

(No Model.)

C. DORIOT.
MUSICAL INSTRUMENT.

No. 504,671.

Patented Sept. 5, 1893.

FIG. 1

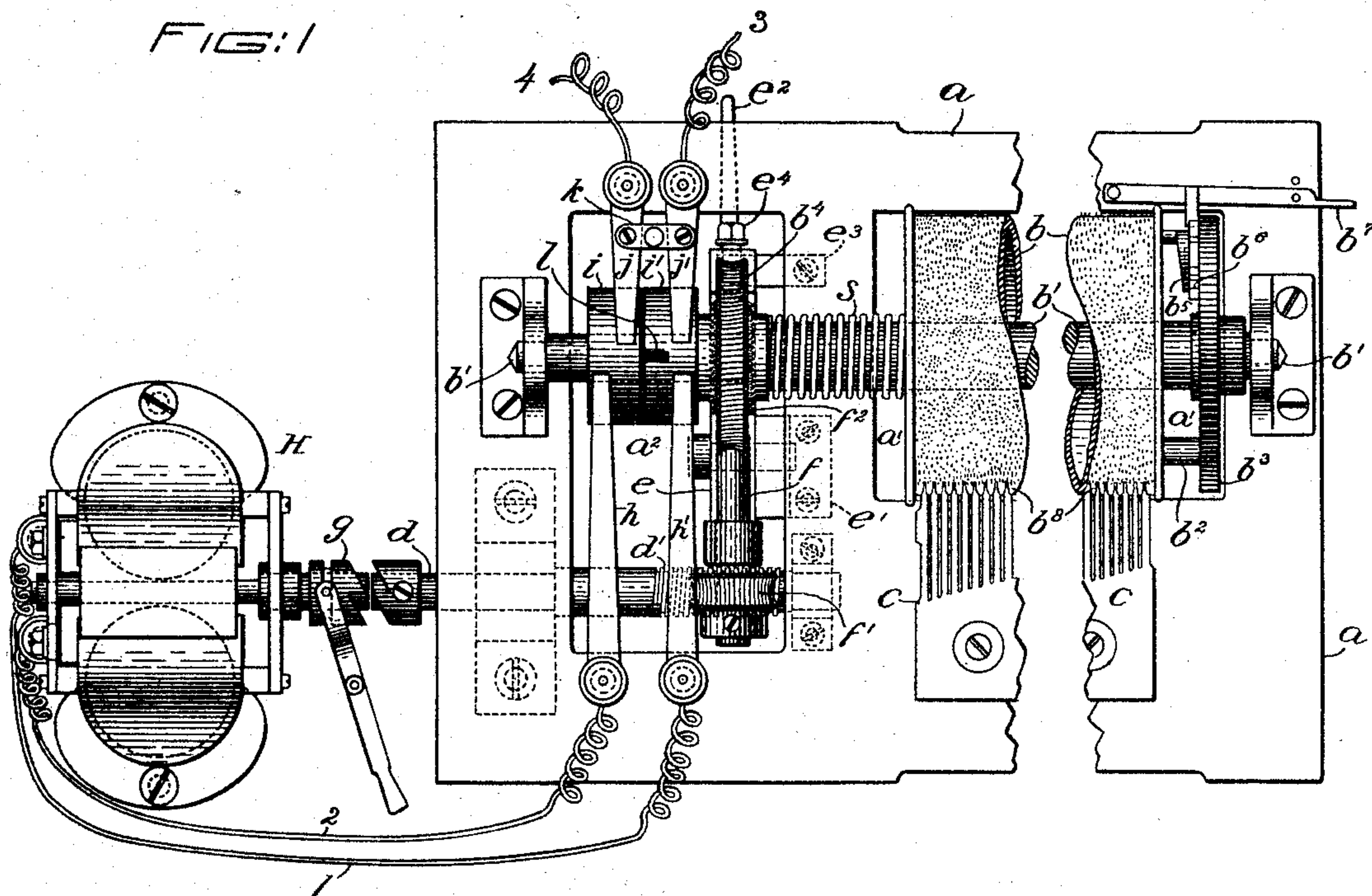
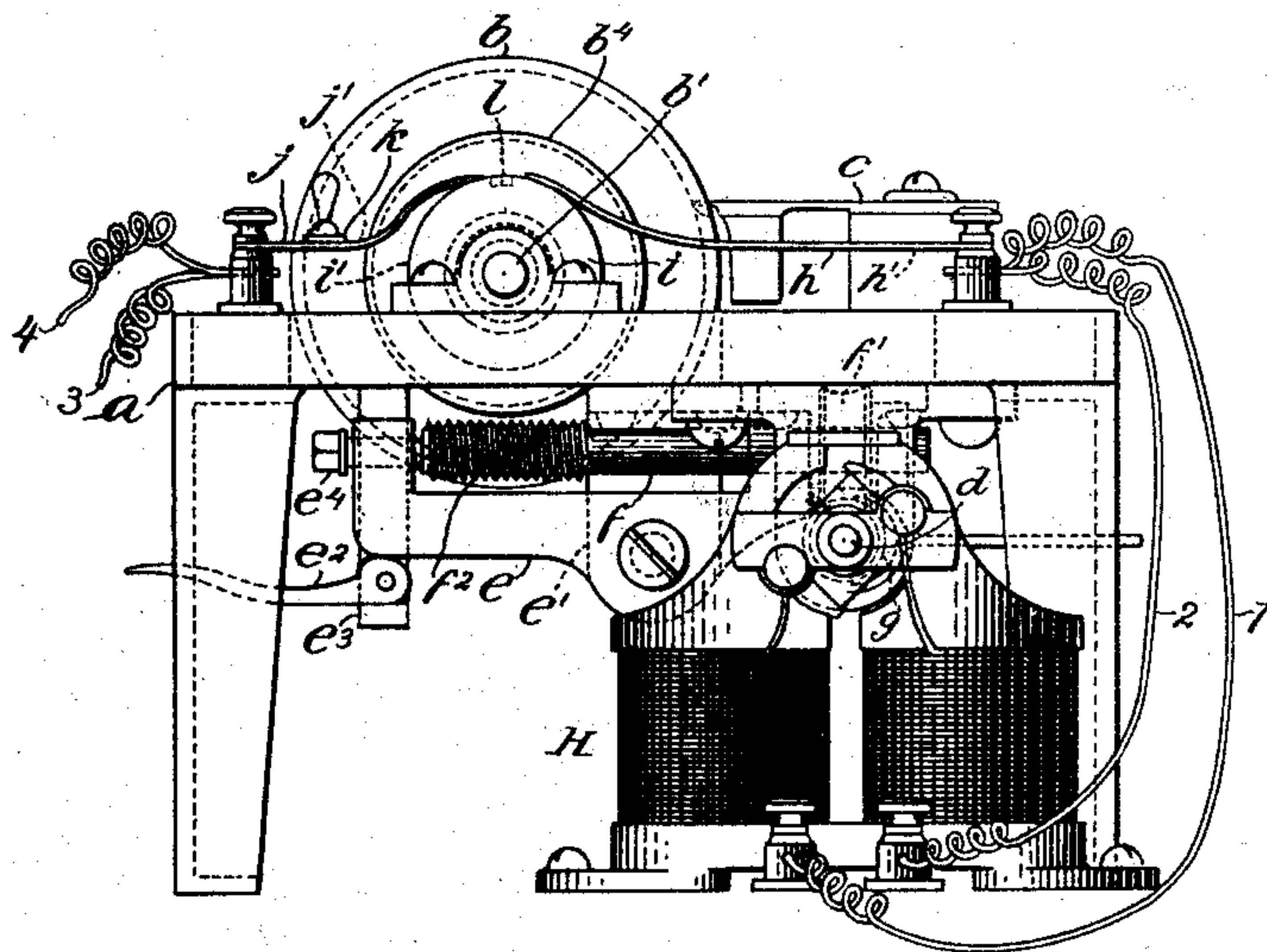


