(Model.)

C. C. REYNOLDS.

DEVICE FOR MECHANICALLY OPERATING MUSICAL INSTRUMENTS.

No. 249,482. Patented Nov. 15, 1881.

Fig. 1.

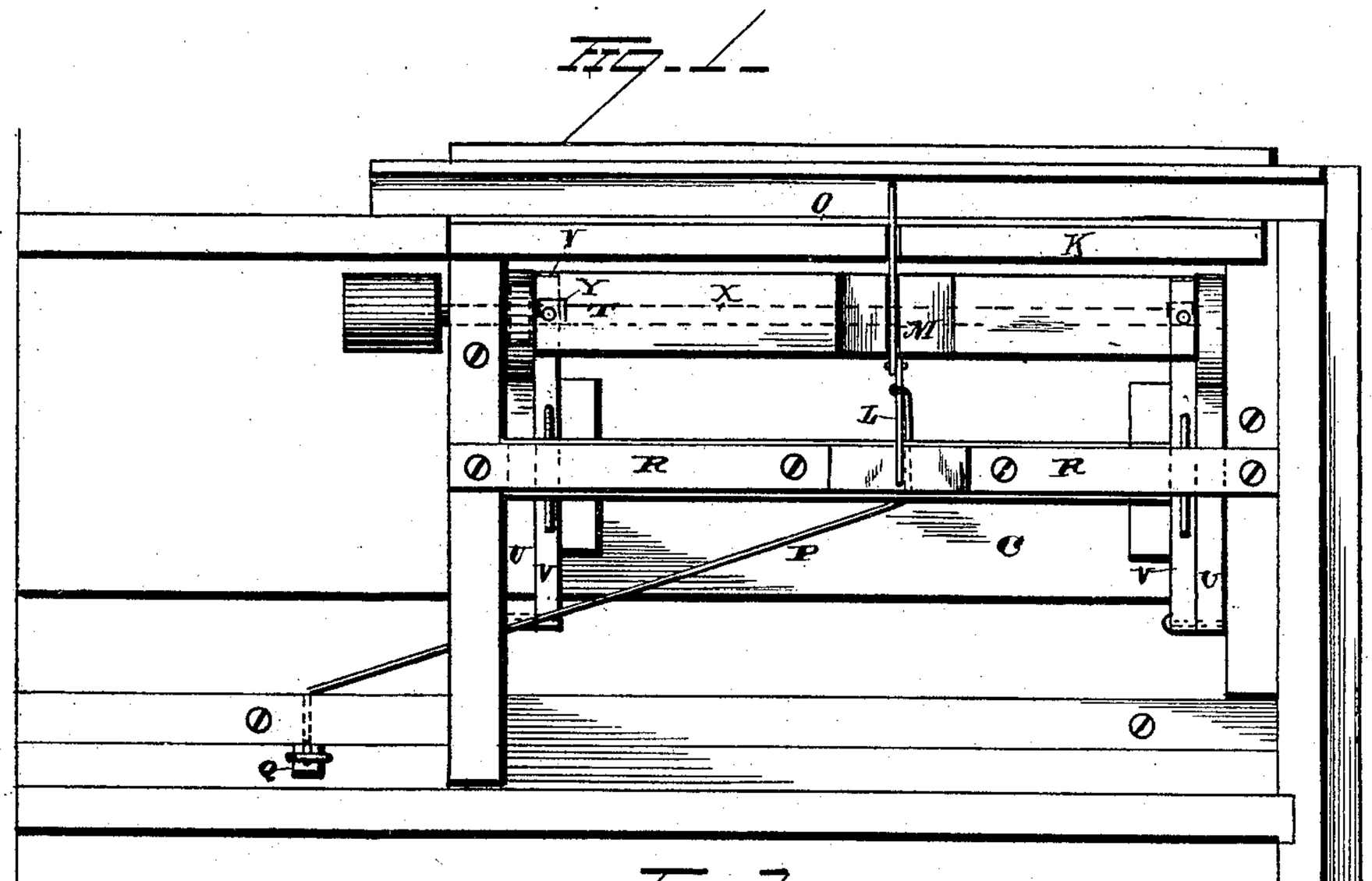


Fig. 2.

