(No Model.)

E. THOMSON.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 354,273. Patented Dec. 14, 1886.

Fig. 1.

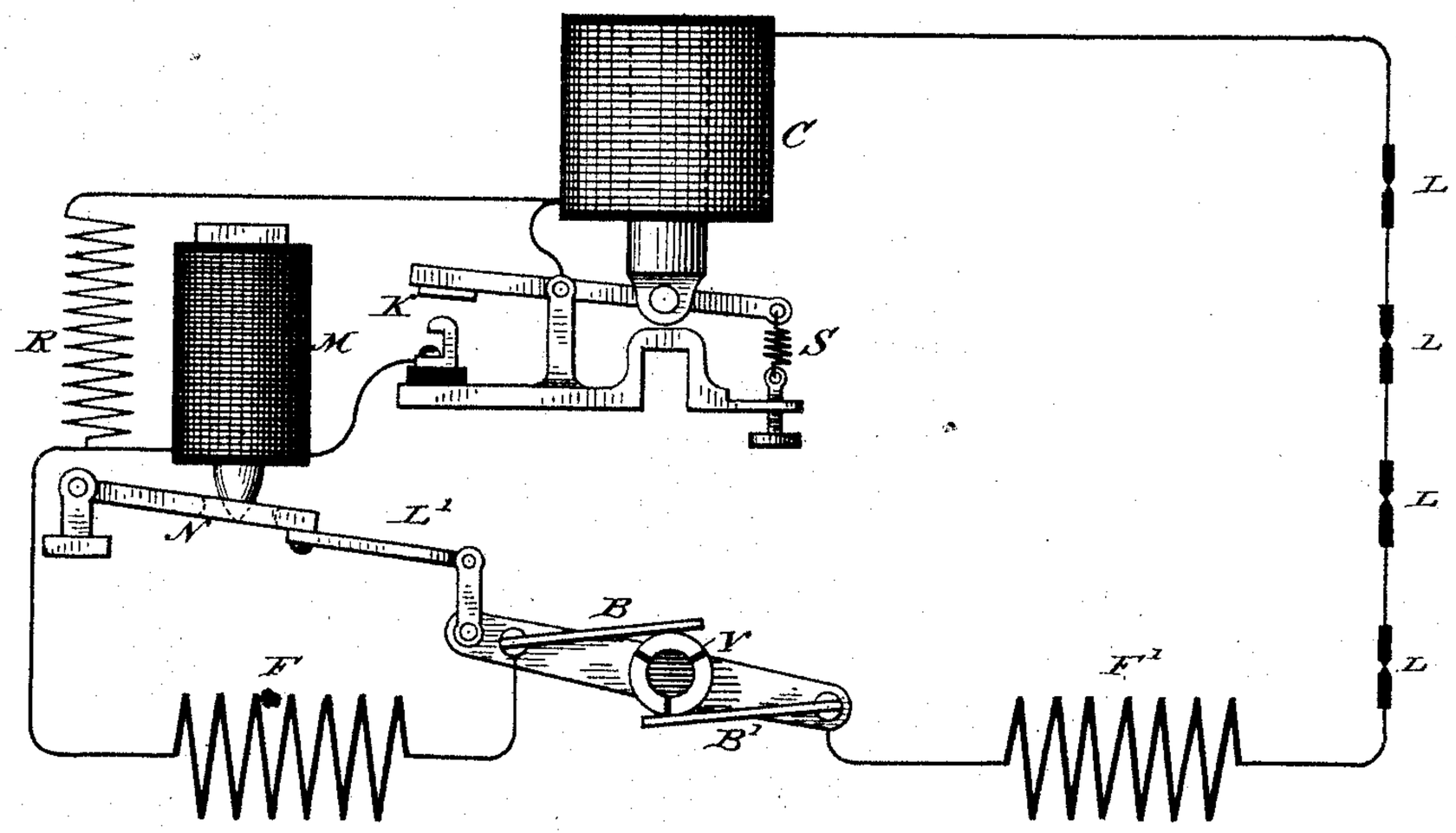
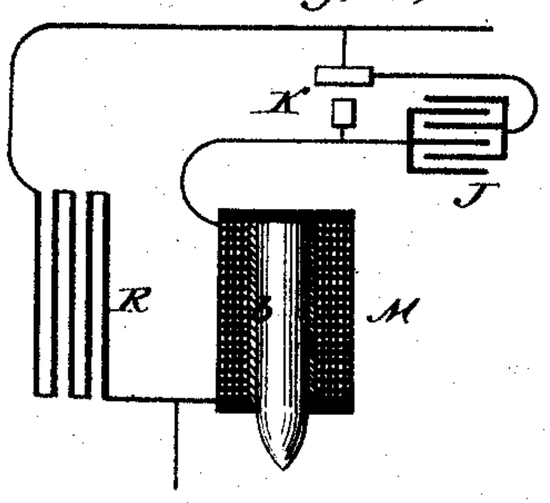


