

(No Model.)

H. A. GAUTSCHI.
MUSIC BOX.

No. 415,034.

Patented Nov. 12, 1889.

Fig. 1.

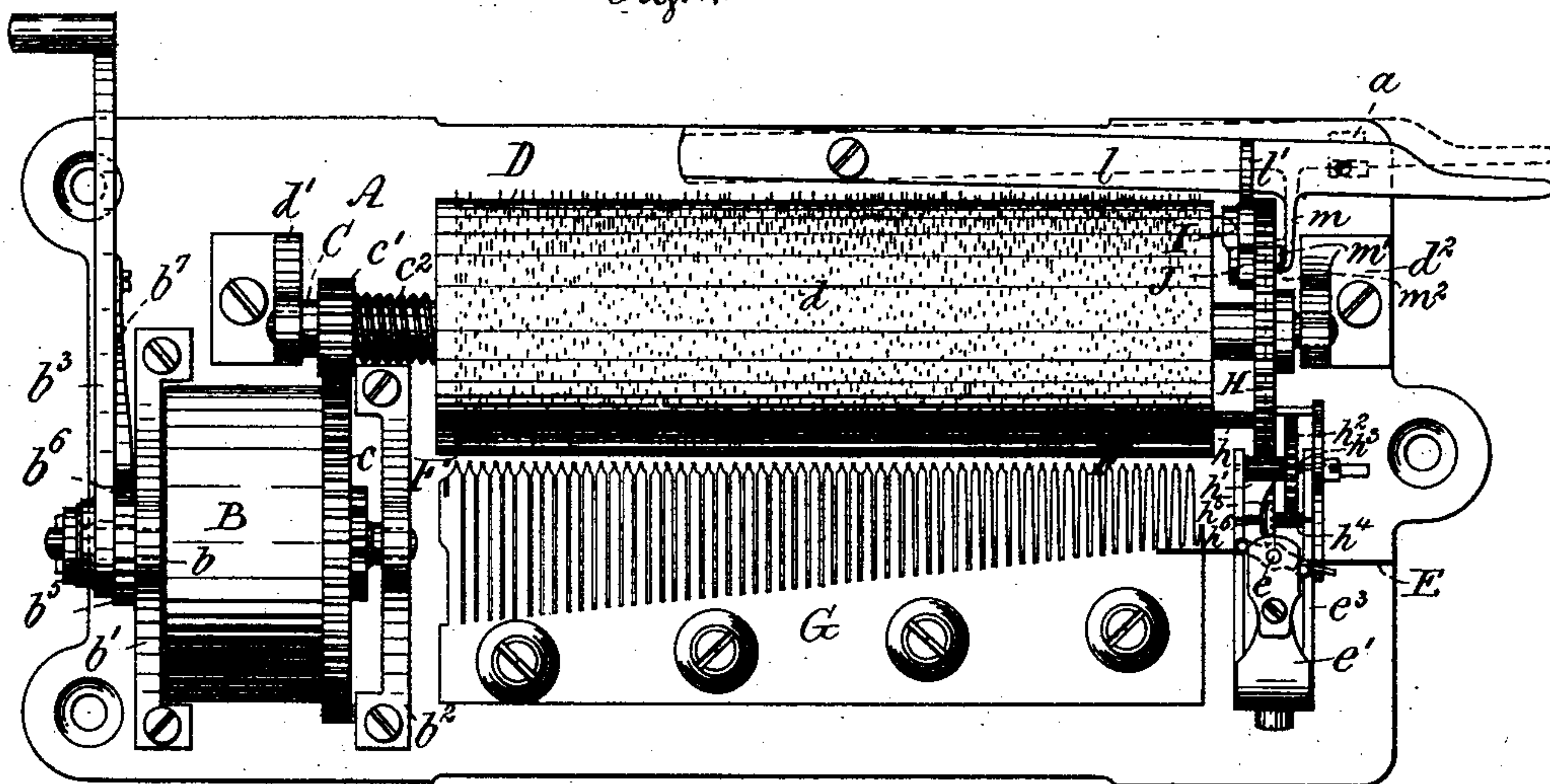


Fig. 2.

