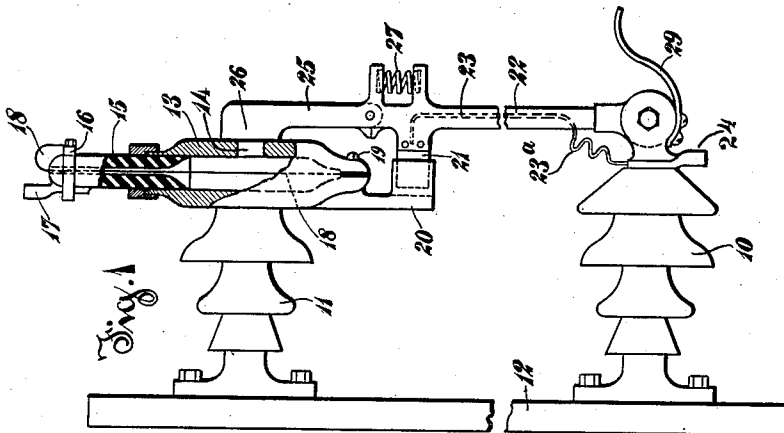
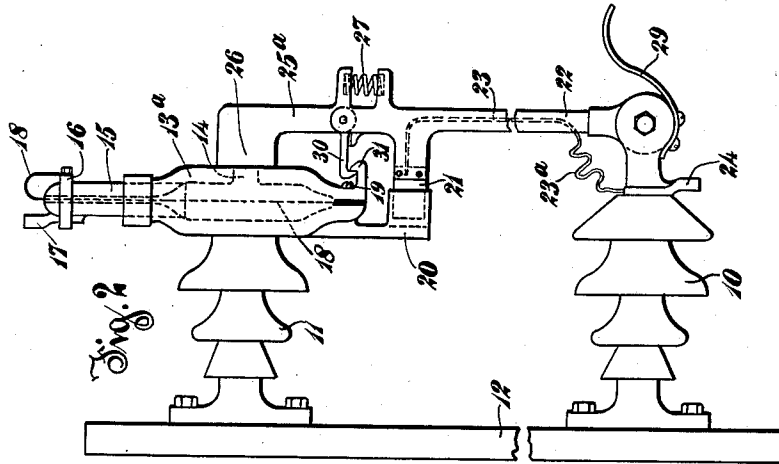


W. J. LIETZENMAYER.
EXPULSION FUSE CIRCUIT BREAKER.
APPLICATION FILED APR. 15, 1907.

1,021,054.

Patented Mar. 26, 1912.



Witnesses

Oscar Schuman
Fred J. Kinsey

Inventor
William J. Lietzenmayer
By
Chas. E. Lord
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM J. LIETZENMAYER, OF WEBSTER, NEW YORK, ASSIGNOR TO ALLIS-CHALMERS COMPANY, A CORPORATION OF NEW JERSEY, AND THE BULLOCK ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF OHIO.

EXPULSION-FUSE CIRCUIT-BREAKER.

1,021,054.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed April 15, 1907. Serial No. 368,184.

To all whom it may concern:

Be it known that I, WILLIAM J. LIETZENMAYER, a citizen of the United States, residing at Webster, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Expulsion-Fuse Circuit-Breakers, of which the following is a full, clear, and exact specification.

My invention relates to circuit interrupting devices.

In modern high tension electrical transmission systems special protective apparatus is required, as the ordinary circuit-breakers are not adapted to provide a separation between their terminals sufficient to break the arcs which form. Moreover the ordinary circuit-breaker is so slow in acting that it allows current to continue long enough both to defeat the object of the circuit-breaker and to cause injury to the circuit-breaker itself. These same objections apply even where simple fuses are used.

It is the object of my present invention to provide an arrangement whereby under abnormal conditions an electric circuit will be interrupted sufficiently quickly and by a break sufficiently wide to prevent a continuance of the current for any appreciable time.

It has been found that the pressure generated by the blowing of an inclosed fuse is almost explosive in its nature, the pressure instantaneously produced in the fuse chamber often becomes enormous. In my device I aim to use the pressure suddenly developed by this blowing of the fuse to move to off position a circuit-breaker arm which is in series with the fuse, thus obtaining an almost instantaneous interruption of the circuit.

My invention therefore comprises the combination of a fuse, and a switch arm arranged to be moved from one position to another by pressure generated by the blowing of said fuse.

Other features of my invention will appear from the description and drawings and will be particularly pointed out in the claims.

Figure 1 shows one embodiment of my invention; and Fig. 2 shows a modification.

