

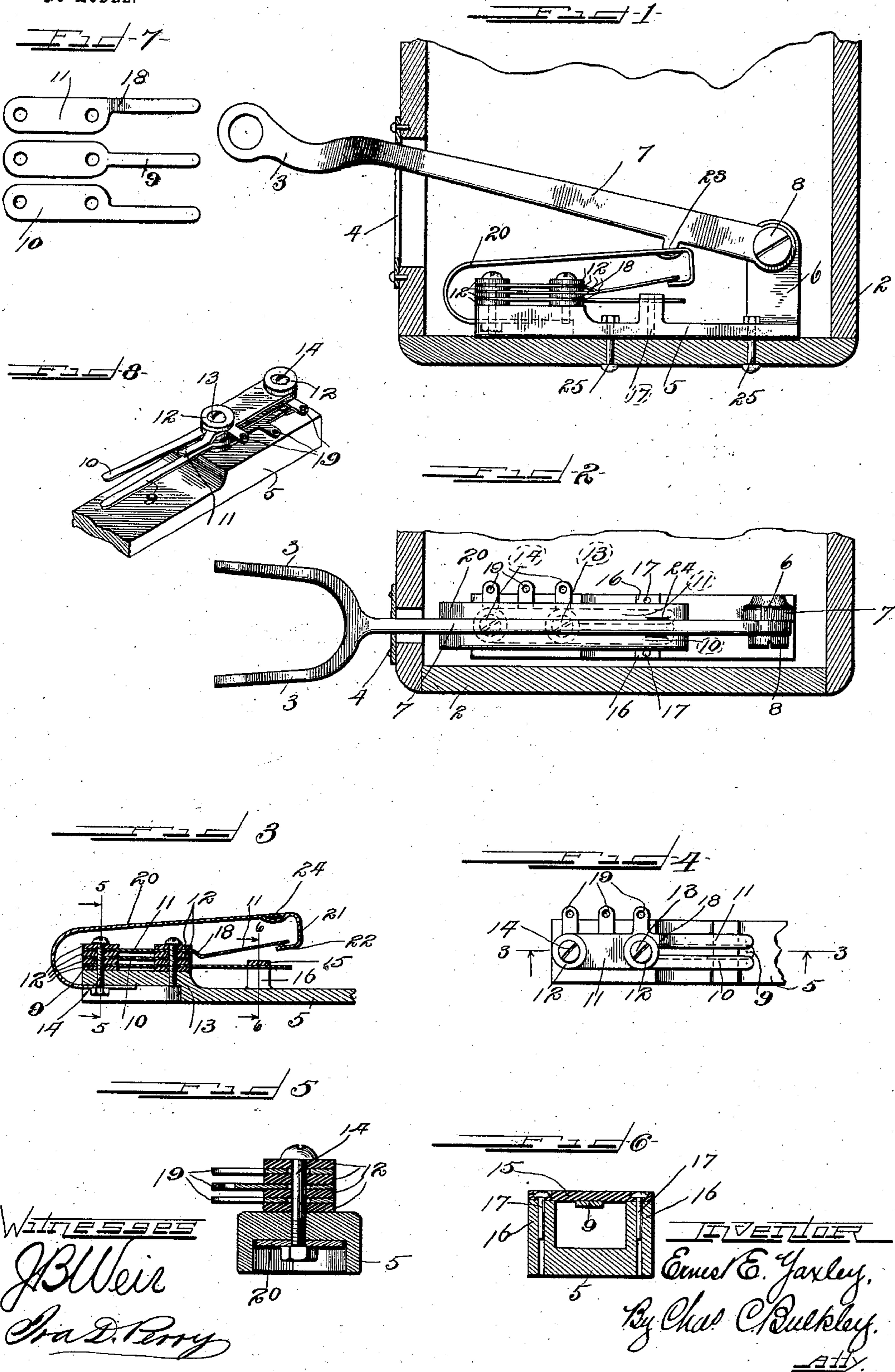
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PATENTED JAN. 19, 1904.

E. E. YAXLEY.
TELEPHONE HOOK SWITCH.

APPLICATION FILED JUNE 12, 1901. RENEWED DEC. 23, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

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TELEPHONE-HOOK SWITCH.

SPECIFICATION forming part of Letters Patent No. 749,977, dated January 19, 1904.

