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PATENTED SEPT. 10, 1907.

A. H. MATHEWSON.

ATTACHMENT FOR ELECTRIC MOTOR CONTROLLERS.

APPLICATION FILED MAR. 28, 1907.

Fig. 1.

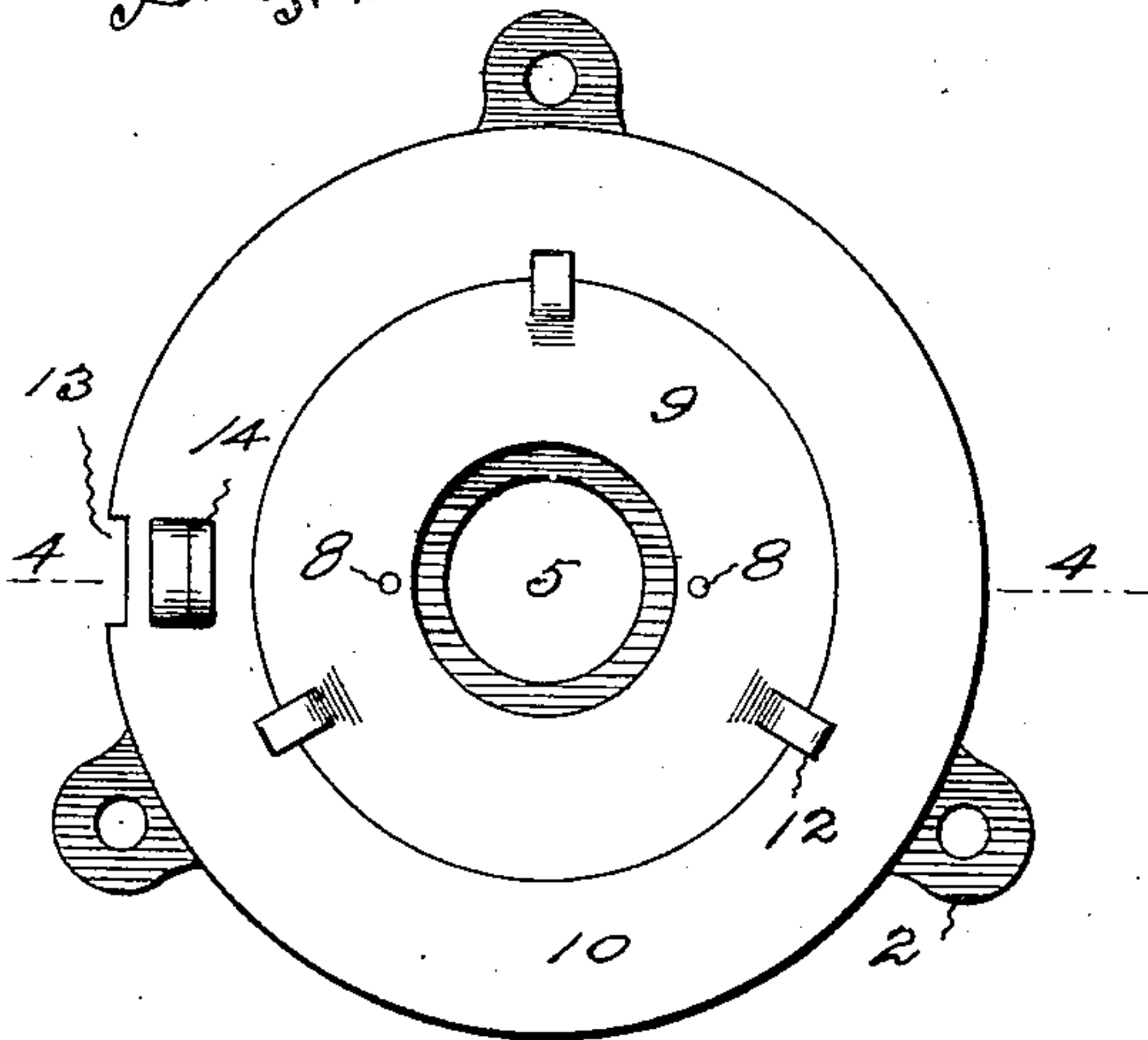


Fig. 3.

