

J. F. MENNINGEN.
 CONTROLLER.
 APPLICATION FILED DEC. 30, 1907.

910,561.

Patented Jan. 26, 1909.

2 SHEETS—SHEET 1.

Fig. 1

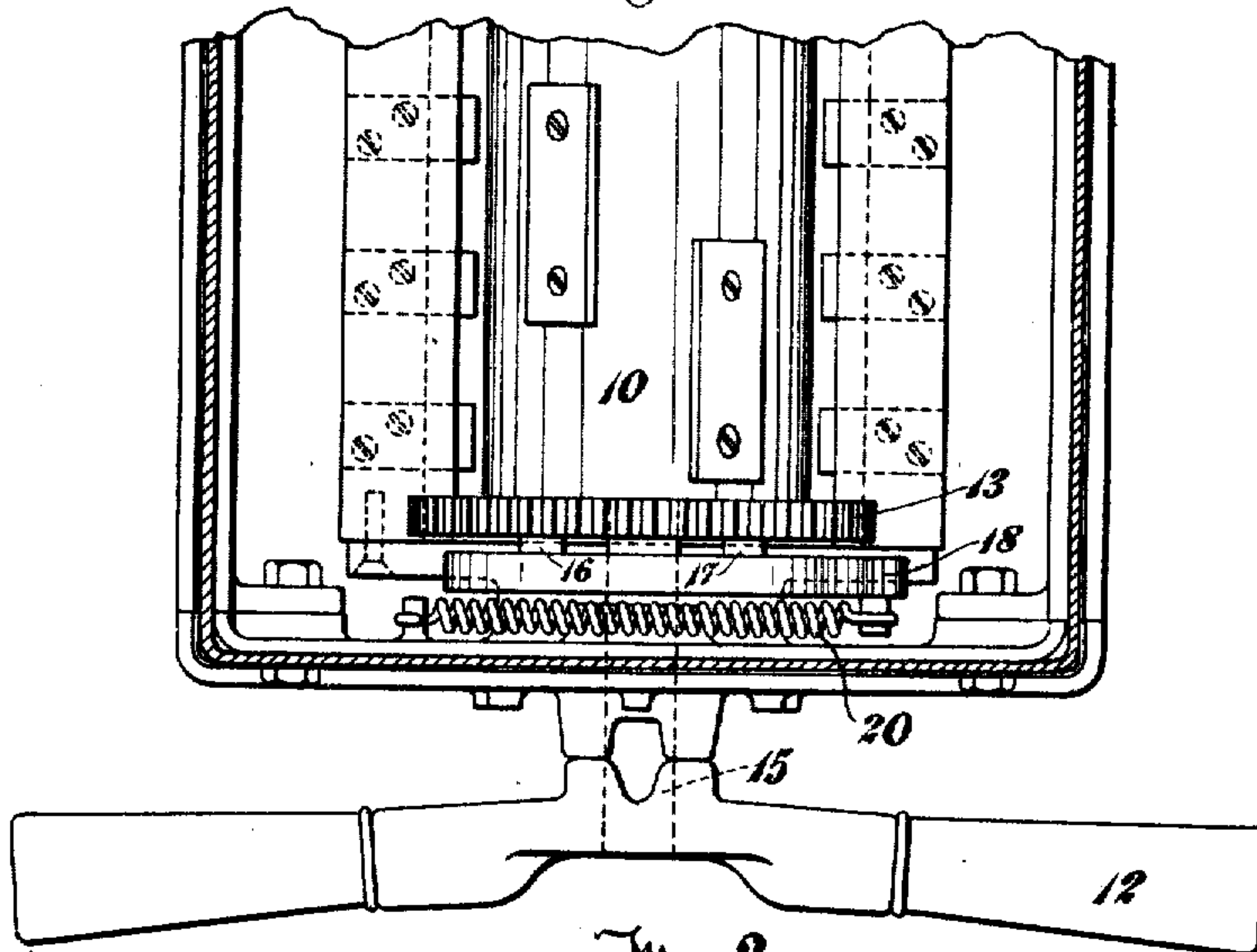
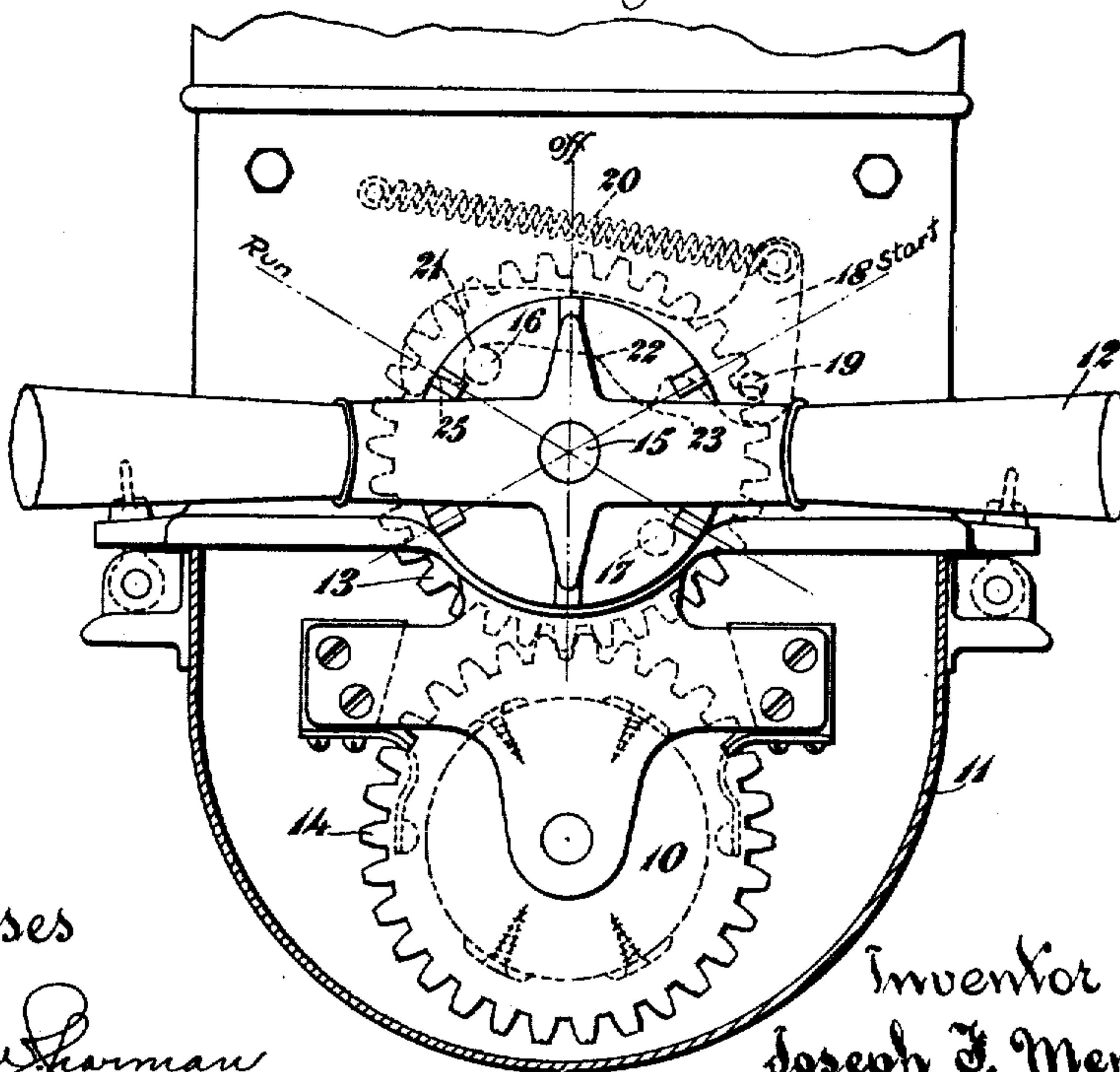


