(No Model.) 2 Sheets—Sheet 1.

T. A. EDISON.

ELECTRICAL GOVERNOR.

No. 251,547. Patented Dec. 27, 1881.

Fig. 1.

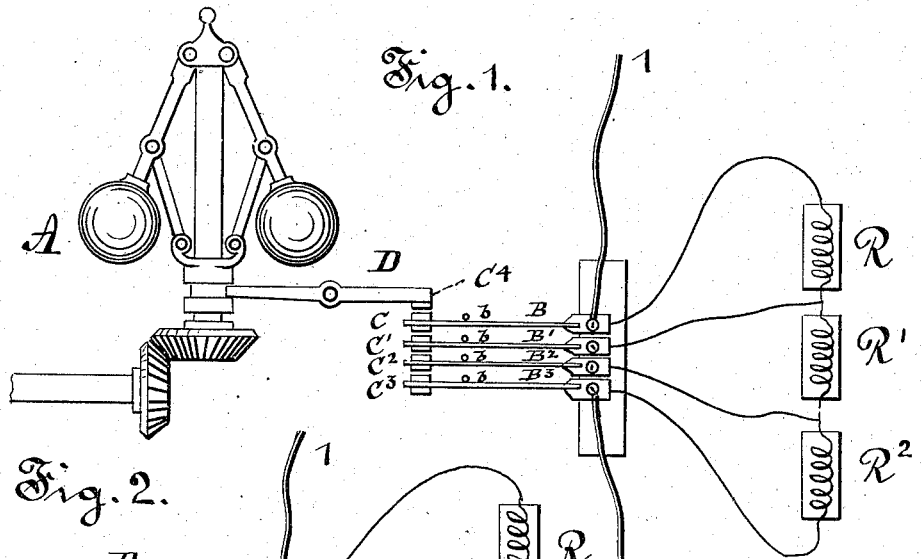


Fig. 2.

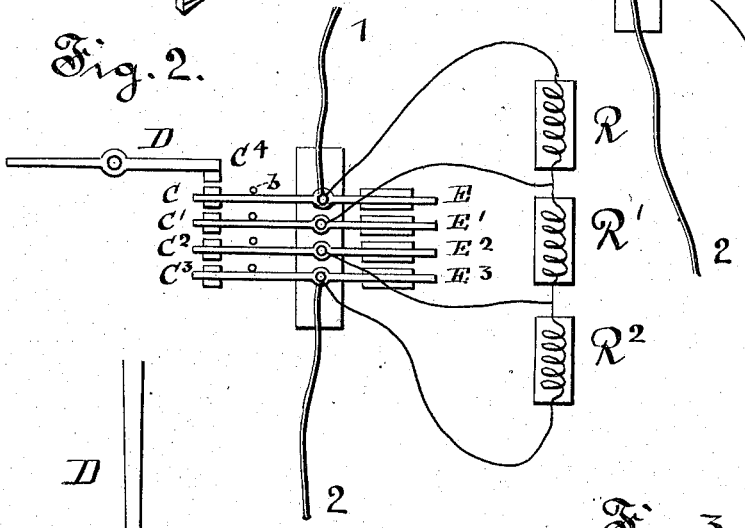
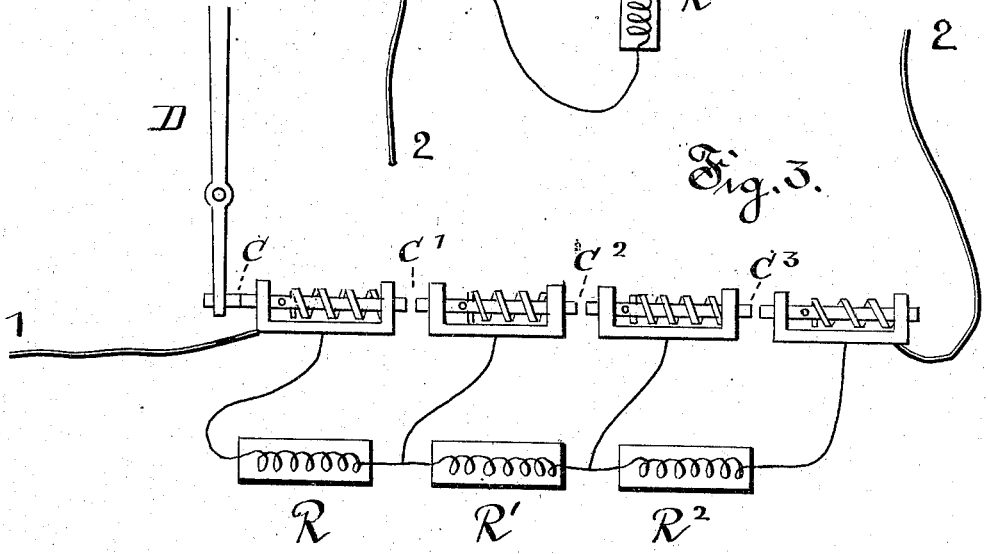


