



# Victory Calling

THE TELEPHONE IN THE WAR



*We are the unseen—ever watchful, never sleeping,  
Binding the atoms together.*

*Not ours the glory nor applause,  
We wear no uniform—and yet—are part of our  
land's destiny,  
Guarding her secrets well.*

*We are the unseen—loyal—true to an ideal,  
One God—one country—one flag;  
We want no praise, knowing, out there,  
Men have shed their blood that we might live . .  
With others soon to follow them.*

*Our reward shall be—one day—with the touch  
of magic at our finger tips  
To send across the quivering wires  
One far-flung cry—"Ours is the Victory!"*

Written by Eleanora Dayton Surry  
Long Distance Operator, Washington, D. C.

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# Victory Calling

**T**HE telephone is an essential tool of war because it gets things done *fast*. War telephone calls carry orders, gather materials, hustle guns down the assembly line — all in a few minutes. The telephone moves troops and supplies and puts production “on the double.” It speeds the production and distribution of food. Twelve thousand calls go into the making of one big bomber — more than sixty thousand into the building of a Liberty ship. The whole rhythm of the war effort is timed to the ringing of telephone bells.

So the telephone is in the thick of our *attack* on the enemy. Telephone lines are also the nerve system of our *defense* against assault. Over them flash the calls that spread the warning and direct action. The telephone is a shield as well as a spear.

Our telephone system is the biggest and best in the world. And that makes a difference — never doubt it. It is no mere coincidence that this country, which has so swiftly acquired tremendous military power, is also the country with the greatest communication system ever organized. Behind the clatter of rivets, the roar of war engines and the thunderous procession of the bombs is the ring-ring-ring of the telephone bell. War's on the wire. It is Victory calling.

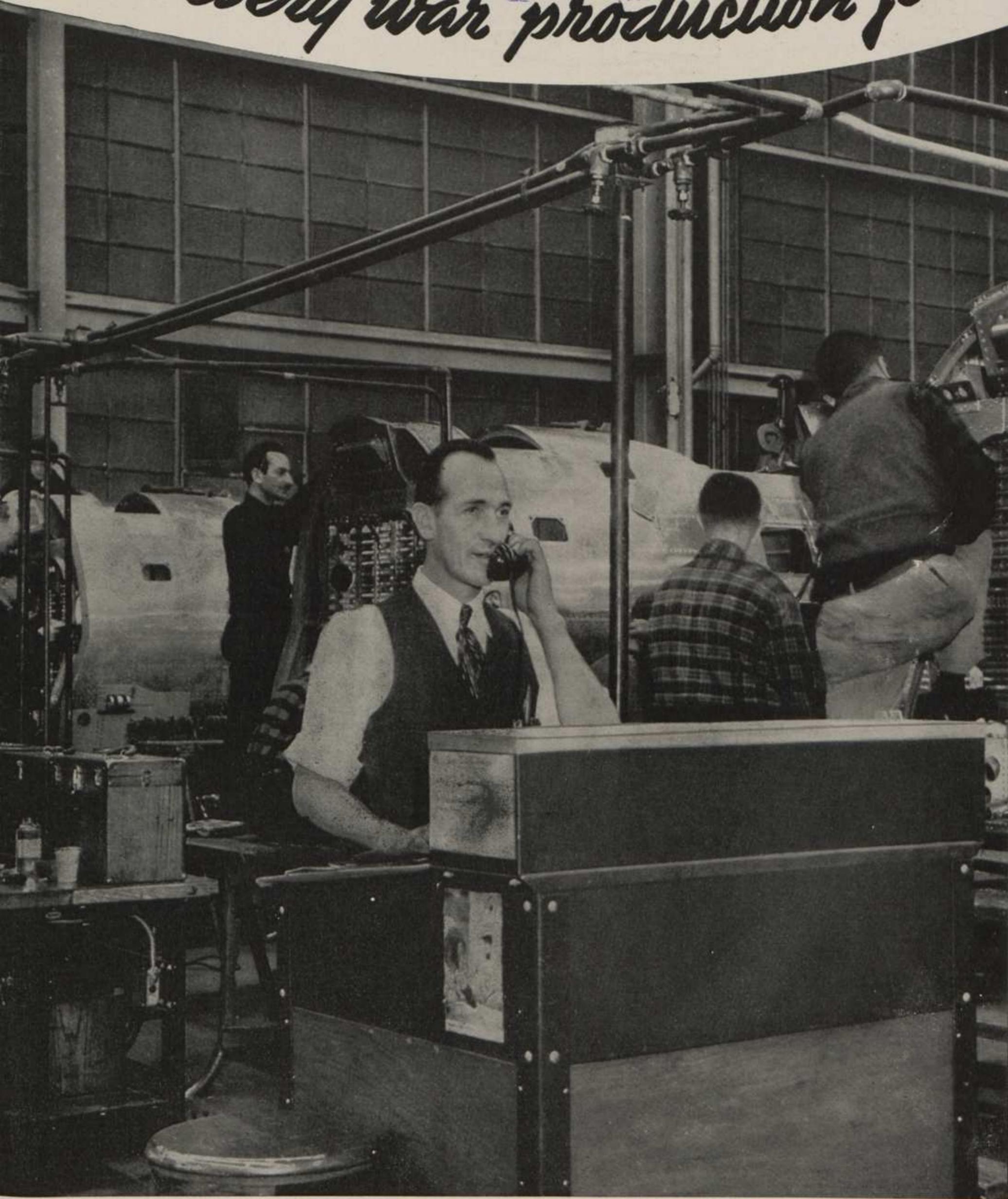
9/21/2009  
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*The telephone is in every fight*



Advance post in the desert; soldiers at the end of a telephone line observe and direct artillery fire.

*-and every war production job.*



In the fuselage assembly department of a fighter plane plant (Courtesy Republic Aviation Corporation).

