(No Model.) 2 Sheets—Sheet 1.

H. LANGFELDER.

DRIVING GEAR FOR MUSIC BOXES.

No. 547,610. Patented Oct. 8, 1895.

Fig. 1.

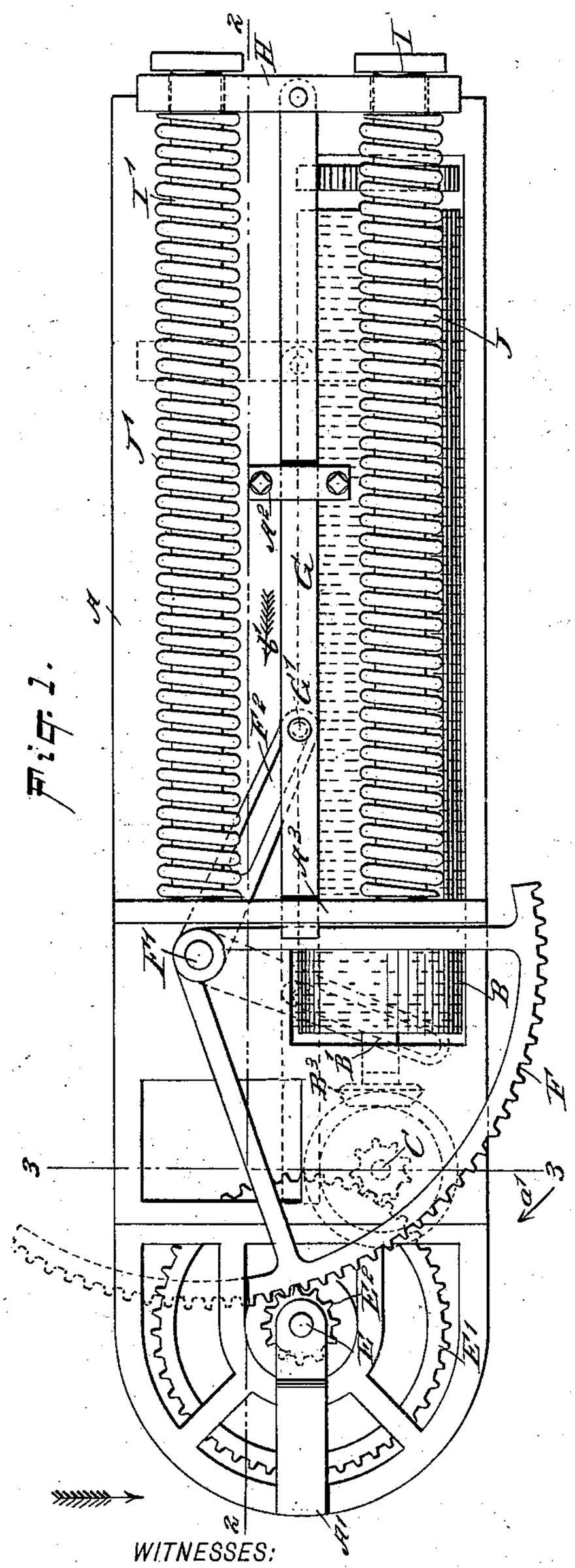
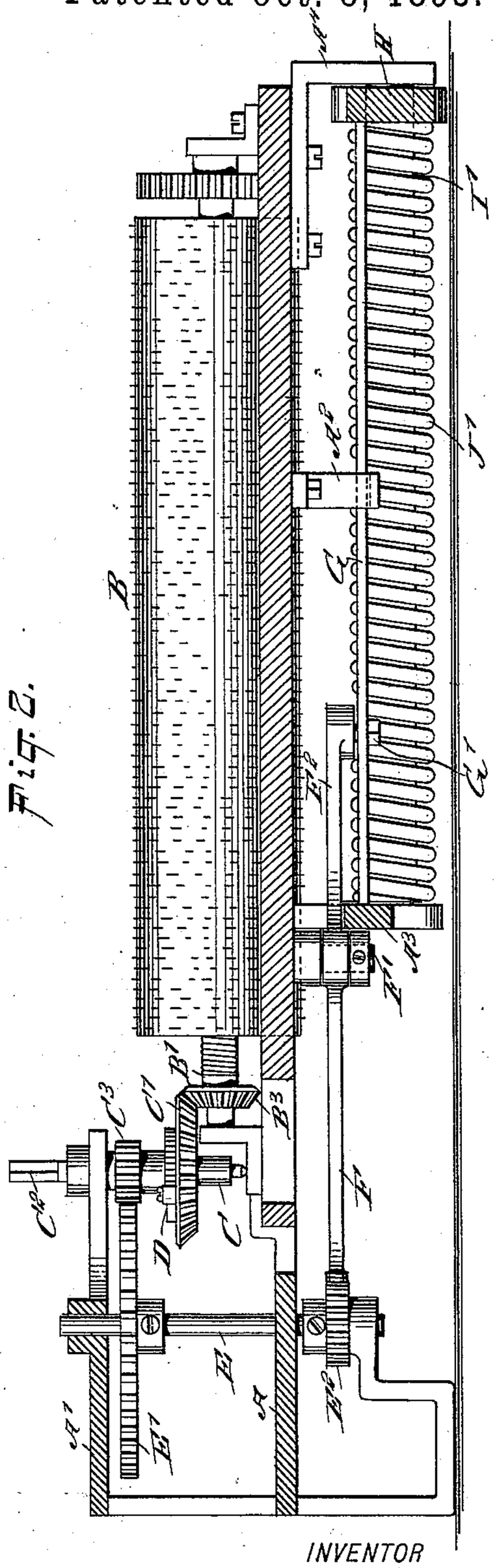