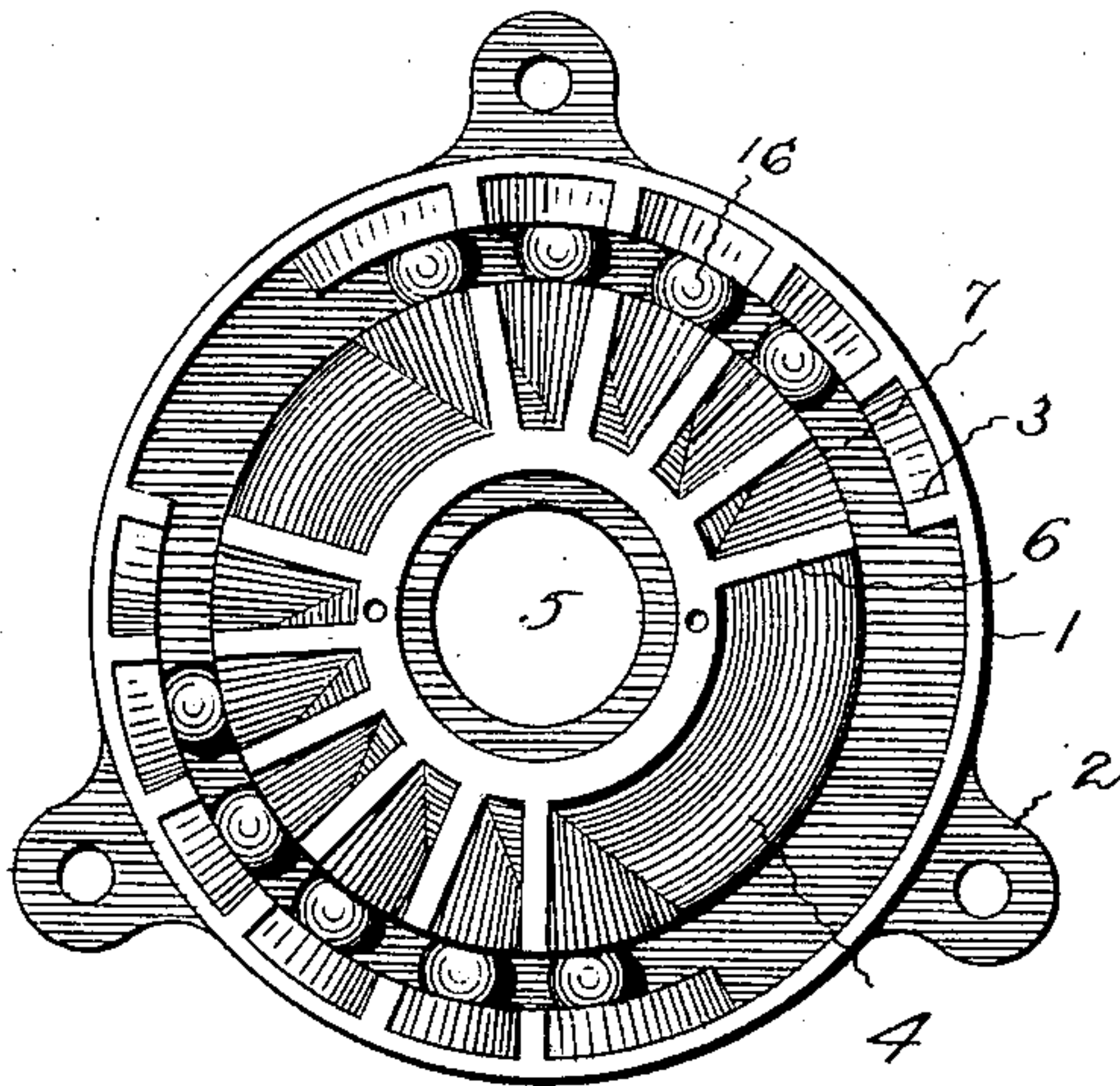


Fig. 2.

