

1,064,422.

Patented June 10, 1913.

2 SHEETS—SHEET 1.

Fig. 1a.

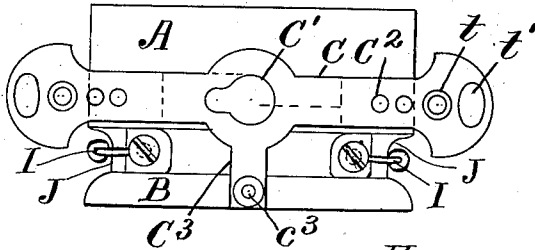


Fig. 1.

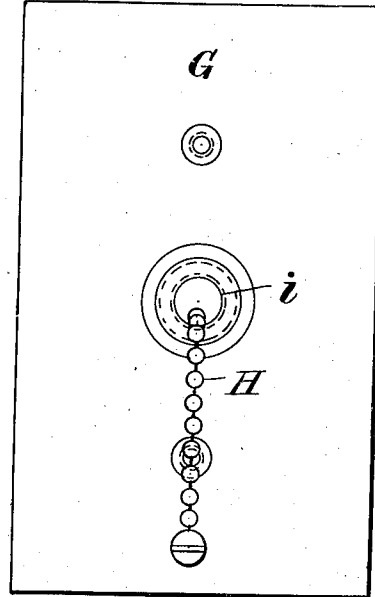


Fig. 2.

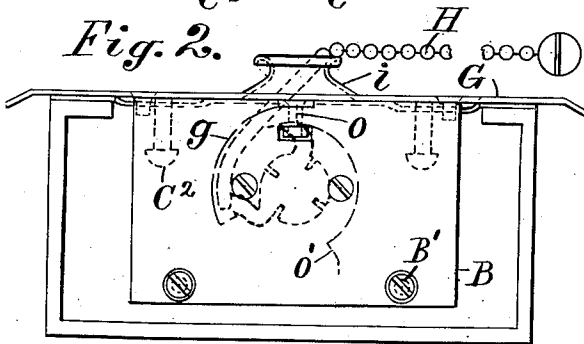


Fig. 3.

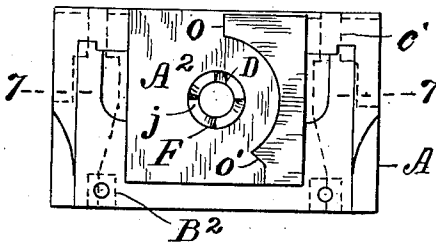


Fig. 6.

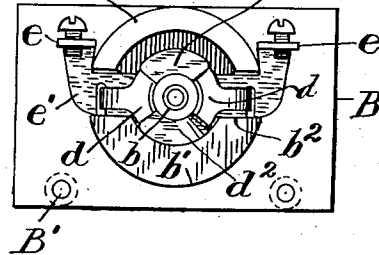


Fig. 4.

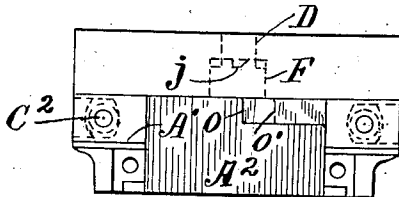


Fig. 7.

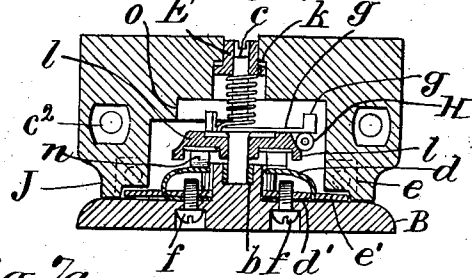


Fig. 5.

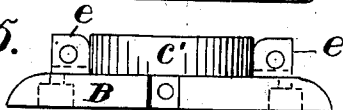
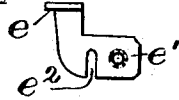


Fig. 7a.



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2 SHEETS—SHEET 2.



Fig. 12.

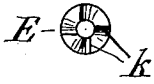


Fig. 13.



