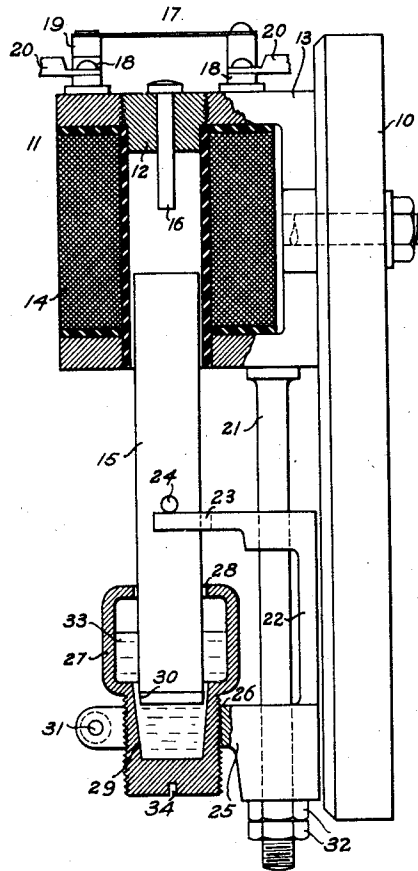


A. J. LOGUIN.
TIME ELEMENT RELAY.
APPLICATION FILED MAR. 23, 1912.

1,217,469.

Patented Feb. 27, 1917.



Witnesses

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UNITED STATES PATENT OFFICE.

ALEXANDER J. LOGUIN, OF NORWOOD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
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TIME-ELEMENT RELAY.

1,217,469.

Specification of Letters Patent.

Patented Feb. 27, 1917.

Application filed March 23, 1912. Serial No. 685,685.

To all whom it may concern:

Be it known that I, ALEXANDER J. LOGUIN, a subject of the Czar of Russia, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Time-Element Relays, of which the following is a full, clear, and exact specification.

This invention relates to time element devices to be used in connection with protective devices for electric circuits.

It is customary to use time element devices of various types in connection with circuit-breakers for interrupting electric circuits in response to abnormal conditions. It is the object of my invention to provide such a time element device which is simple, compact, and inexpensive, and which is adapted to meet all of the requirements for successful commercial operation.

The various novel features of my invention will be apparent from the description and drawing and will be particularly set forth in the appended claims.

The invention is illustrated in the figure of the accompanying drawing, which is a side elevation, parts being in section, of the preferred form of my time element device.

Secured to any suitable insulating support 10 is a magnet 11 having a stationary core 12 screwed into the yoke 13 of the magnet 11. Mounted in the yoke 13 and surrounding a portion of the stationary core 12 is the magnet winding 14 which is adapted, upon abnormal circuit conditions, to actuate the movable core 15. Located within the path of the movable core 15 and slidably mounted in the stationary core 12 is a pin 16 which is adapted to open a switch 17, having stationary and movable contact members 18 and 19 respectively, to the former of which are connected terminals 20 of the circuit to be controlled. The stationary contact members are preferably secured to the upper portion of the magnet yoke 13. Suspended from the magnet yoke 13 is a rod 21 upon which is slidably mounted a supporting member 22 having a projection 23 which limits the downward movement of the movable core 15. The projection 23 is preferably engaged by a pin 24 secured to the movable core 15 and being so placed as to engage the projection 23 when said movable core moves downwardly. The supporting member 22 is also provided with a bi-

furcated projection 25 having a circular threaded portion 26 into which is screwed an adjustable liquid containing receptacle 27 having an opening 28 and a tapered socket portion 29. One end of the movable core 15 is provided with a tapered portion 30 adapted to cooperate with and to extend into the tapered socket portion 29 of the receptacle 27. When the receptacle 27 is properly adjusted within the bifurcated projection 25 a screw or bolt may be passed through an opening 31 formed in the outer portions of said bifurcated projection to clamp said receptacle in the desired position. In order to retain the supporting member 22 in a fixed position the rod 21 is provided with nuts 32 at its lower end against which the support 22 rests.

