A. J. LOGUIN.

SWITCH.

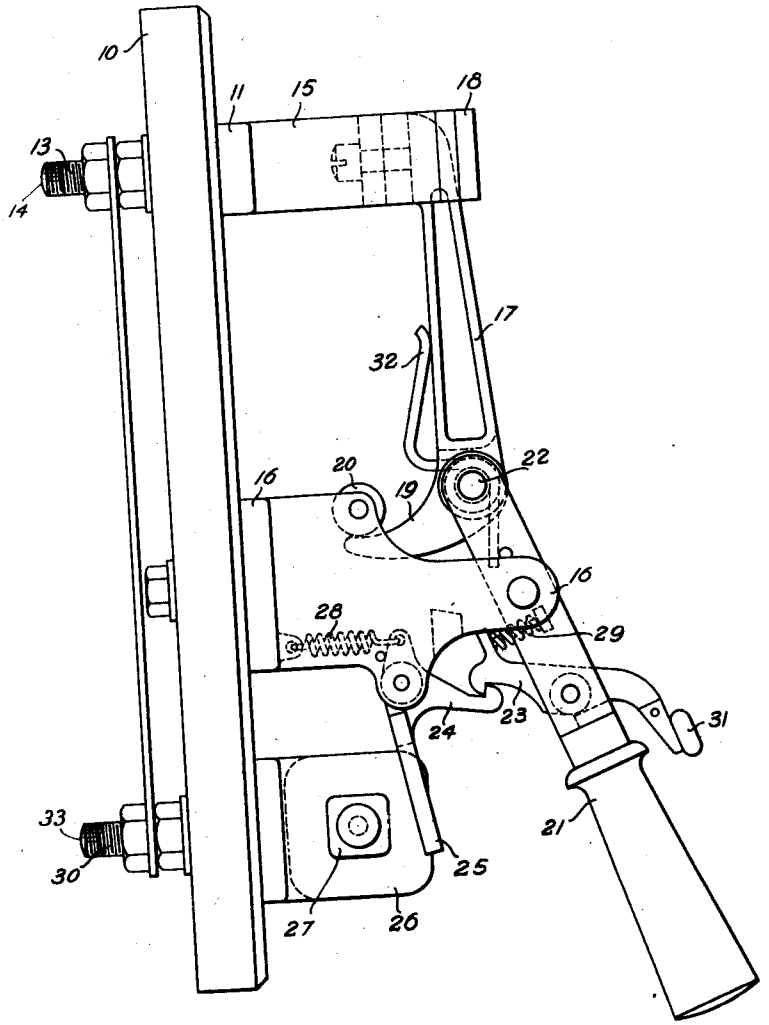
APPLICATION FILED JAN. 11, 1911.

Patented June 25, 1912

2 SHEETS—SHEET 1.

1,030,593.

Fig. 1



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2 SHEETS-SHEET 2.