Fig. 2.



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INVENTOR

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 1.

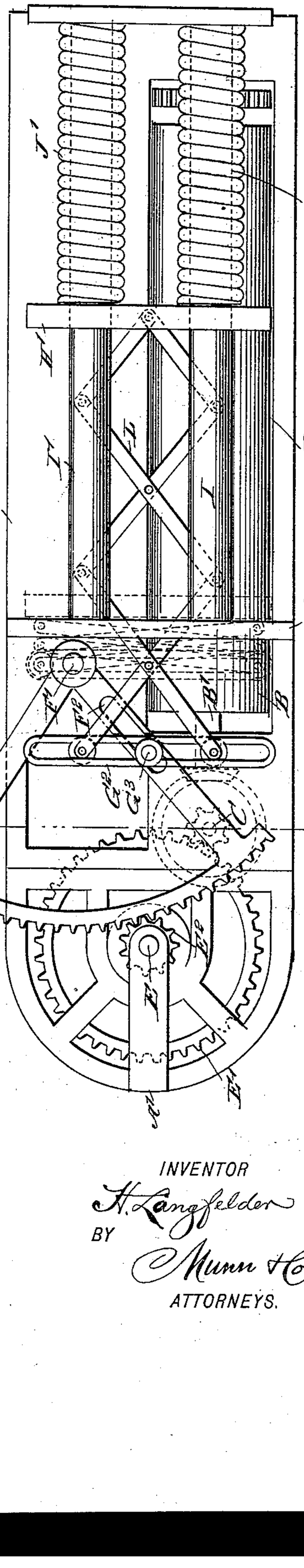

Fig. 2.