FIG. 2



WITNESSES:

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CONSTANT DORIOT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN R. PAINTER, OF SAME PLACE.

MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 504,671, dated September 5, 1893.

Application filed April 17, 1893. Serial No. 470,586. (No model.)

To all whom it may concern:

Be it known that I, CONSTANT DORIOT, a citizen of the Republic of France, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification.

My invention has relation to musical boxes, orchestrions and other similar instruments; and it relates more particularly to the construction and arrangement of mechanism for permitting of the actuation of such instruments through the instrumentality of a suitable motor.

The principal objects of my invention are first, to provide a musical instrument with simple, durable, efficient and comparatively inexpensive mechanism and devices for permitting of the actuation thereof by means of an electric or other motor; second, to simplify the construction of a musical-box or similar instrument and to insure a positive action thereof; third, to provide differential mechanism for effecting the intermittent or continuous actuation of a musical-box and for controlling by a positive movement the pin-cylinder with respect to its comb or combs; fourth, to provide a musical-box or similar instrument with differential actuating mechanism controlled by a motor; fifth, to provide a musical instrument with devices and mechanism actuated by an electric-motor for imparting motion to and governing the speed of a pin-cylinder with respect to its comb or combs with a switch for controlling the stopping and starting thereof; sixth, to provide a musical instrument with a detachable device for disengaging the actuating mechanism thereof which is controlled by a motor from the driving shaft of the instrument; seventh, to provide a musical box or similar instrument with mechanism adapted to be brought into engagement with and to become disengaged from the main driving shaft of the instrument by simple devices and controlled by a motor through a movable-switch adapted to contact with an insulating contact of a rotatable commutator on the driving shaft of the pin-cylinder

thereof; eighth, to provide a musical instrument with detachable differential mechanism adapted to impart a rotary motion to the main-shaft of the instrument and controlled by means of a motor in such manner that the rotation of the motor-shaft is differentiated in respect to the driving-shaft of the instrument so that the speed or motion is positively and uniformly regulated from the motor; ninth, to provide a musical-instrument with a differential worm-gear mechanism for imparting motion to and governing the speed of the instrument through the instrumentality of an electric-motor caused to engage with the driving mechanism thereof and controlled by means of a switch; tenth, to provide simple actuating mechanism for governing by a positive action the movement of the pin-cylinder with respect to its comb or combs by means of an electric-motor interposed in a circuit and controlled by means of a switch contacting with the makes and breaks of a rotating commutator mounted on the main driving-shaft of the instrument and the said actuating-mechanism adapted to be brought into and thrown out of engagement with the operative parts of the instrument by devices connected therewith; eleventh, to provide a musical instrument with differential worm-gear actuating mechanism controlled by an electric-motor for imparting motion to the operative parts of the instrument and governing the speed thereof and provided with a switch or cut-out for stopping the same; and twelfth, to provide a musical instrument having a pin-cylinder mounted on a shaft with its complemental comb or combs actuated and governed as to the speed thereof by a worm-gear differential mechanism controlled by an electric-motor in a line circuit from a generator through a revolving commutator provided with makes and breaks and mounted on the pin-cylinder shaft and having brushes and a manual-switch contacting therewith, the construction being such that the instrument can be included in and excluded from the circuit to respectively start and stop *ad libitum* the same by means of said manual-switch.

My invention consists of a musical instru-

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ment provided with a differential gear and worm actuating mechanism, a speed controlling mechanism, a driving shaft controlling the tune producing devices, and a motor for
5 actuating said mechanisms.

My invention further consists of a musical instrument provided with a shaft controlling the operative parts and having a speed controlling wheel mounted thereon and actuated
10 by differential mechanism through the intervention of a motor.

My invention further consists of a musical instrument provided with a comb or combs, a pin-cylinder mounted on a shaft driven by
15 a toothed speed controlling wheel meshing with a worm and counter worm-gear mechanism controlled by a motor.

My invention further consists of a musical instrument provided with a comb or combs,
20 a pin-cylinder and its shaft and a gear-wheel driven by a differential worm-gear mechanism by means of a motor in a circuit having a commutator with insulating and conducting surfaces mounted on said shaft and a manual
25 switch and brushes interposed in said circuit.

My invention further consists of the improvements hereinafter described and pointed out in the claims.

The nature, and scope of my invention will
30 be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a top or plan view partly in
35 broken section of a musical instrument embodying features of my invention; and Fig. 2, is an end view thereof.

