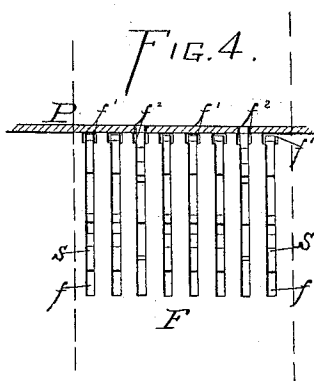
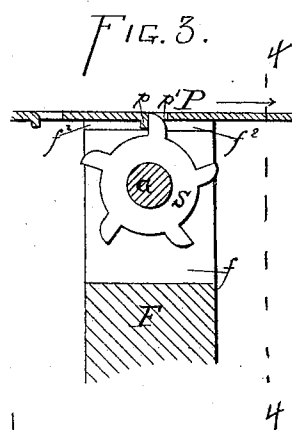
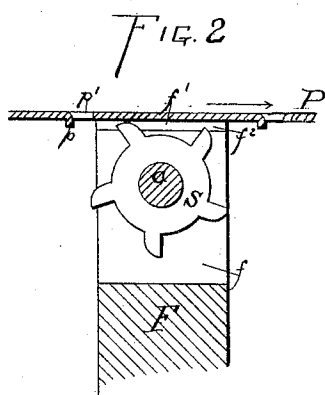
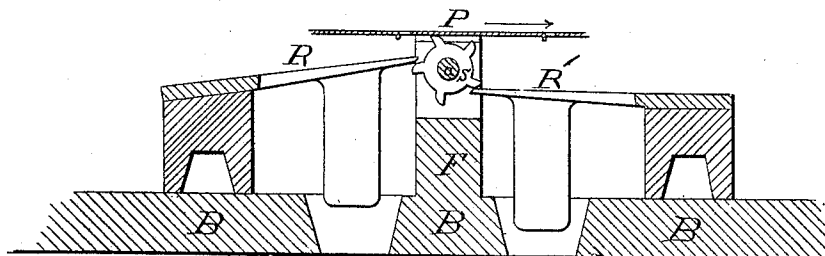


(No Model.)

J. BORNAND.  
MUSIC BOX.

No. 574,299.

FIG. 1. Patented Dec. 29, 1896.



WITNESSES:

S. C. Connor

Geo. C. Abbe

INVENTOR

Joseph Bornand

BY

Horison and Horison  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

JOSEPH BORNAND, OF NEW YORK, N. Y.

## MUSIC-BOX.

SPECIFICATION forming part of Letters Patent No. 574,299, dated December 29, 1896.

Application filed May 22, 1896. Serial No. 592,618. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH BORNAND, a citizen of the Republic of Switzerland, and a resident of New York city, New York, have  
5 invented Improvements in Music-Boxes, of which the following is a specification.

In music-boxes of that class in which the musical tongues of the comb or reed are vibrated to give the notes by means of star-wheels operated by traveling tune-sheets there have been two ways of constructing and arranging the sheets in relation to the star-wheels. In one case sufficiently deep or long  
10 projections have been formed on the under side of the sheet to permit the rotation of the star-wheels upon fixed axes without coming into contact with the main body of the sheet; but such long projections are apt to get  
15 broken. To meet this difficulty it has been common to perforate the tune-sheets, allowing the teeth of the star-wheels to enter the perforations, but in such case it has been necessary to allow a vertical motion to the star-wheels to permit the imperforate part of the  
20 tune-sheet to conveniently pass over the wheels; but this increases the cost of construction and renders the operation of the music-box unreliable. To meet these difficulties, I mount the star-wheels on fixed axes  
25 and construct the tune-sheets with short projections and adjacent perforations and so construct the bearing-piece for the star-wheels that the tune-sheet will be supported at such a distance from the axes of the star-wheel  
30 that the unperforated parts of the sheet can pass over the star-wheels, while the appropriate tooth of any wheel will be caught by the short projection, and as that wheel is thus turned the tooth will pass up into the perforation adjacent to the said projection.  
40

In the accompanying drawings, Figure 1 is a vertical section of the main parts of a music-box embodying my invention. Figs. 2 and 3 are sectional views, drawn to an enlarged  
45 scale, showing a star-wheel and tune-sheet in two different positions and their relation to the bearing-piece. Fig. 4 is a sectional view on the line 4 4, Fig. 3.

