

(No Model.)

3 Sheets—Sheet 1.

C. E. SCRIBNER.
REGULATOR FOR DYNAMO ELECTRIC MACHINES.
No. 435,527. Patented Sept. 2, 1890.

Fig. 2.

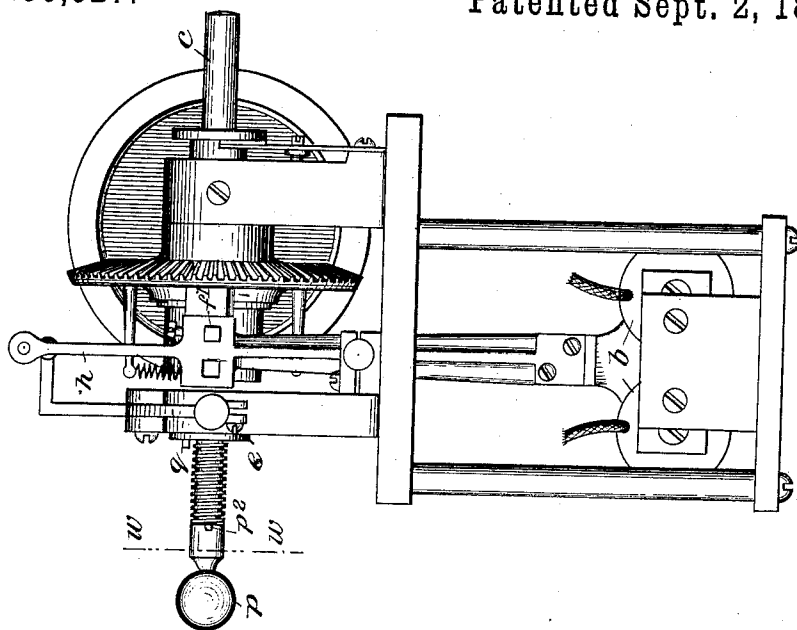
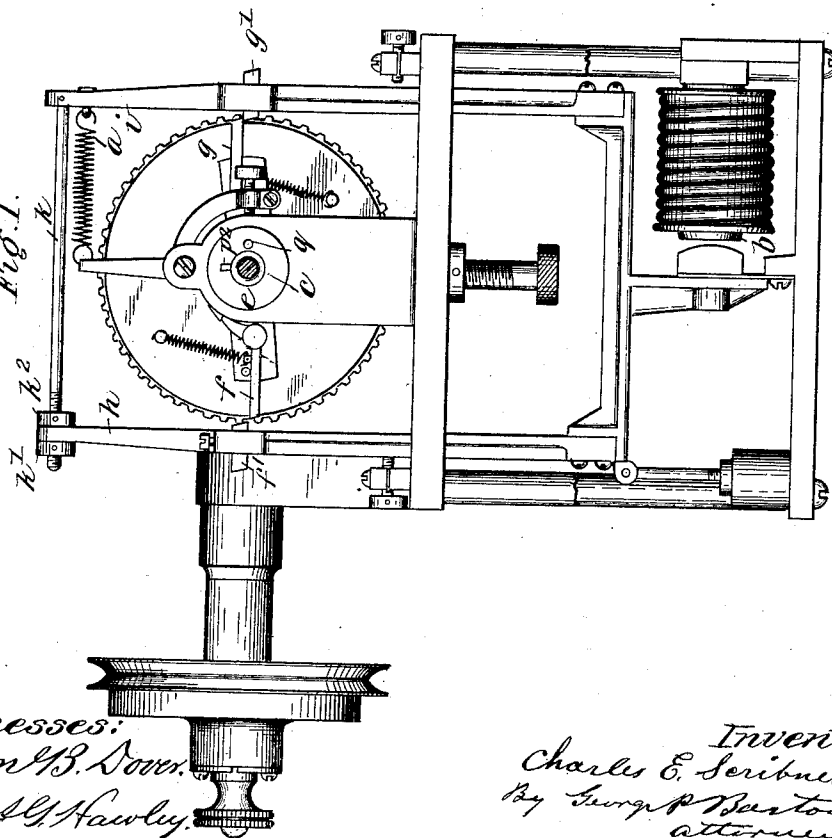


Fig. 1.



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Fig. 3.