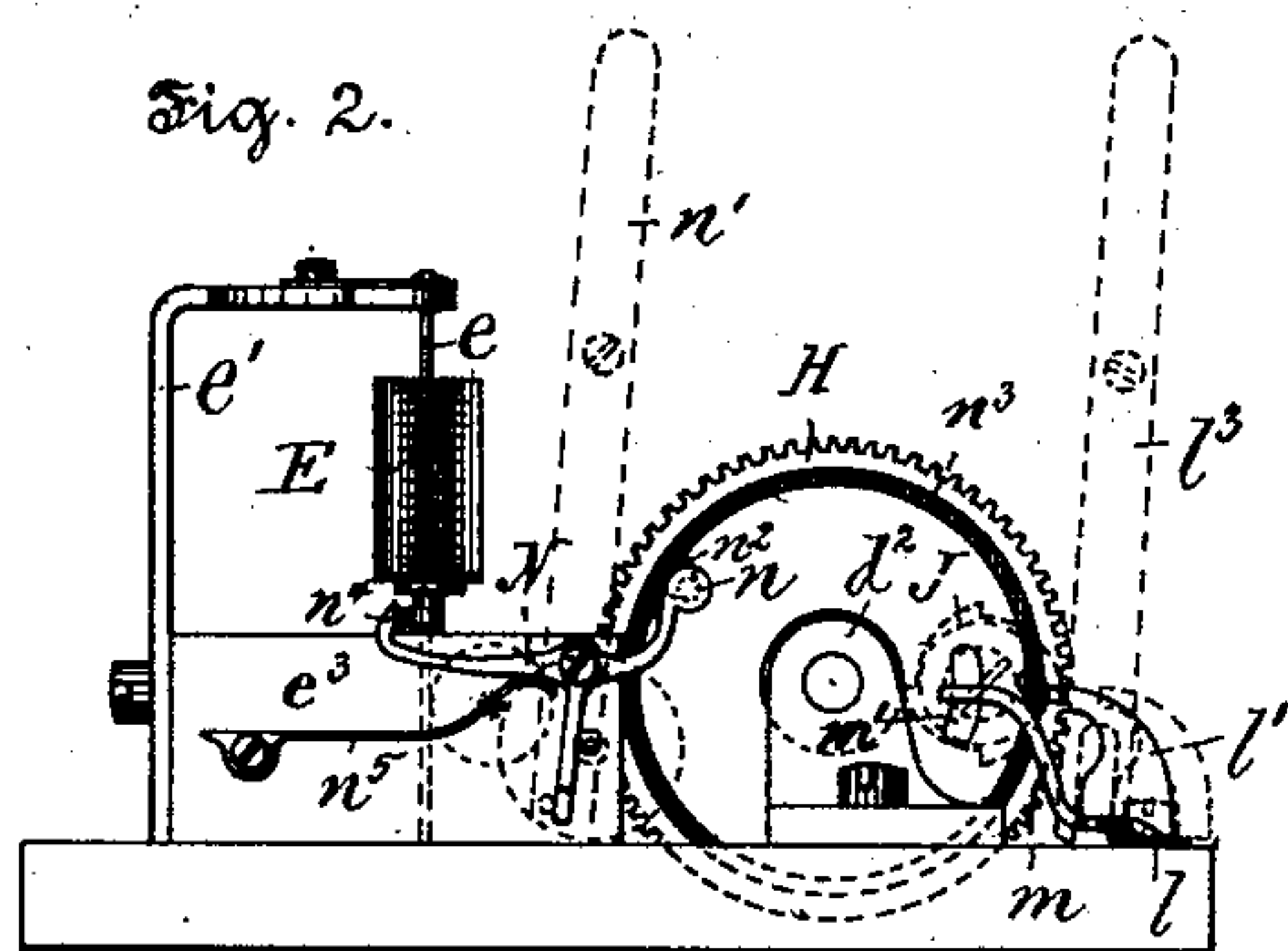


Fig. 3.

