

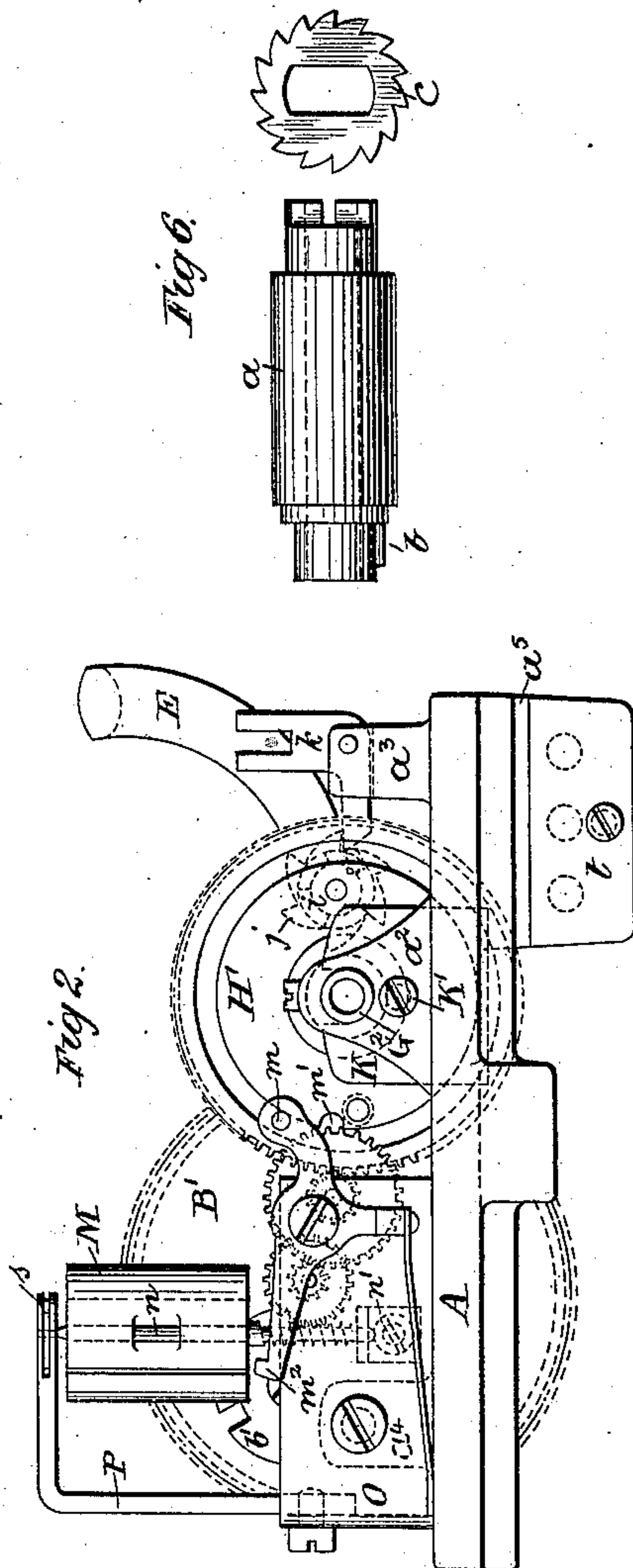
