

July 12, 1927.

J. SAMPER

1,635,348

MEANS FOR INDICATING ELECTRICAL OVERLOADS

Filed Jan. 17, 1925

2 Sheets-Sheet 1

Fig. 1.

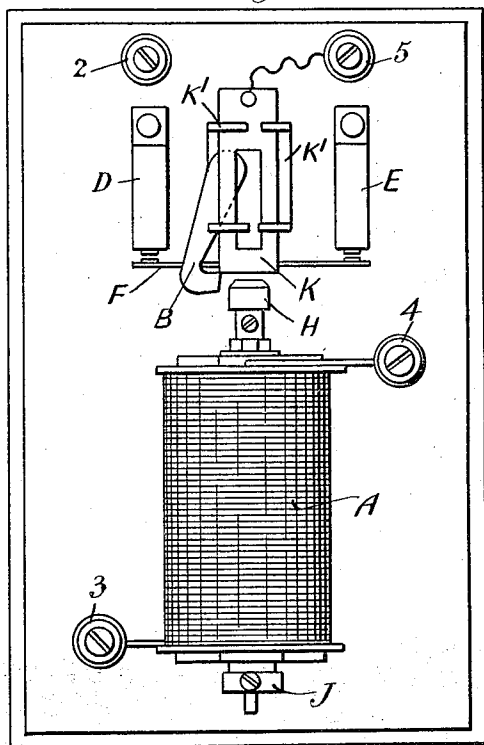


Fig. 2.

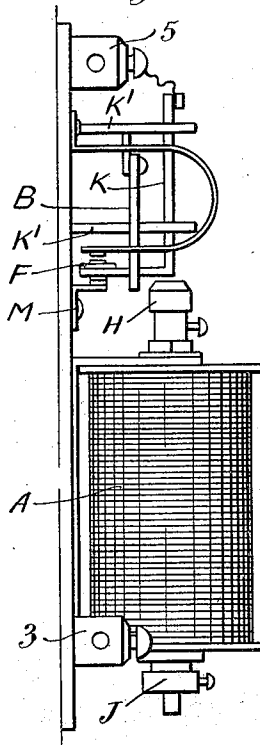
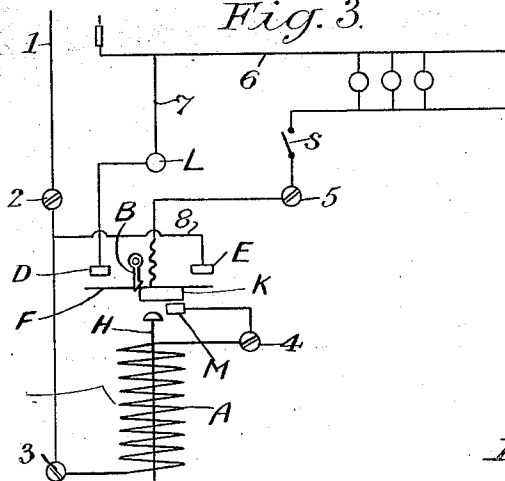


Fig. 3.



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Fig. 4.

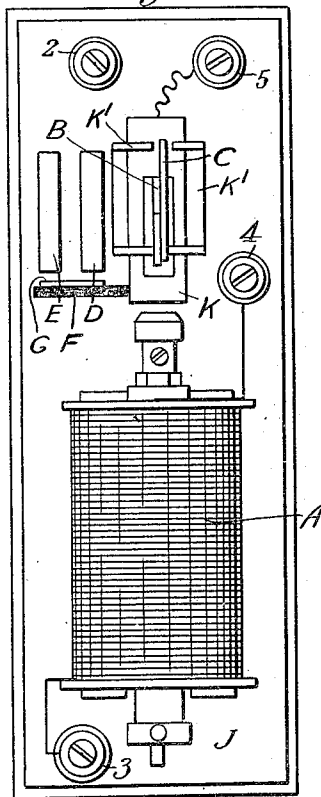


Fig. 5.

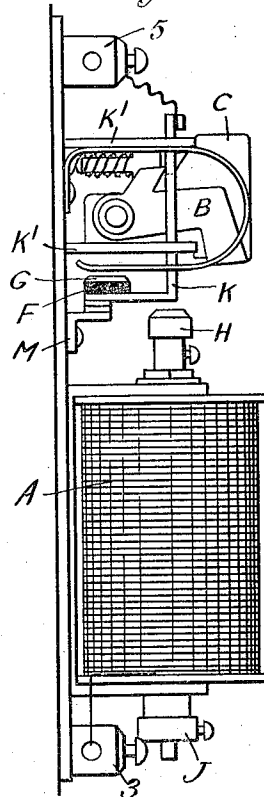
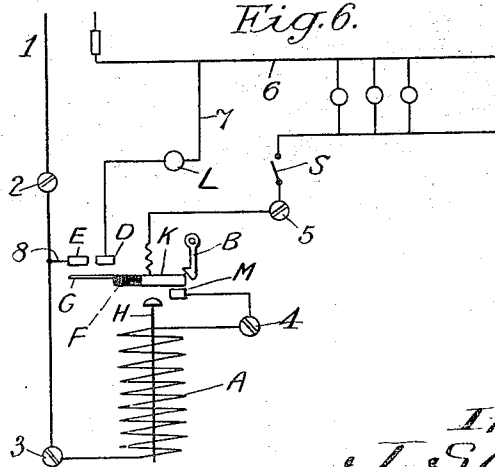


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MEANS FOR INDICATING ELECTRICAL OVERLOADS.

Application filed January 17, 1925, Serial No. 3,121, and in Great Britain October 13, 1924.