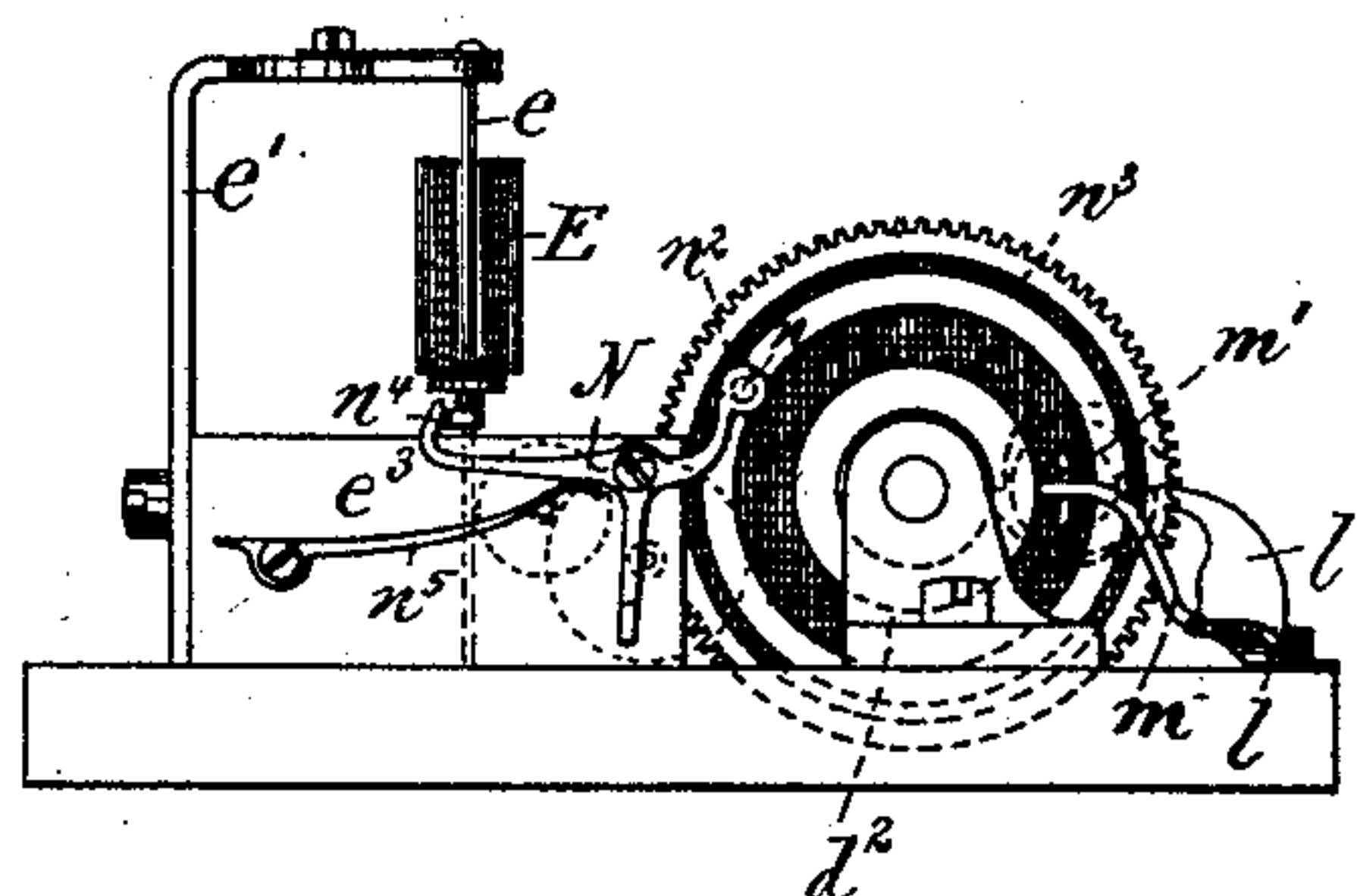


Fig. 4.

