A. J. LOGUIN.

CIRCUIT BREAKER.

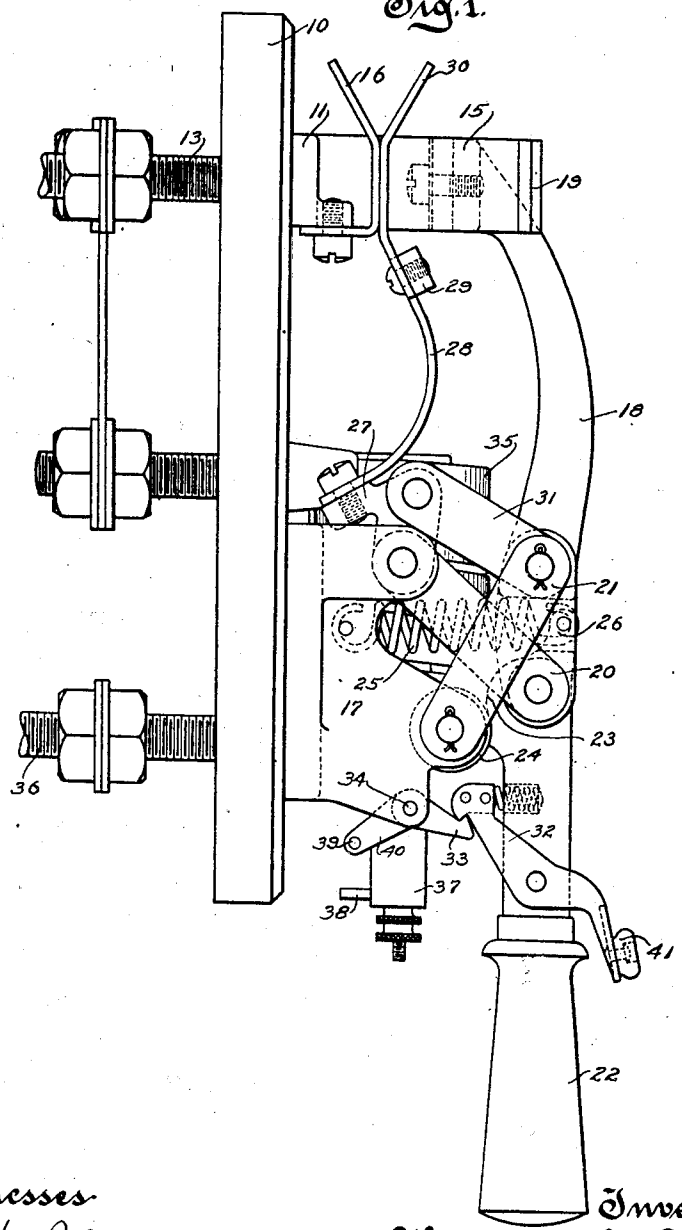
APPLICATION FILED DEC. 12, 1910.

1,115,448.

Patented Oct. 27, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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Inventor

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3 SHEETS—SHEET 2.

Fig. 2.