As shown in the drawing, the circuit protective device with its time element arrangement is in normal operative position, there being no abnormal conditions existing on the circuit. If, however, an abnormal condition should arise the magnet winding 14 would be energized in proportion to such abnormal condition. If the abnormal condition or overload on the circuit should be beyond the safe or adjusted value, the magnet winding 14 would be energized sufficiently to actuate the movable core 15 into the magnet toward the movable pin 16. The movable core is, however, retarded in its upward movement due to the fact that one end of the movable core, which is immersed in liquid 33 in the receptacle 27, is provided with a tapered portion which cooperates with the tapered socket portion of said receptacle. In this liquid containing receptacle there is created a suction which is gradually decreased only by the slow upward movement of the movable core which increases the distance between the tapered portions of the movable core 15 and receptacle 27. The upward movement of the core, however, gradually increases and is accelerated, provided the abnormal condition still exists on the line, until the lower part of the movable core 15 is drawn out of the liquid 33, whereupon said movable core 15 is jerked with great rapidity against the pin 16, forcing said pin upwardly to open the switch 17, breaking the circuit. When the abnormal condition of the circuit ceases, due to its weight, the movable core 15 falls back into its normal position. The recep-

tacle 27 and the lower part of the core with its tapered end 30 constitute, in effect, a dash-pot device, the lower end of the core acting as a piston or plunger element.

5 The retractile position of the core 15 and consequently the air gap between the stationary and movable magnet cores 12 and 15 may be varied by adjusting screws 32 to cause the support 22 to move along
10 the rod 21. In this way the overload responsive device may be made to respond to overloads or abnormal circuit conditions which vary in magnitude. The retardation may be varied by adjusting the receptacle
15 27 relative to the support 22. This adjustment may be effected by inserting a key or screw-driver within the groove 34 of the receptacle 27 and rotating the same. This adjustment will change only the space be-
20 tween the tapered portions of the movable core 15 and receptacle 27. It is to be noted that the adjustment of the receptacle 27 for varying the retarding effect or time element is not only made relative to the support 22,
25 but made independent of any movement of the movable core 15. In other words, the adjustment of the receptacle 27 does not in any manner vary the length of air gap between the stationary and movable cores of
30 the magnet.

There may be various modifications and arrangements of the precise form other than that here shown and described, and I intend to cover all such modifications and arrange-
35 ments which do not depart from the spirit and scope of my invention as set forth in the appended claims.

What I claim as new is:

1. In combination, an electro-magnet pro-
40 vided with an armature movable on the occurrence of a desired condition in the energizing circuit of said electro-magnet, an element adjustably supported in position, a part associated with said armature and co-
45 operative with one portion of said element to variably determine the retractile position of said armature, and a dash-pot device associated with said armature for retarding the movement thereof to attracted position,
50 said dash-pot device comprising relatively fixed and movable coöperative parts, the fixed part of said dash-pot device being mounted on another portion of said element and the movable part of said dash-pot device being operatively connected to said armature and movable therewith.

2. In a retarded circuit breaker, an electromagnet provided with an armature movable in response to a predetermined condition in the energizing circuit of said electro-magnet, an element adjustably supported
60 in position and provided with spaced por-

tions, a part associated with said armature and coöperative with one of said portions to determine the normal position of said
65 armature, and a dash-pot device comprising a receptacle and a piston element, one of the parts of said dash-pot device being adjustably supported by the other of said
70 spaced portions, and the second part of said dash-pot device being associated with said armature and coöperative with the first part of said dash-pot device to retard the movement of said armature on the occurrence of the predetermined condition in the
75 circuit of said electromagnet.

3. In combination, an electromagnet provided with a movable armature, adjustable means for varying the retractile position of said armature, said means comprising an
80 element adjustably supported in position and having a portion coöperative with a part associated with said armature, and means for retarding the movement of said armature to attracted position, said retard-
85 ing means comprising coöperative relatively movable parts, one of said parts being supported in operative position by a second portion of said element and the other of said parts being movable with said arma-
90 ture, said first means being adjustable at all times without danger of affecting the operative relation between the relatively movable parts of the retarding means.

4. In combination, an electromagnet com-
95 prising a fixed part and an armature coöperative therewith and movable on the occurrence of a predetermined condition in the energizing circuit of the electromagnet, an element comprising spaced portions, means
100 associated with the fixed portion of said electromagnet and operative to adjustably support said element in operative position, a part associated with said armature and coöperative with one of said spaced por-
105 tions to variably determine the retractile position of said armature, and means for variably retarding the movement of said armature to attracted position, said means comprising a dash-pot device including a
110 receptacle adapted to contain fluid and a piston element coöperative with said receptacle, one of said dash-pot elements being adjustably mounted on the second one of said spaced portions, and the other one of
115 said dash-pot elements being movable with said armature.

Milwaukee, Wis., Feb. 24, 1912.

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

ALEXANDER J. LOGUIN.

Witnesses:

C. W. STEEN,

C. B. TAYLOR, Jr.