

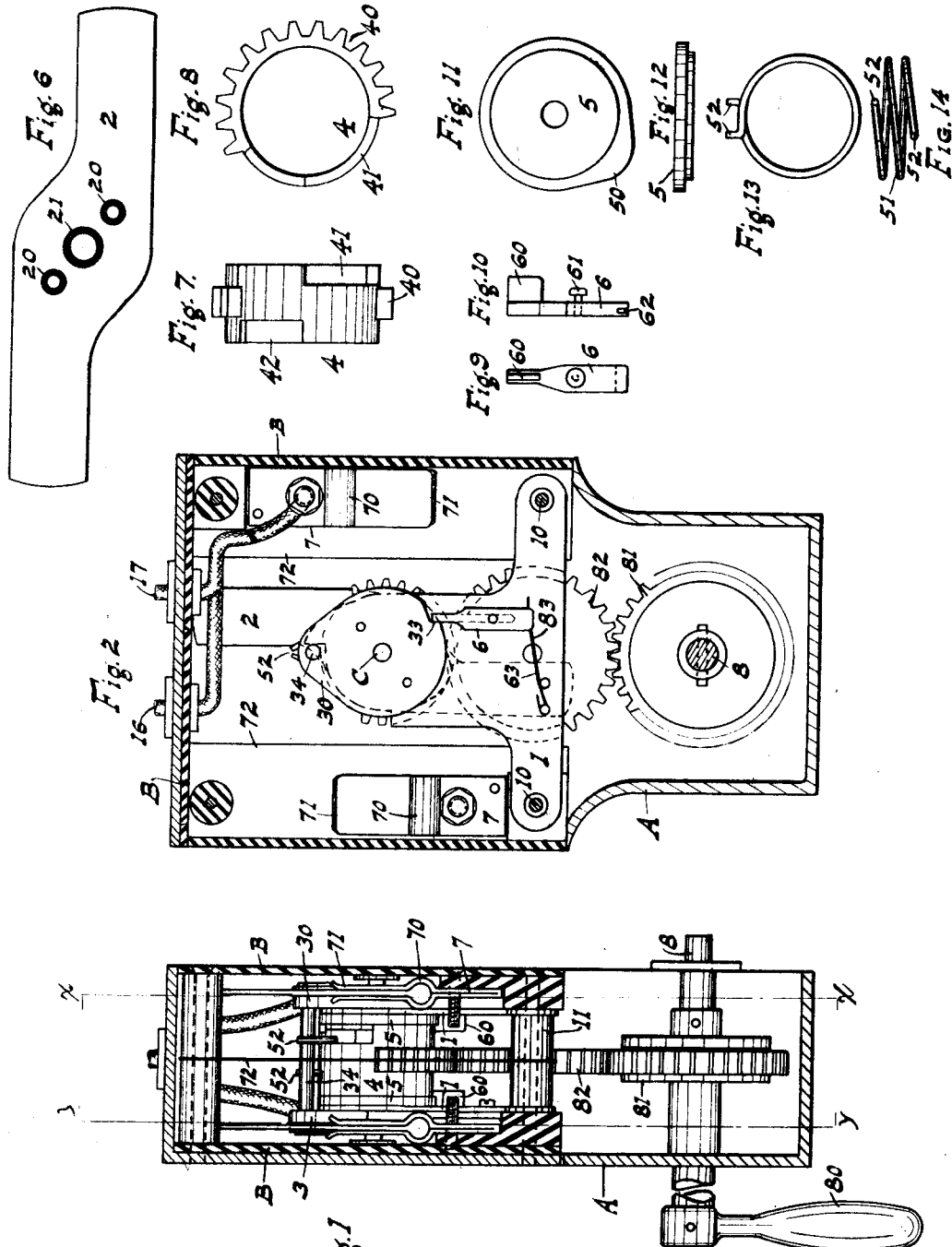
A. P. NICHOLS.
ELECTRICAL SWITCH.

APPLICATION FILED MAR. 29, 1911. RENEWED MAY 4, 1912.

1,047,277.

Patented Dec. 17, 1912.