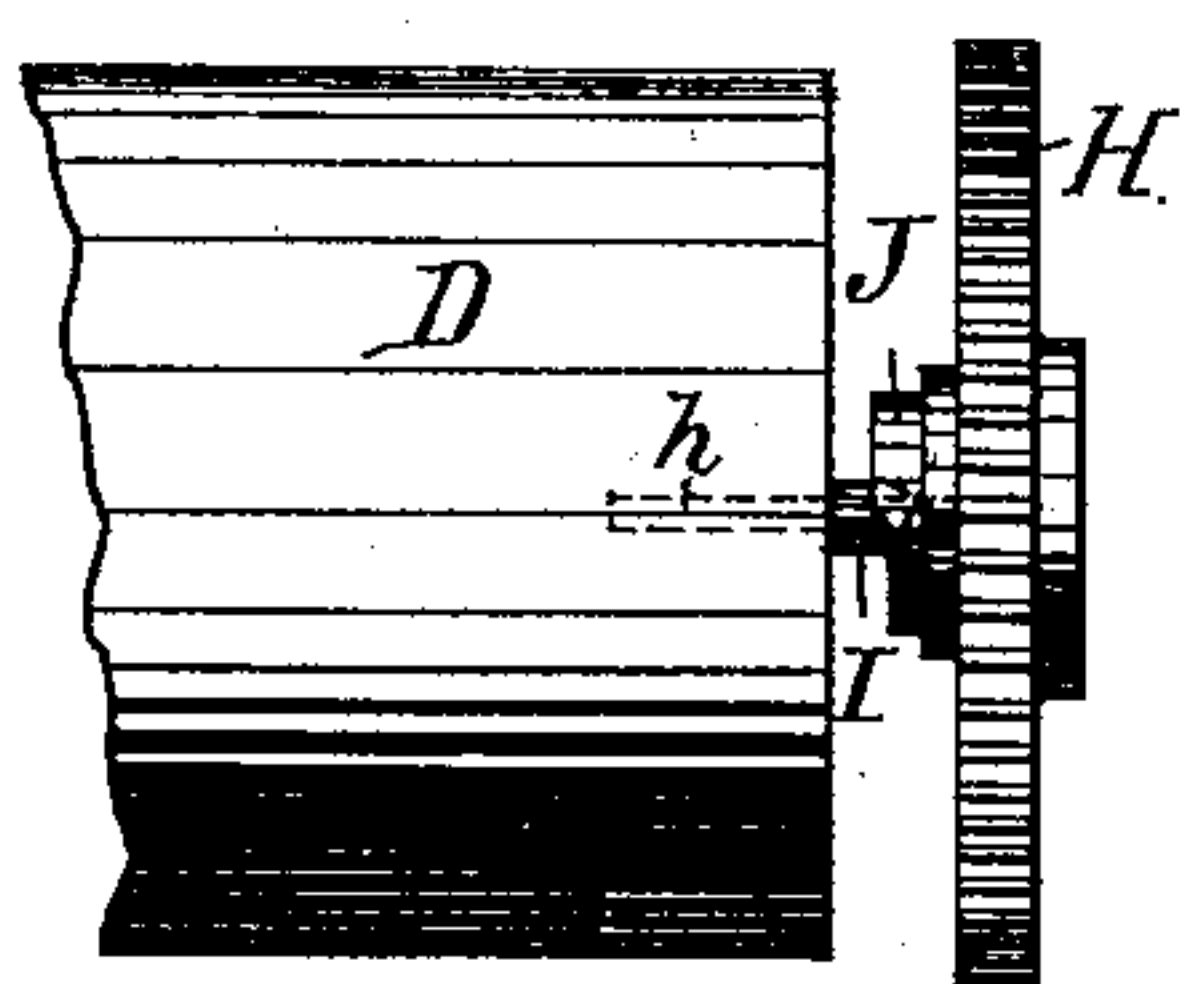


Fig. 5.

