

1,427,160.

R. H. MANSON.
HOOK SWITCH MECHANISM.
APPLICATION FILED NOV. 19, 1917.

Patented Aug. 29, 1922.

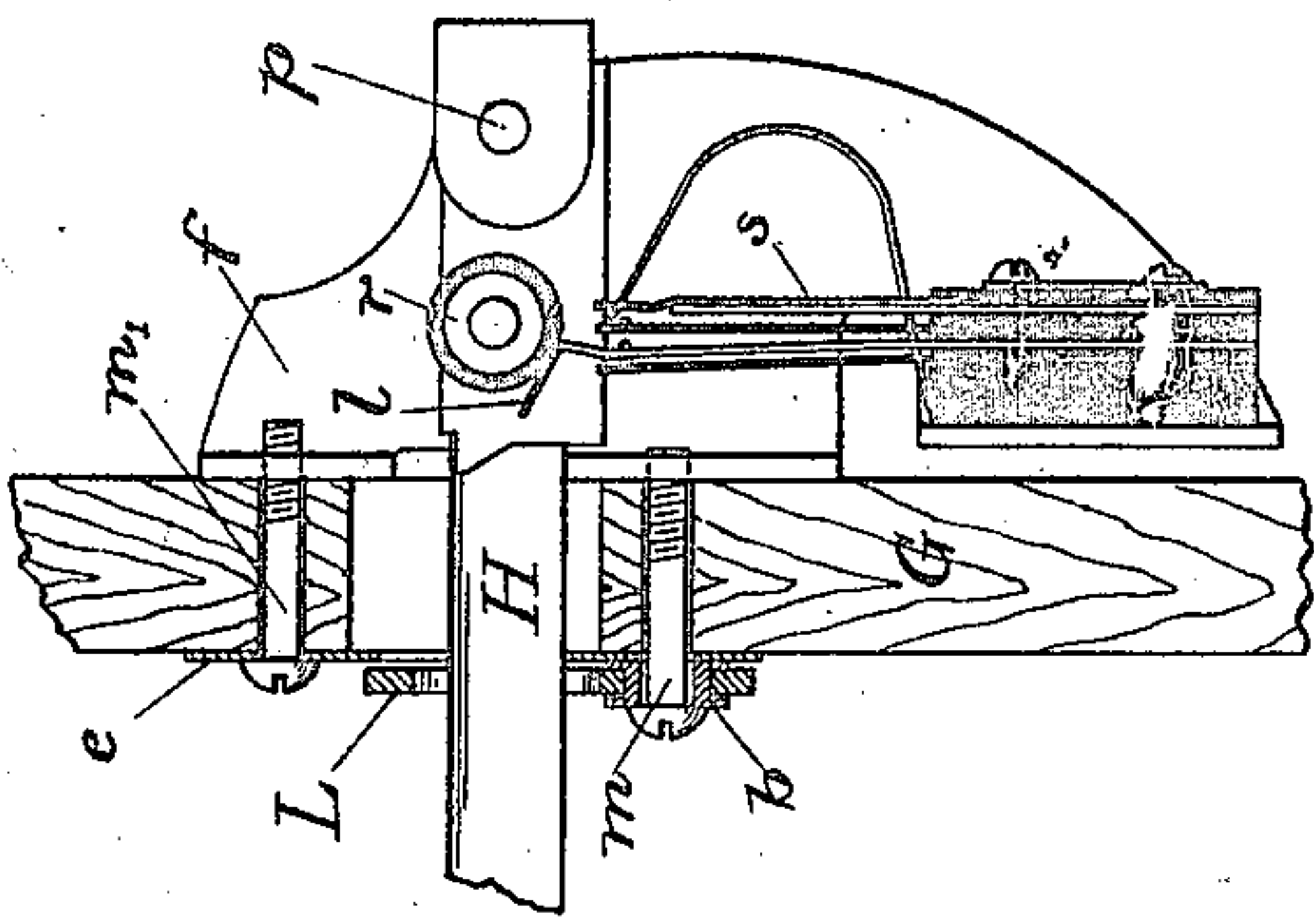


Fig. 1.