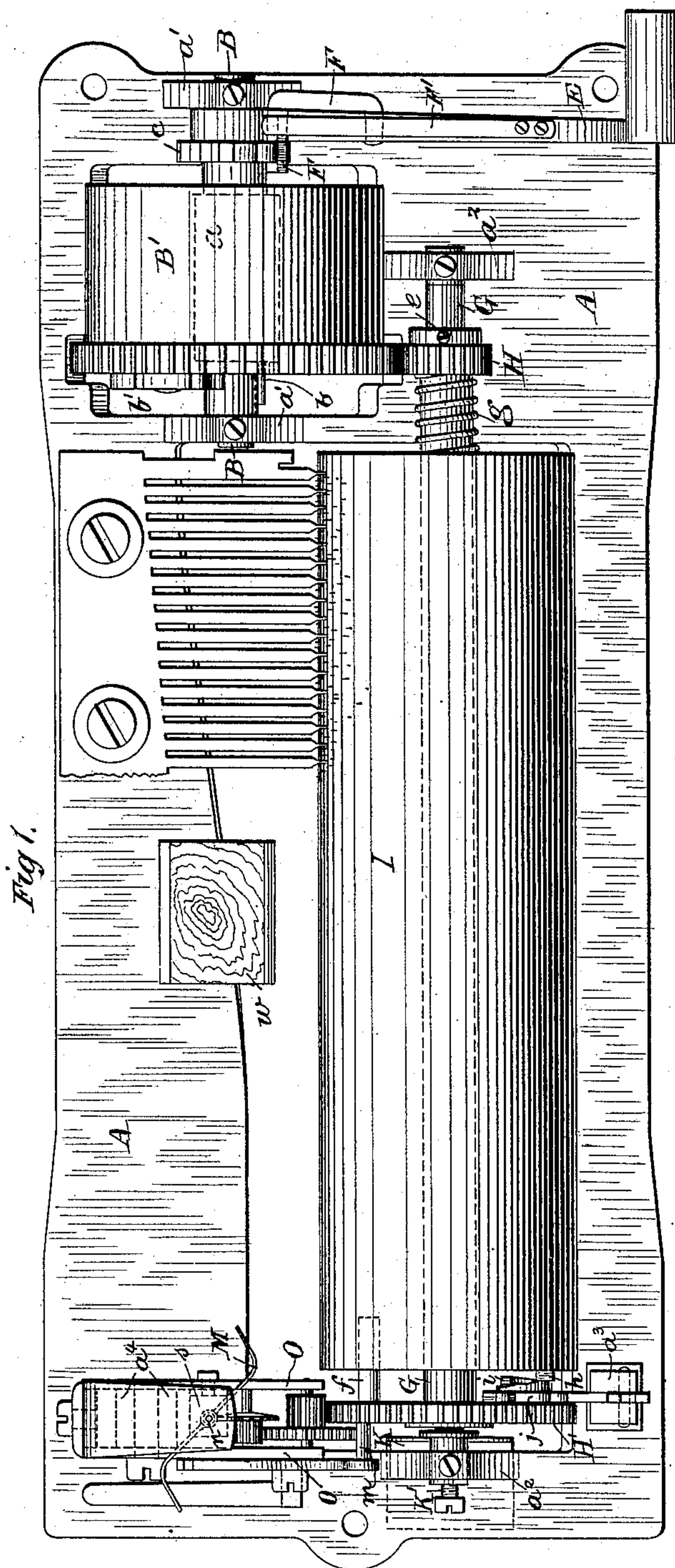
(No Model.)

