

G. W. HART.
SWITCH.
APPLICATION FILED JUNE 30, 1910.

987,985.

Patented Mar. 28, 1911.

Fig. 1.

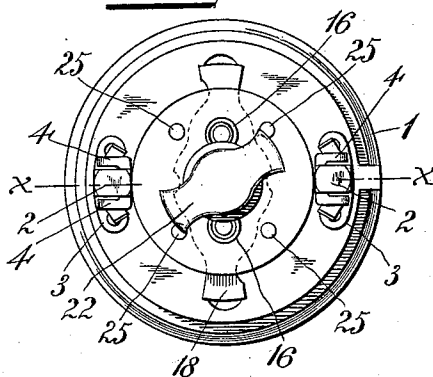


Fig. 2.

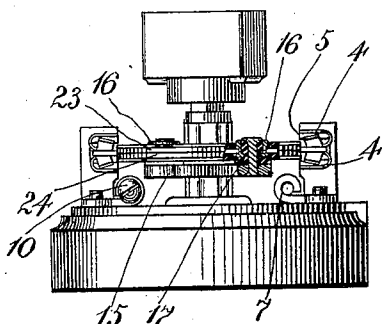


Fig. 3.

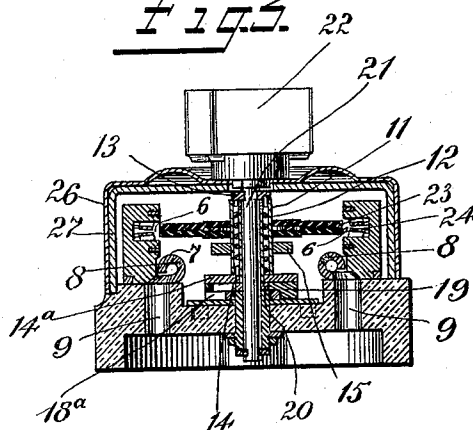


Fig. 4.

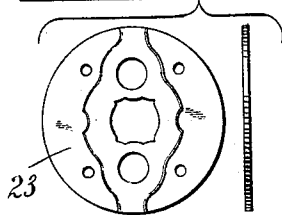
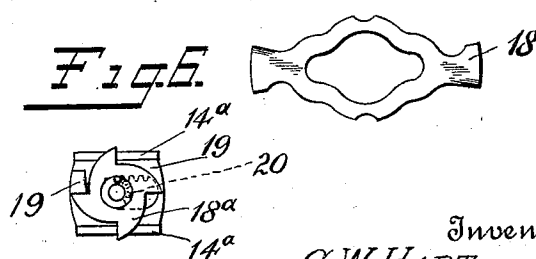


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SWITCH.

987,985.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GERALD W. HART, a citizen of the United States, residing at West Hartford, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Switches, of which the following is a full, clear, and exact description.

My invention relates to improvements in switches, and has for its object to produce a small and compact switch for breaking a circuit without harmful sparking or arcing.

It is particularly designed for circuits having a voltage higher than 110 volts, such, for instance, as a 500 volt circuit or thereabout, which voltage in a switch of ordinary dimensions with no arc preventing means is liable to produce harmful results.

The following is a description of a switch embodying my invention, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of the switch, the cover being omitted. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section of the same with the cover present on the line $x-x$, Fig. 1. Fig. 4 is a plan and side elevation of a detail. Fig. 5 shows a plan view of the switch arm. Fig. 6 shows a detail of a stop block, latch and switch plate.

Referring more particularly to the drawings, 1 is a switch base of porcelain or other suitable insulating material.

2—2 are contact posts.

3—3 are base plates secured to the contact post and themselves secured to the switch base 1 by screws in the ordinary manner.