Application filed June 12, 1901. Renewed December 23, 1903. Serial No. 186,413. (No model.)

To all whom it may concern:

Be it known that I, ERNEST E. YAXLEY, 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 Telephone-Hook Switches, of which the following is a specification.

My invention relates to electric switches primarily adapted for use in a telephone-subscriber's instrument or apparatus. In such an instrument the wires of the line-circuit are normally connected through the signaling-bell, so that the subscriber may be called by time cut out, and when the subscriber is talking the wires are connected through the telephone. The switch commonly used for thus changing the circuit is operated by the telephone-hook or forked lever upon which the telephone-receiver is adapted to be hung when the subscriber is through talking, the weight of the receiver being sufficient to depress the lever against its lifting-spring and change the circuits, as stated.

Generally stated, the object of my invention is to provide an efficient and serviceable form of telephone-hook switch.

A special object of my invention is to provide an improved construction and arrangement for relieving the hook-arm from all electrical coöperation with the switch and at the same time to allow the switch to be mechanically operated by the hook-arm.

A further object of my invention is to provide an improved arrangement whereby the spring for lifting the hook-arm may be employed for operating the switch-springs or contact-strips.

It is also an object of my invention to provide a relative arrangement of the parts and a construction tending to secure compactness and insure the proper operation of the switch. As a matter of further and special improvement the arrangement is preferably such that the spring for lifting the hook-arm makes positive contact with the switch-springs when the receiver is on the hook-arm and also when the receiver is removed from said arm.

To the foregoing and other useful ends my

invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of the device. Fig. 2 is a plan view thereof. Fig. 3 is a sectional elevation of the springs on the line 3 3 of Fig. 4. Fig. 4 is a plan view of the same. Fig. 5 is a cross-section on the line 5 5, Fig. 3. Fig. 6 is a cross-section on the line 6 6, Fig. 3. Fig. 7 is a plan view of one of the separate springs, and Fig. 8 is a perspective view of the switch-springs.

In the figures the numeral 2 designates the ordinary box in which the hook-switch is mounted, the forked end 3 thereof, on which the telephone-receiver is adapted to be hung, projecting through a slot in one side of the same, a small cover-plate 4 being placed over the slot for appearance sake and to limit the movement of the hook-arm. The device consists of a base or supporting plate 5, preferably a casting of brass or composition, though any suitable material may be employed, on the rear end of which, and preferably at one side of the center of the same, a standard 6 rises, having the hook-arm 7 pivoted to its upper end, preferably by a shouldered screw 8. The forward end of the plate is raised slightly, and on the flat upper surface of the same the several switch-springs are insulatively mounted with their free ends extending rearwardly to be operated by the hook-lever 7, as hereinafter described.

All of the springs of the switch elements 9, 10, and 11 are of the same width and size at their fixed ends, as shown in Figs. 4, 5, and 7, and are placed one above the other with insulating-washers 12 therebetween and above and below the outer ones, screws 13 and 14 being passed therethrough and threading into the castings to firmly secure them in place and in alinement. The apertures are larger than the screws 13 and 14, so as not to touch the same, and may be further insulated from them by forming the washers to extend into such apertures. Bolts may obviously be used instead of the screws, and the lower spring 9 may be and preferably is narrowed toward its free end (see Fig. 7) and extends rearwardly,

bearing when not prevented by some external source upon the lower face of an insulating-strip 15, supported transversely of the plate 5 above its upper surface upon lugs or projections 16 on either side of the same, the latter being preferably cast with the base, though they may be made separate. Pins 17 or similar fastening means secure the strips 15 to said lugs. The other springs 10 and 11 have their free ends normally lying side by side, but separated upon the upper face of said strip 15; but as their fixed portions are lying above one another this is accomplished by cutting away one side of the free end of said springs, as shown in Fig. 7, the upper spring 11 being cut away on the opposite side from spring 10 and depressed near the fixed portion, as at 18, to cause it to lie in substantially the same plane as the other. Projections 19 from the sides of said spring are provided to solder the circuit-wires to and are staggered or arranged at different points for ease in wiring. The lower surface of said supporting-plate 5 at the forward end is hollowed or cored out to form a recess or depression, as shown in Figs. 1, 3, and 5, in which the end of the lifting-spring 20 is secured by a nut on the end of the screw or bolt 14, the said spring end being slotted for ease in assembling and for purposes of adjustment. The spring is then curved upwardly over the fixed ends of the switch-springs before described and extends rearwardly to a point beyond the free ends of said springs, where it is given a downward bend, as at 21, with its extreme end 22 hooked or bent back, so as to play between the ends of the lower and the two upper springs. Platinum contact-points may be provided on said portion 22 of the lifting-spring to strike against the ends of springs 9, 10, and 11. A lug or protuberance 23 on the lower edge of the lever-arm 7 is adapted to rest and work in a depression 24 in the top of the free end of the lifting-spring 20 to insure its always remaining in proper position and not shifting to one side.