2 Sheets—Sheet 1.

E. FORNACHON.
MUSICAL BOX.

No. 382,080.

Patented May 1, 1888.



Witnesses.
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UNITED STATES PATENT OFFICE.

EDMOND FORNACHON, OF LA MOTHE, NEAR YVERDUN, SWITZERLAND.

MUSICAL BOX.

SPECIFICATION forming part of Letters Patent No. 382,080, dated May 1, 1888.

Application filed October 2, 1886. Serial No. 215,179. (No model.) Patented in Belgium May 14, 1886, No. 73,119; in France May 18, 1886, No. 176,207; in England May 24, 1886, No. 6,962, and in Germany May 31, 1886, No. 41,807.

To all whom it may concern:

Be it known that I, EDMOND FORNACHON, a citizen of the Republic of Switzerland, residing at La Mothe, near Yverdun, in the Canton of Vaud, Switzerland, have invented certain new and useful Improvements in Musical Boxes, (for which I have obtained Letters Patent in Belgium, No. 73,119, dated May 14, 1886; in France, No. 176,207, dated May 18, 1886; in Great Britain, No. 6,962, dated May 24, 1886, and in Germany, No. 41,807, dated May 31, 1886,) of which the following is a specification.

My invention relates to improvements in the construction and arrangement of certain parts of musical boxes, which I have made with a view to simplifying the same and reducing their cost of manufacture.

To clearly explain the nature of my invention, reference is made to the accompanying drawings, in which—

Figure 1 is a plan view of a musical box constructed according to my invention. Fig. 2 is an end view of same, looking from the left-hand side of Fig. 1. Fig. 3 is a front elevation of Fig. 1. Fig. 4 is a sectional elevation on the line $x x$ of Fig. 3, looking to the right. Fig. 5 is a detached view of a portion of the cylinder-spindle and end bearings, and Fig. 6 is a view of a portion of the spring-barrel and of the ratchet for winding it.

For the sake of economy, I find it convenient to cast upon the upper surface of the bed-plate A, Fig. 1, six projections or lugs, a', a', a^2, a^2, a^3 , and a^4 , the latter being more clearly shown in Fig. 2, and upon the underside of the bed two lugs, $a^5 a^5$. The projections $a' a'$ serve as bearings for the fixed shaft B of the spring-barrel B'. Upon this shaft B is loosely mounted a hollow shaft or collar, a , Fig. 6, the ends of which are turned down or reduced in diameter, as shown. The left-hand end, as shown in Fig. 4, is cut away to receive a pin, b , which is firmly secured in same. The other end is squared so as to receive a ratchet-wheel, c , having a corresponding opening therein, as shown in Fig. 6. Upon this shaft or collar a is secured one end of the spring, the other being affixed to the interior of the usual barrel B', which is otherwise loose upon the shaft or collar. On one face of this barrel is affixed by a screw or stud a star-wheel, b' , the notches

b^2 in which engage with the pin b when the spring is being wound up, the purpose of which is to prevent the spring being overwound in one direction and to prevent its running down too far in the other, such device being well understood in instruments of this description. The ratchet-wheel c is prevented from turning on the shaft or collar a by reason of the squared head, and the spring is prevented from turning the same in a backward direction by means of a pawl, D, Fig. 4, consisting of a short pin, which passes through a hole in the bed-plate and engages with the teeth of the ratchet-wheel, being pressed thereto by means of a spring, D', a slot in which engages with a tang, d , Figs. 3 and 4, on its lower end.

The ratchet mechanism of the winding-handle consists of a pawl, F, one end of which is bent at right angles and is pivoted in the handle E, the other end, which is similarly bent, being knife-edged and engaging with the teeth of the ratchet-wheel c , a spring, F', secured upon the handle, keeping it in engagement.

The journals of the cylinder-spindle G, as shown detached and in part broken away in Fig. 5, are supported in bearings G' G', composed of short tubular pieces, one of them, G', having thereon a flange, as shown. These are held in the lugs $a^2 a^2$ by means of screws or pins. One end of the spindle carries a pinion, H, having a shoulder through which passes a screw, e , which enables it to be secured upon the spindle without squaring it at that point, and which also allows of its easy adjustment. This gears with and is driven by the toothed rim of the spring-barrel B'. The other end of the spindle carries the usual fixed pinion, H', at right angles from which projects a pin, f , which passes into a hole in the end of the cylinder I, which latter is loose upon its spindle for the purpose of being shifted, so as to change the tune. A spring, g , forces the cylinder continually to the left and keeps a projection, h , Fig. 1, pressed against the usual circular stepped stud, i , which is pivoted on the pinion H' and which has a notched flange, j . With the teeth of this flange engages the lever which operates it for the purpose of changing the air. This I make in the form of a bent arm, k , which is pivoted in the projection a^3 , and is so arranged as to be capable of being

