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1,647,010

G. S. MARSTON

ELECTRIC CIRCUIT BREAKER

Filed April 1, 1927

Fig. 1. 11

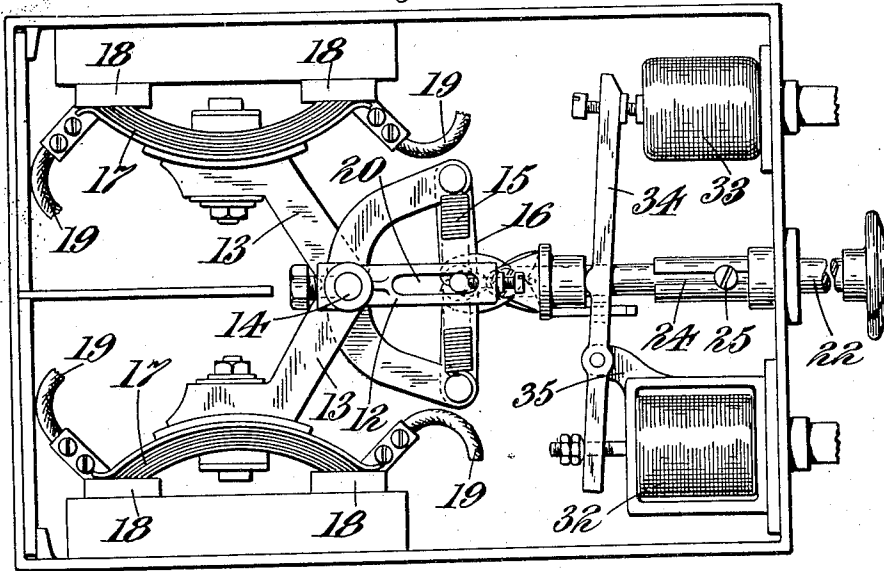
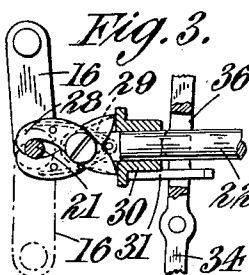
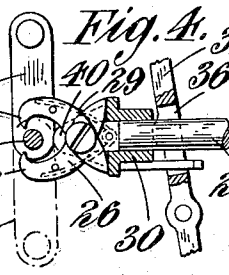
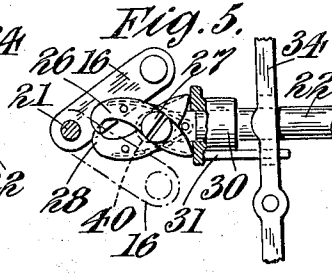
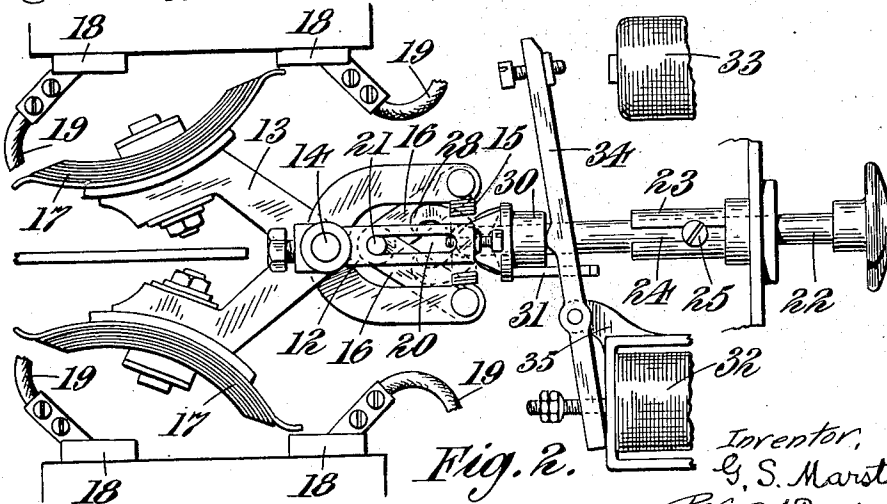


Fig. 2.

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UNITED STATES PATENT OFFICE.

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ELECTRIC-CIRCUIT BREAKER.

Application filed April 1, 1927, Serial No. 130,213, and in Great Britain April 12, 1926.

This invention has relation to electric circuit breakers or switches and it has for its object the provision of improvements by means of which certain advantages shall be obtained.

In order that the invention may be clearly and readily understood, reference will now be made to the embodiment illustrated, to some extent diagrammatically, on the accompanying sheet of drawings.

Fig. 1 is a view showing the parts of the mechanism in the positions they occupy when the circuit breaker is closed.

Fig. 2 is a view showing the parts of the mechanism in the positions they occupy when the circuit breaker has just been opened.

Figs. 3, 4 and 5 are detail views and show parts of the mechanism in different positions and to a larger scale than Figs. 1 and 2.