In the drawings of which Fig. 1 is a plan and Fig. 2 an end elevation, a , is a horizontal bed plate provided with openings a' and
40 a'' , for the accommodation of the pin-cylinder b , and of portions of the mechanism for driving the same. This pin-cylinder b , is movable endwise upon its shaft b' , and is rotated
45 by means of a post b^2 , penetrating an aperture in the head of the pin-cylinder b , and projecting from a disk b^3 , carried by the shaft b' .

s , is a spring interposed between a toothed
50 governor and speed worm-wheel b^4 , on the shaft b' , and the end of the pin-cylinder b , and tending to shift the latter toward the right.

b^5 , is a tune-changing cam pivotally mounted on the disk b^3 , and adapted to engage a
55 pin or projection on the head of the pin-cylinder. This cam b^5 , is provided with a ratchet-wheel b^6 , disposed in range of a tune-changing lever b^7 , which serves, when in the position shown in Fig. 1, to engage the teeth of
60 the ratchet-wheel b^6 . Under these circumstances the movement of the disk b^3 , causes the ratchet-wheel b^6 , to shift the cam b^5 , whereby the cylinder b , is shifted longitudinally.

65 c , are one or more combs having their teeth

vibrated by means of pins projecting from the pin-cylinder b . In this connection it may be remarked that the pins are omitted along an axial line so as to form a blank space b^8 ,
70 opposite the teeth of the comb or combs c , before the pin-cylinder is shifted in the direction of its length. Moreover, it is desirable that the instrument should be stopped with the blank space b^8 , opposite the teeth of
75 the comb or combs c , in order to avoid accidental breakage or other injury that might occur to the teeth of the comb or combs, or to the pins of the cylinder, or to both, if the instrument had been stopped with one or more
80 of the teeth in engagement with the pins.

d , is a worm-shaft journaled to the under side of the bed-plate a , and provided with a driving-screw d' , having in the present instance a square thread.

e , in Fig. 2, is a bracket pivoted to a lug
85 e' , depending from the bed-plate a , and adapted to be slightly rocked by means of a cam-lever e^2 , pivotally attached to an arm e^3 , depending from the bed-plate a , for purposes to be presently fully described.
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f , is an intermediate worm-shaft journaled at one of its extremities in bearings in the bracket e , and supported at its other extremity by means of a conical screw center e^4 , carried by the bracket e . This shaft f , is provided with a worm-wheel f' , having in the present instance square teeth adapted to mesh
95 with the square thread of the screw d' , and with a worm-screw f^2 , having in the present instance V-shaped teeth adapted to mesh
100 with corresponding teeth on the worm-wheel b^4 . Rapid rotary motion is imparted to the worm-shaft d , through the instrumentality of the clutch g , and by means of a suitable motor, for example, the electric motor. In the
105 present instance the shaft d , is assumed to make two thousand revolutions per minute, and drives the intermediate shaft f , through the instrumentality of the screw d' , and worm-wheel f' at the rate of one hundred
110 revolutions per minute, and the intermediate shaft f , in its turn drives the shaft b' , and pin-cylinder b , through the instrumentality of the screw f^2 , and worm-wheel b^4 , at the rate of one revolution per minute. However, the
115 rate of speed imparted by the motor to the shaft d , and to the instrument may be increased or diminished by rocking the bracket e , through the intervention of the cam-lever
120 e^2 downward or upward as illustrated in Fig. 2 according to requirements. When the bracket e , is rocked downward, the teeth of the worm-wheel f' , are slightly withdrawn from the thread of the screw d' , and the thread of the screw f^2 , is slightly withdrawn
125 from the teeth of the worm-wheel b^4 , so that the frictional resistance of the driving gear is reduced, with the result that the speed of the motor is permitted to decrease. When the bracket e , is rocked upward the teeth of the
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worm-wheel f' , are pressed down upon the screw d' , and the thread of the screw f^2 , is pressed against the worm-wheel b^4 , so that the frictional resistance of the driving-gear is increased with the result that the speed of the motor is permitted to increase. It may be remarked that the lever e^2 , affords means, whereby the instrument may be stopped and started. However, for this purpose the bracket e , must be shifted sufficiently to throw the intermediate shaft f , out of and into action. The instrument may also be stopped and started by means of the clutch g , that serves to detachably connect it with the motor.

