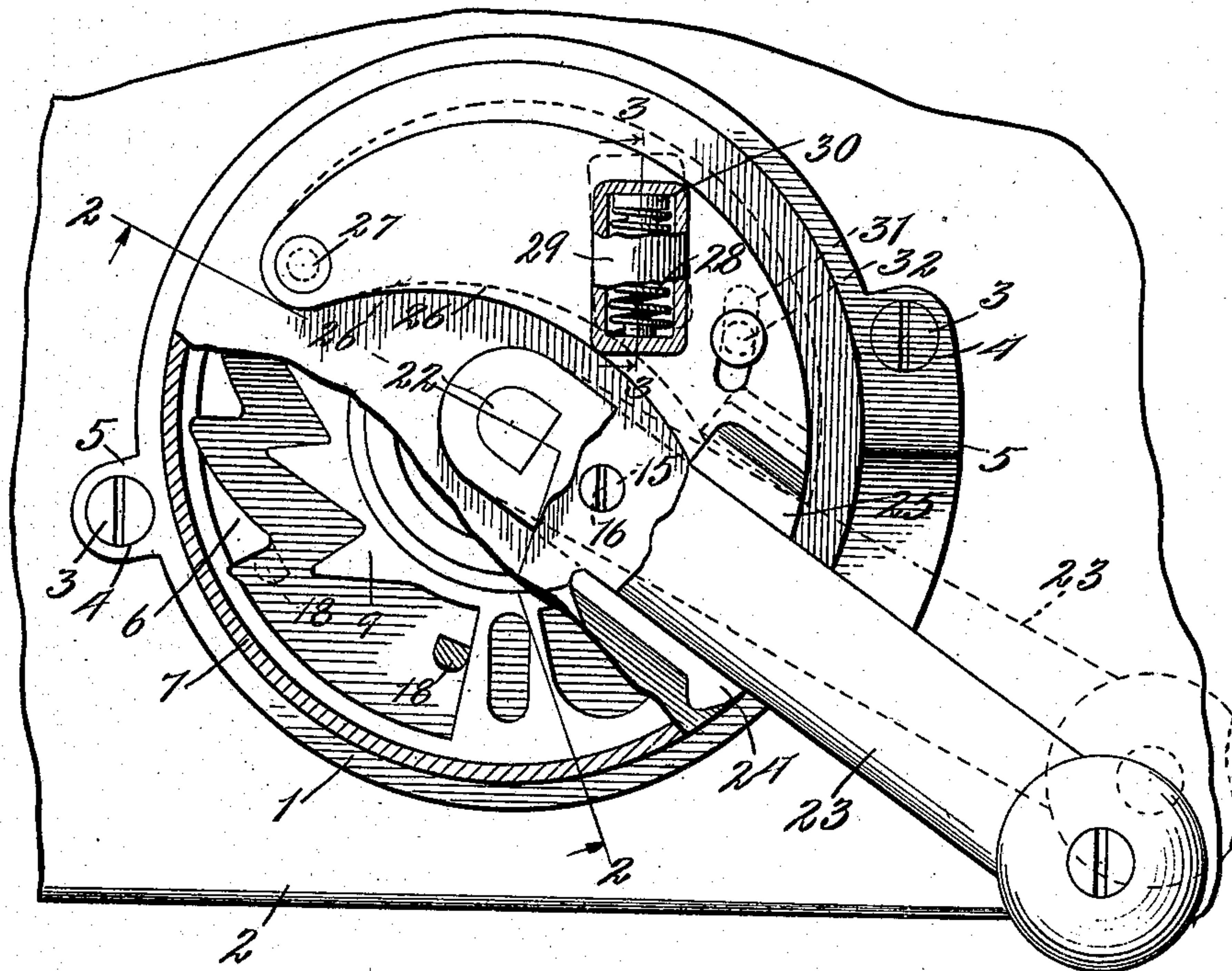


C. P. EBERSOLE.  
 CONTROLLER REGULATOR.  
