No. 871,484. PATENTED NOV. 19, 1907.

G. H. DAVIS.

ELECTROMECHANICAL POWER GOVERNOR.

APPLICATION FILED FEB. 13, 1906.

Fig. 1.

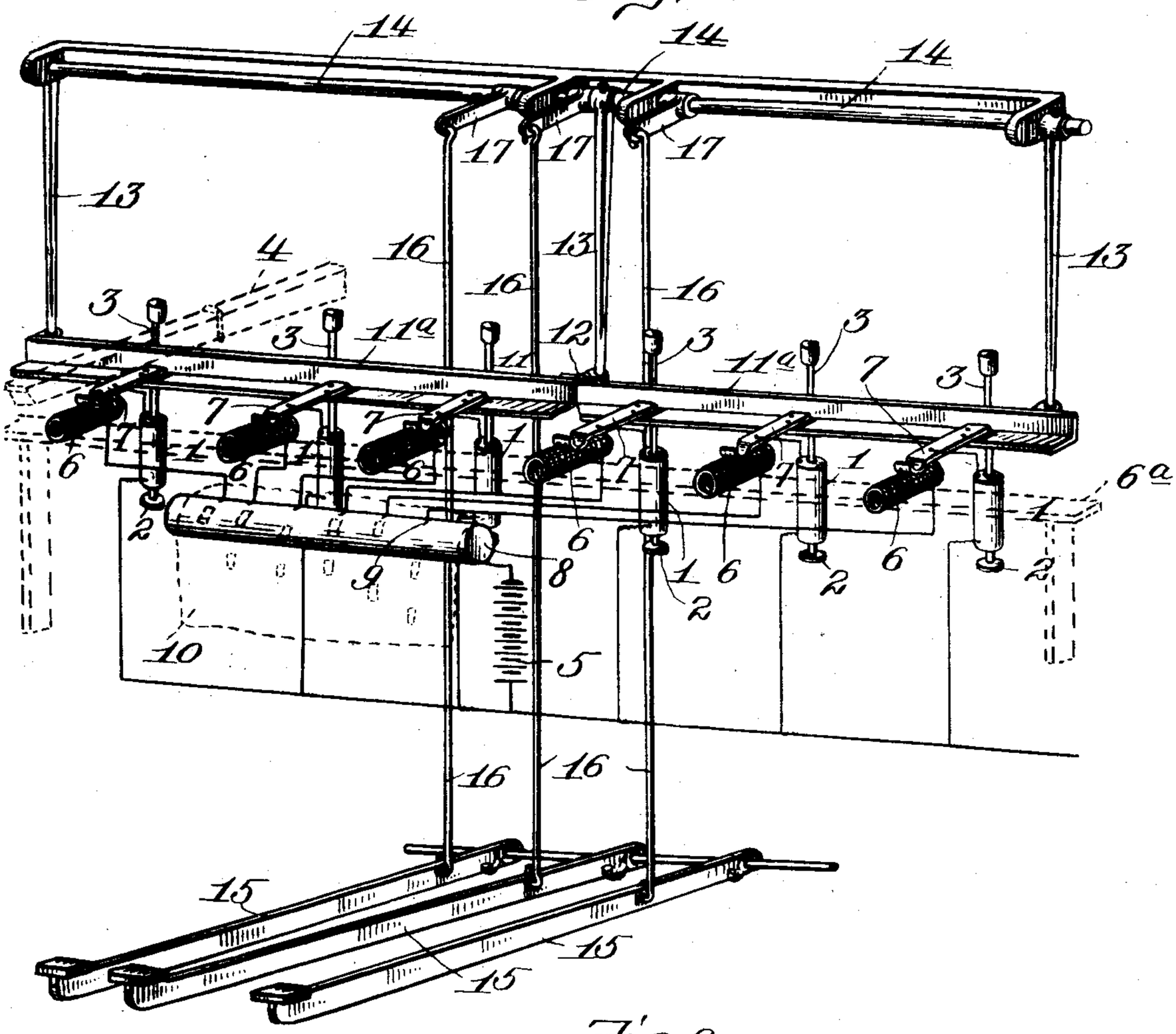

Fig. 2.

Fig. 3.