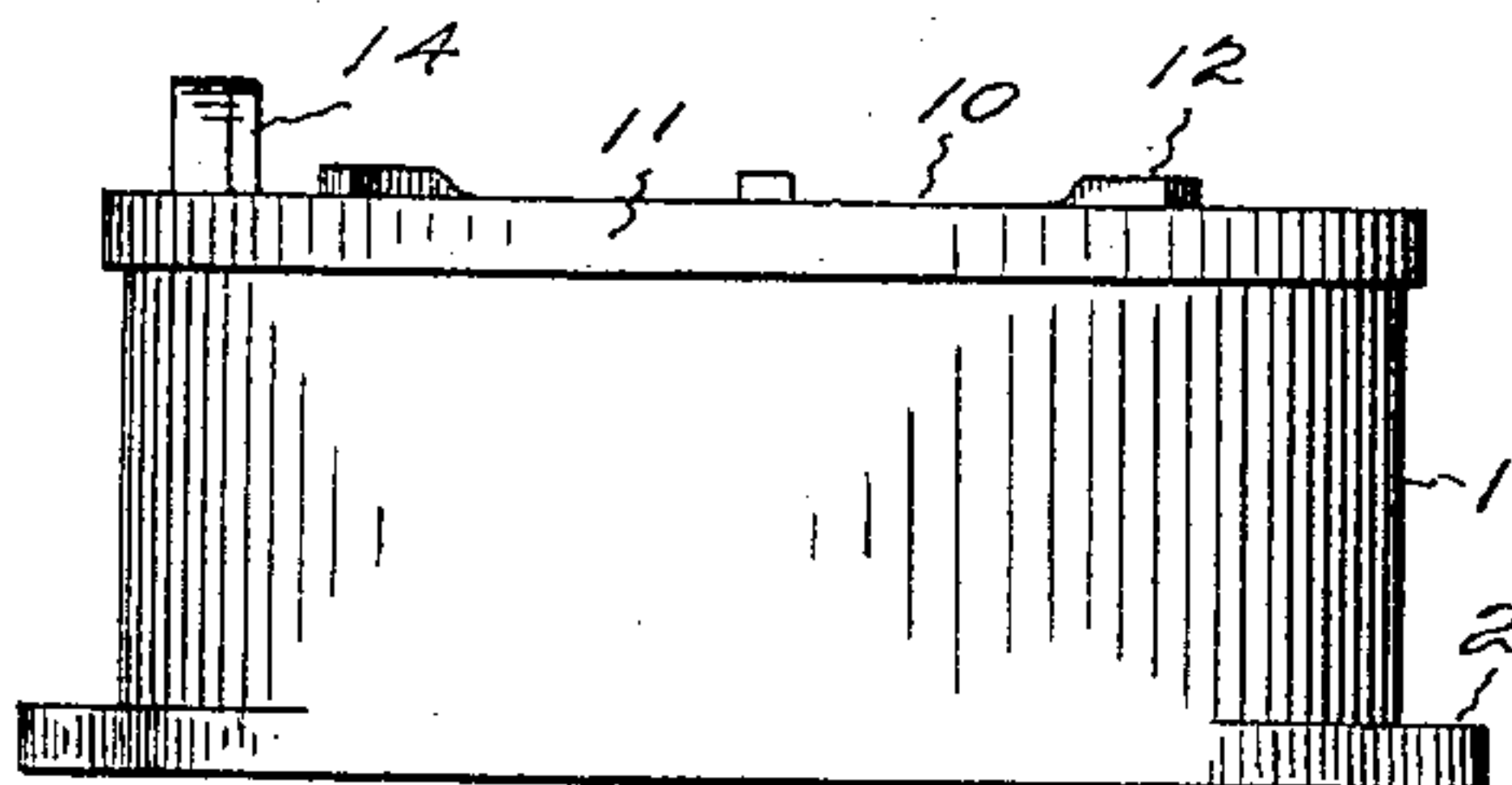


Fig. 4.