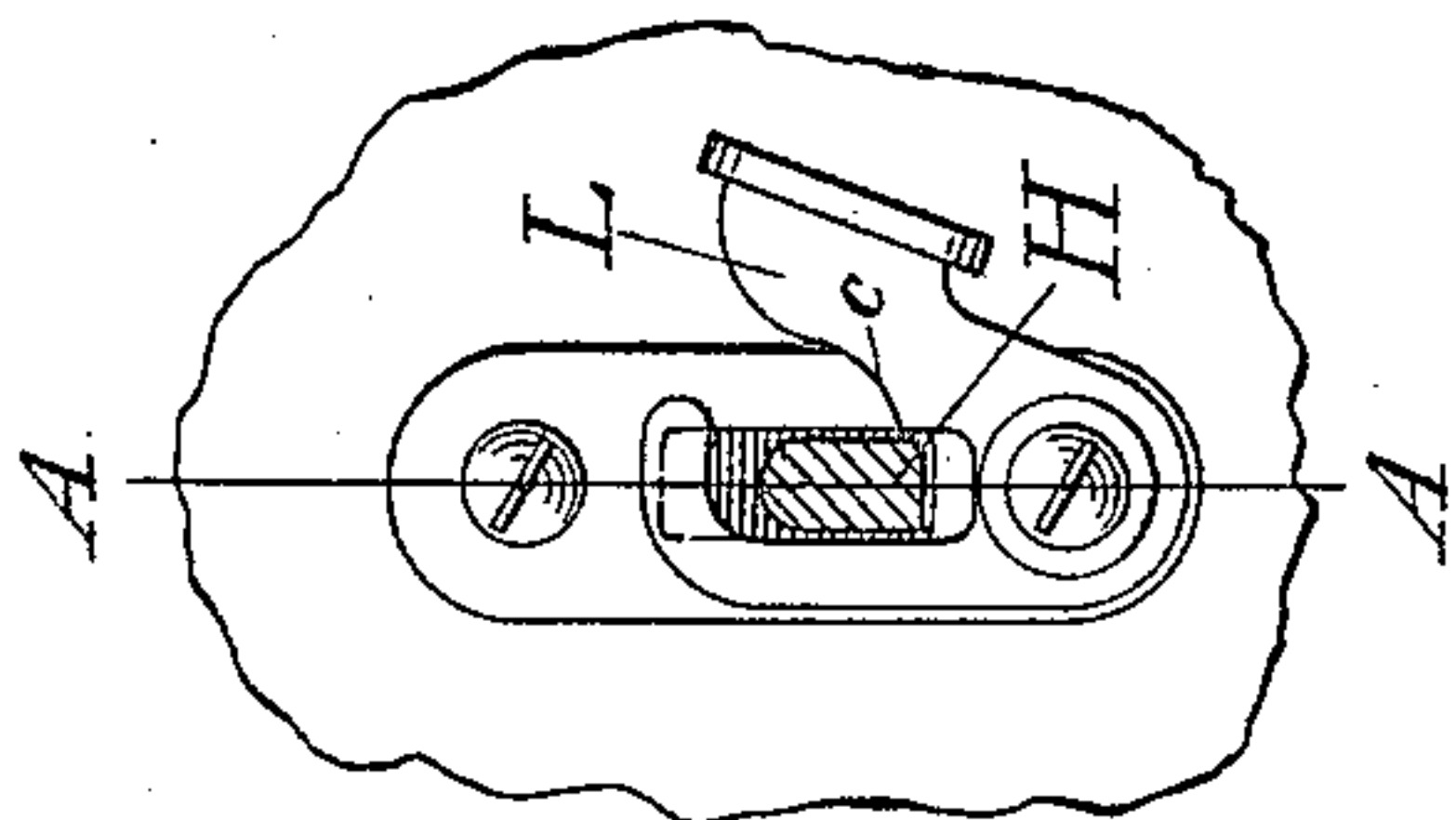


Fig. 2.

