

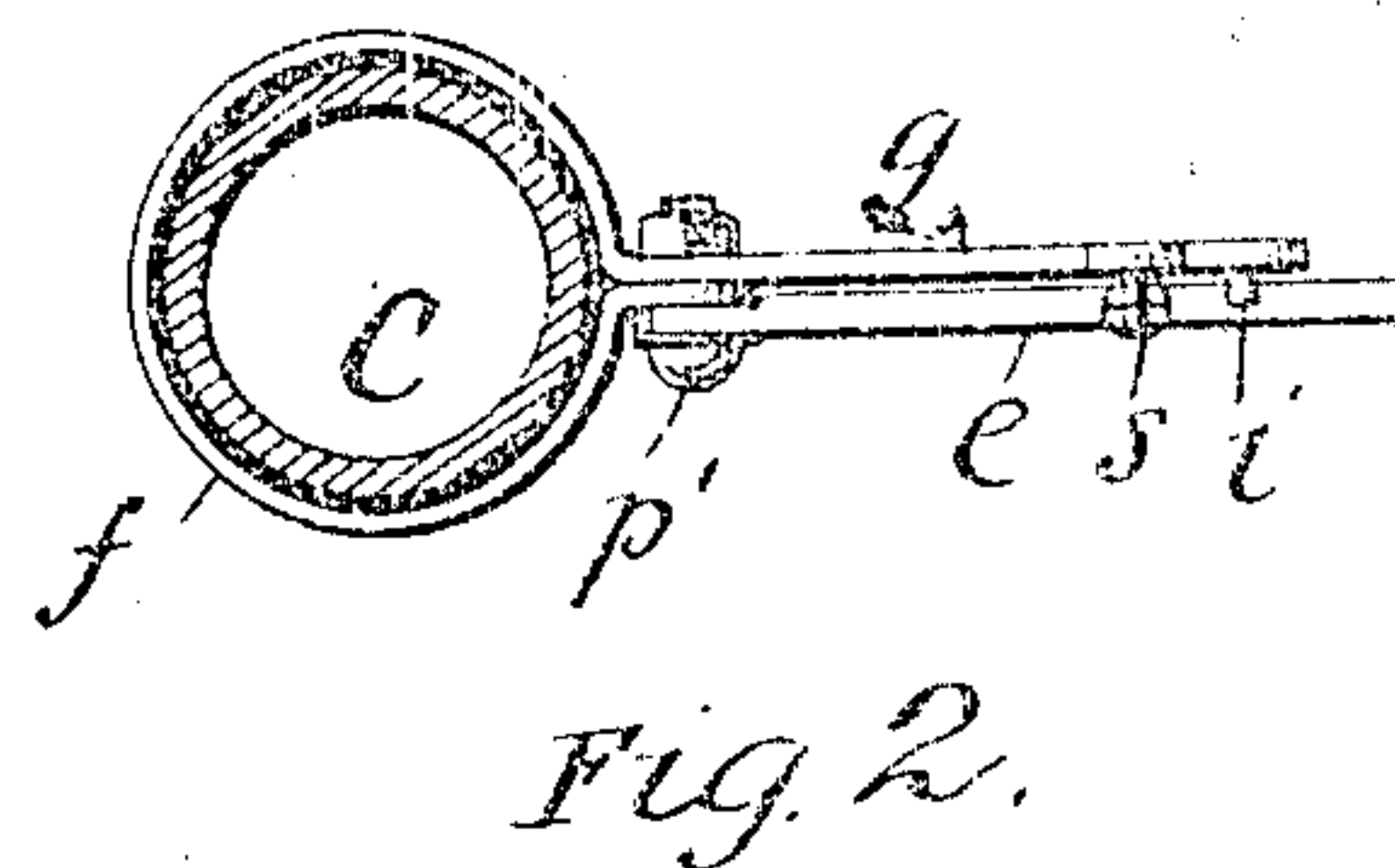
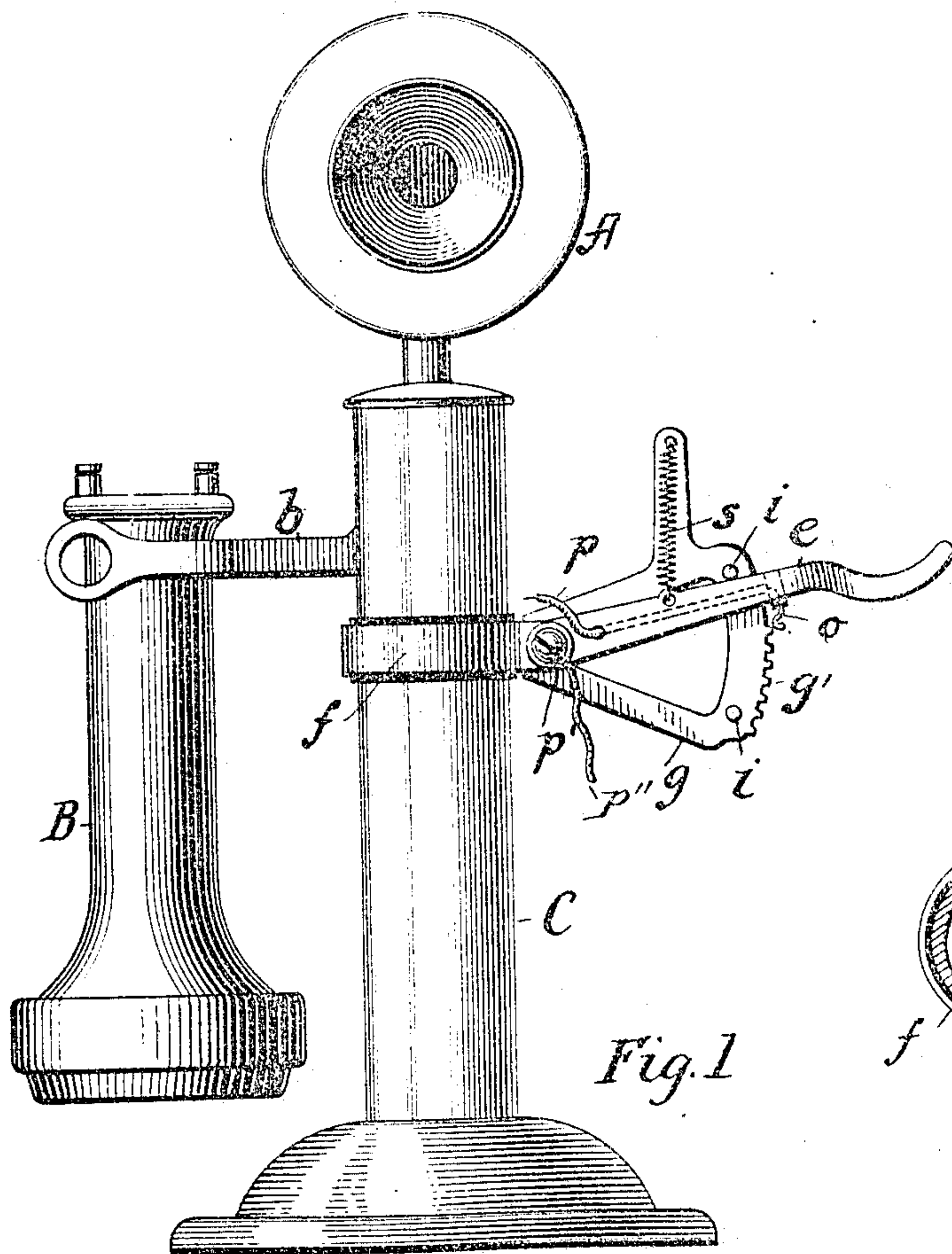
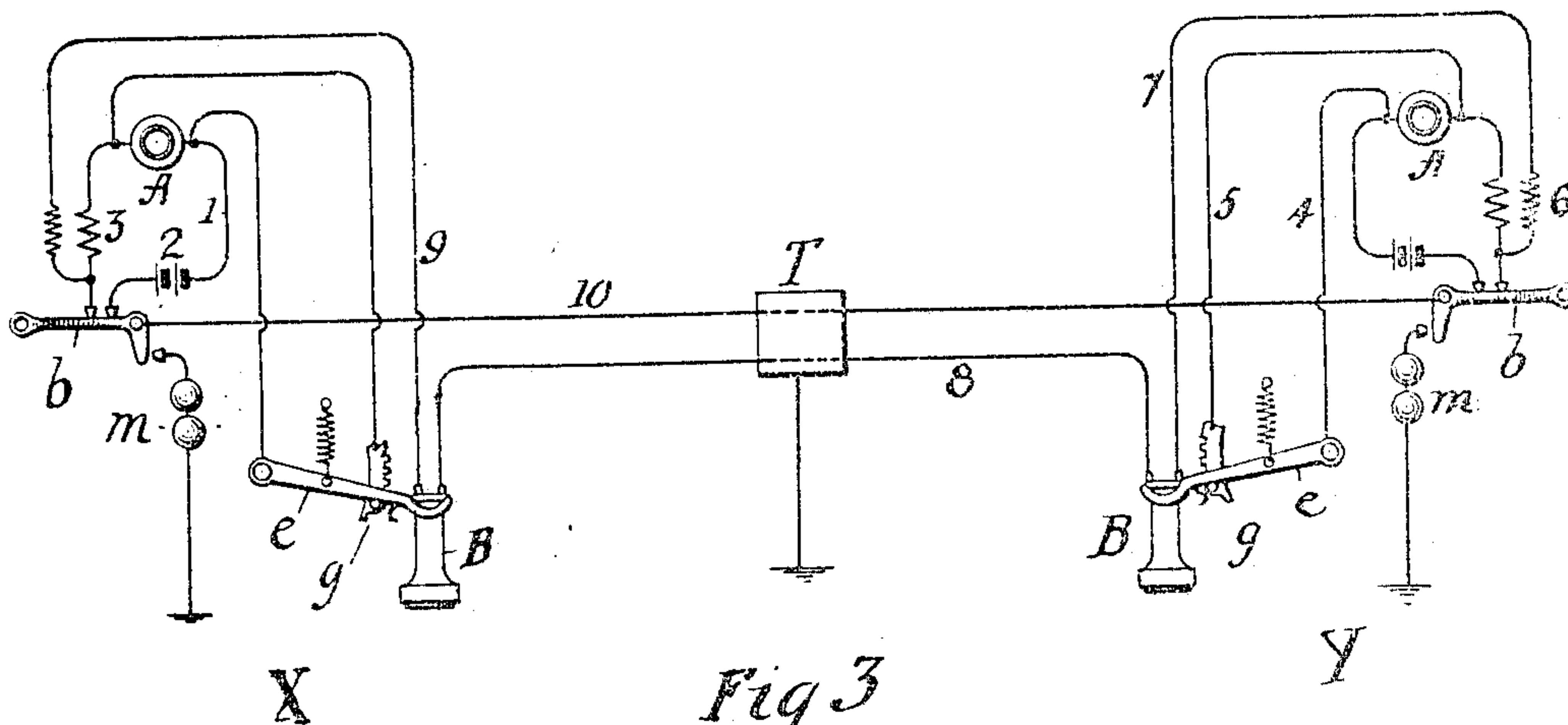
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ANDREAS VILHELM (CALLED WILHELM) RUDOLPH FECHTENBURG.