When use is made of an electric motor H , for actuating the instrument, the terminals of the motor are connected by means of conductors 1 and 2, with insulated contact springs h' , that sweep over conducting commutator disks i and i' , insulated from each other, and mounted on and insulated from the shaft b' . The line conductors 2, 3 and 4, are in electrical connection with insulated pivotal contact springs j and j' , adapted to sweep over the conducting commutator disks i and i' . These pivotal springs j and j' , are connected together by an insulating yoke k , provided with an operating handle, whereby they may be shifted transversely of the commutator disks i and i' . When the springs j and j' , occupy the positions illustrated in Fig. 1, the circuit entering at the conductor 3, may traverse the spring j' , disk i' , spring h' , conductor 1, motor H , conductor 2, spring h , disk i , spring j , and conductor 4. However, when the springs j and j' , are shifted toward the left in Fig. 1, the spring j' , is brought into range of an insulation l , on the disk i , so that the spring j' , may ride upon this insulation l , and thus break the circuit through the motor H , and cause the latter to come to rest. It may be remarked that the insulation l , is disposed or positioned in such manner that it is adapted to engage the spring j' , when the space b^8 , is opposite the teeth of the comb or combs c , so that if the spring j' , is shifted toward the left, the instrument may continue to play until the space b^8 , comes opposite the teeth of the comb or combs, whereupon it will be stopped by the action of the insulation l , upon the spring j' . This is important, because it insures the stopping of the instrument in such position that the pins of the cylinder b , and teeth of the comb or combs c are not broken nor do they otherwise injure each other.

The mode of operation of the hereinbefore described musical instrument, is as follows: Current for driving the motor H , is supplied from the line of street conductors 3 and 4, through the springs j and j' , the disks i and i' , the springs h and h' , and the conductors 1 and 2, as illustrated in Fig. 1, and the motor H , drives the shaft b' , and pin-cylinder b , at a uniform and comparatively low rate of speed through the intervention of the clutch g , shaft d , screw d' , worm-wheel f' , shaft f , screw f^2 ,

and toothed governor and speed worm-wheel b^4 . In order to stop the instrument the yoke k , is shifted toward the left, as illustrated in Fig. 1, thus bringing the spring j' , into range of the insulation l , so that the latter, as soon as the space b^8 , comes opposite the teeth of the comb or combs c , contacts with the spring j' , and thus interrupts the circuit and stops the instrument with the pins of the cylinder b , clear of the teeth of the comb or combs c , and in a proper and safe position.

It will be obvious to those skilled in the art to which my invention appertains, that modifications may be made in the details thereof without departing from the spirit of my invention. Hence I do not limit myself to the precise construction and arrangement of the parts hereinbefore explained and illustrated.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A musical instrument provided with a shaft controlling the operative parts thereof, a differential gear and counter-gear mechanism, a motor and a speed controlling wheel, substantially as and for the purposes set forth.

2. A musical-instrument provided with a pin-cylinder mounted on a shaft, a comb or combs for said pin-cylinder, a worm-gear actuating mechanism for controlling said shaft, a toothed speed controlling wheel mounted on said shaft and detachably engaging said worm-gear an electric motor included in circuit and adapted to be connected with said mechanism, and means for stopping and starting said shaft, substantially as and for the purposes set forth.

3. A musical-instrument provided with a pin-cylinder mounted on a shaft and its complementary comb or combs, a worm-gear and counter-worm gear mechanism controlled by a toothed speed controlling wheel mounted on said shaft and detachably engaging said worm-gear an electric motor suitably connected with said mechanism and a commutator mounted on the pin-cylinder shaft and provided with contact springs or brushes and a manual switch included in the motor circuit, substantially as and for the purposes set forth.

4. A musical-instrument provided with a comb or combs, a pin-cylinder mounted on a shaft driven by a toothed-speed controlling wheel meshing with a worm-and-counter-worm gear mechanism controlled by a motor, substantially as and for the purposes set forth.

5. A musical-instrument provided with a comb or combs, a pin-cylinder, a shaft controlling the same and having a speed controlling wheel meshing with counter-worm-and-gear mechanism, means for throwing said mechanism into and out of engagement with said speed-controlling wheel, and a motor detachably connected with said mechanism, substantially as and for the purposes set forth.

6. A musical-instrument provided with a

shaft controlling a spring-actuated pin-cylinder and tune-changing device, a speed controlling wheel mounted on said shaft, a differential actuating mechanism engaging therewith and a motor for controlling the same, substantially as and for the purposes set forth.

7. A musical-instrument provided with a comb or combs and a pin-cylinder and its shaft provided with a gear-wheel driven by a worm and counter-worm-gear-mechanism adapted to be connected with an electric-motor included in circuit by means mounted on the pin-cylinder shaft and provided with conducting and insulating surfaces and brushes or contact strips and a manual-switch, substantially as and for the purposes set forth.

