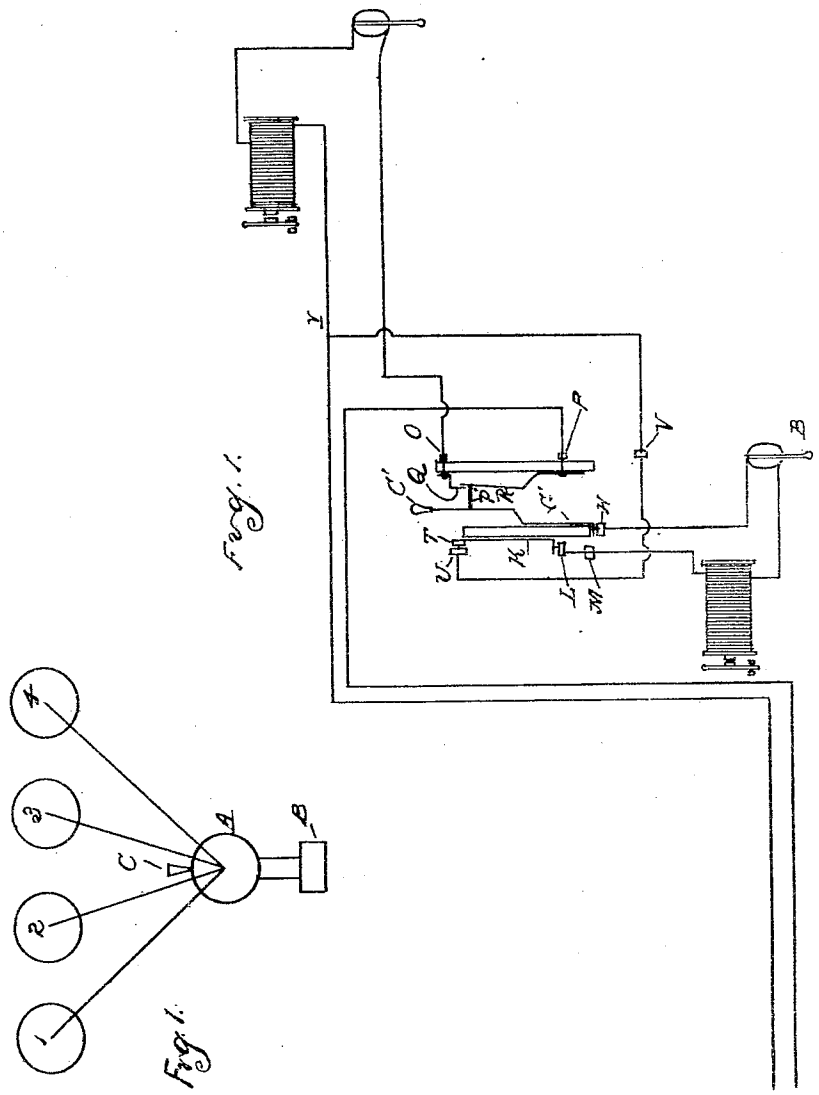
No. 864,694. PATENTED AUG. 27, 1907.

J. J. ROSS.

ELECTRIC SWITCH.

APPLICATION FILED APR. 19, 1905.

3 SHEETS—SHEET 1.



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James J. Ross
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Witnesses
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Geo. H. Graves

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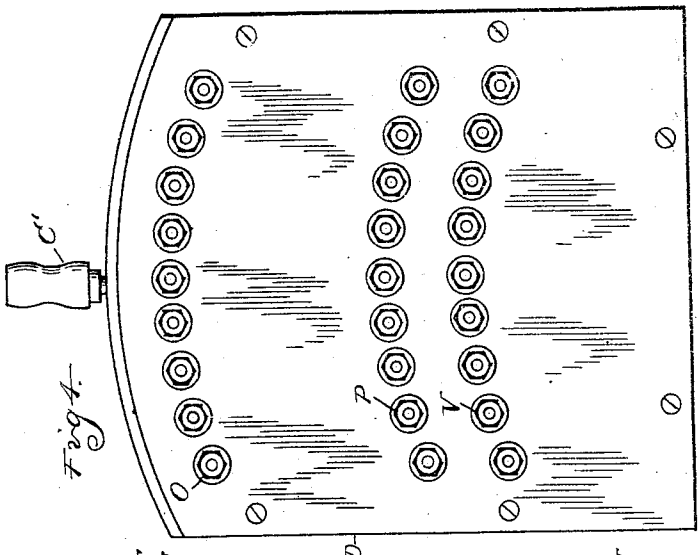


Fig. 4.