Fig. 8.

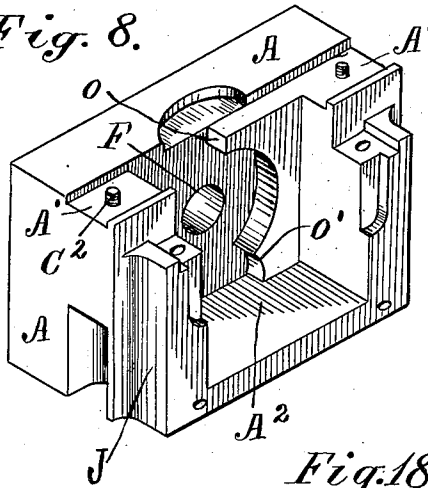


Fig. 14.



Fig. 15.

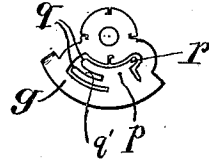


Fig. 18.

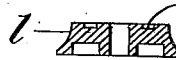


Fig. 9.

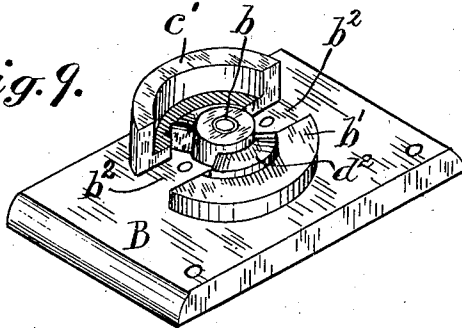
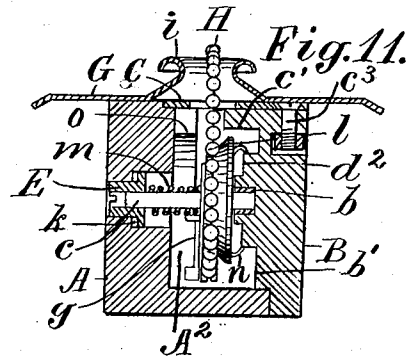
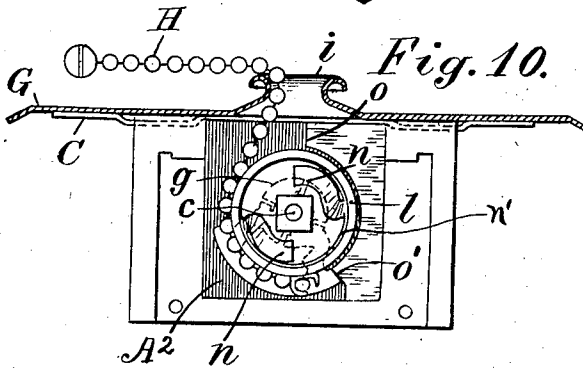
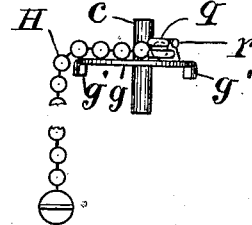


Fig. 16.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDERIC BARR, OF NEW YORK, N. Y.

PULL-SWITCH FOR WALL-BOXES.

1,064,422.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed January 17, 1911. Serial No. 603,079.

To all whom it may concern:

Be it known that I, FREDERIC BARR, a citizen of the United States, residing at 362 Livingston street, borough of Brooklyn, city of New York, State of New York, have invented certain new and useful Improvements in Pull-Switches for Wall-Boxes, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to electrical apparatus and particularly to wall-box pull-switches and involves a special construction for the insulating body of the switch and details of the mechanism.

It contemplates the application of the principle of the pull-switch to the wall-box type, doing away entirely with the push-button operation in common use in wall-switches.

To facilitate the application of the spindle to the insulating body, the body in the present invention is made with a chamber opening upon one edge of the body next the face-plate of the wall-box, and the body is made with a detachable cover upon one side of the chamber, the main block of the switch and such cover each being provided with a bearing for one end of the rocker-segment-spindle.

