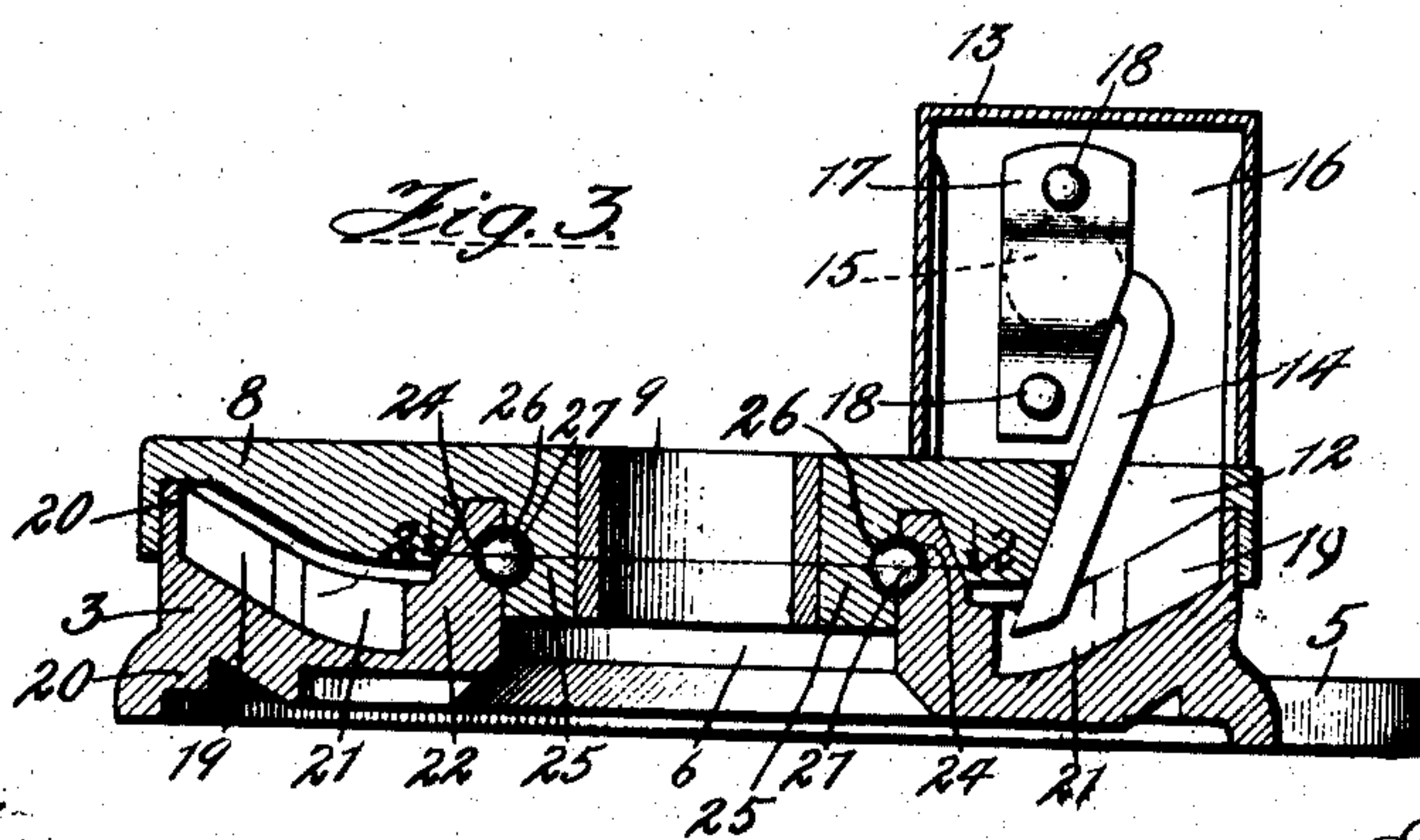
