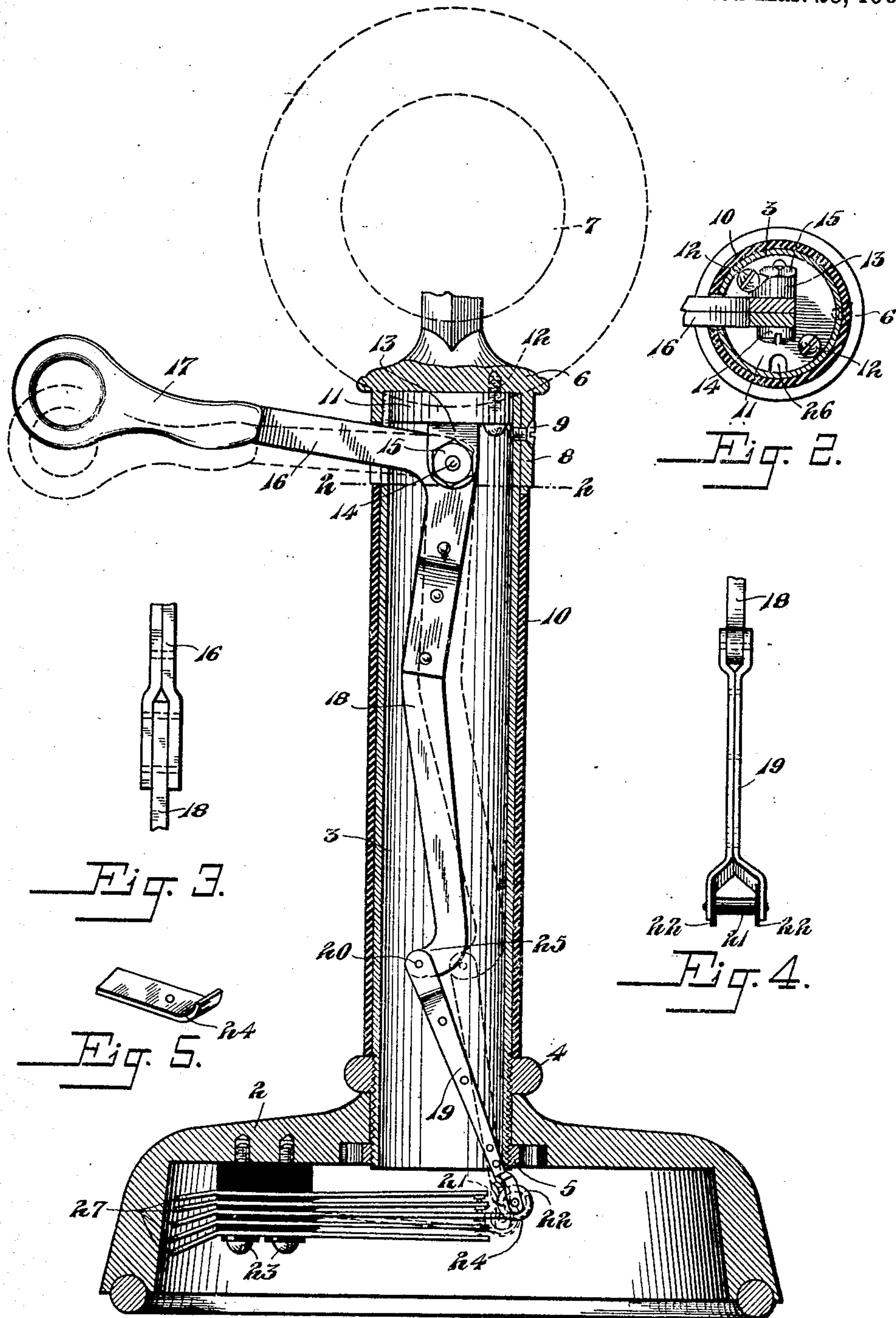


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SUBSCRIBER'S TELEPHONE INSTRUMENT.
APPLICATION FILED SEPT. 1, 1904.

916,235.

Patented Mar. 23, 1909.



