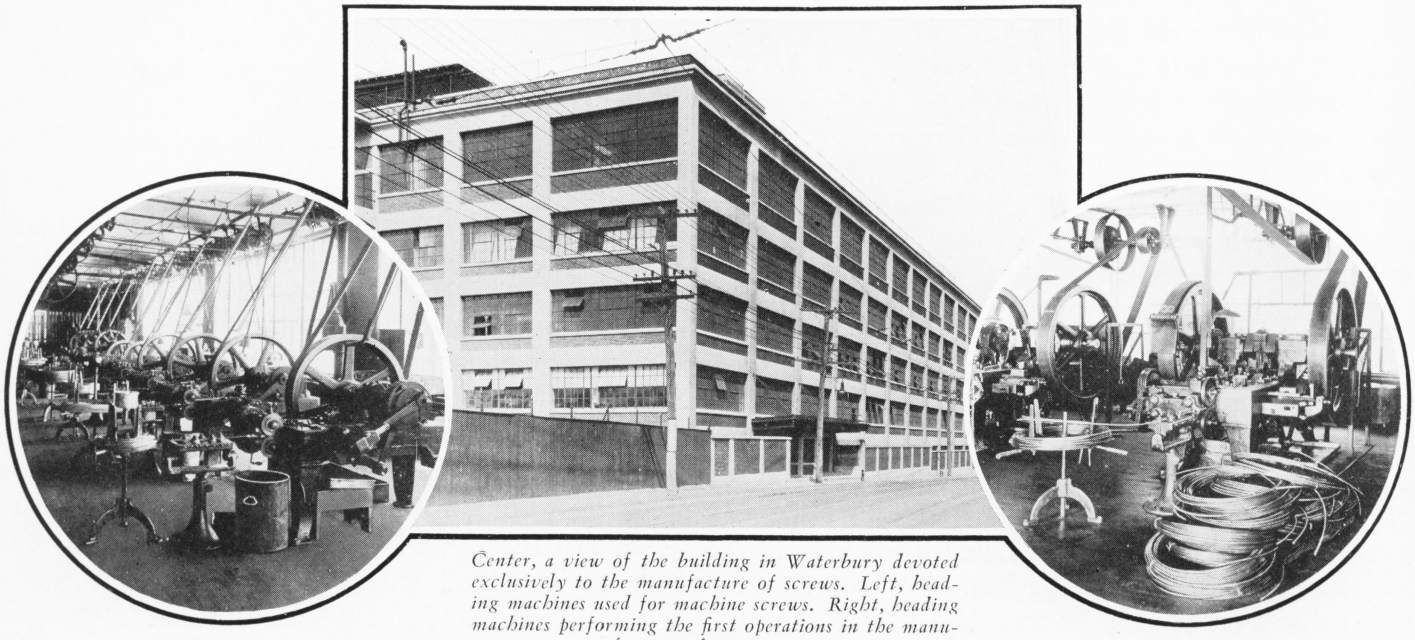
Archimedes, the Greek philosopher, is credited with the invention of the screw, during the latter part of the Third Century, B.C. It is probable, however, that screws and their uses were known before that time, but to Archimedes belongs the credit for having first classified their mechanical powers, which lead to the study of the laws regulating a screw's actions and the formulating of the rule of calculating its efficiency.

There are two classifications of the screw — the male and the female, sometimes referred to as external and internal threads. Their use to the various branches of modern industry are as innumerable as the variety of their sizes, ranging from the jack-screws to those used in watch making.

In the year 1794, David Wilkenson of Rhode Island, applied to the United States Government for a patent on a machine for cutting screw threads. Previously, in 1789, Samuel Briggs, of Philadelphia, had petitioned the Pennsylvania



Left, slotters used in slotting the heads of round, filister, and flat head cap screws. Right, a partial view of the Waterbury cap screw stock room.



Center, a view of the building in Waterbury devoted exclusively to the manufacture of screws. Left, heading machines used for machine screws. Right, heading machines performing the first operations in the manufacture of cap screws.

Legislature and the General Congress on the subject of a machine for making nails, screws and gimlets.

Abel Stowell of Worcester, Mass., took out a patent in 1809 for a machine for cutting screws, and in the same year, Ezra l'Hommedieu of Saybrook, Conn., patented a double-podded screw auger, and later in the year informed the Secretary of the Treasury that he made wire for himself from which a man, aided by two boys, could make three hundred pounds a day of assorted screws which were better than the imported ones. It was his opinion that in a short time screws for domestic consumption would be supplied by his simple and cheap processs.

Between 1810 and 1817 patents on machines were granted to various persons, all of them playing their part toward the general improvement of producing screws by machinery.

Phineas Dow and Daniel Treadwell, both of Boston, had long worked on the perfection of a machine into which a coil of wire was fed and which produced completed screws at the rate of 10 a minute. This machine took the wire, headed, slotted, cut the thread and polished the head in successive operations. The machine was infinitely better than previous processes of screw manufacturing, and improvements were soon made upon it so that by 1834 there were machines producing screws efficiently enough to warrant the formation of a company for the purpose of making screws in mass production.

In that year, at Providence, R. I., the New England Screw Company and one other concern were formed. From then on, with improved machinery being placed on the market for the production of all types of screws, many companies have sprung up all over the country.

The Scovill Manufacturing Company first started the production of machine screws by the cold upset, rolled thread method on little

(Continued on page 21)

GLENN H. WAYNE

was born in Tompkinsville, Staten Island, New York, September 2, 1885. He came to Scovill Manufacturing Company on March 2, 1903, and began work in the Screw Department.

