

No. 669,072.

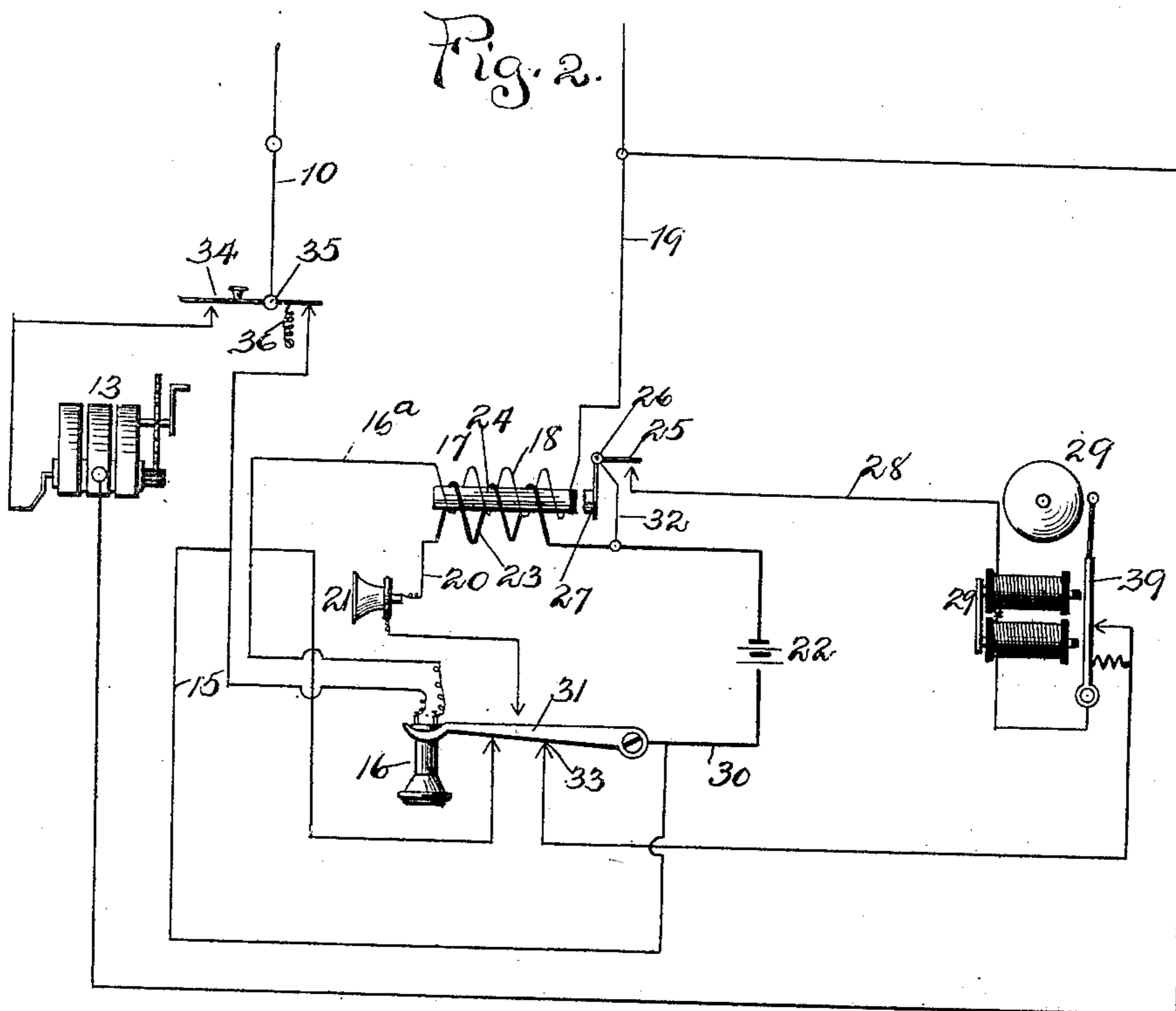
