

Five Telephone Conversations Over One Circuit Now Possible

How telephone equipment can be made to carry five telephone conversations over the same circuit of two telephone wires, without interfering with each other, is an electrical achievement difficult for the mind of the average man or woman, not versed in the intricacies of electrical engineering, to comprehend. Yet the invention of the multiplex telephone system, recently announced by President T. N. Vail of the Bell Telephone System in a letter to Postmaster General A. S. Burleson, has made this electrical phenomenon a reality.

The only difficulty which now stands in the way of the general use of the telephone multiplex is the excessive cost of the equipment. The highly technical equipment required is so costly that it is economically available only for long distance lines and for those only between points at least 100 miles apart.

Bancroft Gherardi, acting chief engineer of the American Telephone

and Telegraph Company, who headed the large staff of engineers whose work made the multiplex telephone system a reality, in commenting recently on the new invention said:

"The story of the development of the multiplex telephone and telegraph system reads like that of many other inventions. It is a story of long years of effort to accomplish a great result. The steam turbine, for example, is but recently developed to be practically useful and yet was suggested in principle as long ago as 170 B. C. Dr. Alexander Graham Bell was experimenting to produce a multiplex telegraph in 1872 and three years later, while still working on that device, he conceived of the telephone.

"Now, forty-six years after Dr. Bell made those experiments, the multiplex telephone and telegraph has become a reality. The system is the product of no one man's efforts, but rather the result of the cumulative efforts of several hundred members of the Bell Telephone System's engineering staff, covering a period of years. It is one of the greatest single contributions to the science of telephony since that science was born in a Boston attic in 1875."

"The possibilities of the telephone," said Engineer Gherardi, "lie in the direction of expansion of long distance service. Physically the multiplex can be employed on any open wire telephone line, but practically it is not advantageous to use it on any line less than 100 miles in length. The highly technical equipment required is so costly that it is economically available for long lines.

"We have one installation in service, that on the Baltimore-Pittsburgh line which was used in the recent demonstrations.

"It will be some time," said Mr. Gherardi, "before the larger benefits of the system can be made available to the telephone-using public, because a great amount of new apparatus must be installed and considerable work must be done on the lines themselves to adapt them to the new system. Our plans call for installing the system at several points where additional long distance facilities are required.

"For years the Bell System engineers have worked to create a system

giving universal telephone service to the people of this country. We have sought to make it possible for anyone to talk to anyone else in any other part of the country at any time.

"Now, with the multiplex system, we greatly enlarge the service capacity of all long distance lines which economically may be equipped with the system. The three transcontinental circuits, for example, two of which are of wire while one is a phantom circuit, when equipped with the multiplex system can carry ten conversations at once instead of three as at present.

"The advantages of the system when applied to telegraphy as well as to telephony were clearly shown in our tests. We found that we can combine our system with the printing telegraph so as to secure the full advantages of the multiplex system in reducing wire requirements.

"Using our multiplex system with the ordinary hand-operated telegraph instrument, connected with a telephone circuit, we can send from 1500 to 1600 words a minute. When the multiplex system is connected with the printing telegraph, we can send from 4,000 to 5,000 words in 60 seconds."

WILSON SEES NEED OF ROADS CONSTRUCTION

President Wilson's declaration that highway construction and development is among the most important essentials to our peace reconstruction is the most optimistic stimulant given the campaign for the improvement of our national highways," says W. O. Rutherford, vice president of the B. F. Goodrich Rubber Co., and automobile and accessories manufacturers' representative in the Highways Industries Association.

"It was his first commitment on this subject since the start of the war," continued Rutherford. "Friends of the movement were elated when he incorporated in his last message to congress: 'What the country badly needs is that its means of transportation should be developed, its railways, its waterways, its highways and its countryside roads.'

"Of almost equal moment is the action taken at the recent highway convention in Chicago. The president's viewpoint was emphasized and approved at a joint meeting of the Highways Industries Associations, the State Highway Officials' Association, the Highways Transport Committee, the National Automobile Chamber of Commerce, the American Automobile Association, and the Lincoln and Dixie Highway Associations. Among the delegates were highway officials from forty-four states.

"National sentiment in favor of an adequate highway system was never more graphically brought to light than at the Chicago gathering. With perfect accord the convention resolved that the following main points should be embodied in a bill to be put before the present short term of congress for passage:

1. That a Federal Highways Commission be appointed to plan, maintain and construct a national system of highways.
2. That the mileage of highways to be taken over in any given state should not amount to over 4 per cent of the total mileage of the roads of that state.
3. That a thorough survey and analysis of the transportation requirements of the nation and its highway traffic should be compiled.
4. That an appropriation should be made by the federal government of \$100,000,000 per year for carrying on this work.
5. That the Federal Highways Commission shall take over the work of the Highway Transport Committee and the Office of Public Roads of the Department of Agriculture.