After holding various positions in the Scovill organization, Mr. Wayne was placed in charge of the entire Screw and Rivet Departments on February 18, 1920. He has remained in that position since.

In this article Mr. Wayne not only tells something of the history of screw manufacturing by the Scovill Company, but also gives an interesting picture of some of the problems and activities of the whole industry.

A NEW SCOVILL SCREW REFERENCE BOOK—FREE

Write for the new Scovill Screw Catalog, a 48-page book with complete and correct formulae and dimensions of all recognized standard types of cap screws and machine screws, and dimensions and tolerances of Class II and Class III American Standard threads. This new catalog is thumb indexed and is used in engineering departments and drafting rooms as a standard reference book on dimensions of screws and screw threads. It will be sent you without obligation of any kind. Write to Screw Department, Scovill Manufacturing Company, Waterbury, Conn.

SWINGING AROUND THE CIRCLE WITH SCOVILL

No. 16

AKRON · OHIO

Factory, warehouse, and sales office of A. Schrader's Son, Inc., of Ohio, located at 705 Johnson Street in Akron.

OUR next, and almost the last, stop in our swing around the "Scovill Circle" takes us to Akron, Ohio, where Scovill is represented by its Akron Office—a branch of the Cincinnati Office—and the factory, warehouse and Sales Office of A. Schrader's Son, Inc.

Akron, as well as the other Ohio city where Scovill maintains a branch office—Cincinnati—is located in territory that was part of Connecticut's "western reserve," land given to the state by the Federal Government.

Early in Colonial history, when James I and Charles II were issuing charters to the colonies of America, very little was known about the geography of the internal regions. Maps were fallacious, founded upon conjecture rather than exploration and survey. Thus several states often claimed the same land.

Connecticut and Pennsylvania entered into a dispute over a section of land which is now included in the state of Pennsylvania, a dispute which even caused bloodshed. In 1780 Congress began the work of arbitrating these disputes. Connecticut lost her contest against Pennsylvania, and was given as a consolation prize a reserve, which included several counties of the present state of Ohio.

EARLY HISTORY

It was an important section of about 3,500,000 acres. Later, in 1792, the Connecticut General Assembly set apart some of this reserve for her citizens who had suffered losses during the Revolutionary War, and in 1795 the remainder was sold to the Connecticut Land Company, which company surveyed the territory and sold lots to settlers. Thus the present state of Ohio became settled.

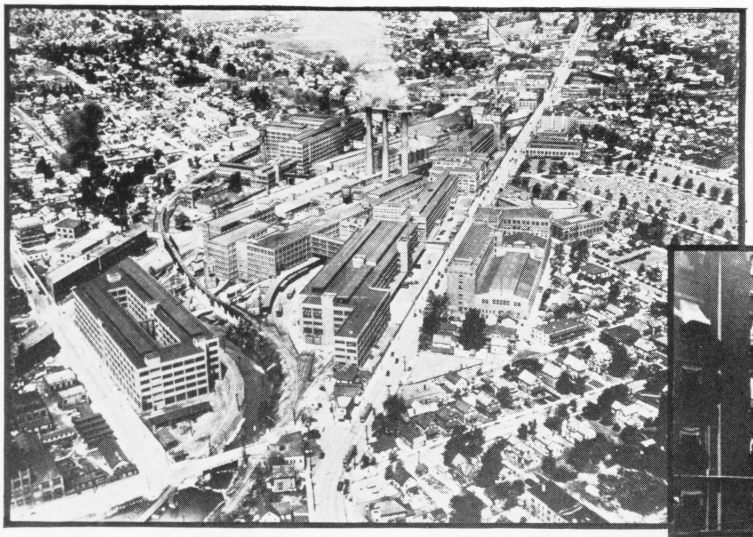
BORN A CENTURY AGO

Akron, however, was not established until the third decade of the 19th Century—in 1825. About that time a proposed canal to join the Great Lakes with the Ohio river and thus give a continuous outlet to the sea by way of the Mississippi river stirred the settlers of that section. As soon as plans for the canal were definitely established and the route of the canal decided, General Simon Perkins of Warren, who owned property at a suitable point along the proposed canal, decided to found a new town.

Paul Williams, another inhabitant of the section, who owned some property adjacent to the general's, joined with Perkins, and on December 6, 1825, a plat of the site was recorded in the archives of Portage County. The name Akron was selected by General Perkins. It is a Greek word meaning "high place" and was chosen because it was erroneously believed at that time that Akron was the highest point in the state.

Lots in the new town sold rapidly. Two years later the town had a population of 200. After the canal was opened Akron became a market center and settled down to a period of slow but steady growth.

It was almost by accident that Akron became



Left, industrial Akron: an air view of Plant One of the Goodyear Tire and Rubber Co., one of the largest manufacturers in the world. Below, view of one section of Akron's business district.

PHOTOS BY U & U

the thriving manufacturing city of 255,040 population that it is today. Certainly the town's founders had no dream of the prosperity that was one day to reach it. A comfortable marketing center, yes; but hardly a great metropolis, the home of one of the country's foremost industries. By 1835 the population of Akron was 900; thirty years later it was only 5,066; and in 1900 it was less than 30,000.

FATE INTERVENES

Then fate intervened. One day Dr. Goodrich happened to pick up a pamphlet issued by some men in Akron who believed that the city should have more industries and more factories. The rest is modern history. Today Akron is a splendidly modern city with many beautiful buildings, well-paved streets and fine parks and residences. In Akron is being built the ZR4, giant Navy airship which will bear the name of the city in which it was manufactured.

Though it ranks around thirtieth place in the United States from a population standpoint Akron ranks thirteenth in industrial production.