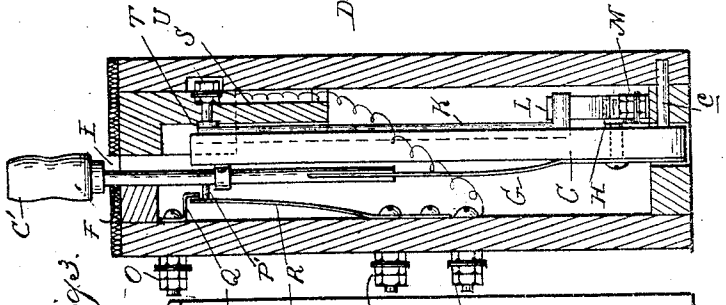


Fig. 3.

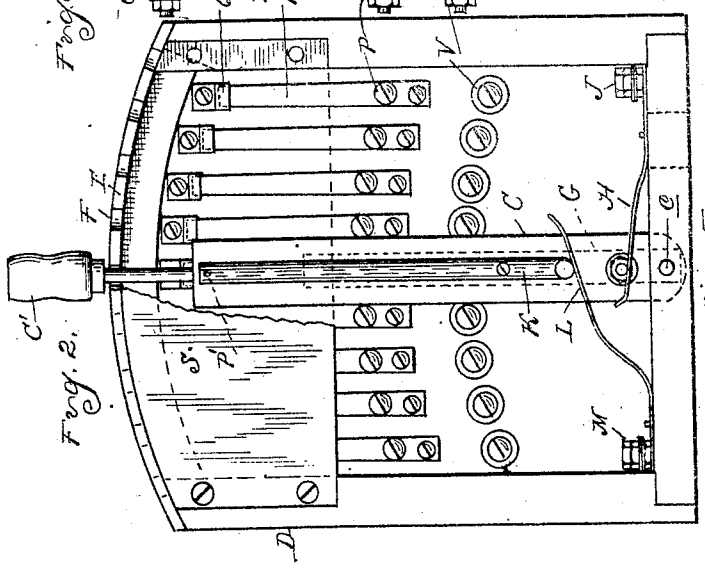


Fig. 2.

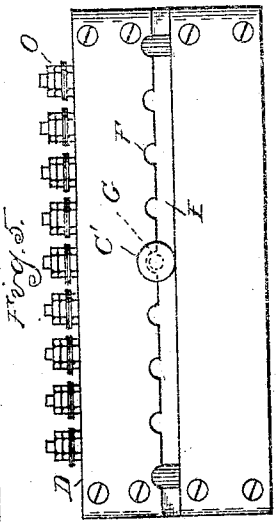


Fig. 5.

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3 SHEETS—SHEET 3.

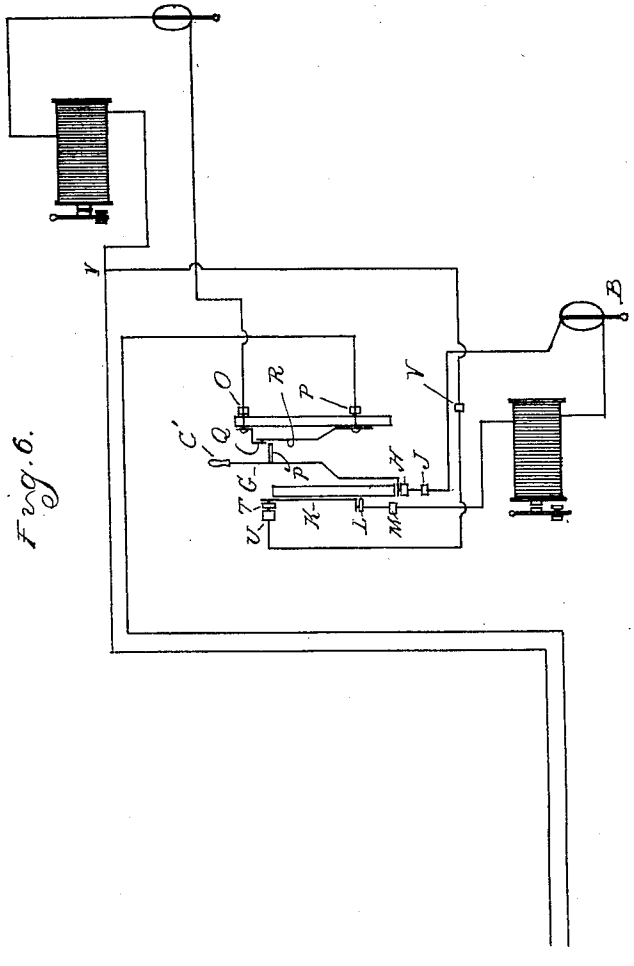


Fig. 6.

