

C. M. FEIST.
 CONTROLLER REGULATOR.
 APPLICATION FILED JUNE 5, 1909.

942,722.

Patented Dec. 7, 1909.

Fig. 1.

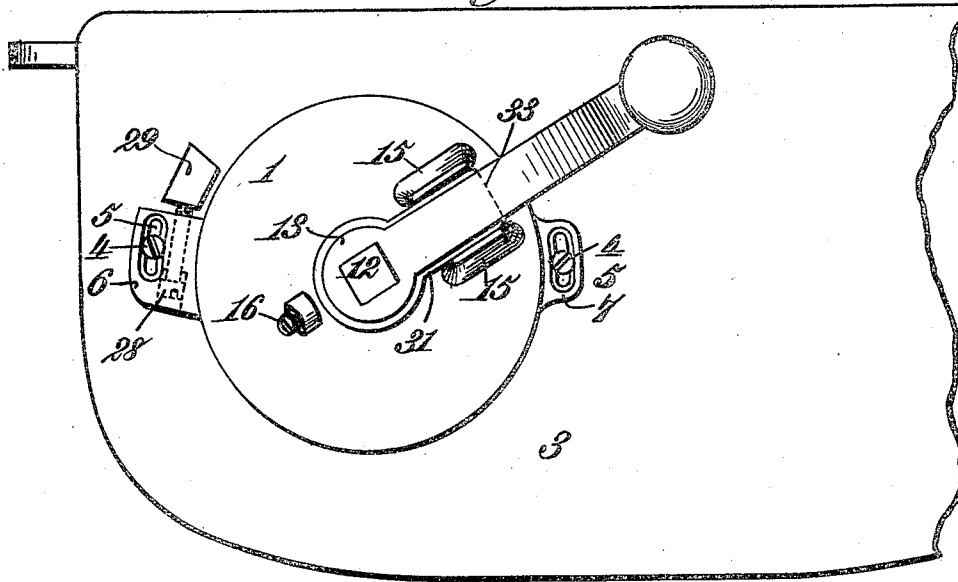


Fig. 2.

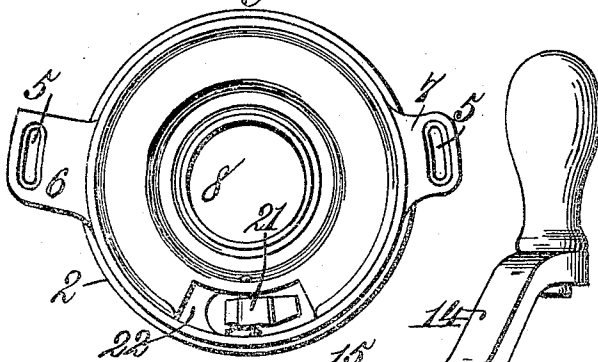


Fig. 3.

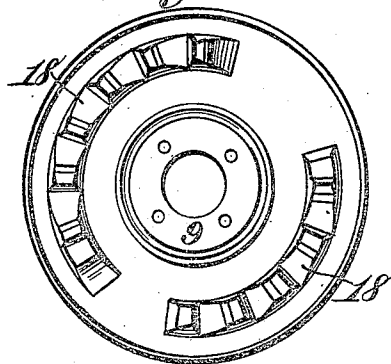


Fig. 4.

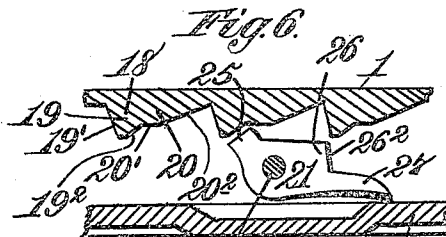
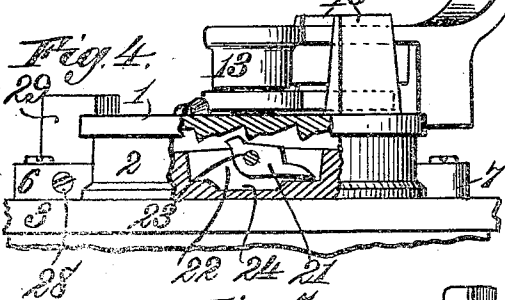
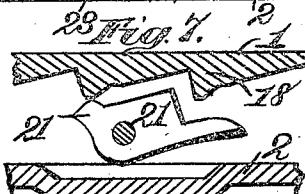
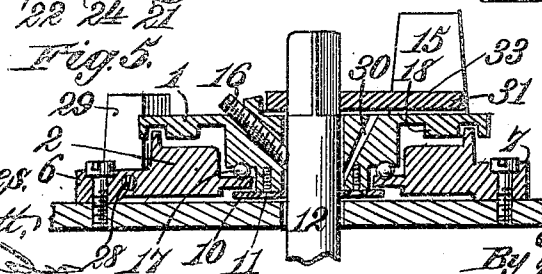


Fig. 5.



