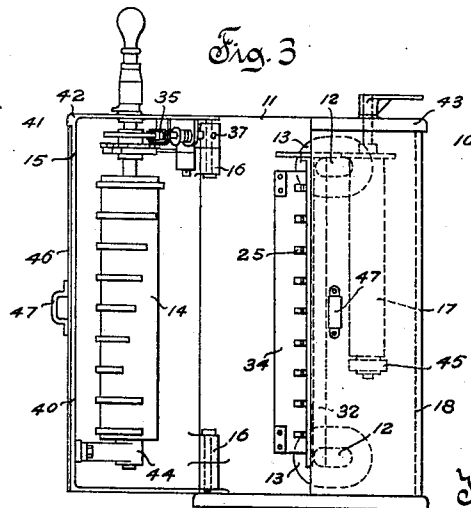
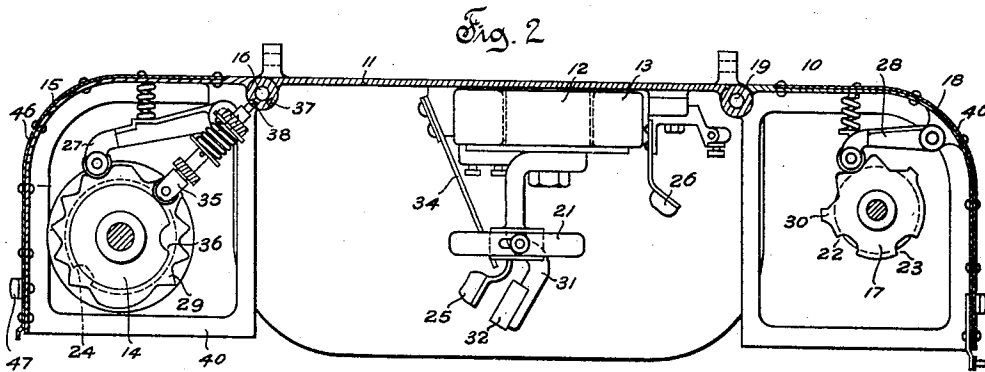
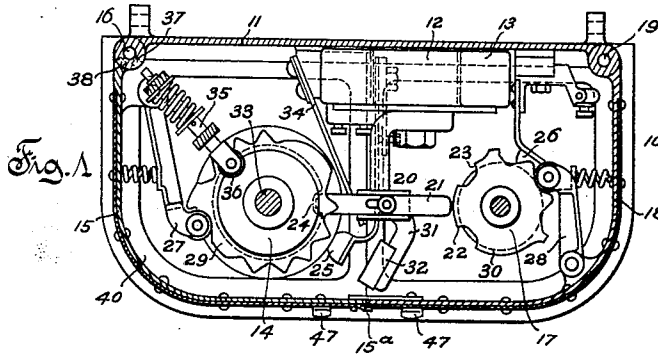


J. F. MENNINGEN.
CONTROLLER.

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1,028,948.

Patented June 11, 1912.



Witnesses

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CONTROLLER.

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To all whom it may concern:

Be it known that I, JOSEPH F. MENNINGEN, a citizen of the United States, residing at West Allis, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Controllers, of which the following is a full, clear, and exact specification.

This invention relates to controllers for electric circuits.

It is desirable to inspect the interior parts of controllers occasionally in order to ascertain in what condition they are being operated. It is necessary to inspect controllers when they become disabled and in need of repair. In most controllers the parts are rigidly fixed relatively to each other and are packed in closely together leaving little and in some portions no space between the various parts. Inspection under such conditions is therefore rendered difficult and repair almost impossible without disassembling adjacent parts. At the same time a great deal of valuable time may be spent in accomplishing the desired end.

The object of this invention is to make the inspection and repair of controllers more easy and with the expenditure of less time than has been possible heretofore. This object is accomplished by providing a simple, durable, and inexpensive controller having its parts advantageously arranged and relatively-movably mounted so that one or more of the parts can be readily shifted from their normal operating positions.