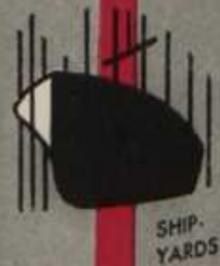


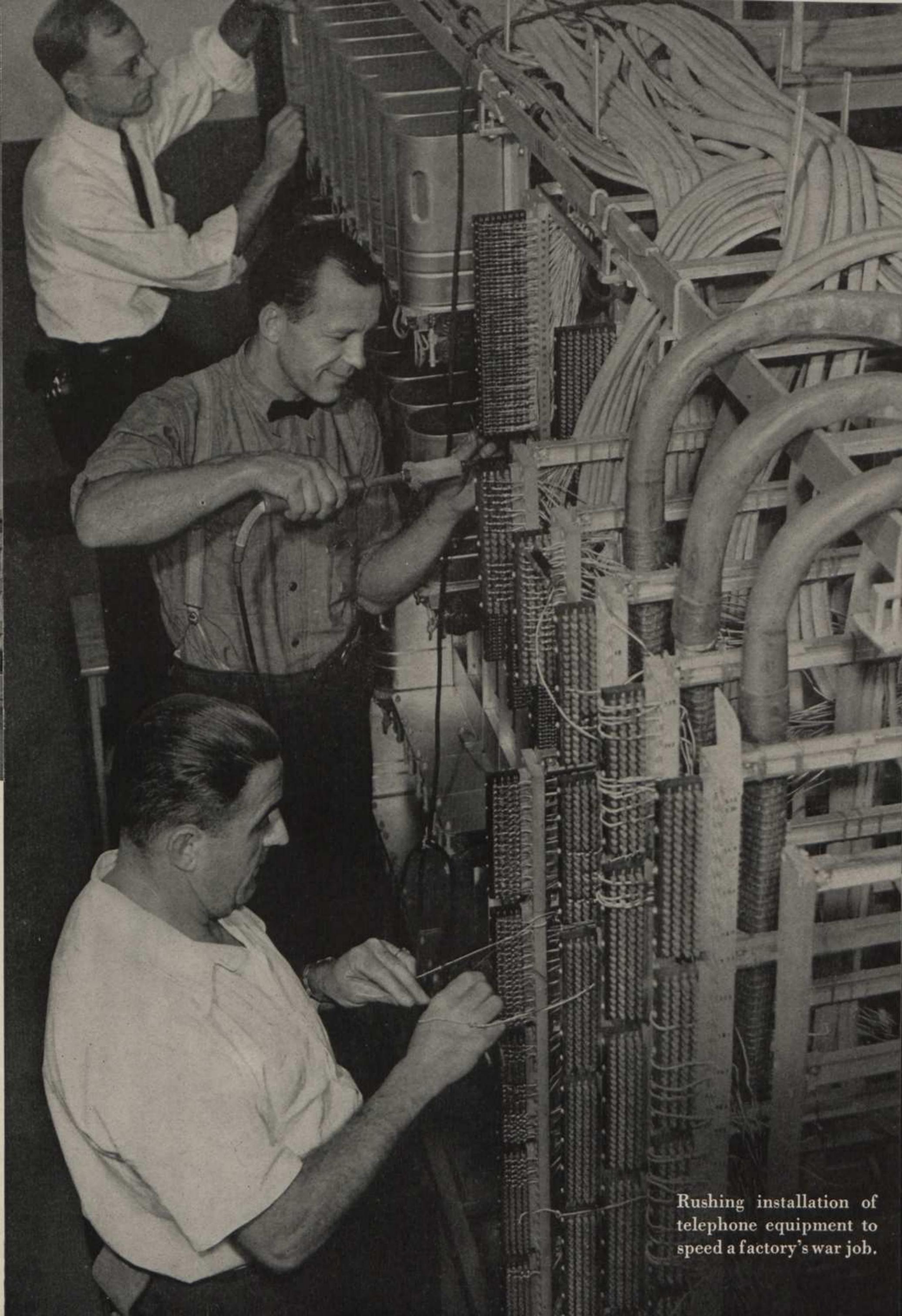
## *Serving camps and war plants*

Shells are loaded now where the tall corn used to grow, and vast air bases reach for miles where once were only sand and grass. Thousands of Army camps, Naval stations and other war projects, some of them as big as good-sized cities, have needed telephone service installed — fast. Each has got it — on time.

Often the necessary facilities have had to be built from the ground up, with new telephone central offices, new switchboards and many miles of wire. Often they have been needed “day before yesterday.” To serve Government projects alone, the Bell System has placed telephone cables containing some 20 billion feet of wire. For the War Department in Washington the System built and placed in service the biggest private telephone switchboard in the world. The capacity of the Navy Department’s Washington telephone system was tripled in 18 months.

All this has been in *addition* to a vast expansion of telephone facilities to serve privately owned war plants. From the moment the defense program began in 1940, the Bell System has followed this plan of action — to know the communication needs of the Army and Navy as soon as they knew them, and to meet those needs promptly. That was the plan, and that is what has been done.





Rushing installation of telephone equipment to speed a factory's war job.



This is what a big Army camp public telephone center looks like on a busy evening . . .

## ***For fighting men — the best we can give***

A telephone call is a little thing, perhaps — but how much it can mean! For men in the armed forces the Bell System is doing its utmost to make telephone service as personal and pleasant as skill and care and friendly helpfulness can make it. Maps that show how to reach the nearest telephone easily. Cheerful operators on the spot to help the boys with their calls. Camp telephone managers working full-time to keep the service as convenient and pleasing as possible. Comfortable chairs and maybe something to read if calls are unavoid-



The telephone manager is always ready to help.

ably delayed. These are some of the thoughtful details you would find if you were to make a tour of the big Army camps and Naval bases.

At some locations, trailers and buses with built-in booths are used to meet unusual demands for service, as when fighting ships come in. Everywhere, the desire of Bell System people is to do their best for every soldier and sailor. The job isn't always easy, because the war load on telephone lines is tremendous; often the wires are crowded, and sometimes there isn't room for everybody who wants to telephone at the same time. But telephone men and women will keep trying.



... And this is how the girls who handle the calls feel about their assignment.





**OPERATING FOR THE ARMY**

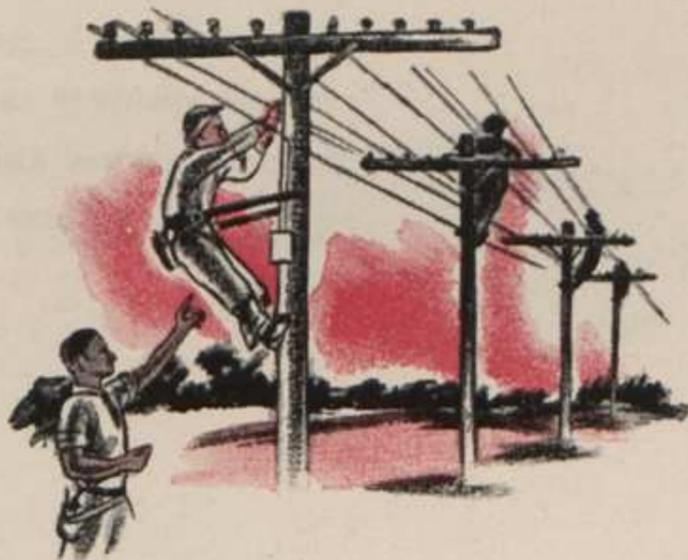
Bell telephone men and women now maintain and operate Army telephone systems at hundreds of camps and bases. This picture shows an Army switchboard during gas mask drill.



