

Western Electric News



VOLUME 19
NUMBER 5

JULY
1930



The Western Electric News

An Illustrated Magazine Devoted to the Interests of Western Electric Men and Women

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Published Monthly by the Western Electric Company, Inc., EDGAR S. BLOOM, *President*;

H. B. GILMORE, *Secretary*; F. L. GILMAN, *Treasurer*, 195 Broadway, New York, N. Y.

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THREE TYPES



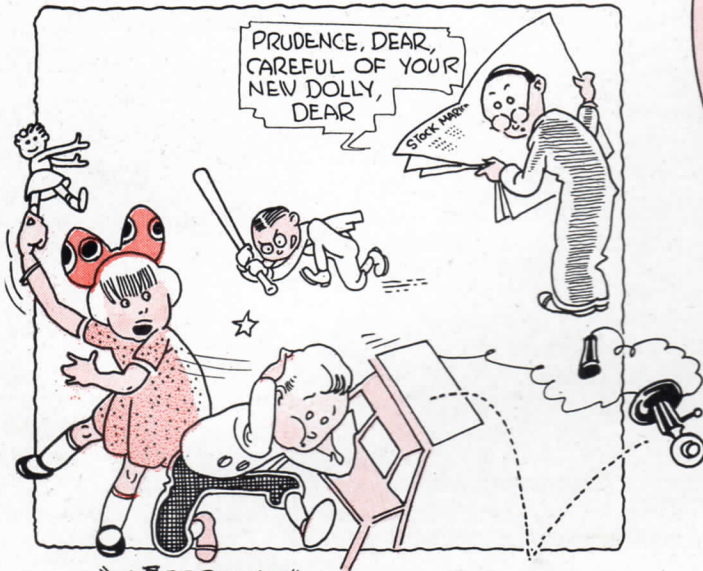
UCCESS, as it is generally measured in this fair land of ours where opportunity beckons to every ambitious man and woman, is of three sorts. There is, first, the type of success represented by the possession of things. The second is manifested by the possession of power. The third is neither of these.

The first type of success is most apparent among the extremely wealthy. Mr. Blank, having earned or inherited more coin of the realm than he can spend upon the maintenance of his homes, continues to want to stand out among his fellows. Perhaps, he takes up yachts in a big way. Or it may be hospitals or libraries. The chances are that the public benefits through his generosity—museums, college endowments, research foundations, parks, art collections—but the fact remains that he is known as a man who owns things, even if he ultimately gives them all away.

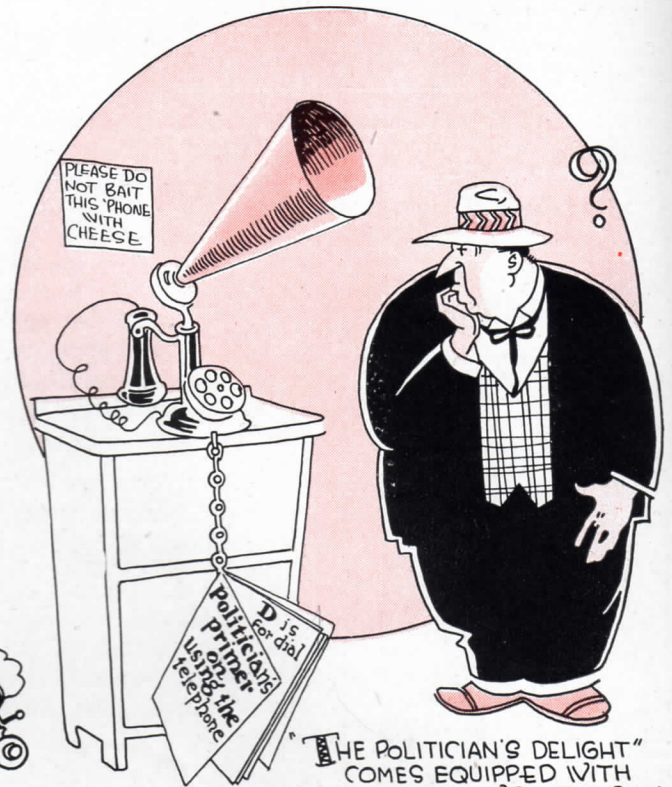
OUR second successful type is a hard worker. He is one who, oftener than not, lives in a modest suburb in a modest house on a modest scale. At home he is just John Jones of Pleasantdale. But, when he gets off his train and steps into his office—ah, that is something else again. There he is not John Jones. He is John Jones, General Manager. He is Mister Jones this and Mister Jones that and yes, sir, Mister Jones. He is The Boss. His opinion is highly regarded. He influences the lives of dozens of men. Is it to be wondered that such a man hates the thought of retiring from business to become just plain John Jones without a title, without power, often without even a hobby to console him?

There is yet a third successful man and, fortunately, we discover him often. He is the man who has found work which brought him not only bread, butter and a ration of cake, but joy. He has not striven for power or for possessions but chiefly for the joy of doing a thing he loved to do. He has found what General J. J. Carty once called "that internal satisfaction which every man can get from doing his absolute best." When he reaches his twilight years and gets out of harness, he has laid by enough to provide food, clothing and shelter for himself and those dependent upon him. He has a sense of having brought to completion a good job. He takes up on a full time basis a new one, his hobby, whatever it be. He has earned and enjoys his leisure. He knows how to loaf and invite his soul. He knows the pleasure of books, of companionship, of little simple things. Life for him is always full, vivid, stimulating. He has earned the highest form of success.

