

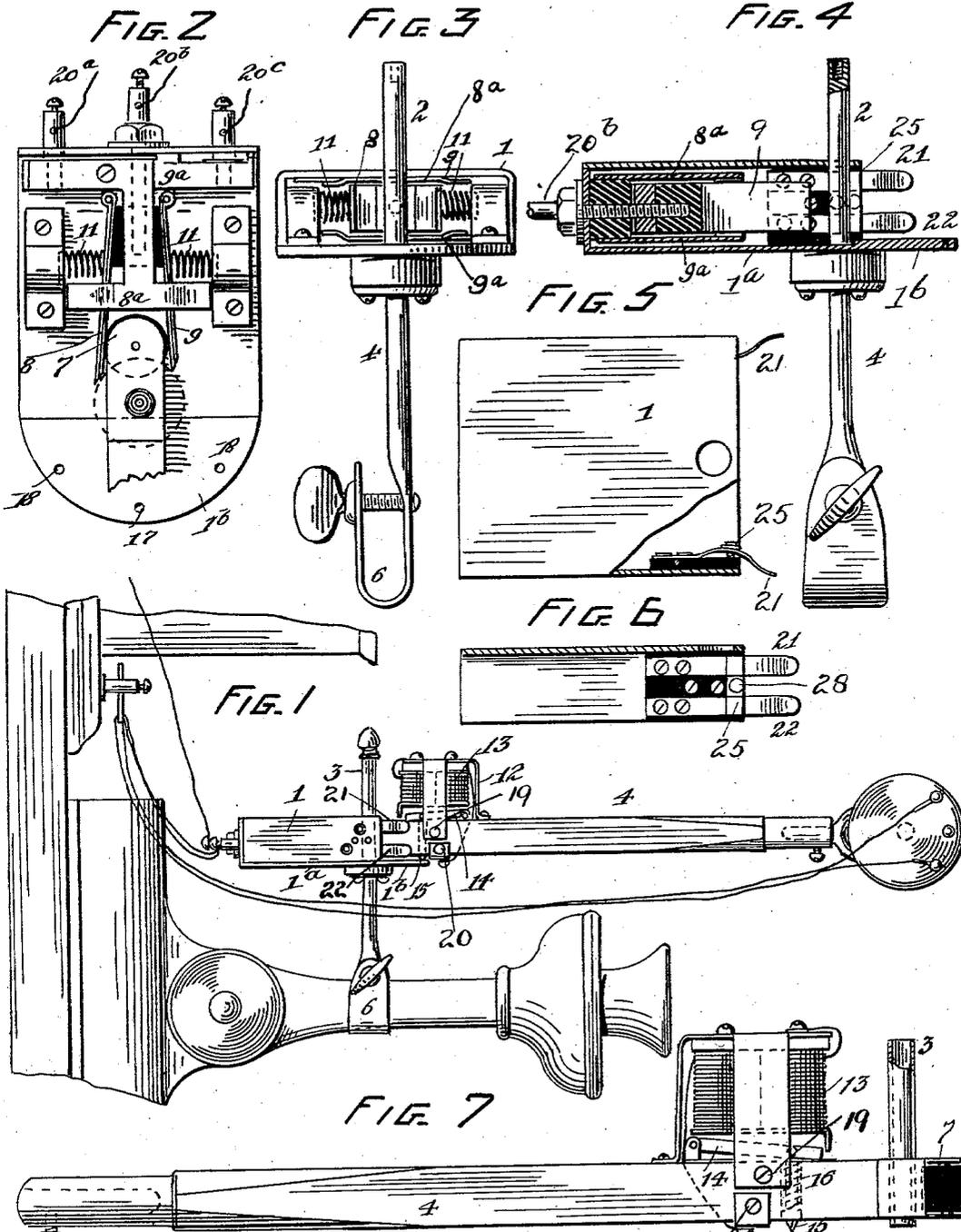
No. 753,493.

PATENTED MAR. 1, 1904.

S. C. HOUGHTON.
TELEPHONE.

APPLICATION FILED APR. 3, 1903.

NO MODEL.



WITNESSES:
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UNITED STATES PATENT OFFICE.

STEPHEN C. HOUGHTON, OF SAN FRANCISCO, CALIFORNIA.

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 753,493, dated March 1, 1904.

Application filed April 3, 1903. Serial No. 150,940. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN C. HOUGHTON, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Telephones, of which the following is a specification.

My invention relates to telephones. In the ordinary telephone if the receiver is left off the hook, the subscriber's circuit being connected with the line, the normal signaling-circuit is suspended, and the talking-circuit is continued until the receiver has been restored to the hook, the talking-circuit disconnected, and the line thereby restored to normal condition.

The primary object of my invention is to provide means adapted to be operated by the central office for disconnecting the subscriber's talking-circuit, and thereby restoring the line to normal condition.