Witnesses,

Robert Emmett,

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UNITED STATES PATENT OFFICE.

CHARLES M. FEIST, OF SIOUX CITY, IOWA, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO EDWIN L. KIRK, OF SIOUX CITY, IOWA.

CONTROLLER-REGULATOR.

942,722.

Specification of Letters Patent.

Patented Dec. 7, 1909.

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To all whom it may concern:

Be it known that I, CHARLES M. FEIST, a citizen of the United States, residing at Sioux City, in the county of Woodbury and State of Iowa, have invented new and useful Improvements in Controller-Regulators, of which the following is a specification.

The present invention is an improvement in controller-regulators, and its prime object, briefly stated, comprehends the production of an extremely simple and inexpensive device of the type specified for effectively preventing the operator from turning on the current so fast as to endanger the motor or the mechanism actuated by the latter.

To accomplish this end, there is provided a regulator comprising connected fast and loose members, the fast member carrying a rocking dog arranged for engagement with a single annular series of teeth formed upon the inner surface of the loose member, the construction and arrangement of these parts being such as to insure a relatively slow, continuous movement of the loose member during each period of acceleration. While this gradual acceleration is the essential feature of most of the regulators now in use, it is ordinarily accomplished by means of a tortuously arranged series of teeth or by two concentric series, acting in conjunction with a dog which, in addition to its ordinary rocking movement, is also arranged for a swinging movement sidewise, in order to effect its engagement with the various teeth, the loose member thus having what may be regarded as a step-by-step movement. This construction is obviously complicated and correspondingly expensive, these defects being avoided in the present construction, wherein the dog is arranged to operate only in the ordinary manner, and engages only a single series of teeth, as already stated.

As a further object, this invention comprehends the provision of means for accurately adjusting the regulator with reference to the controller mechanism without necessitating the drilling of separate holes in the case to suit the particular controller.

Finally, the invention resides to a more or less material extent in the attachment of the two members of the regulator to each other in such a manner as to prevent access to the working parts thereof without first re-

moving the regulator bodily from the case; and in so mounting the dog as to permit it to drop and clear the teeth in the event of any injury to its pivot pin.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view illustrating the application of the invention. Fig. 2 is a similar view of the lower member of the regulator. Fig. 3 is an inverted plan view of the upper member. Fig. 4 is a side elevation, partly in section, of the regulator. Fig. 5 is a longitudinal vertical sectional view of the regulator. Figs. 6 and 7 are detail vertical sections, illustrating two different positions of the dog.

Reference being had to said drawings, and to the numerals marked thereon, 1 and 2 designate, respectively, the upper and lower members of the regulator, the latter member being fastened directly to the cap or top piece 3 of the controller by means of screws 4 which extend through elongated slots 5 formed in the lugs 6 and 7 with which the member in question is provided. The body portion of the lower member is formed with a stepped axial opening 8 designed to receive the correspondingly-stepped lower end of a depending tubular throat 9 formed upon the upper member 1. The connection of the two members is effected by a ring 10 which is disposed against the bottom wall of said opening and has its outer face in direct contact both with said wall and with the lower end face of said throat, to which latter it is fastened by screws 11. By reason of this arrangement, it will be seen that access to the interior of the regulator can be had only by first removing the latter from the controller, and then detaching the ring.

The ring is disposed with its central space or opening in registration with the bore of the throat and with an opening formed in the controller cap. The controller shaft 12 extends through these openings and has its squared upper end projecting above the upper member for engagement with the socket 13 with which the operating handle 14 is provided. The shank of said handle is designed to fit between a pair of spaced upstanding jaws 15 formed upon the upper member, rotation of the handle in either direction imparting a corresponding

movement to said member, which latter has a direct connection with the shaft through the medium of a threaded bolt 16. To avoid friction during such movement, the two members of the regulator are formed with oppositely-located races arranged to receive a series of anti-friction devices 17.

The loose upper member has formed upon its under face a single annular series of teeth 18, each comprising two shoulders 19 and 20 of different heights, as shown in Figs. 4, 5 and 6, the forward shoulder having a substantially vertical front face 19', and the rear shoulder a substantially horizontal face 20'. The rear faces 19² and 20² of the two shoulders likewise have different inclinations. These teeth are arranged to successively engage and operate a rocking or tilting dog 21 located within a pocket 22 formed in the annular side wall of the lower member, said dog being mounted upon a horizontal pivot pin 23. The pocket above referred to is sufficiently narrow to prevent any lateral movement of the dog and its bottom wall is formed with a depression or cavity 24. Pin 23 passes through the dog adjacent the front end thereof, at which point said dog is formed with an upwardly projecting shoulder 25 which normally extends into the path of movement of the teeth 18. The rear portion of the dog is formed with an upstanding shoulder 26, the inclination of whose rear face 26² is substantially the same as that of the face 19' of the shoulder 19, so as to permit said faces to abut squarely against each other under certain conditions, as hereinafter described. Rearwardly of this shoulder, the dog is provided with a tail 27 which normally rests upon the bottom wall of the pocket 22, as shown in Figs. 4 and 5.