"This is the platform of the coordinated highway and business interests of the entire country. Its broad and vital aspects will help meet America's pledge to supply Europe with foodstuffs. It will furnish an inestimable national asset in the transportation of around 25,000,000 tons of grain, butter, eggs, stock and prepared food from farming communities and industrial centers to the seaports. Furthermore, this legislation will create a highway foundation for the future which will help broaden our vision in the development of national resources.

"Our conception has been small—our interstate highway transportation has been cramped and handicapped by boundary lines. The stumbling block planted itself on the state line where, one state with different plans, appropriations and specifications halted their highway work—perhaps the neighboring state was poor, or its policy was to improve the country lanes on a bigger scale than the big interstate laterals and motorways. The vital road was incomplete—it contained bad stretches rendering it inefficient.

"Under the Federal Highways Commission groups of states will better understand each other's problems and government direction will furnish a stimulus that will be reflected and felt on down the line to the county and township road commissions.

"Today only 11 per cent of our roads are improved. There are 2,299,000 miles of roads in the United States, of which approximately only 250,000 miles are hard surfaced. It is estimated 50,000 miles may be placed in and maintained under the improved classification each year under the newly proposed Federal Highway Commission.

"Highway's transportation facilities should be placed at the farmer's gate—at every farmer's gate. We should encourage inter-city, inter-town and inter-village traffic over the highways. By releasing railroad rolling stock from these short hauls concentrated food and other supplies may be shipped over longer distances. Concerted and immediate action by all the agencies affected should be

amalgamated in order that the highways may rightly share the responsibilities and of transportation with the railways and the waterways."

New Western Nebraska Banks
Western Nebraska towns are to have new banks, with two of them starting in at Crawford, giving that town four. Sidney will probably have another one, although the charter has not yet been granted. The state banking board granted the following charters on Friday:
Crawford State bank, capital \$25,000; J. L. Winter, president; A. L. Moyer, vice president; E. M. Warner, cashier.
Farmers Bank of Crawford, capital \$25,000; T. L. Gordon, president; Peter L. Raben, vice president; E. M. Stapleton, secretary.

Farmers State bank of Bradish, capital, \$10,000; George H. Gutru, president; R. J. Gutru, cashier.
Bank of Bingham, capital \$15,000; Charles Finegan, president; C. H. Anderson, vice president.
Farmers State bank of Douglas, capital, \$15,000; D. E. Trumbull, president; S. A. Walker, vice president; John S. Parrell, cashier.

Farmers State bank of Bruning, capital \$25,000; J. H. Casper, president; F. M. McMennea, vice president; F. R. Hoagland, cashier.

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SALTS IS FINE FOR KIDNEYS, QUIT MEAT

Flush the Kidneys at once when Back hurts or Bladder bothers—Meat forms uric acid.

No man or woman who eats meat regularly can make a mistake by flushing the kidneys occasionally, says a well-known authority. Meat forms uric acid which clogs the kidney pores so they sluggishly filter or strain only part of the waste and poisons from the blood, then you get sick. Nearly all rheumatism, headaches, liver trouble, nervousness, constipation, dizziness, sleeplessness, bladder disorders come from sluggish kidneys.

The moment you feel a dull ache in the kidneys or your back hurts, or if the urine is cloudy, offensive, full of sediment, irregular of passage or attended by a sensation of scalding, get about four ounces of Jad Salts from any reliable pharmacy and take a tablespoonful in a glass of water before breakfast for a few days and your kidneys will then act fine. This famous salt is made from the acid of grapes and lemon juice, combined with lithia and has been used for generations to flush clogged kidneys and stimulate them to activity, also to neutralize the acids in urine so it no longer causes irritation, thus ending bladder disorders.

Jad Salts is inexpensive and cannot injure; makes a delightful effervescent lithia-water drink which all regular meat eaters should take now and then to keep the kidneys clean and the blood pure, thereby avoiding serious kidney complications.

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This is not an extraordinary example of the money-saving service that people get from Neolin Soles. It is typical of the experience millions are having. These soles do wear a very long time and so help you keep shoe bills down. They are scientifically made so they must wear.

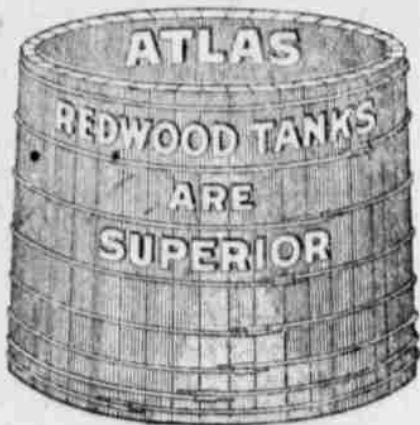
Get Neolin-soled shoes at almost any good shoe store. Get them for your whole family in the styles you prefer. And have these cost-saving soles put on your worn shoes. They are very comfortable and waterproof as well as durable. They are made by The Goodyear Tire & Rubber Company, Akron, Ohio, who also make Wingfoot Treads, guaranteed to outwear any other heels.

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