The invention includes various other details of construction, which will be understood by reference to the annexed drawing, in which—

Figure 1 is a front view of a wall-box-switch embodying my invention; Fig. 1^a is a plan of the switch ready for application to the wall-box; Fig. 2 is an elevation of the switch and the cover-plate in the outline of a wall-box; Fig. 3 shows the inner side of the body-block for the switch with the cover removed; Fig. 4 is a plan of such body-block, and Fig. 5 a plan or edge view of the cover; Fig. 6 shows the inner side of the cover; Fig. 7 a section of the switch, where cross hatched, on line 7—7 in Fig. 3; Fig. 7^a is a plan of one of the binding-posts; Fig. 8 is a perspective view of the body-block; Fig. 9 is a perspective view of the insulating switch-cover; Fig. 10 is an elevation of the switch with the cover removed; Fig. 11 is a vertical cross section of the switch; Fig. 12 is a plan

and Fig. 13 an elevation of the rotatable spindle-bearing with ratchet-teeth thereon; Fig. 14 shows the under side of the rocker segment with the parts bent into their final position to engage a ball of the chain; Fig. 15 is a plan of the rocker-segment with the ear having two tongues to engage the ball-chain cut therefrom, but not bent into their final position; Fig. 16 is an edge view of the rocker-segment showing the chain engaged with the tongue; Fig. 17 is a perspective view of the insulating disk with metal ratchet-plate; and Fig. 18 is a cross section of the insulating disk.

The body-block A and the cover B are designed to be made of porcelain or other suitable material. The cover is secured to the body by screws B' with nuts inserted in recesses B² upon the body-block, (see Fig. 3). The top of the body-block is provided with recess A' (see Fig. 8), to receive a bridge C having an aperture C' in the center for the passage of a pull-chain. The bridge is secured to the body-block by screws C² inserted in the body-block.

The body-block has a rectangular chamber A² open upon one edge (shown at the top in Fig. 3), and a wall at one side of the chamber, and the opposite side formed by the cover B. The cover has a bearing b for one end of the spindle c, and switch-contacts d' and binding-posts e are mounted on the cover by feet d' and e' respectively which are intersected by screws f extended through the cover (see Fig. 7).

The binding-posts are at the upper edges of the cover so as to be readily accessible. The feet of the binding-posts are made to hold the switch-contacts firmly in place by making the contacts with reflexed feet, as shown in Fig. 7, and forming notches e² in the edges of the feet e' upon the binding-posts, to pass over the elbows of the spring-contacts d, thus bringing the feet of the binding-posts on top of the feet d' so that the screws f press them firmly thereon and hold the switch-contacts in place while maintaining an electrical contact therewith. A single screw f thus holds the switch-contact and its connected binding-posts in their operative positions.

The feet d' and e' are held securely in

position upon the cover B by a circular ridge b' and a segmental flange c' at opposite sides of the feet, notches b^2 being formed between the ridge b' and flange c' to receive the feet snugly. The switch-fixtures lie within the chamber A^2 with the spindle c transverse to the cover and the opposite wall of the chamber, and the rocker-segment g which is attached to the spindle is oscillated by the chain H which extends therefrom through the open side of the chamber and through a projecting mouth i upon the face-plate G of the wall-box. Opposite the bearing b in the cover is a cylindrical seat D in the body-block with an enlarged socket F upon its inner side having ratchet-teeth j in the bottom. A spindle-bearing E is fitted movably to the seat D and has radial arms or ratchet-teeth k to engage the teeth in the socket F. An insulating-disk l is fitted movably to the spindle below the rocker-segment and is provided upon its under side with two spring-leaves n attached to a circular plate n' , so that when the leaves touch the contacts d the circuit may be connected through such contacts.

