

(No Model.)

2 Sheets—Sheet 1.

G. M. PATTEN.

APPLICATION OF KEY BOARD MECHANISM TO MUSIC BOXES.

No. 247,849.

Patented Oct. 4, 1881.

Fig. 1.

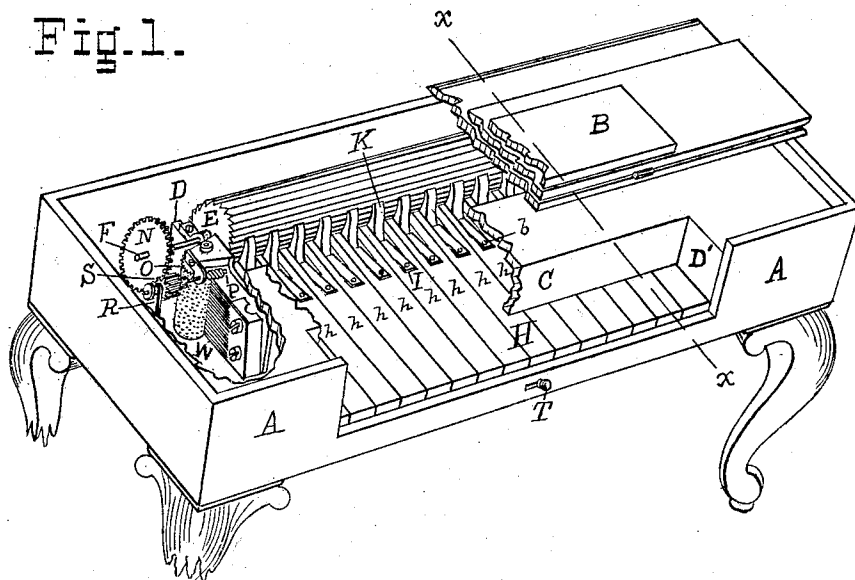


Fig. 2.

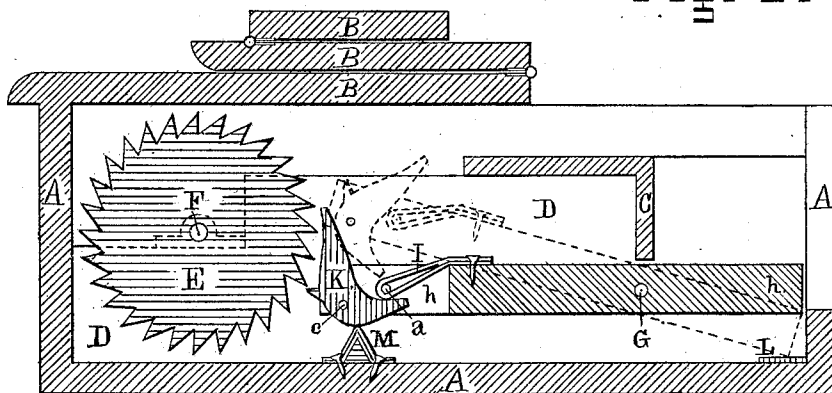
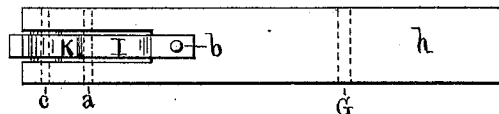


Fig. 3.



Witnesses.

S. H. Perrine
G. H. Rice

Inventor.

G. M. Patten

(No Model.)