turned up out of the way. A bent spring-plate, K, secured to the under side of the bed-plate presses against the flange of the bearing G², so that a turn on the adjusting-screw K' will enable the spindle G and connected parts to be slightly shifted, so as to set the pins on the cylinder exactly opposite the musical tongue-ends. An exchange of cylinders is effected by entirely removing the bearing or bush G', when, if the adjusting-screw K' and spring-plate K are slackened, the cylinder may be lifted out. The pinion H' has a groove in its outer face, in which travels the usual pin, m, which, falling into the notch m', Fig. 2, stops the action of the instrument, the hooked end m² of the three armed lever or trigger assisting in this by engaging with the fly. The third or lower arm of this lever or trigger has secured to it a spring for operating it, which presses directly on the bed-plate. The fly M is formed from a bent piece of metal, the center of which is slit in two or more places, and through which slits pass the center spindle, n. This spindle is driven in the usual manner through a train of wheels by the pinion H', and is stepped at the bottom in a small bracket-piece, n', which is screwed to one side of the frame O. This frame is formed from a single piece of metal bent round into U shape, and is held in place upon the bed-plate by a screw passing through it and through the lug a⁴. Before closing up the free arms or ends, the bearings of the pinions which drive the fly are inserted therein. Secured to the back of this frame is the lower end of a bent arm, P, the other end of which is split for the purpose of holding a small hardened-steel plate, s, upon which the spindle of the fly has its bearing, such steel plate taking the place of the jewel heretofore employed.

The lugs a⁵ beneath the bed plate are employed for carrying the chime-rods R, which ordinarily are fitted into their bearings by turning, but in my device are simply rods of the same diameter throughout, which are slipped through the holes in the lugs and retained in place by the plates t, screwed thereto when the rods are in place. This construction enables them to be easily changed or removed. These chime-rods are well known in musical boxes. Each carries a bent wire, which is soldered thereto, and which terminates in a hammer at some point above the cylinder where it can strike a gong, castanet, or drum of ordinary construction. (Not shown.) Each rod is operated from a small arm or lever secured upon it, to which is connected a wire affixed to the under side of one of the musical tongue ends. The usual metallic receptors are replaced by blocks of cork w, secured upon the bed-plate, as shown in Fig. 1.

The box or case of the instrument may be of any known description; but, as a means of reducing their cost, I prefer to line and cover

them with morocco or similar paper, and to mount the glass which incloses the movement by means of a strip of woven fabric in place of the usual wooden framing and hinges.

The operation of the parts will be evident to those familiar with this class of instrument; but it may be stated that the winding of the spring-barrel is effected by handle E, the pawl F on which engages with one of the teeth of the ratchet-wheel c each time that the handle is pulled up, any backward movement of said ratchet-wheel being prevented by means of the pawl D, which is pressed into it by the spring D'. This revolves the shaft or collar a and winds up the spring in the barrel, which, upon the release of the fly M, as described, will drive the pinions H and H', the pin f on the latter carrying round the cylinder, the pins on which come in contact with the musical tongue-ends. The circular stepped stud i is carried round with the pinion H' until it returns again to the position shown in Fig. 1, when one of the notches of the flange j is caught by the end of the bent arm k, which gives it a slight turn, thus shifting the cylinder and changing the air by causing the projection h on the cylinder to move to the next step of the stud, as is well understood. When the bent arm k is turned out of the way, the same tune is repeated.

Having now described the nature of my improvements, I declare that what I claim is—

1. In a musical box, the spindle G and pinion H adjustable upon the same, substantially as described.

2. In a musical box, the cylinder-spindle G and bearings G' G², in combination with the spring-plate K, substantially as described, and for the purposes set forth.

3. In a musical box, the hollow shaft or collar a, having at one end the pin b and adapted to carry at the other the ratchet-wheel c, in combination with the fixed shaft B, all substantially as described, and for the purposes set forth.

4. In a musical box, the frame O, for carrying the fly and its train of wheels, formed from a single piece of metal and having a bent arm, P, and steel bearing-plate s, in combination with the three-armed lever or trigger, the spring of which bears directly upon the bed-plate, substantially as and for the purposes set forth.

5. In a musical box, the bent arm k, pivoted in the lug a³ and adapted to operate the air-changing device, substantially as described.

6. In a musical box, the combination of the winding-handle E, spring F', pawl F, ratchet-wheel c, pawl D, and spring D', substantially as described, and for the purposes set forth.

EDMOND FORNACHON.

Witnesses:

FÉLIX PITTON,
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