H. B. HORTON.

Automatic Musical Instrument.

No. 196,529 Patented Oct. 30, 1877.

Fig. 1.

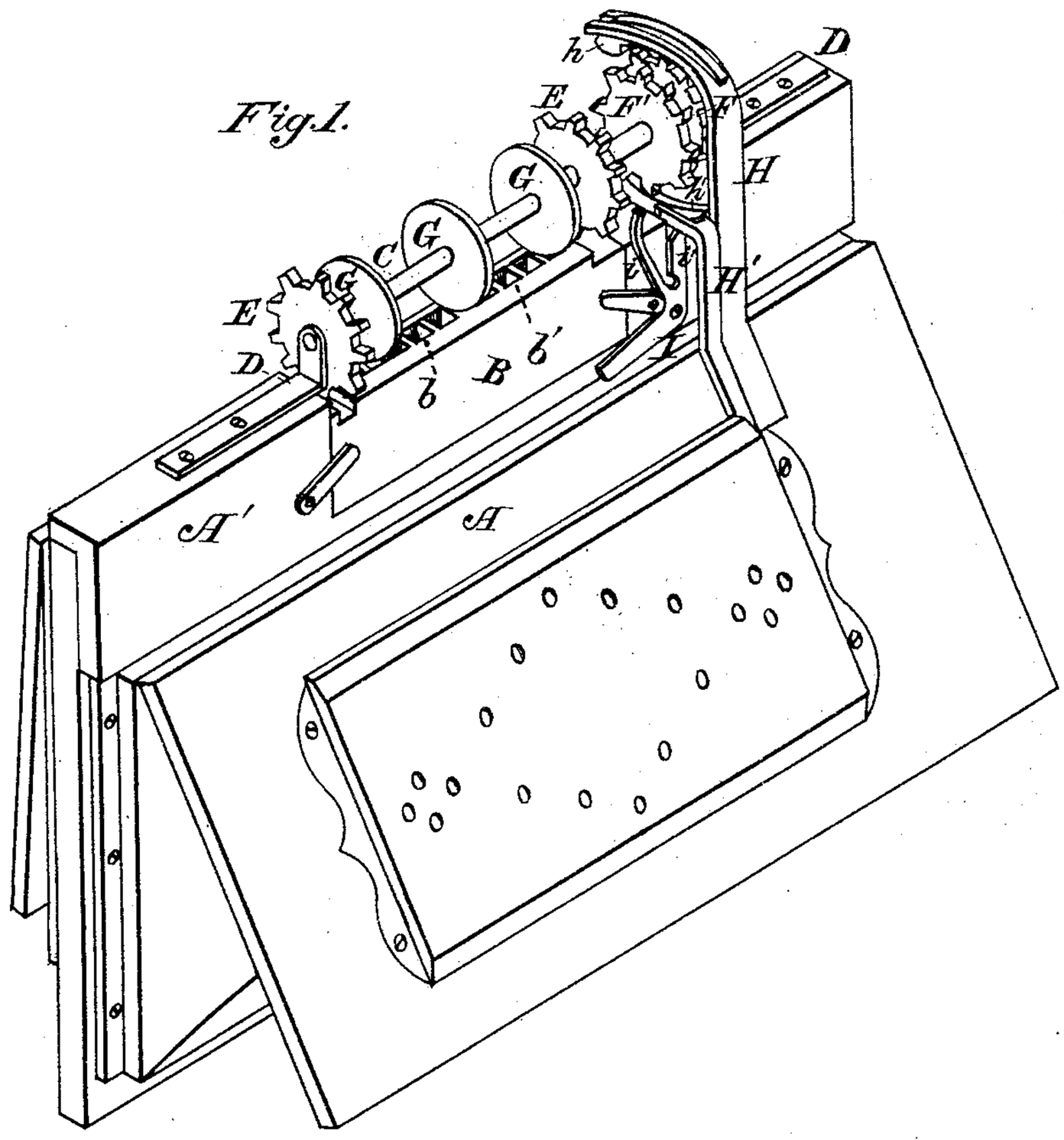
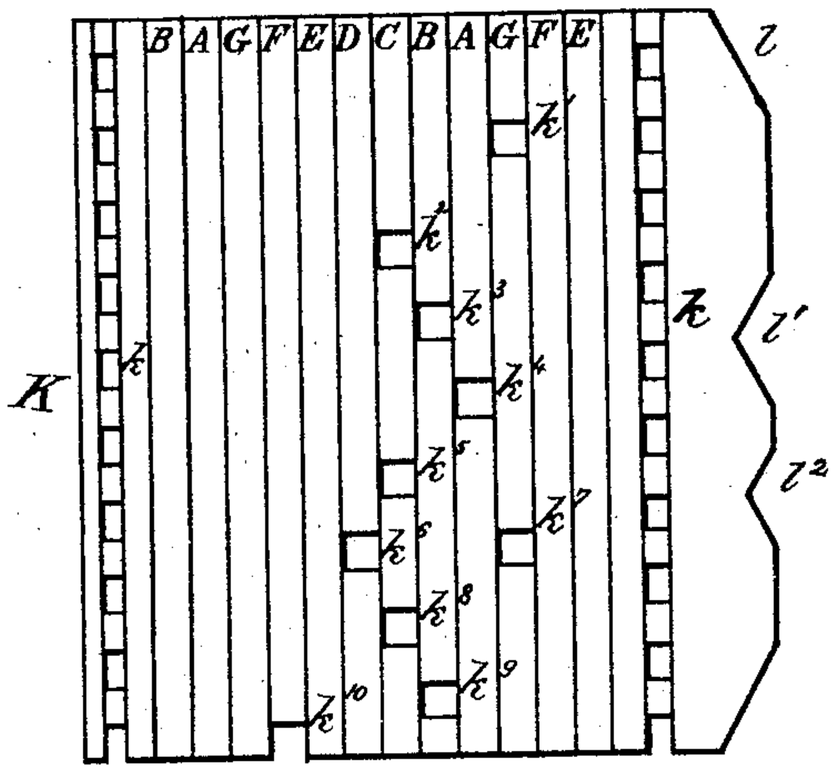