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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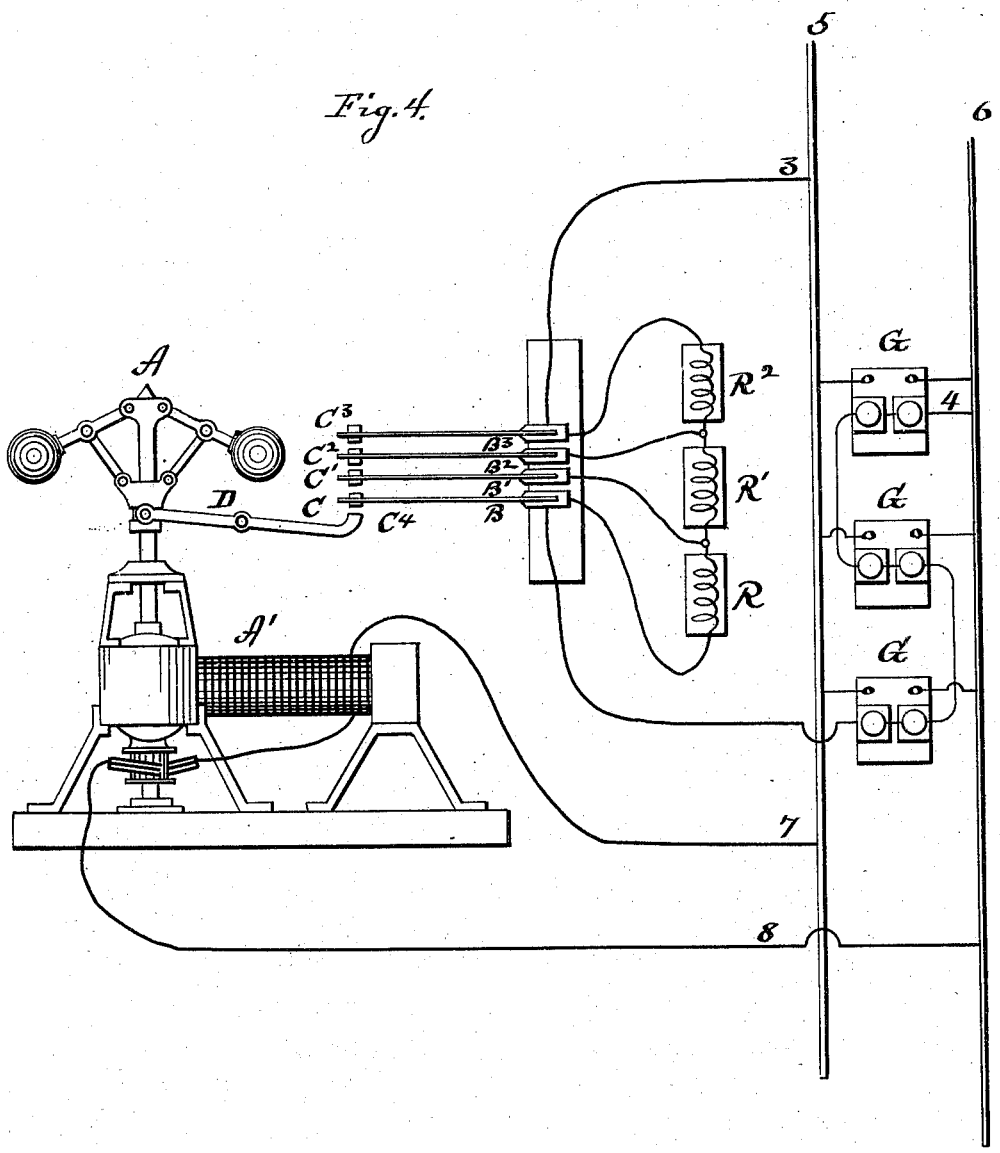
Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 251,547, dated December 27, 1881.

Application filed June 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Electrical Governors; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In a system of electrical distribution in which both lamps and motors are placed in circuits derived from the same main or consumption circuit the throwing into circuit of a motor would momentarily affect the lamps if provision were not made to avoid this consequence, since the motor, before it attains its maximum speed and establishes a counter electro-motive force in its own derived circuit, has much less resistance and requires many times more current than a lamp. In my application No. 27,371, filed March 3, 1881, I overcame this difficulty by means of resistances in the derived circuit of the motor, which resistances are gradually thrown out of circuit as the speed of the motor increases by means of a lever moved by a centrifugal governor run by the motor, said lever making a sliding contact with the contact-plates of the resistances.