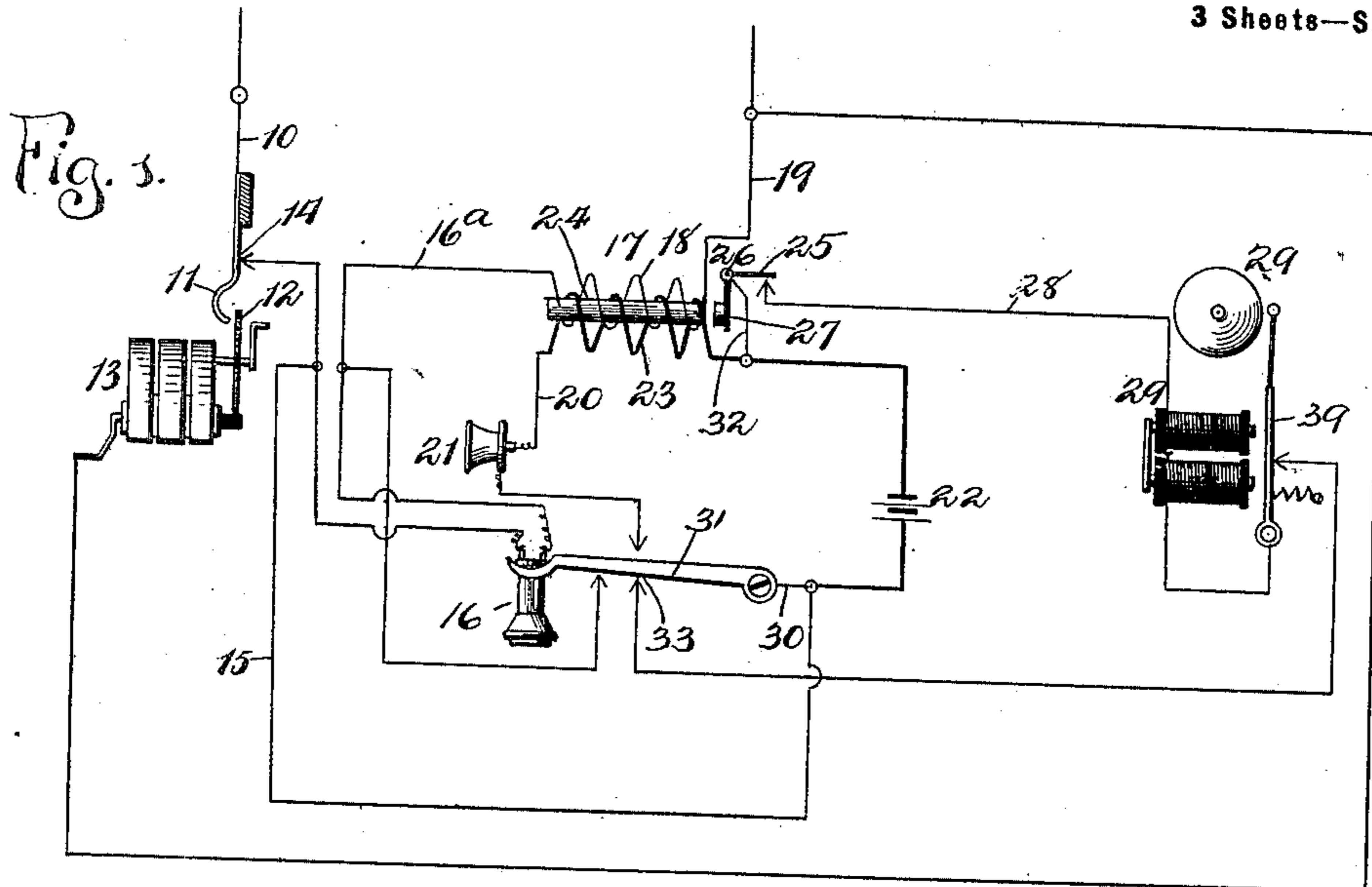
Patented Mar. 5, 1901.

