F. BUCHANAN.

SWITCH.

APPLICATION FILED JUNE 5, 1915.

1,304,655.

Patented May 27, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

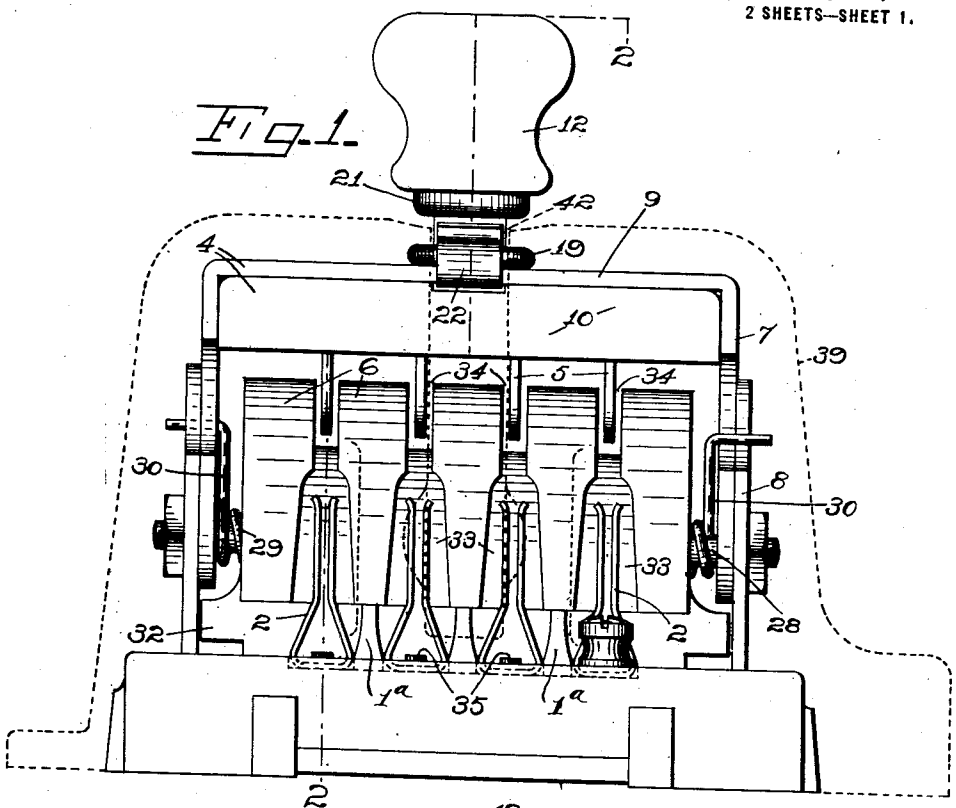
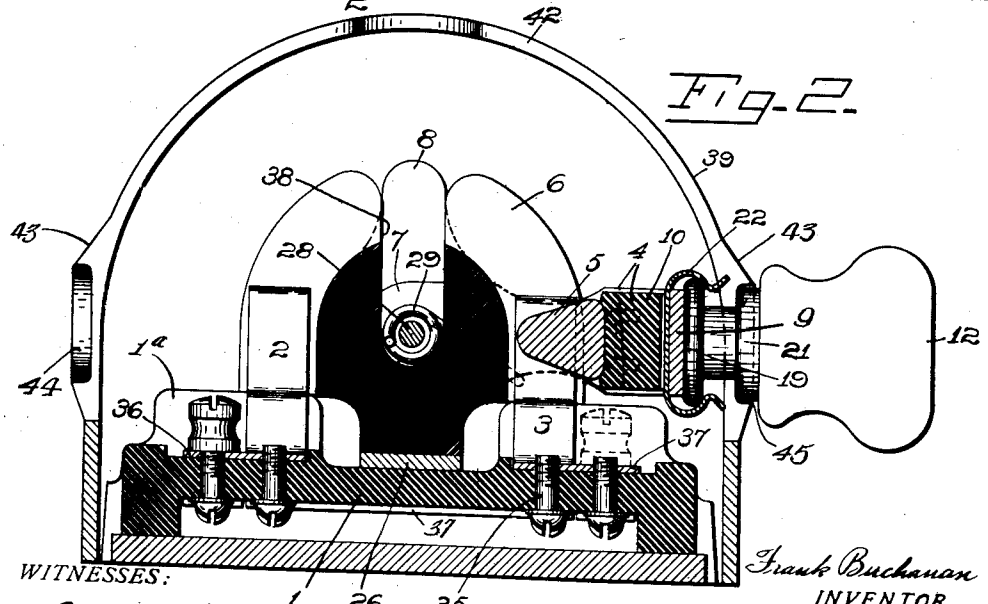


Fig. 2.