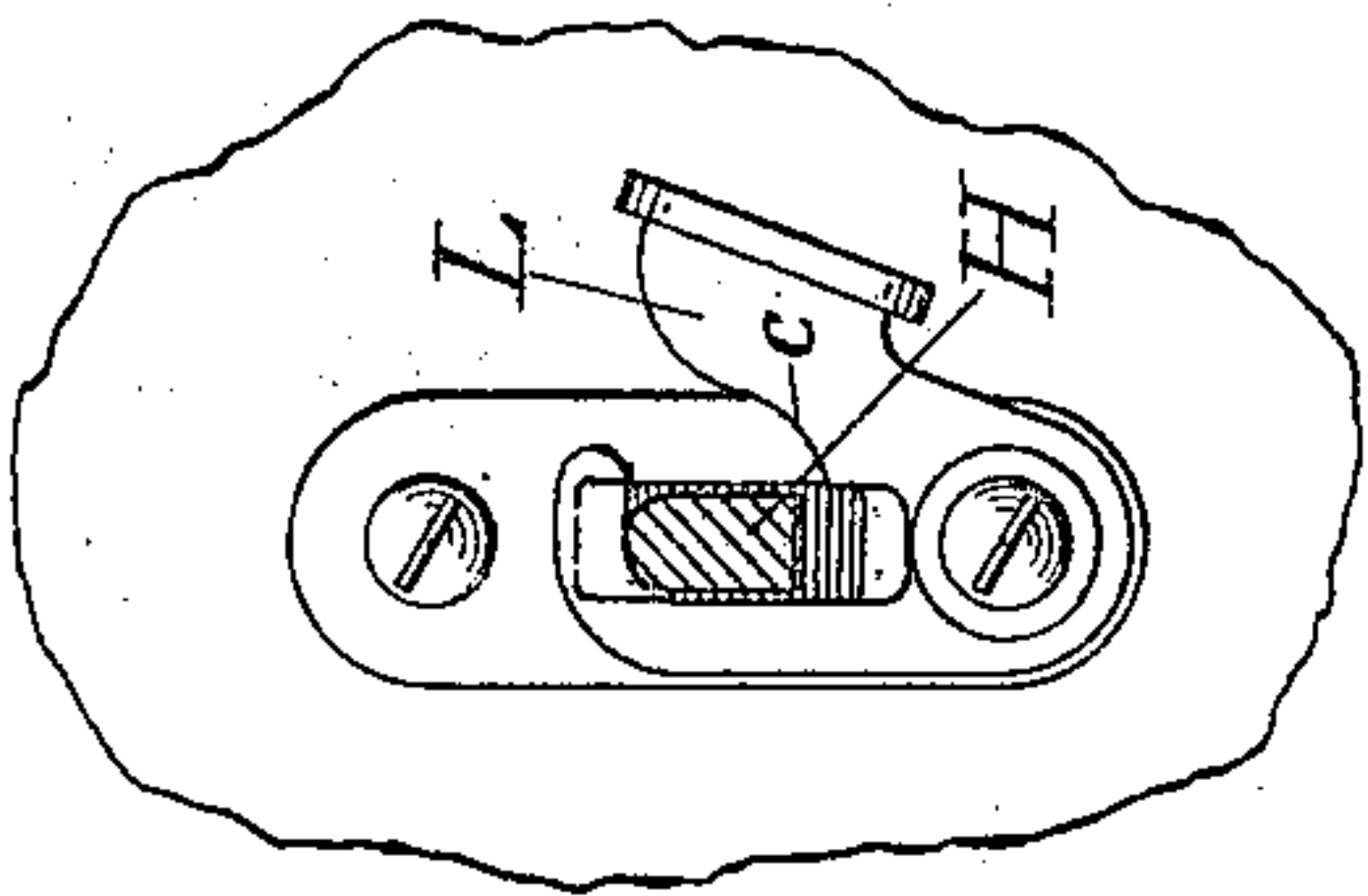


Fig. 3.