Some New Telephone Designs



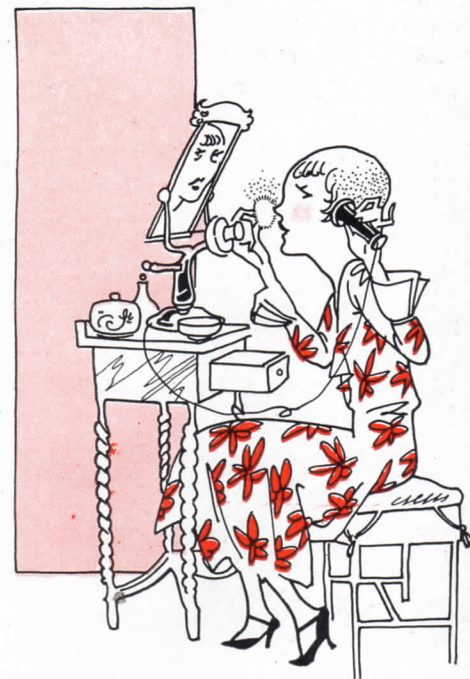
"MOBREAKO"
A GOOD STURDY INSTRUMENT
DESIGNED FOR THE LARGE FAMILY



"THE POLITICIAN'S DELIGHT"
COMES EQUIPPED WITH
INSTRUCTION BOOK WRITTEN SO A
FIVE YEAR OLD CHILD CAN UNDERSTAND IT



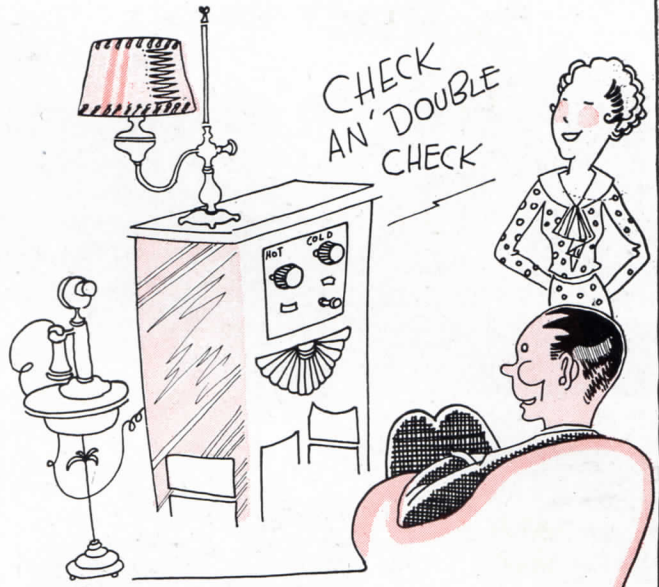
**"OR PERHAPS YOU PREFER TO HAVE
YOUR 'PHONE DESIGNED TO
MATCH YOUR FURNISHINGS"**



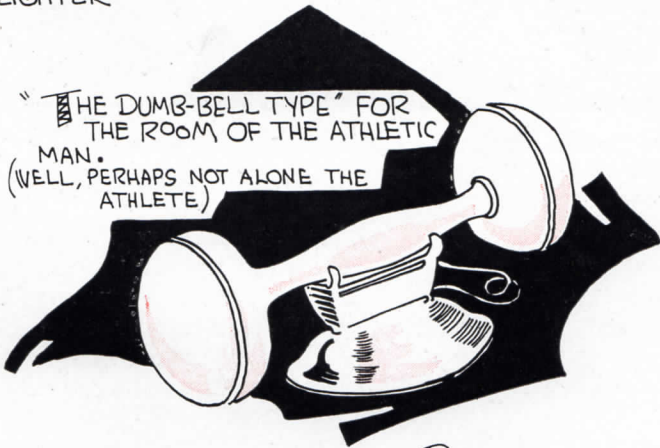
"LE BOUDOIR"
AN INSTRUMENT "OU EST MA
PLUME" (MODERN AND SMART)
FOR MILADY'S DRESSING TABLE



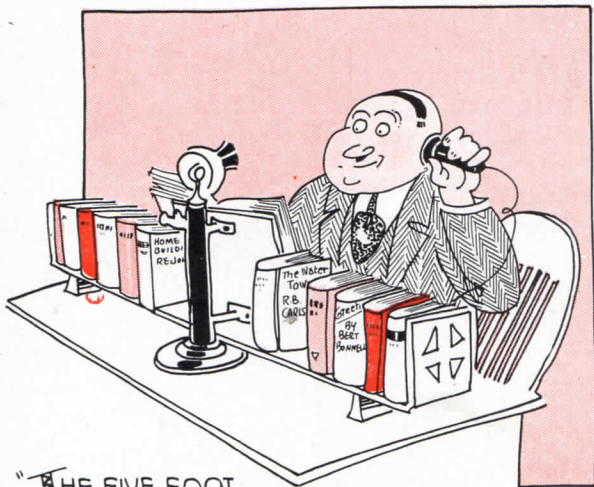
"THE EASY CHAIR MODEL" COMBINING TELEPHONE, ASH TRAY AND LIGHTER



"THIS MODEL TELEPHONE OBLIGINGLY DISCONNECTS ITSELF WHEN THE RADIO IS TURNED ON. THIS ALLOWS UNINTERRUPTED ENJOYMENT OF YOUR FAVORITE PROGRAM

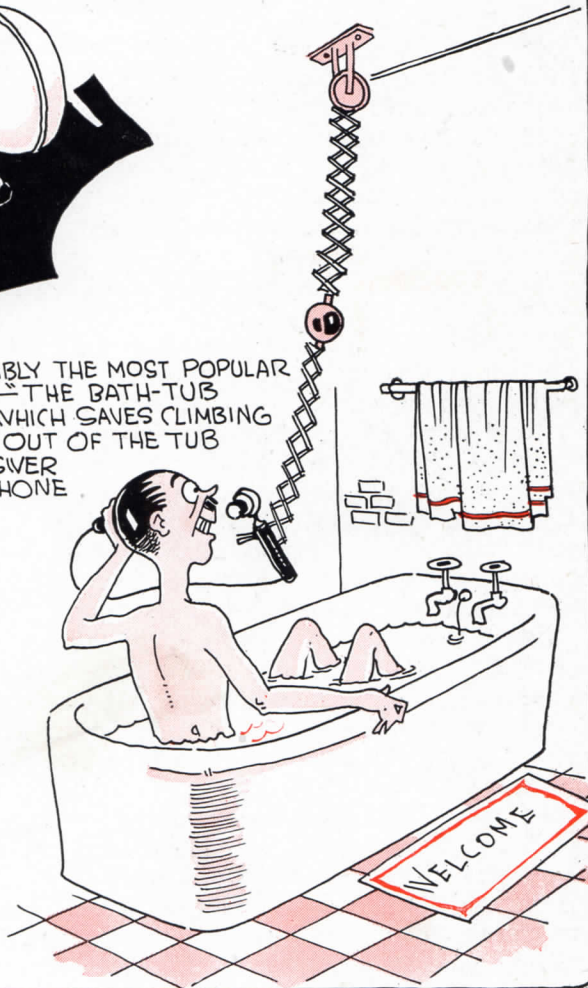


"THE DUMB-BELL TYPE" FOR THE ROOM OF THE ATHLETIC MAN. (WELL, PERHAPS NOT ALONE THE ATHLETE.)