WITNESSES:

C. C. Schorneck

Frank Buchanan
INVENTOR.

BY Parsons & Bodell
ATTORNEYS.

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2 SHEETS—SHEET 2.

Fig. 3.

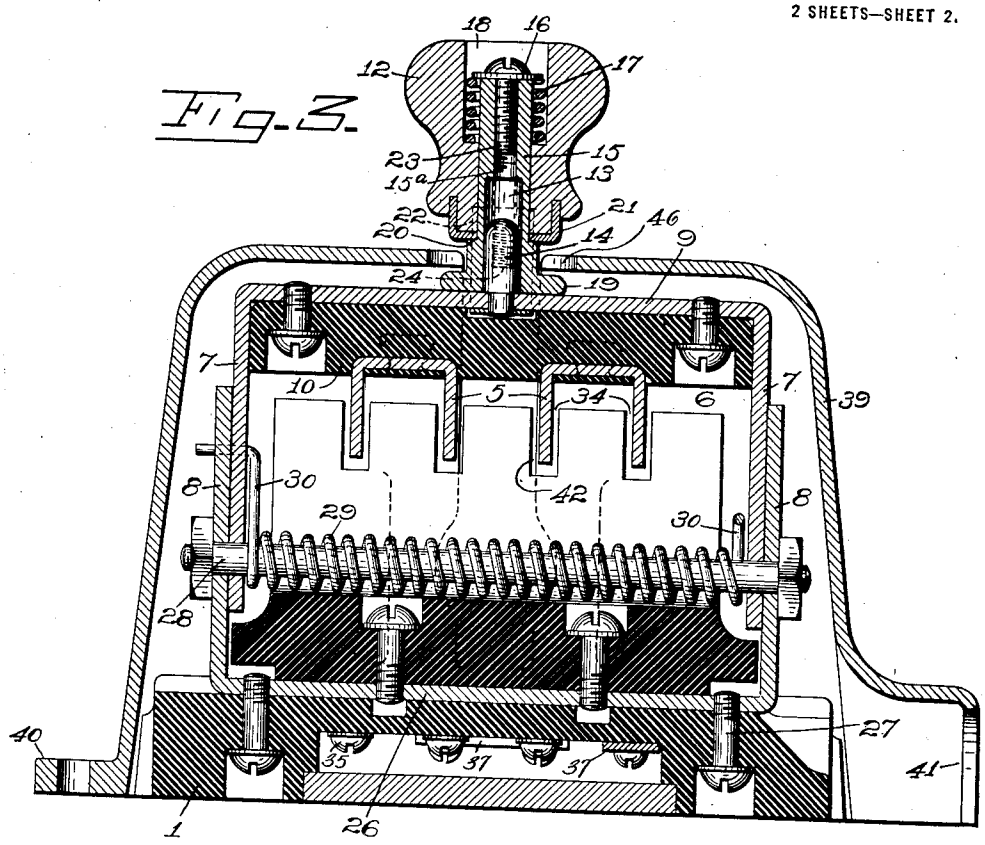


Fig. 4.

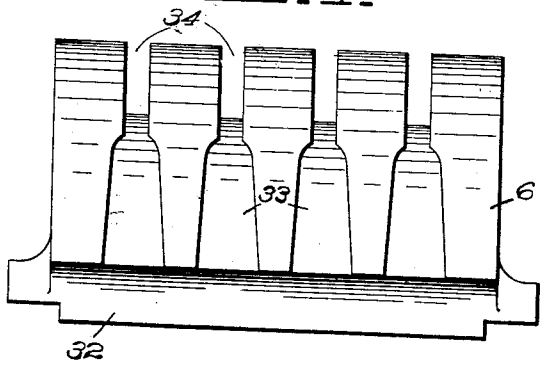
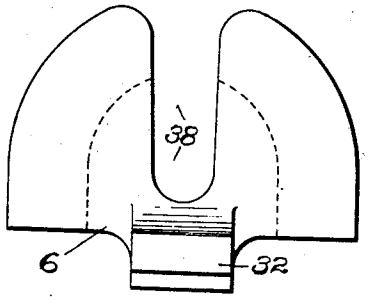


Fig. 5.