I have embodied my invention in a form shown in the drawings, to which reference is made in this specification, although this is not the only embodiment of which my invention is capable.

Figure 1 is a side elevation of the receiver-support shown as attached to a transmitter-arm. Fig. 2 is a detail showing in plan view the circuit-operating devices or switches which are operated by the receiver. Fig. 3 is a front elevation of the receiver-support. Fig. 4 is a longitudinal section of the receiver-support shown in Fig. 3. Fig. 5 is a plan view of casing which supports the receiver-arm and contains the switches. Fig. 6 is a sectional detail of the casing, showing another circuit-operating device or switch to be referred to. Fig. 7 is a side elevation of a receiver-support, showing, upon an enlarged scale, the electromagnet and studs shown in Fig. 1 for releasing said support to thereby operate the circuit-operating device and disconnect the subscriber's circuit from the line.

The casing consists of a box-like structure open at one end for the introduction of the receiver-arm 4. The casing has a vertical pin 2 passing through it, upon which by a sleeve 3 is mounted the movable receiver-arm 4, which is thus rendered capable of lateral move-

ment in a horizontal plane, swinging on pin 2 as a pivot. As my invention is herein illustrated, the entire casing is secured to the arm or extension of the transmitter, which is commonly adjustable in a vertical plane, and for this purpose I have shown a clip 6, (see Fig. 1 and Fig. 3,) which is the arrangement preferred for attaching the receiver-support to the transmitter-arm of an ordinary wall-telephone. For attachment to the transmitter-arm of a desk-telephone I prefer to use two perforated ears, adapted to enter at the opposite sides of the hinge of the transmitter-arm and to be secured by a traverse pin. This allows an adjustment of the receiver-arm in two planes at right angles to each other. The receiver may be attached to the telephone independently of the transmitter—for instance, as shown in my Patent No. 586,793, dated July 20, 1897.

The receiver may be of any ordinary construction, and is preferably swiveled in the end of the arm 4, as shown, so that it can be applied to either ear. The inner end of the receiver-arm 4 may be rounded or, as shown and in order to avoid friction, is provided with a roller 7 of some insulating material, which projects between the plates 8 and 9. The latter in themselves may be springs; but I have shown them as spring-pressed plates caused to approach each other by the coiled springs 11. The opposing pressure of these spring-actuated plates holds the receiver-arm in the normal or intermediate position. (Shown in Fig. 2.) If the receiver-arm be moved to the right or left and then released, one of these springs restores it to normal position. These spring-actuated plates 8 and 9 also serve as the movable members of two circuit-operating devices or switches which connect the subscriber's talking-circuit with the line.

Mounted upon the receiver-arm is a bracket 12, which supports an electromagnet 13. The armature 14 of this magnet carries a cone-ended pin 15, provided with a coiled spring 16. This spring tends to hold the pin 15 down against the extension 1^b of the bottom plate 1^a of the casing. In normal position the pin 15 enters a hole 17 in said extension and ordinarily remains there; but the cone end of the

pin can be easily disengaged from the hole by movement of the receiver sidewise. When the arm is thus moved in either direction, the effect is the same as when the ordinary telephone-receiver is removed from the hook and the signal is sent to the central office in the usual manner. The electrical connections are made by means of the circuit-operating devices of the switches, of which the plates 8 and 9 constitute the movable members.

8^a and 9^a represent two T-shaped springs, which are placed one over and the other under the plates 8 and 9, the ends of said springs being bent slightly toward each other, as shown in Fig. 3, so that when either of said plates is moved laterally it engages the bent-end portions of both T-springs. To the plates and T-springs are connected at the rear by suitable binding-posts the conductors 20^a 20^b, which are connected to the line and telephonic instruments in any usual or suitable manner. The extension-plate 1^b of the casing is provided on one side or both sides with holes 18 for receiving a pin 15 when the receiver-arm has been swung far enough in one or the other direction for the pin to engage with such hole. When in this abnormal position, the effect is the same as if the ordinary receiver had been removed from the hook—that is to say, the inner end of said arm has moved one or the other spring-actuated plate 8 or 9 into engagement with the T-shaped springs and closed the circuit at such point, and the subscriber's talking-circuit is thereby connected with the line and so held.