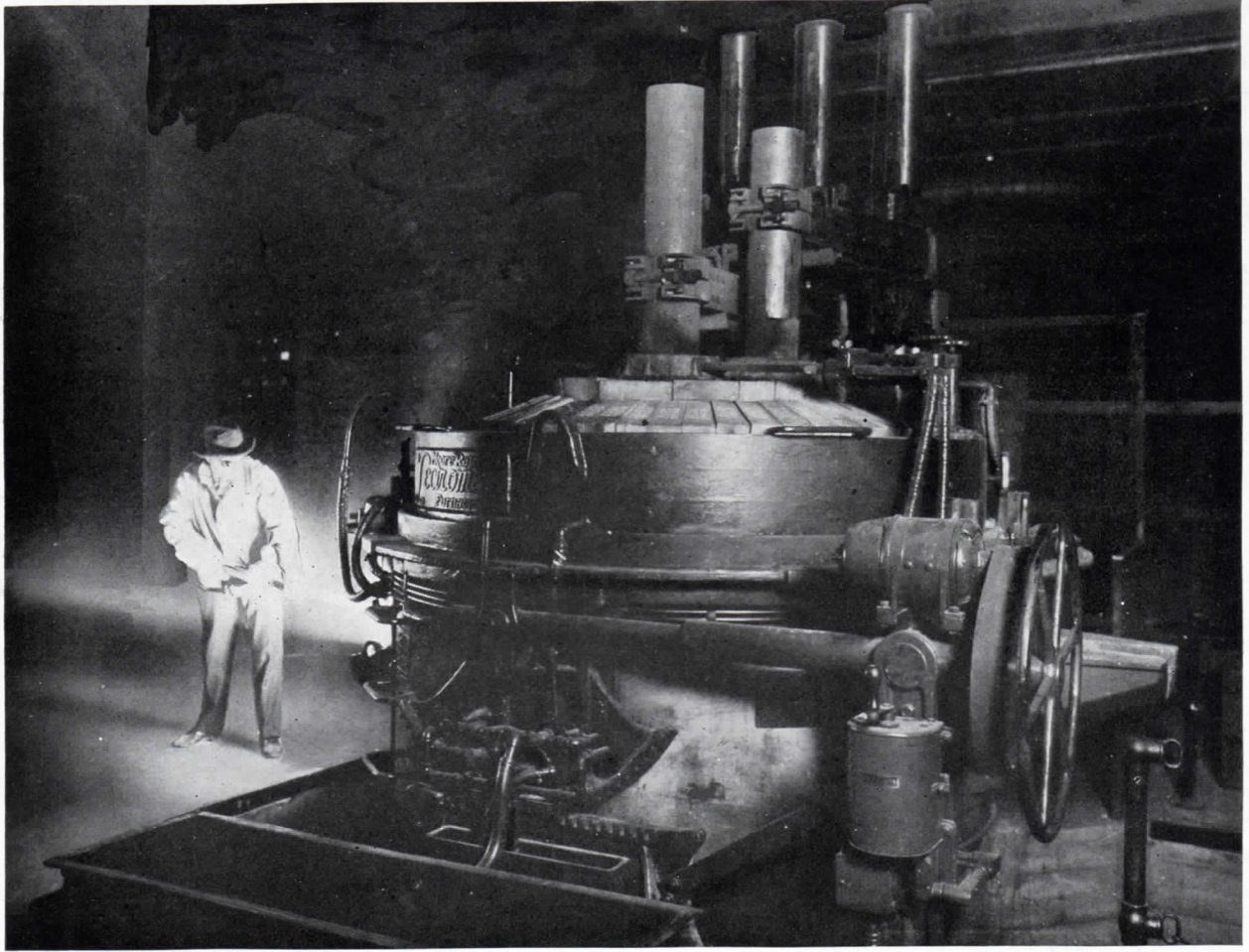


"THE FIVE FOOT SHELF MODEL" FOR THE MAN WHO DOES MUCH TALKING WITH HIS WIFE

"PROBABLY THE MOST POPULAR OF ALL — 'THE BATH-TUB STYLE' WHICH SAVES CLIMBING IN AND OUT OF THE TUB TO ANSWER THE 'PHONE



WESTERN ELECTRIC NEWS



A vibrating bellow sounds forth and eerie lights play in the surrounding gloom when the big arc furnace, Hawthorne's champion metal melter, goes into action

Hot Spots at Hawthorne

Just a Few Glimpses that Show the Part Heat Plays in Manufacturing Processes

IT is a hot and sultry afternoon. Even the breeze that idly drifts in and out of the office windows is equatorial in its scorching breath. With life almost unbearable anyway, along comes Bill, the Bore. As you would expect, he wants to know: "Is this hot enough for you?" I can't take him for a ride, so I take him for a walk instead to show him what real heat is.

Our first stop is over in the foundry, where the cupola which delivers molten iron for castings rears its head in the misty interior of this cathedral of industry. Coke, limestone, pig iron, and scrap iron are fed into the furnace's maw at a charging door on the second floor. A forced draft from below induces a fiercely burning flame from the coke. This quickly melts the iron, producing a liquid whose temperature is 2,700° F. Now, that's heat! A traveling crane carries big buckets of the seething molten metal to the larger molds while each molder carries his own portion in a ladle for the smaller castings.