WITNESSES:

C. C. Schoneck

Frank Buchanan

INVENTOR.

BY Parsons & Bodell

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK BUCHANAN, OF SYRACUSE, NEW YORK.

SWITCH.

1,304,655. Specification of Letters Patent. Patented May 27, 1919.

Application filed June 5, 1915. Serial No. 32,294.

To all whom it may concern:

Be it known that I, FRANK BUCHANAN, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Switch, of which the following is a specification.

This invention relates to switches and has for its object a switch having a quick break action and means for shielding or separating the terminals to prevent short circuiting during the quick break action; and the invention consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings, in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation of the switch, the cover therefor being indicated in dotted lines.

Fig. 2 is a section on line 2—2, Fig. 1, the switch arm being shown as swung on its hinge into one of its operative positions and the cover for the switch being also shown.

Fig. 3 is a longitudinal sectional view taken at a right angle to Fig. 2.

Figs. 4 and 5 are, respectively, side and end elevations of the insulation.

This switch comprises, generally, a base, terminals on the base, a switch arm having conductors movable into and out of engagement with the terminals, a spring coacting with the switch arm and tending to hold the same in its open position and to effect a quick break action thereof when said arm is operated to disengage its contact from the terminals.

My invention is here shown as embodied in a switch especially applicable for use in connection with headlights for changing the polarity of the current through the lamp of the headlight, or for alternately closing different circuits of lamps, as an arc lamp and an incandescent lamp, or for cutting in or out a resistance in the lamp circuit, and the switch here shown includes opposing rows of terminals on the base. The switch arm is provided with conductors or contacts movable into engagement with either row of terminals, and the insulation includes barriers separating the rows and also separating the terminals of the rows from each other and from adjacent parts of the switch and separating the switch conductors or contacts during the movement of the switch arm.

1 designates the base which is usually a slab of insulating material. 2, 3 are the opposing rows of terminals, and 4 is the switch arm as a whole, which carries conductors 5 for engagement with the terminals of either row 2, 3, the switch arm being movable about an axis located between the rows of terminals and above the base 1, that is, between the upper and lower ends of the terminals 2, 3.

6 designates the block of insulation having the barrier means between the rows 2, 3, and between the members of the rows. The switch arm 4 is bifurcated and the branches 7 thereof are hinged to opposing upwardly extending arms 8 of a support rising from the base 1, the intermediate portion 9 of the switch arm carrying a block of insulation 10 in which the contacts or conductors 5 are located. A suitable handle 12 is connected to the portion 9. The handle 12 is usually detachable for preventing the operation of the switch by curious persons, and is here shown as formed with a socket 13 which receives a stud 14 rising from the intermediate part 9 of the switch arm. The socket 13 is formed in a stem 15 extending axially of the knob of the handle, the stem having a shoulder 16 at its upper end; and a spring 17 is located between the shoulder and the bottom of a recess 18 in the knob of the handle, in which recess the upper end of the stem extends. The lower end of the stem is formed with a widened base 19 and also with an upwardly facing shoulder 20 on which seats the lower end of the knob when the switch arm is in neutral position, the knob being protected at its lower end by a ferrule 21. Spring clips 22 carried by the switch arm coact with the base 19 to resist removal of the handle. The spring clips detachably lock the handle from removal. The handle 12 is detachable and held in position by a screw 23 threading into a passage 15^a in the stem 15, the passage opening into the socket 13, and in case it is not desired to have the knob removable, the screw 23 may be long enough to thread into a threaded socket 24 in the stud 14, as shown in dotted line Fig. 3.

The arms 8 of the support are, in this

form of my invention, the opposite branches of a U-shaped bracket, the intermediate part 26 of which is secured by screws 27 to the base 1, these screws extending through the base from the rear side thereof. The branches 7 of the switch arm 4 are hinged to the arms 8 of the bracket by a hinge pin 28 extending the full length of the bracket and a spring 29 is coiled about the pin, the spring having arms 30 at its opposite ends which act in opposite directions on the branches 7 of the switch arm, so that the spring tends to return the switch arm quickly to its central position, and hence the switch arm has a quick break action.