My invention may be applied to music-boxes employing one or more sets of reeds or combs. In Fig. 1 I have shown, by way of  
50 example, two sets of reeds R and R', mounted

in any suitable way upon the base B and having between them the bearing-piece F, which carries the star-wheels S to act upon the  
55 tongues of the reeds. These star-wheels are mounted upon fixed axes *a* in slits, Figs. 2, 3, and 4, in the bearing-piece F. A single rod may serve as the axis for each row of star-wheels. Those parts of the bearing-piece F  
60 which lie between the several star-wheel slits, Fig. 4, extend to such a point as to constitute bearing-ribs *f'* for the imperforate parts of the tune-sheet P. When a star-wheel is in the position of inaction, Fig. 2, the teeth of  
65 the star-wheel do not extend beyond the bearing-face of the piece F; but as the wheel is turned the uppermost tooth will in its movement from one position of rest to the next extend beyond the said bearing-face, as shown  
70 in Fig. 3.

I prefer to mill out the star-wheel slits at the bearing-face of the piece F, so as to produce grooves *f*<sup>2</sup>, each a trifle wider than the  
75 slit, or, in other words, than the thickness of the star-wheel. On the tune-sheet I form a short tooth or projection *p*, adjacent to a perforation *p'*, Figs. 2 and 3, wherever a star-wheel is to be turned to strike a reed-tongue to produce a note. These projections *p* and  
80 perforations *p'* may be formed or produced in any suitable way. A convenient method will be to bend the projection *p* up out of the metal of the sheet at the same time that the perforation *p'* is cut, as the drawings indicate, but I do not wish to confine myself as to  
85 this.

Assuming that the teeth of the star-wheels are made only of about such a length as the proper action of the tune-sheet thereon requires, the projections *p* will extend from the  
90 under face of the tune-sheet and into the grooves *f*<sup>2</sup> about half the length of a star-wheel tooth, while the other half of the tooth will project into and through the perforation  
95 *p'* as the moving tune-sheet rotates the star-wheel, as shown in Fig. 3. The projection *p* is sufficiently long to catch the tooth of the wheel as the part of the tune-sheet moving in the direction of the arrow, Fig. 2, comes  
100 up to the wheel, yet the projection is sufficiently short to prevent its being broken off, more especially as a part of the thrust is within the plane of the body of the sheet. As the

latter bears upon and is supported by the bearing-piece F and the projections  $p$  are guided in the grooves  $f^2$ , in which the upper teeth of the appropriate star-wheels lie, and  
5 as the axes of those wheels do not have any rising or falling movement, it will be evident that I have a construction which is not only simple, but is strong and not liable to get out of order.

10 I claim as my invention—

1. A music-box having a comb and star-wheels in combination with a traveling tune-sheet and a bearing-piece having its bearing-face for the tune-sheet extending beyond the  
15 teeth of the star-wheels when the latter are in their positions of rest, substantially as described.

2. A music-box having a comb and star-wheels in combination with a traveling tune-sheet having short projections and adjacent  
20

perforations and a bearing-piece having its bearing-face for the tune-sheet extending beyond the teeth of the star-wheels when the latter are in their positions of rest, but the teeth of the star-wheels extending beyond  
25 the said bearing-face as the wheels are turned, substantially as described.

3. A music-box having a comb and star-wheels in combination with a traveling tune-sheet having projections, and a bearing-face  
30 for the tune-sheet and grooves  $f^2$  into which said projections of the tune-sheet pass, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of  
35 two subscribing witnesses.

JOSEPH BORNAND.

Witnesses:

CHARLES H. FULLER,  
HUBERT HOWSON.