In Fig. 1 two high tension insulators 10 and 11 are mounted on a base 12. The upper insulator 11 carries a casing 13 provided

with an outlet 14. Supported at the upper end of the casing 13 is a sleeve, or bushing 15 of insulating material such as fiber. A ring 16 is attached to the upper end of the sleeve 15 and carries a terminal 17 for connection to one side of the circuit. A fuse 18 extends from the ring 16 lengthwise through the bushing 15 and the chamber of the casing 13 to the lower end of said casing, where it is fastened as by means of a screw 19. This forms an expulsion fuse. An extension 20 from the lower end of the casing 13 forms a stationary contact which cooperates with the blade 21 of a switch arm 22 supported on the insulator 10. A wire 23 in conjunction with a shunt 23^a connects the blade 21 with the other line terminal 24. Pivoted to the upper end of the arm 22 is a second arm 25 having an enlarged head 26 which when the switch is closed fits over and closes the outlet 14 from the chamber within the casing 13. A spring 27 normally holds the arm 25 in its extreme counter-clockwise position relative to the arm 22 and acts as a buffer to prevent too great shocks on the arm 22 when the arm 25 is suddenly forced in a clockwise direction.

The circuit is complete from the terminal 17 to the terminal 24 through the ring 16, fuse 18, casing 13, extension 20, switch blade 21, wire 23 and shunt 23^a. In case of an overload, whether the current be alternating, pulsating or direct, the fuse 18 blows. Since the fuse is in the comparatively small space of the chamber within the casing 13 which has but one main outlet 14, a comparatively great pressure is generated by the blowing of the fuse and exerts itself through this outlet upon the head 26, violently forcing this head and the arm 25 in a clockwise direction. This compresses the spring 27 and through it moves the arm 22 quickly and almost violently to the right, causing a nearly instantaneous separation between the extension 20 and the switch blade 21. This separation is great enough to prevent any continuance of the current and sudden enough to prevent any damage before the circuit-breaker has operated. The distance of separation is further increased because the remnant of the fuse 18 is blown suddenly out of the casing 13 through the small opening in the sleeve 15. The buffer spring 29 catches the arm 22.

The modification of Fig. 2 is practically the same as above described with a few slight exceptions. The arm 25^a is provided with a latch 30 which engages a hook 31 on the casing 13^a to normally hold the arm 22 so that the blade 21 is in engagement with the extension 20. This prevents any accidental clockwise movement of the arm 22. When the fuse 18 blows, the arm 25^a is moved to the right to first release the latch 30 and to then carry the arm 22 to the right to put a wider break in the circuit.

Many modifications in the precise arrangements here shown and described may be made without departing from the spirit and scope of my invention and all such I aim to cover in the following claims.

What I claim as new is:—

1. In combination, a fuse, a casing inclosing said fuse and provided with an outlet, and a pivoted switch arm so mounted relatively to said casing that when the arm is in one position said outlet is closed and the switch arm is movable from such position to another position by pressure generated in the casing upon the blowing of the fuse.

2. In combination, a fuse, a casing therefor provided with an outlet, and a switch arm outside of said casing and provided with a part which closes said outlet when said arm is in a closed position.

3. In combination, a fuse, a casing in which said fuse is mounted, said casing being provided with an outlet, and a pivoted switch arm in series with the fuse and so mounted that when it is in a closed position said outlet is closed by a portion of said arm and the switch arm will be blown to open position by the pressure generated in said casing upon the fusing of said fuse.

4. In an overload protective device, a fuse, a casing therefor provided with an outlet, and a switch arm outside of said casing and connected in series with said fuse, said switch arm being mounted so that said outlet is closed thereby when the switch arm is in a closed position.

5. In combination, a switch arm, a latch for holding said switch arm in closed position, a casing provided with an opening which is closed by said latch when the latter holds the switch arm in closed position, and a fuse in said casing, said fuse when it blows generating pressure which alone releases said latch and forces said switch arm to open position.

6. In an overload protective device, the combination of a fuse, a casing in which said fuse is mounted, said casing being provided with an outlet, a switch arm in series with the fuse, and a latch hinged to the switch arm for holding it in closed position, said latch being mounted so that when it holds the switch arm in closed position it closes said opening and is releasable by pressure generated in the casing upon the blowing of the fuse.

7. In an overload protective device, a switch arm, a latch for holding said switch arm in closed position, a casing provided with an outlet which is normally closed by said latch when the switch arm is in closed position, and a fuse connected in series with said switch arm and mounted in said casing so that the pressure generated by the blowing of the fuse releases the latch and blows the switch arm out of said closed position.

8. In combination, a fuse, a casing therefor provided with an outlet, a switch arm, a latch permanently secured to said arm and arranged to hold said switch arm in closed position, and a part attached to said latch and fitting over said outlet so that the pressure generated by the blowing of the fuse alone releases the latch and moves the switch arm away from said closed position.

9. In an overload protective device, the combination of a fuse, an inclosing casing therefor provided with an outlet, a switch arm in series with said fuse, and a latch permanently secured to said switch arm for holding said switch arm in closed position, said latch being mounted so that when it holds the switch arm closed said outlet is covered and the latch will be released and the switch arm forced to open position by the pressure generated in said casing when said fuse blows.

10. In combination, an expulsion fuse, a casing therefor provided with an outlet, and a switch outside of said casing and normally covering said outlet and in series with the fuse and so mounted relatively to said casing that it is forced open solely by the expulsion from said outlet of gases generated by the blowing of the fuse.

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

WILLIAM J. LIETZENMAYER.

Witnesses:

FLORENCE E. MACCURY,
FRED J. KINSEY.