As here shown, the block 6 of insulation includes a body located between the rows of terminals 2, 3 and having a contracted foot or base 32, and side portions formed with vertical recesses 33 and with transverse arc-shaped passages 34, connecting the vertical recesses and extending through the top of the block 6, these side portions overhanging the base. The base 1 is preferably provided with upwardly extending barriers 1^a which meet the lower edges of the overhanging portions of the block 6 of insulation. The terminals 2, 3 extend vertically through the lower ends of the recesses 33 and into the same, and the conductors 5 depend in the passages 34. The terminals 2, 3 are here shown as spring arms which are connected to the base by screws, as 35, or to plates or conductors 36, 37, mounted on the face of the base, or the underside of the base.

The conductors 36, 37 are arranged in any suitable way to conduct the current in the desired manner, and in some instances, they are arranged so that when the switch blades or conductors 5 are in contact with one set of terminals 2, or 3, an electrical resistance is cut in to the lamp circuit, and when said blades are in engagement with the other set of terminals the resistance is cut out, or they may be arranged so that the direction of the current through the lamp is reversed to change the polarity of the electrodes of an arc lamp, or they may be arranged to cut out one lamp of the headlight and cut in another lamp, as will be understood by those skilled in the art. The connections of these terminals are of no importance so far as this invention is concerned.

As here shown, the base 32 of the block 6 of insulation is mounted on the intermediate part 26 of the U-shaped support, and the block 6 is formed with a lengthwise channel 38 extending centrally thereof and opening through its top and end faces and in which the hinge pin 28 and the spring 29 coiled thereon are located.

39 is a cover for the switch. Said cover is provided with suitable means, as perforated ears 40, for securement to the part upon which the base 1 is mounted and also with a suitable inlet 41 for the wires. The cover is also formed with a slot 42 in its top through which the handle 12 extends, and with cams 43 and seats 44 at the ends of the slots for coacting with the spring-pressed knob of the handle 12, as the handle approaches either end of the slot. The cams act to press the handle outwardly against the action of its spring 17 until the seat 45 on the under side of the handle engages one of the seats 44. The slot is widened at 46 between its ends to form a passage for the base 19 of the handle when the handle is being removed or replaced.

This switch is particularly advantageous in that the terminals are insulated from each other by a particularly simple form of insulation embodied in a simple manner in the switch structure.

What I claim is:—

1. A switch comprising a base, two opposing rows of terminals mounted on the base, a movable switch arm hinged to the base between the rows of terminals and having a conductor movable in an arc into engagement with terminals of either row, and a block of insulation having barriers separating the rows of terminals and the members of each row, said block having transverse channels in its upper face into which the switch conductor extends, each channel extending from one terminal of one row to the opposite terminal of the other row, the channels forming passages for the conductors of the movable switch arm, substantially as and for the purpose set forth.

2. A switch comprising a base, opposing rows of conductors mounted on the base, a movable switch arm hinged between the rows of conductors and above the base, and a block of insulation having barriers extending between the members of the rows of conductors and between the conductors and above the outer ends thereof, said block of insulation having recesses in which the rows of conductors are located, and arc-shaped passages connecting the recesses on one side with those on the other side of the block, through which passages the conductors of the switch arm move, substantially as and for the purpose described.

3. A switch comprising a base, rows of terminals mounted on a base, a bifurcated switch arm, a support having opposing arms, and a hinge pin connecting the arms and the bifurcations of the switch arm, said pin being located midway between the rows of terminals and between the upper and lower ends of the terminals, and a block of insulation having a central lengthwise channel opening though its upper face for receiving the hinge pin of the switch arm, vertical recesses on opposite sides thereof, and opening through the lower face of the block, and arc-shaped transverse passages connecting

the vertical recesses and forming continuations thereof, the terminals extending into the vertical recesses and the conductors of the switch arm being movable in the transverse passages during the movement of the switch arm about its axis, substantially as and for the purpose specified.