The usual insulating sections or seats d^2 are formed upon the cover between the switch-contacts d to support the spring-leaves n when not resting upon the contacts d . A spiral-spring m is applied to the spindle between the rocker-segment g and the bearing E for retracting the rocker-segment after each pull of the chain. One end of the spring is engaged, as shown in Fig. 7, with a flange upon the end of the bearing E, and the other end is extended to the edge of the rocker-segment to press thereon. The spiral tension of the spring operates to oscillate the segment, while its longitudinal tension operates to press the bearing E outwardly and to press the leaf-springs n upon the contacts d or seats d^2 . The rocker-segment is shown provided at its opposite ends with lugs g' and the wall of the chamber upon the body-block is provided with two stops o and o' , with which the lugs g' contact to regulate the oscillating movement of the rocker-segment.

A special provision is made for attaching the end of the ball-chain H to the rocker-segment g , by means of a sheet-metal ear p punched from an aperture p' in the segment near one end of the same, as shown in Fig. 15, and bent at right angles to the plane of the segment, as shown in Fig. 14, and provided with two tongues q reflexed backwardly toward such end of the segment and separated by a slot q' . The end ball upon the chain H is readily inserted between the two tongues by the passage between the two tongues of the neck between the balls. When thus engaged with the

tongues, the ball is held in place by a prong r formed upon the ear p and bent over the rear side of the ball to hold it between the tongues. The rocker-segment has four ratchet-teeth s arranged to engage ratchet-teeth upon the insulating-disk l , and the lugs g' and the stops o, o' are so arranged, as shown in Fig. 10, as to permit a movement of the rocker-segment through an arc of about 90 degrees, so as to shift the spring-leaves n , as is usual, alternately over the contacts d or the seats d^2 .

The bridge C upon the switch is the means for attaching it to a wall-box, by screws passed through holes t or t' in the ends of the bridge, and the bridge is provided also with an arm C^3 which is secured by a screw c^3 to the edge of the cover opposite that which is held by the screws B'. The bridge differs from those used upon ordinary wall-box switches, in having the central aperture C' which permits the passage of the chain from the open side of the chamber A^2 into a mouth i upon the usual face-plate G. The outer end of the mouth is curled or flanged over so as to form a curved guide for the chain in whichever direction it may be pulled.

Fig. 2 shows the rocker-segment in dotted lines, and the chain pulled to turn the segment against the stop o ; while Fig. 10 shows the rocker-segment retracted by the spring m into contact with the stop o' . The chain in its movements is guarded from any contact with the circuit-making springs d or n by the segmental flange c' , which is extended from the cover to the nearest edge of the insulating-disk l , as shown in Fig. 11. The outer edge of the disk is beveled or grooved to incline the chain toward the flat side of the rocker-segment g , and all the movements of the chain are carried over the edge of the guard-flange c' , which thus holds it close to the rocker-segment and prevents it effectively from touching the springs which carry the electric current. To lead the circuit terminals or conductors I to the binding-posts, from the inlets of the wall-box, a groove J is made in the edge of the body at each end of the cover B, terminating close to the clamp-screws on the binding-posts. The bridge C and its arm C^3 are both fitted snugly into the notches A', in the outer edge of the body and cover, and their fit in such recesses holds all the parts firmly from displacement.

Two constructions for the insulating disk are shown, in one of which, shown in Fig. 18, the ratchet-teeth u are formed directly in the substance of the insulating disk to engage the teeth s upon the rocker-segment. The other construction is shown in Fig. 17 where a shallow recess v is formed in the upper side of the insulating disk of suffi-

cient depth to admit a sheet-metal plate *w* with ratchet-teeth *v'* bent thereon into corresponding notches beneath the plate in the bottom of the recess. The construction permits mounting a pull-switch in a wall-box, and furnishes a compact and inexpensive device which is efficient and durable in use.

The insulating base will be seen to be composed of two parts in the form of a rectangular parallelepiped. These two parts are held together by the screws *B'* and also by the bridge piece *C* which is secured to the body *A* by the screws *C²* and is also secured to the side plate *B* by the bolt *c³*. The two parts of the base may be separated by loosening the screws and bolt referred to. The face plate *G* is detachably secured to the base by being screwed to the bridge piece *C*. The switch is operated by pulling on the chain *H* which extends through the guide *i*. When the chain is pulled the segment *g* is rotated and by means of this ratchet connection with the insulating disk *l* rotates the disk and the contact plate *n'* with the contact arms *n, n*. When the chain is released the spring *m* returns the segment *g* but the disk *l* and contact plate do not rotate backward. Repeated pulls on the chain *H* oscillate the segment *g* and thus rotate the disk *l* and the contact member step by step making and breaking the circuit across the switch contacts *d, d*. The circuit terminals *e, e* being carried by the insulating side plate *B* the parts can be readily reached for assembling, adjustment and repair as the same may be necessary.