 APPLICATION FILED DEC. 16, 1907.

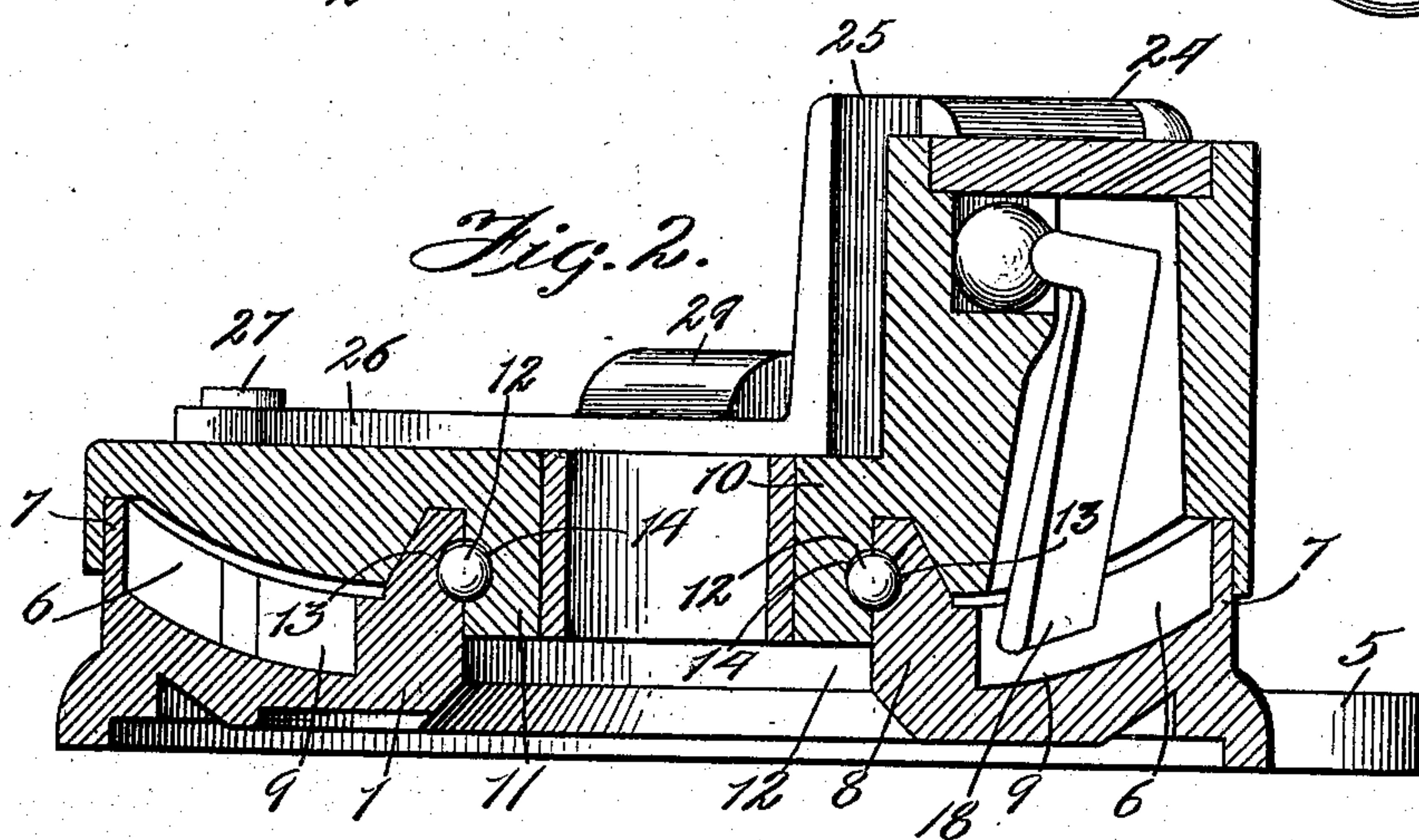
899,717.

Patented Sept. 29, 1908.