The left hand lug 6 of the lower or stationary member 2 has formed therein a threaded passage which opens through the sides thereof and is designed to receive a threaded bolt 28, the projecting end of whose stem is arranged to contact with the adjacent face of the upstanding lug or stop 29 customarily provided upon the controller cap. By turning the bolt in the proper direction, the position of the regulator with reference to the controller mechanism may be accurately adjusted, the attaching screws 4 being tightened at the conclusion of such adjustment.

The upper member 1 is preferably formed with a downwardly-inclined passage 30 which opens through the wall of the bore of the throat 9 at the point where said wall intersects the bottom face of the throat, lubricant being supplied through this passage to the shaft and its customary bearings. The pocket 22 is likewise designed to be filled with a lubricant.

The operation of the invention may be

stated as follows: The coöperation of the dog and teeth is such that when the current is turned on by a quick movement of the handle, the front face 19' of the tooth nearest the dog will strike sharply against the shoulder 25, thereby rocking the dog upon its pivot and raising the rear portion thereof, so that the face 26² of the shoulder 26 is moved into contact with the front face of the succeeding tooth, thus abruptly terminating the movement of the loose or rotary member. To release the dog from such engagement, it is necessary to reverse the movement of the rotary member until the dog is free to drop of its own weight into its normal position, whereupon the initial or clockwise movement of the rotary member may be continued, such movement, if sudden, being again terminated when the next tooth is reached. On the other hand, the current may be turned on continuously and without interruption, if the rotary member be turned slowly, in which case the front shoulders 19 of the teeth will pass successively over the front shoulder of the dog and will not rock the latter to an extent sufficient to raise its rear shoulder into operative position. Thus, it will be seen that where the movement of the rotary member is rapid, the latter can advance only step by step, but where said member is rotated slowly, the current can be turned on to the proper point without interruption.

With reference to the mounting of the dog, it may be stated that in the event of the pivot pin breaking, the dog will be free to drop into the depression in the pocket, thereby clearing the teeth and precluding any interference on its part with the same.

In addition to the screw 16 which connects the upper member 1 to the shaft 12, it has been found advisable to provide a second attaching device for bracing the shaft and for preventing the otherwise excessive wear upon the handle socket 13 incidental to the abrupt stoppage of the shaft due to the engagement of the dog and teeth when the current is suddenly turned on. To this end, a steel plate 31 is shrunk on, or rigidly secured in some other manner to the squared upper end of the shaft subsequent to the attachment of the regulator to the casing, the inner end of the plate being formed with a square opening through which the shaft end projects. The end 33 of the shank fits between the jaws 15 and thus maintains the regulator member accurately in position with respect to the shaft.

What is claimed is:

1. A controller regulator comprising fast and loose members, a series of teeth provided upon one member, each tooth consisting of a pair of shoulders of different heights, and a pivoted dog carried by the other member and arranged for engagement

with said teeth, to insure a step-by-step movement of the loose member when the latter is rapidly rotated, said dog being inoperative when said loose member is slowly rotated.

5 2. A controller regulator comprising fast and loose members, a series of teeth provided upon one member, each tooth consisting of a pair of shoulders of different heights, and a pivoted dog carried by the other member and
10 formed with a pair of shoulders, the higher shoulders of said teeth being arranged to ride one of the shoulders of said dog when the loose member is rotated slowly and to be engaged by the other shoulder of the dog
15 when said member is rapidly rotated, to abruptly terminate such rapid rotation.

3. A controller regulator comprising fast and loose members, a series of teeth provided upon one member, and a pivoted dog
20 carried by the other member for coöperation with said teeth, said dog being formed at opposite ends with a trip shoulder and a tail, and intermediate its ends with a locking shoulder.

25 4. A controller regulator having one member thereof formed with a pocket having a depression in its bottom wall, in combination with a dog pivoted in said pocket above

said depression and arranged to drop into the latter upon injury to its pivot. 30

5. The combination, with a controller cap and its stop, of a regulator mounted upon the cap and having its base member formed with a pair of lugs, one lug having a horizontal passage formed therethrough, a movable member extending through said passage
35 and having one end thereof arranged for contact with said stop, to adjust said base member with reference to the controller mechanism, and means for retaining said
40 base member in adjusted position.

6. The combination, with a controller shaft, of a regulator mounted upon the cap of the controller and comprising fast and
45 loose members, the loose member being provided with a pair of spaced jaws, and a member rigidly secured at one end to the shaft, the other end of said member fitting between said jaws.

In testimony whereof I have hereunto set
50 my hand in presence of two subscribing witnesses.

CHARLES M. FEIST.

Witnesses:

TOM LONG,

M. L. SLOAN.