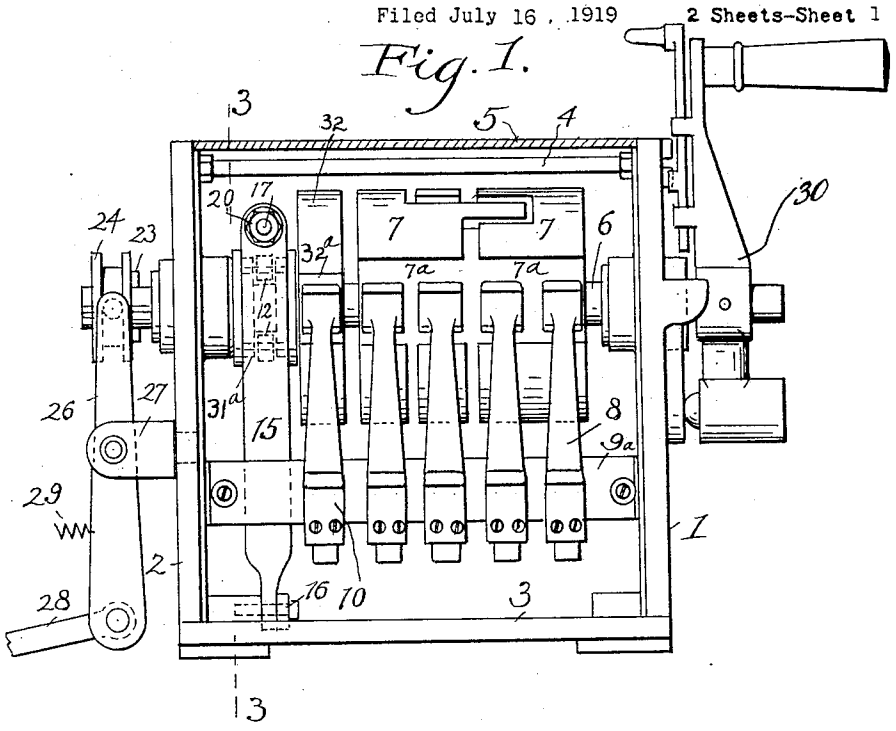
June 10, 1924. 1,496,874

E. EISENHUT

ELECTRIC CONTROLLER

Filed July 16, 1919 2 Sheets-Sheet 1

Fig. 1.



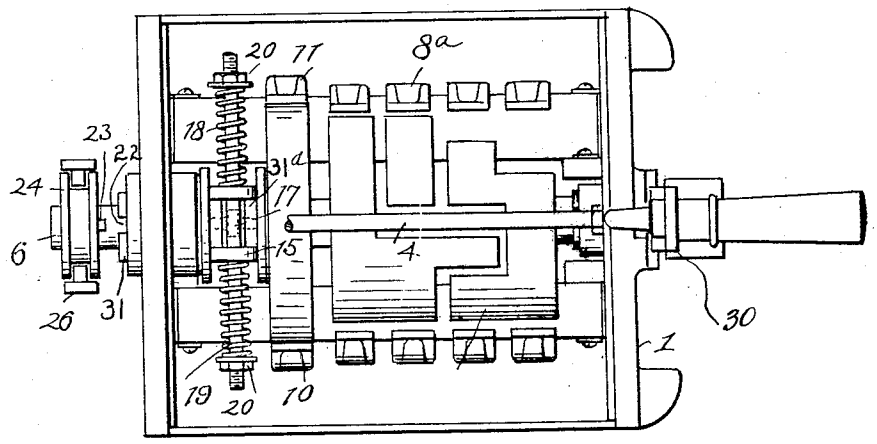


Fig. 2.