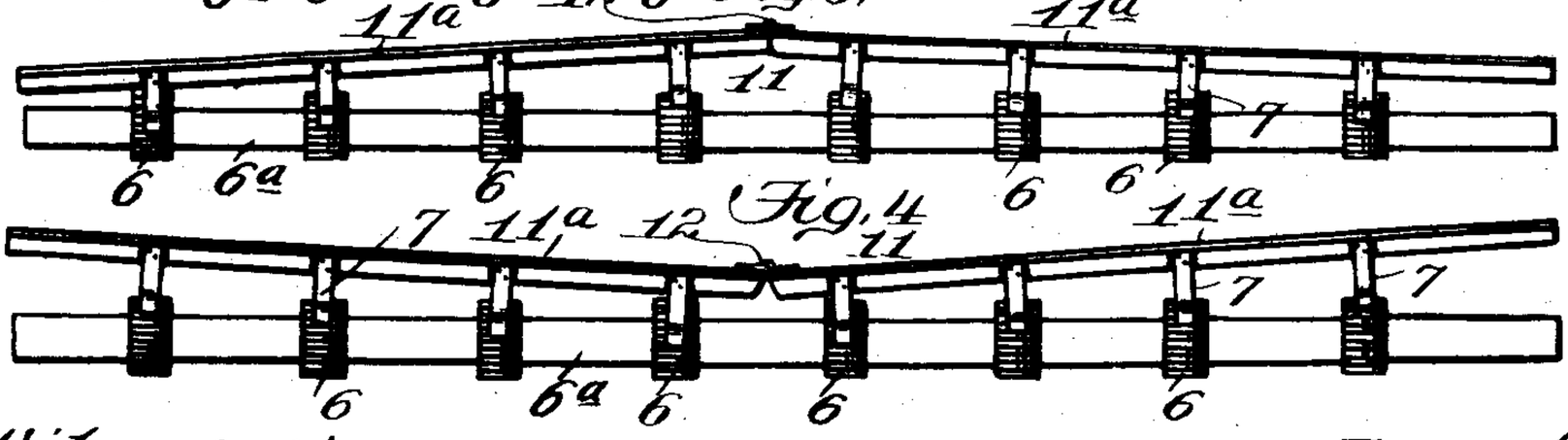

Fig. 4.

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UNITED STATES PATENT OFFICE.

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ELECTROMECHANICAL POWER-GOVERNOR.

No. 871,484. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed February 13, 1906. Serial No. 300,946.

To all whom it may concern:

Be it known that I, GEORGE HOWLETT DAVIS, a citizen of the United States, residing at West Orange, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Electromechanical Power-Governors, of which the following is a specification.

My invention relates to an improved electro-mechanical means for imparting a regulable or controllable force to an element for actuating or operating mechanical or other instrumentalities to do work; and has for its object to regulate or control the force of action of such element; and also to provide for difference in force of action as between a plurality of such elements combined in a single organization.

To the end stated the invention consists in the features, and in the combination of parts hereinafter set forth.

That which is regarded as new will be set forth in the several clauses of claim appended to the description.

In the accompanying drawings illustrating that which I consider the best known embodiment of my invention in one of the uses of which it is capable, Figure 1 is a perspective view; Figs. 2, 3 and 4 are plan views (parts being removed) showing different relative positions of the governor elements, to illustrate the variety of regulation attainable by my invention.

In said drawing the reference numeral 1 designates a series of solenoids or electro-magnets, the armatures or cores 2 of which carry or are provided with elements 3, which, by reason of their function, I term "actuators", and which, when the armatures or cores 2 are influenced, do work by operating or imparting action to mechanical or other instrumentalities. In the illustrated but not restrictive example of the invention, this work is exerted on the keys of a musical instrument, one of which is shown conventionally at 4. Each of said solenoids or magnets is connected in series with a source of electricity, shown as a battery 5, and included in each magnet-circuit is a resistance, shown as a coil 6 suitably supported as at 6^a, and slip contact 7. As illustrated 8 is a contact common to the several magnet circuits; 9 are contacts individual to said several circuits; and 10 a traveling contact-maker and breaker, such for example as a perforated music sheet, by the operation of which the solenoid or magnets 1 are energized and de-energized, as will be obvious.

The several slip contacts are carried by a movable bar 11 operatively co-extensive with and common to the series of magnets 1, and which is termed for brevity a "governor". This governor may be moved to increase or decrease the resistance in the several magnet-circuits to increase or decrease the flow of current through the magnets from a maximum to a minimum, imparting action of corresponding value to the elements 3.