A typical group of Signal Corps trainees "goes to school" under experienced Bell System instructors.

## ***Teaching telephone "know-how"***

"Get the Message Through"—that is the watchword of the U. S. Army Signal Corps, which handles the Army's vital communications job. This assignment today takes all kinds of skill and technical knowledge, as well as front-line courage. To help carry out its huge training program, the Signal Corps invited the Bell telephone companies to assist in teaching soldiers to become telephone installers, cable splicers, repairmen and teletypewriter maintenance men. The Bell System is conducting its part of the job in its own training schools throughout the country, where telephone men have been trained for years. Several thousand soldiers have already been trained — men who used to be grocers and truck drivers, bookkeepers and cowboys — and more will be given instruction each year. In addition, Bell System experts are conducting a continuous school for Army and Navy men in the operation and maintenance of complex electrical and radio protective equipment essential to mechanized warfare. All the "know-how" the System has is helping the Signal Corps to get the message through.





Day and night, telephone operators are alert to speed "Army Flash" calls from aircraft spotters to Army Information Centers.

## ***Blue-streak service for "Army Flash"***

Before the war began in Europe, practical working plans for spotting and reporting enemy aircraft had been developed cooperatively by the U. S. Army Signal Corps and the Bell System. These plans, modified by the best experience abroad, are substantially those being used throughout the United States at the present time. The nation's vast and flexible telephone network provides the express highways for "flash" calls from aircraft spotters to Army Information Centers, and for the swift dispatch of instructions and messages from each Information Center to fighter squadrons, anti-aircraft batteries and civilian defense organizations.



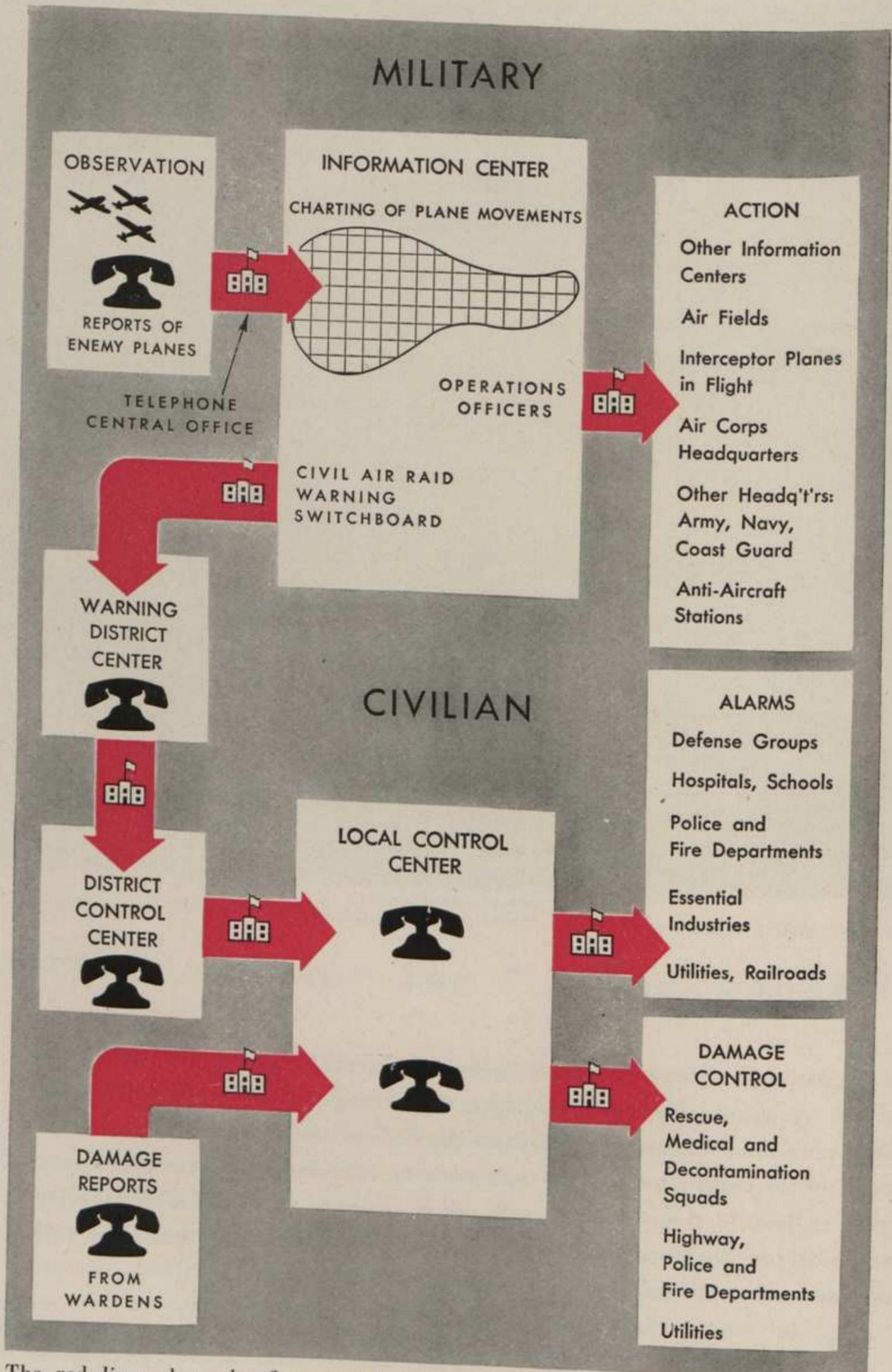
*Courtesy Look Magazine*

In each Center, skilled volunteers chart the planes' course. Above, our pilots run for their fighters on word from a Center.

At the Army's request, Bell System engineers designed, and Bell Telephone companies provided, the specially arranged equipment needed for the operation of Information Centers throughout the country. As a result of continued coordinated effort, thousands of telephone operators are now able to handle Army "flash" calls at an average speed of about thirty seconds from the time the aircraft spotter lifts the receiver until the call is answered at the Information Center.



# Air defense communications



The red lines show the flow of telephone calls from aircraft observation posts to military and civilian defense organizations. Calls come in to the Information Center from many observation posts, and warnings go to many district and local control centers.



### ***CARGOES AROUND THE WORLD***

Over the long sea lifelines, our convoys deliver the products of farm and factory to every battlefield. In this infinitely difficult task, the telephone plays so important a role that telephone people have been called part of "the invisible Navy."



Copper must go into bullets instead of telephone wire.