The contact posts carry spring contacts 4—4, which are O-shaped punchings bent upon themselves, each having one side inserted in a slot in the binding posts at 5, the edges of the slot being upset to hold the contact member securely in place. The engaging portions of the contact members 4 lie within large slots 6 formed in the binding posts so as to not extend out beyond the binding posts but to coincide substantially with the axes of the posts. With this construction of binding post, the switch arm for a switch with a base of a given diameter can be made very much longer than it could be made if the contacts extended inward from the binding post toward the axis of the switch blade. The base plate 3 of the binding post has an inner extension 7 which

is bent and screw-threaded so as to form a screw-threaded bore. The bores are each provided with a transverse perforation 8 connecting with holes 9 for the leading-in wire, which passes through the transverse perforation 8 and is secured by a screw 10 engaging screw-threads on the inner surface of the bore formed by the bent projection 7.

11 is the shaft of the switch mechanism having within it the spring 12, one end of which is connected to a spring plate 13, and the other end of which is connected at 14 to a switch plate 14^a. The shaft 11 carries a rotating member or switch arm carrier 15 secured thereto. To this rotating member are secured bushings 16, being separated therefrom by insulation 17.

18 is a switch arm carried by the bushings 16, which pass through the same, the edges of the switch arm fitting loosely in recesses in the bushings so as to permit the switch arm to have considerable play, thereby enabling it to adjust itself to any variation in the position of the contacts 4.

The switch is provided with a stop block 18^a and a latch 19 moving in a recess in the switch plate 14^a, the latch being moved by a pinion 20 carried by the spindle 21, to which the handle 22, spring plate 13 and switch plate 14 are connected, thus producing a quick acting step-by-step switch mechanism of the general type shown in my Patent No. 753,881.

This switch as thus described, on account of the distance between the two pairs of contacts 4, has a larger throw and will therefore tend to more readily break a circuit without arcing when mounted on a base of given dimensions, than a switch with a shorter switch arm, such as would have to be used with contact posts having inwardly projecting contact members. There is still, however, a liability that the arc will follow the switch arm or jump to the switch mechanism on the breaking of a circuit and produce damage. In order to prevent this injurious result, I place between the carrier 15 and the switch arm a thin circular sheet of insulating material 23, and above the switch arm 18 place a similar sheet 24 holding the two sheets together and clamped about the switch arm 18 by rivets 25. These two sheets move with the switch arm 18 and are provided with openings, which surround the bushings 16 loosely, so as not to interfere with the move-

ment of the sheets 23, 24, or the movement of the switch arm 18 relatively to the bushings. The ends of the switch arm 18 extend beyond the edges of the insulating sheets sufficiently to pass between the contacts 4. The switch mechanism is inclosed in the usual cap 26 with a lining of paper 27 to thoroughly protect it from arcing. With such an arrangement, when the switch is operated, the switch arm 18 moves away from the contacts quickly, and in its place opposite the contacts is substituted a portion of the insulating disks 23, 24. Moreover, a portion of the insulating disks 23, 24 is interposed in the direct path between the exposed ends of the switch arm and the contacts. With such an arrangement, the tendency to arc is very greatly reduced, and currents of very considerable voltage can be broken without the danger of establishing injurious arcs. The construction is simple to manufacture and the operation is effective.

What I claim is:

1. In a switch, the combination of a quick acting switch mechanism, a carrier rotated thereby, a switch arm supported by said carrier but insulated therefrom, and sheets of insulating material immediately above and below said switch arm fastened together so as to be secured thereto and carried thereby, said switch arm and insulation being mov-

able relatively to said carrier, said switch arm having its ends extending beyond the edges of said insulating sheets and contacts engaged by said ends.

2. In a switch, the combination of a quick acting switch mechanism, a switch arm loosely carried thereby but insulated therefrom, sheets of insulating material above and below said switch arm secured together so as to move with said switch arm and be carried thereby, said switch arm having ends extending beyond the edges of said sheets, and contact posts carrying contacts adapted to engage the extremities of said switch arm at points approximately in line with the axes of said contact posts.

3. In a switch, the combination of a quick acting switch mechanism, a carrier rotated thereby having projecting studs, a switch arm loosely engaging said studs and sheets of insulating material immediately above and below said switch arm fastened together so as to be secured thereto and carried thereby, said switch arm and insulation being movable relatively to said studs and carrier, said switch arm having its ends extending beyond the edges of said insulating sheets, and contacts engaged by said ends.

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Witnesses:

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