P. C. BURNS.  
TELEPHONE APPARATUS.

(Application filed July 31, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:  
J. B. Keir  
Ira D. Perry.

Inventor  
Peter C. Burns  
By Chas. C. Buckley  
att.

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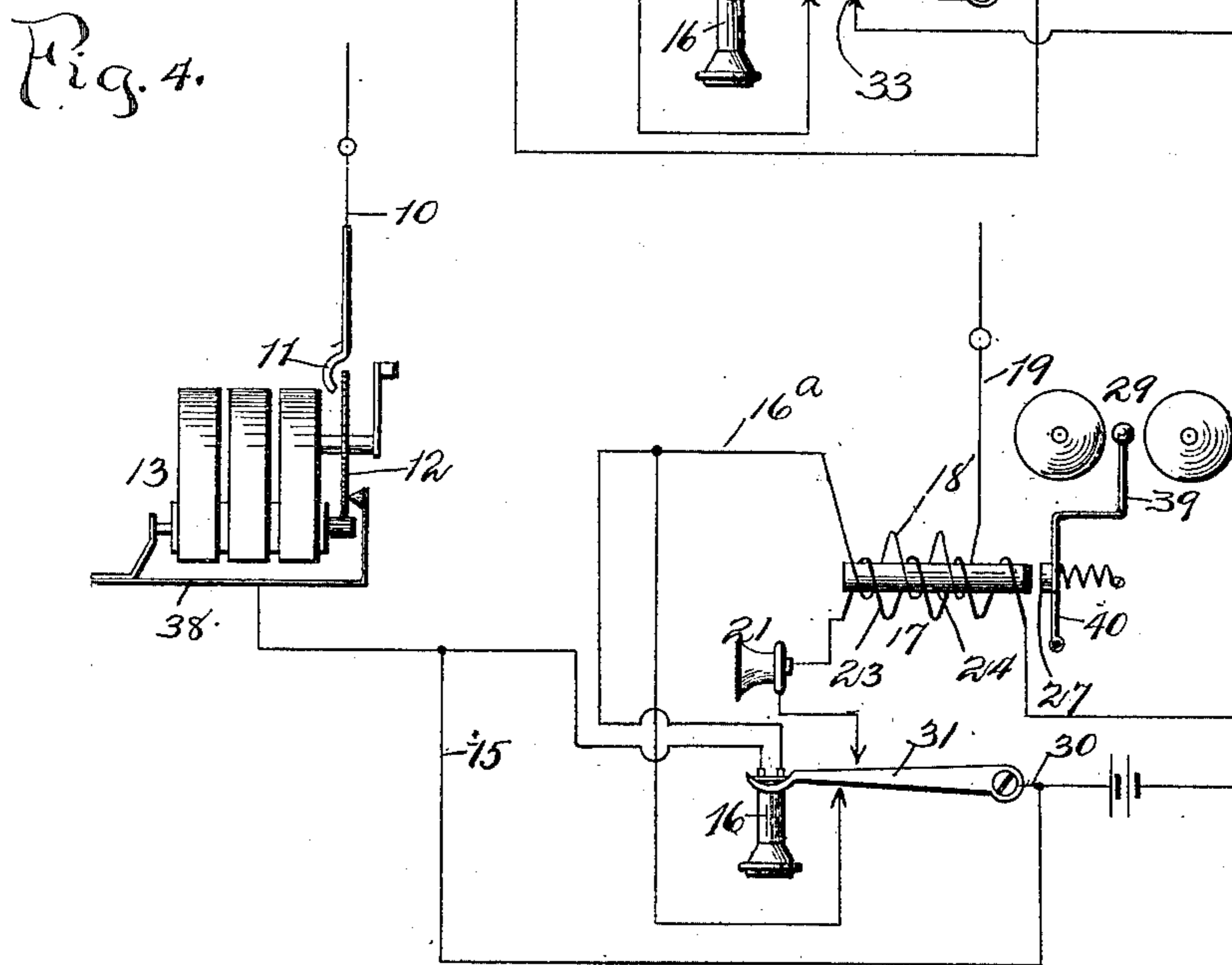
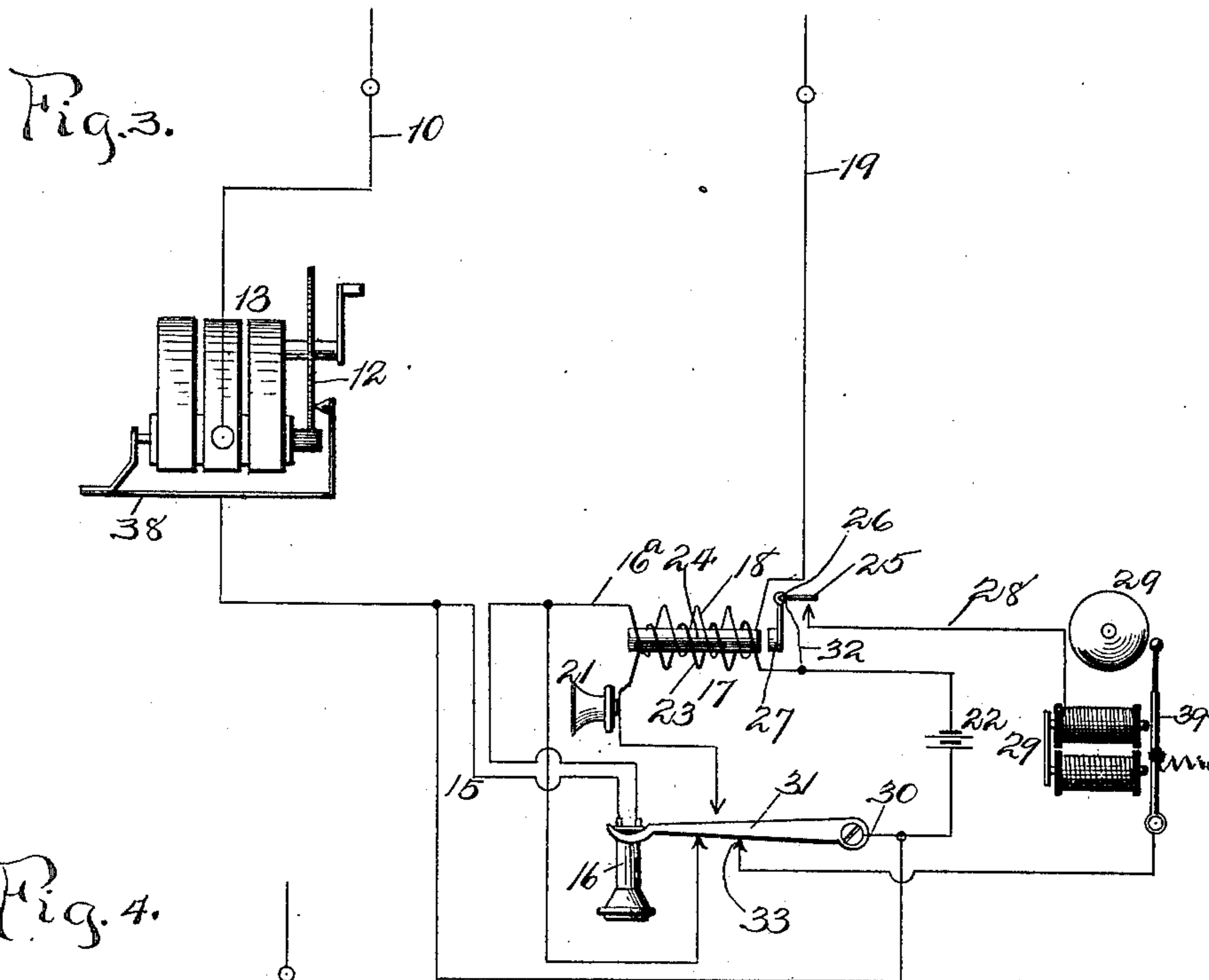
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J. B. Weir  
Ira D. Perry

Inventor  
Peter C. Burns,  
By Chas. C. Buckley  
Att.