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UNITED STATES PATENT OFFICE.

JAMES J. ROSS, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-THIRD TO EDWARD A. EVERETT, OF DETROIT, MICHIGAN

ELECTRIC SWITCH.

No. 864,894. Specification of Letters Patent. Patented Aug. 27, 1907

Application filed April 19, 1905. Serial No. 256,418.

To all whom it may concern:

Be it known that I, JAMES J. ROSS, residing at Detroit, in the county of Wayne and State of Michigan, a citizen of the United States, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in switches for electric circuits, as will be more fully hereinafter described and particularly pointed out in the claims.

My invention consists in means for cutting in a central or working set of telegraph or other instruments with any one of a series of sets of instruments in a telegraph or other office without interrupting the circuit, thus eliminating sparking. By this means, the operator at said central key can receive messages coming through any one of the various lines in circuit with the office.

The invention is particularly designed for use with a typewriter, so that the operator can write out the messages coming over any one of said lines without moving the typewriter to a different instrument for each line.

In the drawings, Figure 1 is a diagrammatic view of the system; Fig. 2 is a front elevation of the box with the cover removed; Fig. 3 is a vertical cross-sectional view through the box, showing the levers and contacts in elevation; Fig. 4 is a rear elevation of the box; Fig. 5 is a top elevation of the box; Figs. 6 and 7 are diagrammatic views of the switch box and circuits.

As shown in Fig. 1,—1, 2, 3 and 4 represent several instruments in a telegraph office. A represents the switch box and B the central instrument or "key." By means of the lever C the operator can receive at B the message directed to any one of the instruments 1, 2, 3 or 4, as will be more fully hereinafter described. D represents the box proper having a slot E in its top for the passage of the metal contact piece G and the notches F to receive and retain it in any desired position. The metal contact piece G carries the handle member C′ at its outer end and is mounted on the back of the lever C, which is preferably of wood or other sufficiently insulating material. At its inner end G engages the spring contact H, which connects with the lower terminal post J in the lower end of the box, as clearly shown in Figs. 2 and 3. Upon the front side of the lever C is the metal bar K having its lower end engaging the spring arm L connected to the lower terminal post M.

I have shown in Fig. 2 the lever C pivoted on the pin *c* in the lower end of the box and the lower end of the contact piece G, preferably carried forward and through the lever C to make my connections. O, V and P respectively represent an upper, lower and intermediate series of binding posts on the back of the box, the upper series O being connected to the U-shaped contact pieces Q rigidly attached to the inside of the back of the box, and the intermediate series P being connected to the spring arm R, attached to the inside of the back of the box. The free ends of the spring arms R normally contact with the downwardly projecting free ends of the pieces Q, as clearly shown in Fig. 2. The notches F are radially alined with the free ends of the spring arms R, so that when the contact piece G is resting in one of the notches, the pin P′ on the back of the contact piece will engage the corresponding spring arm R and force the same out of contact with its contact piece Q. S represents a plate forming a part of the front wall of the box and having a series of contact plates or disks T corresponding in number to the series of contacts Q and opposite thereto. These plates or disks are connected through the plate S to form the branch terminals U which are connected to the line wires of the circuits at *v* through the series of binder posts V.

It will be readily understood by those skilled in the art that my switch box may be employed with other arrangements of wiring and I therefore do not wish to limit myself to the specific arrangement shown.

Each line instrument in the office has one wire of its circuit connected to one of the terminals O and the circuit goes through the contact members Q and R and a line wire connected to the corresponding terminal P.

The contact member G is made yielding, so that it may be forced towards the lever to pass from one notch to another and the tension of the yielding part will be sufficient to overcome the tension of the spring arm R and drop the contact piece G into any notch desired.

By following the circuits through the diagrams shown in Figs. 6 and 7, it will be seen that when the lever handle is not in one of the notches, the line instruments in the office are each in a closed circuit and will operate as usual and the central instrument connected to the terminals J and M is cut out. When it is desired to operate the central instrument to receive a message directed to one of the line instruments, the operator simply shifts the lever handle to the notch representing that instrument, and the pin P′ will break the circuit and cut out that instrument, at the same time making the circuit through central instrument, that is the circuit will be through the terminal U, the contact piece K, the spring arm L, the terminal M, thence through the central instrument to the terminal J, the spring arm H, the contact piece G, the pin P′, the spring arm R, the terminal P and through the line circuit. The operator can thus at will cut in the central instrument on any line in the office, and in so doing may cut out the corresponding line instrument or leave it in according as the binder post V is connected to the line wire at *v* or to the post O as above described. Neither of these

advantages has been secured by any switch yet known, so far as I am aware, and both are of inestimable advantage in telegraph, telephone or other electric circuits. I therefore do not wish to limit myself to any one class of circuits.