Witnesses.
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Fig. 1.

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UNITED STATES PATENT OFFICE.

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SUBSCRIBER'S-TELEPHONE INSTRUMENT.

No. 916,235.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALFRED H. WEISS, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Subscribers'-Telephone Instruments, of which the following is a specification.

My improvements relate to subscribers' telephone instruments and particularly to the hook switch mechanism thereof, which is used to change the circuits of the instrument from normal condition to talking condition, and vice versa, by the taking up and replacing of the telephone receiver.

It has been found desirable in instruments of this class to utilize a bunched set of flat superposed springs for the switch, said springs being provided with suitable platinum contacts through which the electric circuits are made and broken. These springs are usually of considerable strength and in some combinations of circuits a large number of such springs and a somewhat extended movement of the same are required to suitably operate the same. For these reasons a considerable power is required to suitably operate the said springs and this is ordinarily furnished by means of the receiver which is placed upon the projecting end of the switch hook when the telephone is not in use. The weight of the receiver operates the said springs through the medium of the switch hook mechanism to place said springs in a state of stress, their elasticity being ordinarily depended upon to return them to position for talking when the receiver is lifted from the hook. It has been proposed heretofore to operate these switch springs in various manners, a hook switch in the form of an elbow lever being sometimes provided in which the receiver is hung upon the end of one arm of the elbow lever and the other arm is depended upon to engage and operate the switch springs. Other arrangements have included a vertically-reciprocating rod between the switch hook and the springs by means of which the latter were operated. These arrangements, generally speaking, en-

counter the difficulty that the greater the movement imparted to the springs the greater the power required upon the switch hook, which means that a sufficiently heavy receiver must be employed to operate said springs to the limit of their movement and when under the greatest tension. In the case of telephone desk stands it is often desired to locate such springs in the base of the instrument or in the neighborhood of the base, so that they may be readily placed in position and inspected and repaired, and this further increases the difficulty mentioned, particularly with the elbow type of lever, since the arm utilized to engage and operate the springs must be considerably longer than the projecting short arm upon which the receiver is adapted to be hung.

My invention has among other objects that of overcoming the difficulties mentioned and by means of which a considerable movement may be imparted to the springs without any or at least a great increase in the power that must be applied to the switch hook toward the limit of its movement. In accomplishing this result I preferably arrange a toggle mechanism between the springs and the switch hook by means of which when the greatest power is required to operate the switch springs the said mechanism is in position to exert its greatest effect thereon, whereby a large movement of the many or few springs may be secured with a telephone receiver of not undue weight.

Other objects of the invention are to provide a switch hook mechanism for desk stands that is simple and cheap to construct and efficient in operation.

One embodiment of my invention is illustrated in the accompanying drawing, of which:

Figure 1 is a sectional view of a telephone desk stand embodying the improvements; Fig. 2 is a section upon the line 2—2 of Fig. 1 looking toward the head of the stand; Fig. 3 is a detail view of the rigid joint between the two portions of the elbow lever of the hook switch; Fig. 4 is a detail view of the connection between the two portions of the

toggle lever and of the roller at the lower end of the latter lever; and Fig. 5 is a detail perspective view of the projecting end of the operating spring of the set.

5 The desk stand comprises a base 2 of cast iron or other suitable material having a central aperture from which extends the stand-
ard consisting of the brass or other tube 3,
10 having a threaded ring or nut 4 at its lower end resting upon the upper edge of the cen-
tral aperture in the base 2, a suitable nut 5
threading upon the lower end of said tube
within a recess provided therefor in the inner
15 face of the base 2 and serving to clamp the said standard and base together. At the
upper end of this standard a head 6 is pro-
vided, to the upper end of which the tele-
phone transmitter 7—indicated by dotted
20 lines—is pivoted in the usual or desired man-
ner, and which is secured to said standard by
means of the depending flange 8 fitting out-
side of the said tube 3 and secured thereto
through the medium of one or more screws
9. A hard rubber tube 10 may be slipped
25 over the metallic tube 3 to provide a better
appearance. To the lower side of the head
6 and within the flange 8 a block 11 is se-
cured by the screws 12, said block being
provided with a depending lug 13 to which
30 is secured a suitable pivot for the hook switch
consisting of a shouldered screw or bolt 14
provided with a nut 15 upon its threaded
end and through the medium of which it
35 may be securely clamped and locked in place
in the lug 13.

