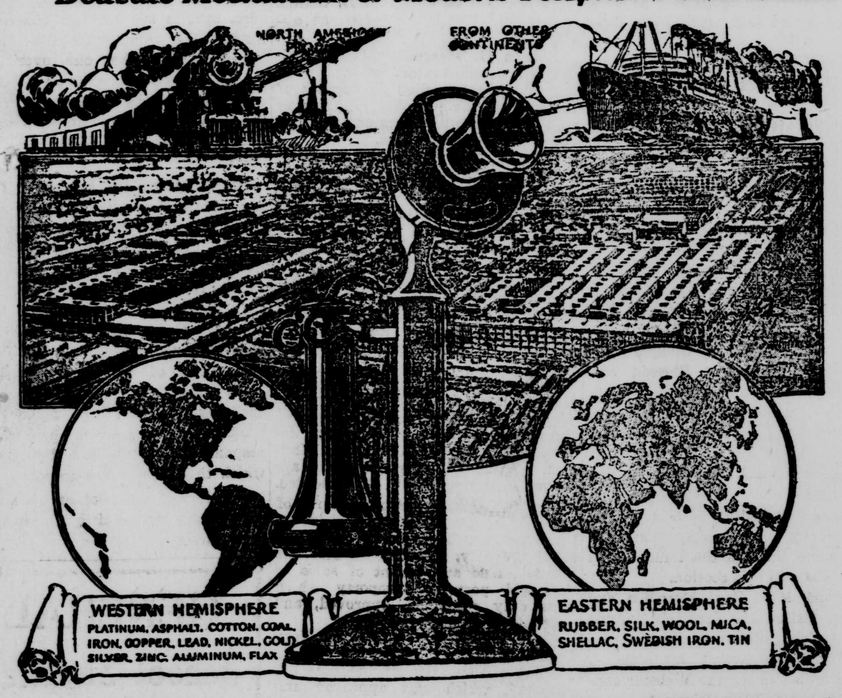
Many Lands Contribute Materials Used in Making Delicate Mechanism of Modern Telephone Instrument



By JOHN B. O'BRIEN

From the gold mines of Alaska, the asphalt lakes of Trinidad, the silk worms of China and the rubber trees of the Dutch East Indies, come some of the essential materials in the construction of the telephone as it has been perfected today. Many and various are the products required in this delicate piece of mechanism, and almost every part of the world is called upon to furnish these necessary raw materials.

Gold and platinum, for example, are to be found in every telephone. To be sure, there is not a great amount of either in any one particular telephone, but when it is remembered that all the Bell System telephones, placed side by side, would reach around lakes Erie and Ontario, the amount of these valuable materials used in their production is voluminous. Gold is used for contact metal in an alloy with platinum and silver. Most of the gold comes from Alaska, but it is also obtained from mines in California, Colorado, Arizona and Montana.

Platinum, which most people think of only in terms of watches and wedding rings, comes chiefly from Colombia, although small deposits are also found in some of the western states, including Oregon, California, Washington, Wyoming, Idaho, Arizona, New Mexico, Utah, Nevada and Colorado. Formerly most of the platinum came from the Ural Mountains until that source of supply was cut off.

Silver also is used in the contact metal as it combines well with gold and platinum and resists the effect of sparking at contacts, which are opened and closed. Most of it comes from Canada, Mexico and the western states in the United States.

Into the cores of the receiver coils goes Swedish iron from Norway and Sweden. Domestic iron is used in the diaphragm and magnet heel piece. Recently steel has been used in the tubes and bases on desk stands and also in the terminal plate, washers and screws.

Copper in the telephone may be most easily detected in such wires as the receiver terminals and coil terminals and in the windings of the coil. It comes chiefly from the Butte district in Montana, but is also obtained from the Lake Superior district of Michigan and the Bisbee district of Arizona. German silver, known as nickel silver, is used in the receiver spool heads, the desk stand contact spring and in the transmitter damping spring.