## LONG DISTANCE

*goes to war*

War has brought the greatest demand in history for long distance telephone service. In two years' time the Bell System has handled over its longer toll routes added calls equal to nearly 17 years' peace-time growth. To meet this demand the System has added thousands of new talking channels with a total length of several million miles. Even so, the lines are loaded to the limit, and today enough lines cannot be built because the necessary copper and other materials are needed for war weapons and ammunition.

Most of the increase in long distance calling is due to the war effort. The wires are humming all the time with calls that speed materials and parts on their way to bomber assembly lines — calls that help launch ship after ship in record-breaking time — calls that flash military orders and organize convoys and hurry the day of victory.

These calls are essential and they *must* go through promptly. Therefore the telephone companies are asking the public to keep the wires clear. As President Walter S. Gifford of the A. T. & T. Company said recently, "We telephone people are in the strange position of spending money for advertising, urging people not to use our service if they can avoid it. Certainly that seems to make no sense, and it would make no sense except that we are at war and the one important thing is to win the war. The Bell Telephone System is dedicated to doing its full part in that task and we are asking you to help by not making long distance calls to or from busy war centers, especially Washington, unless they are absolutely essential." Nothing must interfere with the communication requirements of our armed forces and the producers of weapons.

**WAR CALLS COME FIRST**



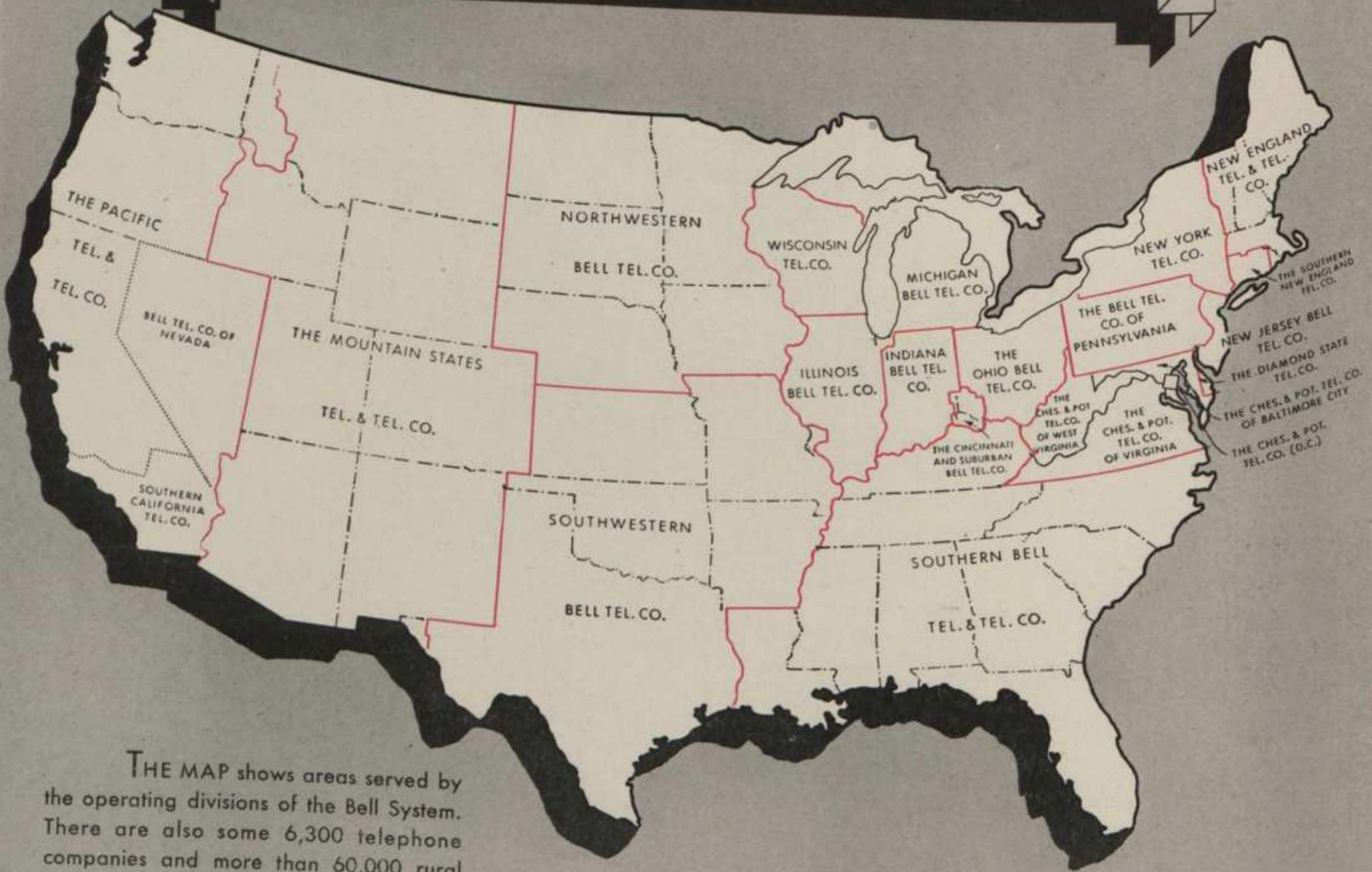
### *GOING PLACES*

A new 1,600-mile cable from Omaha to Sacramento, buried by plow trains like the one above, completes all-cable telephone facilities from coast to coast. This line was begun in 1939 against the possibility of war with Japan.

At the right are three of hundreds of operators who have volunteered to leave their home posts to handle calls at switchboards in war centers.



# THE BELL TELEPHONE SYSTEM



THE MAP shows areas served by the operating divisions of the Bell System. There are also some 6,300 telephone companies and more than 60,000 rural lines not owned by the System, but which connect with it to furnish a national service.

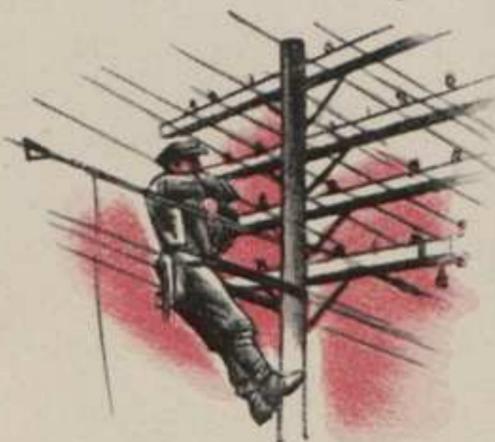
## **ORGANIZED** *to serve America at war*

The Bell System is well organized to meet emergencies, including the supreme emergency of war. Each of the operating telephone companies shown on the map provides telephone service in its territory, and each is closely associated with the American Telephone and Telegraph Company, which is the headquarters company of the System. Through its Long Lines Department, the A. T. & T. Company owns and operates long distance telephone service interconnecting the territories of the regional companies, and the A. T. & T. headquarters staff serves the whole System in much the same way that the general staff of the Army functions for the whole Army.