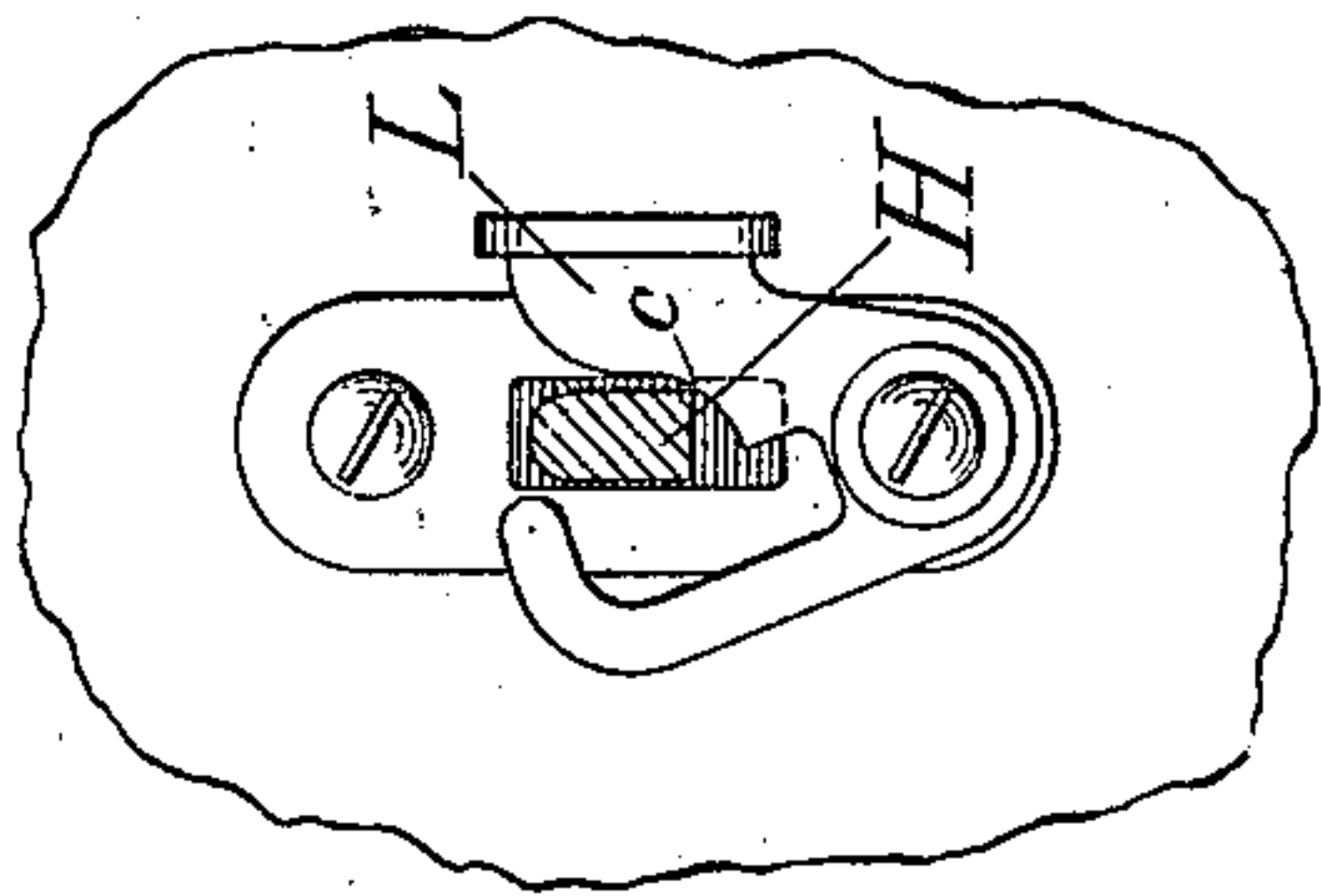


Fig. 4.

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HOOK-SWITCH MECHANISM.

1,427,160.

Specification of Letters Patent.

Patented Aug. 29, 1922.

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To all whom it may concern:

Be it known that I, RAY H. MANSON, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Hook-Switch Mechanisms; of which the following is a complete, clear, and exact description.

My invention relates to telephone instrument mechanisms and particularly to mechanisms associated with the automatic hook-switch common to telephone instruments. In these instruments the telephone receiver upon being removed from the supporting switch-hook is moved upwardly by the motive force of a spring to operate a set of switch contacts to connect the operating elements of the telephone, namely, the transmitter, the receiver, the induction coil and associated elements and circuit conductors in a given manner to produce a given operative effect when the telephone is connected to a telephone line.

It is an object of my invention to arrange the switch-hook contacts in such a manner that a set of the said contacts will be operated upon the automatic operation of the switch-hook, and to provide manually operated improved means for accomplishing a different hook-switch position whereby different circuit connections are caused by the operation of a second set of contacts.

It is an object of my invention to so construct the manually operated means that it will be positive in action, positive in release, be pleasing in appearance to the eye, and at the same time being of durable construction so that it cannot be injured by abuse or long continued use.

It is a further object of my invention to provide such means as may be installed on existing types of telephones without change and with the minimum expenditure of time, labor and expense.