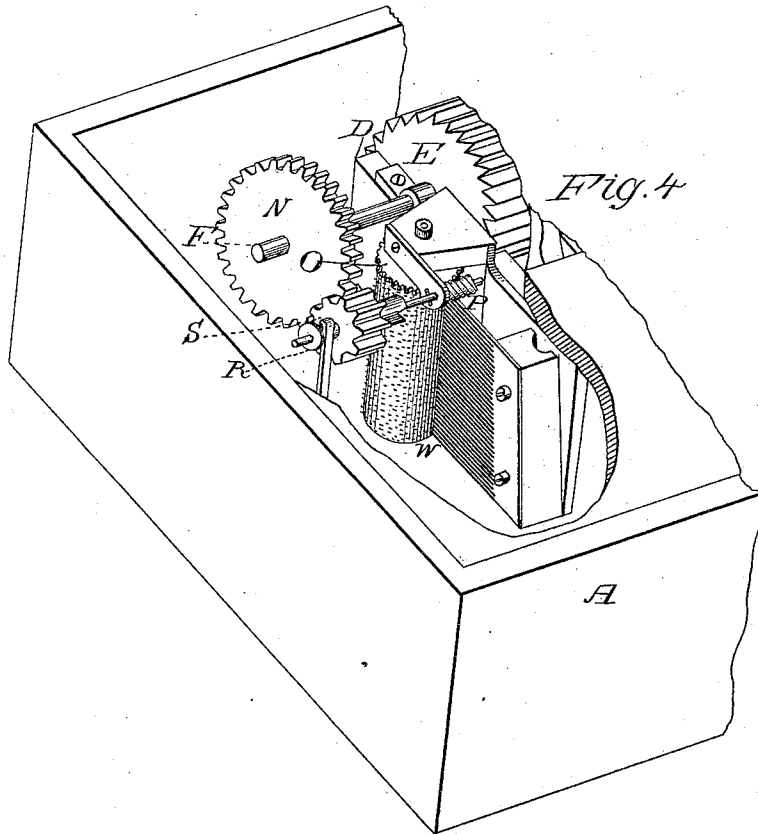
2 Sheets—Sheet 2.

G. M. PATTEN.

APPLICATION OF KEY BOARD MECHANISM TO MUSIC BOXES.

No. 247,849.

Patented Oct. 4, 1881.



Witnesses:

Cottenden J. Smith
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Geo M. Patten

UNITED STATES PATENT OFFICE.

GEORGE M. PATTEN, OF JERSEY CITY, NEW JERSEY.

APPLICATION OF KEY-BOARD MECHANISM TO MUSIC-BOXES.

SPECIFICATION forming part of Letters Patent No. 247,849, dated October 4, 1881.

Application filed January 26, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. PATTEN, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Mechanical Musical Instruments, of which the following is a specification.

My invention relates to mechanical musical instruments, and more particularly to that class of musical instruments which are designed for toys or for the use of children; and the object of my invention is to produce a mechanical musical instrument in similitude of a piano or other musical instrument having a key-board, upon which, by manipulation of the keys, any person can produce a tune or musical notes in harmony without regard to the order in which the keys are struck, and therefore not requiring either skill or a knowledge of music on the part of the performer.

I am aware that there are toys in similitude of the piano and such instruments now manufactured; but to produce a tune on them the performer must be skilled in the art, and other than skillful manipulation of the keys will produce only discords, while in my invention a discord cannot be produced, no matter how unskilled and ignorant the performer. I attain this object by mechanism illustrated in the accompanying drawings.

Figure 1 is a perspective view of my invention in the similitude of a miniature piano, with part of the case cut away and the cover folded back and also partly cut away, in order to show the mechanism. Fig. 2 is an enlarged cross-section of the same on the line *x x*, Fig. 1. Fig. 3 is a top view of one of the keys and its appurtenances. Fig. 4 is an enlarged view of the gearing connecting the ratcheted roller and the music-box mechanism.

Similar letters refer to similar parts throughout the several views.

The case *A* is formed to represent a piano-case with a folding cover, *B*. At each end of the key-board *H* cross-partitions *D D'* are placed, which serve as supports for the mechanism of the instrument. Between these partitions *D* and *D'*, and at the back part of the case, is hung a ratcheted roller, *E*, by means of fixed axles *F* at each end, which axles have a bearing on their respective partitions *D D'*, and

project beyond the same into the spaces between the partitions and the ends of the case *A*.

Extending through and between the partitions *D D'*, below the name-board *C*, is a rod, *G*, on which are pivoted the keys *h*. These keys extend back to near the ratcheted roller *E*, so that the line of their motion on the pivot *G* passes near but does not touch the roller *E*, and the preponderance of their weight is on that side of the pivot *G* nearest the roller *E*. The middle portion of each key *h* is cut away from top to bottom at the back end, leaving them forked, as shown in Fig. 3, for sufficient distance to place between the prongs the pawl *K* and buffer *I*, hereinafter described.