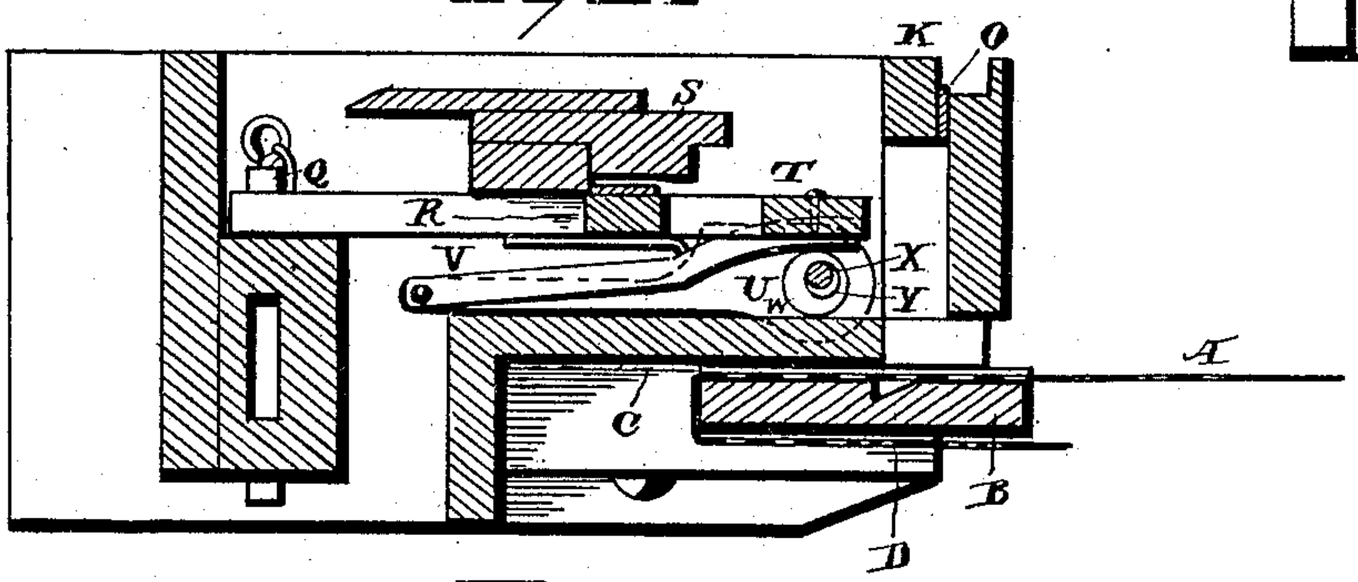
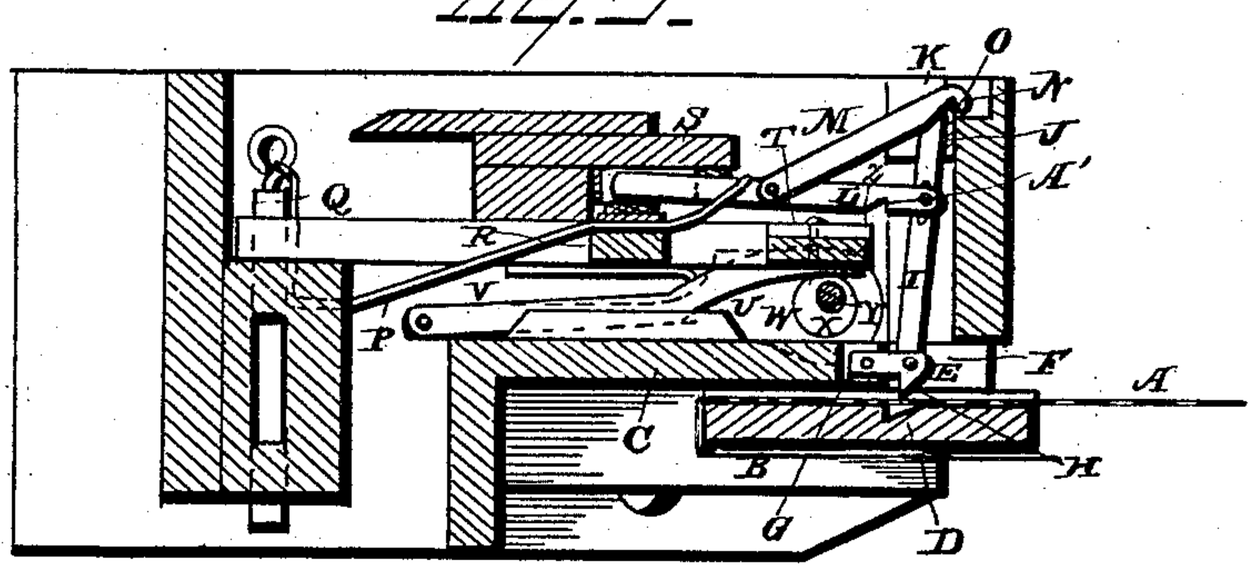