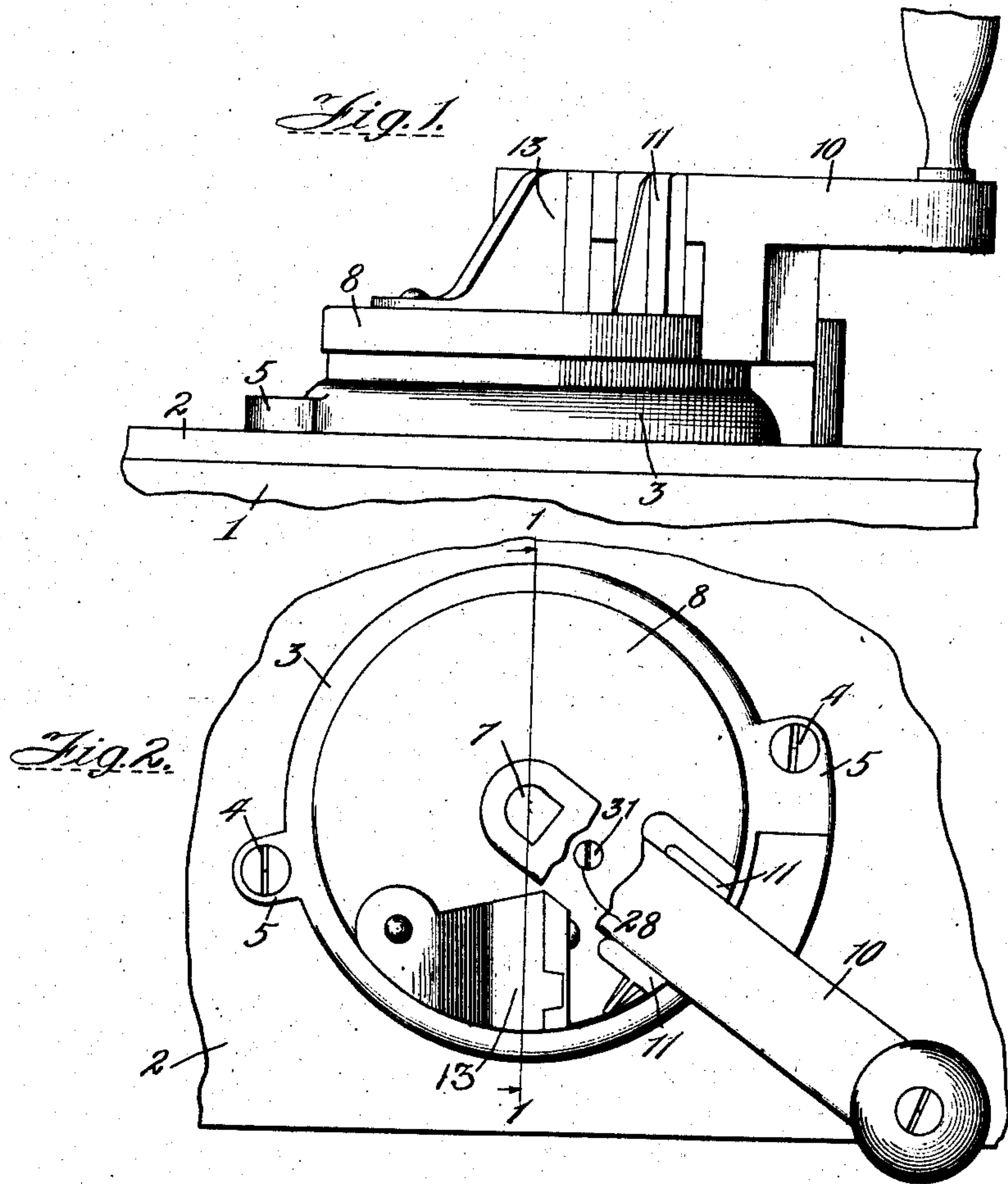