At the point *a*, Figs. 2 and 3, a pin is passed through the forks of the key *h*, and in the space between them a strip of felt, *I*, is passed around the pin, and both ends are fastened on top of the key at *b*, the felt to act as a noiseless buffer for the pawl *K*, which is hung between the jaws of the key *h* on the pivot *c*. Another felt buffer, *M*, presenting a narrow apex, is placed lengthwise on the bottom of the case, so that the keys *h* being in a horizontal position, the bottom of the pawls *K* rest thereon at a point a little nearer the front of the case than the pivot *c*, and the pawls and keys are thereby supported in the horizontal position, as shown in Fig. 2. Another buffer, *L*, is placed along the bottom of the case, at the front edge, so that the front end of the keys *h* shall strike noiselessly when depressed.

The pawl *K* is of a peculiar shape, projecting in three directions from the pivotal point. When at rest, as shown in the figures, a point projects in line of the key, beyond the jaws of the same, such a distance that the line of the arc of its motion on the pivot *c* would pass closely to, but not intersect, the line of the ratchet-points of the cylinder *E*; but as the key *h*, at rest in its horizontal position, as shown, is below the center of the cylinder *E* when the front end is depressed, and by that means the pawl is raised, these conditions would be changed, and the point of the pawl would engage in the ratchets of the cylinder *E*. Either the points of the pawls or the cylinder-ratchets are clothed with rubber or some other substance, which renders their contact nearly noiseless, and washers of some soft sub-

stance are placed on each side of the pawls K, around the pivot *c*, to prevent noise of rattling in the jaws of the key. Another portion of the pawl K is a projection toward the front of the key *h*, and is curved downward, so that a portion of it is slightly below the bottom line of the key *h*. The third extension is upward above the pivotal point *c*, and is mostly on the opposite side thereof from the curved extension, and is proportioned to act as a counter-balance thereto.

The operation of each key and its pawl is as follows: The front end of the key being depressed by the performer, the rear end rises and carries the pawl, which, being balanced on its pivot *c*, does not change its position with reference to the key, but the point thereof engages with the ratchet-cylinder E and revolves the same until, by reason of the different arcs in which the cylinder and the key move, the pawl becomes disengaged, and, its center of gravity in this raised position being in front of the pivot *c*, it turns thereon until the top portion of the same rests on the top of the buffer I. This position of the key and pawl are shown by dotted lines in Fig. 2. The key *h*, being released by the performer, returns to its horizontal position, and the pawl K is carried back without engaging the ratcheted cylinder. As the key nears its horizontal position the curved extension of the pawl K reaches the buffer *m*. Being of proper length and curve to strike the top of same, it passes over and returns the pawl K to its first position, ready for a repetition of the operation. As each key and its pawl act independently of all others, it will be seen that successive movements of one of the keys, or of different keys, will keep the ratcheted cylinder in continuous motion. A fly-wheel may be attached to the cylinder or its shafts, if desirable. On each of the axle-shafts F, between the partitions D D' and the ends of the case, is fixed a spur-wheel, N, and also in the same spaces, as will be more definitely stated hereinafter, the mechanism of one or more music-boxes, W, constructed in the ordinary way, excepting that the spring and train of gears or clock-work by which motive power is usually obtained and communicated to the barrel is omitted. At one end of

the barrel of the music-box is fixed a spur-wheel, O, which meshes with a worm, P, having bearings at right angles to the bed of the music-box mechanism.

On the extended shaft of the worm is placed a loose clutch-pinion, S, and the music-box mechanism is so located that this clutch-pinion S meshes into the spur-wheel N.

By means of a shifter, R, which is extended to a knob, T, in the front of the case, the clutch-pinion can be made to engage a pin in the shaft of the worm, and thus rotary motion of the ratcheted cylinder is transmitted to the barrel of the music-box mechanism and music produced.

The number of musical mechanisms may be diminished or increased, and may be located and geared in a different manner; and the relative sizes of the transmitting-gears may be varied, so that a uniform movement of the cylinder E will give proper time to the musical mechanism.

Other devices may be used for converting the lever-movement of the ordinary key of a musical instrument into rotary motion and transmitting it to the barrel of the music-box system, or for operating by means of the keys any automatic action for producing music, and I do not confine my invention to this particular or specific construction as described, or to the employment of the music-box system only; but,

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a musical key-board and the mechanism of the ordinary music-box, substantially as and for the purposes described.

2. The combination of the key-board, pawls, ratcheted roller, transmitting-gears, and music-box mechanism, all substantially as and for the purposes described.

3. In a musical instrument, the combination of the key-board, pawls, and ratcheted roller, substantially as and for the purposes described.

G. M. PATTEN.

Witnesses:

C. J. SMITH,

E. C. BIGELOW.