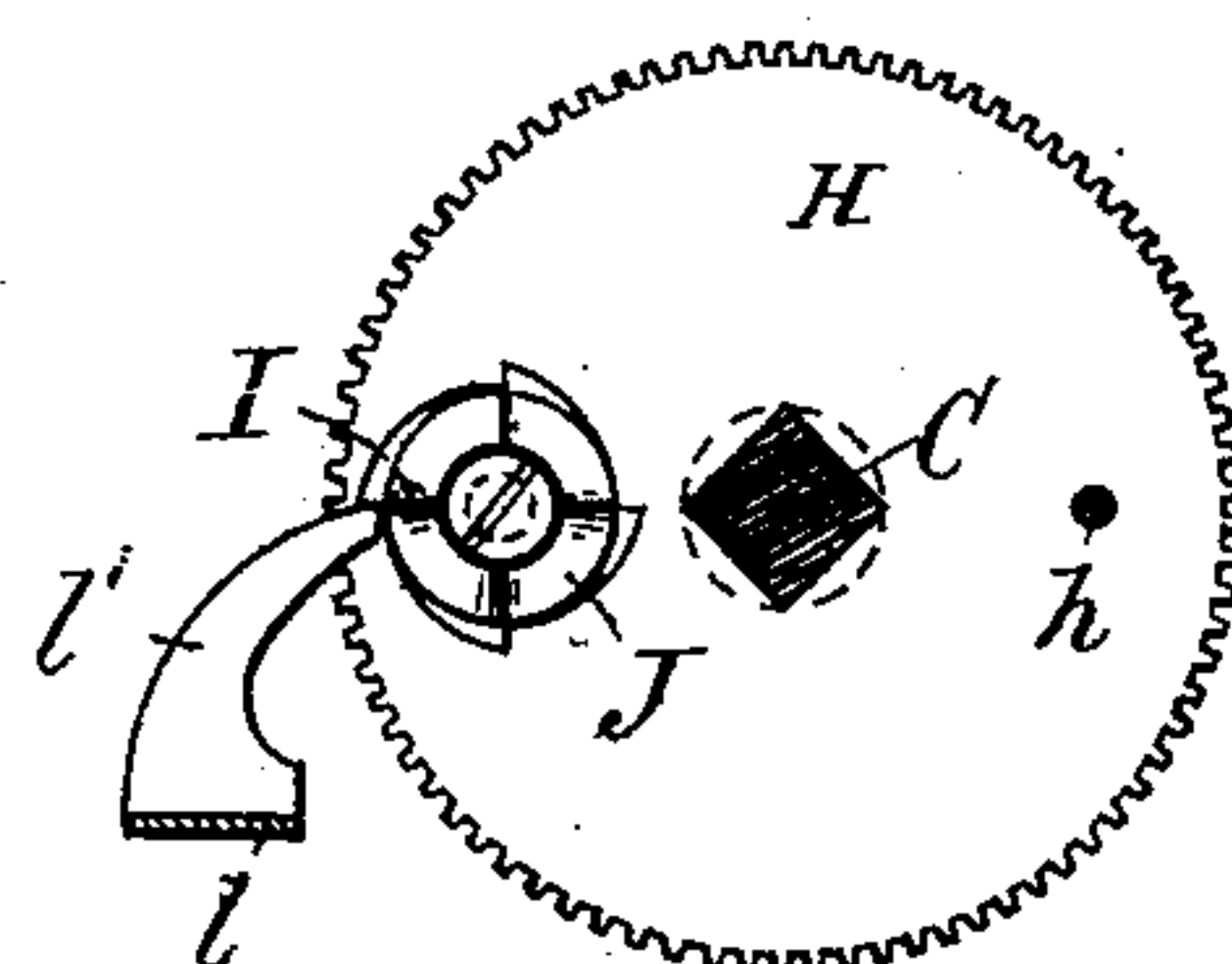
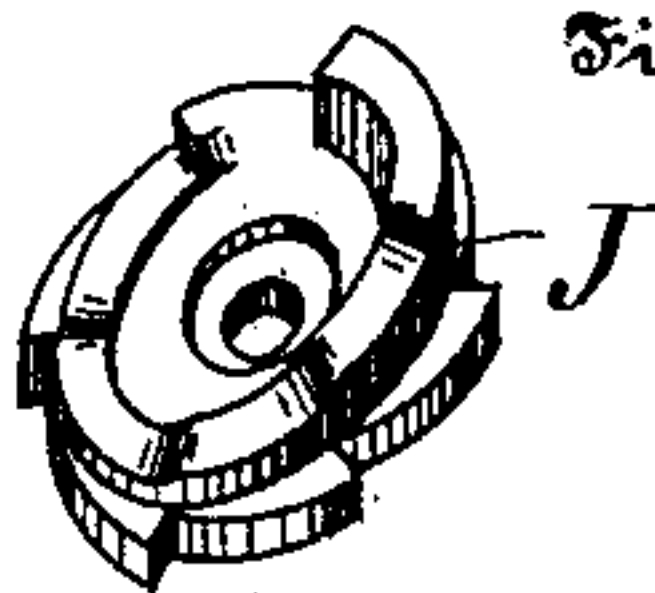


Fig. 6.



Witnesses:
Hermann Bornmann.
Thomas M. Smith.

Inventor:
Henry A. Gantochi
by J. Walter Douglas
Att'y.

UNITED STATES PATENT OFFICE.

HENRY A. GAUTSCHI, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HENRY GAUTSCHI & SONS, OF SAME PLACE.

MUSIC-BOX.

SPECIFICATION forming part of Letters Patent No. 415,034, dated November 12, 1889.

Application filed April 19, 1889. Serial No. 307,772. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. GAUTSCHI, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Music-Boxes, of which the following is a specification.