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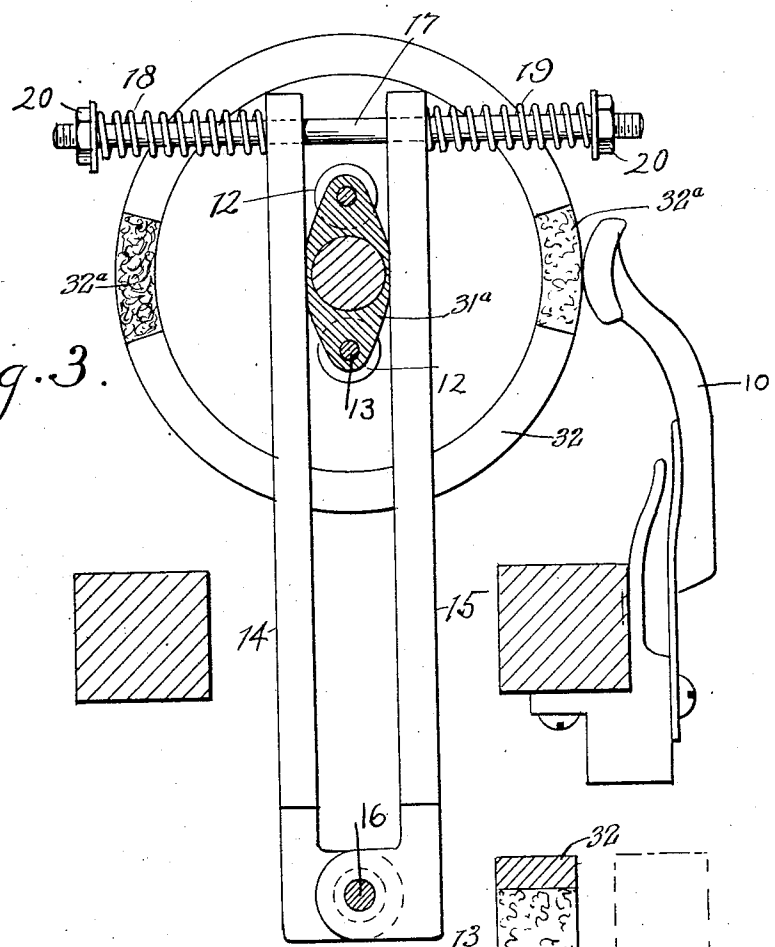


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

EARNEST EISENHUT, OF CLEVELAND, OHIO, ASSIGNOR TO THE LAKEWOOD ENGINEERING COMPANY, OF LAKEWOOD, OHIO, A CORPORATION OF OHIO.

ELECTRIC CONTROLLER.

Application filed July 16, 1919. Serial No. 311,216.

To all whom it may concern:

Be it known that I, EARNEST EISENHUT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Electric Controllers, of which the following is a full, clear, and exact description.

The present invention relates to an electric controller.

One of the objects of the invention is to provide a controller having an automatic control feature whereby the circuit through the controller is broken and the controller rendered inoperative whenever the operator leaves the controller or ceases to positively restrain the automatic control feature from functioning.

Another object of the invention is to provide a controller in which after the automatic control has operated to break the circuit through the control, the circuit cannot again be established until the segments of the controller have been returned to their zero or off position.

A further object of the invention is to provide an automatic control feature for the controller wherein one of the contact members must be positively clutched to the controller shaft and such relationship maintained in order to maintain the circuit through the controller and when such clutched relation is released, the aforesaid contact member is returned to its initial position, in which position it is inoperative as a conductor of current with respect to the other contact members of the controller.

Other objects of the invention will appear more at large as the description proceeds, and generally speaking the invention may be said to comprise the elements and the combinations thereof set forth in the accompanying claims.

Reference should be had to the accompanying drawings forming a part of this specification in which Fig. 1 is a side elevation; Fig. 2 is a top plan view; Fig. 3 is a section upon the line 3—3 of Fig. 1 and Fig. 4 is in part a top plan view and section.

Referring to the drawings, 1 and 2 indicate end plates for a suitable frame, the end plates being joined by members which extend between the end plates, such as indicated at 3 and 4.