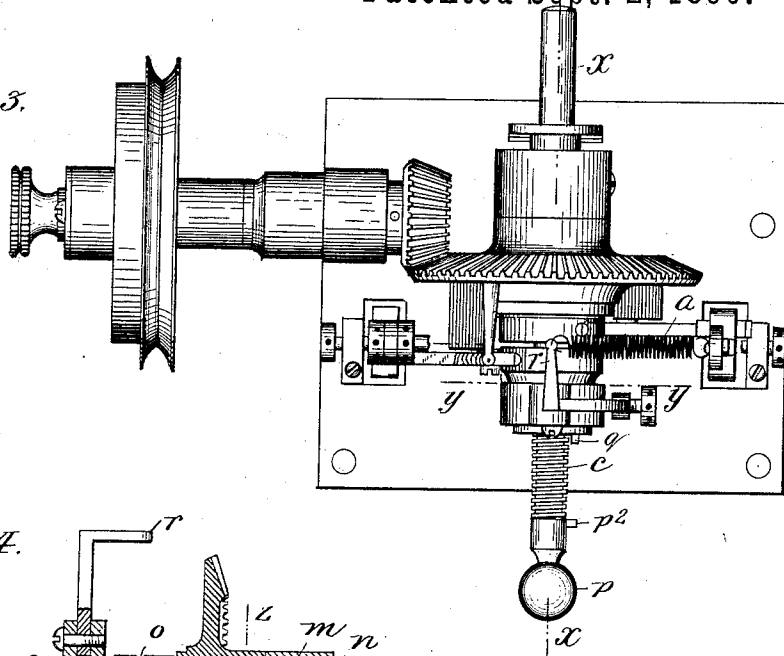


Fig. 4.

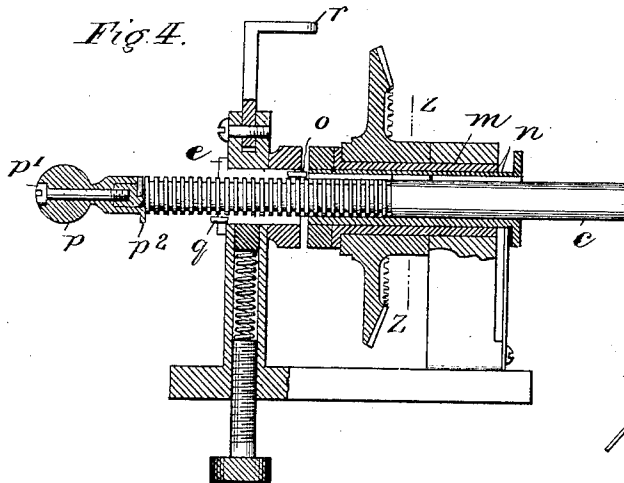


Fig. 6.

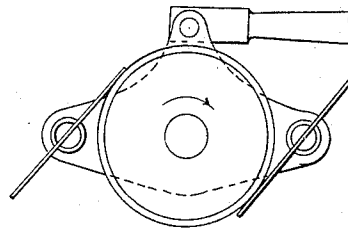


Fig. 5.

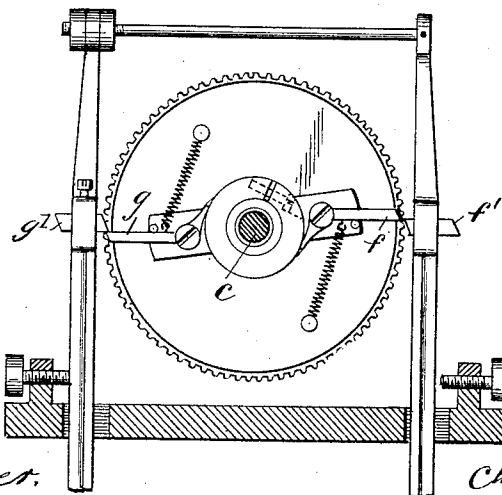
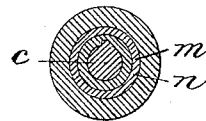