Two other vitally important units of the System are the Bell Telephone Laboratories, the largest industrial research organization in America, and the Western Electric Company, which both manufactures and purchases from others the apparatus and materials needed by the Bell telephone companies. Western Electric performs the Bell System's "service of supply" and its facilities for that purpose include supply depots at strategic locations throughout the country.

Telephones, switchboards, cables, tools and methods of work are standard throughout the System. This means that people and materials can be mobilized effectively for emergencies, for the same tools and equipment will fit the need wherever the need arises, and people who know their job in one place can get right to work somewhere else without waste motion. For instance, operators who have gone from their home cities to help handle the flood of calls at busy war centers are able to fit right in on the job because the methods of work are the same.

The forces of the operating telephone companies and the Long Lines Department of A. T. & T. are the front line troops of the Bell System. A general headquarters staff coordinates their efforts. A great research laboratory is constantly at work to develop the best facilities that science can evolve. A fully rounded service of supply provides standard equipment. This organization has given America the most complete and dependable communication service in the world, and it is well suited to serve the nation in war.



## ORGANIZATION OF THE BELL SYSTEM

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

ADVISORY SERVICES TO TELEPHONE COMPANIES  
AND OPERATION OF LONG DISTANCE LINES

WESTERN ELECTRIC COMPANY  
MANUFACTURING AND PURCHASING

BELL TELEPHONE LABORATORIES  
RESEARCH AND DEVELOPMENT WORK

OPERATING TELEPHONE COMPANIES  
TELEPHONE SERVICE WITHIN THEIR RESPECTIVE TERRITORIES



Teletypewriter switchboard operators handle the switching of written messages, just as telephone operators make connections when people want to talk.

More than 60,000 women of the Bell Telephone Companies other than operators have, each one of them, a vital part in rendering our wartime telephone service.



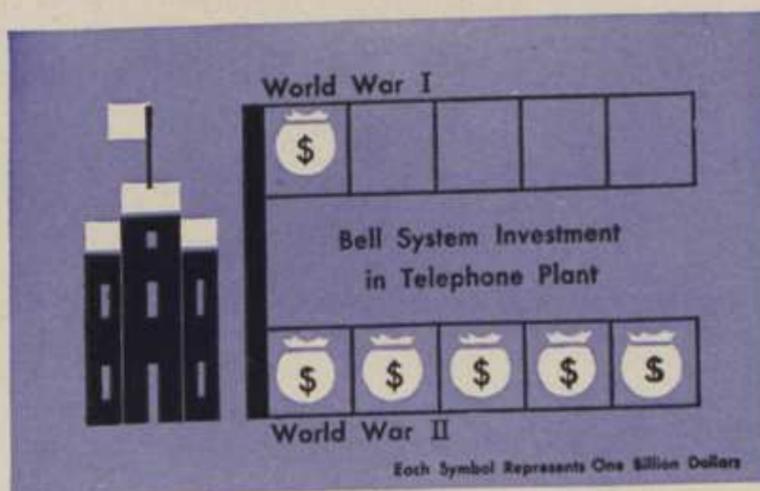
# A GREAT NATIONAL RESOURCE

The Bell System serves more than twenty million telephones in the United States and its lines connect with several million other telephones of independent telephone companies. There is one telephone for every five people in this country.

The wire network of the Bell System totals nearly 100 million miles and interconnects more than seventy thousand cities and towns. In the three years beginning in 1940 the System spent more than a billion dollars to add new telephone facilities to meet present needs. In one year, in World War II, it has handled more toll and long distance calls than in three years at the time of World War I. Nowadays the people of America make approximately 110 million telephone calls a day, and the number is steadily increasing.

Overseas telephone service, which was developed by the Bell System, is today invaluable to the Government and the armed forces in maintaining instant communication with the battle fronts in all parts of the world. Teletypewriter exchange service, also a Bell System development, permits the swift communication of written messages between thousands of points interconnected through teletypewriter switchboards. Thousands of miles of private telephone and teletypewriter lines are furnished by the Bell System to the Army and Navy, to the Federal Bureau of Investigation, to the Civil Aeronautics Administration, and to other Government agencies and war industries.

These vast physical facilities are an asset whose value in wartime cannot be calculated. There is something else, however, that is even more important, and that is the Spirit of Service which is the honored tradition of telephone men and women everywhere. In peaceful years they have dedicated themselves to the ideal that the message shall go through, and some, in times of crisis, have given their lives in line of duty. As guardians of a service essential in war, they know the responsibility that rests on them and they will continue to meet it.





Bell System engineers are working and planning night and day to stretch telephone facilities to the limit.

## ***Doing more with less***

Material made from waste is now used as insulation for electrical telephone parts. Rayon has taken the place of silk in switchboard wire. Mechanisms once wrapped in rubber are now wrapped in a special kind of paper. In the year following Pearl Harbor, the Bell System saved 100 million pounds of strategic metals. The System's rate of use of aluminum has been cut from 1,200 tons to 50 tons per year; of zinc, from 7,500 to 850 tons; of rubber, from 2,000 long tons to 200 long tons. Small lengths of used wire are spliced together and used again. Old switchboards previously replaced by dial systems are back in service. Every ounce of scrap metal is saved for the melting furnace. *In 1943 the Bell System is actually returning as much copper to the nation's stockpile as it is withdrawing from it.*

Much of this saving of materials is due to Government conservation orders — but the Bell System anticipated official action and took many of the necessary steps before the Government ordered them. Today the System is able to keep its facilities in good repair because down through the years its scientists and engineers have unceasingly studied how to make the best use of all kinds of materials.