Fig. 2



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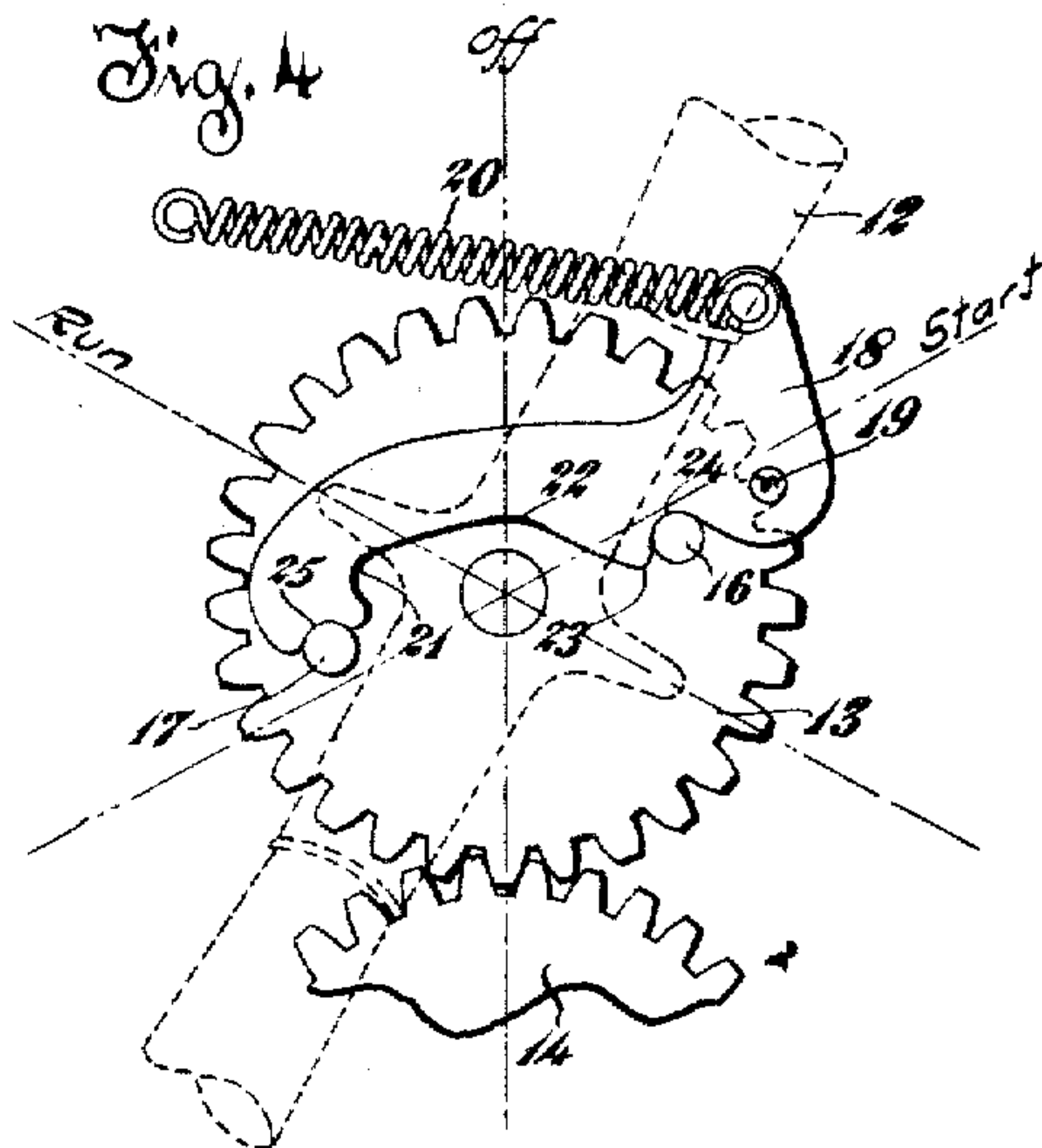
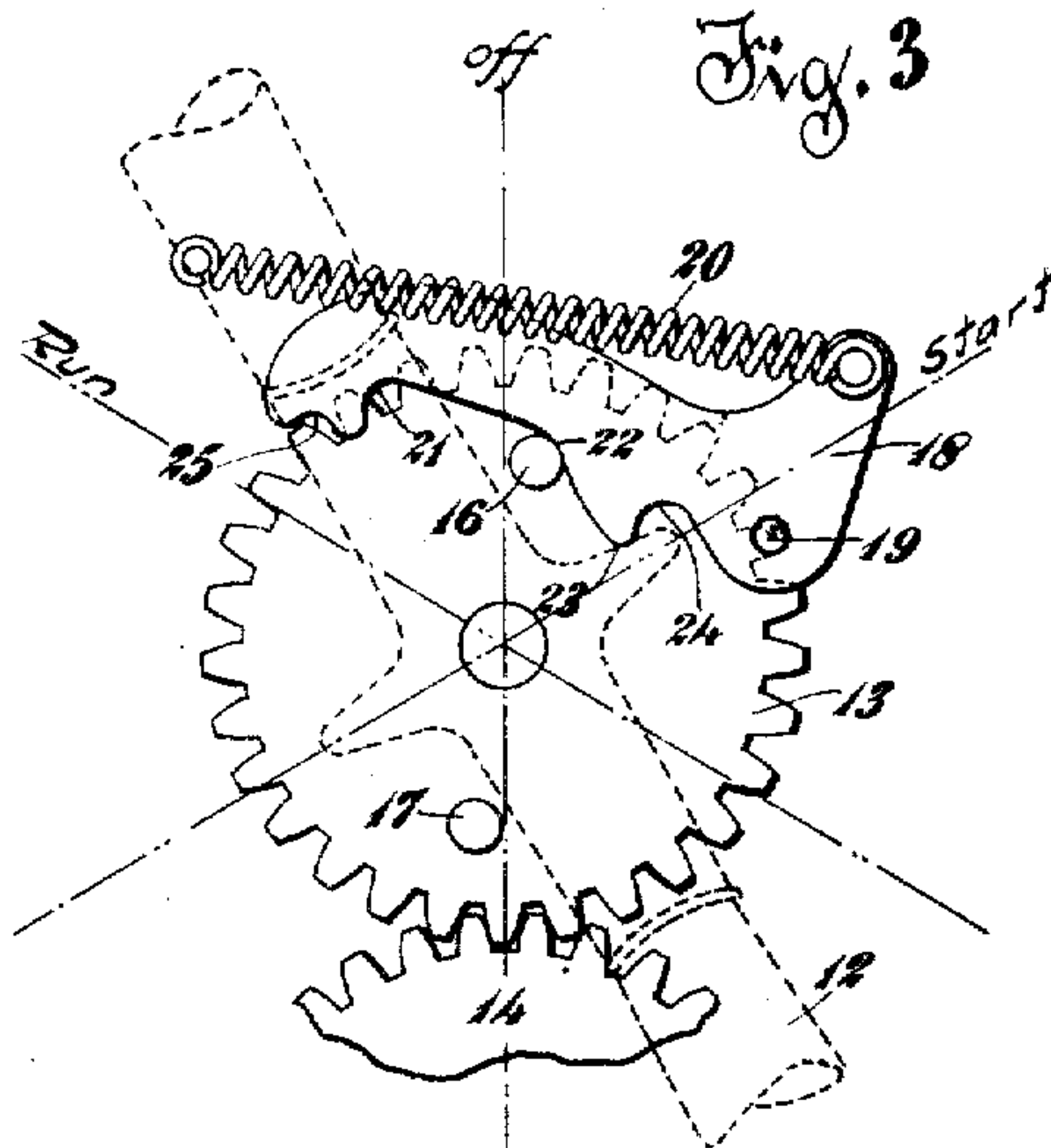
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Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH F. MENNINGEN, OF OAKLEY, OHIO, ASSIGNOR TO ALLIS-CHALMERS COMPANY, A CORPORATION OF NEW JERSEY, AND THE BULLOCK ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF OHIO.