Other objects of my invention and the invention itself will be apparent from a description of the invention in which reference will be made to the accompanying drawings, in which similar reference characters are used to designate like parts.

Figure 1, shows partly in cross-section and partly in side elevation a switch-hook structure of an embodiment constructed in accordance with my invention.

Figure 2, shows an end view of the latch of the switch-hook in its normal or unoperated position, but illustrated as broken away so as to show the latch mechanism.

Figures 3 and 4, likewise show the switch-hook latch in the intermediate or latched position and in its released or ultimate position, respectively.

Figure 1, shows a side elevation of the parts of the switch-hook mechanism enclosed inside the telephone casing. It also shows in cross-section the parts of the switch-hook mechanism not enclosed inside the telephone casing and comprises a portion of a side of the telephone casing and the external parts, such as the latch L, etc.

The internal parts comprise a frame *f*, whereon the switch-hook lever *H* is pivoted at *p*, the switch-hook carries an insulated roller *r*, contacting normally with a lever switch spring *l*. This lever switch spring is adapted to be moved by the roller *r*, and to cause the set of switch springs to be operated.

A portion of a side of the telephone casing is illustrated at *G*, an escutcheon plate being mounted on the outside thereof, shown at *e*, and secured through the walls of the casing to the frame *f*, by means of machine screws *m*₁ and *m*. The machine screw *m* has a flanged bushing-washer *b* secured firmly between the head of the screw *m* and the escutcheon plate *e*. Pivoted loosely between the flanges of this bushing-washer and adapted to rotate on the same, is the latch member *L*. These external parts, including the latch member, are perhaps more clearly shown in the views of Figs. 2, 3 and 4 which are side views of the external parts showing their positions under different operating conditions.

Referring to these latter figures I provide an inclined cam surface *c* for the latch which is engaged by the hook *H*. This construction involving such a cam surface is important, as by means of this and the provided construction of the co-operating parts, I am enabled to forcibly return the latch member *L* to normal position as illustrated in Fig. 2 from the ultimate position as illustrated in Fig. 4 by means of the forcibly propelling of the same by means of the under surface of the switch-hook lever *H* engaging this cam surface.

I thus do not depend upon the force of gravity alone as in prior constructions of such devices with which I am familiar, wherein dependence is placed upon the gravity force overcoming the friction between the mobile part or parts and the stationary parts to which they are secured.

Furthermore, I do not clamp, as in prior constructions, the latch member L directly to the casing or escutcheon plate by means of the machine screw *m*, but provide a non-corrosive flanged metal bushing *b* upon which the latch member is pivoted loosely, the flanges preventing the screw from binding the latch member L as would otherwise occur and as does often occur in prior constructions above referred to.

The switch-hook of my invention as described above is capable of many specific uses. For instance, it has been customary in improved telephone systems to so arrange the sub-station apparatus with circuit connections as to secure the maximum of telephonic transmission when the subscriber speaks into his telephone transmitter.

These circuit connections, however, while producing the above desired results, produce an undesirable result in that the "side-tone" effect is increased; that is, there is reproduced in the telephone receiver of the transmitting sub-station to an abnormal degree, the sounds which are projected into the transmitter of that station, the receiver reproducing these sounds to such an abnormal degree that the various noises of the room in which the telephone instrument is placed will be heard and will drown out much of the sound in the receiver, due to the incoming voice currents from the distant station.

Circuits have also been proposed which will not have this excessive "side-tone" effect in the receiver but these circuits are invariably attended by a loss in outgoing transmission.

The switch-hook combination of my invention will permit the use of either type of circuit at the will of the sub-station instrument user, whereby such user can obtain the use of a telephonic circuit of high transmitting power, or when this is not required can obtain the use of a circuit in which the "side-tone" is not so severe, for ordinary local conversations.

The providing of circuit connections combined with the mechanism of my improved switch-hook as described herein, is described in full and claimed in Patent No. 1,303,351, issued May 13, 1919.