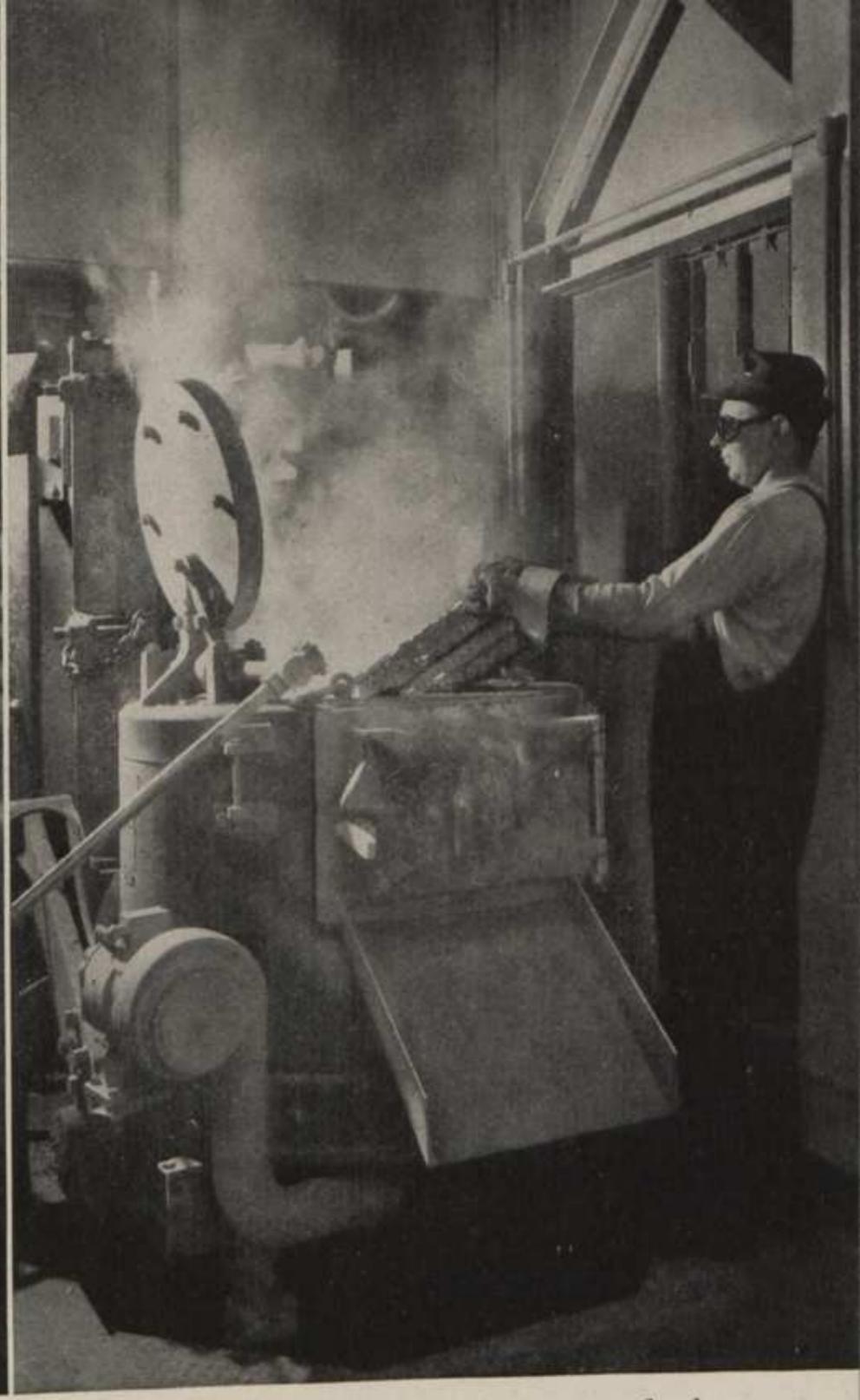


Splicing pieces of used wire.

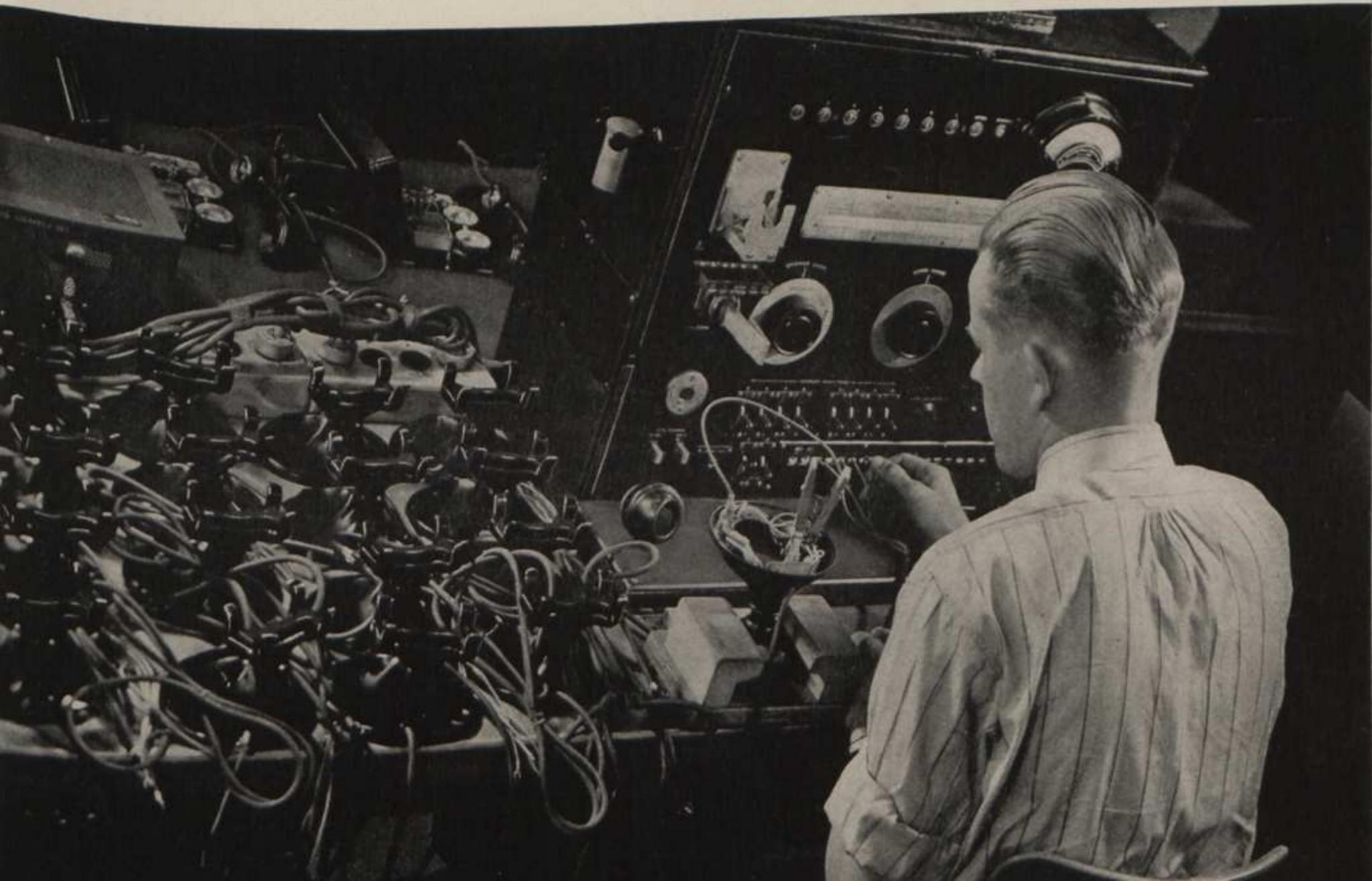
Used telephones are carefully repaired and carefully tested, as in the picture at the right, to give good service as long as possible.