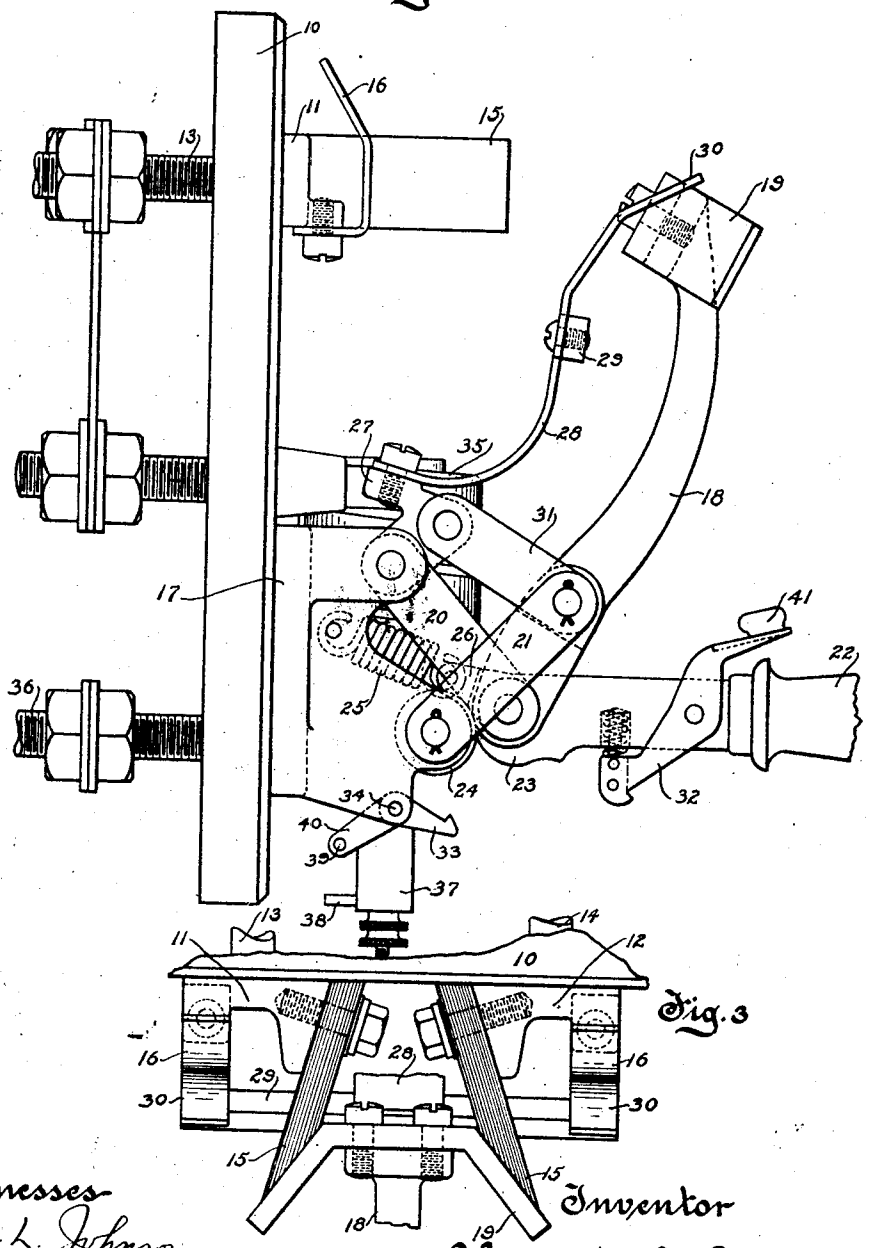


Fig. 3

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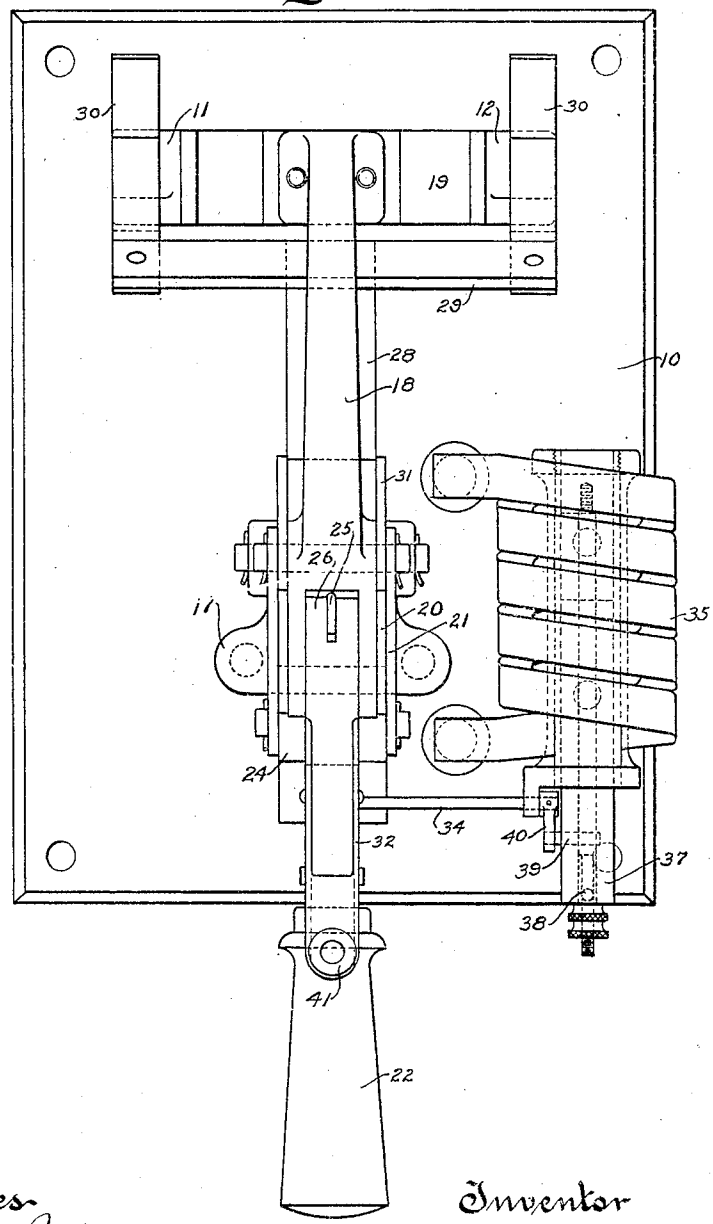
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Fig. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER J. LOGUIN, OF WEST ALLIS, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ALLIS-CHALMERS MANUFACTURING COMPANY, A CORPORATION OF DELAWARE.

