W. E. RUSSELL.

CIRCUIT CLOSER.

APPLICATION FILED DEC. 11, 1913.

1,119,043.

Patented Dec. 1, 1914.

2 SHEETS—SHEET 1.

FIG. 1.

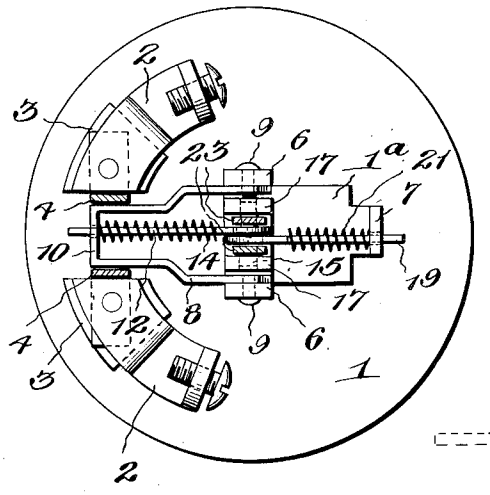


FIG. 2.

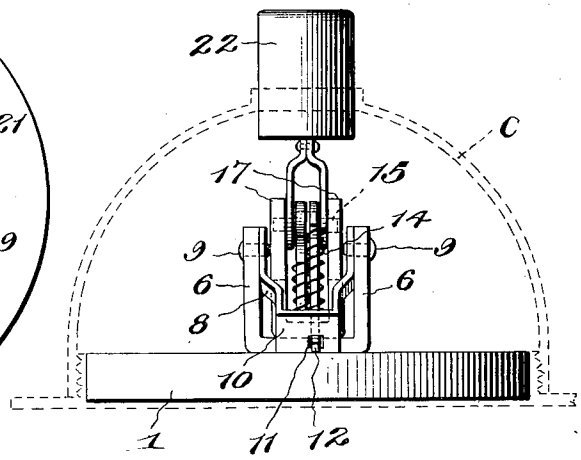


FIG. 3.

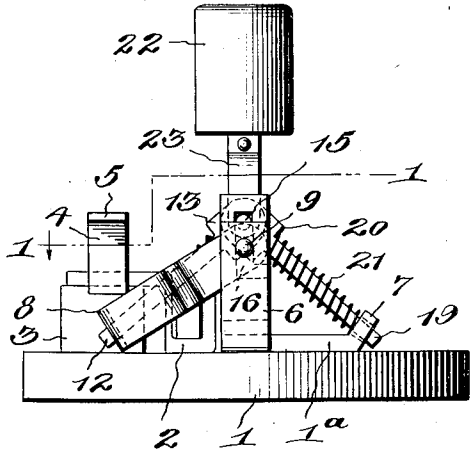
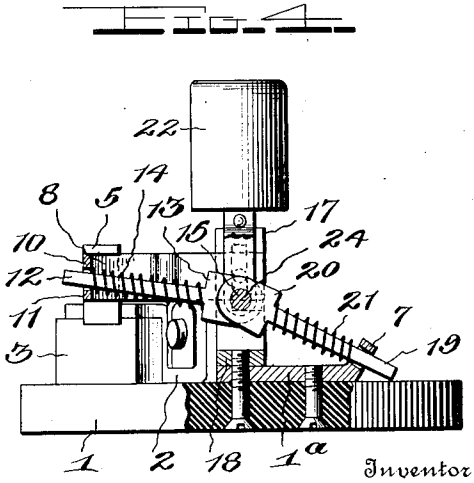


FIG. 4.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

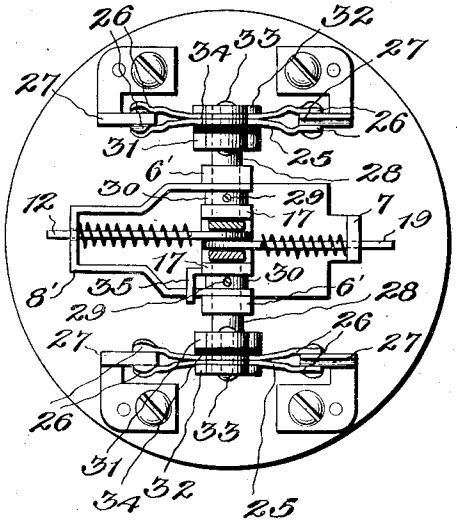


Fig. 6.