2 SHEETS—SHEET 1.



WITNESSES

Charles H. Meyer.
Earl Young

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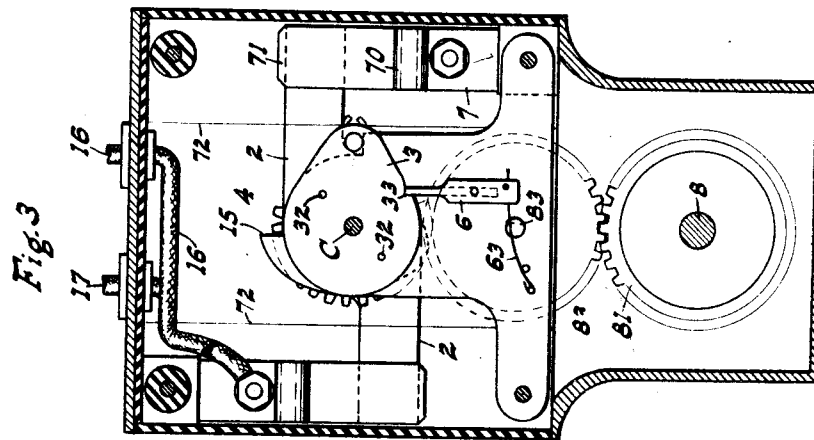
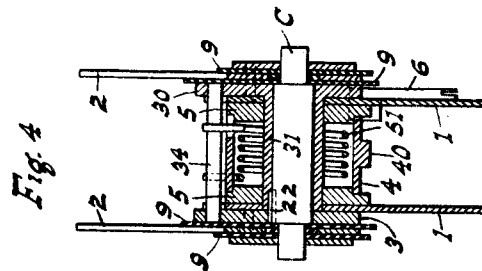
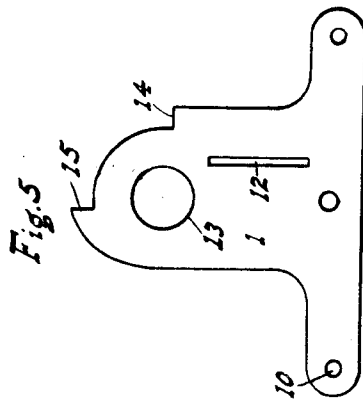
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WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW P. NICHOLS, OF SEATTLE, WASHINGTON.

ELECTRICAL SWITCH.

1,047,277.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed March 29, 1911, Serial No. 617,713. Renewed May 4, 1912. Serial No. 695,324.

To all whom it may concern:

Be it known that I, ANDREW P. NICHOLS, a citizen of the United States, and resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Electrical Switches, of which the following is a specification.

My invention relates to improvements in electric switches of that type which are ordinarily called quick throw, that is, switches which have a delayed movement, but which are thrown under the influence of a spring when they do start.

My invention comprises the novel parts and combinations of parts which will be hereinafter described and particularly pointed out in the claims.

The object of my invention is to improve and simplify such devices.

In the accompanying drawings I have shown my device in the forms which are now preferred by me.

Figure 1 shows the switch mechanism in elevation from a side edge view, the casing being in section just within the edge. Fig. 2 is a front elevation, the front of the casing being removed, or upon the line X, X, of Fig. 1. Fig. 3 is a similar elevation from the opposite direction, or on the lines Y, Y, of Fig. 1. Fig. 4 is a central section through the operating parts of the switch. Fig. 5 is a side elevation of one of the frame plates upon which the switch mechanism is mounted. Fig. 6 is a side view of one of the switch bars. Fig. 7 is a side elevation and Fig. 8 a face elevation of the drum case to which most of the operating parts are secured. Figs. 9 and 10 are elevations from different view points of one of the detents or pawls. Figs. 11 and 12 are respectively face and edge views of the cam ring by which the pawls are released. Figs. 13 and 14 are similar views of the spring.

The casing A which incloses the operative parts of the switch may be of any suitable construction. I have shown a metal frame having insulating plates B, inclosing the switch bars and the parts which are immediately connected thereto, including the leads 16, 17 and the clips 7. I have shown two sets of bars 2 adapted to be connected between the clips 7 which are in turn connected with the leads. These clips or jaws 7 are each made of a single piece of metal, bent upon itself, as clearly shown

in the edge view, Fig. 1. The ends are separated sufficiently to accommodate the ends of the bars 2, and, to prevent sticking of the bars when thrown into place, I have given them an enlarging curve 70 at the point where the separated ends 71 join the opposite end, where the two sides are in contact. In this way there can be no wedging when the arms 2 are thrown between the jaws 71.

The operating parts of the switch are mounted upon two plates 1, one of which is shown in plan in Fig. 5. These plates are secured to the main frame A, by bolts at 10. In the holes 13 is mounted the central pivot bar or journal C of the switch throwing mechanism. Two disks 3 and 30 fit over this journal. The disk 30 has a central sleeve 31 integral therewith and surrounding the journal C. The journal and both disks are secured against rotation by a pin key 22 which engages all of them. The disks 3 and 30 are further connected by a pin or rod 34, this lying within a slight protuberance or cam projection of the disks. These disks are placed outside the frame plates 1.