What I claim as my invention is;—

1. In a switch for electric circuits, the combination with a plurality of closed circuits, of an operating member, means carried by said member for cutting out a portion of one of said circuits and cutting in a connection having terminals carried by said means, and means for moving said member from one to another of said circuits free from all intermediate circuits.

2. In a switch for electric circuits, the combination with a plurality of closed circuits and a normally open circuit, of an operating member, means carried by said member for cutting out a portion of one of said closed circuits and cutting in said normally open circuit, and means for moving said member from one to another of said closed circuits free from all intermediate circuits.

3. In a switch for electric circuits, the combination with a plurality of normally closed circuits and a normally open circuit, of an operating member, means carried by said member for cutting in said normally open circuit into one of said normally closed circuits, and means for moving said member from one to another of said closed circuits free from all intermediate circuits.

4. In a switch for telegraph circuits, the combination with a plurality of normally closed circuits, an instrument in each of said closed circuits, a normally open circuit and an instrument in said open circuit, of an operating member, means carried by said operating member for cutting out the instrument from one of said normally closed circuits and cutting in the instrument included in said normally open circuit, and means for moving said member from one to another of said closed circuits free from all intermediate circuits.

5. In a switch box for electric circuits, the combination with a plurality of closed circuits passing through said box, a normally open branch connection on each of said circuits a terminal for each branch circuit carried by said box, a member carried by the box, means for moving said member from one to another of said closed circuits free from all intermediate circuits, an independent circuit, and terminals therefor carried by said member and movable therewith to contact respectively with any one of said closed circuits and the branch terminal thereof, for the purpose described.

6. In an electric switch, the combination with a plurality of normally-closed circuits, and a plurality of contacts, each connected to one line of said circuits respectively, of a movable member, a normally-open independent circuit, a terminal therefor carried by said member, and being adapted to engage said contacts, a second terminal for said independent circuit yieldingly carried by said movable member for permitting a path of movement of said yielding terminal free from said closed circuits, and permitting contact with any one of said circuits when desired, for the purpose described.

7. In an electric switch, the combination with a plurality of normally-closed circuits and a movable contact in each of said circuits for breaking the same, of a movable member, a normally-open circuit, a terminal therefor in operative relation to each of said closed circuits, a second terminal for said open circuit adjustably mounted on said movable member and adapted to close said open circuit through a portion of any one of said closed circuits by engaging the movable contact therein, for the purpose described.

8. In an electric switch, the combination with a plurality of normally-closed circuits and a movable contact in each of said circuits for breaking the same, of a movable member, a normally-open circuit, a terminal therefor for connection with each of said closed circuits, a second terminal for said open circuit adjustably mounted upon said movable member and adapted to close said open circuit through a portion of any one of said closed circuits, and subsequently break said closed circuit through said movable contact, for the purpose described.

9. In a switch for electric circuits, the combination with a casing, of an arm pivoted therein, a rigid arm and a spring arm carried by said first-mentioned arm and forming terminals of a normally-open electric circuit, a plurality of pairs of contacts on said casing, each pair comprising coöperating rigid and yielding members, a pin on said spring arm arranged for adjustment to separate the members of any one of said pairs of contacts, and a plurality of single contacts on said casing arranged for contact with said rigid arm, for the purpose described.

10. In a switch box for electric circuits, the combination with a casing having a slot therein, and a notch in one side of said slot, of a lever pivoted in said box, a normally open circuit, terminals therefor carried by said lever, one of said terminals being resiliently connected to said lever at one end, and having its free end projecting through said slot, the resilience of said connection tending to move said terminal towards said notch, a normally closed circuit passing through said casing, coöperating spring contacts in said circuit adjacent to said notch, a branch connection for said normally closed circuit, a terminal for said branch connection on said casing adjacent to said notch, whereby said resilient terminal will engage one of said spring contacts when in said notch and the other terminal of said normally open circuit will engage said branch terminal for the purpose described.

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

JAMES J. ROSS.

Witnesses:
JAS. P. BARRY,
EDWARD D. AULT.