More rubber products are manufactured in Akron than in any other city, and 45% of the crude rubber production of the world is consumed to produce this record. Akron also holds a high place in the manufacture of books, cereal products, clay products, dirigible airships, dynamos and motors, fishing tackle, machinery, reclaimed rubber, rubber-working machinery, twist drills, well-drilling machinery and many other items.

Akron is decidedly a home-owning city as is indicated by the fact that about 45% of its citizens own their own homes as compared with only about one in three in an average of other American cities over 100,000.

Schrader has maintained sales offices and a warehouse in Akron since 1921 to provide for the tire manufacturers' requirements of finished tire valve products, both in that city and throughout the state. In 1926 facilities were increased when a modern five-story building with 84,000 square feet of floor space was added to the 24,000 square feet originally occupied. An assembling department is now maintained to supply tire company needs.

M. C. Stevens, manager of the Akron branch, has held that position since 1925. Along with his branch activity he is interested in the sales distribution and service of Schrader products. He is ably assisted by Clarence Wilkens, who has been with the service department for a number of years. William Prosser contacts with the tire plants in the state, keeping abreast of their needs and their problems. John Metz has been in charge of the office routine since the opening of the Akron branch.

The assembly plant is supervised by Albert Smyers; the receiving and shipping is under Jerry May's direction.

By centralizing distribution to the tire companies from Akron, Schrader is prepared to render the fastest service to all the rubber companies within that radius. In addition, the tire plants in the state may be reached by motor delivery service within a few hours.

Tire engineers recognize the strategic location and the important service rendered by Schrader's Akron office.

A Brass Boat and a "Pewter Mug"

(Continued from page 3)

It was a desperate bit of sailing. The Vigilant's topmast "buckled and her backstays were as taut as harpstrings." If anything parted that whole tower of bellying cloth would go over the bows in a hopeless mass, with possible loss of life and the race would be lost.

Now Friday the 13th took a hand.

The 35 men on the Valkyrie had been no less busy during this time. Dunraven and his skipper had left the Valkyrie's mainsail half-reefed, with a working topsail aloft, but had set a spinnaker and a balloon jib-topsail. The English crew sent up the spinnaker in British fashion, in a loose bunch instead of in stops, to be sheeted home as quickly as possible.

Friday, the 13th

On the way up the cloth got caught in the bitts, tore slightly. Lord Dunraven looked forward darkly and probably tapped wood. Skipper Cranfield probably prayed a seaman's prayer. But it was Friday the 13th. The wind roared against the tear, widened it inch by inch. Suddenly the whole sail went into two screaming pieces.

"Up with the linen," roared the skipper.

The excursionists saw a great, beautiful sail of white light Irish linen float out to the wind, a light weather spinnaker. The Valkyrie's crew set the light sail in an unbelievably short time, but in vain. A few minutes after it was sheeted home the howling wind had blown it to tatters.

"Bowsprit spinnaker," snapped Skipper Cranfield in last resort.

The little sail, corresponding to an American balloon jib-topsail, bellied out. It was too late. The Vigilant was even then slipping by.

It was the second closest cup race ever run. Vigilant rushed over the line two minutes and 13 seconds ahead of Valkyrie II, only 40 seconds ahead on corrected time after deducting Valkyrie's allowed handicap. The "brass" boat had justified itself and successfully defended the "pewter mug."

"When We Speak of a Tenth . . . "

(Continued from page 7)

oil like baby minnows.

It is unbelievable that these mimic things are not some form of marine biology. Dainty wheels like infant starfish, spindles like young new-hatched trout; gold settings (for the jewels) clustered like shadroe; gold screws to weight the balance wheels (12,000 would go in a thimble; the

INSPECTION!

Individual Handling Of Every Item Insures Oakville Quality

Above is pictured one section of the Inspection Tables in the Oakville-American Plant at Waterbury. Every item that goes to these tables is individually handled, individually inspected. Can there be any more positive proof that Oakville-American wire-formed pieces will reach the manufacturer and consumer in perfect condition?

This same care is exercised in every step of production, throughout the Oakville plant. Oakville Jewelry Findings, Badge Makers' Supplies and a host of miscellaneous Pointed and Formed Wire Products and small Metal Stampings have been perfected by nearly a century's experience in manufacturing procedure. They are built to meet the demands of the market.

Write to the Oakville Company for further information about its complete line of wire-formed products. Your inquiries will be answered quickly and fully.

A SCOVILL PRODUCT

SCOVILL

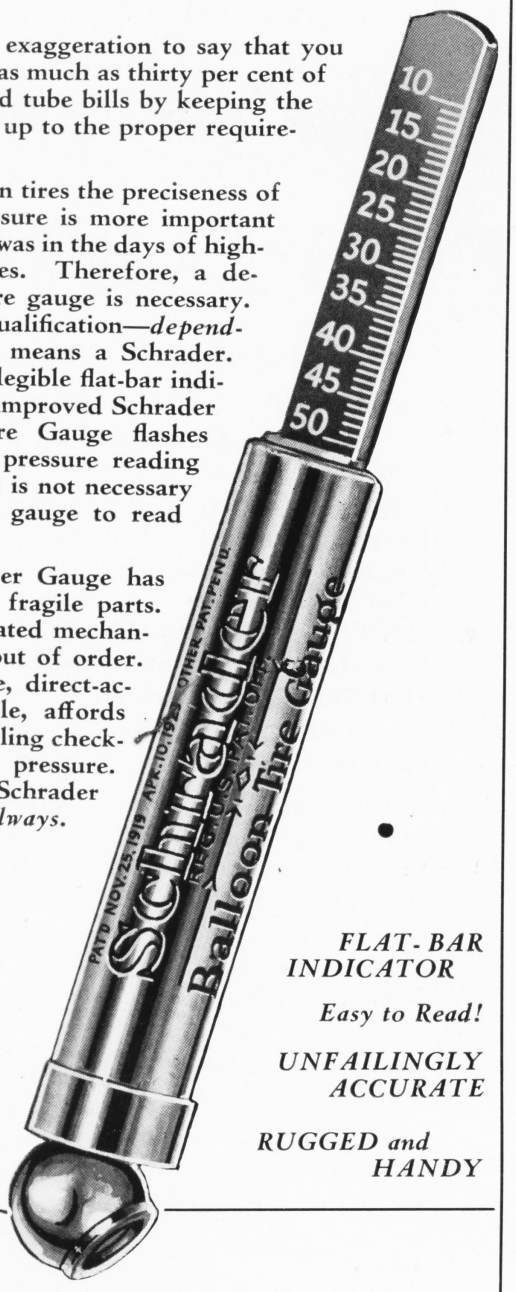
OAKVILLE COMPANY DIVISION
Scovill Manufacturing Company
WATERBURY CONN.

