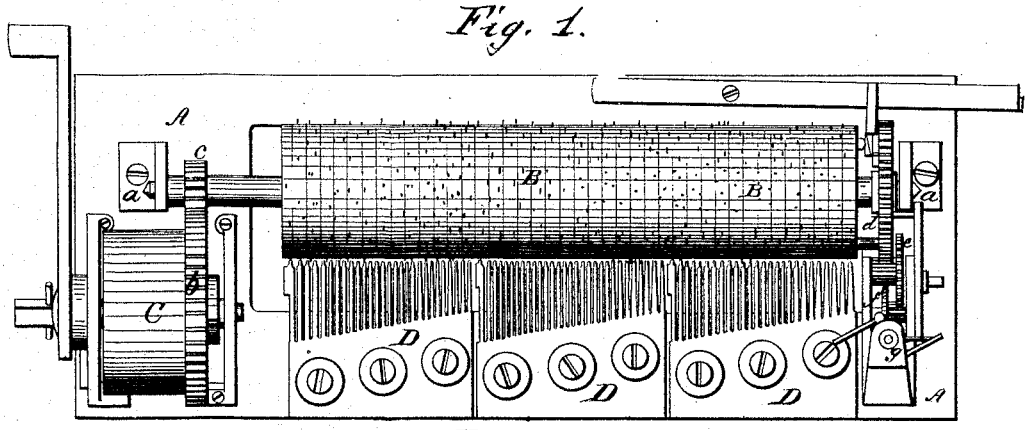
2 Sheets--Sheet 1.

C. PAILLARD.

Music-Box.

No. 161,055. Patented March 23, 1875.

Fig. 1.



PLAN.

WITNESSES.

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2 Sheets--Sheet 2.

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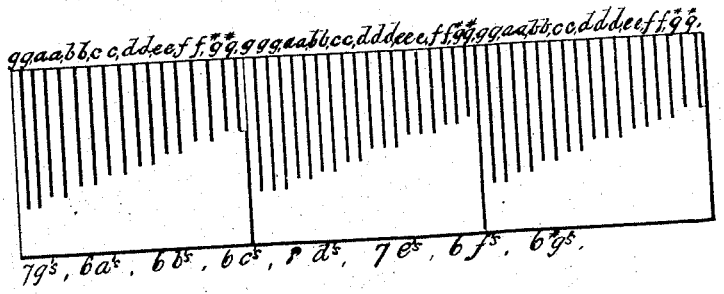
Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES PAILLARD, OF ST. CROIX, SWITZERLAND.

IMPROVEMENT IN MUSIC-BOXES.

Specification forming part of Letters Patent No. **161,055**, dated March 23, 1875; application filed November 19, 1874.

To all whom it may concern:

Be it known that I, CHARLES PAILLARD, of St. Croix, Canton de Vaud, Switzerland, have invented certain Improvements in Musical Boxes, of which the following is a specification:

My invention relates to musical boxes, in which the music is produced by the action of a pin-studded cylinder on metal prongs arranged in a graduated scale and known collectively as a comb.

Prior to my invention, so far as known to me, musical boxes were furnished with but one comb, and but a feeble and metallic sound was obtained, while, if more volume of sound was desired, larger and more numerous prongs or vibrators were used, thus diminishing the pitch and lengthening the duration of vibration, the effect of which was to cause interference of the vibrations or sound-waves, and destroy the harmony and produce discord; and thus this system presented many imperfections regarding clearness, tone, harmony, and expression.

My invention is designed to remedy these imperfections; and consists in combining, with a revolving music-cylinder, two or more combs, the similar notes or vibrators of which are of similar pitch or nearly so, or in combining with the said cylinder two or more series of scales on one comb-plate, the similar notes in all of which are of one pitch, or nearly so, as will be fully hereafter set forth.

Figure 1 represents a plan view of my improvement in musical boxes. Fig. 2 is a diagram illustrating the arrangement of the notes in the combs.

A is the frame or bed-plate, to which the other parts of the instrument are secured; B, the cylinder, having its bearings at *a a;* C, the box inclosing the motive-spring; *b c*, the gears for revolving the cylinder, and *d e f g* the mechanism for regulating and controlling the motion of the cylinder. D D D are the combs on which the notes on the cylinder act to produce music. These combs may be formed on one plate, or may be in separate sections. There being more than one comb to each cylinder, shorter prongs or vibrators can be used, consequently producing vibrations of less duration, and the said prongs not vibrating beyond measure, do not produce that confusion and indistinctness in the melody and in the harmonic accompaniments which were always noticeable in musical boxes prior to my invention, and especially in those where numerous prongs were used.

In musical boxes the scale of notes differs from that in the piano, as only the notes necessary to render the pieces the box is intended to play are embodied in the scale, and as the vibration of the prong prevents its being operated upon by the note or pin projecting from the cylinder, it often occurs that two or more similar notes are embodied in one scale, to be repeatedly quickly, one after another, as occasion may require.

In arranging the notes of similar pitch I distribute them as evenly as circumstances will admit among the several scales. Where the number of scales is an exact divisor of the total number of similar notes each scale has a similar number of such notes, but where this is not the case one scale will have less than the others. This will be readily understood by reference to Fig. 2 of the drawings. This renders the scales as nearly similar to each other as possible.

In tuning the prongs of the sundry combs of the same tone I introduce a very slight dissonance, and the fact of this dissonance, and the prongs of same sound being separated, produces a more powerful and harmonious sound than could be produced by the old system in musical boxes.

If the object of the box is to produce a more powerful and harmonious tone than that of other musical boxes, it is only necessary to let the same air be played completely by two or more combs; but if I wish to produce the different shades of musical expression, such as the "pianos," the "crescendos," the "fortes," the "decrescendos," &c., I let one or more combs play at a time, according to the effect I wish to produce.

It must be understood, also, that in some compositions only parts are played on each comb—that is, the piece is divided among the different combs, each playing certain notes. In this performance the great power of expression of the improvement is displayed, it being in musical boxes what touch is in piano

performance, as by it the power of any separate note may be increased or diminished, and all the effect of the pedal in the piano produced.

I am aware of musical boxes having two combs, one large and another smaller. The prongs of the latter comb are weakened considerably in order to play the soft parts; but only two shades of expression can be introduced—the fortes and the pianos—and in a very different way from that observed in my invention where none of the combs are weakened, and where the expression is obtained by the use of one or more prongs of the same sound in the different combs.

I am also aware that in many large musical boxes the comb is made in two sections, one section containing the high, and the other the low, notes, thus in reality forming but one scale.

The arrangement of the music on the cylinder will, of course, be in sections to correspond to the combs and to render the different shades of expression. Thus, when a part is piano, the cylinder will act on one comb, when crescendo, on two, and when forte, on all three at once, producing a striking effect, and one which it is impossible to produce on the ordinary musical box, in which the nearest approach to it would be playing on octaves, the defect of which has already been alluded to.

I claim—

1. In a musical box, two or more scales of vibrators, the similar notes in all of which are of one and the same pitch, or nearly so, substantially as described and specified.

2. The combination, with the cylinder B, of the series of combs D, the similar notes in all of which are of one and the same pitch, constructed and arranged to operate substantially in the manner described and specified.

CHARLES PAILLARD.

Witnesses:

CONSTANT JACCARD,
GEORGES BORNAND.