The various novel features of my invention will be described in the specification and particularly set forth in the appended claims.

Figure 1 is a top elevation of my controller with the cap plate broken away and the parts of said controller in a position preparatory to being operated; Fig. 2 is a top elevation similar to that shown in Fig. 1 with the parts shifted relatively to each other for inspection or repair; and Fig. 3 is a diminished front elevation of a controller embodying my invention with one of its movable parts shifted to expose the interior of the controller.

The controller 10 has a main back body portion 11 upon which is mounted, preferably integrally formed, a plurality of magnet cores 12. The cores with their windings 13 wrapped around them form

blowout magnets for destroying arcs which are formed when the main controller drum 14 is moved from one operative position to another. The main controller drum or switch is mounted in a frame 15 which is hinged or pivoted on the main body portion 11, as indicated at 16. A reversing drum or switch 17 is mounted in another frame 18 which is hinged or pivoted on the portion 11, as shown at 19. These two hinged or pivoted frames, which form parts of the controller casing, with their drums are adapted to be swung or shifted outwardly away from each other in order that all parts of the controller may be readily inspected or repaired. The term "shift" is here used as meaning a lateral or similar movement as distinguishable from a rotary movement of the drums. These hinged members 15 and 18 comprise metal frames 40 which include an integral cap plate 41. This cap plate is split in the middle, one part 42 thereof covering the main drum structure and the other part 43 thereof covering the reversing drum structure. The main and reversing drums are supported in vertical positions by having their shafts mounted in supports 44 and 45 secured to the metal frames of the hinged members 15 and 18 respectively. Sheet metal shells 46 are formed around the metal frames 40 and are provided with handles 47 to assist in swinging the hinged members.

In Fig. 1 the drums 14 and 17 are in their off positions previous to being operated with the reversing switch in neither a forward nor backward operative position. In this position, of course, it would be impossible to move the main drum until the reversing drum is moved in one direction or the other so that the interlock 20, comprising a slidably mounted bar 21, occupies one of the detents 22 or 23 in the reversing drum so that said bar 21 can be drawn out of the detent 24 of the main drum. These detents or grooves are formed in disks which are secured to the shafts of the drums 14 and 17. When the bar 21 is moved out of the detent 24 and is forced into one of the detents 22 or 23, the main controller drum can be rotated for effecting the operation of a motor or motors. The main drum 14 is provided with the usual contact segments which are adapted to be engaged by contact fingers 25 and the reversing drum is also

provided with segments which are adapted to be engaged by contact fingers 26. Associated with the drums are spring-pressed roller members 27 and 28 which engage the cam surfaces of the disks 29 and 30 respectively which locate the different operating positions. Secured to the core 12 of the blowout magnets is a long cast-iron arm 31 to which is secured a bar of soft metal 32 which forms one pole of the blowout magnets. This bar 32 is so located relatively to the contact fingers 25 that a flux is set up between the bar 32 and the shaft 33, which forms the other pole of the blowout magnet, to destroy any arcs which are formed between the contact fingers and segments when the controller drum 14 is moved from one operative position to another. An insulating shield 34 is interposed between the controller drum 14 and other metallic parts to prevent flashing.

With the controller as shown in Fig. 1, the hinged or pivoted frames 15 and 18 can be swung outwardly in the positions shown in Fig. 2. But if the main controller drum 14 were rotated on its shaft in either direction, one end of a spring-pressed rod 35 would be forced out of a detent 36 of the main drum and the other end of said rod forced into a slot 37 formed in a lug in the casing or main body 11, locking the hinged frame 15 so that it could not be opened or swung outwardly. The hinged frame 18 could not be swung outwardly with the hinged frame 15 in its closed position for the reason that the hinged frame 15 overlaps the frame 18, as shown at 15^a. The only time when it is possible to swing the hinged frames outwardly or shift them relatively to each other is when the controller is in off position and one end of the rod 35 is located in the detent 36. When the hinged frames 15 and 18 are swung about their pivots thereby shifting the main and reversing drums relatively to each other, all parts of the controller are presented so that an unobstructed inspection can be made and any repairing done easily without the expenditure of much time for the reason that all parts are readily accessible. The drums in this position, as shown in Fig. 2, may be rotated about their axes so that a thorough inspection of the contact segments may be had. If the main controller drum 14 be rotated on its axis from its normal operating closed position, the rod 35 will be forced out of the detent 36 and into another slot 38 in the portion 11, locking the hinged frame 15 in its swung position. In order to swing the hinged frame 15 with its controller drum back into the position shown in Fig. 1, it is first necessary to rotate the main controller drum 14 about its axis into its off position, in which case the rod 35 will again occupy the detent 36. It is there-

