

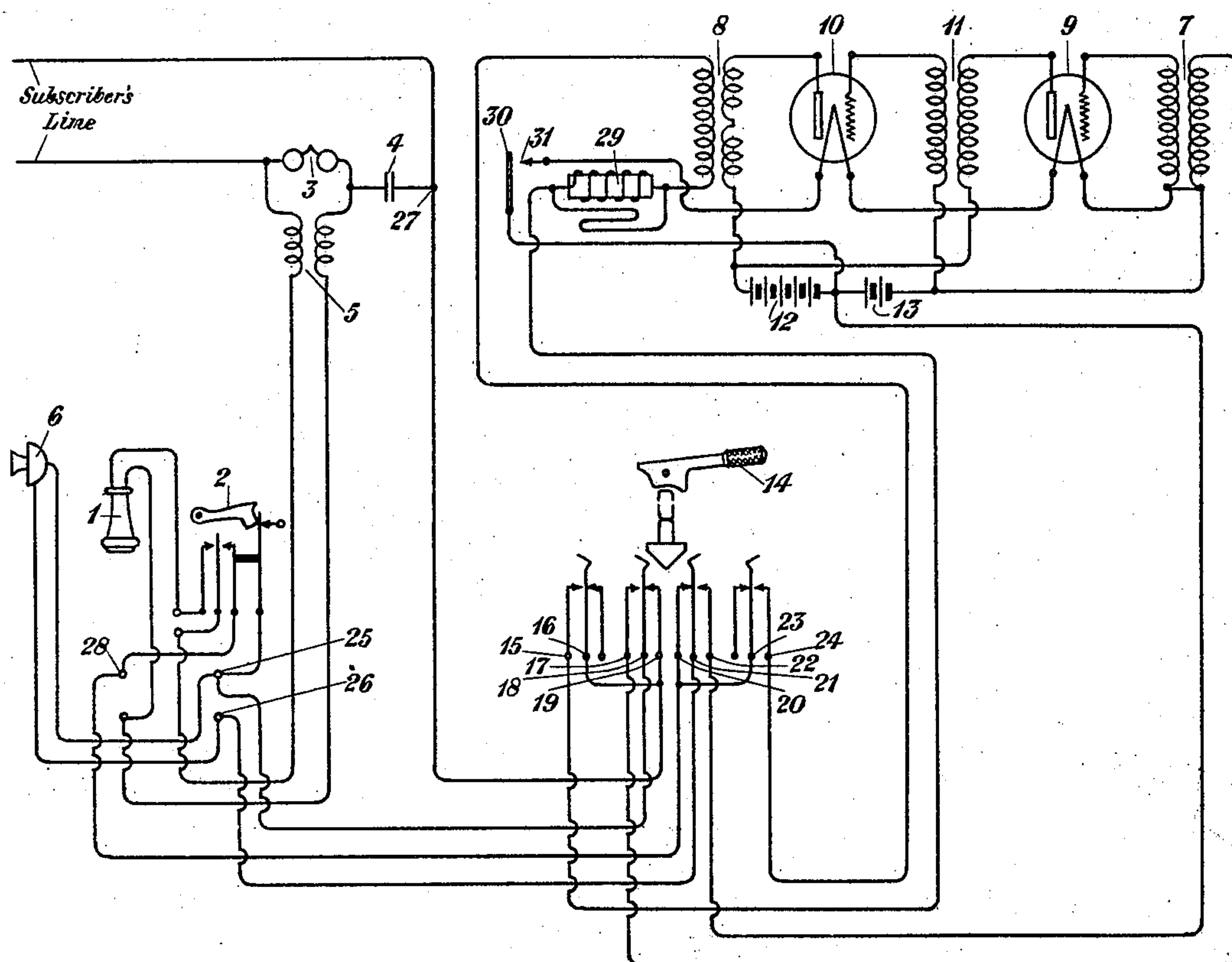
Feb. 22, 1927.

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SUBSTATION CIRCUITS

Filed April 25, 1925

1,618,201



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SUBSTATION CIRCUITS.

Application filed April 25, 1925. Serial No. 25,940.

This invention relates to telephone substation circuits.

The principal object of the invention is the satisfactory transmission of speech which is abnormally low, for instance, the mere whisper of one who has lost the use of his vocal cords. Other objects and advantages of the circuit arrangement will be made clear by the following detailed description.

Applicant combines with certain subscriber station apparatus, well known in the art, amplifying means for compensating for the low voice level and suitable means for switching the amplifier in and out of the subscriber's circuit.

The detailed description of the circuits is to be read with reference to the accompanying drawing, which shows diagrammatically the circuit arrangement.

With reference to the details of the drawing, the receiver 1, the switchhook 2, the contacts associated therewith, the ringer 3, the condenser 4, and the induction coil 5 are apparatus usually found in substation sets. The transmitter 6 may be any transmitter which is of sufficiently high quality for use in transmitting speech of the low level of a whisper and at the same time suitable for service in the ordinary telephone substation set.

The amplifying means shown in the drawing is a two-stage amplifier using vacuum tubes and comprises the input transformer 7, the output transformer 8, the thermionic vacuum tubes 9 and 10, and the inter-stage transformer 11. The battery 12 serves as a source of current for the plates of the tubes and the battery 13 is the filament current source. The grid bias is obtained from the potential drop in the filaments.

Suitable switching means are provided whereby the amplifying means may be connected into or cut out of the subscriber's circuit. When the speech to be transmitted is normal, of course, the amplifier is not used, and the key lever 14 remains in the position indicated in the drawing, contact being

made between points 18 and 19 and 20 and 21, which connections complete the circuits of the substation set without including the amplifier.

If the speech to be transmitted is abnormally low, the lever 14 is thrown down, contact between points 18 and 19 and 20 and 21 is broken, and contact is made between points 15 and 16, 17 and 18, 21 and 22, and 23 and 24. The contact made between points 17 and 18 and 21 and 22 connects the primary winding of the input transformer 7 across the transmitter circuit at points 25 and 26. The contact made between points 15 and 16 connects one terminal of the secondary winding of the output transformer 8 to the point 27 on one side of the subscriber line, and the contact made between points 23 and 24 connects the other terminal of the same winding to the other side of the subscriber line through point 28 and the switchhook.

The filament current of the amplifier is controlled by a relay, shown in the drawing, with electromagnet 29 and armature 30. This relay, as clearly appears from the circuit diagram, is operated by the switchhook 2 and makes and breaks the filament circuit at 31.

What is claimed is:

1. A telephone substation system including a transmitter, a receiver, a line circuit, a switchhook controlling the connection of said transmitter and receiver with said line circuit, a vacuum tube current amplifying device, a relay controlling the filament circuit of said amplifying device, and a single switching means for connecting the input of said amplifying device to the transmitter and the output thereof to the line circuit and for connecting said relay to the line circuit through the switchhook.

2. A telephone substation system including a transmitter, a receiver, a line circuit, a switchhook controlling the connection of said transmitter and receiver with said line circuit, a vacuum tube current amplifying device, a relay controlling the filament circuit of said amplifying device, and a two-

position switch, said switch in the first position connecting the transmitter to the line circuit through the switchhook and disconnecting the relay from said circuit, and in
5 the second position connecting the input of the current amplifying device to the transmitter, the output of said device to the line circuit, and the relay to said circuit through the switchhook.

In testimony whereof, I have signed my name to this specification this 23rd day of April, 1925. 10

ALFRED H. INGLIS.