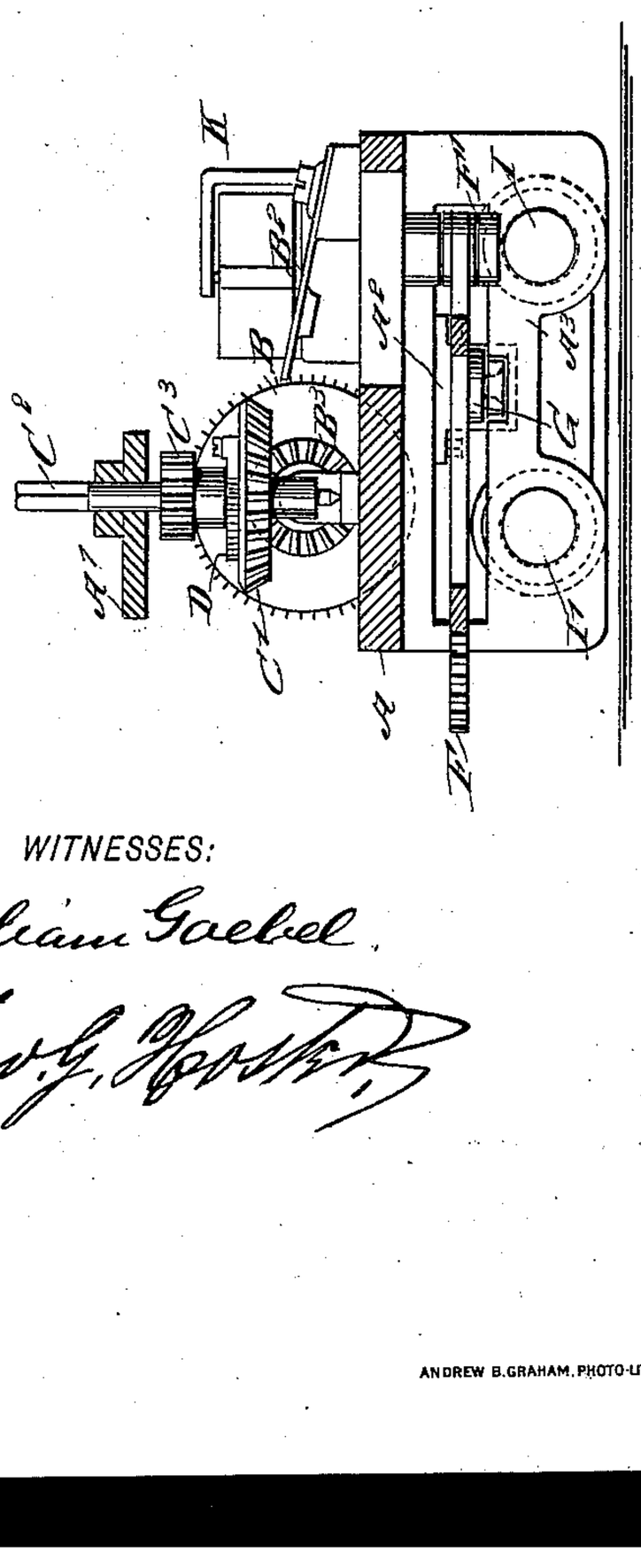

Fig. 3.

Fig. 4.

Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY LANGFELDER, OF JERSEY CITY, NEW JERSEY.

DRIVING-GEAR FOR MUSIC-BOXES.

SPECIFICATION forming part of Letters Patent No. 547,610, dated October 8, 1895.

Application filed January 2, 1895. Serial No. 533,594. (No model.)

To all whom it may concern:

Be it known that I, HENRY LANGFELDER, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Driving-Gear for Music-Boxes, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved driving-gear for music-boxes, whereby the latter are driven for a considerable length of time without requiring rewinding of the springs.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this invention, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is an inverted plan view of a music-box provided with the improvement. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 1. Fig. 4 is an inverted plan view of a modified form of the improvement, and Fig. 5 is a transverse section of the same on the line 5 5 of Fig. 4.

The Swiss music-box of the usual construction, with the exception of the driving-gear, is provided with the bed-plate A, on which is journaled the shaft B′, carrying the pin-cylinder B, which when rotated acts on the comb B^2, so that the latter is sounded to produce the music. On one end of the pin-cylinder shaft B′ is secured a beveled pinion B^3 in mesh with a beveled gear-wheel C′, mounted to rotate loosely on the winding-shaft C, extending vertically and journaled in suitable bearings in brackets A′, attached to or forming part of the bed-plate A. The gear-wheel C′ is connected by a pawl-and-ratchet device D of the usual construction with the shaft C, so that in winding up the latter the gear-wheel C′ remains at a standstill, and after the shaft is wound up and the power of the springs hereinafter more fully described rotates the shaft C in the opposite direction from that in which it is wound up then the gear-wheel C′ is carried along by the pawl-and-ratchet device D and the rotary motion of the gear-wheel C′ is transmitted by the pinion B^3 and shaft B′ to the pin-cylinder B to bring the pins of the latter in contact with the comb B^2 to produce the music.

The upper end of the winding-shaft C is made square, as at C^2, to permit of applying a key for winding up the shaft. On the latter is secured a pinion C^3 in mesh with a gear-wheel E′, secured on the shaft E, disposed vertically and journaled in suitable bearings on the bracket A′ and bed-plate A. On the lower end of the shaft E is secured a pinion E^2 in mesh with a segmental gear-wheel F, mounted to turn on a stud F′, secured to the under side of the bed-plate A, as is plainly shown in the drawings. This segmental gear-wheel F is provided with a slotted arm F^2, engaging a pin G′, secured on a longitudinally-extending bar G, mounted to slide in the bearing A^2 and bracket A^3, both secured to the under side of the bed-plate A.