Fig. 2

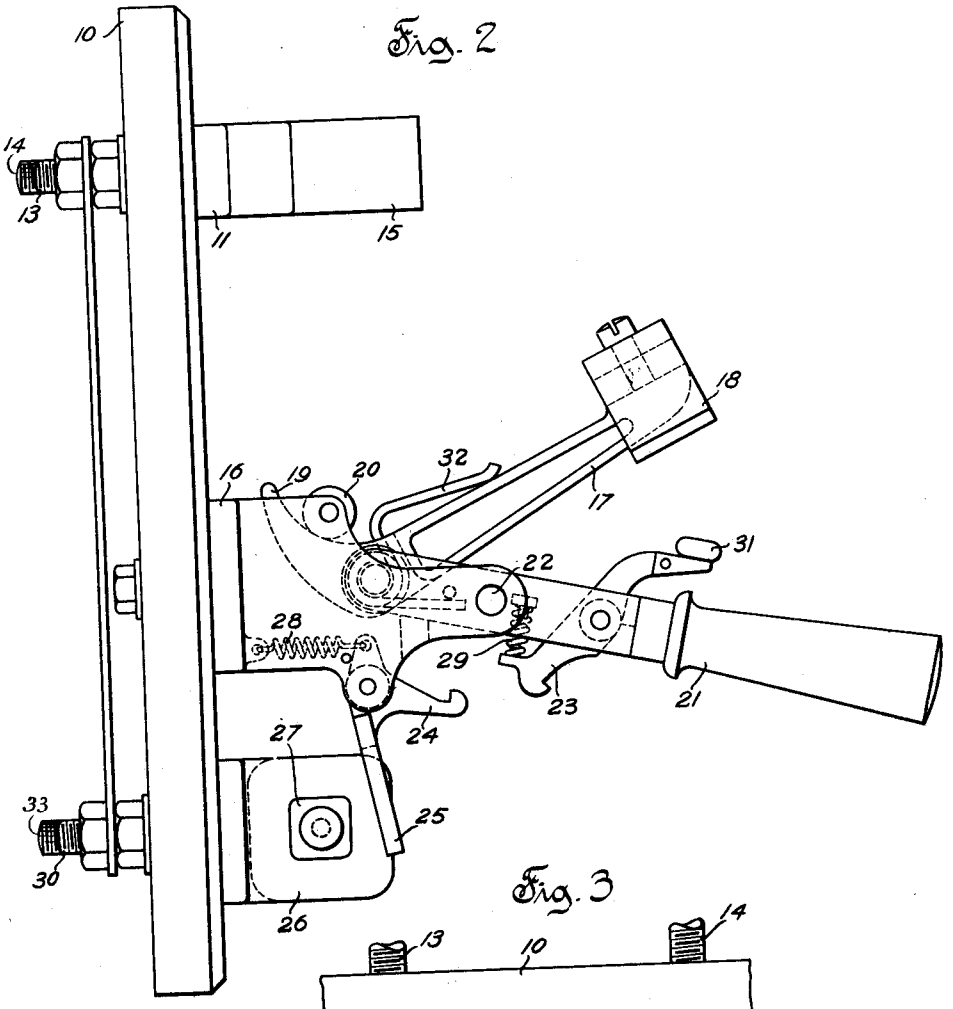
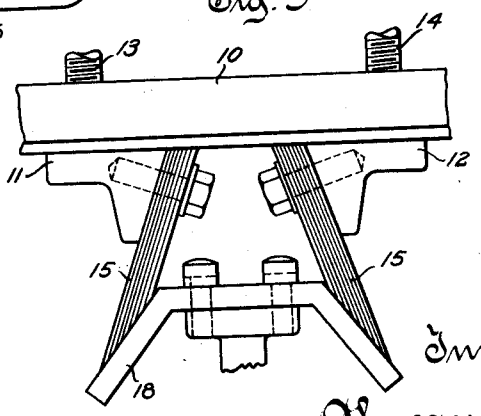


Fig. 3



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UNITED STATES PATENT OFFICE.

ALEXANDER J. LOGUIN, OF WEST ALLIS, WISCONSIN, ASSIGNOR TO ALLIS-CHALMERS COMPANY, A CORPORATION OF NEW JERSEY.

SWITCH.

1,030,593. Specification of Letters Patent. Patented June 25, 1912.

Application filed January 11, 1911. Serial No. 601,961.

To all whom it may concern:

Be it known that I, ALEXANDER J. LOGUIN, a subject of the Czar of Russia, residing at West Allis, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Switches, of which the following is a full, clear, and exact specification.

This invention relates to electric switches or circuit-breakers.

Among the objects of my invention are to improve and simplify the construction of switches and circuit-breakers, to cheapen their cost of manufacture, and to provide an effective engaging and disengaging action between the contacts.

The various novel features of my invention will be described in the following specification and particularly set forth in the appended claims.

The invention is illustrated on the accompanying sheets of drawings in which—

Figure 1 is a side elevation of my improved switch or circuit-breaker in a closed position; Fig. 2 is a side elevation of the same in an open position; and, Fig. 3 is a partial plan elevation of the same switch.

On the base 10, of suitable insulating material, are mounted two supports 11 and 12 for the fixed contacts of the switch. These contacts are connected respectively to suitable bolts 13 and 14 which extend through the base 10 for electrical connection purposes. On each support 11 and 12 are mounted a group of laminæ 15 which are preferably oblique to the face of the base 10. On the base 10 is also a support 16 for the movable parts of the switch.

An arm 17, carrying at its outer end a movable contact 18, is provided at its opposite end with a cam surface 19. This cam surface is adapted to engage and slide on a bearing member or roller 20 preferably rigidly secured to the support 16. An actuating handle or member 21 is pivotally secured to the cam end of the contact carrying arm 17 at the point 22 and is also pivotally secured to the support 16. By means of this simple arrangement an effective toggle is provided for cramping the movable contact 18 into firm engagement with the stationary contacts 15. The cam portion of the arm 17 is so shaped that when the movable contact member is moved from an open position to a closed position, said movable contact member is given first a large movement for a comparatively small movement of the cam surface and actuating member and then a comparatively small movement for the same movement of the cam surface and actuating member when the movable contact member is in close proximity to the stationary contact. In this construction the resultant pressure is always exerted through the point or movable fulcrum 22, the resultant being the geometric sum of reactive forces through the bearing member 20 and stationary contacts 15. This point or movable fulcrum moves on the arc of a circle the center of which is the point at which the actuating member 21 is pivotally connected to the support 16. As the actuating member is moved downwardly to a switch closing position the resisting moment decreases, thereby rendering the closing of the switch an easy matter. Any desired power can be exerted with this arrangement, the only limiting feature being the strength of the materials used.