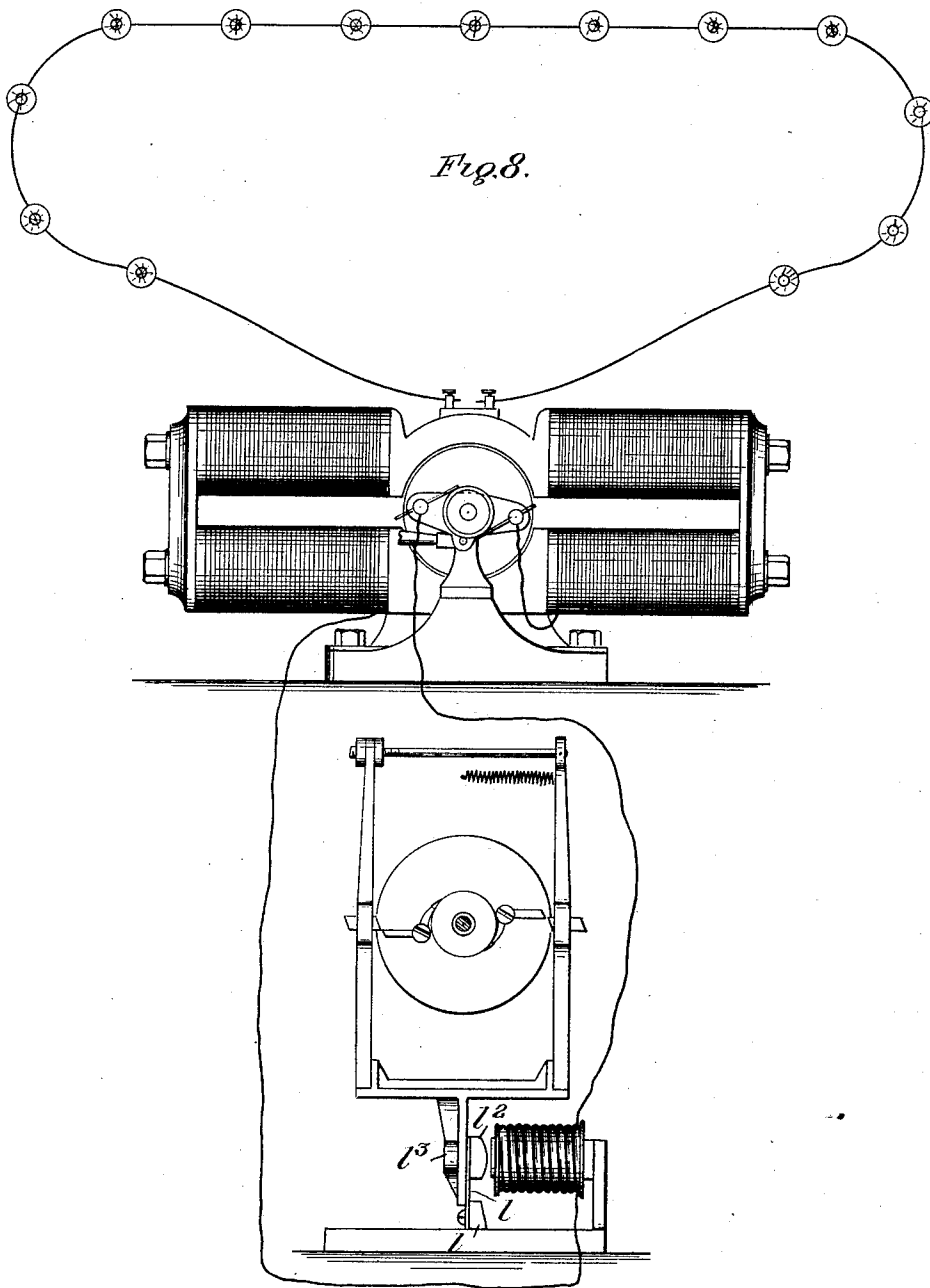
Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 435,527, dated September 2, 1890.

Application filed November 19, 1887. Serial No. 255,596. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Regulators for Dynamo-Electric Machines, (Case 143,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to regulators for dynamo-electric machines; and it consists in certain details of construction.

The regulator is in general construction the same as described in my application, Serial No. 194,369, (Case 102,) filed March 8, 1886, for automatic regulators for dynamo-electric machines.

As hereinafter described, the trigger-dogs are attached rigidly to adjustable arms extended from the armature-lever of the electro-magnetic regulating device. The armature-lever is mounted upon a flexible spring in such manner as to respond readily to changes in the strength of the electro-magnet.

In my application above referred to special stop mechanism is provided for limiting the longitudinal movement of the screw toward the commutator.

In my present invention I have placed the spline upon the screw and provided a longitudinal slot in the sleeve or screw carrier, the spline being preferably at the point on the screw where the thread stops. Upon the nut is provided a pin or stop corresponding to the spline, so that when the screw in its longitudinal movement toward the commutator brings the spline against the pin upon the nut the nut and screw will be locked together, and thus the carrier screw and nut will be locked together, moving at the same rate of speed, and hence no further longitudinal movement will be imparted to the screw. I have also made a modification in the screw, which consists in making the ball of the ball-and-socket joint removable from the screw, the stop upon this end of the screw being attached to the movable portion. By simply

turned off. In order to remove the nut it is only necessary to loosen the clamp or collar secured thereto, when it may be screwed out.

My invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of my regulator, the screw being shown in section, indicated by line *ww* of Fig. 2. Fig. 2 is a side elevation of my regulator. Fig. 3 is a plan view thereof, the rod for adjusting the arms which carry the trigger-dogs being broken away. Fig. 4 is a sectional view upon line *xx* of Fig. 3. Fig. 5 is a detail elevation upon section-line *yy* of Fig. 3. Fig. 6 shows the pitman connected with the brush-carrier. Fig. 7 is a detail sectional view showing the spline upon the screw and the slot in the screw-carrier on line *zz* of Fig. 4. Fig. 8 is a diagram illustrative of the circuits.