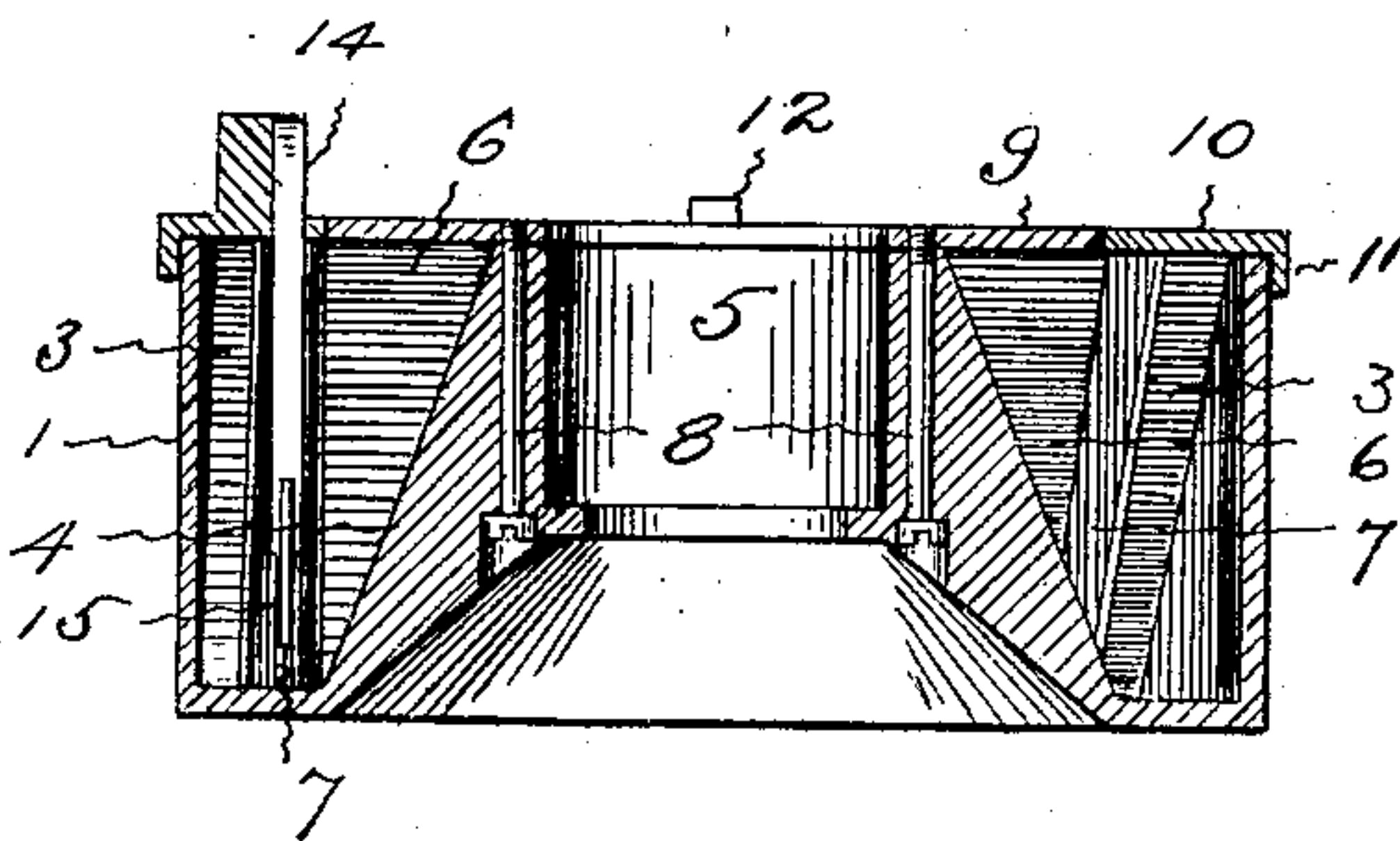
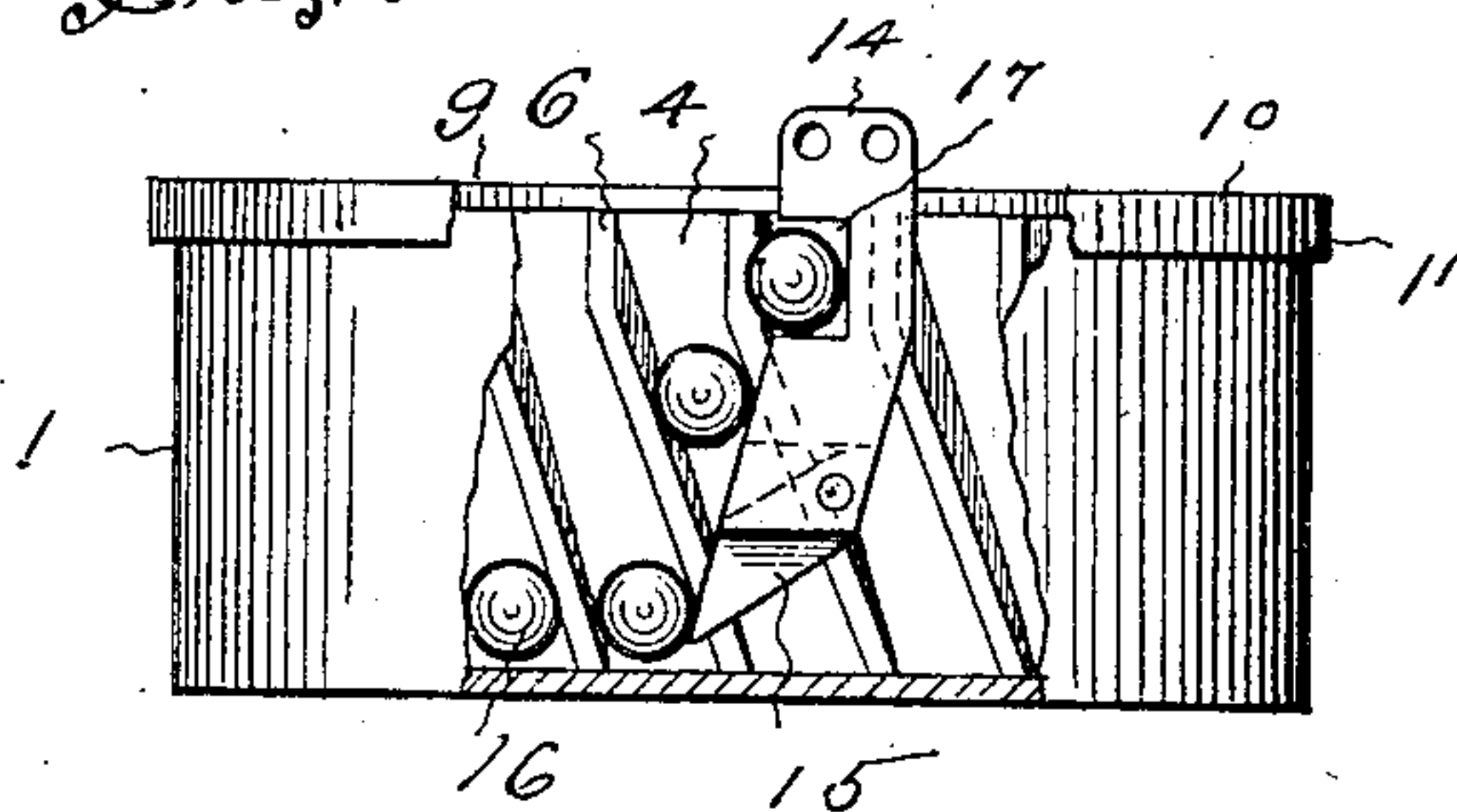


