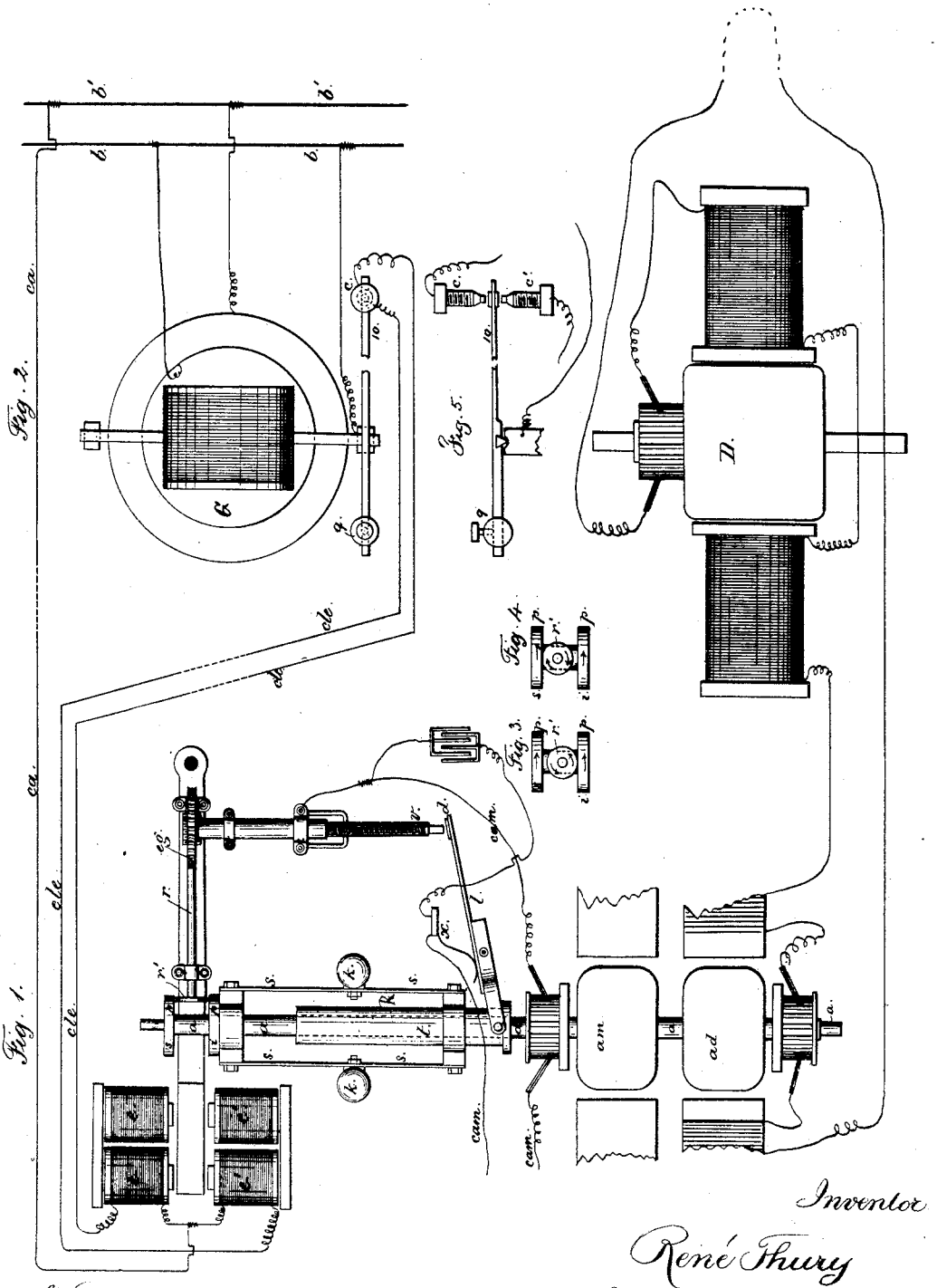
(No Model.)

R. THURY.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 260,136. Patented June 27, 1882.



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REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 260,136, dated June 27, 1882.

Application filed July 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, RENÉ THURY, of Geneva, Switzerland, have invented an Improvement in Regulating the Electric Current from Dynamo-Electric Machines, of which the following is a specification.

Governors have been employed in connection with magneto-motors, and dynamo-generators have been regulated in their action by the current passing through the helices of the field-magnets.

My present invention is for regulating with great accuracy the current that is employed in a system of multiple-arc electric lights or other working devices, so that the throwing into or out of circuit of electric lamps will not materially change the brilliancy of the light. This I accomplish by the use of a delicate galvanometer that acts, with a governor and circuit-connections, to vary the speed of the motor that drives the dynamo-generator, and thus render the electric current uniform, or nearly so, under all conditions of use.

In the drawings, Figure 1 shows the governor and the circuit-connections. Fig. 2 represents the galvanometer in plan view. Figs. 3 and 4 show the means for moving the regulating-screw, and Fig. 5 represents the circuit-connections with the galvanometer.

a m represent the electric motor, the shaft *a* of which carries the armature *a d* of a dynamo or magneto electric machine. The shaft *a* is provided with the governer R, which may be of any kind provided it is non-isochronous. I prefer a spring-governor with two springs, *s s s s*, with weights *k*, connected to the centers of the springs.