In the next room, under an exhaust hood, is a row of "soup kettles" with oil flames roaring lustily beneath them. The soup in these kettles (crucibles,

they are technically called) consists of various brass, aluminum, and other non-ferrous metal mixtures for castings used in our telephone workshop. Temperatures ranging from 1,200° to 2,300°, depending on the metal mixture, are required to melt the ingredients and form the liquid alloy to be used. We watch them transport a load of the white-hot liquid from the furnace to the molds, using a hand-operated, overhead, monorail hoist, which saves the arduous task of carrying the heavy ladles by hand.

AT the south end of the main foundry building a huge cylindrical object, with three odd looking black rods projecting from the top, attracts us. This proves to be an arc reduction furnace employed in the production of brittle permalloy, and the devastating heat produced here is horrible even to contemplate on a day like this. Three low voltage, high current arcs, jumping from graphite electrodes to the metal charge in the belly of this monster, produce a temperature of 4,500° F. (making the thermometer work 50 times as hard as do the waves of withering heat that the pavements reflect under today's sun). This

heat not only melts the charge, but also burns away any impurities that may be present. The arc furnace is operated only at night, when it presents a spectacular and awe-inspiring sight with lurid lights playing about it, sending fantastic shadows dancing in the semi-darkness under the foundry's lofty dome, to the accompaniment of the snarling, crackling arcs.

The big flashy brute can certainly claim the Hawthorne championship as a fast worker at metal melting, for in less than an hour it completely melts a 6,000 pound charge, consisting of permalloy dust and fragments, iron, iron ore, and electrolytic nickel. To show how smart I am, I tell Bill that one hour of this amount of heat, if it could be usefully applied to cooking meals, would do all the gas range calisthenics for all the families in What Cheer, Iowa, for the next 7 years, 3 months, and 18 days. Bill, however, looks dubious, so I suppose he will go home and figure it out on paper and find that I am all wrong. Anyhow the amount of electricity that this arc furnace draws while in operation is 2,000 kilowatts, which would take care of all the electrical needs of a town the size of Malone, N. Y., or La Grange, Ill.

THERE are lots more hot spots to visit on our itinerary, but few will produce any temperatures comparable with that arc furnace. We walk through the boiler room of the Power House and take a squint through the peep holes in the boiler walls to watch the raging flames from the beds of pulverized coal that move slowly under the boilers, borne by chain grate stokers. It looks like a comfortable bed for a salamander, but a poor couch for a white man. Here the engineers are interested in rapid transference of heat from the blazing coal to the water in the boiler tubes. The water boils and produces steam to spin the turbine wheels, which in turn run the generators, supplying Hawthorne with electric current. We forge onward.

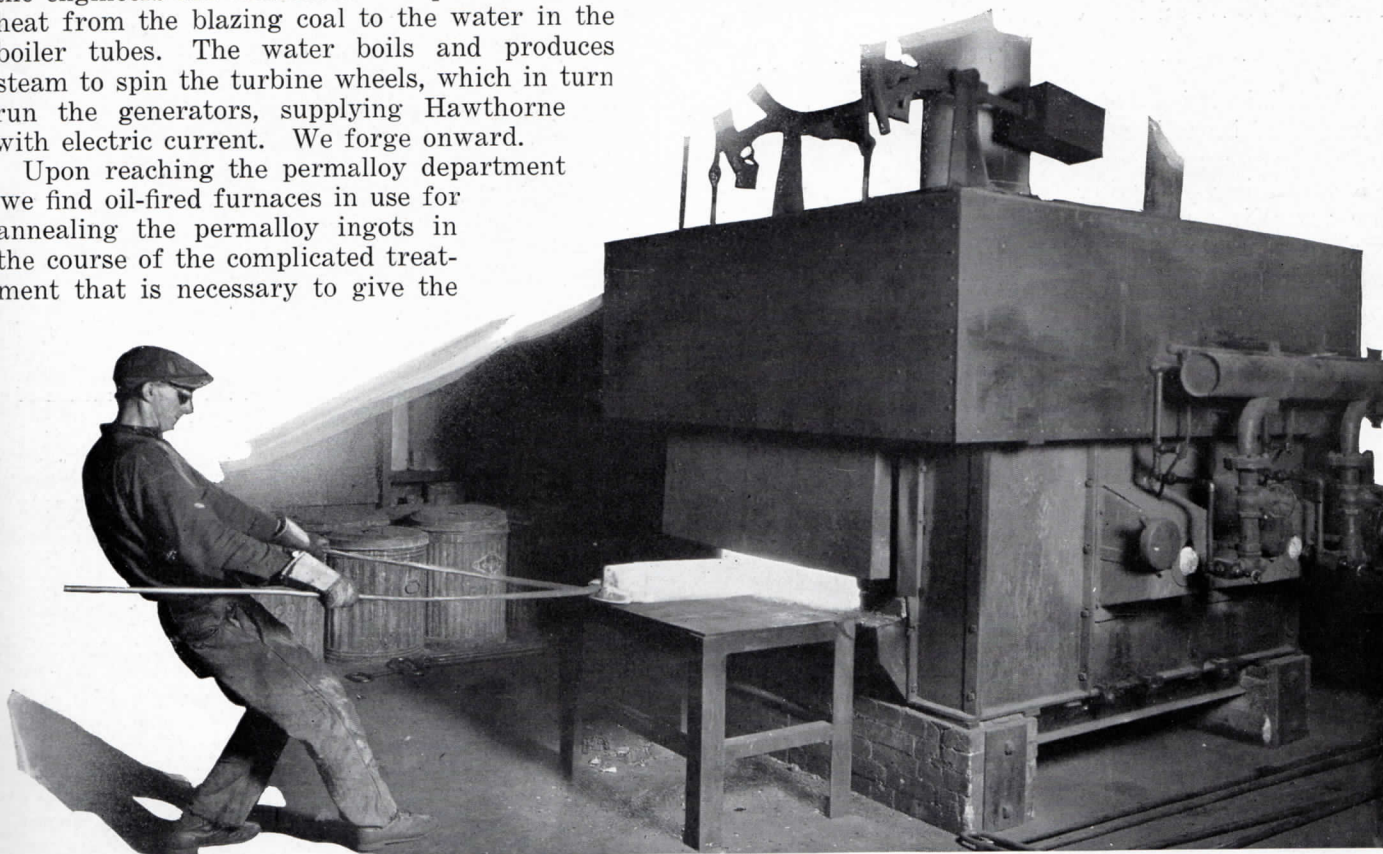
Upon reaching the permalloy department we find oil-fired furnaces in use for annealing the permalloy ingots in the course of the complicated treatment that is necessary to give the

desired qualities to this wonder-metal. In these furnaces, temperatures as high as 2,500° are attained and accurately regulated. Several large electric furnaces of the induction type are also employed here in the production of permalloy. In addition, these induction furnaces are used to melt metal mixtures for bronze castings, particularly cast phosphor bronze parts, which involve a very critical process of temperature and ingredient control.

