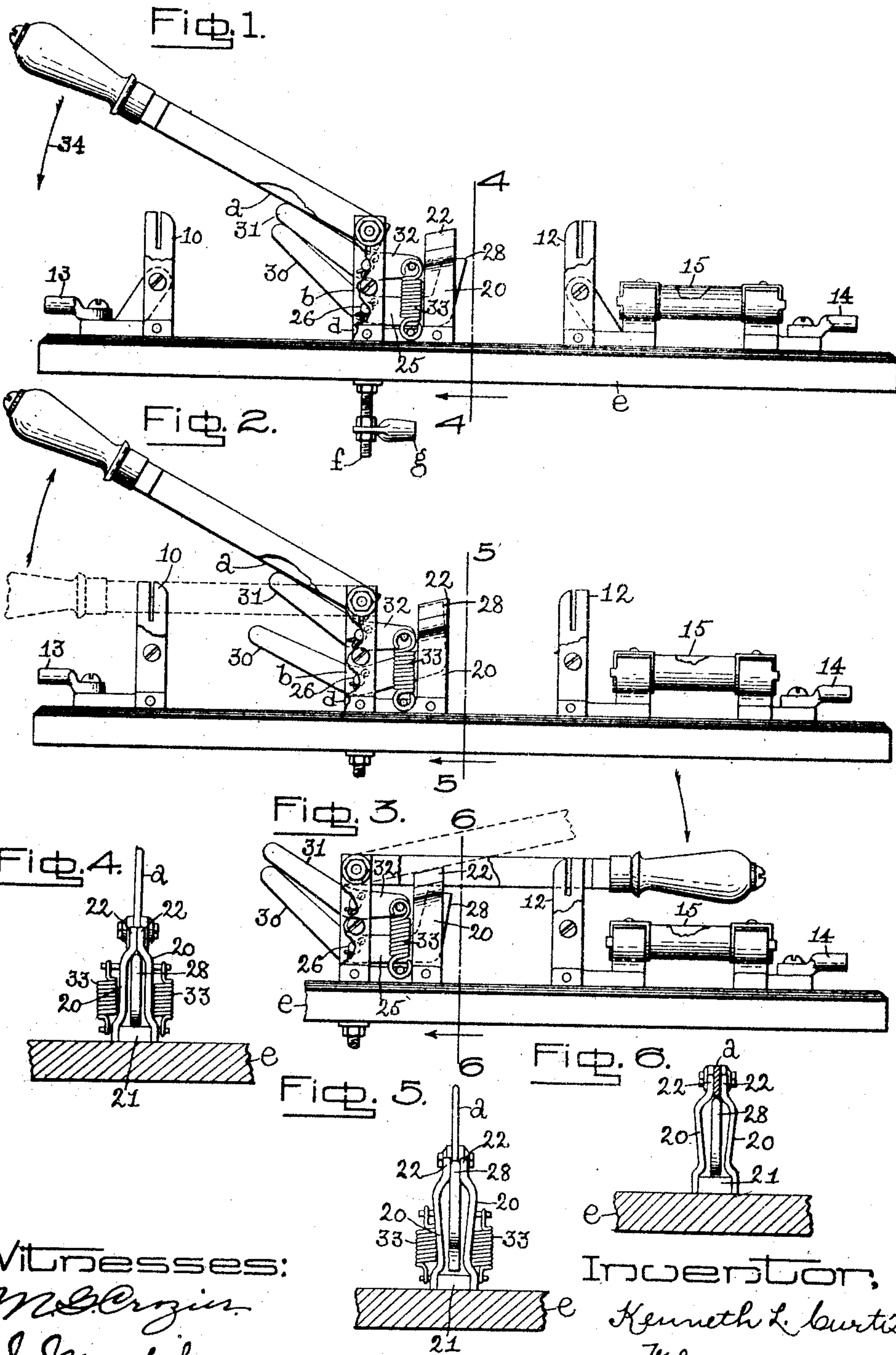


K. L. CURTIS.
CIRCUIT CONTROLLER.
APPLICATION FILED MAY 4, 1910.

969,607.

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UNITED STATES PATENT OFFICE.

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CIRCUIT-CONTROLLER.

969,607.

Specification of Letters Patent.

Patented Sept. 6, 1910.

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To all whom it may concern:

Be it known that I, KENNETH L. CURTIS, a citizen of the United States, residing in Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Circuit-Controllers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a circuit controller of that class having a movable contact member, which is located between two sets of stationary contact members and coöperates with both.