Fig. 3.



WITNESSES

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DEVICE FOR MECHANICALLY OPERATING MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 249,482, dated November 15, 1881.

Application filed August 16, 1881. (Model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER C. REYNOLDS, of Kelseyville, in the county of Lake and State of California, have invented certain new and useful Improvements in Devices for Mechanically Operating Musical Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to devices for mechanically operating musical instruments by means of perforated traveling sheets of music, the object being to provide mechanism adapted to accomplish such a result, which will combine simplicity of construction and ease of operation with durability in use.

With these ends in view my invention consists in certain details of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a key-board attachment embodying my improved action. Fig. 2 is a view in vertical cross-section, showing one of the eccentrics and its strap; and Fig. 3 is a similar view, showing one of the lever systems.

A represents a music-sheet provided with a series of perforations, each of which represents a note upon a music-scale. The said sheet is wound upon suitable rolls adapted to be actuated to move it, by hand, foot, or any other desirable motive force, slowly over a table, B, located beneath the transverse bar C, to which the lever systems are attached, and provided with a groove, D, into which the pawls E of the lower levers, F, of the lever systems fall when they pass through the perforations in the music-sheet. The lever systems aforesaid, which will vary in number according to the scope of the instrument to be operated, are located closely adjacent to each other, the lower lever, F, of each system having its inner end pivoted in a vertical slot, G, formed in the transverse bar C. The outer ends of the said levers F are provided each with a depending pawl, E, having an inclined face, H, which engages with one end of the perforation in the music-sheet, into which the pawl E has fallen, to raise the lever of which it is a part therefrom. Upright levers I, pivoted near the outer ends of the levers F, are supported in vertical adjustment in slots J, formed in the inner face of the front frame-piece, K. Notched horizontal levers L have their outer ends pivotally secured to the said upright lever I, and in turn support the retaining-levers M, the upper ends of which are notched, as at N, to engage in proper season with the upper edge of a plate, O, located in the front frame-piece, K.

Cords or wires P, attached to the rear ends of the horizontal levers L, are adapted to operate a series of fingers, Q, which rest upon the keys of the instrument, and which descend to depress them when the cords or wires are drawn taut. The rear ends of the horizontal levers rest upon a bridge, R, through which the cords or wires P are inserted before their attachment to the levers L. In many cases several bridges, or devices equivalent to them, will doubtless be necessary to guide the cords or wires aright. The levers L are held in upright position in vertical slots formed in the under face of a frame piece, S, located over the bridge R.

We come now to the consideration of an important feature of my invention, which consists of a horizontal bar, T, located at right angles to and under the forward ends of the levers L, the said bar being adapted to have a fourfold oscillatory motion imparted to it by means of eccentric-straps U, to the rear ends of which bars V, supporting the said bar T, are pivotally secured. The eccentrics W, which actuate the straps U, bars V, and bar T, are secured to a shaft, X, actuated preferably through connection with the motive power which operates the driving-rolls before alluded to. The said shaft is also provided with lugs Y, made integral with or secured to it, which serve, by impinging on the forward ends of the bars V as they rise with the revolution of the shaft X, to impart a greater eccentricity to the motion of the bar T than is obtained by the eccentrics W alone, the first and second, or the upward and forward, motion of bar T being augmented. The forward upper edge, Z, of the said bar T is adapted to engage with notches A′, formed

in the under faces of each of the horizontal levers L when any one of them is depressed, which will occur when one of the pawls E, forming a part of the lever F, falls into a perforation on the music-sheet A.