This wire is being carefully taken down from a line no longer needed, so that it can be saved and used again.



Millions of pounds of salvaged copper and other scrap metals are reclaimed each year in Bell System smelters.





Telephone engineers survey the route of a desert communication line that has since been built to serve the Army.

## *Everywhere under the sun*

The telephone is everywhere and so are telephone people. They are out in the desert sun and under the city streets — in big-town offices and at the switchboards through which flows the very life of little towns — in research laboratories and on communication equipment production lines — aloft on poles and even, sometimes, under water. Men and women together, they number half a million or more, of whom some 400 thousand are members of the Bell System. In this struggle for freedom there is no section of the country, no fighter or producer, no maker of military mousetraps, that the telephone army does not serve.



Divers help lay submarine cable.



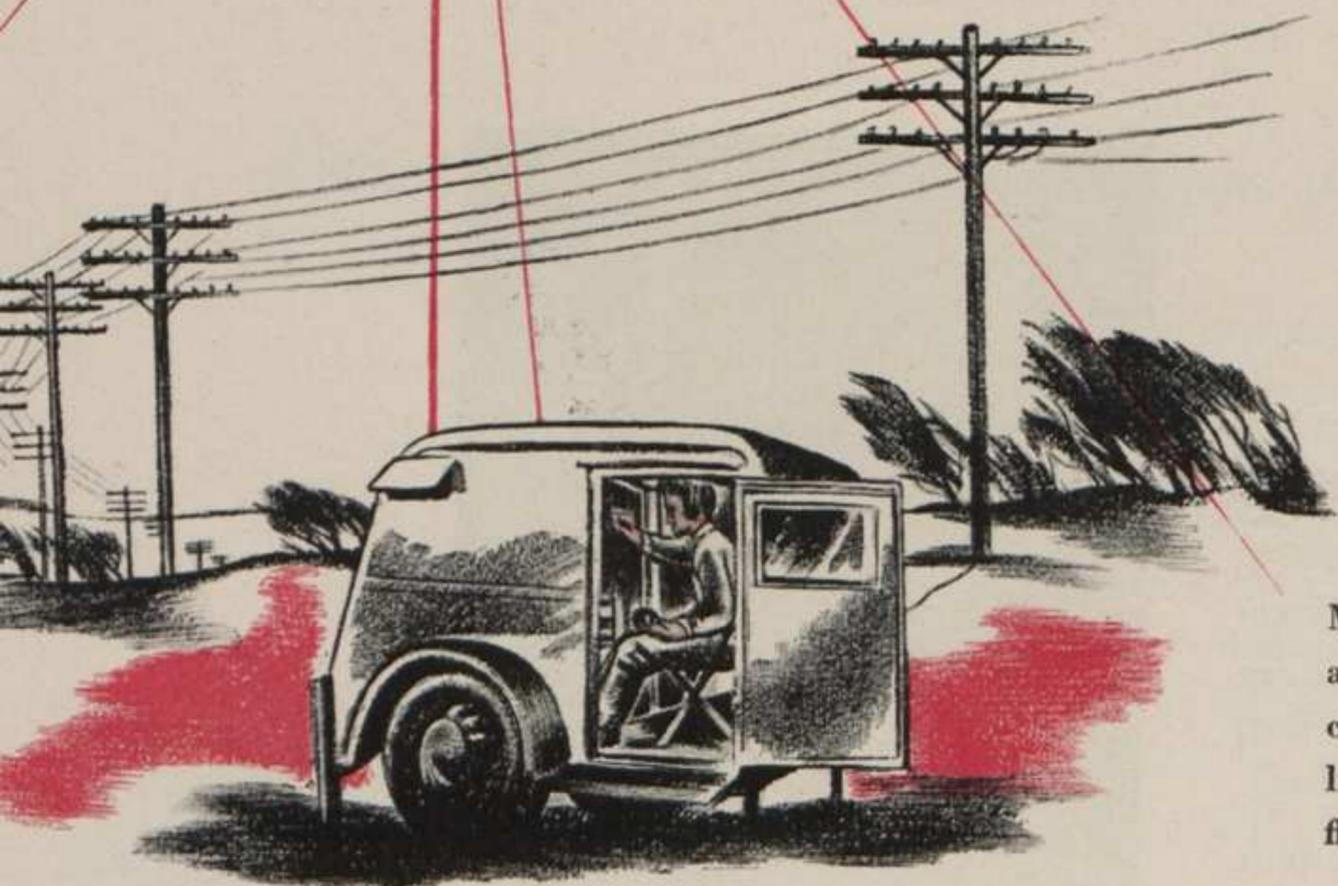
Deep in a concrete vault, this cableman tests cables carrying thousands of wires into a big telephone central office.



Above is a telephone dial; at the right, new operators are being trained. Both are needed to handle the torrent of war calls. Two-thirds of all Bell telephones are dial—yet more than 160,000 Bell System operators are at work. The telephone job today can be done only by people *and* machines.



These telephone women are only a few of many thousands who have received First Aid training. Three out of four Bell telephone men have First Aid certificates.



Mobile radio-telephone units are always ready for emergencies. Quickly connected to wire lines, they bridge gaps caused by flood, storm or other disaster.



## ***Prepared for what may come***

Flood, fire and storm have made preparedness a telephone habit. The Bell System has taken step after step to safeguard war telephone communications. Lines are patrolled. Stand-by engines are ready to provide emergency power. Nearly two-thirds of the wire network is underground. Vigilant engineers stand watch around the clock. Long distance cables are under gas pressure which sets off automatic alarms when trouble develops. If a line is broken, essential calls can be switched over alternative routes. Pre-engineered and packaged switchboards are spotted around the country to speed restoration of service if exchanges are damaged. The Bell System is on guard, ready for what may come.





The eye and mind of the telephone scientist are concentrated on producing better weapons to speed victory.

## BELL LABORATORIES AT WAR

There are more than 6,000 people at work in Bell Telephone Laboratories, of whom 2,000 are trained scientists and engineers; their job today is war. Electrical communication is the directing arm of modern combat. No battle is won that telephone science does not help to win. Mechanisms born of this science detect the enemy's movements and locate his weapons; they organize the attack; they guide the flyer to his home field; they do a hundred other things which stagger the imagination. Without these mechanisms an army or fleet is helpless.