The present invention has for its object to provide a circuit controller of the class described, with means to compel the movable contact member to be moved a predetermined distance toward and preferably into engagement with one set of stationary contact members in order to enable it to be engaged with the second set of stationary contact members. The means referred to may and preferably will be made in the form of a stop, which is normally in the path of movement of the movable contact member and is laterally movable out of said path, by means actuated by the movable contact member. Provision is also made for automatically returning the movable contact member back into its normal position in case it is released by the operator after the said member is engaged with the first set of stationary contact members. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of a circuit controller embodying this invention. Fig. 2, a side elevation with stop mechanism in position to permit the movable contact member to be engaged with the second set of stationary contacts. Fig. 3, a detail in side elevation showing the movable member engaged with the second set of contacts. Fig. 4, a detail in section on the line 4—4, Fig. 1. Fig. 5, a detail in section on the line 5—5, Fig. 2, and Fig. 6, a detail in section on the line 6—6, Fig. 3.

Referring to the drawing, *a* represents the center movable member or contact blade of a three pole double throw circuit controller embodying this invention. The movable member *a* is pivoted to upright arms *b* secured to or forming part of a terminal bar

or block *d*, which is fastened to a base *e* of insulating material, such as slate, rubber, etc. and is provided as herein shown with a threaded post *f* extended through the base and having secured to it a terminal clip *g* of any desired construction, to which one circuit wire is secured. The movable member *a* coöperates with two sets of stationary contact members 10, 12, secured to the base *e* on opposite sides of the pivot for the movable member. The contact member 10 has secured to it a terminal clip 13, and the contact member 12 is connected as herein shown, to a terminal clip 14 by a removable fuse 15, which may and preferably will be of the inclosed type. The parts of the circuit controller as thus far described may be duplicated according to the particular circuit in which it is to be used, and in practice a circuit controller provided with three movable members *a*, which coöperate with three sets of contact members 10, 12, is especially adapted for controlling a three phase motor, the set of contacts 10 being included in what may be termed the starting circuit for the motor and the contacts 12 being included in what may be termed the working circuit for said motor, the starting circuit being of relatively lower voltage than the working circuit, so as to enable the motor to be started up by connecting it to the starting circuit, before it is connected to the working circuit, and thereby avoid burning out or otherwise injuring the motor.

The present invention has for its object to provide means for compelling the operator to connect the motor in the low voltage circuit before it can be included in the high voltage circuit. To this end, a stop or device is interposed between the terminal or support for the center pivoted blade or member *a* and the contact member 12 coöperating therewith and connected with the high voltage circuit, which device is normally in the path of movement of the said blade or member and is such as to be engaged by said blade before the latter can engage the contact member 12, if it is attempted to connect the motor with the high voltage circuit. The stop referred to, may be made as herein shown and comprises two upright spring metal arms 20 separated at their lower ends and secured to the opposite side of a block or bar 21 (see Figs. 1, 4, 5 and 6) and having inwardly bent fingers 22 at their upper

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of three ends, which are normally in contact, (see Fig. 4) and are designed to be engaged by the blade or member a , and prevent the latter being engaged with the contact members 12.

Provision is made for moving the stop device laterally so as to separate the fingers 22 sufficiently to enable the blade a to pass between them, and thereby enable the said blade to engage the contact members 12. For this purpose, I provide a device, herein shown as a lever 25, which is pivoted at 26 to the arms b and is provided with an arm having an upturned end 28, which is designed to be forced up between the fingers 22 so as to separate the same, (see Fig. 5), and to hold them separated until disengaged therefrom. The lever 25 is provided as herein shown with an arm 30, which is designed to be actuated by the blade a so as to force the upturned end 28 between the fingers 22. In the present instance, the lever arm 30 is directly engaged by the arm 31 of a lever 32, which is turned in one direction by springs 33 and in the opposite direction by the blade a , when the latter is turned in the direction of the arrow 34 toward the contact members 10. The purpose of the spring actuated lever 32 is to disengage the blade from the contact member 10 and move it back into its normal or open position shown in Fig. 1, and thereby automatically open the low voltage circuit, in case the operator should leave the blade a in engagement with the contact member 10 and fail to throw the blade into contact with the member 12. In this manner injury to the low voltage circuit is avoided. After the low voltage circuit is closed and the motor is set in operation, the latter can be connected in the high voltage circuit, for at such time the stop fingers 22 are separated, so as to no longer engage the blade a , which can now be turned down into engagement with the contact member 12 as represented in Fig. 3. The blade a on its movement into the position shown in Fig. 3 engages the end 28 of the separator lever 25 and forces the same down out of engagement with the stop fingers 22 and into its normal position represented in Figs. 1, 4 and 6.