Having thus set forth the nature of the invention what is claimed herein is:

1. In a pull switch, an insulating base, a spindle supported therein, switch contacts on opposite sides of said spindle, circuit terminals secured to said contacts, an oscillating lever on said spindle, an operating chain secured to said lever, a guard flange projecting from said base around the outer edges of said contacts between said circuit terminals, and a front plate having a guide passage for said chain.

2. In a pull switch, an insulating base, a spindle supported thereby, switch contacts carried by said base, an oscillating lever on said spindle, an operating chain secured to said lever, a bridge plate secured to said base, and a box secured to said bridge plate and surrounding and inclosing said base and having a guide passage for the chain at the front.

3. In a pull-switch having switch-fixtures with a spindle and seats with bearings for the said spindle, and a rocker-segment and chain for actuating such fixtures, the combination, with the spindle and one of the bearings fitted to rotate and to move length-

wise in its seat, of a spiral spring fitted to the spindle and engaging the rocker-segment and the said bearing, the bearing being movable lengthwise in its seat in opposition to the extension of the spring, and having a ratchet-connection with its seat, whereby the bearing may be turned to tighten the spring and the ratchet-parts held in engagement by the extension of the spring.

4. In a pull switch, an insulating switch base in two parts with a chamber open at the front, a spindle transverse to the chamber, switch contacts and circuit terminals carried by one part of the base on opposite sides of said spindle, said circuit terminals having binding posts at the front of the base and said base having grooves in its ends and front leading to said posts and an operating chain passing through the opening at the front of the base.

5. In a pull switch, an insulating body, contacts and a spindle therein, an insulating disk on said spindle flaring outwardly toward said contacts, an oscillating lever adapted to turn said disk step by step and an operating chain secured to the outer end of said lever, the flaring of said disk tending to cause said chain to draw away from said contacts when the chain is pulled.

6. In a pull switch, an oscillating lever comprising a ratchet portion, a flange portion, arms integrally connecting the flange and ratchet portions and a chain-engaging member integrally connected with the inner edge of said flange and comprising two prongs spaced apart from each other to pass between the two end balls of a chain and a third prong to engage around the outer surface of the end ball of the chain and an operating chain having its end ball held between said three prongs.

7. A pull-switch for a wall-box, having a rectangular body with the chamber opening at the front edge of the body for the passage of the chain, a removable cover forming the wall at one side of the chamber, a spindle extended across the chamber with bearings in the said body and cover and means for oscillating the spindle and connecting and disconnecting switch-contacts, recesses at opposite sides of the spindle-bearing in the cover, circuit-connection-blocks having feet extended into said recesses, reflexed segmental switch-springs having feet extended under the feet of the connection-blocks, and screws passing through the cover and feet of the segments and engaging the feet of the connection-blocks, to secure the segmental contacts in place.

8. A pull-switch for a wall-box, having a body with a chamber therein open at one edge of the body, a bridge secured on the

body across such open edge of the chamber for securing the body in a wall-box and having a central opening for the passage of a chain, and a wall-plate with means for securing it upon the said bridge and provided with a guide passage to support the chain when pulled in any direction.

9. A pull-switch for a wall-box, having a body with a chamber opening upon one edge of the body for the passage of a chain, means for securing the body in a wall-box having apertures for circuit terminals, switch-fixtures within the chamber and a pull-chain for operating the same, a face-plate with an aperture for the passage of the chain, one side of the body being detachable from the remainder of the body at one side of the chamber with binding-posts at one edge and switch-contacts on the cover, and grooves in the edges of the body at the joint of the cover for leading the conductors to the circuit terminals to the binding-posts.