No. 874,173.

PATENTED DEC. 17, 1907.

C. P. EBERSOLE.
CONTROLLER REGULATOR.
APPLICATION FILED APR. 15, 1907.

2 SHEETS—SHEET 1.



Witnesses:

Wm. D. Perry
A. A. Thomas

Inventor:

Cyrus P. Ebersole

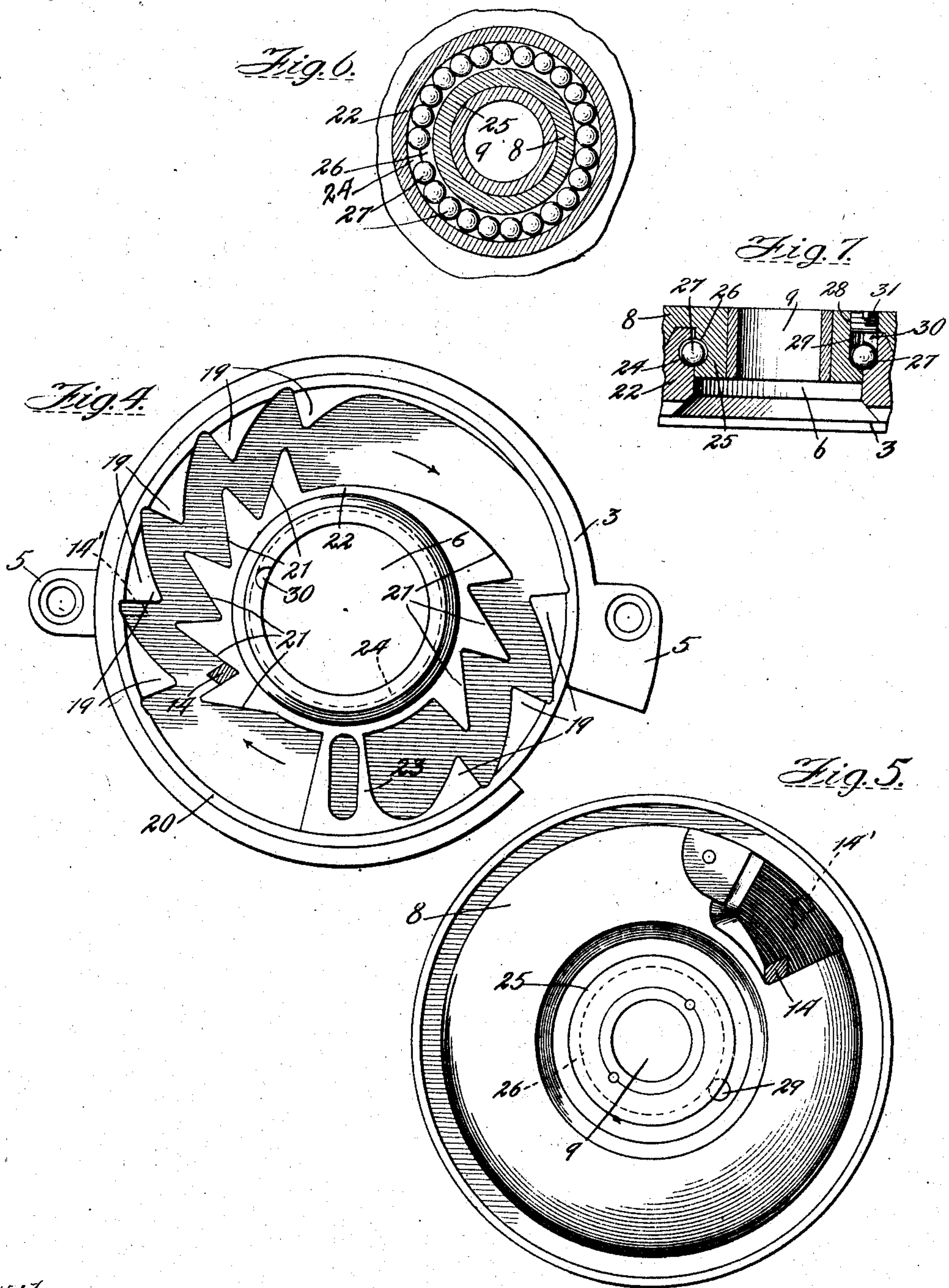
By Jones, Addington & Ames
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CYRUS P. EBERSOLE, OF KEOKUK, IOWA, ASSIGNOR TO ELECTRIC SERVICE SUPPLIES COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CONTROLLER-REGULATOR.

No. 874,173.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed April 15, 1907. Serial No. 368,255.

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 improvements in regulators for electric controllers, such as are used in connection with street car motors to compel the operator to turn on the current by a slow step-by-step movement of the operating handle of the controller, in order to obviate the injuries to the motor circuit that would result from a sudden turning on of the full current sent through the supply circuit.

The specific object of my invention is to provide improved means whereby the stationary base of the regulator and the movable hood therefor are locked together so as to prevent separation of the parts, without in any way interfering with the movement of the hood.

Referring to the drawings, the several figures of which illustrate one embodiment of my invention, Figure 1 is a side elevation of a controller regulator provided with my new and improved means for locking the hood to the base; Fig. 2 is a top plan view showing part of the controller handle broken away to show more clearly the opening through which the rollers are fed into the raceway, as hereinafter described. Fig. 3 is a cross section on the line 1—1 of Fig. 2; Fig. 4 is a top plan view of the base of the regulator with the hood removed, indicating the normal position of the pawl in full lines, and its deflected position in dotted lines; Fig. 5 is a bottom plan view of the hood showing the pawl in its normal position, as indicated in full lines as well as in its deflected position, as indicated in dotted lines; Fig. 6 is a cross sectional plan view on the line 2—2 of Fig. 3 showing the ball-bearing connection between the base and the hood; and, Fig. 7 is a cross-sectional side view of my improved locking arrangement between the stationary base and the rotatable hood, the parts being in a position to show one way in which the insertion of the balls into the raceway may be effected.