From the above description, it will be seen that the movable member a cannot be engaged with the contact member 12 so as to close the relatively high voltage circuit, before it has been moved a predetermined distance toward and preferably into engagement with the contact members 10 so as to close the low voltage circuit. Also it will be observed, that the low voltage circuit does not remain closed, if the operator should fail to positively open the same, as in this case the low voltage circuit is automatically opened by the spring actuated lever 32.

I may prefer to employ a stop comprising

two laterally movable members, but I do not desire to limit the invention in this respect, as a single member may be used with its finger 22 of sufficient width to be engaged by the blade a .

While it may be preferred to make the circuit controller as herein shown, it is not desired to limit the invention to the particular construction shown.

The invention herein shown may be embodied in a switch of any desired number of poles, and the stop can cooperate with any one of the movable blades.

Claims.

1. In a circuit controller, in combination, a pivoted contact member, stationary contact members located on opposite sides of the pivot of said member and with which said member cooperates, a stop interposed between the pivot for the movable member and one set of said stationary contact members and comprising laterally movable arms normally in the path of movement of said pivoted contact member, a lever cooperating with said movable arms to separate the same and permit said pivoted member to pass between them and into engagement with one set of the stationary contact members, said lever being actuated by the pivoted member when moved into engagement with the second set of stationary contact members, and a spring actuated device cooperating with said pivoted member to automatically disengage it from said second set of stationary contact members, substantially as described.

2. In a circuit controller, in combination, a pivoted contact member, stationary contact members located on opposite sides of the pivot of said member and with which said member cooperates, a stop interposed between the pivot for the movable member and one set of said stationary contact members and normally in the path of movement of said pivoted contact member, means actuated by movement of the pivoted contact member into engagement with the second set of contact members for moving said stop laterally to permit the pivoted contact member to be engaged with the first mentioned set of contact members, substantially as described.

3. In a circuit controller, in combination, a pivoted contact member, stationary contact members located on opposite sides of the pivot of said member and with which said member cooperates, a stop interposed between the pivot for the movable member and one set of said stationary contact members and normally in the path of movement of said pivoted contact member, means actuated by movement of the pivoted contact member into engagement with the second set of contact members for moving said stop laterally to permit the pivoted contact mem-

ber to be engaged with the first mentioned set of contact members, and means for automatically disengaging said pivoted member from the second set of contact members, substantially as described.

4. In a circuit controller, in combination, two sets of contact members, a movable member interposed between said contact members and cooperating therewith, a movable stop cooperating with said movable member to prevent the engagement of said movable member with one set of contact members until it has been engaged with the second set of said contact members, and means actuated by said movable member to move said stop out of the path of the movable member when the latter is moved in one direction to engage the second set of contact members, and to hold said stop out of said path until released by the engagement of the movable member with said means, after the movable member has been moved a predetermined distance in the opposite direction toward the first-mentioned set of contact members.

5. In a circuit controller, in combination, two sets of contact members, a movable member interposed between said contact members and cooperating therewith, a movable stop cooperating with said movable member to prevent the engagement of said movable member with one set of contact members until it has been engaged with the second set of said contact members, means actuated by said movable member to move said stop out of the path of the movable member, and hold it out of said path until

said means is actuated by said movable member to release said stop, said means being actuated to move said stop only when the said movable member has been engaged with the said second set of contact members, and means to automatically disengage said movable member from the second set of contact members if said movable member is released by the operator after it has been engaged with said second set of contacts, substantially as described.

6. In a circuit controller, in combination, two sets of contact members, a movable member interposed between said contact members and cooperating therewith, a movable stop cooperating with said movable member to prevent the engagement of said movable member with one set of contact members until it has been moved a predetermined distance toward said second set of contacts, and means actuated by said movable member to move said stop out of the path of the movable member when the movable member has been moved a predetermined distance toward said second set of contact members, and to hold said stop out of said path until released by the movement of the movable member in the opposite direction toward the first-mentioned set of contact members.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

KENNETH L. CURTIS.

Witnesses:

J. MURPHY,

JAS. H. CHURCHILL.