So Bell Telephone Laboratories — fountain-head of so much of the world's knowledge of electrical communication — is working hand in hand with the Army and Navy to create the best electrical weapons that can be devised. Hundreds of research and design projects are moving full speed ahead. All the brains, all the knowledge and all the resources of the No. 1 communications laboratory are in this job.

Details of the work can not be revealed. But this can be said: *There have been notable results. There will be more.*

At left—one of our aircraft carriers at sea. From Bell Laboratories have come instruments which are the very eyes and ears of American fighting ships.





Main entrance to a new addition to the research facilities of Bell Telephone Laboratories, at Murray Hill, N. J.



### *PATHS OF VICTORY*

The vacuum tubes being tested at the left help to carry several conversations over the same pair of wires at the same time. Bell Laboratories scientists developed this method in time to add millions of miles of talk channels for war calls, without using nearly as many copper wires as would otherwise be required. Huge quantities of copper have thus been saved for war uses.

# WESTERN ELECTRIC

## ... arsenal of communications

Western Electric, the great manufacturing and supply organization of the Bell System, is the nation's largest manufacturer of military communications equipment. This equipment is used by the United Nations throughout the world. Wherever American planes fly and fight, they get their orders over Western Electric radio sets. Western makes microphones for military use in all climates, and its radio sets for tanks are specially designed and constructed to withstand shock and vibration. Sound-powered telephones, battle-announcing systems for fighting ships, and numerous other vital communication devices are produced for the Navy. The Army uses vast quantities of Western Electric field wire and cable, and the company's field telephones transmit tactical orders and urgent commands on all the fighting fronts.



The telephone stands watch.

Western Electric has three vast principal manufacturing plants — at Kearny, New Jersey; Hawthorne, Illinois, near Chicago; and Point Breeze, Maryland, near Baltimore. Here and at other points throughout the United States the Company employs more than 70,000 men and women. Much of what these men and women do requires extreme care and precision, for modern

communication equipment is very complicated and a great deal of it must be made and installed according to the most exacting specifications. Yet Western Electric people must and do meet hurry-up schedules. For example, when the U. S. Army Signal Corps was preparing to open up communications for the Alaska-Canada (Alcan) Highway, Western manufactured and shipped 14 tons of intricate equipment in 26 days instead of the 26 weeks usually required for so big a task. Ever since the defense effort began, rush jobs have been the order of the day.

But Western Electric, like the telephone companies, is accustomed to rush jobs. When hurricanes, floods and fires have wrecked wire lines, Western has kept supplies rolling to speed the job of restoring service.



Oxygen masks have built-in "mikes."



Tank soldier with throat microphone.



Western Electric military equipment in a U. S. Army Signal Corps supply depot gets ready to move . . .

It still has that responsibility, and its long experience in equipping the Bell System in times of peace is an asset of the greatest importance in war.

In the first year of the war Western Electric's production of war equipment increased *seven times* over the year before. Production is far greater now. The company's production of war materials in all of World War I amounted to \$33,000,000. Now it is turning out almost twice that amount of war equipment every month. But not all parts for Western Electric war equipment are made in the company's own plants. The company's huge task is shared by more than 1,300 sub-contractors who make a variety of different units which go into the completed equipment. Teamwork is the order of the day — every day!

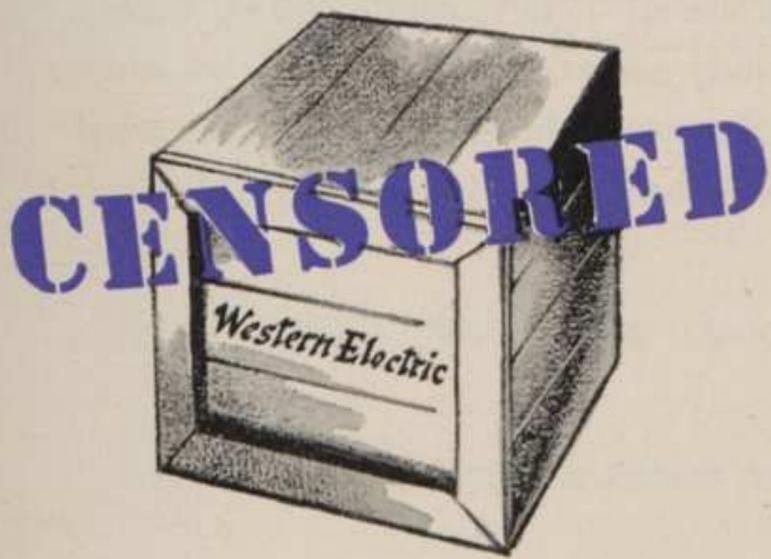




... to this and every other shore where our marines, soldiers and sailors carry the United States flag.

### *BATTLE EQUIPMENT*

Western Electric has made and is making very large quantities of communication equipment that is so important to our military effort that it cannot be described. All that can be said is that these weapons of war are the best and most effective tools of their kind ever produced anywhere. They have helped to win battles already, and will help to win more.





## ***The Signal Corps of the home front***

To the men and women of the Bell System have come these words from Major General Dawson Olmstead, Chief Signal Officer of the Army:

*"You are rendering a vital service to your country in this time of war by the rapid and efficient manner in which you are doing your job. The Army commends you for rising to the new and greater needs of the nation with a spirit of loyal effort over and above your line of duty. Conduct of the war effort demands dependable communications under all conditions. You are doing your part in holding the lines of communications for us."*

We in the Bell System are proud of those sentences, but most of all because they tell us again of the responsibility we are eager to fulfill. The Signal Corps of the Army performs the vital job of maintaining the Army's communications; telephone men and women like to feel that they have a common goal with the communication forces of the Armed Services and that in doing their own big job they form the signal corps of the home front. Thousands of skilled Bell System men have volunteered for service with the Army Signal Corps, and of them General Olmstead has said, *"This was the calibre of man the Signal Corps needed in order to place in operation the units now fulfilling their duties in various theatres of operation and in the Continental United States. . . . During the coming year, I know the same spirit of cooperation will exist between your organization and the Armed Services."*

It will indeed. On land and sea and in the air — in fox-hole and in factory — dependable communication is absolutely essential to the victory we must win. A major share of the responsibility rests on the telephone. Come what may, this nation can count on the Bell System to do its full part.



Telephone men and women on the home front and in the armed forces are marching to the same goal — victory.

**More than forty-five thousand Bell  
System men and women were in the  
armed forces in the Spring of 1943.**