Any current, (in the wires *c a m*,) preferably derived from the main circuit, enters by the spring *x* and passes through the contact *d* and enters the motor, which it actuates in the usual manner of magnetic motors.

The motor is revolved at a given speed, the balls *k* of the governor fly outward and move the sleeve *t*, which latter in its turn moves the contact-lever *l*, breaking the contact of *d v*, and breaks the circuit to the motor *a m*, the speed lessens, the balls *k* approach each other, the lever *l d* again makes contact with *v*, and the current *c a m* is again established. Thus the governor secures a uniform movement to the motor as long as the screw *v* remains in the same place; but as soon as the screw *v* is raised or lowered the regulation is changed, because the motor must move more or less rapidly before it acts upon the lever *l* to break the circuit at *d v*.

In order to avoid the spark that would be produced at *d*, I insert a condenser whose poles are connected, one to the screw *v* and the other to the lever *l*.

By means of a double commutator one part of the current that operates the motor *a m* can be regulated. The other part may pass off continuously. This method is preferable in some cases, for the regularity of the movement of the motor is increased and the sparks at *d* are diminished.

To regulate and vary the speed of the motor, it is only necessary to vary the position of the contact of *d* and *v* by raising or lowering the screw *v*. This can be accomplished by employing a shaft, *r*, upon one end of which there is a worm-pinion meshing into a wheel, *e g*, upon the screw *v*, and at the other end a disk or wheel, *r'*, between two plates upon the shaft *a*.

It will be readily understood that if the wheel *r'* touches one of the plates—*i p*, for instance—this latter will cause *r' r* to rotate, and by the worm will turn the wheel *e g* and screw *v* and raise or lower the latter. If the wheel *r'* touches the other plate, *s p*, it will immediately turn in the opposite direction and turn the screw *v* in the opposite way. Therefore to vary the position of the contact of *d* and *v* it is simply necessary to bring the wheel *r'* against the upper plate, *s p*, or lower plate, *i p*. To accomplish this the shaft *r* is mounted on the armature-lever of a double electro-magnet, or connected to said lever in any suitable manner. It suffices, then, to have a galvanometer of suitable power adjusted to establish by means of a double contact a circuit from a battery or some derivation to either one or the other of the electro-magnets *e e'*.

I have represented at G a galvanometer. It should be made with two bobbins, one fixed preferably in a horizontal position and the other movable upon two steel pivots made as knife-edges, which also serve to establish the communication with the main circuit *b b'* and

electro-magnets *e e* and *e' e'*. One of these pivots has an arm provided with a counter-weight, 9, at one side of the pivot, and at the other side of the pivot there is a spring contact-blade, 10, between the two contact-screws *c c'*. (Shown more clearly in Fig. 5.)

If the path of the current to the electro-magnets *e e'* is followed, it will be seen that the current by *c a* enters the electro-magnets *e e e' e'* and goes forth by the wires *c l e* to the two contact-screws *c c'*, and by the contact-blade 10, which touches one or the other of the screws *c c'*.

If the current is too strong on the line *b b'*, it will move the galvanometer, pass, for instance, by the screw *c*, to the electro-magnet *e' e'*, which will attract the armature, and bring the wheel *r'* against the plate *i p*. The wheel *r'* and shaft *r* will be turned in the direction of the arrows, and the screw will be turned to raise it. As soon as the motor slows down the current of the dynamo-machine *a d* is weakened and lessens the magnetism of the machine D and brings back the line-current to its normal condition.

If the current in *b b'* is too weak, the reverse will be produced. The galvanometer G will close the circuit to *e e*, and the wheel *r'* will be moved against the upper plate, *s p*, and turned in the opposite direction, and the screw *v v* will be lowered, the motor will increase in speed, and the current of *a d* and of *d* will be increased.

I remark that the form and nature of the various contacts may be varied. The wheel *r* may be a gear-wheel or a double screw and arranged differently.

The drawing is only what may be termed "diagrammatic," and intended to explain clearly the whole action of the governor in the circuits.

The electric motor may be replaced in many cases by a steam or other motor, and then the steam is regulated at the throttle-valve and cut-off by the movement of the screw *v* or analogous means.

I have shown at D a second dynamo-generator, the field-magnet helices of which are to be in the same circuit as the helices of the dynamo-generator *a d*, so as to illustrate that two or more dynamo-generators furnishing electricity to one main line may be regulated simultaneously, as the current in the fields will be varied according to the speed of the motor, and this will cause a greater or less development of current by the armature-helices. If but one dynamo-generator *a d* is used, the currents will be taken from the same to the lamp working circuit.

I claim as my invention—

The combination, with a motor and the governor and generator rotated by the motor, of a circuit-opener, a screw, mechanism for moving the screw, an electro-magnet to bring into action the devices that rotate the screw, and a galvanometer and circuit-connections, substantially as set forth, whereby the speed of the motor is varied to render the current upon the line uniform, substantially as specified.

Signed by me this 25th day of June, A. D. 1881.

RENÉ THURY.

Witnesses:
GEO. T. PINCKNEY,
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