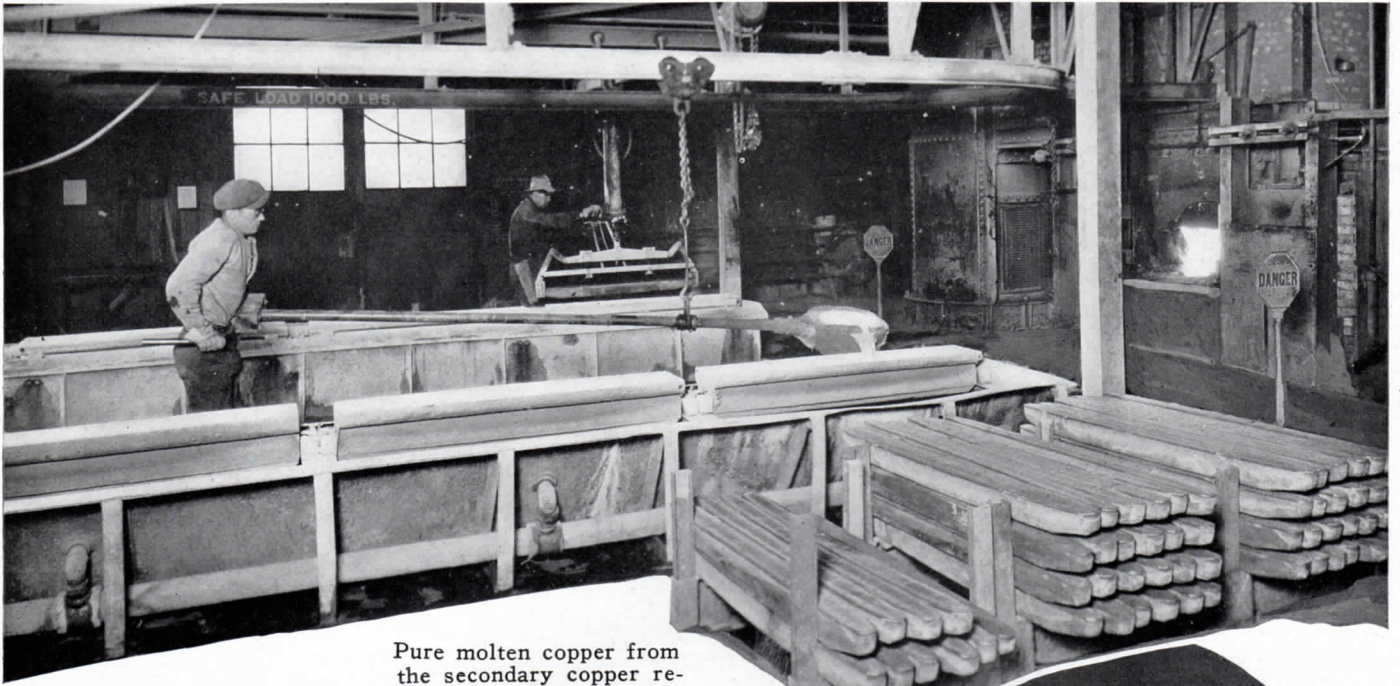
The heat of the seething masses in the depths of these artificial volcanoes runs as high as 3,400° or 3,500°. The advantages of the induction furnaces, as we use them, are absolute purity and non-contamination of the alloys, and homogeneity of the mixture. The latter property is brought about by the chaotic churning of the molten metals.

EN route to the Rod and Wire Mill we make a detour to observe the secondary copper refinery, where copper billets for wire drawing are produced from wire returned from the field and wire mill scrap accumulated at Hawthorne. It is a whole story in itself, this cycle of charging, melting, refining, poling, and pouring that goes on here day and night. The molten copper is very accurately kept at a temperature of 2,060° for pouring, so as to handle easily and still not destroy the ladles and moulds. At every charging, 100,000 pounds of copper are melted up by the fiercely burning oil jets in the refinery furnace.

Passing on into the copper rod mill, the new, oil-fired, billet-heating furnace just being completed claims our attention. The temperature and the atmosphere inside this unit will be controlled automatically and held to very close limits. The 250-pound billets—



Pulling a red-hot permalloy billet from the jaws of a fiery furnace in the course of preparing this wonder metal for use in the telephone industry



Pure molten copper from the secondary copper refinery furnace, shown at the right, is poured into the billet molds, using this long-handled ladle, which keeps the operator away from the intense heat

about 60,000 pounds of them each hour—will be heated to 1,750°, only 15° below their melting point, so that it is vitally important to avoid fluctuations in temperature in order to prevent reduction or losses in metal. The furnace is so designed that two rows of these huge billets are pushed through side by side, dropping out at the discharging end red hot and ready to be rolled into copper rod.

IN the adjacent Wire Mill, a furnace installation used in bright wire annealing merits a visit from us because of its unique method of operation, although not extraordinary as to temperature. To prevent the wire from becoming discolored from oxidation during the annealing process, it is annealed with the air excluded by means of a water seal. A load of copper wire to be treated is lowered into a tank of water on an elevator; the annealing furnace is moved directly over it; the elevator rises with its load up into the furnace, which applies a temperature of about 1,700°; and then the elevator drops the wire back down again, now annealed, but still bright and shiny.