ACCURATE INFLATION easy with a Schrader No. 5050 Balloon Tire Gauge

IT IS NO exaggeration to say that you can save as much as thirty per cent of your tire and tube bills by keeping the air pressure up to the proper requirements.

With balloon tires the preciseness of the air pressure is more important than it ever was in the days of high-pressure tires. Therefore, a dependable tire gauge is necessary. Note the qualification—*dependable*. That means a Schrader. The highly legible flat-bar indicator of the improved Schrader Balloon Tire Gauge flashes the correct pressure reading instantly—it is not necessary to turn the gauge to read pressure.

The Schrader Gauge has no delicate, fragile parts. No complicated mechanism to get out of order. The positive, direct-action principle, affords you an unfailing check-up on tire pressure. Carry a Schrader with you—*always*.



FLAT-BAR INDICATOR

Easy to Read!

UNFAILINGLY ACCURATE

RUGGED and HANDY

Be sure it's a Schrader—Look for the name

Schrader

Makers of Pneumatic Valves Since 1844

Tire Valves · Tire Gauges

thread is 260 turns to an inch)—all these are individually inspected with gauge and micrometer. The girls sit very low with eye-glass on a level with the high work-bench. Intent on their infinitesimal subjects their humble attitude with arms raised gives a queer impression. It is like a room at prayer.

One of the most memorable things was the sinewy hand of a graver underturning small spindles. He was cutting a special nick in them after they had been hardened and tempered; something that can only be done by the instinct of practised fingers. His was the hand of the true artist; amid so much marvellous machinery it is good to see the sensitive hand still overlord. By this time I was surprised at nothing: not even when they told me that in checking accuracy of the jewel settings their gauges are precise to 1-100,000 of an inch. In fact, they measured for me the compression caused in a thick bar of solid steel by my resting my hand upon it.

Consider My Wrist Watch

Now I am thinking about my wrist-watch. At this moment it is in an indoor temperature of 70°. Presently, when I go outdoors (it happens to be a cold February day) it will suddenly meet a drop of nearly 60° in temperature. All those delicate little minnows and starfish and curled hairs and Pullman passengers will shudder and draw 1-100,000 of an inch closer together for comfort. Then, when I come home again, after they have got used to the chill, there will be the same sudden leap of 50 or 60 degrees. No human cunning can entirely guard against that sort of strain. But watchmakers do what they can.

The balance wheel, for instance, is made of brass outside and steel within to counteract expansion. The truing of the balance wheel is so important that the workmen hide their heads inside little black mystery curtains while doing it, to avoid even a draught of air. In those confessionals is needed the whole truth and nothing but. In the testing department the assembled movement is put in a refrigerator at 40° and then in a hot box at 98° and variation noted. Each watch has its own serial number and its own history of tests. It is queer to hear that competitive rattling whisper from hundreds of watches together in the racks—some on their heads, some on their sides; testing their accuracy in different positions. Above them all, proctor of the examination, is the dignified tock-tock from the Master Clock in the main hall below.

Lancaster was always a name of honor to me,

for I was brought up on the Lancaster Pike, the most famous road in America. It was the old road of the Conestoga wagons; now they call it the Lincoln Highway. It runs right past the Hamilton factory. Lancaster was, for one day only, the capital of the United States, during the Revolution. Lancastrians were disappointed it did not remain so. But they have made themselves the capital of an invisible empire, the one reality we never have enough of. As honorably as the big wheels of the Conestoga wagons, the very small wheels of their watches travel the mysterious highway of Time.

The Story of Screws

(Continued from page 16)

brass screws which were used on kerosene burners and on screws used on shade holders for electric fixtures, to hold the shade in position.

During the late 90's engineers of one of the larger electrical concerns were visiting the Scovill Plant, saw Scovill machines in operation, and asked the company to experiment to see if it could make some of their electrical apparatus screws by the same method. Scovill took small orders of the sizes these machines would make, and then made a number of repeat orders. The screws were so satisfactory that the electrical concern asked Scovill to make the full line of sizes of machine screws, as well as electrical apparatus screws. From this small beginning Scovill's present enormous screw business has gradually developed.

There was nothing new about the method of making rolled thread screws when Scovill began screw manufacturing. There was, however, an appreciation on the part of Scovill Engineers of the fact that rolling threads on screws required an accuracy of dimension in the blank. They realized that varying diameters of blanks could not be put through the rolled threading dies and squeezed down to the same thread size.