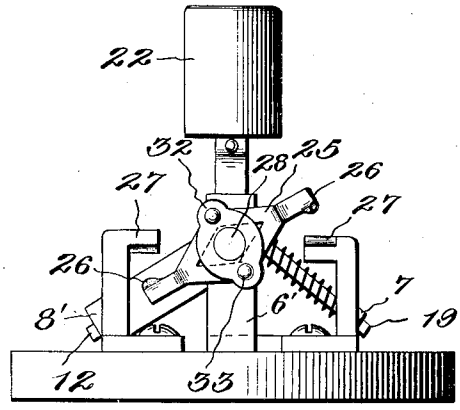


Fig. 7.

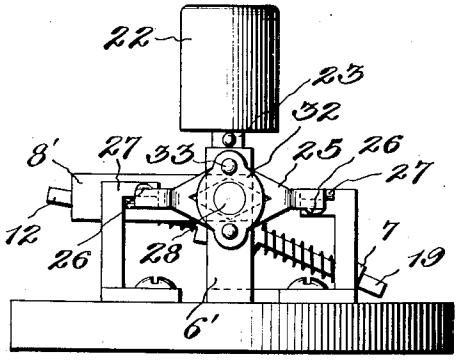


Fig. 8.

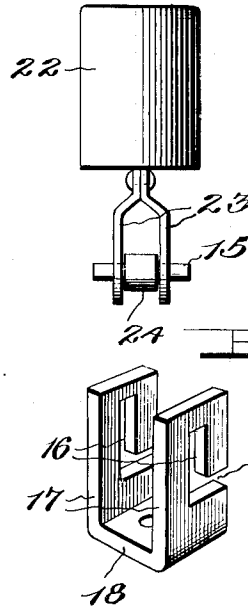


Fig. 9.

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CIRCUIT-CLOSER.

1,119,043. Specification of Letters Patent. Patented Dec. 1, 1914.

Application filed December 11, 1913. Serial No. 805,957.

To all whom it may concern:

Be it known that I, WILLIAM EARL RUSSELL, a citizen of the United States, residing in the city of Danbury, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Circuit-Closers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in circuit closers, and relates more particularly to circuit closers of the type employed in connection with door bells, elevator signals, and the like, operated by high voltage currents.

The primary object of the invention is to provide a circuit closer which effects lightning-like rapidity of movement of the movable contact member to make and break positions.

Further the invention aims to provide a circuit closer which has novel and improved means for positively effecting the stated exceedingly rapid movement of the contact member, and to also provide a device of the type mentioned which is certain and effective in its movements.

In the drawings: Figure 1 is a section taken on the line 1—1 of Fig. 3; Fig. 2 is an end elevation, the terminals and stationary contact members being omitted; Fig. 3 is a side elevation; Fig. 4 is a side elevation partly broken away and in section illustrating the parts in position to close the circuit; Fig. 5 is a top plan view of a modified form of the invention for use with double pole circuits; Fig. 6 is a side elevation of Fig. 5; Fig. 7 is a similar view showing the parts in position to close the circuit; Fig. 8 is a detail view showing the reciprocal device in end elevation; and Fig. 9 is a detail perspective view of the inner frame.

In proceeding in accordance with the present invention, a base 1 is employed to which the terminals 2 are secured, blocks of insulation 3 being interposed between the base and terminals. Contact members 4 seat on and are secured to the blocks 3 and are disposed beneath the terminals 2, and have electrical contact with said terminals, the contact members 4 having lips 5 which extend toward each other in spaced relation and which provide stops that limit the extent of upward movement of the swinging contact member 8.

Rigidly secured to the base 1 is a frame which has a pair of spaced parallel arms 6 and a perforated upwardly extending guide member 7 located in spaced relation to the arms 6. The contact member 8 is of substantially U-shape and has oscillatory movement, the free ends of its legs being pivoted by means of pins 9 or the like to the arms 6 to enable the member 8 to be moved from the break position shown in Fig. 3 to the make or operative position shown in Fig. 4.

The end 10 of the member 8 is provided with a perforation 11 through which passes the free end of a rod 12, which rod has a head 13 at its inner end, a coil spring 14 surrounding the rod 12 and having its ends abutting the head 13 and the end 10 of the member 8. The head 13 of the rod 12 is pivotally mounted on a pin 15 which latter has vertical reciprocatory movement in the vertical slots 16 formed in the vertical spaced parallel arms 17 of an inner U-shaped frame 18 which latter is attached to the base of the main frame 1^a. The slots 16 preferably having right angular entrances 16^a to enable the pin 15 to be introduced into the slots 16. A rod 19 has its free end passed through the perforation of guide member 7 and has a head 20 on its inner end, which is also pivotally mounted on the pin 15, a spring 21 surrounding the rod 19 and abutting the guide member 7 and head 20 at its ends.

