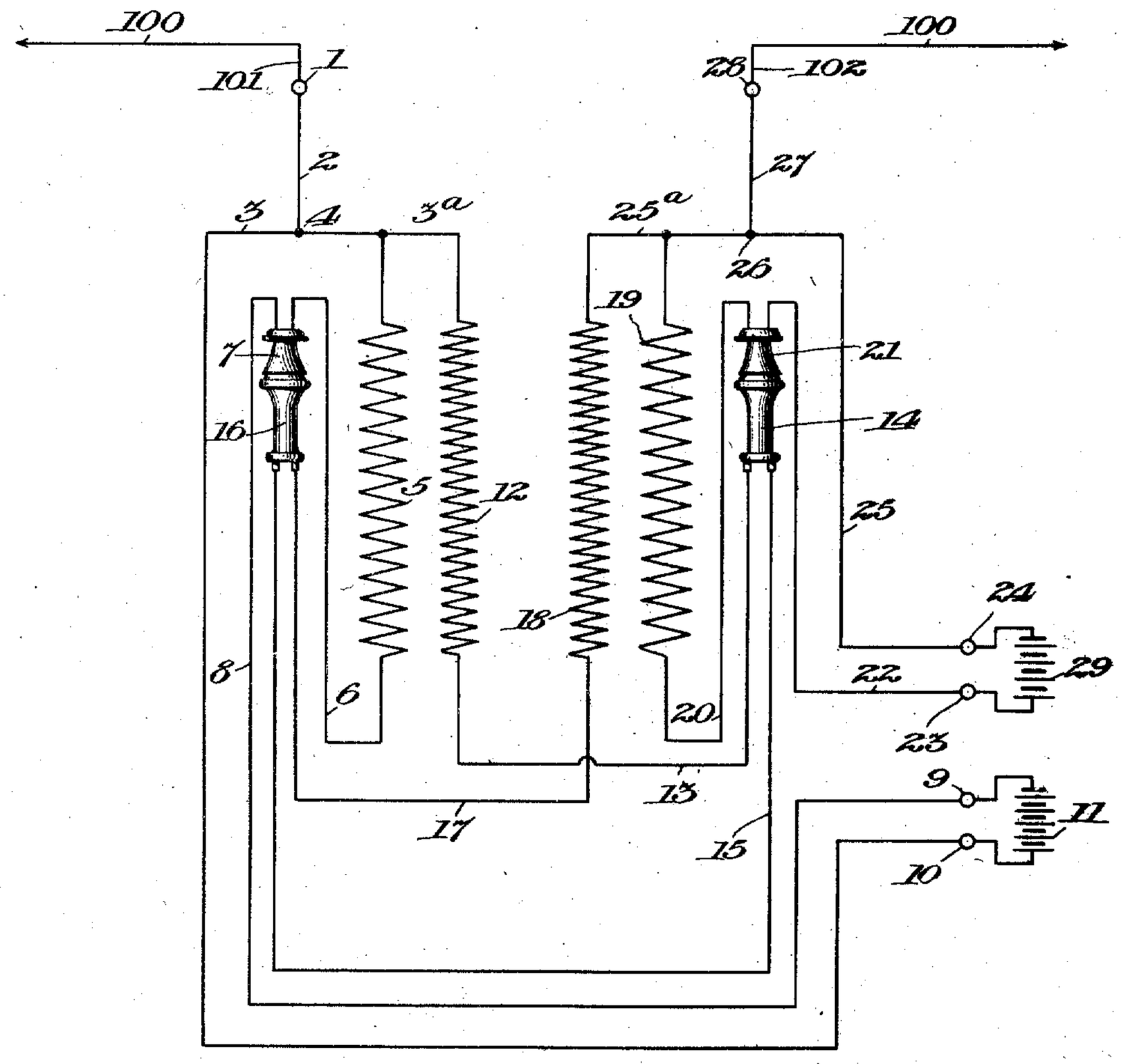
W. ANDERSON.

TELEPHONE REPEATER.

APPLICATION FILED NOV. 12, 1909.

997,594. Patented July 11, 1911.

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# UNITED STATES PATENT OFFICE.

WILLARD ANDERSON, OF LONGDALE, OKLAHOMA.

## TELEPHONE-REPEATER.

997,594. Specification of Letters Patent. Patented July 11, 1911.

Application filed November 12, 1909. Serial No. 527,752.

*To all whom it may concern:*

Be it known that I, WILLARD ANDERSON, a citizen of the United States of America, residing at Longdale, in the county of Blaine, in the State of Oklahoma, have invented certain new and useful Improvements in Telephone-Repeaters, whereof the following is a specification.

This invention relates to telephone repeaters for long distance telephone lines.

The object of the invention is to provide a simple device automatically operative in either direction of transmission for amplifying or reinforcing the current vibrations so that messages may be delivered at either end of the line in full and distinct volume.

The drawing is a diagrammatic figure representing the invention or one embodiment thereof in operative connection with a telephone line or circuit.