This invention relates to means for indicating electrical overloads of the kind which automatically indicates, by means of the movement of the core of a solenoid in the circuit, that the electric installation to which the device is fitted has been subjected to a greater load than that contracted or stipulated between the customer and the firm, company or concern supplying the electric service.

In such devices as heretofore proposed the solenoid core has been secured to a pivoted switch which is normally closed but is opened by the movement of the core caused by excess load in the installation whereupon the current is shunted through an electrical lamp circuit, the parts remaining in this position and only returning to normal when the current taken off decreases to the predetermined limit.

According to my invention the parts of a two-part contact are separated by the direct action of the solenoid core on one of them, the displaced part being held in the out-of-action position by a hook which automatically falls into position under the displaced part of the contact, the device being returned to the normal only when the hook is released.

Two methods of carrying out my invention are used. In the first case the apparatus, when receiving an overload, ignites the lamp without cutting off the supply to the installation, but leaving a visual indication that the predetermined load has been exceeded. In the second case the apparatus not only visually indicates the overload but cuts off the supply to the installation. In both cases the lamp remains alight until the operator again returns the installation to its normal working condition.

The invention is illustrated in the accompanying drawings wherein:—

Figs. 1 and 2 are respectively front and side elevations of the first form of the apparatus and Fig. 3 is a diagram showing the electrical circuits of the same; and

Figs. 4 to 6 are similar views of the modified form of the apparatus.

The same parts are lettered to correspond in all the figures.

Referring first to Figs. 1 to 3. A is a coil of wire, wound on a bobbin, in series with the electrical installation used, and within the bobbin is movably mounted a soft iron core H.

One end of the wire A is connected with

the supply line 1 by screws 2 and 3; the other end passes through a connection 4 to a contact piece M.

When the installation is working normally the current from the supply line 1, passes through the coil A and thence to the contact piece M, which is in contact with a movable member K, and from there through a connection 5 to the installation, passing through a switch S outside the apparatus direct to the installation. The supply line 1 has a branch line 8 terminating in a contact piece E located in the path of a contact plate F carried by the movable member K; and the return line 6 from the installation, has a branch line 7 passing through a lamp L, which forms part of the apparatus, and terminating in a contact piece D, which is also located in the path of the plate F on the movable member K. K' K' are guides, fixed to the apparatus, between which the member K moves.

Now if the installation is subjected to an overload, i. e., to a load beyond the predetermined limit, the soft iron core H becomes sufficiently magnetized to raise and hold up the movable member K which upon being raised breaks the contact at M, and establishes connection between the contacts D and E by means of the contact plate F. B is a hook pivoted to some fixed part of the apparatus and lying in the path of the member K. The moment the member K is raised, the hook engages its undersurface and maintains the member K in the raised position until released.

Upon examining the diagram (Fig. 3) it will be seen that, when the contact is broken at M, the coil A is cut out of the circuit whilst the member K establishes another path for the current to the installation which then passes from the supply line 1 through the branch line 8 to the contact E, and from there through the movable member K to the installation, without the supply being interrupted except momentarily during the movement of the member K to the raised position. The same member K also connects up the current between the contacts F and D and branch line 7 thereby igniting the lamp L which indicates the overload and remains ignited until the operator arrives and restores the apparatus to its original position.

The modified type shown in Figs. 4 to 6 consists of the same component parts, although otherwise arranged. The working

of this form is as follows:—If a greater supply of current is taken than the predetermined limit for which the apparatus is set, the core H rises and breaks the circuit at the 5 contact M by raising the movable member K (Fig. 6) thus throwing the installation out of circuit. Secured to the member K, but electrically insulated therefrom, is a metallic member G which establishes connection 10 between the contacts D and E, thereby igniting the lamp L in the branch line 7. The hook B, upon the raising of the member K, seizes the latter and maintains it in the raised position until the apparatus is restored to its 15 original position, which is effected by pressure on the spring member C, which acts on the hook.

In both types of apparatus the hook B is in a locked box under the control of the operators. The two types of apparatus are 20 adjustable, within the limits of their capacity, for a determined load, and this is effected by unscrewing the set screw from the collar J located in the lower part of the guide tube 25 for the core and adjusting said collar so as to raise or lower the initial position of the core.

I claim:

1. In a device for indicating electrical 30 overloads, a supporting base, a normally contacting fixed contact and a movable contact carried by the base, additional fixed contacts to be bridged by the movable contact when displaced from the normal position, one of 35 said additional contacts being in circuit with an electrical source through a signal, overload operated electromagnetic means for moving said movable contact from its normal position to its contact bridging position,

the first mentioned fixed contact, the movable contact, and the electromagnetic means being in series with the electrical load. 40

2. In a device for indicating electrical overloads, a supporting base, a normally contacting fixed contact and a movable contact 45 carried by the base, additional fixed contacts to be bridged by the movable contact when displaced from the normal position, one of said additional contacts being in circuit with an electrical source through a signal, overload operated electromagnetic means for 50 moving said movable contact from its normal position to its contact bridging position, and means for retaining the movable contact in the bridging position, the first mentioned fixed contact, the movable contact, 55 and the electromagnetic means being in series with the electrical load.

3. In a device for indicating electrical overloads, a supporting base, a normally contacting fixed contact and a movable contact 60 carried by the base, additional fixed contacts to be bridged by the movable contact when displaced from the normal position, one of said additional contacts being in circuit with an electrical source through a signal, overload operated electromagnetic means for 65 moving said movable contact from its normal position to its contact bridging position, and an automatically acting hook for maintaining the movable contact in the bridging position, the first mentioned fixed contact, the 70 movable contact, and the electromagnetic means being in series with the electrical load. 75

In testimony whereof I have hereunto set my hand this twelfth day of December, 1924.

JOAQUIN SAMPER.