The circuit-operating device 8 8^a or 9 9^a is under the control of the central office, so that in case the receiver-arm should not be replaced by the subscriber the subscriber's talking-circuit may be disconnected from the line by an operator at the central office and the line thereby restored to normal condition. In the form of my invention here shown the electromagnet 13 is employed for this purpose, and said magnet is included in circuit by a circuit-operating device, which is herein shown as operated by the receiver-arm. On each side of the receiver-arm two studs 19 and 20 are provided, to which are connected the terminals of the electromagnet. When the arm is swung in either direction, these studs are brought into engagement with the contact-springs 21 22, which are arranged in pairs at the opposite sides of the casing. One of said pairs of contact-springs is represented in Fig. 6. The springs 21 22 normally occupy a position beneath and in engagement with a bridge or cross-piece 25, which is secured to the wall of the casing by a middle stud 28, and whenever the studs 19 and 20 are brought into engagement with said springs they will be removed from engagement with the bridge or cross-piece 25. To connect the springs 21 22 with the signaling or other subscriber's circuit, the circuit-wire is cut, and from each

end of the wire so cut a conductor is brought to each spring, so that either by means of the bridge 25 or the contact-studs 19 20 the circuit will remain uninterrupted. When the receiver-arm is swung to one side and the springs 21 22 are engaged and removed from contact with the bridge 25, a path for the current is provided through the electromagnet 13. Therefore it will be seen that whenever the receiver-arm is swung to one side to extreme position the subscriber's talking-circuit is connected with the line by the circuit-operating device 8 8^a or 9 9^a, and the electromagnet 13 is included in the circuit by the circuit-operating device 19 20 21 22.

By energizing the electromagnet 13 by a current over the line from the central office its armature is attracted and the pin 15 removed from engagement with the bottom plate and the receiver-arm restored by means of the pressure of one or the other springs 11, and the circuit-operating device 8 8^a or 9 9^a is operated and the subscriber's circuit thereby disconnected from the line, and the circuit-operating device 19 20 21 22 is also operated and the circuit of the electromagnet disconnected. Therefore, although the receiver-arm may be left in its abnormal position, which is the same in effect as if the ordinary receiver was left off the hook, the connected subscriber's circuit is under the control of the central office and can be disconnected at will.

I do not limit myself to the precise constructions and arrangements herein described and set forth in the drawings, as I desire to avail myself of such modifications and equivalents as fall properly within the spirit and scope of my invention.

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

1. The combination with a telephone at a substation, of a substation-circuit, a line-circuit, a circuit-operating device for connecting the said substation-circuit with the line-circuit, and means, operable from a distance, for operating said circuit-operating device to disconnect said substation-circuit from the line-circuit and thereby restore the line-circuit to normal condition.

2. The combination with a telephone receiver and transmitter, of a circuit-operating device for connecting a subscriber's circuit with the line, and an electromagnet operated by a circuit from the central office for operating said circuit-operating device to disconnect said subscriber's circuit from the line, and thereby restore the line to normal condition, substantially as described.

3. The combination with a telephone receiver and transmitter, of a circuit-operating device for connecting a subscriber's circuit with the line, an electromagnet operated by a circuit from the central office for operating said circuit-operating device to disconnect said

subscriber's circuit from the line, and thereby restore the line to normal condition, and means operated by the receiver for including said electromagnet in the circuit, substantially as described.

4. The combination with a telephone receiver and transmitter, of a circuit-operating device for connecting a subscriber's circuit with the line, means operated by the receiver for operating said circuit-operating device, an electromagnet operated by a circuit from the central office for operating said circuit-operating device to disconnect said subscriber's circuit from the line, and thereby restore the line to normal condition, substantially as described.

5. In a telephone, a laterally-movable receiver-arm, a surface against which it moves, means for holding said receiver-arm in engagement with said surface, an electromagnet supported by the receiver-arm for releasing said receiver-arm from said engagement, and electrical connections for operating said magnet, substantially as described.

6. In a telephone, a pivoted receiver-arm carrying a receiver and adapted to be moved laterally, means for holding the said arm at the limit of its lateral motion, a spring tending to hold said arm in a normal central position, and means controlled by the central office for releasing said receiver-arm and permitting said spring to act, substantially as described.

7. In a telephone, a casing adapted to be attached to the telephone set, a receiver-arm piv-

oted in said casing and adapted to be moved laterally over the same, a pin on said arm for engaging a hole in said casing whereby said arm is held in a normally central position from which it can be released by sidewise pressure, a spring bearing on the arm and tending to move it to said central position, means for holding said arm to said plate at the limit of its sidewise motion, and means controlled by the central office for releasing said arm from its sidewise limit of movement and permitting said spring to act, substantially as described.

8. In a telephone, a receiver-support adapted to be moved from its normal position and to be held in another position, and means under control of an operator at a distant point for releasing and restoring it to its normal position, substantially as described.

9. In a telephone, a receiver-support adapted to be moved from its normal position to a position whereby a signal is sent to a distant point with communication established therewith, means for holding said receiver out of its normal position and means controlled from a distant point for releasing the receiver-support and restoring it to normal position, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 24th day of March, 1903.

STEPHEN C. HOUGHTON.

Witnesses:

F. M. BURT,
C. H. DUNSINOOR.