Associated with the frame construction which has just been described is a cover or shield which cooperates more particularly with the end members 1 and 2, this cover being indicated at 5, and serving to enclose the mechanism which will be later described, which is included within and supported by the frame.

A shaft 6 supports the various segments which are indicated at 7, and inasmuch as particular form or arrangement of these segments forms no part of the present invention they need not further be described except to indicate that the segments 7 are provided with portions 7^a which are composed of insulating material so that when the controller segments are in their zero or off position, the nonconducting portions 7^a of the segments are in contact with fingers 8. These fingers 8 are carried upon a suitable support 9^a which at its opposite ends is supported in the frame which has previously been described. In the present instance there are two sets of contact fingers, the second set being represented at 8^a. Inasmuch as the contact fingers form no part of the present invention further description of them need not be given.

The shaft 6 at one end is supported in the plate 1 and the extension of the shaft 6 receives a controller handle 30 by which the shaft may be turned, thereby causing rotative movement of the segments 7. So far as the contact features and the operation thereof is concerned, any suitable form of these members may be employed.

Mounted in the plate or end member 2 is a sleeve 31. This sleeve is more particularly shown in Fig. 4. The sleeve is mounted upon the shaft 6 but has no connection therewith. A portion of the sleeve is mounted so as to have a rotative bearing in the end plate 2.

The sleeve 31 at one end thereof has mounted upon it a contact member 32 and this contact member has conducting portions and portions of insulating material, one of which is indicated at 32^a. There are two such insulating portions 32^a which are diametrically opposed to each other.

Cooperating with the contact member 32 are fingers 10 and 11 which are located upon opposite sides of the contact member 32 and when the contact member is in its zero or off position, these fingers 10 and 11 are in con-

tact with the insulated portions of the contact member.

The sleeve 31 adjacent the middle portion thereof is made to assume a somewhat elliptical form as indicated at 31ª in Fig. 3 and at what may be described the ends of the major axis of this elliptical portion rollers 12 are mounted upon pins 13 which are inserted through suitable openings formed in the sleeve. Extending upon opposite sides of the portion 31ª of the sleeve 31 are upright members 14 and 15. These members at their lower ends are pivoted upon a stud 16 in such a fashion that the members 14 and 15 may be spread apart in a manner which will be later described. The upper ends of the members 14 and 15 are provided with openings through which extend a rod 17; this rod at the portions thereof which extend beyond the members 14 and 15 receives springs 18 and 19, the springs being held upon the rod by any suitable means such as the nuts and washers indicated at 20. It will be apparent from the construction described and referring particularly now to Fig. 3 that the action of the springs 18 and 19 is to urge the levers 14 and 15 toward each other and it would be apparent that by adjusting the position of the nuts 20 the tension of the springs 18 and 19 may be regulated.

The levers 14 and 15 extend upon opposite sides of the sleeve 31 and engage with the portion thereof which is indicated at 31ª and which has been previously described and the action of these levers 14 and 15 under the action of the springs 18 and 19 is to hold the sleeve in a position in which it is shown in Figs. 1 and 3, that is to say with the fingers 10 and 11 engaging with the non-conducting portions of the conducting segment 9.

The end of the sleeve 31 which extends beyond the end member 2 is provided with a vertical slot such as indicated at 22. This slot is adapted to cooperate with a tongue 23 which is formed as a part of a collar 24 which collar is mounted upon the shaft but is capable of having a sliding movement upon the shaft. In the present instance this is accomplished by feathering the collar 24 of the shaft 6 as indicated at 25.

The collar 24 is provided with a groove 24ª which groove cooperates with the bifurcated lever 26. This lever is mounted upon the end member 2 by a suitable mounting, as indicated at 27, the mounting being such that the member 26 is pivoted so that the lever 26 may be moved to cause the collar 24 to cooperate with the end of the sleeve 31 or moved away from the sleeve under certain conditions.