Cotton in the telephone is easily observed. It is used as a part of the insulation covering of the wires and cords. Wool also can be detected at once. It is the pad upon which the instruments rests that keeps it from marring the desk and other furniture.

To make receiver shells and earpieces, the rubber trees of Brazil, Bolivia, Africa and Ceylon are tapped; and in far-away India laborers are busy producing block mica for the carbon button rings in the telephone transmitter. Mica is also found in North Carolina. Mica, sometimes called isinglass, is valuable as an insulator and is used for transmitter insulators and transmitter washers.

Tin from the Straits Settlements and the Dutch East Indies is used as solder, made of a mixture of tin and lead. All of the terminals of the telephone are finished with a tinned surface so that solder will stick to them.

Illinois, Pennsylvania, Kansas, Oklahoma, Arkansas, Canada, Mexico and Australia furnish quantities of zinc ore. Africa and India are additional sources. In the telephone it is used as an ingredient of nickel silver and, combined with copper, makes brass possible. Some of the piece parts are zinc plated and among the places in the telephone where brass is found is the receiver, where it is used in the bell, binding post, screws, hexagon nuts and washers; in the transmitter, where it can be located in the bell, machine bolt, screws, lugs, washer and rivets; and in the bushings, number plate, cord tipped terminals and carbon cup.

The picturesque Island of Trinidad supplies the asphalt for the telephone which is used in the form of black-insulating and water-proofing paint.

Raw silk is imported from Asia and Europe in large quantities for use in the cord to the stand and to the receiver and for the insulation on receiver windings.

India also furnishes the shellac, which is used to stick pieces of mica together as a part of insulating paints and varnishes and as a binder for the materials of the composition used in the mouth-piece. This material comprises about 85 per cent. resin, 5 per cent. wax and the rest in coloring matter and impurities.

Aluminum in the telephone is used in the sound receiving diaphragm of the transmitter. Canada and the United States lead the world in the production of this raw material. It is found particularly in Arkansas, Alabama, Georgia and Tennessee. Lead from the southeastern part of Missouri, after a refining process, gets into solder together with zinc. Nickel ore from Ontario is used in the manufacture of telephones as a plating for bright parts and is also an important ingredient of nickel silver, used in the receiver and desk stands. There are some deposits of nickel in Oregon and North Carolina.

All the coal in your house, if you are fortunate in having any, is not in your cellar. In case the coal shortage becomes acute again, it may be a satisfaction to realize that there is some securely hidden in the transmitter of the telephone. A group of carbon granules serves to interpret the modulation of the voice by varying the current transmitted, just as the voice varies. When one speaks the air currents alternately push and let up on these carbon granules, which come from a selected vein of anthracite in a Pennsylvania mine.

Rubber from the Dutch East Indies, Java, Sumatra, Ceylon, Malaya, Borneo and West Africa is used in forming the receiver case diaphragm cup and earpiece, and is also used in the transmitter bushings and insulators.

Last in the category of raw materials which enter into the manufacture of the telephone is paper, which traces its ancestry back to vegetable growths in the form of the flax plant, which is first made into linen and thence into paper.

Thus the telephone industry, which employs over 400,000 people in the United States, secures its products from all over the world. It is a job that combines mining, geology, chemistry, metallurgy, botany, biology, Zoology, entomology, geography, and quite a number of allied sciences. Is it any wonder that the telephone has become one of the most useful instruments in the world?

MARYLAND WEEKLY INDUSTRIAL REVIEW.

The most striking manner to illustrate the interest the public should have in industrial development and economic stability is to consider for a moment what happens when industries are idle. We never have bread lines and hard times when the wheels are turning. We all demand work for sound politicles which means study payrolls and good wages.

Baltimore—New rod and wire plant to be built soon by Baltimore Copper Smelting and Rolling Company; will cost $500,000 and have capacity of 40,000 tons of rod and wire annually.