The switch hook which is pivoted upon
this bolt or screw 14 is provided with an
outwardly-extending arm 16, a slot being
provided for said arm in the tube 3 and the
40 flange 8 and a suitably-formed hook 17 is
provided upon the outer end of said arm 16
upon which the receiver is adapted to be
hung when the instrument is not in use.
This switch includes also an arm 18 rigidly
45 connected with said arm 16 and extending
downwardly through the standard or tube
3. On account of ease in manufacture the
arm 16 is preferably formed of two punched
pieces riveted together, and forming also the
50 upper end of the arm 18. The lower portion
of this latter is formed by means of a single
strip riveted to said two portions as indi-
cated in Fig. 3. The third part of the switch
hook comprises the bar 19, also preferably
55 formed from two pieces of punched sheet
metal riveted together as indicated in Fig. 4,
the upper end of which is pivoted as at 20
to the lower end of the arm 18 and the lower
end of which carries the roller 21 preferably
60 of insulating material and which is provided
upon each end with suitable insulating
washers 22.

The switch springs in any desired number
are located in the hollow base 22 and if need
65 be are insulated from each other and from

the base by suitable insulating strips or
blocks and are clamped together and in posi-
tion within the base by means of the screws
23. One of these springs has a forwardly
projecting end 24 in which the roller 21 car- 70
ried by the arm 19 of the switch hook is
adapted to rest. The full lines indicate the
position of the parts when the receiver is not
upon the hook 17 and the dotted lines indi-
cate their position when the receiver is 75
placed thereon. In the position shown in
full lines the arm 16 of the switch hook has
been moved to its upper position by means of
the elasticity of the spring 24 of the set of
switch springs though it will be understood 80
that other means might be provided to cause
or assist in this movement. The said switch
is stopped by the upper edge of the slot
formed in the flange 8 of the head 6 but it is
apparent that any suitable stop may be pro- 85
vided for this purpose. Upon placing the
receiver upon the switch hook the arm 18
thereof is moved toward the right which
causes the toggle mechanism consisting of
arms 18 and 19 to straighten, thereby de- 90
pressing the spring 24 and changing the
switch springs and the circuits controlled
thereby from talking condition to normal
condition. It is apparent that as the arm
16 descends the spring 24 exerts a greater 95
force upon the roller 21, due to its increased
tension, but owing to the greater leverage
afforded by the toggle arrangement of the
arms 18 and 19 the power exerted by the
weight of the receiver upon said springs is in- 100
creased and the switch is thus positively
operated. A large movement may thus be
imparted to the free ends of the springs in
order to make good contacts between the
lower springs and to permit the upper springs 105
to separate from each other. In order to
prevent the pivot 20 of the toggle mechanism
from approaching too closely a line between
the pivot 14 at the upper end of the switch
and the center of the switch 21 at the lower 110
end of the switch, I preferably curve the
lower end of the arm 18 as shown at 25, so
that when the hook is depressed to its great-
est extent said arm will strike the inside of the
tube 3 and act as a stop to prevent the fur- 115
ther movement thereof. It will be observed
that this stop might be formed in any de-
sired manner without departing from the
scope of the invention.

I have not shown the circuits or the wiring 120
of the desk stand to which my improvements
are applied as they form no part of the inven-
tion and may conform to the particular in-
strument and circuits with which the inven-
tion may be employed. In the head 6 and 125
the block 11 I have, however, indicated an
aperture 26 which may be utilized for the
passage of the conductors from the trans-
mitter to the base of the instrument. The
rear ends of the springs are shown provided 130

with the usual projections 27 to which the circuit conductors may readily be soldered. Any desired cover may be provided for the open bottom of the base 2.

