

UNITED STATES PATENT OFFICE.

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HOOK-SWITCH.

No. 846,590.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES T. MASON, a citizen of the United States, residing at Sumter, county of Sumter, and State of South Carolina, have invented certain new and useful Improvements in Hook-Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to telephone switching apparatus, and more particularly to receiver hook-switches for making and changing electrical connections at subscriber's substations, and has for its object to provide a hook-switch constructed as a unitary apparatus in which the contact-springs cooperate with actuating-pins to produce a positive increased or intensified contact or engagement beyond that of the natural trend of such springs, and thereby to effect more efficient connections between said springs in both the signaling and talking positions of the switch.

In the accompanying drawings, Figure 1 is a side elevation of the convenient arrangement of the switch, showing the same secured in position. Fig. 2 is a corresponding view showing the switch with the receiver removed. Fig. 3 is a similar view of the opposite side of the switch.

Referring to the drawings, the hook proper *a* fits in the jaws *b'* of the hook-rocker *b* and is secured therein by a set-screw *d*, the loosening of which allows the ready removal of the hook *a* from the rocker *b* for convenience in assembling and packing. Integral with the rocker *b* is a shaft *n*, which has a bearing in the frame *c* and is secured in position by a suitable retaining-nut *m*. The frame *c* is conveniently formed as a metal stamping provided with lateral flanges and is secured to the containing-box by screws *f f'*, extending through the escutcheon-plate *e*. The hook is raised by means of a spring *j*, which is restrained at one end by pins or screws *k k'*, set into the frame *c*, the other end hooking under a small roller *e'*, which has a bearing on the projecting end of the set-screw *d*.

Mounted on the frame *c* are the circuit-changing springs *h, h', h'',* and *h'''*, which are separated and insulated from each other by strips of vulcanite or similar material *p*, the whole being secured to the frame by ma-

chine-screws *i i'*. These circuit-changing springs include two relatively short springs *h''* and *h'''*, having contact-points on their inner faces, a single relatively short spring *h* likewise having a contact on its inner face and a relatively long intermediate spring *h'*. The intermediate spring *h'* has a normal trend toward the springs *h''* and *h'''*, and the free ends of all of the springs extend toward and lie adjacent the pivot of the switch-hook.

On the rocker *b* of the switch-hook are located three insulating-rollers *g g' g''*, mounted on projecting pins or screws *o o' o''*, which pins cooperate with and control the engagement of the springs to establish signaling and talking connections for the respective positions of the hook. These pins are conveniently arranged in triangular form about the pivot of the hook, so that pin *g* engages spring *h*, pin *g''* engages spring *h'''*, and pin *g'* is adapted to engage the end of spring *h'* when the hook is in its down position. The relation of the several pins and the springs is such that when the receiver is on the hook the end of spring *h'* is forced upwardly by the pin *g'* and spring *h* is forced downwardly by pin *g*, so that the engagement between said springs is heavy and positive. Pin *g''* is sufficiently retracted to permit springs *h''* and *h'''* to separate. This establishes a signaling connection with the subscriber's instrument. When the receiver is removed from the hook, the latter automatically moves upward under the tension of spring *j*, thereby causing pin *g'* to move away from spring *h* and spring *g''* to force spring *h'''* into positive contact with spring *h''* and the latter into positive contact with spring *h'*. The normal trend of spring *h'* toward springs *h''* and *h'''* adds to the pressure imposed upon the contacts and establishes an efficient connection for talking. As the hook moves upward the pin *g* tends to move away from spring *h*, which, because of its normal trend toward said pin *g*, moves out of contact with spring *h'*, thereby breaking the signaling connection.

It will be noted that the operation of the switch differs from switches as heretofore constructed in that the actuating-pins in the present construction cause the appropriate springs to engage with a relatively heavy contact. Thus for making the back or ringer contact-spring *h'* is brought up firmly against

spring *h* by the couple produced by the rotatory movement of the pins *g* and *g'* as the hook moves downward. Similarly the normal trend of spring *h*, combined with the positive movement of pin *g''*, causes a like firm engagement between the springs *h'*, *h''*, and *h'''*.

While the circuit-switch as heretofore described is particularly adapted to the ordinary form of subscribers' instrument, it is to be noted that it may be modified for use in connection with a bridging instrument without departing from the invention by merely omitting spring *h* and roller *g* and retaining the relative arrangement of the other springs and their cooperating pins. It will also be noted that it is not essential that the specific arrangement of the springs on the frame *c* be followed, as the invention contemplates the disposition of the springs relatively to hook in any manner, provided the free ends of the springs lie in general proximity to the pivot, and the pins on the rocker are so disposed relatively to the springs as to effect the object sought.

What I claim is—

1. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulating circuit-changing springs each and all having a free end lying adjacent the pivot, and insulated pins projecting from the hook on opposite sides of the pivot and alternately cooperating with said springs.

2. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulating circuit-changing springs having their free ends adjacent the pivot, and pins disposed longitudinally of the hook and on opposite sides of the pivot to cooperate alternately with said springs.

3. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulating circuit-changing springs having their free ends adjacent the pivot, and pins projecting from the hook and arranged in substantially triangular relation about the hook-pivot to cooperate with said springs to establish signaling and talking connections respectively.

4. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulating circuit-changing springs including one member longer than the others and having their free ends adjacent the pivot, pins on the hook disposed on opposite sides of the pivot adapted to engage the short and long springs alternately in the respective positions of the hook.

5. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulating circuit-changing springs including an intermediate member longer than the others, said springs having their free ends adjacent the pivot, and pins on the hook disposed in triangular relation about the

pivot to cooperate with said springs to establish signaling and talking connections respectively.

6. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulated circuit-changing springs including two short springs and a relatively long spring, the latter having a normal trend toward the short springs, all of said springs having their free ends adjacent the hook-pivot, and pins on the hook on opposite sides of the pivot adapted to engage the outer short spring and the long spring alternately in the respective positions of the hook.

7. In a telephone switching apparatus, the combination of a pivoted switch-hook, insulated circuit-changing springs including two short springs, a single short spring, and a relatively long intermediate spring, the free ends of all of said springs lying adjacent the pivot, and pins on the hook disposed in triangular relation about the pivot to cooperate with the outer short springs and the intermediate spring to establish signaling and talking connections respectively.

8. In a telephone switching apparatus, the combination of a frame, a switch-hook pivoted thereto, insulated circuit-changing springs mounted on said frame and each and all having a free end extending toward the pivot, and insulated pins projecting from the hook and lying on opposite sides of the pivot and alternately cooperating with said springs.

9. In a telephone switching apparatus, the combination of a frame, a switch-hook pivoted thereto, insulated circuit-changing springs mounted on said frame and having their free ends extending toward the pivot, said springs including two short springs and a relatively long spring, and pins projecting from said hook and lying on opposite sides of the pivot to alternately force said short springs into positive contact with each other and with the long spring and relieve said contact in the respective positions of the hook.

10. In a telephone switching apparatus, the combination of a frame, a switch-hook pivoted thereto, insulated circuit-changing springs mounted on said frame and having their free ends extending toward the pivot, said springs including two short springs, a single short spring and an intermediate long spring, and three pins on said hook arranged in triangular form about the pivot and cooperating with the appropriate springs to cause them to positively engage for signaling and talking connections in the alternate positions of the hook.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES T. MASON.

Witnesses:

H. R. VANTWENTER,
E. M. HALL.