CONTROLLER.

No. 910,561.

Specification of Letters Patent.

Patented Jan. 26, 1909.

Application filed December 30, 1907. Serial No. 408,550.

To all whom it may concern:

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

My invention relates to controllers for electric motors, and particularly to certain fool-proof protective devices therefor.

In the patent to Herbert W. Cheney No. 864,446, August 27, 1907, there is described an arrangement whereby in case a starting controller is left by the operator in a starting position it will be automatically returned to off position, while it can be left as long as desired in off or running positions.

My present invention is an improvement on and has the same general objects as the arrangement set forth in said patent.

The specific novel features of my invention will appear from the specification and drawings and will be particularly pointed out in the claims.

Figure 1 is a plan view of a controlling drum and operating mechanism therefor constructed in accordance with my invention, the controller casing being shown in section; Fig. 2 is a front elevation of the lower part of the controller of Fig. 1 showing the parts in off position; and Figs. 3 and 4 are views showing the operating mechanisms in starting and running positions respectively.

The details of the starting controller proper will not be described herein as they form no part of my present invention and are unnecessary to an understanding thereof. For what does not appear in the following description reference may be made to the aforesaid patent to Cheney.

A controlling drum 10 is designed to make the proper connections for starting an electric motor in any desired manner, the particular drum shown being designed for starting a polyphase induction motor by means of auto-transformer windings. The controller drum, which is immersed in oil in the oil tank 11, is moved by the operating handle 12, acting through gear wheels 13 and 14. The opposite halves of the controller drum are identical in structure. Each half cooperates in turn with each of the two sets of contact fingers during successive operations

of the controller, the sets of contact fingers being on opposite sides of the drum. The normal operation of the drum is continuously in the same direction, which is counter-clockwise in the arrangement shown.

From one face of the gear 13, which is fixed on the shaft 15 of the operating handle 12, project two diametrically opposite pins 16 and 17, which, if desired, may carry rollers. A lever 18 is pivoted at 19, and is pressed downward by a spring 20 toward the pins 16 and 17 and against one or both of them in different positions of the controller. The lower surface of the lever 18 is formed substantially as shown, so that it forms notches and cam surfaces. By means of the latter, during parts of the rotation of the drum the lever 18 is turned against the spring 20 and tends to force the drum back to off position. By means of the former, the lever 18 serves to mark the positions of the drum and to hold it in the off and running positions.

When the controller is in off position the parts are as shown in Fig. 2, with the pin 16 (or 17) resting in the notch 21 of the lever 18. From this position backward or counter-clockwise movement of the handle 12 is prevented by means of the pin 16 and notch 21. However, the notch is so shaped that forward or clockwise movement of the handle is allowed. In such forward movement the pin 16 turns the lever 18 about its pivot 19 against the spring 20. When the handle 12 reaches the position shown in Fig. 3, which is the starting position of the controller, the pin 16 strikes the notch 22 in the lever 18, beyond which notch the cam surface of such lever is noticeably steeper. Thus the operator is enabled to feel when the starting position is reached. Should the operator release the handle 12 at this time, the spring 20, acting through the cam surface between the notches 22 and 21 of the lever 18, will force the pin 16 back to the position shown in Fig. 1, thus throwing the controller back to off position. However, if the operator does not release the handle while it is in the position shown in Fig. 3, but after the motor to be controlled has gained sufficient speed moves the handle 12 farther in a clockwise direction, the pin 16 turns the lever 18 farther against the spring 20 until such pin has passed the crest of the projection 23, when the spring 20

and the operator together will bring handle 12 into the position shown in Fig. 4, with the pin 16 seated in the notch 24 and the pin 17 in the notch 25. The controller may be left indefinitely in this position, being firmly held in position by the engagement of pins 16 and 17 with the notches 24 and 25. The engagement of the pin 16 with notch 24 prevents backward movement of the handle, while the engagement of the pin 17 and notch 25 prevents any accidental forward movement thereof. Indeed, through the pin 17 and notch 25 the handle 12 will be returned to the position shown in Fig. 4 if it is moved slightly ahead of such position.