Denton—Concrete work started on Franklyn street.

Baltimore—New buildings to be erected at Bay View Asylum.

Frederick—Concrete shoulders constructed on Frederick-Baltimore state road from this city to Elicott City.

Denton—Site selected for construction of $100,000 school buildiing.

Sudlersville—Construction of new hard-surface road completed through city.

Salisbury—Contract awarded for construction of new post office buildinig; work to start at once.

Frederick—completion of present road projects will make Frederick center of one of finest good road systems in state.

Salisbury—O. I. C. Loupe Company opens packing plant to handle this year's fruit crops.

Ellicot City—Sidewalks on west Main street being repaired and placed in first class condition.

St. Michaels—Water mains being laid in Annex to supply Chew avenue and south Talbot street.

Salisbury—From 12 to 15 special trains of potatoes passing through city daily from lower Maryland counties and eastern shore of Virginia.

Pocomoke City—Worcester Democrat breaks ground for erection of modern new home.

Cumberland—operations resumed at bar mills at tin plate plant of N. and G. Taylor.

Baltimore—State roads commission opens bids for construction of five projects involving expenditures of $252,133.

Baltimore—Approximately $25,000 to be spent for water and sewer extensions in Linthicum Heights section.

Annapolis—Plans under way to replace present structure known as Priest's bridge, between Anne Arundel and Prince Georges counties, with modern concrete bridge.

Baltimore—Gas and Electric Company preparing to finance $9,000,000 improvement project for Gould street plant.

Baltimore is one of largest centers in country for manufacture of candy and ice cream. These industries pay out approximately $2,000,000 a year in wages and spend $8,750,000 annually for milk, sugar and other raw materials.

New York National Bank of Commerce says there is little ground for fear that even with a world wheat crop estimated at 10 per cent. below that of 1923, an actual shortage will develop in 1924-25.

Final estimate of 1923-24 Indian wheat crop is 364,149,000 bushels compared with 369,152,000 bushels last year. 340,000,000 bushels is generally estimated as amount required for needs of the country, leaving an exportable surplus of something more than 20,000,000 bushels.

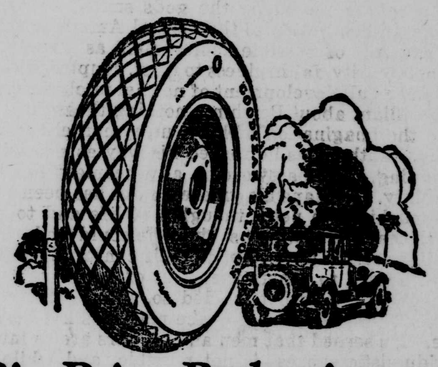
TELEPHONE BOOSTS SALES

San Francisco.—Roos Brothers, Inc., now rely upon the telephone as a big and profitable source of business. For example, during the month of April, although there was a slight decrease in the number of calls made by salespeople in all stores, the actual percentage of responses and sales was higher than for any month since the telephone campaign was started. Salesclerks in the various stores of the Roos chain made a total of 1,551 calls, and 786, or 51 per cent of this number made purchases.

MORE TELEPHONE WORKERS THAN REGULAR ARMY MEN

There are three times as many people employed in the telephone industry in the United States as there are enlisted men in the entire United States Army. There are more than twice as many telephone operators in this country as there are officers and men in the whole United States Navy.

Some 350,000 persons are now directly employed in the telephone industry, not counting the thousands of other workers who are engaged in manufacturing telephone equipment and supplies. They far outnumber the Army and Navy put together, with the Marine Corps thrown in for good measure.



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GOODYEAR

Sallie's Temptations

CURTIS WRIGHT, THE GENTLEMAN

"J'ever see her?" I asked Curtiss Wright laconically, when we had climbed the steep slopes of the sand-dunes and had settled ourselves snugly.

"Whom?" he was sitting beside me while I stretched my full length in the soft sand that sparkled with the hard glitter of diamonds.