The lever 26 is connected with any suitable operating mechanism, such as the rod 28 and associated with the lever 26 or with the operating mechanism is a spring, the action of which must be to cause the clutch collar 24 to move and normally remain in its unclutched position. This spring is conventionally represented at 29, it being understood that the particular position of the spring is immaterial so long as it accomplishes the function which has just been described.

In making the electrical connections necessary to include the controller as a part of an electrical circuit, the contact member 9 with its cooperating fingers 10 is arranged so as to be in serious relation with the other contact members and their cooperating fingers so that the position of the contact member 9 with respect to its cooperating fingers 10 and 11 determines the condition of the circuit through the controller, that is to say whether it is open or closed.

Attention is called to the fact that when the segments of the controller are in their zero or off position, the projection 23 which is carried by the collar 24 is so positioned as to be directly in line with the slot 22 formed in the end of the sleeve 31 so that if the collar be moved along the shaft the projection 23 may enter the slot 22 thereby clutching the shaft 6 with the collar 31. On the other hand, however, if the shaft 6 has been turned so as to occupy any other position than that which corresponds to the zero or off position of the segments 7, the projection 23 and the slot 22 are not in line and consequently the clutching relationship cannot be effected under these conditions. This is a very important matter, because, as will later be explained, the controller cannot be initially operated unless the contact segments 7 start from their initial or zero position.

In operating the controller, the operator first moves the clutch collar 24 so as to engage with the sleeve 31. As before stated, the mechanism for operating the clutch collar may be a manular or pedular operated mechanism.

As soon as the clutching relationship between the shaft 6 and the sleeve 31 is obtained, the controller handle when moved will move the contacts 7 and the contact member 32 so that under these conditions the controller is operative to make the various electrical connections in the controller for which it is adapted.

So long as the operator maintains the collar 24 in its clutch position, against the action of the spring 29, the controller is in functioning condition, however, if the operator releases the mechanism which controls the clutch collar 24, the action of the spring 29 immediately throws it out of clutching position and under the action of the levers 14 and 15, which is induced by the springs 18 and 19, the sleeve 31 returns to its initial

position in which position the fingers 10 and 11 bear upon non-conducting portions of the contact member 32, consequently regardless of whatever may be the position of the handle 30, the controller is rendered inoperative, for the circuit through the contacts of the same has become broken consequently the position of the contact member 32 controls the condition of the controller circuit, that is whether it be made or broken.

As has before been noted, if the controller handle is in any other position than that corresponding to the zero or off position of the contact members 7, the clutch collar 24 cannot effect a clutching relationship between the shaft 6 and the sleeve 8 until the controller handle is in the position which corresponds to the zero or off position of the controller segments, consequently carelessness of the operator is effectually guarded against.

When the shaft 6 is turned by the handle 30 with the collar 24 in its clutching position, the sleeve 31 is turned. This causes the rollers 12 to move into engagement with the levers 14 and 15, thereby spreading them apart against the action of the springs 18 and 19. This tension is maintained throughout the movement of the sleeve 31. The arrangement is such that a complete range of movement of the handle 30 is accomplished without turning the sleeve 31 through a complete 90° turn, in other words, the sleeve 31 is never turned far enough so as to bring the rollers into a dead center position with respect to the levers 14 and 15.

Having thus described my invention what I claim is:—

1. The combination of a rotatable shaft, contact members carried thereby, a sleeve mounted upon the shaft but rotatable with respect thereto, a spring pressed member mounted independently of the shaft engaging said sleeve and tending to maintain it in a definite position, a clutch mechanism adapted when moved to connect the sleeve with the shaft and maintain such connection, the said spring pressed member being displaced as the sleeve is turned and serving to return the sleeve to its initial position when the clutching mechanism is moved to inoperative position.

2. The combination of a rotatable shaft, contact members carried thereby, a sleeve mounted upon the shaft but free to turn thereon, a spring pressed lever mounted independently of the shaft engaging with said sleeve serving to normally hold the same in a definite position, clutch mechanism adapted when moved to connect the shaft with the sleeve and maintaining such connection, the said spring pressed lever being displaced as the sleeve is turned and serving to return the sleeve to initial position when the clutching mechanism is moved to disconnected position.