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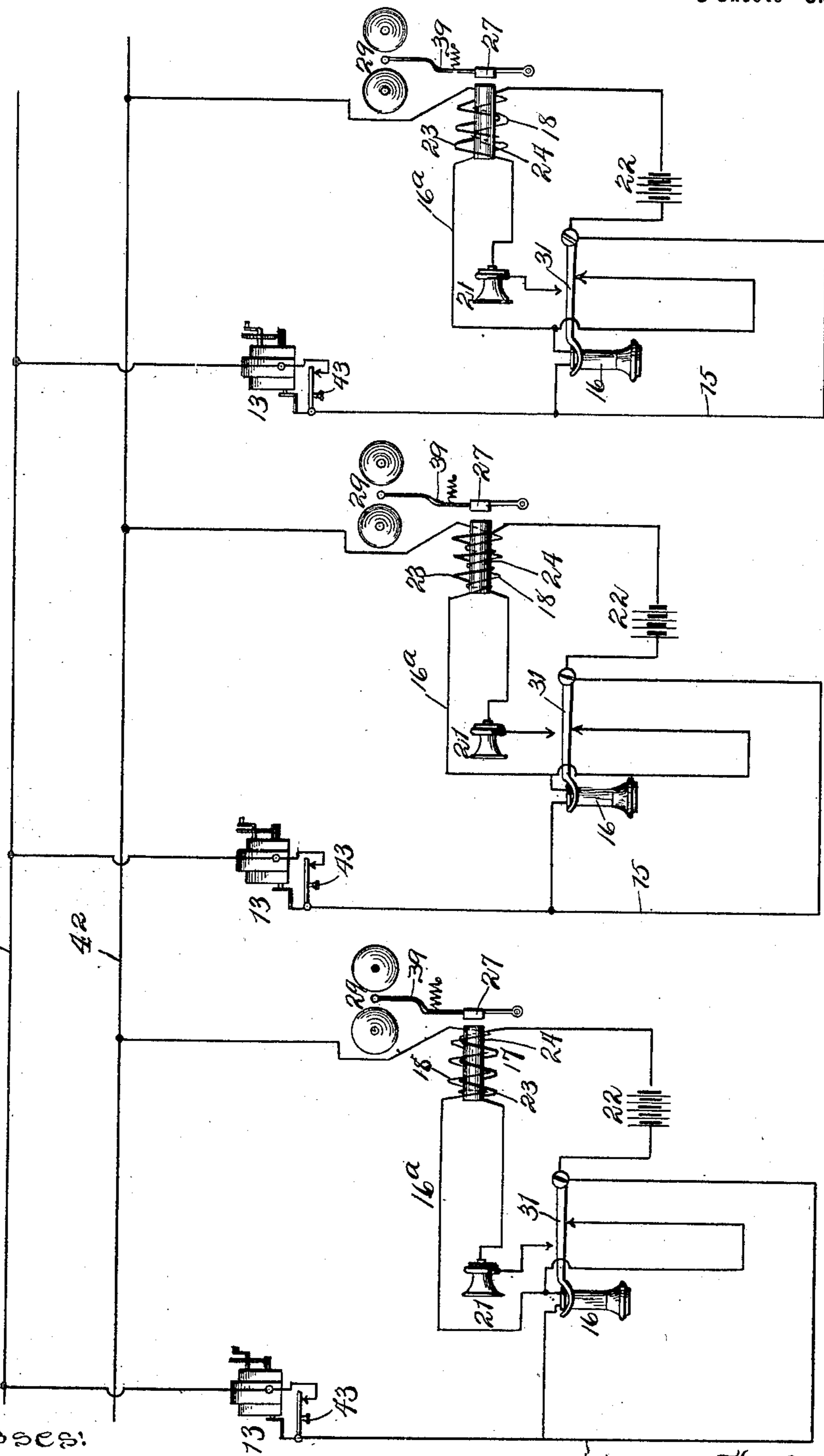
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3 Sheets—Sheet 3.