Most Modern Machines Used

From the beginning of the manufacture of screws, up-to-date equipment has gradually been added to Scovill's Screw Department. At the present time the company is producing hundreds of millions of screws yearly on the most modern machines.

During the World War, when most of the business was that of producing munitions, great difficulty was encountered in the assembly of interchangeable threaded parts, due to the fact that there were then in existence various standards of

••• SCOVILL ••• OPEN TOP — CLOSED TOP

Tack Buttons for Strength

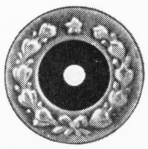
All products of the Scovill Button & Fastener Division are designed with a liberal safety factor; they will withstand many times the strain they will ever encounter in actual use. Many Scovill buttons and fasteners include patented features developed by Scovill Engineers.

Consider Overall Buttons.

A Scovill Closed Top Button is sturdily constructed, yet it is light and graceful. It is built with a patented automatic compensating anvil which allows for the absorption of pressure when the button is set on varying thicknesses of material, and eliminates strain on the fabric of the garment.

The anvil also grips and supports the tack at three points, which gives it the greatest resistance to tipping of any metal button on the market. When it is mounted, the tack hermetically seals the back which is an insurance against deterioration by rust.

The Scovill Open Top Button also has important features of superiority. A close examination of the hub of the button shows a double thickness of metal reinforcing the hole. This ingenious construction causes the button to give double strength and double utility.



There is a Scovill button and fastener for every purpose.

Scovill Manufacturing Company

BUTTON & FASTENER DIVISION

WATERBURY, CONN.

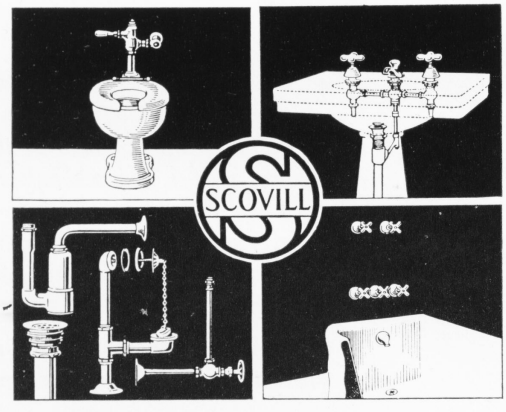
A SCOVILL PRODUCT

NEW YORK CHICAGO ATLANTA
SAN FRANCISCO LOS ANGELES SEATTLE
PORTLAND, OREGON THE HAGUE, HOLLAND

Scovill Flush Valves are manufactured for all types of exposed and concealed installations. They have operated successfully and have given trouble-free service on various water conditions—including salt water.

Scovill Flush Valves may be regulated for length of flush from the outside of the valve without changing any of the parts; they are equipped with a self-cleaning device for the by-pass. In short, Scovill Flush Valves are designed and constructed for *trouble-free service.*

Ask your plumber to show you the complete line of Scovill Plumbing Fixtures.



Scovill Flush Valves . . . Shower and Bath Fixtures . . . Tubular and Miscellaneous Plumbers' Brass Goods for General Plumbing Requirements.

Scovill Manufacturing Company
PLUMBERS' BRASS GOODS DIVISION
WATERVILLE, CONN.

screw threads and an indefinite knowledge on the part of manufacturers as to their classification. Each had its own ideas as to the application of formulas, forms of thread, and so forth, with the result that an extremely serious situation arose, which, through the United States Department of Standards was brought to the attention of Congress. The question was considered to be of such importance that a Commission called the "National Screw Thread Commission" was authorized by Congress on July 18, 1918, for the purpose of ascertaining and establishing standards for screw threads. The Commission consisted of members representing the United States Army, Navy, American Society of Mechanical Engineers and the Society of Automotive Engineers. Representatives of both manufacturers and consumers of screws and screw threads in all branches of industry were invited to confer with the Commission, with the result that the Commission's suggested standard was approved by the American Engineering Standards Committee in May, 1924.

The American (National) Standard

This is now known as the American (National) Standard. It consists of but one form of thread, but covers various classifications such as pitches and fits, so that its adoption can be readily applied to practically all types of threaded parts.

Since the adoption of the American Standards, the American Society of Mechanical Engineers and the Society of Automotive Engineers have appointed committees on which there have been representatives of the United States Government, manufacturers and consumers, to evolve standards for wrench openings, head forms and slot sizes, together with lengths of thread for various types of screws, bolts and nuts. Their recommendations have been approved by the American Engineering Standards Committee, and their acceptance by manufacturers and consumers in all industries is rapidly taking place.

From the National Screw Thread Commission invitations were extended to and accepted by representatives of foreign countries for the purpose of endeavoring to establish an International Screw Thread Standard that could be adopted by all countries. Nothing was accomplished at first, because of the established practices of foreign manufacturers, but since the adoption of the American (National) Standard by the Engineering Societies in the United States and because of the large export trade which has been going on for the past few years from this country, the American Stand-

ard is beginning to be looked upon with favor by most of the European Countries and orders are being received by United States manufacturers calling for the American Standard for shipment abroad.

Scovill-made screws, of course, measure up to the specifications of the American Standard, although the company is able to furnish special screws and headed parts. One entire building at the main plant in Waterbury is devoted to the manufacture of screws and special equipment and facilities insure satisfactory production of this important item.

The Scovill Manufacturing Company produces its own non-ferrous raw material, which means that exactly the correct type of material is selected for the purpose intended. It may be added that Scovill has produced screws from gilding metal, aluminum, Monel, nickel silver, and Everdur, as well as screws from the usual brass and steel.