CIRCUIT-BREAKER.

1,115,448. Specification of Letters Patent. Patented Oct. 27, 1914.

Application filed December 12, 1910. Serial No. 596,897.

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 Circuit-Breakers, of which the following is a full, clear, and exact specification.

My invention relates to circuit-breakers. Among the objects of my invention are to improve and simplify the construction of circuit-breakers, to cheapen their cost of manufacture, to provide an effective engaging action between the main contacts, and to mount the arcing contacts so that they have a more desirable action in engaging and disengaging.

In carrying out my invention, the movable contact of the switch is mounted on an arm which is connected to a suitable support by crossed links. By reason of this mounting, the engagement of the relatively movable contacts of the switch is effected with a slicing or oblique wiping action. The movable arcing contact is mounted on an arm separate from the main contact-carrying arm, but so mechanically connected thereto that the arcing contacts remain in engagement until some time after the main contacts have separated, and then separate with a comparatively quick motion. The mounting for the main and arcing contacts is capable of use separately or in conjunction. The circuit-breaker may be operated by any suitable means, the preferred operating mechanism being a cam.

The various novel features of my invention will appear from the description and drawings, and will be particularly pointed out in the claims.

Figure 1 is a side view of my improved switch or circuit-breaker in closed position. Fig. 2 is a side view of the same switch in open position; Fig. 3 is a partial plan view of the same switch; and Fig. 4 is a front view thereof.

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 to suitable bolts 13 and 14 which extend through the base 10 for 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. Each support 11 and 12 also carries a spring arcing contact 16, preferably at the side of the corresponding group of laminæ 15. On the base 10 is also a support 17 for the movable parts of the switch. An arm 18, carrying at its outer end the main movable contact 19, is mounted on the support 17 by two crossed links or pairs of links 20 and 21. The support 17, the arm 18, and the links 20 and 21 form a complete linkwork. A handle member 22 is pivoted to some suitable part of the linkwork, preferably the pivotal point between the link 20 and the arm 18, and is provided with a cam 23 which coöperates with a roller 24 on the support 17 to cause the movement of the arm 18. A spring 25 extends from the support 17 to a projection 26 from the handle member 22, and tends to move the switch parts into the position shown in Fig. 2. An arm 27, mounted on the support 17, carries a spring arm 28 on the end of which is a cross piece 29 carrying the movable arcing contacts 30, which coöperate with the stationary arcing contacts 16. The arm 28 is connected by a link 31 to the arm 18 or some other suitable point of the linkwork, preferably at the pivotal point between the link 21 and the arm 18. The switch is shown in open position in Fig. 2.

By depressing the handle 22 the cam 23 forces the lower end of the arm 18 to the right, causes the links 20 and 21 to swing in a counter-clockwise direction about their fixed pivots on the support 17, and thus causes the upper end of the arm 18 to move to the left to bring the movable contact 19 toward the groups of laminæ 15. By reason of the link 31, this movement causes the arm 27 to swing in a counter-clockwise direction to bring the arcing contacts 30 into engagement with the arcing contact 16. After the arcing contacts have been brought into engagement, the continued movement of the handle 22 causes the beveled surfaces of the two sides of the main contact 19 to engage the two groups of laminæ 15, and as they engage to slide thereon with an oblique slicing motion which is very effective to keep the contacts clean. The spring arms 28 bend to allow this continued motion of

the handle 22, but because of the way the link 31 is connected they need not bend very greatly, for the first part of the closing movement of the arm 18 produces the greatest part of the closing movement of the arm 27. The cam 23 and the linkwork are so designed that the contact 19 is forced against the laminæ 15 with considerable pressure, but because of the arrangement of the parts the stresses in the links 20 and 21 are entirely tensional and their dimensions may be comparatively small.