11 is a casing in which the parts of the circuit breaker are contained and mounted. 12 is a frame or standard mounted on the back wall of the casing 11 and in which a pair of arms 13 is pivotally mounted on a pin 14. The arms 13 are connected together at their one end by a spring or springs 15 and by the members of a toggle 16 and at their other ends carry contact making and breaking members 17 that co-operate with fixed contacts 18 mounted on the side walls of the casing 11 and to which the electric leads 19 are connected. The spring 15 tends to maintain the arms 13 in positions in which the contact making and breaking members 17 are out of contact with the contacts 18. The frame 12 has a longitudinal slot 20 with which the knuckle pin 21 of the toggle 16 engages and by which it is guided. 22 is a push-pull rod mounted in a bearing 23 and extending to the outside of the casing 11. The bearing 23 is itself mounted on one of the end walls of the casing 11 and has a longitudinal slot 24 with which a pin 25 on the rod 22 engages. The rod 22 is thus constrained to rectilinear movement only. The free or inner end of the rod 22 is recessed and on this portion a pair of arms 26 is pivotally mounted on a pin 27. The one end of each of the arms 26 is hooked as indicated at 28. The arms 26 are subject to the action of a spring 29 which tends to cause the hooked ends 28 to overlap. 30 is a sleeve loosely mounted on the rod 22 and constrained as hereafter men-

tioned to rectilinear movement only. The sleeve 30 is adapted to co-operate with and actuate the arms 26. 32 is a "no-volt" release coil and 33 is the coil of an "over-load" tripping device. 34 is a lever pivotally mounted on a bracket 35. The rod 22 passes through the lever 34 and the hole 36 provided for this purpose is such that an extension 31 on the sleeve 30 can also pass therethrough. The hole 36 is further such that by reason of the engagement of the extension 31 therewith the sleeve 30 is restrained against rotary motion.

The operation is as follows:—

The circuit breaker is open at which time the contact making and breaking members 17, arms 13, toggle 16 and spring or springs 15 are in the position shown in Fig. 2 and the hooked ends 28 of the arms 26 are in engagement with the knuckle pin 21 of the toggle 16. To close the circuit breaker, the rod 22 is pulled outward and through the hooked arms 26 causes the knuckle pin 21 to travel along the slot 20 of the frame 12. The members of the toggle 16 are thus moved into line and the arms 13 are moved to bring the contact making and breaking members 17 into contact with the contacts 18. The arms 26 and toggle 16 now occupy the positions shown in Fig. 3. The circuit breaker is now closed and will so remain until the rod 22 is pushed inward or the device controlled by the coil 32 or the coil 33 is actuated. When the rod 22 is pushed inward its free end 40 comes into contact with the knuckle of the toggle 16 as shown in Fig. 4. When this happens, the toggle 16 is broken the spring 15 acting on and moving the arms 13 in directions to separate the contact making and breaking members 17 and contacts 18. If one of the devices controlled by the coil 32 or 33 become operative, the lever 34 is rocked to the position shown in Fig. 4, and acts on the sleeve 30 to move it endwise. The sleeve 30 during this movement acts on the arms 26 and causes their hooked ends 28 to move apart clear of the knuckle pin 21 of the toggle 16 as shown in Fig. 4. The movement of the sleeve 30, when the arms 26 are fully separated, is also imparted to the rod 22 and its end 40 is caused to contact with the knuckle of the toggle 16 which is thereby broken as before. The circuit breaker can be reset by inward movement of the rod 22, thereby causing the hooked ends 28 of the arms 26 to engage the

knuckle pin 17, after which the rod 22 is pulled outward.

What I claim is:—

1. A circuit breaker comprising a pair of
5 arms pivoted on a common pivot and each
carrying at one end a contact making and
breaking member, toggle mechanism con-
necting the other ends of said arms, fixed
10 contacts to co-operate with said contact
making and breaking members and means to
make and break the toggle and to move the
arms to close or open the circuits.

2. A circuit breaker comprising a pair of
15 arms pivoted on a common pin, and each
carrying at one end a contact making and
breaking member, toggle mechanism and
spring means connecting the other ends of
said arms, fixed contacts to co-operate with
said contact making and breaking members,
20 a push-pull rod and a pair of arms pivot-
ally mounted on said rod on a common pin
and having hooked ends to engage the
knuckle pin of the toggle.

3. A circuit breaker comprising a pair of
25 arms pivoted on a common pin, and each
carrying at one end a contact making and

breaking member, toggle mechanism and
spring means connecting the other ends of
said arms, fixed contacts to co-operate with
said contact making and breaking members, 30
a push-pull rod, a pair of arms pivotally
mounted on said rod on a common pin and
having hooked ends to engage the knuckle
pin of the toggle and means on said push-
pull rod to open the circuit breaker. 35

4. A circuit breaker comprising a pair of
35 arms pivoted on a common pin, and each
carrying at one end a contact making and
breaking member, toggle mechanism and
spring means connecting the other ends of 40
said arms, fixed contacts to co-operate with
said contact making and breaking members,
a push-pull rod, a pair of arms pivotally
mounted on said rod on a common pin and
having hooked ends to engage the knuckle 45
pin of the toggle, and endwise movable
sleeve on said push-pull rod to open said
hook ended arms and means to actuate said
sleeve.

Dated this 10th day of March, 1927.

GORDON MARSTON.