Fig. 5.



Witnesses:  
J. B. Weir  
J. D. Perry.

Inventor  
Peter C. Burns,  
By Chas. C. Buckley.

# UNITED STATES PATENT OFFICE.

PETER C. BURNS, OF CHICAGO, ILLINOIS.

## TELEPHONE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 669,072, dated March 5, 1901.

Application filed July 31, 1899. Serial No. 725,591. (No model.)

*To all whom it may concern:*

Be it known that I, PETER C. BURNS, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in a Telephone Apparatus, of which the following is a specification.

My invention relates to certain improvements in telephone circuit arrangement and apparatus, and has more particularly to do with the circuit arrangement and apparatus for extending and receiving signals between different stations or between stations and a central switchboard.

In the operation of telephone systems it frequently becomes desirable to arrange a plurality of subscribers' or toll stations upon one circuit instead of providing one circuit for each station, as is ordinarily the case. These plural-station circuits are termed generally "party-lines" or "party-circuits."

In order to extend and receive signals between several stations or between the stations and a central exchange, it is necessary or desirable that means be provided to prevent the talking-currents from being diverted, or "short-circuited," as it is termed.

My invention has for its object the provision of means and circuit arrangement whereby the signal-bell or other signal-indicating device may be operated by one of the necessary instrumentalities or parts of the telephone; and it consists in certain features and arrangements about to be more particularly described, reference being now had to the accompanying drawings, in which—

Figure 1 is a diagrammatic view of the circuit arrangement and apparatus embodying my invention. Fig. 2 is a like view showing a manually-operated switch for cutting out the signal apparatus when in the act of signal-sending. Fig. 3 is a like view showing the apparatus so arranged that when a shunt around the generator is broken the signal apparatus is cut out of the circuit. Fig. 4 is a like view showing the induction-coil and core acting directly to operate the bell.

In carrying out my invention it is my purpose to utilize the induction-coil of the telephone-transmitter to establish a condition whereby the signal device is operated or to act directly upon such signal device. In or-

der to increase the intensity of the currents generated or caused to pass upon the line, it is necessary to employ an induction-coil 55 which consists of a primary coil of relatively large wire and a secondary coil of relatively smaller wire, these two coils being arranged in such proximity the one to the other that the talking-currents circulating in the primary coil of larger wire are induced into the secondary coil of smaller wire, thus increasing the intensity of the currents passing out upon the line. When this induction-coil is supplied with a core, it then has the properties of an electromagnet and is capable of attracting objects when energized. I utilize the properties of this induction-coil in combination with the signaling device and effect a circuit arrangement and positioning of 70 parts in such a manner that the induction-coil is employed to either directly act upon the operative mechanism of the signaling apparatus or establish a circuit condition which will cause the operation of the signal device. 75

In Fig. 1 I have shown an arrangement in which the line or one lead of the circuit (designated at 10) is connected to a spring contact-strip 11, adapted to contact with the drive-wheel 12 of the generator 13 when the generator is operated to generate a current for signal-sending purposes. The line-circuit is therefore normally open at the generator, but it is normally closed at the point 14 of contact between the strip 11 and the lead 15, connected with the receiver-hook, to the induction-coil 17. The secondary coil 18 of the induction-coil 17 is connected to the lead 16 and also to the line-wire 19 in the usual way, and the local transmitter-circuit 20, including 80 the transmitter 21 and the battery 22, is also connected with the primary coil 23 of the induction-coil 17. A core 24 is located within the coils of the induction-coil. A switch-arm 25, pivoted at 26 and operated by an armature 27, is adapted to close a local signaling-circuit 28, including the signal-bell 29, and this local signal-circuit is connected in such a way with the transmitter-battery 22 as to include 95 said battery in the local signal-circuit to energize the magnets of the signal-bell 29 and operate the bell thereof. This is accomplished by means of the branch wire 30, connected with the receiver-hook 31, and also by 100

the branch wire 32, which is connected to the switch-arm 25 and the local transmitter-circuit 20.