TELEPHONE SIGNAL.

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# UNITED STATES PATENT OFFICE.

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## TELEPHONE-SIGNAL.

No. 818,675.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed December 8, 1904. Serial No. 235,968.

*To all whom it may concern:*

Be it known that I, ANDREAS VILHELM (called WILHELM) RUDOLPH FECHTENBURG, a subject of the King of Denmark, residing at the city of New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Telephone-Signals, of which the following is a full, clear, and exact description.

This invention relates to telephone-signals; and the object is to save time in telephonic communication.

Occasionally when two persons are in communication by telephone it happens that one of them requests the other to "hold the wire." This necessitates one of the parties standing idle at the telephone until the other is again ready to converse. The instrument must be held off of the hook, so that central office will not sever the connection between the parties, and it is necessary for the waiting party to hold the instrument to his ear in order to know when the other party has returned and taken up his instrument. Considerable time is sometimes occupied in this way, and it is in any case a great inconvenience to be forced to remain at the telephone and hold the instrument to the ear.

The object of the present invention is to enable the waiting party to so dispose of his instrument that while waiting he can be attending to other matters and will not be compelled to hold the instrument to his ear. This is accomplished by providing a second hook-switch upon which the telephone-receiver is hung by both parties when either of them is requested to wait or hold the wire. This second hook controls a shunt-circuit around the transmitter, and in moving downward under the weight of the receiver it closes and opens said shunt-circuit a number of times, thus cutting out and in the resistance of the transmitter and correspondingly varying the current on the line. These variations are indicated by a sharp click in each telephone-receiver, so that each party knows when the other has hung up the instrument on the supplemental hook. The receiver being off the main hook, the line is retained in its "busy" condition and the connection will not be disturbed by the central operator. When either of the parties is again ready for conversation, he removes the receiver from the supplemental hook, which again sends the pulsations

over the line, giving the same signal as before in both telephone-receivers and calling the waiting party to the instrument. The removal of the waiting party's instrument from the hook again sends the signal over the line and informs the first party that conversation may begin.