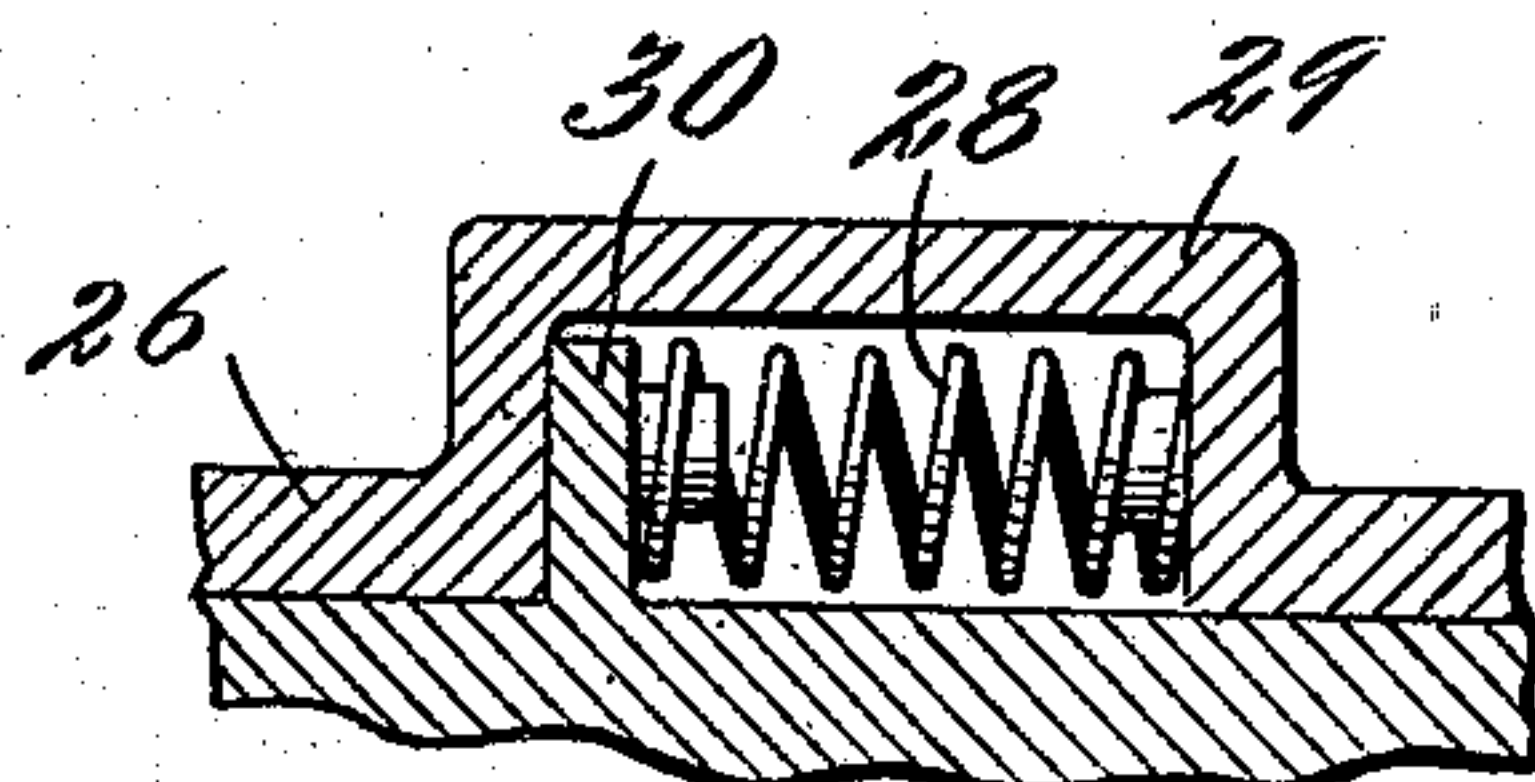
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses:

*W. D. Perry*  
*W. Perry Hahn*

Inventor:

*Cyrus P. Ebersole*  
*By James R. Addington & Co.*  
*Attys*



# UNITED STATES PATENT OFFICE.

CYRUS P. EBERSOLE, OF KEOKUK, IOWA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AMERICAN AUTOMOTONEER COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## CONTROLLER-REGULATOR.

No. 899,717.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed December 16, 1907. Serial No. 406,711.

*To all whom it may concern:*

Be it known that I, CYRUS P. EBERSOLE, a citizen of the United States, residing at Keokuk, in the county of Lee and State of Iowa, have invented new and useful Improvements in Controller-Regulators, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to an improvement in the construction of controller regulators for electric motors. The purpose and function of such regulators is, as well known to those skilled in the art, to compel the operator to turn the line current into the motor windings by step movement of the controller, whereby the full-line voltage is prevented from being suddenly sent through the motor, and thereby forestalling injury to the motor windings that would result if the motor were started with the full-line current.

The specific object of my invention is to provide a yieldable clamping connection between the hood of the controller regulator and the controller handle, so as to accommodate various sizes and makes of handle.

In the accompanying drawings, in which my invention is shown applied to any approved form of controller regulator, Figure 1 represents a top plan view of a controller regulator provided with my improvement, a portion of the hood being broken away for the purpose of showing the arrangement of the cams and stops on the base, as well as the initial position of the pawl with respect to said cams and stops. Fig. 2 is a cross-sectional view, showing the position of the pawl in its housing. Fig. 3 is a detailed cross-sectional view on line 3, 3 of Fig. 1.

The base 1 is rigidly secured to the top 2 of the controller by any suitable means, as by screws 3, passing through openings 4 in the lugs 5. This base is provided with a series of cams 9, projecting toward the stops and in staggered relation therewith, as clearly shown in Fig. 1. It will thus be seen that there is formed on the stationary base an irregular or zig-zag path, in which the pawl on the hood is adapted to travel as presently explained.