In the raised position of the lever the two upper springs are connected together by the lifting-spring at their free ends, as in Fig. 1, which is the condition for talking, the lower spring having its free end resting against the insulating-strip 15, and consequently out of the circuit, while in the lowest position of the lever-arm, as when the receiver is hung up, the lifting-spring 20 and the lower spring 9 are electrically connected. At such time the upper springs rest upon the insulating-strip and are, therefore, in open circuit. Circuit-wires may be connected with the lifting-spring in any desired way, as by soldering directly to the casting, to washers carried by the bolt 14, or the bolts or screws 25, used to secure the plate in the box, or in any other devised way.

As shown in Fig. 1, the plate is installed merely by securing it in place by the bolts

or screws 25 inserted from the exterior and avoids the more common method of mounting the hook on one part, the switch-springs on another, and the lifting-spring on still another. The described construction results in a device that is convenient to install or take out, efficient and durable in operation, and one that is cheap to manufacture.

When the receiver hook-arm is up, the lifting-spring 20 makes positive contact with the switch-springs or contact-strips 10 and 11, and when the hook-arm is down the lifting-spring then makes positive contact with the switch-spring or contact-strip 9. In this way the free end of the lifting-spring is interposed between the free ends of the switch-springs or contact-strips, and such free end of the lifting-spring is adapted to vibrate, and thereby alternately make and break any circuits which may include the said switch-springs or contact-strips. It will also be seen that the bolt 14 serves to clamp both the switch-springs or contact-pieces and the lifting-spring to the base-plate 5. With the hook-arm thus pivotally connected with one end of the base-plate and with the lifting-spring and the contact-strips or switch-springs clamped upon the other end portion of the base-plate, as shown in the drawings, a compact and simple construction is obtained and also a proper and efficient action of the switch is secured. Whether the hook-arm moves up or down the lifting-spring makes positive contact with either the upper or lower switch-spring and a positive electrical connection is insured.

It is apparent to those skilled in the art that various changes, alterations, and substitutions may be made in the invention and still come within its scope and principle, and I do not, therefore, wish to be limited to the precise details shown and described; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a telephone-hook switch, the combination with a support, of a hook-lever arm pivoted to said support, switch-springs insulatively mounted adjacent said arm, a lifting-spring for said arm having a depression or recess in its upper surface, a lug on said arm entering said depression, said lifting-spring being adapted to engage said switch-springs and operate them.

2. In a telephone-hook switch, the combination with a supporting-plate having a standard thereon, a hook-lever pivoted to said standard, switch-springs insulatively mounted upon said plate, and a leaf lifting-spring upon which said hook-lever bears having its free end interposed between said springs to operate them.

3. In a telephone-hook switch the combination with a supporting-plate having a standard thereon, a hook-lever pivoted to said standard, switch-springs mounted upon said plate beneath the hook with their free ends toward the standard, a leaf lifting-spring secured to

said plate and extending rearwardly over and beyond said springs, the end of said lifting-spring being bent down to engage and operate the switch-springs, and the hook-lever being adapted to bear upon said lift-spring.

4. In a hook-switch, the combination with a supporting-plate, of a standard thereon at one end, a hook-lever pivoted to said standard, a set of switch contact-springs insulatively mounted upon the other end of said supporting-plate with their free ends toward the said standard, a leaf-spring also secured to said front end of the supporting-plate and curved back over said switch-springs and extending beyond them, the extended end being bent downward and backward and interposed between the free ends of said switch-springs to operate them, the said spring having a depression therein adjacent the bent end, and a lug on said hook-lever bearing in said depression.