An apparatus and the circuits for carrying out the above idea are illustrated in the accompanying drawings; but it will be understood that various modifications of the special manner of creating the signals and retaining the connection may be devised without departing from the spirit of my invention; it being understood that I am the first to provide signals of any character, whether audible, visible, or otherwise, for the purpose referred to.

Figure 1 is an elevation of an ordinary desk-telephone set equipped with devices for carrying out my invention. Fig. 2 is a section through the standard of the instrument, showing the novel attachments in plan; and Fig. 3 is a diagram of the circuits where two subscribers are connected together through central-office connections.

It will be understood that although I have shown only a desk set of instruments the invention is applicable to any other style of telephone-subscriber's set.

A is a transmitter, and B the receiver, of any ordinary construction.

b is the usual hook-switch, upon which the receiver normally hangs when out of use. The standard C, upon which the two instruments are supported, also supports a second hook-switch e, adapted to support the receiver B. This hook is pivoted to the standard by means of a clamping-ring f, insulated from the standard and also supporting a metallic bracket g, having a concentric row of projections g' on its forward edge. The hook is mounted to swing between limit-stops i i in a vertical plane parallel to the bracket, and it carries a contact-finger o, adapted to make and break contact successively with the projections g' when moving in either direction from one stop-pin to the other. The contact o is preferably out of electrical contact with the bracket and contact projections thereon when at either limit of its stroke, and the circuit controlled thereby is consequently normally open. This contact-finger forms one terminal of a circuit, (indicated by the wire p,) 55 60 65 70 75 80 85 90 95 100 105



leading through the hollow arm of the hook. The other terminal of the same circuit is the bracket *g* itself, to which another wire may be connected at the pivot-screw *p'* or at any special binding-post provided for the purpose. A spring *s* is used to carry the hook upward to its normal position whenever the weight of the receiver is removed therefrom, and, if desired, a dash-pot or other motion-governor may be applied to the switch-arm to time the movement of the arm in either direction, such devices being very commonly known in the art.

Fig. 3 shows a diagram of circuits. Each subscriber's set includes a local circuit containing a battery, induction-coil, and transmitter, the operation of which in connection with my invention will now be described. We will assume that subscribers X and Y have been duly connected for conversation through the central office T and that subscriber Y has requested subscriber X to hold the wire. Both subscribers then place their receivers B upon the supplemental hooks *e*, and this is the condition we find the circuits in at Fig. 3. It will be seen that the calling-circuit, including the bells *m* of both stations, is open by reason of the main hook *b* being relieved of the weight of the receiver and in its uppermost position. Therefore the central operator will get a busy test whenever she attempts to connect either subscriber X or Y with any other calling subscriber. It will also be seen that the local transmitter-circuits 1, containing the battery 2 and primary coil 3, are closed by the hook-switch *b*. Now when subscriber Y is again ready to talk he lifts his receiver off the hook *e*. This allows the hook to rise and successively close and open the shunt-circuit 4 5 around his transmitter. The transmitter being of considerable resistance, these interruptions cause strong sharp high-potential impulses to be induced in the secondary coil 6, which impulses take the following circuit: wire 7, receiver of station Y, wire 8, receiver of station X, wire 9, switch-lever *b* of station X, wire 10, switch-lever *b* of station Y, to coil 6. Thus both receivers are affected by these impulses, which cause their diaphragms to give out loud sharp clicks, which can be plainly heard by both parties at a considerable distance from the instrument itself. This signal calls subscriber X back to the telephone, who then removes his receiver from hook *e*, causing another signal to be sent over the line to Y by reason of the short-circuiting of the transmitter at the X station. Both Y and X now know that each is ready to talk, and the conversation is again taken up. In the meantime both parties have been free to attend to other matters, Y to obtain the data or attend to such other matters as gave him reason to request X to hold the wire and X to attend to any other business he might