Rotatably mounted upon the base 1 is a hood 10, having a downwardly extending portion 11, which fits snugly into the central opening 12 of the base. The hood and base may conveniently be locked together by any

approved means which will prevent separation of the parts, while permitting rotation of the hood on the base. For the sake of illustration, I have shown such locking means in the form of rollers 12, working in a circular race way, formed by the alined grooves 13 and 14 on the base and hood, respectively, as shown in Fig. 2. The rollers may be fed into the race way or removed therefrom through an opening 15, which may be covered by a suitable plug 16, as indicated in dotted lines in Fig. 1. In a chamber 17 on the hood is mounted a pawl 18. In the instance shown the pawl is provided with an arm extending at right angles thereto, which is provided with a ball which seats in a socket formed in the inner face of one of the walls of the housing and is secured in place by a cap-plate 20. In its normal position the pawl, as shown in Fig. 1, is free to the action of gravity. In this normal position the pawl rests against the rear wall of the housing. Looking at Fig. 2, it will, therefore, be seen that the pawl is free to pendulate to the right and left, as well as to move pivotally toward the observer, but that it is prevented from moving away from the observer by virtue of its abutment against the rear wall.

On the projecting portion 22 of the controller shaft is removably mounted the controller handle 23, which makes connection with the hood by passing through the space formed between the lugs 24 and 25. The lug 24 is rigidly mounted on the hood, and may preferably be integral therewith.

Before I proceed to describe in detail my novel form of clamp between the hood and the controller handle, I desire to direct attention briefly to the operation of a controller regulator above described.

The hub of the controller handle 23 having been slipped over the projecting portion 22 of the controller shaft, so that the controller handle will rest in the space formed by the lugs 24 and 25, if it is desired to start the motor, the handle is turned in a clockwise direction. The hood will rotate correspondingly. The pawl 18 will move from its initial position, indicated in Fig. 1, until it encounters the first of the cams 9, which will force it against the first of the stops 6, as indicated in dotted lines in Fig. 1. Inasmuch as the pawl cannot move backwardly, the movement of the hood is arrested. In order to effect further movement, it is only necessary



to relieve the forward pressure on the controller handle, when the pawl will pendulate across the zig-zag path, past the first of the cams. A further movement of the controller handle in a clockwise direction will bring the pawl against the second cam, which, in turn, will deflect it against the second stop, when the movement of the hood is again arrested. By continuing the operation in this manner, the hood may be rotated by a step-by-step movement until the final position is reached, when the full current is passing through the motor windings. To cut the motor out of circuit, the controller handle is moved in a reverse direction. Inasmuch, however, as the pawl is free to move in a direction away from the wall 21, as above explained, it will be apparent that the free reverse movement of the hood is not interfered with, for the reason that the pawl readily rides over the cams and stops.

In order to accommodate any size or make of controller handle, I mount the lug 25 yieldably upon the hood. This yieldable mounting may be brought about in several ways. In the present instance, the lug carries an extension 26, pivoted to the hood at 27. Any suitable spring means may be employed for urging the lug 25 toward the lug 24. One form of such means is shown in detail in Fig. 3. A spring 28 is located in the housing 29 on the extension 26, and abuts at one end against said housing, and at its other end against a projection 30, rising from the hood. The spring, tending to expand, will force the extension 26, and, therefore, the lug 25 toward the lug 24, so that the controller handle in the space between these lugs will be firmly clamped to the hood, while, at the same time, different sizes of handles may be accommodated. Although the arrangement shown in Fig. 3 will of itself limit the pivotal movement of the lug 25, I may provide additional limiting means in the shape of a slot 31 and a lug 32, in the extension 26 and the hood. Other spring means than that illustrated in Fig. 3 will readily suggest itself to those skilled in the art. For instance, it is plain to see that in lieu of a compression spring one might as well use an expansion spring, to accomplish precisely the same result in the same way, by merely changing the position of the projection 30 to the other side of the housing 29, and having the expansion spring secured at one end to the left wall of the housing, as viewed in Fig. 3, and the other end to the lug 30. In this arrangement the spring, tending to contract, would urge the lug 25 in a direction toward the lug 24.

Although I have shown a specific form of controller regulator in connection with my invention, it is to be understood that this showing is merely for the sake of illustration, and to set forth the nature and object of my invention in a full and clear manner. It is

evident that my improved clamping means between the controller handle and the hood may be applied to any approved form of regulator in which a connection between the controller handle and the hood is necessary for proper operation of the regulator.