The object of my present invention is to produce means for making and breaking the contact of the governor-lever and resistance contact-plates which will do away with the friction of a sliding contact and permit of the throwing in and out of all the resistances by a short movement, making the governor much more sensitive in its action. This I accomplish by connecting the resistances with movable contact blocks or plates, located in line with each other and forced together in succession by the movement of the governor, and returned to their normal positions by springs or by gravity. The governor for this purpose works a pivoted lever having on its free end a contact block or plate in line with the contact of the resistances. The contact blocks or plates of the resistances can be arranged in a number of different ways. They can be carried by parallel spring-arms secured rigidly at one end, or by pivoted levers thrown in one direction by springs or by gravity, or they may be in the form of sliding pins forced in one direction by springs or by their own or additional weight; or other constructions could be devised for accomplishing the same end. When the motor is out of circuit the contacts will be separated and all the resistances will be connected with the line. The motor being thrown into circuit, the resistances in the derived motor-circuit will be sufficient to prevent any effect upon the lamps of the system, and as the speed of the motor increases the governor-lever will force the contacts together one after another, cutting out the resistances in succession as the counter electro-motive force established by the speed of the motor increases until the maximum speed is reached, when all the resistances will be cut out or one or more may be allowed to remain to give the proper resistance to the motor-circuit. When the motor-circuit is broken the stopping of the motor and governor will allow the contacts to separate, so that the resistances will be in the circuit when the same is again completed. By reversing the arrangement the device could be used to control the field-circuit of a generator or battery of generators, the motor being driven by a circuit derived from the main circuit, and the governor throwing resistance into the field-circuit when its speed exceeds the normal rate.

In the drawings, Figure 1 is a top view of the governor and movable contacts, such contacts being carried by spring-arms; Fig. 2, a view showing the contacts carried by pivoted levers; Fig. 3, a view showing the contacts in the form of spring-pins, and Fig. 4 a diagrammatic view, showing the device arranged for regulating the resistance of the field-circuit of a battery of generators.

Like letters denote corresponding parts in all four figures.

A is a centrifugal governor, either horizontal or vertical, which is driven by an electro-motor, A′. (Shown in Fig. 4.)

R R′ R^2 are resistances in the derived motor-circuit 1 2, Figs. 1, 2, and 3. These resistances can be of any desired number. They are connected with movable contact blocks, plates, or points C C′ C^2 C^3, which are placed in line with each other and held normally a short distance

apart. The pivoted governor-lever D has a contact, C^4, placed in line with the resistance-contacts, and adapted, when moved by the governor, to force the resistance-contacts together in succession or allow them to separate in succession and assume their normal positions. These contacts C C′ C^2 C^3 may be carried by parallel spring-arms B B′ B^3 B^3, as shown in Figs. 1 and 4, or by pivoted levers E E′ E^2 E^3, Fig. 2, which levers are moved in one direction by springs or by gravity. Stops *b* are used to limit the movement of the pivoted levers in one direction, and may also be employed in connection with the spring-arms. The resistance-contacts could also be made in the shape of pins, Fig. 3, which could be returned to their normal positions by springs or by their own or additional weight.

I do not limit myself to the means shown for carrying the movable contacts, since other means could be employed for the same purpose.

The device is shown in Fig. 4 arranged for regulating the generative force of a battery of Faradic generators by controlling the resistance of the field or exciting circuit. The governor is shown as running at a speed higher than the normal rate, all the resistance being thrown into the field-circuit 3 4 of the generators G. The main or consumption circuit is shown at 5 6, while the derived circuit, in which the governor-motor A′ is placed, is shown at 7 8. As the electro-motive force of the current decreases the speed of the motor A′ and governor A will lessen, and the contacts C′ C^2, &c., will be made in succession by the governor-lever D, so as to cut out the resistances.

What I claim is—

1. The resistances having movable contacts located in line with each other, in combination with means for making and breaking the contacts in succession, substantially in the manner set forth.

2. The resistances having movable contacts located in line with each other, in combination with a governor driven by an electro-motor and adapted to force the contacts together in succession, and means for breaking the contacts in succession as the force of the governor is removed, substantially as set forth.

3. A centrifugal governor driven by an electro-motor and a lever, in combination with a plurality of resistances and movable contacts, said contacts being forced together in succession by the governor-lever and returned to their normal positions by springs or by gravity, substantially as set forth.

This specification signed and witnessed this 2d day of June, 1881.

THOS. A. EDISON.

Witnesses:
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H. W. SEELY.