fore seen that the hinged frames 15 and 18 can only be swung open and closed when the controller drums are in off position. In this way no damage could be occasioned by the recklessness of a motorman.

There may be many arrangements and modifications of the precise form herein shown and described, and I aim in my claims to cover all such arrangements and modifications which do not involve a departure from the spirit and scope of my invention.

What I claim as new is:

1. In a controller, the combination of a plurality of pivotally mounted drums adapted to be shifted relatively laterally to each other only when the controller is in off position.

2. In a controller, the combination of a plurality of hinged movable members, and a plurality of drums secured to said movable members and arranged so that the drums may be shifted relatively to each other only when the controller is in off position.

3. In a controller, the combination of a casing comprising a plurality of pivotally mounted parts, a drum in each of said parts, means whereby said parts may be shifted relatively to each other, and means whereby said parts may be shifted relatively to each other only when the drums are in certain predetermined positions.

4. In a controller, the combination of a casing comprising a plurality of pivotally mounted parts, a main drum mounted in one of said parts, a reversing drum mounted in another of said parts, and means for shifting the relative positions of said parts and drums only when the drums are in certain predetermined positions.

5. In a controller, the combination of a plurality of pivotally mounted drums, and means whereby said drums may be shifted relatively laterally to each other only when the controller is in off position.

6. In a controller, the combination of a plurality of pivotally mounted drums adapted to be shifted relatively laterally to each other, and means whereby when the drums are in certain positions they can only be shifted to their operating position when one of said drums has been moved to its off position.

7. In a controller, the combination of a casing comprising a main portion and a plurality of parts pivotally mounted on said main portion, a drum mounted in each of said pivoted portions whereby said drums may be shifted relatively to each other, and means to prevent shifting of said drums relatively to each other except when in off position.

8. In a controller, the combination of a casing comprising a main portion and a plurality of members pivoted thereto, a main switch drum carried by one of said members,

a reversing switch drum carried by another of said members whereby said drums may be shifted relatively to each other, and means to prevent relative shifting of said drums except when the controller is in off position.

9. In a controller, the combination of a casing comprising a main portion and two members secured thereto, a drum secured in each of said members, and means whereby said drums may be shifted relatively to each other only when the controller is in off position.

10. In a controller, the combination of a casing comprising a main portion and two parts secured thereto, a controller drum mounted in each of said parts, said drums being adapted to be shifted relatively to each other only when the drums are in a certain relative position.

11. In a controller, the combination of a casing comprising a main portion and a plurality of parts pivotally secured thereto, a controller drum mounted in each of said parts, said drums being adapted to be shifted relatively to each other only when the controller is in off position.

12. In a controller, the combination of a plurality of drums adapted to be shifted relatively to each other, and means whereby said drums are locked before and after being shifted.

13. In a controller, the combination of a split casing having a plurality of movable parts adapted to be moved relatively to each other, a main drum in one of said movable parts, a reversing drum in another of said movable parts, and means to prevent relative movement of said movable parts except in a certain position of the controller.

14. In a controller, the combination of a split casing comprising a plurality of pivotally mounted parts, members of the controller mechanism located within said parts, and means to prevent movement of said pivotally mounted parts except when the controller is in off position.

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

JOSEPH F. MENNINGEN.

Witnesses:

CHAS. L. BYRON,
ROB. E. STOLL.