10. A pull-switch for a wall-box, having a body with a chamber opening at the front edge of the body for the passage of a chain, means for securing the body in a wall-box, switch-fixtures within the chamber and a pull-chain for operating the same, a cover detachable from the body at one side of the chamber, a bridge secured upon the body across the opening of the chamber with a central aperture for the passage of a chain, and the said bridge having an arm extending over the edge of the cover and engaged therewith, substantially as herein set forth.

11. In a pull-switch for a wall-box, having a body with a chamber opening at the front edge of the body for the passage of a chain, switch-mechanism in the chamber with a chain for actuating the same and a cover detachable from the body at one side of the chamber, the combination, with such parts, of a bridge extended over the body across the opening of the chamber with a central aperture for the passage of the chain, the said bridge having an arm extending over the edge of the cover, means for securing the bridge upon the body and the cover, and the body and the cover having notches A' in the surface adapted to fit the bridge.

12. The combination of a two-part insulating switch base in the form of a rectangular parallelepiped with an interior chamber open at the front, a pull switch located therein and a front plate having a guide passage for the operating chain.

13. The combination of an insulating switch base in the form of a rectangular parallelepiped with an interior chamber open at the front, a pull switch located therein and a front plate having a guide passage for the operating chain.

14. The combination of a two-part insulating switch base in the form of a rec-

tangular parallelepiped with an interior chamber open at the front, a pull switch located therein and a front plate having a guide passage for the operating chain, one part constituting the body and having flanges extending around three edges and the other part fitting the said flanges and constituting a side plate.

15. In a wall switch, a two-part insulating base comprising a body having an interior chamber for the switch mechanism and a detachable side, a bridge secured to said body and to said side and having a passage for the pull chain and also having means for attaching a face plate.

16. The combination of a two-part insulating base having an interior chamber for the switch mechanism, a bridge piece secured to both of said parts and a face plate secured to said bridge piece and having a guide passage for the operating chain.

17. In a wall switch, a two-part insulating base having an interior chamber for the switch mechanism, circuit terminals secured to one of said parts, said parts having grooves on opposite edges for the conductors leading to said circuit terminals.

18. In a wall switch, the combination of an insulating base formed in two-parts, means for adjustably securing the parts together, said parts having between them a chamber for the switch mechanism, switch contacts and circuit terminals carried by one of said parts between said parts, a rotating switch member mounted between said parts and a face plate having a guide passage and a chain extending through said guide passage and operatively connected with the switch mechanism.

19. In an electric switch, an insulating carrying block having a chamber open at the front and formed of a body member and a side plate member, a switch contact carried by said plate member, a circuit terminal connected to said contact and carried by said plate member and having a binding screw exposed at the front of said block, a rotary switch member coacting with said switch contact, a ratchet member, a pull chain for operating said ratchet member, said insulating body member having flanges formed so as to house said switch contact and ratchet member and cover part of said circuit terminal and preventing said pull chain from contacting with said circuit terminal and means for holding the parts of said insulating carrying block together.

20. In a pull switch, a two-part insulating block, switch mechanism carried between the two parts and including a spindle, a movable switch member mounted on said spindle, a ratchet operating lever mounted on said spindle for rotating said switch member step by step, a spiral spring

on said spindle having one end engaging
said ratchet lever, one part of said insulat-
ing block having an opening extending
through it in axial alinement with said spin-
5 dle, an adjustable abutment in said opening
adapted to rotate and also adapted to be
moved lengthwise in said opening, said ad-
justable abutment and said insulating block
having coöperating ratchet teeth adjacent
10 said opening, the other end of said spring
being connected to said adjustable abutment
whereby said adjustable abutment may be

rotated for adjusting said spring and said
ratchet teeth will cause said abutment to be
automatically moved lengthwise when said 15
abutment is rotated.

In testimony whereof I have hereunto set
my hand in the presence of two subscribing
witnesses.

FREDERIC BARR.

Witnesses:

L. LEE,

THOMAS S. CRANE.