Across the street is the Rubber Plant with its subtle aroma. About the best heat we can add to our collection here seems to be a mere 270° in the steam vulcanizing ovens, where limp rubber sheets laid on trucks between alternate layers of tin become hard rubber after baking. But, no; we seem to have overlooked a bet, for over at one side of the room are little gas furnaces, where the temperature ranges from 400° to 500°. They are used to remelt the tin sheets that produce the gloss on hard rubber, so the metal can be used again in the vulcanizing process.

Leaving the Rubber Plant we enter the Cable Plant and traverse its vast 5½ acre room filled with insulators, twistors, and stranders before reaching the Lead Press Room. Here our next hot spots are the gas-heated lead kettles, serving each press with molten lead to be extruded as sheath around the cable core.



A row of roaring kettles, in which the soup consists of various copper, aluminum, zinc, and other non-ferrous metal alloys. A crucible with a melted metal mixture ready for pouring is being lifted from the fire by means of a manually operated hoist

The largest of these kettles contain 20 tons of lead apiece for charging the presses, and yet this enormous mass of molten metal is maintained day in and day out at an exact charging temperature of 700°, plus or minus 10°. Very precise and ingenious automatic control mechanisms have been devised to accomplish this by regulation of the gas flames which heat the kettles.

The gas heated, continuous tunnel kilns for firing small porcelain parts, such as protector blocks, constitute the next item on our roster of hot spots. They are in the Ceramics Department and their temperature rises to about 2,300° at points. The WESTERN ELECTRIC NEWS of May, 1927, told in detail about this fascinating place, so we move rapidly on, stopping only to watch them mix up a batch of glass. This is much like mother mixing a complicated cake

except that the ingredients are sand, bone and soda ash, saltpeter, red lead, calcium carbonate, and other things with hard names, instead of eggs, flour, salt, butter, and so on; and except that a fearful heat of about 2,400° F. is necessary in order to melt and fuse the component elements of the glass mixture. A blast of heat like that would consume the cake batter, the pans and kitchen utensils, and the gas range along with them, if it were ever turned loose for domestic use.

Some decidedly warm places that we pause at next are the filament carbonizing furnaces, which develop temperatures up to 2,600° F. These are used in the process of making filaments for switchboard lamps. Nearby are the carbon roasting furnaces with temperatures nearly as high as their neighbors, where the granular carbon used in all telephone transmitters is processed. This carbon is put through a mechanically controlled heat program from room temperature up to over 2,000° and down again. It is a very critical operation, and one of vital importance in telephone manufacture for if the carbon buttons were not just right, voice transmission would be very unsatisfactory.

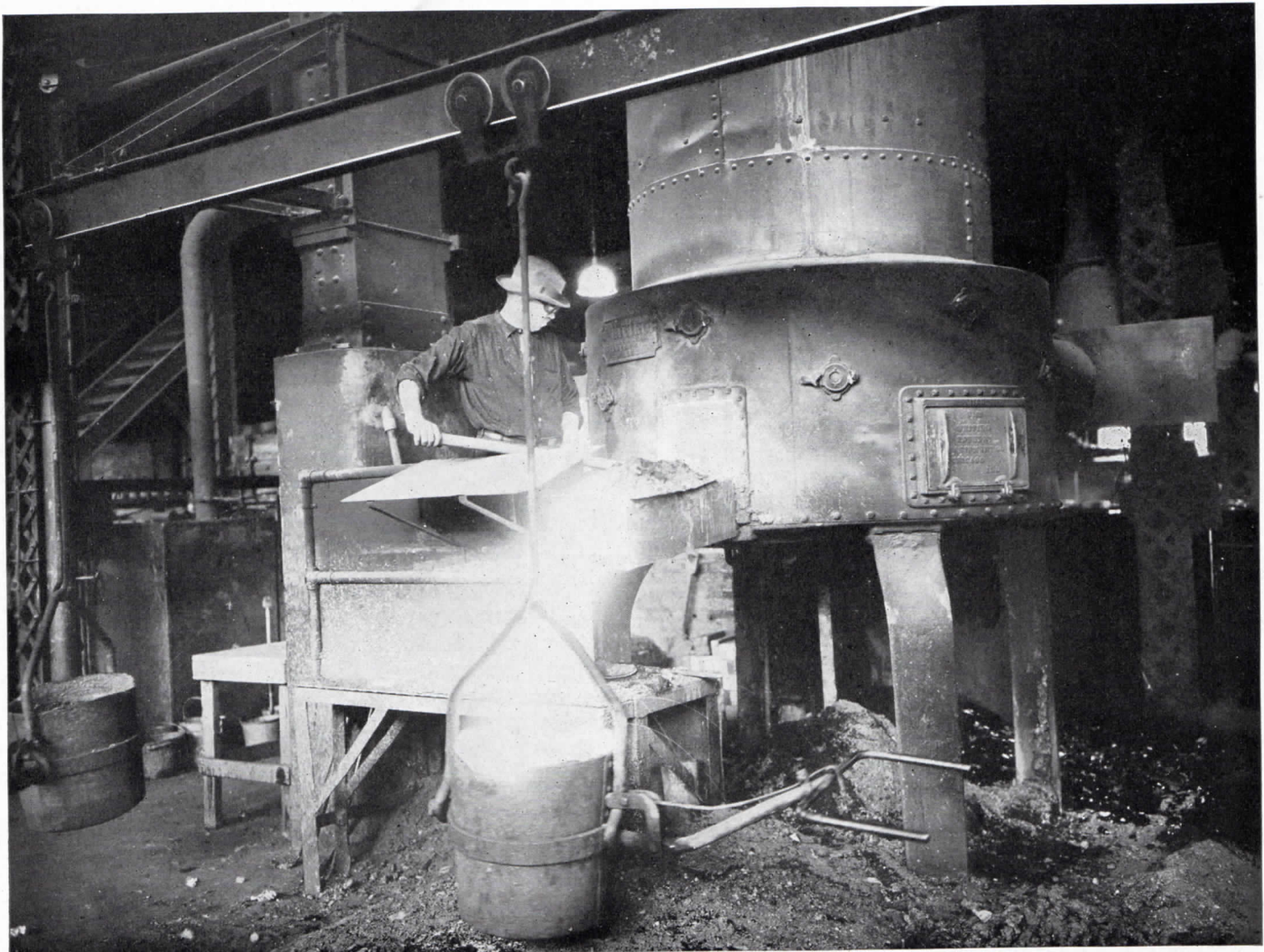
The different forms of welding of course claim their rightful place high among the things that are hot at Hawthorne. In fact atomic hydrogen welding pro-

duces an almost unimaginable heat of 8,000° and the various spot welding and arc welding operations involve temperatures of 5,400° to 6,000°, which far exceed all other heats encountered in our peregrinations. All of these processes, however, concentrate this extreme heat on a very limited area.