Like parts are indicated by similar letters of reference throughout the different figures.

The retractor *a* may be adjusted so as to balance the force of the electro-magnet *b* when energized by the desired strength of current, the force of the retractor being greater or less, according to the strength of current required. The screw *c* and nut *e* are driven together or alternately by means of the triggers *f* and *g*. The dogs *g' f'* are arranged so as to be brought into or out of the paths of the triggers as they are revolved, so as to trip the triggers and drive the nut or the screw-carrier, as the case may be, according to the strength of the magnet *b*. The armature-lever of electro-magnet *b*, as shown, is extended in two parts with arms *h i*, the trigger-dog *f'* being in arm *h* and the trigger-dog *g'* being in arm *i*. The adjusting-rod *k* is placed, as shown, so as to connect the arms *h* and *i* together. By means of the nuts *k'* and *k''* the arms *h i* may be flexed or bent to bring the dogs *f' g'* into proper position with respect to the triggers *f* and *g*. It will be understood that as long as the triggers are not tripped by the dogs *g' f'* the screw and nut will be turned together in the same direction at the same rate of speed and no longitudinal movement will be imparted to the screw. It is the movement of the dogs *f'* and *g'* into

the paths of their respective triggers that causes the triggers to be tripped from time to time to vary the speed of the screw and nut, respectively. These dogs should be adjusted, therefore, quite near to the triggers and yet leave sufficient margin so that the triggers will pass by them freely, and this adjustment is effected by means of the screws k' k^2 upon the rod k when the regulator is in operation.

The fulcrum of the armature-lever consists of a flat spring l , secured to the lug l' and clamped between the armature l^2 and the armature-lever l^3 , the armature-lever l^3 extending downwardly so as to extend below the upper end of the lug l' . Thus the spring l , which must be quite delicate, is prevented from buckling or moving, as it were, bodily toward the pole-piece of the magnet. We have thus the delicacy of the spring-fulcrum without the defect heretofore existing in spring-fulcrums. This feature I do not consider as limited to regulators for dynamo-electric machines, since it may be applied wherever an electro-magnetic device of delicate adjustment may be required.

Referring to Figs. 4 and 7, it will be seen that the spline m is provided upon the screw at the point where the thread of the screw ceases. This spline forms the connection between the screw-carrier n and the screw, the spline moving longitudinally back and forth in the slot as the screw is carried to the right or left. Upon the nut is provided a pin o . If now the screw is carried toward the brush-carrier until spline m engages with pin o , it is evident that the spline and pin will be locked together, thus locking the nut and screw together and preventing any further longitudinal movement of the screw.

The ball p is secured to the end of the screw, preferably as shown in Fig. 4, so as to be readily removable by simply removing the attaching-screw p' . The lug p^2 is carried upon the removable portion so as to be taken off when the ball is removed. It is this lug p^2 which engages with a pin q upon the nut so as to limit the longitudinal movement of the screw away from the machine by locking the nut and the screw together. This feature was described in my previous application. Now, it will be seen that when the ball p is removed the screw c may be at once removed, since there will be nothing to prevent it being screwed through the nut. When it is de-

sired to remove the nut, the clamp or collar r is simply loosened. It is desirable that the screw and nut be readily removable in order that the bearings may be examined and cleaned from time to time.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the revolving-trigger devices, of the nut and screw-carrier driven thereby, adjustable arms and an electro-magnet for actuating the same, and the dogs carried upon the adjustable arms, whereby the position of the dogs may be adjusted and brought alternately into the paths of the triggers to trip the said triggers as the strength of the current rises above or falls below the normal.

2. In an electric-current regulator, the combination, with the armature of an electro-magnet, of a pivotal spring l , mounted upon a lug l' , and the armature-lever l^3 , which passes behind the lug to prevent the spring from buckling when actuated by the magnet, substantially as described.

3. In an electric-current regulator, the combination, with the screw, its carrier, and nut, of locking devices upon the screw on opposite sides of the nut, whereby the nut and screw are locked together to limit the longitudinal movement of the screw in both directions, substantially as described.

4. In an electric-current regulator, the combination, with the screw c , of the spline m provided thereon, and the driven screw-carrier n , provided with a longitudinal slot for the spline, and the nut provided with a pin o , whereby the screw is locked to the nut when turned so that the spline engages with pin o , substantially as described.

5. In an electric-current regulator, the screw provided with the movable ball p , the pin or locking device p^2 , provided upon the same piece with the ball, so as to be removable therewith, in combination with the nut e , whereby on removing the ball the screw may be withdrawn from the nut, substantially as described.

In witness whereof I hereunto subscribe my name this 17th day of October, A. D. 1887.

CHARLES E. SCRIBNER.

Witnesses:

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