Just within the frame plates 1 are two cam plates 5, each of which has a slight protuberance 50 adapted to act as a cam to release the detents 6. The detents 6, shown in detail in Figs. 9 and 10, each has a side projecting wing 60 adapted to engage a notch 23 in one or the other of plates 3 or 30 as the case may be. This wing 60 and the retaining screw 61 slide in a slot 12 in the frame plate 1. The detent is held up into locking position by a spring 63 which enters a slot 62 in the lower end of the detent. There are two detents, one on each side, each preventing turning of the switch in its respective direction until the detent has first been released. The frame plates 1 have two shoulders, 14 and 15, with which the pin or bar 34 engages to prevent overtravel of the switch bars, and holding against movement oppositely to the detents. The cam disks 5 have their cam projections so placed that when they are turned they will not engage and release the detents until they have been turned through a considerable angle.

Between the cam disks is placed a drum case, shown separately in Figs. 7 and 8. This case has a toothed segment 40, extending about half way around it. It also has two slots 41 and 42 at opposite ends. Within the case 4 and about the central journal

C, is a coiled spring 51 having its ends 52 projecting, one through slot 41 and the other through slot 42 and projecting a sufficient distance to engage the pin 34, one at each side thereof. Normally, that is in a position of rest, these spring ends engage the adjacent ends of the slots 41 and 42. When the casing is turned, one end of the spring will be carried by the drum away from the pin 34, thus putting additional tension upon the spring. As the cam disks 5 are secured to turn with the drum, one of these will engage the detent which is holding the disks 3 and 30 and free it, whereupon these disks 15 and the attached bars 2 will be quickly thrown to their other position, between the jaws or into the open position, as the case may be.

The jaws are secured to the disks 3 and 20 30 by means of pins which pass through insulating bushings 20 in the jaws. Disks 9 of mica or other insulating material are placed between the jaws 2 and the plates at each side thereof. I also place a strip of mica 72 centrally between the jaws and clips.

The turning of the switch may be by any suitable mechanism. The mechanism herein shown consists of a gear 82 which meshes with the segment gear 40 on the drum case 4, and a gear 81 mounted on the shaft 8, which shaft may be provided with a handle 80, if the switch is to be thrown directly by hand, or may be connected with any 35 other mechanism.

What I claim as my invention is:

1. In an electric switch, in combination, two disks connected by a central sleeve and by a pin near their outer edges, detents adapted to engage said disks to prevent their turning, switch blades secured to said disks, jaws for receiving said blades, a hollow drum, or cylinder between said disks, cam disks closing the ends of said drum and having peripheral cam projections adapted to free the detents, a spring within said drum having its ends projecting and respectively engaging opposite sides of the pin which connect the first mentioned disks, and 50 means for turning the drum.

2. In an electric switch, in combination, a central journal, a sleeve mounted to turn upon said journal, a disk secured to each

end of said sleeve and each having a locking notch in its periphery, detents adapted to engage said notches to hold the disks in two positions, switch blades secured to swing with said disks, a pin connecting said disks near their edges, cam disks journaled on said sleeve and adapted to free the other disks from the detents, a hollow drum connecting said cam disks and surrounding said sleeve, said drum having a slot in each end, said slots extending peripherally in opposite directions from a common point, a helically coiled spring about said sleeve and within the drum, the ends of said spring projecting from said slots and engaging opposite sides of the pin which connects the blade carrying disks, and means for turning said drum.

3. In an electrical switch, in combination, two frame plates, means for securing these plates together in separated position, a pivot journal having support in said plates, a sleeve surrounding said journal, two disks secured to the ends of said sleeve outside of the frame plates and having portions extending beyond the frame plates, a pin connecting the parts of said disks which extend beyond the frame plates, said frame plates having shoulders adapted to be engaged by said pin to limit the extent of swing of said disks, switch blades secured to said disks, jaws adapted to receive said blades, detents adapted to engage said disks to lock them, cam disks mounted to rock upon said sleeve and located at the inner sides of the frame plates, said cam disks being adapted to free the detents, a hollow drum secured to and connecting the cam disks and having two peripheral slots extending oppositely from a common line and located at opposite ends of the drum, said drum having a toothed segment whereby it may be turned, and a helical spring within the drum having its ends projecting through said slots and engaging, respectively with opposite sides of the pin which connects the blade carrying disks.

Signed at Seattle, Washington, this 24th day of March, 1911.

ANDREW P. NICHOLS.

Witnesses:

CHARLES H. KREGER,
E. C. BROWN.