Referring to the drawings wherein like reference numerals indicate corresponding parts throughout the several views, the casing 1 of the controller is surmounted by the top or cover 2, which is secured to the casing in any suitable manner. Attached to the top 2 is the controller regulator, comprising a base 3 secured to the top of the casing in any convenient way, as, for instance, by screws or bolts 4 passing into the top 2 through lugs 5 on the base. The base has a central opening 6 through which passes the shaft 7 of the controller. Rotatably mounted on the base is the hood 8 likewise provided with a central opening 9 which registers with the opening 6 in the base to permit the controller shaft to project beyond the hood so that the controller handle 10 may be conveniently attached to the projecting end 7 of the shaft as indicated in Fig. 2. The hood is provided with a pair of upwardly extending lugs 11 between which the controller handle is arranged to fit when the hub of the handle is slipped over the top of the shaft, as clearly shown in Fig. 2. By this means the hood is operatively connected with the handle, and thereby also with the controller shaft, so that a rotation of the latter is accompanied by a corresponding rotation of the hood. To insure proper coöperation between the controller and the regulator, the projecting portion 7 of the controller-shaft is so shaped that the shaft and the hood must be in certain relative positions in order that the handle 10 may operatively engage the shaft of the controller and enter the space between the lugs 11.

Referring to Fig. 2, it will be observed that the upper end of the shaft is squared on three sides, the fourth side being rounded; the opening in the hub of the handle is of an outline to correspond to the shape of the projecting portion 7 of the shaft, as just described. In consequence, to engage the handle with the hood, the latter must be brought to the starting position, in which position the shaft is left when the handle is removed therefrom. The hood is provided with an opening 12 over which is located a suitable housing 13 carried by the hood. A dog or pawl 14 is mounted in the housing and is preferably angle-shaped, one arm thereof extending laterally and being provided with a ball 15, situated in a socket formed partly in the inner face of the wall 16 and

partly in the cap plate 17, which may be secured to the wall by suitable screws or rivets 18. The other arm of the pawl extends downwardly through the opening 12.

5 As shown in Fig. 4 the base of the controller-regulator is provided with a series of stops or teeth 19 projecting inwardly from the peripheral flange 20. A series of outwardly extending cams 21 is provided on the
10 inner circumferential flange 22 of the base.

The downwardly projecting arm of the pawl rests by gravity normally in a position as shown in Fig. 3, and as indicated in Figs. 4 and 5. As will be seen from these three
15 figures, the lower end of the pawl 13 lies normally in a position to engage the cams 21, so that, upon rotation of the hood in the direction indicated by the arrows in Fig. 4, the cams 21 will each deflect the pawl successively against each of the stops 19. One
20 of these deflected positions of the pawl is indicated in dotted lines 14' in Fig. 4. When, as indicated in Fig. 4, the pawl engages one of the stops 19 to arrest the movement of the
25 hood 8, it is only necessary to slightly relax the pressure on the handle, and the pawl will by gravity disengage from the stop and swing inwardly against the next cam-surface, to be by it urged outwardly again, upon forward
30 movement of the handle, into engagement with the next stop. And so the operation is continued until by this intermittent or step-by-step movement of the controller
35 handle, the operator has turned on the full current at which time the hood will have reached the limit of its forward travel, by reason of the pawl engaging the stop 23 over
40 which it cannot ride. By virtue of the ball-and-socket mounting of the pawl it will be apparent that the backward or counter
45 clock-wise rotation of the hood takes place without interference or retardation, inasmuch as the pawl is free to ride over the cams 21 and stops 19.

The above described features of invention are not claimed herein *per se*, inasmuch as they form the subject-matter of and are claimed in certain other applications for
50 United States Letters Patent filed by me July 8, 1905, and October 8, 1906, Serial Nos. 268,848 and 337,998, respectively.

As stated at the beginning of this specification, the essence of my invention resides in the means for securing the hood to the base
55 of the regulator in such a manner as not to interfere with the proper rotation of the hood. It is plain to see that my improved locking mechanism between the base and the hood is capable of use in connection with any
60 improved form of controller-regulator, one form of which I have described and shown by way of illustration only, without in any way intending to limit the use of my invention to such form of regulator. I will now

proceed to describe in detail my improved locking or securing means between the stationary base 3 and the rotatable hood 8.