In operating the switch-hook mechanism of my invention when a subscriber takes his receiver from the hook, the lever H will be propelled by the propelling spring extending to the right of the spring assembly to a position shown in Fig. 3 where it engages the hook extension of the member L, and its

movement will be limited thereby. At this point of the movement the switch springs *s* will be operated so that, for instance, the spring to the left of the lever spring *l* will break its contact from the lever spring *l*, and the lever spring *l* will make a contact immediately with the right thereof. This may, for instance, cause such a circuit change as will operatively connect the automatic "side-tone" circuit of the instrument to the transmission elements thereof, such as the transmitter, receiver, induction coil, etc.

Should the subscriber in such an embodiment of my invention wish to secure the use of a "booster" circuit or one in which the side-tone is more pronounced or which is of higher transmission efficiency, the use of such a circuit can be secured by the manual displacing of the member L from the position shown in Fig. 3, to the full operated position shown in Fig. 4. This will cause the spring *l* to make an electrical contact with both of the springs to the right thereof, these springs at the same time being out of contact with the spring at the left of the lever spring *l*. Such an extended manual operation of the switch-hook and its associated contacts may be made to effect such circuit changes as will associate the transmission elements of the telephone before named in a different manner in the circuit shown with the "booster" or high efficiency transmission circuit operatively connected to the line.

It is obvious that different functions may be performed by the apparatus of my invention and that they may be associated with other kinds of circuits than that referred to and that which is described in detail in my co-pending application above mentioned.

I am also aware that numerous and extensive departures can be made from the embodiment of my invention herein shown and described, such embodiment being illustrated merely that my invention can be more clearly understood and not for the purpose of limiting the same, but what I claim as my invention is defined in the following claims:

1. In a telephone instrument, a support, a hook switch mounted thereon, a switch lever therefor having a plurality of operative positions and a normal position, a latch for retaining said lever in one of its operative positions, said latch being rotatably mounted on said support and being provided with a substantially vertical portion, and an arm connected to and extending at substantially right angles to said vertical portion, the said latch being also provided with a member extending in the general direction of the free end of said arm to define a constricted entrance to said latch and a cam surface on said member to be engaged by said switch in restoring the latch to normal position.

2. In a telephone instrument, a support, a hook switch mounted thereon, a switch lever therefor having a plurality of operative positions and a normal position, a latch for retaining said lever in one of its operative positions, a pivot on which said latch is rotatably mounted, said latch being provided with a hook extending vertically from said pivot, a member integral with said hook and extending in the general direction of the free end of said hook to define a constricted entrance to said hook, said member being provided with a cam surface and a handle by which the movements of the latch are effected.

3. In a telephone instrument, a support, a hook switch mounted thereon, a switch lever therefor having a plurality of operative positions and a normal position, a latch rotatably mounted on said support for retaining said lever in one of its operative positions, said latch being provided with an opening in which said lever normally rests, said opening having a constricted portion through which said lever passes to be released from and to be engaged by said latch.

4. In a telephone instrument, a support, a hook switch mounted thereon, a switch lever for said hook switch having a plurality of operative positions and a normal position, a latch rotatably mounted on said support for retaining said lever in one of its operative positions, said latch being provided with an opening of substantially triangular area in which said lever normally rests, and an entrance to said opening through which said lever passes to be released from and to be engaged by said switch.

5. In a telephone instrument, a support, a hook switch mounted thereon, a switch

lever for said hook switch having a plurality of operative positions and a normal position, a latch for retaining said lever in one of its operative positions, said latch being provided with a substantially vertical portion located at one side of said switch lever, and terminating at one end in a hook, a second portion of said latch located at the opposite side of said switch lever in the normal position thereof, and a pin for rotatably securing said latch to said support.

6. In a telephone instrument, a support, a hook switch mounted thereon, a switch lever therefor, having a plurality of operative positions and a normal position, a latch for retaining said lever in one of its operative positions, a pin on said support on which said latch is rotatably mounted, said latch including a hook extending vertically from said pin and a member integral with said hook extending in one direction to close a portion of the open side of the hook to provide a constricted entrance to said hook.

7. In a telephone instrument, a support, a hook switch mounted thereon, a switch lever therefor having a plurality of operative positions and a normal position, a latch rotatably mounted on said support for retaining said lever in one of its operative positions, said latch being provided with a vertically extending hook, an arm integral with said hook provided with a surface substantially parallel with said hook and a second portion of said arm extending at a direction at an acute angle to said vertical portion.

In witness whereof, I hereunto subscribe my name this 17th day of November, A. D. 1917.

RAY H. MANSON.