My invention has relation to a safety tune changing and repeating device or check operating in conjunction with the tune-changing lever of a music-box to enable the same to be held firmly in such a position as to prevent a change or repeat of the tune being interfered with while the blank space of the cylinder is opposite the comb of the instrument.

The principal object of my invention is to provide an automatic safety tune changing and repeating device or check applied to or acting in conjunction with the tune-changing lever-arm of a music-box, whereby the same is held not only in its proper or correct position while the cylinder is in the act of changing from one tune to another, but also so firmly in such position as to render it impossible to move said tune-changing device, either partially or entirely, in the direction of repeat while the longitudinal blank space extending the entire length of the cylinder between tunes is passing directly opposite the points of the teeth of the comb, and while the tune-changing ratchet-surfaced cam-wheel is in a position to change the tune by the same engaging or contacting with an arm cast with or secured to the tune-changing lever.

A further object of my invention is to provide a tune-changing lever which is pivotally connected with the base-plate of the instrument, so as to permit of the same being shifted at the proper time to "change" or "repeat" a tune at will, as may be desired.

Heretofore the pin-studded cylinder of a music-box has generally been shifted to effect a change from one tune to another by the force of a coiled spring mounted on the cylinder-shaft, which caused a lateral projecting pin of the cylinder to be brought firmly against the inclines of a ratcheted tune-

changing cam-wheel, and the curved arm of the longitudinal tune-changing lever to be brought into engagement with the ratchet-teeth of said tune-changing cam-wheel; but in practice it has been quite common for the tune-changing lever to be automatically forced backward while the cylinder was being shifted by the force of the said coiled spring to effect a change from one tune to another, and hence fail to perform with absolute certainty its functions, so that instead of the intended tune being played the previous tune was again repeated or the pins of the cylinder brought into such position with the teeth of the comb or keys of the instrument as to cause the instrument to play imperfectly, thereby producing unharmonious musical sounds, while at the same time materially affecting or damaging the dampers of the comb, as well as to a greater or less extent impairing the position, shape, or condition of the pins of the cylinder, and, moreover, their effective action in the operation of the instrument.

It is often the case in the use of music-boxes for inexperienced hands to shift the tune-changer at the moment the cylinder is changing from one tune to another, resulting in the teeth of the comb failing to strike, as they should, the actuating-pins of the cylinder positively and directly in the center, but striking them more or less from the sides, thus producing discordant or unharmonious musical sounds, and also causing a disarrangement of the dampers beneath the comb, and to a greater or less extent damaging the pins of the cylinder. In the application of my safety tune changing and repeating check or device the defects and objectionable results hereinabove mentioned are entirely obviated and the effective action and operation of the instrument materially enhanced.

The nature and characteristic features of my invention will be more particularly understood, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a top or plan view of a music-box embodying the characteristic features of the invention. Fig. 2 is an end elevation

showing a cylinder having a grooved gear-wheel in connection therewith, and showing, also, the stop and automatic tune-changing lever and safety tune changing and repeating device or check. Fig. 3 is a similar view of a modified form of safety-check device embodying the particular features of the invention. Fig. 4 is an elevation of a portion of the cylinder provided with a gear-wheel having a ratcheted surface cam-wheel for automatically actuating said cylinder longitudinally to effect a change from one tune to another. Fig. 5 is a side view of the gear-wheel, showing the automatic changing device and safety-check in detail; and Fig. 6 is a perspective view of a ratcheted cam-wheel applied to the gear-wheel of a cylinder, and in this instance arranged so as to play six tunes.

Referring to the drawings, A is the bed-plate of the instrument.

B is the drum, provided with a shaft b , and around which is coiled the driving-spring of the instrument. This shaft is held in bearings provided to receive the same in the standards b^1 and b^2 , and on the outer extremity of the shaft is mounted a crank b^3 . On the shaft b , contiguous to the crank b^3 , is mounted a ratchet-wheel b^5 , and to the crank is pivoted a dog b^6 , which engages with said ratchet-wheel and is held normally in contact therewith by means of a spring b^7 .

C is the shaft, on which is mounted the barrel or cylinder D, provided with pins d , and this shaft is journaled to standards d^1 and d^2 . The extremities of the pins d of the barrel or cylinder D engage or contact with the comb G, suitably attached to the front of the bed-plate A, and supported in operative position therefrom.