In the form represented the line wire 100 of the telephone circuit is severed and the ends 101 and 102 thereof are connected with the terminals of the telephone repeater. This telephone repeater is provided with terminals 1 and 28, preferably in the form of binding posts, by which or otherwise it is connected in series in the telephone circuit or circuits so that all the line currents in either direction including the bell as well as the talking currents pass through the repeater. For messages passing in one direction, say from left to right as illustrated in the drawing, the binding post 1 constitutes the positive or leading-in terminal of the repeater and the binding post 28 the negative or leading-out terminal thereof; while for messages passing from right to left the binding post 28 is the positive or leading-in terminal and the binding post 1 the negative or leading-out terminal. This repeater in the form shown comprises two receivers, two transmitters in operative juxtaposition respectively with said receivers, two batteries, two inductoriums and connections substantially as hereafter described. A wire 2 connects the binding post 1 with a wire 3 at the point 4. The wire 3 is connected on one side of the point 4 at one end with the negative pole 9 of a battery 11 and on the other side of said point with the primary coil 5 of an inductorium, the coil 12 representing the secondary of said inductorium. The primary 5 and secondary 12 are preferably connected in shunt by the wire $3^a$, which may form an extension of the wire 3. A wire 6 connects the opposite end of the primary 5 with a transmitter 7 and a wire 8 connects said transmitter with the positive pole 10 of the battery 11. A wire 13 connects the opposite end of the secondary coil 12 of said inductorium with a receiver 14 and a wire 15 connects said receiver with another receiver 16. A wire 17 connects said receiver 16 with one end of a secondary coil 18 of another inductorium. A primary coil 19 of the second inductorium is connected by a wire 20 with a transmitter 21 and a wire 22 connects said transmitter with the positive pole 23 of a battery 29. A wire 25 connects the negative pole 24 of said battery at the point 26 with a wire 27 and the latter connects the wire 25 with the terminal 28. The opposite ends of the coils 18 and 19 are preferably connected with each other and with the wire 27 by an extension $25^a$ of the wire 25. The receiver 14 is in operative juxtaposition with the transmitter 21 and the receiver 16 is in operative juxtaposition with the transmitter 7. Microphone transmitters and sensitive receivers are used and a new vibration is made in either direction which harmonizes with the original vibrations in the circuit. In long lines or circuits a plurality of repeaters may be employed.

The common inductoriums may be used, but I prefer to use inductoriums in which the primaries and secondaries are shunted together so as to increase the inductive power.

I claim as my invention:

1. The combination with a telephone circuit of a repeater serially disposed in said circuit and automatically operative in either direction of transmission and comprising two transmitters, two receivers disposed in juxtaposition to said transmitters and two inductoriums, the transmitters being connected respectively with the primaries of said inductoriums and the receivers being connected respectively directly with each other and with opposite secondaries of said inductoriums.

2. The combination with a telephone circuit of a repeater serially disposed in said circuit and automatically operative in either direction of transmission and comprising two transmitters, two receivers disposed in operative juxtaposition to said transmitters and two inductoriums, the transmitters being connected respectively with the primaries of said inductoriums, the ends of the primary

and secondary of each inductorium being in connection.

3. The combination of a telephone circuit and a repeater serially disposed in said circuit and automatically operative in either direction of transmission for reinforcing the wave vibrations, said repeaters comprising two microphone transmitters, two sensitive receivers disposed in coöperative relation to said transmitters respectively and two inductoriums, the transmitters being conductively connected respectively with the primaries of said inductoriums and the receivers being conductively connected respectively with each other and with opposite secondaries of said inductoriums.

4. The combination of a telephone circuit and a repeater serially disposed in said circuit and automatically operative in either direction of transmission for reinforcing the wave vibrations, said repeater comprising two microphone transmitters two sensitive receivers disposed in coöperative relation to said transmitters respectively and two inductoriums, the transmitters being conductively connected respectively with the primaries of said inductoriums and the receivers being conductively connected respectively with each other and with opposite secondaries of said inductoriums, and batteries connected with said coils.

5. The combination of a telephone circuit and a repeater serially disposed in said circuit and automatically operative in either direction of transmission for reinforcing the wave vibrations, said repeater comprising two microphone transmitters, two sensitive receivers disposed in coöperative relation to said transmitters respectively and two inductoriums, the transmitters being conductively connected respectively with the primaries of said inductoriums and the receivers being conductively connected respectively with each other and with opposite secondaries of said inductoriums, and a battery disposed in a loop containing one of said transmitters and one of said primaries.

6. The combination of a telephone circuit and a repeater serially disposed in said circuit and automatically operative in either direction of transmission for reinforcing the wave vibrations, said repeater comprising two microphone transmitters, two sensitive receivers disposed in coöperative relation to said transmitters respectively and two induction coils, the transmitters being conductively connected respectively with the primaries of said induction coils and the receivers being conductively connected respectively with each other and with opposite secondaries of said inductoriums, a battery disposed in a loop containing one of said transmitters and one of said primaries, another battery disposed in a loop containing the other transmitter and the other of said primaries.

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Witnesses:
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