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT H. MATHEWSON, OF THOMPSONVILLE, CONNECTICUT.

ATTACHMENT FOR ELECTRIC-MOTOR CONTROLLERS.

No. 865,412.

Specification of Letters Patent.

Patented Sept. 10, 1907.

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To all whom it may concern:

Be it known that I, ALBERT H. MATHEWSON, a citizen of the United States, residing at Thompsonville, in the county of Hartford and State of Connecticut, have invented a new and useful Attachment for Electric-Motor Controllers, of which the following is a specification.

This invention relates to a device which is designed to be made a part of or to be attached to an electric motor controller of the type commonly employed on electric railway cars.

The object of the invention is to provide a very simple device which requires the motorman to pause at the various stations or notches when he is turning on current, but which can not interfere in any way with the movement of the controller handle for turning off current, and if the motorman pauses at the proper localities will not interfere with the movement of the handle for turning on current.

The embodiment of this invention has a base with pockets containing balls which when the controller handle is moved for turning on current are brought into such positions that if no pause is made at the proper points they interpose themselves and prevent further movement of the handle until a pause is made or the handle is given a slight retrograde movement, but if a pause is made they roll out of the way so that the handle is free to be further advanced.

Figure 1 of the accompanying drawings shows a plan of an embodiment of the invention adapted to be fastened to the top of an ordinary railway controller. Fig. 2 shows a side elevation of the same. Fig. 3 shows a plan with the top of the device removed. Fig. 4 shows a diametrical section on the plane indicated by the line 4—4 on Fig. 1. And Fig. 5 shows a side elevation with a part of the base broken away so as to show the interior.

The cylindrical base 1 of the device illustrated is provided with perforated ears 2 for the screws or bolts by which it may be fastened to the top of a controller. In the interior of the base and extending inwardly from the outer wall are forwardly inclined ribs 3. These ribs all incline in the same direction and the same amount and they extend from the bottom to the upper edge of the base at localities which correspond with the various notches or stopping places for the controller handle.