4. A switch comprising a base, opposing rows of terminals mounted on the base, a movable switch arm hinged on an axis extending between the rows of terminals and located above the base, the switch arm having conductors movable into engagement with the terminals of either of the rows, and a block of insulation including a base portion and laterally extending portions overhanging the base portion and spaced apart from the base of the switch, said laterally extending portions being formed with vertical recesses in which the terminals extend, said terminals being mounted on the base of the switch below the overhanging portions and extending into said recesses through the lower ends thereof, and the block also having transverse arc-shaped passages connecting the upper ends of the vertical recesses and through which the conductors of the switch arm move, substantially as and for the purpose set forth.

5. A switch comprising a base, opposing rows of terminals mounted on the base, a hinge support having a portion mounted on the base midway between the rows of terminals and opposing upwardly extending arms, a bifurcated switch arm having its bifurcations pivoted to the opposing arms of the support, and a block of insulation having barriers separating the rows of terminals, and the terminals of each row, said block being mounted on the intermediate part of the support and secured thereto, substantially as and for the purpose described.

6. A switch comprising a base, a U-shaped hinge support mounted on the base, terminals mounted on the base on opposite sides of the hinge support, a bifurcated switch arm having its bifurcations hinged to the opposing arms of the support on a pin located above the base, the switch arm being movable in opposite directions to engage with the terminals, and a block of insulation mounted on the intermediate part of the support and extending between the rows of terminals and having barriers separating the terminals of each row, the block of insulation also having a lengthwise channel opening through its upper and end faces for receiving the hinge pin, substantially as and for the purpose specified.

7. A switch comprising a base, a U-shaped hinge support mounted on the base, terminals mounted on the base on opposite sides of the hinge support, a bifurcated switch arm having its bifurcations hinged to the opposing arms of the support on a pin located above the base, the switch arm being movable in opposite directions to engage with the terminals, a spring coiled about the hinge pin and having its ends bearing in opposite directions on the branches of the switch arm, and a block of insulation mounted on the intermediate part of the support and extending between the rows of terminals and having barriers separating the terminals of each row, the block of insulation also having a lengthwise channel opening through its upper and end faces for receiving the hinge pin and spring thereon, substantially as and for the purpose specified.

8. A switch arm comprising a body formed with a stud, a handle including a stem formed with a socket for receiving the stud and with a lengthwise passage, the stud being also formed with a threaded socket alined with the passage, a knob slidable on the stem and having a recess around the upper end of the stem, a shoulder on the upper end of the stem, a screw threading in the passage of the stem, and serving to hold the shoulder in position, and a spring between the shoulder and the bottom of the recess in the knob, substantially as and for the purpose specified.

9. A switch comprising a base, terminals on the base, a pair of supporting arms rising from the base, a hinge pin supported by said arms above the base, a bifurcated switch arm having the branches thereof mounted on the hinge pin, a spring encircling the hinge pin and bearing on the switch arm to hold the switch arm open and to effect a quick break action thereof, and a block of insulation having a base mounted between the supporting arms and having a channel receiving the spring and the hinge pin and laterally extending barriers arranged to shield the terminals from short circuiting during the movement of the switch arm, substantially as and for the purpose specified.

10. A switch comprising a base, opposing rows of terminals mounted on the base, a movable switch arm hinged on an axis extending between the rows of terminals and located above the base, the switch arm having conductors movable into engagement with the terminals of either of the rows, and a block of insulation including a base portion and laterally extending portions overhanging the base portion and spaced apart from the base of the switch, said laterally extending portions being formed with vertical recesses in which the terminals extend, and the block also having transverse arc-shaped passages connecting the upper ends of the recesses and through which the conductors of the switch arm move, and the base of the switch being also formed with upwardly extending barriers meeting the under

edges of the laterally extending portions of the block, substantially as and for the purpose specified.

11. A switch comprising a movable switch arm, a spring acting on the switch arm and tending to actuate the same, a case through which the switch arm extends, a handle for the switch arm mounted on the outside of the case, a spring tending to move the handle against the outer face of the case, the case having a socket for receiving the handle and thus holding the switch from movement by its spring, the handle being removable from the switch arm and having a portion movable through the case, and said case having a widened or key hole opening, through which such portion passes when the handle is being applied to or removed from the switch arm, substantially as and for the purpose specified.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, and State of New York, this 16th day of April, 1915.

FRANK BUCHANAN.

Witnesses:
C. C. SCHOENECK,
WM. CORNELL BLANDING.