In order to bring the controller to off position the handle 12 is moved still farther in a clockwise direction, bringing it to the position shown in Fig. 2, or rather to a position corresponding to such position but with the various parts turned through 180° about their respective axes. Pins 16 and 17 have now interchanged places, and backward movement of the controller from this new off position is prevented by the engagement of pin 17 in the notch 21. The operation above described may now be repeated, the pin 17 acting as the pin 16 did in the former operation.

Many modifications may be made in the precise arrangement here shown and described and all such which come within the spirit and scope of my invention I aim to cover in the following claims.

What I claim as new is:—

1. A controller for electric motors, comprising a rotatable drum, an operating handle therefor, and a spring-pressed cam cooperating with parts moved by said handle for biasing the controller to off position when it is in certain other positions.

2. A controller for electric motors, comprising fixed and movable contacts, and a spring-pressed lever for biasing the latter in one direction when it is in certain positions and for preventing it from moving in such direction when it is in certain other positions.

3. A controller for electric motors, comprising fixed and movable contacts, and a spring-pressed lever for biasing the movable contact in one direction when it is in certain operative positions, for preventing it from moving in such direction when it is in certain other positions, and for marking the various operative positions.

4. A controller biased to off position when between off position and a point near running position, and biased to running position when near such position on either side thereof.

5. A controller for electric motors comprising fixed and movable members, an operating handle for the movable member, a spring-pressed cam provided with notches, and means moved by said handle and co-

operating with said cam for biasing the movable member to off position when it is in a predetermined starting position and cooperating with the notches of said cam to prevent backward movement of the controller from off or running position.

6. A controller for electric motors comprising fixed and movable members, an operating handle for the movable member, a spring-pressed cam provided with notches, and means moved by said handle and cooperating with said cam for biasing the movable member to off position when it is in a predetermined starting position, and cooperating with the notches of said cam to prevent backward movement of the controller from off or running position and to mark the starting position thereof.

7. A controller for electric motors, comprising a rotatable drum normally movable always in the same direction, an operating handle therefor, and a spring-pressed lever having notches and cam surfaces, said cam surfaces tending to bias the controlling drum backward to off position when it is between such position and running position, and said notches preventing backward movement of the controller from off and running positions.

8. A controller for electric motors, comprising a rotatable drum normally movable always in the same direction, an operating handle therefor, a spring-pressed lever having a notch and cam surfaces, said cam surfaces tending to bias the controlling drum backward to off position when it is between such position and running position, and said notch marking a starting position of the drum.

9. A controller for electric motors, comprising a rotatable drum normally movable always in the same direction, an operating handle therefor, a spring-pressed lever having notches and cam surfaces, said cam surfaces tending to bias the controlling drum backward to off position when it is between such position and running position, a plurality of said notches preventing backward movement of the controller from off or running position, and one of the notches marking a starting position.

10. A controller for electric motors, comprising fixed and movable members, an operating handle for the movable member, a spring-pressed device having notches and cam surfaces and cooperating with parts driven from said handle to bias said movable member backward to off position when it is between off and running positions and to mark the starting position thereof.

11. A controller for electric motors, comprising fixed and movable members, an operating handle for the movable member, a spring-pressed device having notches and cam surfaces and cooperating with parts driven from said handle to bias said movable

member backward to off position when it is between off and running positions and to prevent backward movement of said member from running position.

- 5 12. A controller for electric motors, comprising fixed and movable members, an operating handle for the movable member, a spring-pressed device having notches and cam surfaces and cooperating with parts driven from said handle to bias said movable

member backward to off position when it is between off and running positions and to prevent backward movement of said member from off position.

In testimony whereof I affix my signature, 15
in the presence of two witnesses.

JOSEPH F. MENNINGEN.

Witnesses:

GEO. B. SCHLEY,
FRED J. KINSEY