The "Shock Troops" of Industry

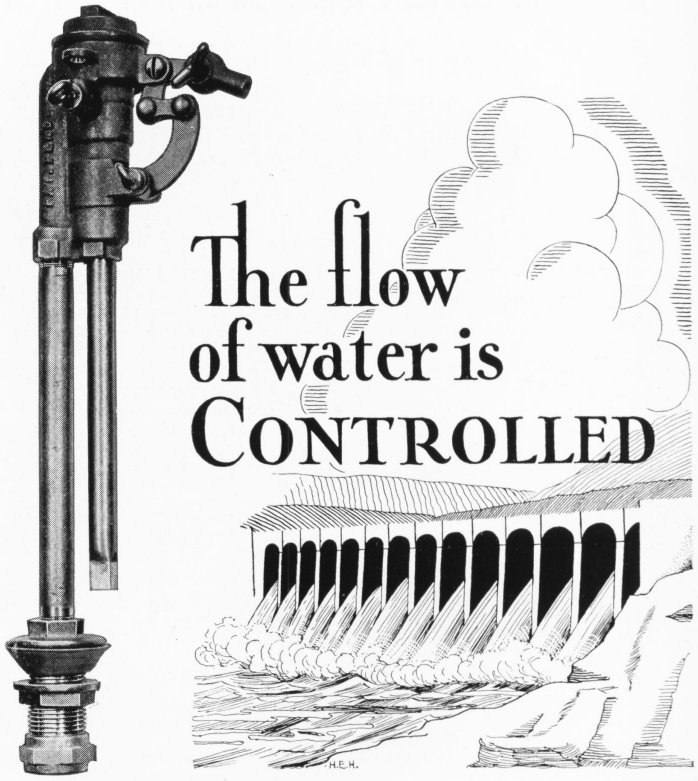
(*Continued from page 5*)

their value as "Shock Troops" of Industry.

To return to New England, there was an alert and highly skilled manufacturer of leather who is, like all manufacturers of leather, more or less the victim of Nature's carelessness in shaping the skin of a steer. In other words, a piece of leather from the top of an animal may sell for $1.50 a pound while the self same hide, of material not intrinsically different, may, in fragments, sell for no more than $8.00 or $10.00 a ton. Accordingly this company has exercised every conceivable ingenuity in utilizing every possible part of every hide, by making stampings, for instance, ranging down from dog collars and leashes and many other products. Still there was a large residue that represented an important item and this residue this company took up with the laboratory. As a result, this company is in a position to produce a new product, set up a new industry and add to its line with no great increase in merchandising costs, a new form of reconstructed leather which may contain as high as seventy per cent of leather and is suitable for floor covering and many other uses.

Arthur D. Little, famous New England Industrial Chemist, when asked of the trend in industrial research today, said:

"That is a large order! For whereas we once talked of the chemical industry as something apart from industry in general, *all* industry is now rapidly being chemicalized."



Morency-Van Buren Replacement Ballcock No. 1 is designed and constructed for replacement work in either high or low pressure territory where service conditions require exacting and reliable performance.

With these requirements in mind, **M-VB** engineers have produced a ballcock that can be installed in any tank and will close against any pressure up to 200 pounds with a 4-inch by 5-inch standard float ball. The flow of water through the refill tube is controlled by a regulating screw.

Smooth, quiet, yet rapid discharge while the tank is filling is insured by the removable retarder in the hush tube; for pressures under 50 pounds the retarder is removed by unscrewing the hush tube. The plunger is double packed to prevent all body leakage. All operating parts are cast of bronze.

Specify **M-VB**
Closet Tank Fittings

A SCOVILL PRODUCT

SCOVILL

Scovill Manufacturing Company

MORENCY-VAN BUREN DIVISION

Sturgis Michigan

M-VB **M-VB** **M-VB**

SCOVILL MANUFACTURING COMPANY, Waterbury, Conn.

The Oldest Brass Company in America and One of the Largest in the World

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J. H. GOSS....*Vice President and General Superintendent*
C. P. GOSS, JR.....*Vice President and Supt. of Mill Depts.*
G. A. GOSS.....*Vice President*
L. P. SPERRY.....*Treasurer and Comptroller*
W. M. GOSS.....*Secretary*
F. J. GORSE.....*Assistant Treasurer*
B. P. HYDE.....*Assistant Secretary*
T. B. MYERS.....*Assistant Secretary*

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1229 West Washington Boulevard.
Scovill Manufacturing Co., Conrad J. Kalbfell, District Manager.
Plumbers' Brass Goods Division, and Morency-Van Buren Div., C. A. Baldwin, District Sales Manager.
Oakville-American Pin Division, C. W. Anderson, Sales Office Manager.
Hamilton Beach Mfg. Company, K. C. Bonde, Representative. (Office and warehouse. Stocks carried of brass mill products, fasteners and cap screws, as well as products of Plumbers' Brass Goods Division, and Oakville-American Pin Division.)
A. Schrader's Son, Inc., Sales office. J. C. Goodner, Manager.

NEW YORK CITY
280 Broadway.
Scovill Manufacturing Company, George T. Power, District Manager.
Plumbers' Brass Goods Division, and Morency-Van Buren Div., L. S. Rothwell, District Sales Manager.
Oakville-American Pin Division, E. F. Brown, Sales Office Manager.
Hamilton Beach Mfg. Company, H. F. Shotten, Representative.

ATLANTA, GA.
Standard Building.
Scovill Manufacturing Company, D. W. Copeland, District Sales Manager.
Plumbers' Brass Goods Division and Morency-Van Buren Div., H. J. Mason, District Sales Manager.

PHILADELPHIA, PA.
Franklin Trust Building.
15th and Chestnut Streets.
Scovill Manufacturing Company, Alfred C. Maule, District Sales Manager.