The inner wall 4 of the base is conical and through the center is an opening 5 for the controller spindle and the end of the handle which fits upon and turns the spindle. On the outer surface of the conical wall in the interior of the base are outwardly extending and forwardly inclined ribs 6. These ribs co-incide with the ribs on the outer wall and they slope or incline in the same direction and to the same extent. The ribs 3

and 6 are so arranged that an annular channel 7 is left between them.

Fastened to the top of the base preferably by screws 8 is an annular plate 9 and outside of this fixed plate is a loose ring 10. This ring is preferably held in place by a flange 11 that extends down over the outer edge of the base and by lugs 12 which project from the plate 9. The ring preferably has in one edge a notch 13 for receiving the lug which usually projects downwardly from the underside of a controller handle, and the engagement of this lug with the walls of this notch causes the ring to turn with the handle. Extending downwardly from the inside of the ring and fastened so as to turn with the ring and the handle is a finger 14. This finger is so located that it extends downwardly and preferably a little forwardly into the annular channel between the ribs that project from the walls of the base. The lower end of this finger has a pivoted tip 15 which also extends forwardly like the rest of the finger but which is so hung that it can swing forwardly but not backwardly out of its normal position.

In the several pockets between the inwardly and outwardly extending ribs in the base are hardened balls 16. The conical wall of the center of the base causes these balls to roll down and to lie on the bottom in the channel between the ribs and in the path of the finger which projects from and which turns with the movable ring on the top.

When the controller handle is moved backwardly from any position, as when current is being cut off, the tip swings up and allows the finger to pass freely above the balls so that there is no interference whatever with the movement of the handle backwardly for cutting off current. When the controller handle is moved forwardly the finger engages each ball in succession and causes it to ride up the ribs in front of the edge of the finger until it reaches the notch 17 in the finger. If the controller handle is stopped in the required position the ball then rolls out of the notch into the pocket between the ribs and down the conical wall of the center of the base to the bottom. If an attempt is made to move past the proper place the finger causes the ball which is caught in the notch to jam between the two ribs so that the ball cannot roll out and down. This, of course, stops the forward movement of the handle and the handle cannot again be moved forwardly until it is given a slight backward movement so as to release the ball. In Fig. 5 the upper ball is shown as caught in the notch and as pressed by the finger forwardly between the ribs so that it cannot roll down. If the finger had been stopped slightly back of the position shown, or if it were moved back slightly then the ball could roll out of the notch and drop down between the ribs.

The base can be located on the top of the controller

in such position that when the handle is stopped at the right place the balls will roll out or it can be located so that it will require the handle to stop each time and then be given a slight backward movement.

- 5 If it is arranged as first mentioned the balls offer no resistance whatever to the movement of the handle, if it is moved properly and paused at the correct time, but if the handle is moved too quickly or not paused then the balls interfere and require the stopping of
10 the handle and a slight backward movement is necessary before the handle can be advanced to the next notch.

This construction is very simple and effective. There are no springs nor parts to get out of order or
15 to wear and become broken and if anything should happen to the finger or one of the balls the space is sufficiently large so that they will not interfere with the movement of the controller handle which under all circumstances can be moved backwardly for cut-
20 ting off current without any interference.

The invention claimed is:—

1. A controller attachment having a base with inclined pockets, balls located in the pockets, a finger adapted to be moved with the handle and arranged to be engaged with
25 the balls when moved in one direction and pass the balls

freely when moved in the opposite direction, said finger being shaped to permit the escape of a ball when the finger is stopped in the correct position, but to hold a ball when the finger is not stopped in the necessary position, substantially as specified. 30

2. A controller attachment having a base, inclined ribs extending inwardly and outwardly in the interior of the base with an annular channel between the edges of the ribs, balls located between the ribs and a finger movable in the annular channel and adapted to raise the balls when moved
35 in one direction and to pass over the balls when moved in the opposite direction, said finger having an opening whereby the balls will be released if the finger in its movement is paused at the necessary positions, and means for causing the balls to roll down after having been released from the
40 finger into the space between the ribs, substantially as specified.

3. A controller attachment having stationary pockets in the interior, a ball located in each pocket, a movable finger adapted to, in sequence, engage and cause each ball
45 to be lifted in each pocket when moved in one direction and to pass the balls when moved in the opposite direction, and means whereby each ball escapes from the finger side-wise into its pocket, if the finger is paused at the proper position, substantially as specified.

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