The switch is shown in open position in Fig. 2. By depressing the handle or actuating member 21 the cam surface 19 engaging the bearing member 20 forces the contact-carrying arm 17 upwardly toward a closed position. As above mentioned, the initial closing movement of the arm 17 is a comparatively large one for a small movement of the cam surface over the bearing member and of the actuating member 21, and as the movable contact member approaches the stationary contact its movement gradually decreases for the same movement of the cam surface over the bearing member and of the actuating member. When the switch is closed, as indicated in Fig. 1, the tip of the cam surface 19 engages the bearing member 20 and the point 22, at which the actuating member and contact carrying arm 17 are pivoted, is in one of its extreme positions and the movable contact is pressed against the stationary contact with a maximum force. As soon as the parts have been brought fully into this closed position, a latch 23 on the handle 21 engages a latch 24 which is pivoted in the support 16. Formed integrally with the latch 24 is the armature 25 of an overload magnet 26. The latch 24 is biased to a locking position and the armature 25 is held away from the core 27 of the magnet 26 by a spring 28. The latch 23 on the handle is

also biased to a locking position by a spring 29. The switch being closed, current can pass from the bolt 14 through support 12, one group of laminæ 15, movable contact 18, the other group of laminæ 15, support 11, and bolt 13. From the bolt 14 the circuit may extend, by suitable connections, to bolt 30 through the coil of the overload magnet 26 to a switch terminal 33. In case of an overload, the armature 25 will be attracted to the core of the overload magnet and the latches 23 and 24 will be drawn out of engagement with each other, permitting the switch to open. The parts 23 and 24 may also be disengaged manually by a thumb button 31 on the latch 23. Upon such disengagement, the coöperating contacts 15 and 18 will be forced apart quickly by the action of a spring 32, the ends of which engage the contact carrying arm 17 and the actuating member 21.

By means of the spring 32, the shape of the cam surface 19, and the relative arrangement of the arm 17 and actuating member 21, the switch contacts can be brought into effective engagement with the maximum pressure upon the application of comparatively little force, and the contacts disengaged with great rapidity when the latches 23 and 24 are caused to unlock each other. The movement of the moving contact upon the opening of the switch being a rapid one, any arc which may be formed is almost immediately broken.

Many modifications may be made in the precise arrangement shown and described, and I aim to cover all such modifications which do not involve a departure from the spirit and scope of my invention as set forth in the following claims.

What I claim as new is:

1. In a switch, the combination of a support, an actuating member pivotally mounted on said support, a bearing member also mounted on said support, a member actuated by said actuating member and carrying a contact, said member having a cam surface engaging said bearing member, and another contact coöperating with the first.

2. In a switch, the combination of a support, an actuating member pivotally mounted on said support, a bearing member also mounted on said support, a member pivotally secured to said actuating member and carrying a contact, said member having a cam surface engaging said bearing member, and another contact coöperating with the first.

3. In a switch, the combination of a support, a bearing member secured thereto, an actuating member pivotally secured to said support, a member carrying a contact and having a portion engaging said bearing member, said actuating member and contact-carrying member being pivotally secured to each other, and another contact coöperating with the first.

4. In a switch, the combination of relatively movable contacts, a member having a cam surface and supporting one of said contacts, a support, a bearing member associated with said support and engaged by said cam surface, and an actuating member pivotally secured to said support and also to said first member at a point intermediate said support and contacts.

5. In a switch, the combination of relatively movable contacts, an arm carrying one of said contacts at one end and having a cam surface at the other end, a rigidly fixed bearing member engaged by said cam surface, and means connected to said arm for actuating said arm.

6. In a switch, the combination of relatively movable contacts, a member carrying one of said contacts at one end thereof and having a cam surface at the other end, a bearing member engaged by said cam surface, and pivotally mounted means for actuating said member.

7. In a switch, the combination of relatively movable contacts, a member carrying one of said contacts and having a cam surface at one of its extremities, a support, a bearing member secured to said support and engaged by said cam surface, and means pivotally connected to said support and to said first member for actuating the latter.

8. In a switch, the combination of relatively movable contacts, a member provided with a cam surface at one end and carrying one of said contacts at the other end thereof, a bearing member engaged by said cam surface, and an actuating member secured to said first member at the cam end of said first member.

9. In a switch, the combination of relatively movable contacts, a member provided with a cam surface at one end and carrying one of said contacts at the other end thereof, a bearing member engaged by said cam surface, and an actuating member pivotally secured to said first member intermediate the cam surface and contact end of said first member.

Milwaukee, Wis., Jan. 4, 1911.

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

ALEXANDER J. LOGUIN.

Witnesses:

CHAS. L. BYRON,

ROB. E. STOLL.