Directing attention to Fig. 1, it will be noticed that when the controller handle is moved in a clockwise direction, it will bear against the rigid lug 24; on the other hand, when the controller handle is moved in the reverse direction, it will bring pressure upon the spring-pressed lug 25, which may yield in consequence, and thereby cause the controller handle to move out of engagement with the lug 24, as indicated in dotted lines in Fig. 1. This position of the controller handle does not interfere with a proper connection between the hood and the controller handle, for the rotation of the latter carries the hood with it by a corresponding movement.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a controller regulator, the combination with a stationary base of a hood rotatably mounted thereon, coöperating means on said base and hood to regulate the movement of the hood in one direction, and a pair of lugs on said hood for receiving the controller handle there-between, one of said lugs being yieldably mounted, whereby the hood and the controller handle are firmly clamped together, while permitting of ready separation.

2. In a controller regulator, the combination with a stationary base, provided with cams and stops, of a hood rotatably mounted on said base, a pawl carried by said hood for coöperation with said cams and stops to compel intermittent movement of the hood in one direction, without interfering with the free rotation of the hood in the opposite direction, and a pair of lugs on said hood for receiving the controller handle there-between, one of said lugs being yieldably mounted, whereby the hood and the controller handle are firmly clamped together, while permitting of ready separation.

3. In a controller regulator, the combination with a stationary base of a hood rotatably mounted thereon, coöperating means on said base and hood to regulate the movement of the hood in one direction, and a pair of lugs on said hood for receiving the controller handle there-between, one of said lugs being yieldably pivoted, whereby the hood and the controller handle are firmly clamped together, while permitting of ready separation.

4. In a controller regulator, the combination with a stationary base, provided with cams and stops, of a hood rotatably mounted on said base, a pawl carried by said hood for



coöperation with said cams and stops to compel intermittent movement of the hood in one direction, without interfering with the free rotation of the hood in the opposite direction, and a pair of lugs on said hood for receiving the controller handle there-between, one of said lugs being yieldably pivoted, whereby the hood and the controller handle are firmly clamped together, while permitting of ready separation.

5. In a controller regulator, the combination with a stationary base of a hood rotatably mounted thereon, coöperating means on said base and hood to regulate the movement of the hood in one direction, a pair of lugs on said hood for receiving the controller handle there-between, one of said lugs being yieldably pivoted, whereby the hood and the controller handle are firmly clamped together while permitting of ready separation, and means for limiting the pivotal movement of said yieldable lug.

6. In a controller regulator, the combination with a stationary base, provided with cams and stops, of a hood rotatably mounted on said base, a pawl carried by said hood for coöperation with said cams and stops to compel intermittent movement of the hood in one direction, without interfering with the free rotation of the hood in the opposite direction, a pair of lugs on said hood for receiving the controller handle there-between, one of said lugs being yieldably pivoted, whereby the hood and the controller handle are firmly clamped together while permitting of ready separation, and means for limiting the pivotal movement of said yieldable lug.

7. In a controller regulator, the combination with a stationary base of a hood rotatably mounted thereon, coöperating means on said base and hood to regulate the movement of the hood in one direction, a lug rigidly mounted on said hood, a second lug spaced from said first-mentioned lug and pivotally mounted on the hood, the space thus formed between the lugs serving to receive the con-

troller handle, a housing on said pivoted lug, and a spring in said housing bearing at one end against the pivoted lug and at the other against the hood, to force said lug toward the first-mentioned lug, whereby the controller handle is yieldably clamped between said lugs.

8. In a controller regulator, the combination with a stationary base, provided with cams and stops, of a hood rotatably mounted on said base, a pawl carried by said hood for coöperation with said cams and stops to compel intermittent movement of the hood in one direction, without interfering with the free rotation of the hood in the opposite direction, a lug rigidly mounted on said hood, a second lug spaced from said first-mentioned lug and pivotally mounted on the hood, the space thus formed between the lugs serving to receive the controller handle, a housing on said pivoted lug, and a spring in said housing bearing at one end against the pivoted lug and at the other against the hood, to force said lug toward the first-mentioned lug, whereby the controller handle is yieldably clamped between said lugs.

9. A controller regulator comprising a base, a rotatable member, means to regulate the movement of the rotatable member in one direction, and yieldable means for clamping the controller handle and said rotating member together.

10. A controller regulator comprising a base, a rotatable member, means to regulate the movement of said rotatable member in one direction, a handle member, and means on one of said members for clamping together said rotatable member and handle member yieldingly.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

CYRUS P. EBERSOLE.

Witnesses:

G. W. Cox,  
W. B. WILSON.