"Why the lady in the moon, up yonder."

"Um—nope, don't believe I ever have," he answered.

"Wanna?" I hurried to get to the point and I tried to remember all the preliminaries just as Ted had first shown her to me at the Country Club that evening.

"I can not say that I am overly anxious to go searching for some vague and ethereal creature," he responded, "moreover, my eyes seem loath to leave the lady in the present landscape. Je suis content, my Romany maiden," he laughingly added.

None of the boys in our crowd talked in words of more than one syllable and it fascinated me to hear his French phrases, which he used so naturally that even a person with a smattering of the language could comprehend their meaning. I thought his conversation was not unlike the French phrases, clothing, as he did, the most platitudinous compliments in charm and majesty. His vocabulary too was compelling.

I pondered his last pretty tribute and turned my head to look at him while he made playhouses and let the sand run through his fingers. He was undeniably handsome and his body graceful, with that indefinable something about it that suggests agility and a splendid fitness to meet any emergency. Reserve strength was there too, and yet, I had an idea that in love, he might be as gentle as a woman.

I gazed up at the stars. The beauty of the tropical night seemed to enter my being. No wonder the whole world was beginning to love Florida. Even the moonlight was different and the stars up there were friendly. Big, yellow ones outlined the dipper. Florida stars . . . then the wind in the palms sighing like a restless virgin waiting for life and its completeness.

It was as if Curtiss Wright and I were off on some desert island, the stretch of sand-dunes only emphasized our seclusion. Long ago the voices of the swimmers had been lost in the distance.

"Well, do you want to see her?" I queried, moved nearer to my companion and putting my face close to his. 'You see the moon—well there's a lady up there and there's also a man. I'm the lady and you're the man. Their profiles touch, like this, and, er, they kiss each other."

My face was against his. My eyes closed expectantly and my lips parted.

He caught me by the shoulders and his voice was tremulous.

"Don't Sallie, for God's sake, child, You don't know what you're doing. Look at me," he ordered, "where do you pick up such things?"

"Ted Billings taught me."

"Ted Billings, eh, the young devil!" he interrupted.

"Oh, don't be so proper," I cajoled, "this time you really will see her." And I turned my face up to his, but he drew away sharply.

"No, thanks, I don't believe I care for your COMMUNITY KISSES!" He stood up, his eyes looking toward the white-caps of the ocean as if he were utterly oblivious of my existence.

"Oh, Mr. Wright," I called to him, "if it isn't against your puritanical principles, I'd live very much for you to go and dig me up a little snifter.

"A little drink, Mr. Holier-than-thou person." I was sitting up, and I shook my finger at him. "And when you return we'll talk it all over. I'll even listen to your complaint about my morals."

"I beg your pardon, I assure you it was not my intention to meddle. What shall it be, I am at your service?"

"Doesn't matter. Whatever you can manage."

He bowed courteously and departed.

Once again I lay supine, the soft sand was soothing. With my hands under my head I lost myself in the glories of the moonlight. Surely Nature had made Florida a garden-spot for lovers. Lovers, ah—if Curtiss Wright HAD kissed me.

A shadow, huge and terrible, fell across the sand in front of me where I was dreaming. It couldn't be Mr. Wright, I thought quickly, the Inn was a half mile off and he had only been gone a few moments.

I could stand it no longer. I looked behind and as I moved my head I saw a man coming unsteadily in my direction.

I tried to scream and couldn't. In a twinkling I realized that I was at his mercy for the beach had long been deserted.

As I jumped to my feet, he lurched forward and towered over me.

THE TELEPHONE DIRECTORY GOES TO PRESS ON Sept. 25, 1924

All changes in or additions to listings and advertising must be in our hands before that time.

THE CHESAPEAKE & POTOMAC TELEPHONE COMPANY

BUSINESS OFFICE: EASTON, Md.

TELEPHONE: 12,000

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