BOSTON, MASS.
80 Federal Street.
Scovill Manufacturing Company, Harry J. Lehman, District Sales Manager.
Plumbers' Brass Goods Division and Morency-Van Buren Div., W. M. Hall, District Sales Manager.

170 Summer Street.
Hamilton Beach Mfg. Company, H. B. Perkins, Representative.

PROVIDENCE, RHODE ISLAND
183 Public Street.
The Scovill Manufacturing Corporation, Frank J. Collins, Representative. A branch of the Boston office. (Office and warehouse. Stocks carried of brass mill products.)

TRENTON, NEW JERSEY
Muirhead and Ott Streets.
Plumbers' Brass Goods Division. Morency-Van Buren Div. (Office and warehouse. Stocks carried of brass tank fittings.)

CINCINNATI, OHIO
49 Central Avenue.
The Scovill Manufacturing Corporation, F. L. Wiggers, District Sales Manager. (Office and warehouse. Stocks carried of brass rod.)

DETROIT, MICHIGAN
General Motors Building.
Scovill Manufacturing Company, Edward McCann, District Sales Manager. Room 7-153.
A. Schrader's Son, Inc., R. W. Davis, Mgr. Room 12-221

SAN FRANCISCO, CALIFORNIA
434 Brannan Street.
The Scovill Manufacturing Corporation, George D. Engle, District Sales Manager.
Plumbers' Brass Goods Division and Morency-Van Buren Div. K. M. Reid, District Sales Manager.
Oakville - American Pin Division, Charles R. Barry Co., Representatives.
(Office and warehouse. Stocks carried of brass mill products, cap and machine screws and products of the Oakville-American Pin Division.)

926 Howard Street.
Button and Fastener Division, Dolliver & Brother, Representatives. Branch at Los Angeles. Service Branches, Portland, Oregon; Seattle, Wash.

LOS ANGELES, CALIFORNIA
2261 East 15th Street.
The Scovill Manufacturing Corporation, Ellsworth D. Goldsmith, Representative.
A branch of the San Francisco office.
(Office and warehouse. Stocks carried of brass mill products, cap and machine screws.)

1151 So. Broadway.
A. Schrader's Son, Inc., of California. John Hoerger, Pacific Coast Manager.

932 So. Main Street.
Button & Fastener Division, Dolliver & Brother, Representatives.

SYRACUSE, NEW YORK
Syracuse Building.
Scovill Manufacturing Company, H. G. Dunn, Representative.

AKRON, OHIO
705 Johnston Street.
The Scovill Manufacturing Corporation (Branch of Cincinnati office).
A. Schrader's Son, Inc., of Ohio. M. C. Stevens, Manager. (Factory, warehouse and Sales Office.)

TORONTO, CANADA
334 King Street, East.
A. Schrader's Son, Inc. S. A. Howell, Manager. (Factory, warehouse and Sales Office.)

LONDON, ENGLAND
26-29 New Street, Westminster, S. W.
A. Schrader's Son, Inc. F. H. Gerrans, Manager. (Assembling plant, warehouse and Sales Office.)

PARIS, FRANCE
91 Bis Avenue de Terne.
A. Schrader's Son, Inc., of France. James Sinstadt, Manager. (Assembling plant, warehouse and Sales Office.)

BERLIN, GERMANY
Reichsstrasse 89-111, Berlin Charlottenburg, 9.
A. Schrader's Son, Inc. Otto Schober, Sales Representative.

THE HAGUE, HOLLAND
13 Korte Voorhout.
European Sales Office, Scovill Manufacturing Co. L. van Herk, Manager.

Divisions and Subsidiaries

MAIN PLANT DIVISION, WATERBURY, CONN.

Manufacturers of brass, bronze and nickel silver alloys in the form of rod, sheet, wire and tube. Specializing in the manufacture of metal goods of all descriptions, such as buttons, snap fasteners, sewing thimbles, ferrules. hinges, Queen Anne lamp burners, steel and brass cap and machine screws, and many merchandise items. Also, to order, metal cosmetic and toilet goods, electrical and radio parts, automotive parts, automatic screw machine products, brass forgings, containers, and special metal goods of all descriptions.

C. P. GOSS, JR., *Vice President and Supt. of Mill Depts.*——A. C. LUSHER, *Supt. of Mfg. Dept.*
E. S. SANDERSON, *Sales Manager*——B. P. HYDE, *Sales Promotion*

A. SCHRADER'S SON, INC., Brooklyn, N. Y.
Makers of Pneumatic Valves Since 1844

W. T. Hunter, President and General Manager; F. Trismen, Secretary and Treasurer; H. M. Scheck, Assistant Treasurer; R. L. deBrauwere, Assistant Secretary and Sales Manager; A. G. Underwood, Assistant Sales Manager; M. H. Tisne, Manager Accessories Sales; W. A. Gute, Manager Dealer Relations; W. J. Kirkpatrick, Service Manager; S. D. Hopkins, Advertising Manager; S. T. Williams, Superintendent.

PLUMBERS' BRASS GOODS DIVISION
Waterville, Conn.
Bath and Shower Fixtures, Flush Valves and Miscellaneous Plumbers' Brass Goods
W. W. Bowers,
Asst. Secretary and Sales Manager.