The governor 11 may be, and for some uses is, flexible, to the end that separately controlled portions thereof may be moved or flexed to greater degree than other portions, whereby variation in the force of action of the "actuator" elements 3, may be obtained and in the illustrated use of the invention the keys of a musical instrument "touched" with different degree of force.

In the illustrated example of my invention the flexible characteristic of the governor is secured by constructing it as a plural member, one composed of sections 11^a having hinged or pivotal connection 12.

The governor may be shifted for the purpose described by any suitable controller, which, when the governor is a flexible or plural member one, will be a plural member controller, the members of the latter being appropriated to different sections of the governor; and it is this embodiment of my invention which is illustrated, and, as illustrated, the governor 11 is freely suspended in arms 13 from rock shafts 14 that may be rocked by means of levers 15 having link and rocker-arm connection 16—17 therewith. When the governor is at rest the several "actuator" elements will exert a normal working force, which, in respect of the entire series, may be increased or diminished by manipulation of the levers 15, which may be operated to shift, the governor and the contacts carried thereby to regulate the flow of current through the magnets and impart like force to the several actuators; the levers may also, as shown on Figs. 2, 3 and 4 be manipulated to variously shift the governor and resistance contacts to control the current flowing individually through the several magnets, and thus vary the force of action of the several "actuator" elements 3, whereby those actuator elements associated with the ends of the governor, or with either end thereof, may be caused to act with greater

force than those located nearer the middle of said governor or vice versa, whereby a graded increasing or decreasing effect from either or both ends to the middle or from the middle to either or both ends may be secured.

Having thus described my invention, what I claim is:

1. In means of the character described, the combination of a solenoid or electromagnet an actuator under the influence thereof, a contact maker and breaker for the circuit thereof, a resistance in the circuit, a freely suspended governor carrying a contact associated with the resistance, and a lever connected to the governor for moving the same to vary the relation of the resistance and contact.

2. In means of the character described, the combination of a series of solenoids or electromagnets arranged in groups, an individual actuator controlled by each solenoid, resistance coils arranged in corresponding groups, and connected, one in series with each solenoid, a governor common to the several solenoids, contact springs individual to the several resistance coils, connected, one to each solenoid, and operatively connected to the governor, and means for operating said governor to vary the relation of the contacts to the resistance coils of any group.

3. In means of the character described, the combination of a series of solenoids or electromagnets, actuators individual to and under the influence thereof, means for making and breaking the circuits thereof, resistances in said circuits, a flexible governor common to the several solenoids or electromagnets, contact springs individual to the several resistances operatively connected to the governor, and means associated with said governor for operation of different parts thereof to vary the relation of the contacts and resistances within the scope of the part or parts operated.

4. In means of the character described, the combination of a series of solenoids or electromagnets, actuators individual to and under the influence thereof, means for making and breaking the circuits thereof, resistances in said circuits, a plural part governor common to the several solenoids or electromagnets, contact springs individual to the several resistances operatively connected to the governor, and means associated with said governor for independent operation of the different parts thereof to vary the relation of the contacts and resistances within the scope of the part or parts operated.

5. In means of the character described, the combination of a series of solenoids or electromagnets arranged in groups, actuator elements under the influence thereof, a governor common to the solenoids or electromagnets, and means operated by the governor for causing the solenoids or electromagnets of any group to act with differing force on the respective actuator elements.

6. In means of the character described, the combination of a series of solenoids or electromagnets, actuator elements under the influence thereof, a governor common to the solenoids or electromagnets, and means operated by the governor for causing the solenoids or electromagnets to act with differing force on the respective actuator elements, the force varying progressively from one end of the series to the other.

7. In means of the character described, the combination of a series of electromagnets arranged in groups, actuator elements under the influence thereof, a governor common to the electromagnets, and means operated by the governor for causing the electromagnets of any group to act with differing force on the respective actuator elements, the force varying progressively from one end of the group to the other.

8. In means of the character described, the combination of a series of electromagnets, actuator elements under the influence thereof, a governor common to the electromagnets comprising a sectional bar, means operated by said bar for causing the electromagnets to act with differing force on the respective actuator elements, and means for moving a section of said bar, independently of the other sections.

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

G. HOWLETT DAVIS.

Witnesses:
GEO. W. REA,
M. C. D. WATERS.