When the telephone is on the hook, as is usually the case when the apparatus of the station is not in use and in readiness to receive a signal, a signaling-current sent from another station enters upon the contact-strip 11, and as the contact 14 is closed and the contact with the generator 13 open the current passes over the leads 15 and 16<sup>a</sup> through the secondary 18 of the induction-coil 17 to line 19, thus energizing the core 24 and attracting the armature 27, which causes the switch-arm 25 to close the normally open contact to the local signal-circuit 28. When this contact is closed, the current from the transmitter-battery 22 traverses the transmitter-circuit 20 to the branch wire 32, passes over this branch wire to and through the switch-arm 25, thence through the local signal-circuit 28 to and through the coils of the signal-bell 29, from thence by means of said local signal-circuit 28 is led to the receiver-hook 31, and from thence by branch wire 30 to the local transmitter-circuit 20 and battery 22. By this means it will be observed that a signal is received at this station by means of a signaling device the magnets of which are energized by the local transmitter-battery, the circuit to which, including the magnets of the signaling device, is normally open and closed by means of a switch operated by the induction-coil of the transmitter.

When the receiver is removed from the hook, the contact at 33 is open, and thus the circuit, including the transmitter-battery 22 and the magnets of the signal apparatus, is opened and the signal apparatus is cut out of circuit.

I have shown the battery for energizing the magnets of the signaling apparatus also adapted for generating the talking-currents varied by the transmitter; but it is evident that my invention should not be confined to the employment of this battery, since a separate or other source of electrical supply may be used.

In signal-sending when the generator 13 is operated the circuit is closed between the contact-spring 11 and the drive-wheel 12 in the ordinary way by the lateral movement of the armature. At the same time that this circuit is closed the contact is broken at 14, thus

cutting out all of the telephone apparatus with the exception of the home generator, which is included directly in the line. In Fig. 2 I have shown the same circuit arrangement and illustrate means for manually including the home generator directly in circuit and cutting out the telephone apparatus in signal-sending by means of a manually-operated switch 34, pivoted at 35 and normally held upon the contact of the receiver-circuit 15 by means of a spring 36. In Fig. 3 I have shown a similar arrangement with the shunt 38 around the generator.

In Fig. 4 I have shown the induction-coil 17 acting directly upon the bell-striker 39 of the signal apparatus. In this arrangement the bell-striker 39 is connected directly to a pivoted armature 40 and the switch-arm 25 and local signal-circuit 28 is dispensed with.

In Fig. 5 I have shown a party-circuit line including three stations. In this view the arrangement of the apparatus is shown diagrammatically in its relation to the leads 41 and 42 of a complete metallic circuit. In this arrangement the signal-sending generator of each station is shown normally cut out of the circuit, but adapted to be included therein by means of the push-button switch 43.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a telephone apparatus the combination with the induction-coil of the transmitter, of a signal-indicating device, a local circuit including said signal-indicating device means for supplying current to said signal-indicating device and a switch operated electromagnetically by the said induction-coil to close the local circuit.

2. In a telephone apparatus, the combination with the induction-coil of the transmitter, of a signal-indicating device located in the local transmitter-circuit, means for supplying current to said signal-indicating device and a switch electromagnetically operated by the said induction-coil to close the local transmitter-circuit.

Signed by me at Chicago, Cook county, Illinois, this 26th day of July, 1899.

PETER C. BURNS.

Witnesses:

L. M. BULKLEY,  
CHAS. C. BULKLEY.