have before him. When the conversation is finished, both parties hang their receivers on the main hook *b*, when the signal-circuit becomes restored in the usual manner and the local transmitter-circuit opened. When the supplemental switch *e* is in either of its two positions, particularly in its lower position, the shunt-circuit around the transmitter is opened to avoid consumption of the transmitter-battery and possible heating of the transmitter. When one party asks the other to hold the wire, he waits until he gets the series of clicks in his telephone, indicating that the other party understands and has hung his receiver on the supplemental hook. He then hangs his own receiver on the supplemental hook, thus indicating to the second party that there is a mutual understanding and that either party can be called to the telephone by lifting the receiver from the supplemental hook, and thus sending the pulsations over the line to the other receiver. The supplemental hook will of course only be used in the cases specified—that is, where communicating parties wish to hold the wire for a considerable time. When they are through with their conversation, they will return the receivers to the regular hooks *b*. If by mistake one of the instruments should be returned to the supplemental hook, the clicks in the receiver would again be sounded and give notice of the fact that the receiver has been improperly placed.

Believing myself to be the first to provide a signal of this character, I wish it to be understood that instead of using the receiver to give the alarm or indication any other kind of signal device may be placed in circuit with the receiver and operated whenever the heavy impulses are sent over the line. It is also not essential that a series of impulses be used for the indications, as any distinctive signal will serve the same purpose. Likewise it is to be understood that the switch-arms *e* may be operated by hand instead of the weight of the receiver, in which case the receiver could rest upon a table or be placed anywhere except on the main hook *b* while the line is held. If my invention is applied to what is known as the "common battery" or "central energy" telephone systems, the same connections will be used—that is to say, the transmitter will be shunted in the same manner and the opening and closing of such shunt will create an effect upon the line to which the receivers will respond.

Having described my invention, I claim—

1. In a telephone system, the combination of a central office and a plurality of subscribers' stations connected therewith with means whereby interconnected subscribers can send call-signals to each other while the central office cannot call either of the connected subscribers.

2. In a telephone system, the combination



of a central office and a plurality of subscribers' stations connected therewith, and each embracing a call-signal, with means for disconnecting the call-signals of interconnected substations, a second call-signal for each substation adapted to be thrown into circuit when the first call-signal is disconnected and means at each substation for operating the second call-signal.

3. In a telephone system, substations each provided with a call adapted to be actuated from the central office and with a second call adapted to be actuated from another substation.

4. In a telephone system, substations each provided with a call adapted to be actuated from the central office and with a second call adapted to be actuated from another substation, the second call being operative only when the first is inoperative.

5. The combination of two telephone substations each provided with a switch controlling the main circuit between the stations, means for transmitting calling-signals over said main circuit from one substation to another and signal devices at each station operative upon said calling-signals only when the telephone-receiver is connected for conversation.

6. In a telephone system, substations provided with means for sending a call-signal while the respective transmitters and receivers of the substations are connected for conversation.

7. In a telephone system, substations provided with means for sending and means for receiving a call-signal while the respective transmitters and receivers of the substations are connected for conversation.

8. In a telephone system, a plurality of substations each provided with means for sending a series of high-potential electric impulses over the line while the transmitter and receiver are connected for conversation.

9. In a telephone system, a plurality of substations each provided with means for sending a series of high-potential electric impulses over the line while the transmitter and receiver are connected for conversation, and call-signals at each station responsive to such

signals when the transmitter and receiver are connected for conversation.

10. In a telephone system, substations provided with a hook-switch and two call-signals, said switch adapted, when sustaining an instrument, to connect one of the signals in circuit, and when not sustaining an instrument, to connect the other signal in circuit.

11. In a telephone system, substations provided with two hook-switches and two call-signals, one hook-switch, when actuated by the weight of an instrument, being adapted to send a signal-current over line, while the other hook-switch, when sustaining an instrument, holds one signal in condition to respond to calling-current.

12. In a telephone system, substations each provided with a call, a central office and means to actuate said calls and means to connect substations, and a call in each substation and means to actuate a similar call in a connected substation.

13. In a telephone system, a number of substations each provided with two hook-switches and two signal-calls, means controlled by one hook-switch for sending a signal over the line when actuated by the weight of an instrument, and means actuated by the other hook-switch for controlling one of the signal-calls and when actuated by the weight of an instrument, holding the said signal-call in an operative condition.

14. In a telephone system, the combination of a central office and a plurality of substations and wires for connecting the same therewith, means at the central office for connecting the wires of two selected substations, means at the substations for producing an electrical condition upon the connected wire indicative to the central office that the substations are in use, and means for sending signals between the substations during the continuance of the said electrical condition.

In witness whereof I subscribe my signature in the presence of two witnesses.

ANDREAS VILHELM (CALLED  
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Witnesses:

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