E is the escapement-fan controlling the speed of the mechanism of the instrument, which is mounted on a vertical shaft e , held in bearings provided therefor in the base-plate A and in an upwardly-projecting curved arm e^1 , suitably secured to a housing e^3 .

Mounted on the main shaft C of the cylinder or barrel D is a large grooved gear-wheel H, provided with a longitudinal pin h , extending into the body of the cylinder D. This gear-wheel H meshes with a pinion h^1 , provided with a small toothed wheel h^2 , and both being mounted on a horizontal shaft h^3 , journaled to the housing e^3 . The gear-wheel h^2 meshes with a pinion h^4 , carrying a worm-wheel h^5 , mounted on a horizontal shaft h^6 , which is journaled to the housing e^3 , and said worm-wheel h^5 engages with the vertical worm-shaft e , provided with a fan E, whereby, through the combined action of the train of gearing just described, said fan is actuated for controlling the speed of the instrument.

To the inner surface of the grooved gear-wheel H is pivoted a ratcheted surface cam-wheel J, provided with a series of inclines or shoulders—that is, with as many inclines or shoulders as it is intended the instrument shall play tunes—and against which cam-

wheel J, by the actuation of the spring c^2 , normally rests a projection I, attached to the end of the cylinder D, but which in the actuation of the cylinder is caused to ride up and down the inclines of said cam-wheel J.

l is a tune-changing lever-arm, to which is secured in any preferred manner a curved projecting arm l' , which, when the instrument is set so as to play the different tunes in regular succession, contacts with the teeth of the cam-wheel J during the interval between tunes, while the blank space F is passing opposite the teeth of the comb to cause the tune to "change." When this curved projecting arm l' is removed from contact with the cam-wheel J, the tune may be repeated again and again at will.

In the ordinary construction of a music-box provided with a pin-studded cylinder caused to rotate in front of a comb or keys there is a blank space in the cylinder at the end of each tune, or at the point of completion of one revolution of the cylinder, and this blank space extends the entire length thereof. This is necessary in order to permit, without injury to the pins of the cylinder or the dampers beneath the comb, the cylinder to be moved by the tune-changing device into a position for commencing another tune.

The longitudinal tune-changing lever-arm l is pivotally attached to the base-plate A, as shown in Fig. 1, and this lever-arm has a lower projection l^1 , which engages in a recess a , formed in the base-plate A, in order that said lever may be readily secured and held in either the "repeat" or change position by means of a vertical lever l^2 , as shown in dotted lines in Fig. 2, pivoted laterally to a frame and extending through a slot therein, and said frame and lever located in the box of the instrument contiguous to the operative mechanism thereof, as is well understood. This vertical lever l^2 is bifurcated at its lower end and engages with the outer extremity of the tune-changing device l , whereby, when in operative position, the same may be readily moved from the change to the repeat position in the frame. To this tune-changing lever-arm l is attached or formed integral therewith an arm m , with a shouldered or curved extremity, as shown in Fig. 1, which engages with a curved or other preferred form of block m' , cast with or secured to the grooved gear-wheel H. This projecting arm of the tune-changing device l engages with the face of the block or the edges or sides thereof, and thereby firmly holding the tune-changing lever l in the position it was caused to assume during the motion of the cylinder D, and preventing a change being made until the starting of the cylinder or the beginning of another tune. When the tune-changing lever l is in such position as to permit the curved projecting arm l' to engage with the teeth of the cam-wheel J and with the longitudinal blank space F of the cylinder D, opposite the comb G, as shown in Fig.

1, it will at each revolution of the cylinder or barrel D change a tune. When the tune-changing lever l is in the position indicated in dotted lines in Fig. 1, it will repeat one tune over and over again until again set by hand to the change position. If this tune-changing lever l be caused to assume a position to repeat or change, as may be desired, before the cam-wheel J is in a position to bring the points of the teeth of the comb G so as to strike positively on the center of the teeth of the cylinder—that is, contacting and striking them sidewise or between the pins of two tunes, which is technically termed “playing between tunes”—not only the pins of the cylinder will be damaged, but the dampers beneath the comb disarranged, thereby producing discordant sounds and unharmonious musical notes in the piece. This is entirely obviated by arranging the arm m of the tune-changing lever l in the manner, for instance, as hereinbefore described.