Fig. 2.



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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF LYNN, MASSACHUSETTS.

REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 354,273, dated December 14, 1886.

Application filed April 9, 1885. Serial No. 161,636. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Regulators for Dynamo-Electric Machines, of which the following is a specification.

The object of my invention is to automatically control the current generated and supplied by a dynamo-electric machine.

My invention consists in the specific improvements and combinations of devices, that will be described in connection with the accompanying drawings, and will then be stated in the claims.

In Figure 1 of the accompanying drawings I have illustrated diagrammatically the application of my invention to an adjustable commutator. Fig. 2 shows a detail of the arrangement shown in Fig. 1.

In Fig. 1, C is an axial magnet-coil or solenoid, whose core, when attracted with a certain force against its own weight, or the force of a retractile spring, S, closes a contact at K, which contact when closed permits the current from the circuit to pass in part through a magnet-coil, M, whose armature N then moves the lever L, so that the brushes B B′ may be set around the commutator V of a generator, to counteract the effects of the current acting in C, so as to close contacts at K by causing a general weakening of the current in the circuit of the lights L L and the field-coils F F′, when included in circuit. The coil C is always in the circuit, and might be replaced by one of the field-coils, when such are used in circuit, by providing a movable contact-closer operated by the variations in the strength thereof. There is a permanent resistance, R, around M and the contacts K, whose amount is preferably superior to that of M itself and the contacts.

In case of any decrease or increase of current in the circuit, the magnet-coil C opens or closes the contact at K, throwing out of or in circuit the magnet M, which latter drops or raises the armature N, as the case may be, and so sets the brushes B B′ to increase or diminish the current in the circuit. The practical result is the preservation of nearly a standard current in the circuit. The magnet M, to avoid spark at K, is preferably surrounded by a thick copper tube or closed circuit of copper, *b*, Fig. 2, and the contacts K may have in addition a condenser, J, arranged in a branch around them. The resistance R is preferably of straight rods of high-resistance material, as carbon, and without much length or self-induction. This resistance, as indicated, consists of parallel conductors connected into the circuit around the contacts. When made of straight carbon rods, it is constructed in any suitable way for connecting a series of said rods into circuit with one another. Artificial resistances of this kind made from ordinary electric-light pencils are common in the art. It is quite apparent that any other artificial resistance could be used in place of that just described.

The devices of Fig. 1 may be used as means of varying resistance—such as a shunt around the field-magnet coils of the machine, or a resistance in the field-circuit of the machine—and the magnet-coil C may be included either in circuit, as where a constant current is to be maintained, or in a shunt from the positive to negative main, where a constant difference of potential is to be maintained.

What I claim as my invention is—

1. The combination, substantially as described, of an adjustable commutator, a motor electro-magnet whose armature is connected with the movable yoke for the brushes, a controller-magnet, a contact governed thereby and placed in a branch including the motor-magnet, a retracter normally tending to keep the contact open against the power of the controlling-magnet, and a branch around the contact and motor-magnet, including an artificial resistance.

2. The combination, substantially such as described, of a controller-magnet, two branches of the main circuit, controller-contacts placed in one of said branches with the motor-magnet, an artificial resistance in the other branch, a closed conducting-band on the motor-magnet, and a condenser in a shunt around the controller-contacts, as and for the purpose described.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 6th day of April, A. D. 1885.

ELIHU THOMSON.

Witnesses:
E. H. KITFIELD,
E. WILBUR RICE, Jr.