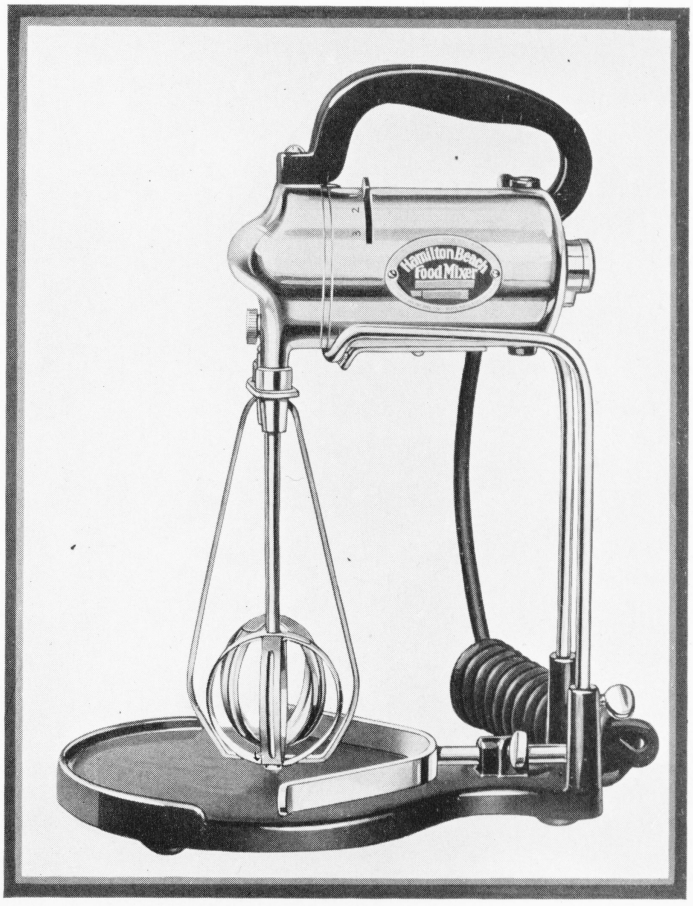
MORENCY-VAN BUREN DIVISION
Sturgis, Michigan
Plumbers' Brass Goods, Tank Equipment, Flush Valves, etc.
R. H. Van Buren, Manager.
Tracy H. Van Buren, Asst. Manager

OAKVILLE COMPANY DIVISION, AND OAKVILLE-AMERICAN PIN DIVISION
Oakville, Conn.
Brass and Steel Common Pins, Safety and Special Pins, Paper Clips, Fasteners and Clasps, Piano Hardware, etc.
Bennet Bronson, Vice President; George Boden, General Manager; C. F. Doherty, Asst. Secretary; C. C. Shee, Sales Manager, Oakville-American Pin Division.

HAMILTON BEACH MANUFACTURING COMPANY
Racine, Wisconsin
Fractional Horsepower Motors, Electric Sewing Motors, Vacuum Cleaners, Vibrators, Hair Dryers, Food Mixers, and other Electrical Household Appliances.
Soda Fountain Supplies, Electric Drink Mixers, Drink Heaters, Ice Cream Dishers, Ladles, Ice Picks, Spoons, Soda Glass Holders, Lemon Squeezers, etc.
T. B. Myers,
Vice President and General Manager.
E. Q. Bangs, Secretary.

The Robert E. Ramsay Organization, Inc.
New York City.

ANOTHER H-B HOME HELP



SCOVILL

A FOOD MIXER

for Chopping . . . Whipping . . . Mixing

Like the other famous Hamilton Beach home helps—the vacuum cleaner, vibrator, hair dryer and the sturdy sewing machine motor—the new Hamilton Beach Food Mixer is a product made essentially to lighten the house-wife's burden.

The Food Mixer, for chopping, whipping or mixing, has four distinct points which recommend it to every housekeeper:

1. You can hold it in your hands, or rest it in the stand for operating alone;
2. The beaters lock in various positions to bring them in contact with all foods;
3. Use any bowl, dish, pot or pan; an adjustable brace holds them in place;
4. The first super-power motor in a popularly priced food mixer; 3 speeds.

Ask your electrical appliance dealer to show you the new Hamilton Beach Food Mixer.

Hamilton Beach

MANUFACTURING COMPANY

RACINE WISCONSIN

Subsidiary of

SCOVILL MANUFACTURING COMPANY

Around the world of INDUSTRY

SPECIALIZING, paradoxically, in the manufacture of many thousands of *different* products, the Scovill Manufacturing Company fills a unique place in industry.

Scovill's function is briefly this: It solves the troublesome problems of metal-part production for other manufacturers.

Such work involves a chain of specialized abilities which have been steadily developed by Scovill during a period of more than a century.

Design . . . Scovill has co-operated in the design of many of the metal parts and products which are used in every home, every office, every industry — from radio condensers to street-car tokens, lawn-sprinklers to lipstick holders. . . . Many an invention in many an industry has been translated into practical production terms by Scovill designers.

Manufacturing . . . The myriad technical processes which are involved in the working of base metals and alloys — stamping, drawing, forming, machining, plating, buffing, polishing — are performed by Scovill with the skill and flexibility of long and intimate experience. . . . The *men* who operate Scovill equipment are not simply "toolmakers," "machinists," "mechanics." They are *specialists* in their work to the highest attainable degree.

Backed by laboratories unceasingly engaged in testing, research and experimentation, the Scovill production units are able to manufacture metal parts to unusual standards of quality, volume and economy. Through Scovill's service, many leading manufacturers have been able to simplify their plants, reduce overhead, and at the same time raise the standards of *their* products.

Scovill

SCOVILL MANUFACTURING COMPANY, WATERBURY, CONNECTICUT

New York *Philadelphia* *Boston* *Providence* *Chicago* *Detroit* *Akron*
Cincinnati *Atlanta* *San Francisco* *Los Angeles* *In Europe: The Hague, Holland*