5. In a hook-switch, the combination with a supporting-plate, of a standard thereon at one end, a hook-lever pivoted to said standard, the other end of said plate having a raised portion with a recess in its lower or bottom face, a plurality of switch-springs insulatively mounted on said raised portion, with their free ends extending toward the standard, a leaf lifting-spring secured at one end to the plate within the recess in its lower face and extending upwardly and rearwardly over and beyond the said switch-springs, said lifting-spring having its free end bent downwardly and engaging the free ends of said switch-springs to operate them and complete electric circuits therethrough.

6. In a telephone-hook switch, the combination with a supporting-plate, of a standard thereon, a lever-arm pivoted to said standard, three superimposed switch-springs with insulating-washers therebetween insulatively secured to said plate, an insulating-strip mounted on said plate near the free ends of said springs, the lower spring being beneath the said strip and the other springs having their free ends side by side on top of said strip, a lifting-spring having its free end interposed between the ends of the upper and lower switch-springs, said lifting-spring being adapted to hold said lever-arm normally up.

7. In a telephone-hook switch, the combination with a supporting-plate, and a standard thereon, and a lever-arm pivoted to said standard, three switch-springs with insulating-washers therebetween insulatively mounted on said plate, an insulating-strip mounted on said plate near the free ends of said springs, the lower switch-springs extending beneath the said strip, and the other switch-springs having their free ends arranged to lie side by side on top of said strip, a lifting-spring against which the lever-arm bears, said lifting-spring having its free end interposed be-

tween the upper and the lower switch-springs to operate them and change the circuits there-through in the operation of the telephone-hook.

8. In a telephone-hook switch, the combination with a supporting-plate, a standard at one end of said plate, a lever-arm pivoted to said standard and forked at its free end, the other end of said plate having a raised portion recessed in its lower face, lugs intermediate said raised portion and standard on the upper face of said plate, switch-springs insulatively secured to said raised portion with their free ends extending toward the standard, an insulating-strip secured to said lugs and lying between the upper and lower switch-springs, a leaf-spring having one end secured by a slot-and-screw connection in the recess in said raised portion said leaf-spring being curved upwardly and rearwardly over the said switch-springs and having a depression in its upper surface and its free end bent downwardly and back between the ends of said switch-springs, and a lug on the lower edge of said lever-arm bearing in said depression, whereby when the lever is operated the leaf-spring is brought into contact with the switch-springs, to change the circuits therethrough.

9. In a telephone-hook switch, the combination of a pivoted lever-arm, a plurality of switch-springs or contact-strips, and a lifting-spring having its free end interposed between the free ends of said switch-springs or contact-strips, said lifting-spring being adapted and arranged to hold said lever-arm normally up.

10. In a telephone-hook switch, the combination of a pivoted lever-arm, a pair of upper switch-springs or contact-strips, a lower switch-spring or contact-strip, and a lifting-spring having its free end interposed between the free ends of the said upper and lower switch-springs or contact-strips, said lifting-spring being adapted and arranged to hold said lever-arm normally up.

11. In a telephone-hook switch, the combination of a lifting-spring and a plurality of switch-springs or contact-strips, a base-plate, a fastening device extending through the switch-springs and the lifting-spring, so as to clamp the same upon said base-plate, a swinging lever-arm having a pivotal connection with the said base-plate, the free ends of said switch-springs and also the free end of the lifting-spring extending in the direction of the pivotal connection between the lever-arm and the base-plate, said lifting-spring being adapted and arranged to hold said lever-arm normally up, and the free end of said lifting-spring being arranged to engage the free ends of said switch-springs or contact-strips.

12. In a telephone-hook switch, the combination of a swinging lever-arm, a base-plate having a pivotal connection with said lever-arm, a plurality of switch-springs or contact-strips

with interposed insulation, fastening devices
for securing said switch-springs and inter-
posed insulation upon the upper surface of
said base-plate, a lifting-spring having one
5 end secured to the under surface of said base-
plate, said lifting-spring extending over the
switch-springs, and the free end of the lifting-
spring engaging the under side of the said le-

ver-arm and also the free ends of said switch-
springs.

Signed by me at Chicago, Cook county, Illi-
nois, this 10th day of June, 1901.

ERNEST E. YAXLEY.

Witnesses:

OLIVE SWANSON,
CHAS. C. BUCKLEY.