The outer end of the bar G is secured with a cross-head H, extending transversely and mounted to slide loosely on rods I and I′, fixed at their ends in the brackets A^3 and A^4, attached to the bed-plate at the under side thereof. On the rods I and I′ are coiled helical springs J and J′, respectively, resting at their inner ends on the bracket A^3 and at their outer ends on the said cross-head H. Now it will be seen that when the several parts are in the position illustrated in Figs. 1 and 2 and the key is applied on the shaft C and the latter is turned then a rotary motion given to the shaft E by the gear-wheels C^3 and E′ causes the pinion E^2 to rotate the segmental gear-wheel F in the direction of the arrow *a′*, whereby the arm F^2 exerts a pull on the pin G′ and draws the bar G in the direction of the arrow *b′*, so that the cross-head H compresses the two springs J and J′. When the music-box has been wound up in this manner and the key is removed from the shaft C, then the power of the springs J and J′ is exerted on the cross-head H and the bar G in the inverse direction of the arrow *b′*, whereby a turning motion is given to the segmental gear-wheel F in the inverse direction of the arrow *a′*, so that the shaft E is rotated and its rotary motion is transmitted to the shaft C, which by the ratchet-and-pawl mechanism D now rotates the gear-wheel C′, so that the pin-

ion B^3, shaft B′, and pin-cylinder B are rotated to produce the music by sounding the comb B^2, as previously explained. A compensating power exerted by the springs J and J′ takes place at the segmental gear-wheel F, as the pin G′ travels in the slot of the arm F^2 nearer to the fulcrum F′ of the gear-wheel F when the springs J and J′ are compressed, so that the leverage between the bar G and arm F^2 of the gear-wheel F is decreased on increasing the compressing power of the springs—that is, when the springs are wound up. Now when the cylinder B is in motion and the springs unwound then the leverage between the gear-wheel F and bar G increases proportionately as the power of the springs decreases, owing to the fact that the pin G′ then travels outward in the slot of the arm F^2.

The shaft B′ of the pin-cylinder B is connected in the usual manner by a gear-wheel with the governor K, of any approved construction, so that a uniform rate of speed is obtained for the pin-cylinder. The transmitting device for connecting the cross-head H with the shaft E may be arranged in different ways—for instance, as illustrated in Figs. 4 and 5, in which the cross-head H′ is connected by a pair of lazy-tongs L with the slotted cross-bar G^2, connected by a pin G^3 with the slotted arm F^2 of the segmental gear-wheel F in mesh with the pinion E^2 on the shaft E. This transmitting device operates similarly to the one above described, so that further description of the same is not deemed necessary, it being understood, however, that when the box is wound up by turning the shaft C, as previously described, then the cross-bar H′ compresses the springs J J′, and the latter in exerting their power on the cross-bar H′ cause the lazy-tongs L to turn the segmental gear-wheel F to actuate the train of gear-wheels connected with the pin-cylinder B.

It will be seen that by the arrangement described the music-box when once wound up will run for a considerable length of time without requiring rewinding. It is further understood that the springs and connecting device by being located under the bed-plate A are not visible and the springs can be made of considerable length, so that the running of the music-box for several hours can be insured. The springs are further not liable to be broken, as is so frequently the case in music-boxes run by spiral springs.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the spring, the movable cross bar engaging one end of the spring to wind the same, a pivoted arm and means for turning it, operating means extending from the cross-bar to the arm and having a slot and pin connection with the latter so that upon the turning of the arm, the point of connection of the arm with the said operating means will slide toward or from the fulcrum of the arm, substantially as described.

2. The combination of the spring, the movable cross bar engaging one end of the spring, the segmental gear wheel provided with an arm slotted in a substantially radial direction, the operating means extending from the cross bar to the said arm and having sliding engagement with the slot thereof, and mechanism having a driving connection with the segmental gear wheel, substantially as described.

3. In a driving gear for music boxes, the combination with a segmental gear wheel in mesh with a train of gear wheels for driving the pin cylinder, the said segmental gear wheel having a slotted arm, of a pin engaging the slot in the said arm, a bar fitted to slide and carrying the said pin, a cross bar connected with the said first named bar, and one or more helical springs adapted to be compressed by the said cross bar, substantially as shown and described.

HENRY LANGFELDER.

Witnesses:
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JNO. M. RITTER.