Having thus described my invention, I will now proceed to briefly set forth its method of operation.

Let it first be supposed that a perforated music-sheet is slowly moving over the table B, and also that the bar T is performing its fourfold motion, both the music-sheet and bar being actuated by the same motive force. When, now, the music-sheet brings any one of its perforations under the lever F of one of the lever systems, the pawl of the said lever will fall into the perforation, and in so doing lower the horizontal bar L. The bar T is arranged to rise at this moment and engage its outer edge, Z, with the notch A′ of the said lever. The forward motion of the bar will now draw taut the cord or wire P, and depress the key and sound the note. The third or downward movement of the bar T performs the twofold function of releasing its engagement with the notch A′ of the lever L, and of engaging the notched upper end of the retaining-lever M with the plate O, by means of which the said lever L is held in position to keep the cord or wire P taut until the music-sheet has traveled through a space equal to the length of the perforation into which the pawl E of lever F has fallen. At this point the rear edge of the perforation will engage with the inclined edge H of the pawl and raise it, together with the lever T and the other levers of the same system, disengaging the lever M and allowing the lever L to be drawn back, thus loosening the cord or wire P and relieving that note of the instrument which it sounds. Three movements of the bar T have now taken place and a note sounded. The fourth movement consists merely in returning the bar to its starting-point.

The above description of the operation of the device in sounding one note will suffice to explain the manner in which the others are operated. The bar T is, of course, adapted to operate the whole number of notes, and will, according to the tune being played, operate one or more at the same time.

One of the important advantages obtained by my invention is that from the moment the lever L engages with the said bar T all of the strain incident to the sounding of the note on the instrument is shifted from the music-sheet to the power actuating it, for it has already been mentioned that the power which actuates the eccentrics, and hence the bar T, is derived from the same source.

My improved device for mechanically playing musical instruments may be embodied in a key-board attachment, as shown and described; or, if desired, it may be located either removably or permanently within the instrument itself. It is also adapted to be used with either stringed or wind instruments.

It is apparent that in adapting my invention to different instruments many immaterial changes and alterations must necessarily be made. I would therefore have it understood that I do not limit myself to the exact construction and arrangement of parts as shown, but hold myself at liberty to make such slight changes as fairly fall within the spirit and scope of my invention.

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

1. In a device for mechanically operating musical instruments, the combination, with a connected system of levers, of a perforated traveling music-sheet located below them, and a bar adapted to amplify the motion imparted to the levers by the music-sheet, substantially as set forth.

2. In a device for mechanically-operating musical instruments, the combination, with a gravity-actuated system of levers, of a perforated traveling music-sheet located below said lever system, a bar, and means for causing the said bar to amplify the motion imparted to the levers by the music-sheet, substantially as set forth.

3. In a device for mechanically operating musical instruments, the combination, with a perforated traveling music-sheet, of a connected system of levers, one being adapted to engage with the perforations in the music-sheet, another to sound a note, and another to prolong the sounding thereof, of a bar located under the lever adapted to sound the note, and means for causing said bar to rise and engage with it, to carry it forward and sound the note connected with it, to fall from it, and to engage the note-prolonging lever with a catch, and to return to its original position, substantially as set forth.

4. In a device for mechanically operating musical instruments, the combination, with a perforated traveling music-sheet, of a connected system of levers, one being adapted to be actuated by the said sheet and another to sound a note on the instrument, of a bar located beneath the said latter lever, which it actuates by means of an upward, forward, downward, and return motion imparted to it by eccentrics located on a shaft and revolving within straps to which the bar is secured, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

CHRISTOPHER C. REYNOLDS.

Witnesses:
C. McMATH,
WM. C. MURDOCH.