In Fig. 3 is illustrated another form of safety-check device, which in this instance consists of an arm m , secured to or formed integral with the tune-changing lever l and curved outwardly and upwardly therefrom and engaging with a block m' , formed in the double-grooved gear-wheel H. It is manifestly obvious that the arm m may be caused to engage with the cylinder D, by the aid of an extra wheel or pins, to perform the same functions hereinbefore described without departing from the spirit of my invention, and hence I do not limit myself to the exact arrangement of the safety tune changing and repeating device or check hereinbefore described.

In the instance of the tune-changing cam-wheel J being attached at the opposite end of the instrument to that shown in Fig. 1—that is, to the left thereof—the same functions or results hereinbefore explained may be successfully accomplished.

To the gear-wheel H is attached or cast with the same a curved block m' , as shown in Fig. 2, and when the tune-changing lever-arm l and the projecting arm l' are in engagement with the teeth of the cam-wheel J, and the pin I, extending from the cylinder D, is in contact with the inclines or shoulders of said cam-wheel J, it will be impossible to move said lever, as the curved block or plate m' will hold the arm m , which may have a laterally-projecting pin m^2 . While the lever l is on the repeat position and the pin I is in engagement with the cam-wheel J, and the longitudinal blank space F is opposite the teeth of the comb G, it will be impossible to cause the instrument to assume the change position until the pin-studded cylinder is again revolved, or immediately after the beginning of another tune, thereby effectually guarding against a partial actuation or turning of the cam-wheel J.

The operation of the instrument may be explained as follows: The mainspring is

coiled around the drum-shaft by operating the lever b^3 , which actuates the ratchet-wheel b^5 , imparting motion to the gear-wheels c and c' . To the housing e^3 is pivoted a T-shaped lever N, provided with a pin n , which is permitted to travel through the groove of the gear-wheel H, and at the completion of a tune, when the right-angular lever pivoted to the frame of the box contiguous to the operative mechanism of the instrument is moved from the “play” to the “stop” position, to engage in a circular recess n^2 , formed in the annular projection of the grooved gear-wheel H, thereby arresting the drum B and the escapement-fan E. To start the instrument again, the lever n' , Fig. 2, is moved toward the left, thereby disengaging the pin n from the recess n^2 of the gear-wheel H, and at the same time releasing the fan E from its arrester n^4 of the stop-lever N and allowing the cylinder D to revolve; or the reverse operation may be had and the same functions performed.

Some instruments are arranged to operate in the reverse way to that heretofore described. The spring n^5 , secured to the housing e^3 , normally engages with the T-shaped lever-arm N. In the middle of a tune being played by the instrument the change mechanism may be operated by the lever l^3 , which actuates the tune-changing lever-arm l , as hereinbefore fully described.

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

1. In a music-box, a safety tune changing and repeating device or check formed integral with the tune-changing lever and caused to engage with a gear-wheel mounted on the cylinder-shaft, substantially as and for the purposes set forth.

2. In a music-box, a safety tune changing or repeating device or check connected with the tune-changing lever and caused to engage in or with the projections of a grooved gear-wheel on the cylinder-shaft, substantially as and for the purposes set forth.

3. In a music-box, the combination, with an arm formed integral with the tune-changing device, of a gear-wheel mounted on the cylinder-shaft, and a block or plate cast with or attached to said gear-wheel, substantially as and for the purposes set forth.

4. In a music-box, the combination, with a laterally-projecting curved arm connected with the tune-changing lever, of a pin-studded cylinder and its shaft, a pin or wedge attached to the end of said cylinder and in contact with a cam-wheel pivoted to the tune-changing gear-wheel mounted on said cylinder-shaft, and a vertical arm engaging with the teeth of said cam-wheel, substantially as and for the purposes set forth.

5. In a music-box, the combination, with an arm formed integral with or attached to the tune-changing device, of a pin-studded cylinder and its shaft, a pin or wedge projecting from said cylinder, a gear-wheel mounted on

said shaft with a block or plate, a toothed
cam-wheel pivoted to said gear-wheel and
provided with inclines, an arm engaging
therewith, and means, as described, for actu-
5 ating the instrument, substantially as and for
the purposes set forth.

In witness whereof I have hereunto set my

hand in the presence of two subscribing wit-
nesses.

HENRY A. GAUTSCH.

Witnesses:

GEO. W. REED,

THOMAS M. SMITH.