THE annealing furnaces include a number of different sizes and types, many electrically controlled to regulate the heating cycle. They receive some attention from us for they perform a very important process. The purpose of annealing is to soften metals, making them more easily workable, and a great many of our metal parts find their way into these heat-treating clinics at some time in their careers. Different metals, and parts of varying sizes and shapes require different temperatures and methods of treatment, so that all the general purpose annealing equipment has to be flexible to some extent. There are pusher types and rotary types and carbottom types of annealing furnaces at Hawthorne and their names are indicative of their method of operation. Some are gas heated, some electrically heated, and a few oil heated. Within the furnaces, blistering temperatures hold forth, ranging from 1,400° to 2,000°.

Tool hardening is the most carefully controlled of

(Continued on page 52)



The bottom of the cupola, from which a stream of white-hot molten metal is periodically released into clay-lined ladles. From these it is poured into molds for gray iron castings used at Hawthorne

ANOTHER LANDMARK IN DISTRIBUTION

(Continued from page 38)

16,000 square foot open cable dock is adjacent to this section. It runs along the north side of the building and is used for the storage of cable, cross-arms and clay conduit.

Special steel racks with a capacity of 5,000 pounds are used for storing lead sleeves. These racks, when empty, are sent to the supplier for loading. After loading they are brought back by the supplier to our receiving platform. Being of the skid type they are raised by a lift truck and taken back to their storage space. Motor trucks making deliveries during the day enter the Telephone Company's garage and unload on a section of the platform which leads to the receiving department. The shipping dock, which is adjacent, is enclosed within the building and can accommodate four trucks. Large steel roller doors, electrically operated, can be closed in cold weather. Extending beyond the building from here is the open cable dock and this arrangement of receiving, shipping and dock spaces has been designed so that should the first two become congested, the latter can be utilized and at no time are receiving and shipping facilities overtaxed.

The first floor has been constructed to sustain 500 pounds to the square foot. Three freight elevators, one 10,000 pound and two automatic 6,000 pound capacity, serve the warehouse and shop. On these, a safety device controlled by a photoelectric cell mounted in the floor tread has been installed. The elevator doors will not close or the car start while there is an obstruction throwing a shadow on this sensitive cell. The building is also equipped with a large rubbish chute leading to an incinerator with a capacity for consuming 500 pounds of rubbish per hour. This greatly facilitates the keeping of a spick and span appearance on all floors.

The health of the personnel has received considerable attention. The House has good medical facilities. Conveniently located to the shop on the fifth floor is a doctor's office with adjoining examination and consultation room. There is a physician in part time attendance. In the west wing of the third floor is a large cafeteria serving excellent food at moderate prices. This is operated by the Telephone Company for the joint use of all employees in the building.

To the most casual visitor, the entire structure bespeaks progress and efficiency. Cheerful and healthful working conditions, fine transportation facilities, desirable location and the best in equipment are available to all Detroiters in their new home.

HOT SPOTS AT HAWTHORNE

(Continued from page 47)

all heat treating processes, for a completed tool worth many hundreds or even thousands of dollars might be entirely ruined by faulty heating. In the case of high speed steels temperatures as high as 2,350° are used for hardening, while for pack hardening on ordinary tool steels the temperatures range from 1,650° to 1,750°. Lead bath hardening involves a 1,500° heat and cyanide bath hardening, from 1,450° to 1,650°. Even the oil baths and acid salt baths

used in the course of the hardening process for quenching the parts operate as high as 650°.

Furnaces that heat parts for hot forming operations are also observed as we stroll from room to room. Some of these mechanically feed the hot parts into the presses that form them, while others deliver the parts to an operator as he requires them.

A particularly interesting spot that we encounter in our travels is the aluminum die casting department, which is scientifically arranged and employs all up-to-date innovations in the die casting art, making it one of the finest and most elaborate plants of its kind in the country. The thermostatically controlled aluminum pots, which are part of each machine, keep the molten metal within about 25° of the critical temperature of 1,200°. That is not as hot as some places we have seen this afternoon, but it is still "hot enough for you."

"Well, Bill," I suggest, "how about some more heat? We can look over the japanning ovens, which are heated by the circulation of high flash point oil at 510°, instead of being heated by steam. Or would you rather watch the casting of precious metal mixtures—gold, silver, and platinum alloys, requiring temperatures of 2,500°, which are developed in a compression type, carbon-pile furnace? We can pay a visit to some of the tanks where insulating compounds (sarco, asphalt, paraffin, rosin, and the like) are kept at heats from 250° to 500°."

But Bill has had enough of Mr. Fahrenheit's product and capitulates. "I guess," he hazards, "that it isn't so much the heat that I mind; it's the humidity."

Momentarily I am tempted to lead Bill over to the wood kilns in the lumberyard. There, the green lumber is thoroughly dried out, and, though the temperature is not very high compared to other places we have visited, the moisture content of the air is something to gasp about. A moment in a wood kiln would let Bill see what humidity really is. But what's the use?

IN INDUSTRIAL SPOTLIGHT

W. R. WILLETS, of Kearny, presented a paper on "The Application of Hydrogen Ion Methods to the Pulp and Paper Industry," at a joint meeting of the Society of Chemical Industry and the American Chemical Society held in New York on May 9th.

F. C. Spencer, of Kearny, Chairman of the A.S.M.E. committee studying the subject of Tungsten Carbide Tools, submitted a preliminary report of the committee at the Detroit meeting of the A.S.M.E. on June 9th.