5 It is thus apparent that I have provided a switch mechanism which overcomes the aforesaid difficulties and which is positive and efficient in operation and is comparatively simple to manufacture. It is also
10 evident that various details may depart from those specifically described, hence I would not desire to be limited in all respects and in all claims thereto.

But having thus described my invention in
15 one practical form what I claim and desire to secure by Letters Patent is:

1. In a telephone desk stand, the combination with a hollow standard and base, of an angular hook switch lever pivoted at the top
20 of the standard and having an arm extending down inside thereof, switch springs in the base of the stand, and a member hinging upon the lower end of the hook lever and engaging the free end of said switch springs
25 adapted by its downward movement to actuate said springs, substantially as described.

2. In a telephone desk stand, the combination with a hollow base, of a hollow standard mounted thereon, switch springs for controlling the circuit of said stand disposed within
30 said base, a hook switch mechanism within said standard upon which the receiver is adapted to be suspended, said mechanism being suitably pivoted near its upper end
35 and containing a toggle joint, said mechanism being adapted to actuate said springs by the lengthening out of the members of the toggle joint when power is applied to said joint by the placing of the receiver upon its
40 hook, substantially as described.

3. In a telephone desk stand, the combination with a hollow base, of a hollow standard mounted thereon, switch springs for controlling the circuit of said stand disposed within
45 said base, a hook switch mechanism within said standard upon which the receiver is adapted to be suspended, said mechanism being suitably pivoted near its upper end and containing a toggle joint, said mechanism being adapted
50 to lengthen out to actuate said springs when power is applied to said joint by placing the receiver upon its hook, said springs being adapted to restore the hook-switch when the receiver is removed from its hook, substantially
55 as described.

4. A hook switch mechanism for telephone desk stands comprising in combination an angular lever pivoted within the stand and having rigid integral members, one extending
60 ing outside for holding the receiver and the other extending downward within the stand, a switch spring in the base of the stand and a link pivotally connected at one end with the lower end of the lever and at the other end
65 with the free end of said spring and adapted

by its longitudinal motion to actuate said spring, substantially as described.

5. In a telephone desk stand, the combination with a hollow base and a tubular standard, of an angular switch-hook pivoted at the
70 top of said standard, one limb of said switch-hook extending outward to hold the receiver, and the other limb extending downward within said standard and adapted to strike against the inner wall of said standard
75 to limit the downward motion of the hook, a pivot carried at the lower end of said hook and engaging a movable arm, switch springs to control the circuits of said desk stand, said movable arm being also pivoted upon the
80 free end of said switch springs and serving by its vertical motion to actuate said springs in the movement of the switch-hook, substantially as described.

6. In a desk stand, the combination with a
85 standard, of an angular hook-switch pivotally supported at the top of the standard with one limb extending downwardly within the hollow portion of the standard, switch springs horizontally mounted in the base of
90 the stand, and a link connected between the free end of said springs and the lower end of the switch-hook, the normal pressure of the springs on the lower end of said link being adapted to hold the switch-hook in its upper
95 position and the weight of the receiver being adapted to hold the switch-hook in its lower position, the lower end of said hook being adapted to abut the inside of the standard to limit the movement of the switch-hook, sub-
100 stantially as described.

7. In a telephone desk stand, the combination with a tubular standard, of a switch-hook supported at the upper end of the tube, the said switch-hook being angular in form
105 and comprising two pieces with a third depending limb secured between them, switch springs in the base of the stand, and a link connecting between the lower end of said depending limb and the free end of the
110 switch springs, whereby the circuit of the springs will be changed by the movement of the switch-hook, substantially as described.

8. In a telephone desk stand, the combination with a tubular standard, of a switch
115 hook supported at the upper end of the tube, the said switch hook being angular in form and comprising two pieces with a third depending limb secured between them, switch springs in the base of the stand, and a link
120 formed of two pieces spread apart at each end, one end being adapted to straddle the lower end of said depending limb and being pivoted thereto, and the other end engaging an insulating member which in turn engages
125 said switch springs, substantially as described.

9. In a telephone desk stand, the combination of a hook switch having a member extending downward within the hollow portion
130