The inner flange 22 on the base, as most clearly seen in Figs. 3 and 7, is provided with a groove or channel 24 which is approximately semi-circular in cross-section. The
70 downwardly-projecting cylindrical flange 25 of the hood fits snugly within the opening 6 in the base and is provided with a groove or channel 26, so constructed and arranged that when the hood
75 and base are properly assembled the two grooves form a race-way in which is located a series of rollers 27. These rollers serve as locking means for securing the base and hood
80 together and also perform the function of an antifriction bearing between the parts. The rollers 27 are readily inserted into the race-way through an opening 28 formed in the
85 hood, as shown in Figs. 2 and 7. This opening registers permanently with a semicircular notch 29 cut in the flange 25, and terminating in the groove 26, as clearly shown in Fig. 7. A similar notch 30 is cut in the upper
90 part of the flange 22, so that by rotating the hood, the two notches may be brought directly opposite each other, forming, in effect, a continuation of the opening 28, leading into
95 the raceway, as illustrated in Fig. 7. The rollers may now be fed into the raceway, and the opening 28 is then closed by means of a plug, such as the screw 31. It will thus be
100 seen that I have provided a simple and efficient arrangement for securing the hood to the base, without leastwise interfering with the proper and necessary rotation of the hood.

In case it should be desired to separate the hood and the base, the regulator is removed from the top of the controller casing, the
105 screw 31 is withdrawn from the opening 28, the regulator is turned up-side down, and the hood rotated until the notches 29 and 30 are made to register. The rollers will now drop out one by one, whereupon the base and the
110 hood may be readily separated. Of course, in lieu of the spherical rollers one might use rollers of other configurations, such as cylindrical, in which event it would merely be necessary to alter correspondingly the shape
115 of the grooves forming the raceway, and the shape of the notches and opening through which the rollers are to be inserted into the raceway.

As above stated, and as set forth in the claims my invention is applicable to any preferred type of controller regulator, one specific type of which I have described and
120 shown in connection with my invention by way of illustration only and in order to secure a clear and complete understanding of the nature and purpose of my invention.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is:

1. In a controller regulator, a base, and a rotatable hood, means for controlling the movement of the hood in one direction, and a series of rollers for locking the parts against separation without interfering with the rotation of the hood.
2. In a controller regulator, a base, a hood mounted to rotate thereon, means for regulating the movement of the hood in one direction, while permitting free rotation of the hood in the reverse direction, and means, consisting of a series of rollers, for securing the base and hood against separation without interfering with the rotation of the hood.
3. In a controller-regulator, a base, a hood mounted to rotate thereon, means for regulating the movement of the hood in one direction, while permitting free rotation of the hood in the reverse direction, and means for securing the hood and the base together without interfering with the rotation of the hood, said means forming a roller bearing between the hood and the base.
4. In a controller-regulator, a base provided with cams and stops, a hood mounted to rotate on said base, a pawl carried by the hood to cooperate with said cams and stops for compelling intermittent movement of the hood in one direction, and coupling means for securing the hood and the base together, said coupling means forming a roller bearing between the hood and the base.
5. A controller regulator comprising a base and a hood each having an annular groove which with the groove of the other provides a

race-way concentric with the axis of rotation of the hood, means for effecting a step by step movement of the hood in one direction without interfering with the uninterrupted movement thereof in the opposite direction, and a series of rollers in the race-way to lock the hood and base together without interfering with the rotation of the hood.

6. In a controller-regulator, a base having a groove, a hood mounted to rotate on said base and provided with a groove, said grooves arranged to form a raceway, cams and stops on said base, a pawl carried by said hood to cooperate with said cams and stops for compelling intermittent movement of the hood in one direction, while permitting free movement of the hood in the reverse direction, and rollers in said raceway for rotatably securing the hood to the base.

7. In a controller regulator, a base, a hood mounted to rotate thereon, means for regulating the movement of the hood in one direction while permitting free rotation thereof in the reverse direction, and means, consisting of a series of rollers, for securing the hood and base together without interfering with the rotation of the hood, said rollers being removed to permit of separation of the parts only when the controller regulator is displaced from its normal operative position.

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

CYRUS P. EBERSOLE.

Witnesses:

G. W. Cox,

C. A. LOEFFLER.