When the parts have been brought fully into the position shown in Fig. 1, a latch 32 on the handle member 22 engages a latch 33 mounted on a shaft 34 carried by the support 17. The switch is now closed, and current may pass from the bolt 13 through the support 11, one group of laminæ 15, the movable contact 19, the other group of laminæ 15, the support 12, and the bolt 14. From the bolt 14, the circuit may extend, by suitable connections, through the overload coil 35 to the switch terminal 36. In case of an overload, the coil 35 lifts its core 37, and a pin 38 carried by the core engages a pin 39 carried by an arm 40 mounted on the shaft 34. This disengages the latch 33 from the latch 32 and causes the switch to open. The parts 32 and 33 may also be disengaged manually, if desired, by a thumb button 41 on the latch 32. Upon such disengagement, the spring 25, which was expanded when the parts were in the position shown in Fig. 1, contracts to move the parts to the position shown in Fig. 2, thus opening the switch. In this opening movement the contact 19 leaves the groups of laminæ 15 while the arcing contacts 30 and 16 are still in firm engagement, and only after the movable contact 19 has moved some distance away from the laminæ 15 is the arm 27 moved sufficiently to separate the movable arcing contacts 30 from the stationary arcing contacts 16. Then the movement of the arcing contact 30 is comparatively rapid, so that any arc which may be formed is almost immediately broken.

Many modifications may be made in the precise arrangement shown and described. For instance, the switch may be a single break switch, the two groups of laminæ 15 then being permanently connected together and the arm 18 serving as a current-carrying arm. All such modifications which do not involve a departure from the spirit and scope of my invention I aim to cover in the following claims.

What I claim as new is:

1. In a switch, the combination of a support, an arm mounted on said support by means of two crossed links, a contact carried by said arm, and another contact coöperating with the first.

2. In a switch, the combination of a stationary contact, a support, two crossed links pivoted at different centers on such support, an arm to which the free ends of such links are pivoted at different points, and a contact carried by said arm and coöperating with said fixed contact.

3. In a switch, the combination of a fixed contact, a support, an arm, two links pivoted both to the support and to the arm at different centers on each, the two links crossing each other, and a contact carried by said arm and coöperating with said fixed contact.

4. In a switch, the combination of a support, an arm, a pair of crossed links connecting said arm to said support, a cam mounted on the arm and coöperating with said support, and a pair of relatively movable contacts one of which is carried by said arm.

5. In a switch, the combination of a group of laminated contacts, a contact plate coöperating therewith and movable relatively to the engaging surfaces of the laminæ, such movement being oblique both to the plane and to the edges of the laminæ, and operating means comprising crossed links for effecting said movement.

6. In a switch, the combination of a group of laminæ with their ends arranged in a plane, a contact plate movable into and out of engagement with the ends of the laminæ and having a slicing movement relative to the edges of the laminæ, and operating means comprising crossed links for effecting such movement.

7. In a switch, the combination of a support, an arm carrying a main contact, a separate arm carrying an arcing contact, a link connecting the two arms, a second link between said support and the point of connection of said first link to said main contact arm, and operating means for causing said main contact arm to move in a definite path.

8. In a switch, the combination of a support, an arm carrying a main contact, another arm carrying an arcing contact, a link connecting the two arms, and means for effecting their movement comprising a cam member connected to said main contact and engaging a portion of said support.

9. In a switch, the combination of a pair of fixed contacts, an arm carrying a contact, a separate arm carrying another contact, a link connecting said arms, and means for effecting the operation of said two arms to bring said movable contacts into engagement with said fixed contacts, said means comprising a pair of crossed links.

10. In a switch, the combination of a support, an arm carrying a main contact, a separate arm carrying an arcing contact, a link connecting said two arms, and a plurality of links independently connecting

said support and one of said two arms at different points along said latter arm.

11. In a switch, the combination of a support, an arm carrying a main contact, a separate arm carrying an arcing contact, a link connecting the two arms, links connecting said suport at two different points to one of said two arms, and means for effecting the operation of said links and arms.

Milwaukee, Wis., Dec. 9, 1910.

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

ALEXANDER J. LOGUIN.

Witnesses:
CHAS. L. BYRON,
TEKLA BAST.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."