"Alloys for Cable Sheathing," a paper by R. S. Dean and J. E. Ryjord, which was published in the March issue of *Metals and Alloys*, has been reprinted by the Bell Telephone Laboratories. (B-468)

H. B. Gilmore, Secretary of the Western Electric Co., has been elected treasurer of the American Management Association.

C. B. Evans, Development Engineer at Hawthorne, has been elected chairman of the Chicago section of the American Welding Society.

Harvey Anderson, Development Engineer at Hawthorne, has been appointed temporary chairman of the A.S.T.M. committee on die-casting metals.



*The telephone recalls old days, on
25th anniversary at Hawthorne*

"I remember when Western Electric's
Hawthorne were surrounded by prairie



Breaking ground—1903

first few buildings at Haw-
thorne — and Cicero was a

village of 4500! That was in 1905 . . . In those days
numbered the men at the Works. And they were right



The last word in style

girls out-
in style

with bustles, high button shoes and Merry Widow hats . . . Many of the pioneers of
1905 are still here making telephones



How they came to work

for the nation. Together
thing has never changed—

the skill and patient care my makers put into every
System apparatus . . . That's why I am able to serve you so



Inspecting early telephones

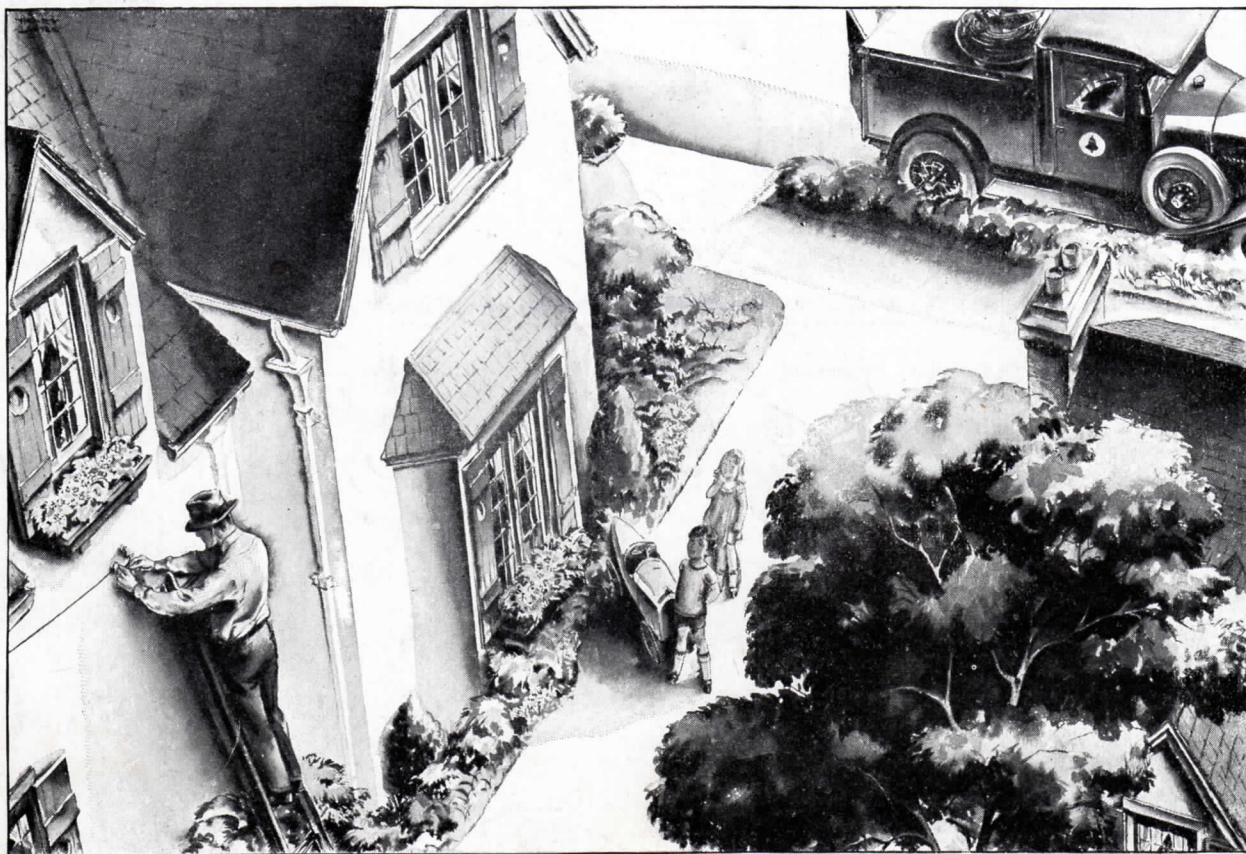
bit of Bell
faithfully?"

Western Electric

Since 1882 Manufacturers for the Bell System



This month's advertisement, one of a series running in Chicago newspapers, commemorates Hawthorne's
Twenty-fifth Anniversary



THE BELL TELEPHONE SYSTEM IS ORGANIZED TO GIVE CONSTANTLY IMPROVED SERVICE . . . QUICK,
ACCURATE, EASY TO USE

What you want of the telephone . . . it is our business to give

An Advertisement of the American Telephone and Telegraph Company

WHEN you order a telephone, you want it put in promptly. During the last five years the average length of time needed to have a telephone installed has been cut nearly in half.

You want quick and accurate service, free from trouble. Good as the service was five years ago, today there are a third less troubles per telephone. During this same period there have been marked increases in the already high percentage of perfectly transmitted conversations.

When you make a toll call, you want a prompt, clear connection. Five years ago 70 per cent of all toll and long distance calls were handled while the calling person remained at the telephone. Today all but a very small per cent are handled this way.

The Bell System is organized to give constantly

improved service. Several thousand persons in the Bell Laboratories are engaged in research that improves the material means of telephony. The Western Electric Company, with plants at Chicago, Kearny, N. J., and Baltimore, specializes in the manufacture of precision telephone equipment of the highest quality. From its warehouses all over the country, it supplies the millions of delicate parts for Bell System apparatus.

The operation of the System is carried on by 24 Associated Companies, each attuned to the area it serves. The staff of the American Telephone and Telegraph Company is continually developing better methods for the use of these operating companies.

Your telephone service today is better than ever before. The organized effort of the Bell System is directed toward making it even better tomorrow.