8. A musical instrument provided with a comb or combs and a pin-cylinder and its shaft and a gear-wheel driven by a differential worm-gear mechanism by a motor in a circuit having the commutator provided with insulating and conducting surfaces mounted on the pin-cylinder shaft and a manual switch and brushes interposed in circuit therewith, substantially as and for the purposes set forth.

9. A musical instrument provided with a spring controlled pin-cylinder mounted on a shaft having a gear-wheel meshing with a worm and counter-worm gear mechanism clutched to the shaft, a motor included in a circuit through a commutator provided with conducting and insulating faces and complementary brushes and a manual switch and a comb or combs adapted to contact with said pin-cylinder, substantially as and for the purposes set forth.

10. A musical instrument provided with a spring controlled pin-cylinder mounted on a shaft having a toothed governor wheel meshing with a differential actuating mechanism controlled by a motor, a comb or combs adapted to contact with said pin-cylinder and means for imparting motion to said motor, substantially as and for the purposes set forth.

11. A musical-instrument provided with a shaft controlling the operative parts thereof and having a speed controlling wheel mounted thereon and actuated by differential mechanism by means of a motor, substantially as and for the purposes set forth.

12. A musical-instrument provided with a spring controlled tune changing pin-cylinder mounted on a shaft provided with a toothed-wheel meshing with a worm and counter-gear-wheel clutched to the shaft of a motor in a circuit, and means for stopping and starting said motor, substantially as and for the purposes set forth.

13. A musical instrument provided with a spring controlled tune mechanism connected with a shaft having a toothed wheel meshing with a worm and gear and counter-worm adapted to be detachably connected with an electric motor in a circuit and said shaft carrying an insulated commutator provided with

contact brushes and a manual switch or cut-out device included in said circuit, substantially as and for the purposes set forth.

14. A musical instrument provided with a spring controlled pin-cylinder loosely mounted on a shaft, a tune changing device, a complementary comb or combs for said cylinder, a gear-wheel mounted on said shaft driven by a worm and counter-gear mechanism by means of an electric motor detachably connected therewith and included in a circuit by means of a rotatable commutator having complementary contact strips or brushes and a cut-out switch, substantially as and for the purposes set forth.

15. A musical-instrument provided with a spring controlled pin-cylinder mounted on a shaft and having a tune-changing device and lever for controlling the same, a gear or toothed wheel mounted on said pin-cylinder shaft and meshing with an adjustable worm engaging a counter-gear and worm controlled as to speed by a motor and means for stopping the operative parts of the instrument at the completion of a tune, substantially as and for the purposes set forth.

16. A musical-instrument provided with a differential gear and worm actuating mechanism, a speed-controlling mechanism, a driving shaft controlling the tune producing devices, and a motor for actuating said mechanisms, substantially as and for the purposes set forth.

17. A musical-instrument provided with a differential worm-gear and counter-worm-gear speed controlling and governing mechanism actuated by an electric motor in a circuit having the commutator thereof connected with the shaft of the tune producing device and brushes and a switch included in said circuit, substantially as and for the purposes set forth.

18. A musical instrument provided with a main driving shaft for the tune producing appliances thereof and carrying a governor wheel meshing with a differential speed controlling mechanism clutched to a motor and means for engaging and disengaging the shaft of said motor, substantially as and for the purposes set forth.

19. A musical-instrument provided with a comb or combs supported by a bed-plate, a pin-cylinder loosely mounted on a shaft and controlled by a spring, a gear-wheel and an insulated commutator secured to said shaft, a differential worm-and-gear-mechanism provided with means of detachment, an electric motor adapted to detachably engage said mechanism, contact springs or brushes and a switch included in said circuit, substantially as and for the purposes set forth.

20. A musical-instrument provided with a comb or combs supported by a recessed plate, a shaft having a longitudinally movable pin-cylinder, a tune changing device controlled

by a pivotal-lever, a toothed wheel and a commutator provided with insulated contacts mounted on said shaft, a worm and counter-gear mechanism adjustably connected with
5 said toothed-wheel, an electric motor included in a circuit and contact springs or brushes and a switch, substantially as and for the purposes set forth.

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

CONSTANT DORIOT.

Witnesses:

RICHARD C. MAXWELL,
J. WALTER DOUGLASS.