3. The combination of a rotatable shaft, contact members carried thereby, a sleeve mounted upon the shaft but free to turn thereon, a pair of pivoted levers contacting with opposite sides of the sleeve, resilient means normally urging the said levers toward each other and into contact with the sleeve, means on the sleeve adapted to engage the said levers to spread them apart when the sleeve is turned, clutch mechanism for connecting the sleeve to the shaft, the said levers serving to cause the sleeve to return to its initial position when the clutching mechanism is disconnected.

4. The combination of a rotatable shaft, contact members carried thereby, a sleeve mounted upon the shaft but free to turn thereon, a pair of pivoted levers contacting with opposite sides of the sleeve, resilient means normally urging the said levers toward each other and into contact with the sleeve, means on the sleeve adapted to engage the said levers to spread them apart when the sleeve is turned, clutch mechanism for connecting the sleeve to the shaft, the said levers serving to cause the sleeve to return to its initial position when the clutching mechanism is disconnected and means for normally maintaining the clutch mechanism in unclutched position.

5. The combination of a rotatable shaft, contact members carried thereby, a sleeve mounted upon the shaft but rotatable with respect thereto, said sleeve being provided with a portion which has a surface of varying radial position with respect to the shaft, a spring pressed member which normally engages with the said portion of the sleeve which is nearest to the shaft and thereby to maintain it in a definite position, a clutch mechanism adapted to connect the sleeve with the shaft and maintain such connection, the said spring pressed member being displaced as the sleeve is turned and serving to return the sleeve to its initial position when the clutching mechanism is moved to inoperative position.

6. The combination of a rotatable shaft, contact members carried thereby, a sleeve mounted on the shaft but free to rotate with respect thereto, a portion of said sleeve being formed substantially elliptical, a spring pressed member engaging with the elliptical portion of said sleeve at the shortest axial distance from the shaft, thereby maintaining the sleeve in a definite position, a clutch mechanism adapted to connect the sleeve with the shaft, the said spring pressed member being displaced as the sleeve is turned and serving to turn the sleeve to its initial position when the clutching mechanism is moved to inoperative position.

7. The combination of a rotatable shaft,

contact members carried thereby, a sleeve mounted on the shaft and having a portion which is elliptical in shape, which elliptical shaped portion is symmetrically arranged with respect to the shaft, a pair of spring pressed members engaging oppositely disposed with the said elliptical portion of the sleeve, each of said members normally bearing against the said elliptical portion at the shortest axis thereof, thereby tending to maintain the sleeve in definite position, a clutch adapted to connect the sleeve with the shaft, the said spring pressed members being displaced as the sleeve is turned, and serving to return the sleeve to its initial position when the clutching mechanism is moved to inoperative position.

8. The combination of a rotatable shaft, contact members carried thereby, means for turning said shaft, a controlled contact member mounted on the shaft and capable of freely turning thereon, resilient means normally maintaining the controlled contact member in a definite position, a collar mounted upon the said shaft, said collar being free to slide along the shaft but rotatable with the shaft, members upon the sleeve and upon the said collar adapted to engage with each other when the collar is moved toward the sleeve and means independent of said shaft turning means for controlling the movement of the said collar.

9. The combination of a rotatable shaft, contact members carried thereby, means for turning said shaft, a sleeve mounted on the shaft but free to rotate thereon, a control contact member carried by the sleeve, resilient means normally maintaining said sleeve in a fixed or initial position, a slidable collar member mounted upon the said shaft, one of said members being provided with projections and the other being provided with depressions, means independent of the said shaft turning means for moving the slidable collar to cause engagement between the collar and the sleeve, projections and depressions upon the said members being in position to engage only when the sleeve is in its fixed or initial position.

In testimony whereof, I hereunto affix my signature.

EARNEST EISENHUT.