A reciprocal actuator, shown by way of example as a push button 22 has a pair of spaced arms 23 secured thereto, which arms are perforated to receive the ends of the pin 15, the latter having a central enlargement 24 which, contacting with the inner faces of the arms 23, holds the arms 23 in spaced relation.

In operation inward movement of the arms 23, accomplished in the present disclosure by depression of the button 22, will cause the pin 15 to move toward the base 1, the pin moving along the length of the slots 16, until the pin 15 passes the pivotal points 9 of the contact member 8, and at the moment of passing, the rod 12 will have its head 13 moved to lowered position, below the pivots 9, thus causing the spring 14, which has been compressed, to move the contact member 8 with great rapidity from the position shown in Fig. 3 to that shown in Fig. 4. As soon as the button 22 is released, the spring 21 which has also been compressed by the stated movement of the

pin 15, will exert pressure on the pin 15 and restore the parts to normal position shown in Fig. 3. In Fig. 2 the inclosing casing *c* is shown in dotted lines, the button 22 being guided in its reciprocal movements by the wall which the opening, formed to receive said button, provides.

From the above it will be apparent that two independent springs are utilized, one being for the purpose of moving the swinging contact member with great rapidity to closed or make position and the other for the purpose of returning the swinging contact member to open or break position.

In the form of the invention shown in Figs. 5, 6 and 7, a double pole type of switch or circuit closer is disclosed, which differs from the aforedescribed form of the invention in the following respects:

The lever 8′ which operates and is constructed identical with the contact member 8 of the single pole type is not employed as a contact member, though carrying and used to actuate a pair of contact arms 25 which latter at each of their ends have spring fingers 26 which receive the knife-edge terminals 27. The lever 8′ is pivoted to the arms 6′ of the main frame by means of studs 28, which studs are rigidly secured by means of screws 29 to hubs 30 which are secured to the arms of the lever 8′ whereby movement of the lever effects movement of the studs therewith. The outer ends of the studs 28 are formed with heads 31 to which clamping plates 32 are connected by means of rivets 33, or the like, the plates 32 engaging the contact arms 25 and the latter in turn engaging insulation 34 which abuts the heads 31. In order to limit the upward movement of the contact arms a stop 35 is secured to one of the arms 17 of the inner frame 18.

It is particularly to be noted that upon depression of the push button 22, that power is stored in the springs 14 and 21, and upon continued movement of the push button, the power in the spring 14 is enabled to move the member 10 to make position, with great rapidity, since the inner end of the rod 12 has been moved in a plane below that in which the pivotal points 9 of member 10 lie. Also, when the push button is forced inwardly, the independent pivot pin 15 is arrested by the walls at the inner ends of the slots 16, and, on the reverse movement of said button, said pin is arrested by the walls at the outer ends of said slots, this operation of the pivot pin 15 between prescribed limits being obviously for the purpose of preventing any overthrow of such pin in either direction.

It will be noted that the push button is operated in direct line with the pivot pin 15, which renders the operation of my device exceedingly easy, requiring as it does a minimum of force to effect the reciprocal movements of said pin.

What is claimed is:

1. In a circuit closer, a pivoted contact member, a pair of independent springs connected to said member and means to actuate the springs to cause one of same to move said member to make position and the other to move said member to break position.

2. In a circuit closer, a pivoted contact member, a pair of rods one of which has sliding engagement with said member, means to guide the other rod, a pin to which each rod is pivoted, means to allow sliding movement of the pin, means to actuate the pin to slide same, and springs surrounding the rods and engaged with said member and said guiding means respectively.

3. In a circuit closer, a pivoted lever for closing and opening a circuit, an element capable of reciprocations in a plane coincident with the plane in which said lever swings from its pivotal point, said element in its reciprocations passing the pivoted point of said lever in both directions, spring actuated devices carried by said element and operating to throw said lever to make and break positions when said element is reciprocated, and manually operated means for forcing said element inwardly against the resiliency of said springs, the latter operating to restore the parts to normal position.

4. A circuit closer, comprising a pivoted make and break element, a pair of angularly disposed members independently pivoted together in a plane normally beyond the plane of the pivotal point of said element, one of said members having its outer end slidably housed in a stationary block while the other member has its outer end slidably housed in said element, springs associated with said members to retain them in their normal positions, and manually operated means for forcing the pivotal point of said members to a plane within the plane of the pivotal point of said element and against the resiliency of said springs, whereby the partial recovery of the latter will immediately throw said element to close a circuit, while the complete recovery of said springs will restore said element to normal position to open a circuit immediately on the release of said means.

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

WILLIAM EARL RUSSELL.

Witnesses:

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CHRISTIAN QUIEN.