Fig 2.



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UNITED STATES PATENT OFFICE.

HENRY B. HORTON, OF ITHACA, NEW YORK.

IMPROVEMENT IN AUTOMATIC MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **196,529**, dated October 30, 1877; application filed April 3, 1877.

To all whom it may concern:

Be it known that I, HENRY B. HORTON, of Ithaca, in the county of Tompkins and State of New York, have invented a new and useful Improvement in Wind Musical Instruments, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a perspective representation of an instrument of the accordion class embracing my improvement. Fig. 2 is a plan view of a perforated strip, which I term the "valve" or "valve-sheet," forming a part of my invention, and used in connection with the instrument.

My invention is specially applicable to wind-instruments having pipes or reeds, such as are usually operated by keys and supplied with air by a bellows, and its object is to enable tunes to be played by persons unacquainted with music, and to assist learners in acquiring a knowledge of musical notes; and my invention consists in the construction hereinafter described.

In the drawings, A represents the wind-chest or bellows; B, the reed-board, containing reeds and cells *b b′*, &c., of different pitch, for producing the various musical notes. To the part A′ standards D D are attached, having bearings which receive the ends of shaft C. This shaft can be rotated at a greater or less speed, in the manner hereinafter described.

Several reed-boards, B, of varying compass, may be provided for the instrument, giving it a more extensive range.

Fixed on the shaft are two spur-wheels, E E, which engage the valve-sheet K and move it forward, and two others, F F′, which cause the shaft to rotate; also, the plain disks G G G, which press the valve-sheet down and hold it in close contact with the top of the reed-board. H H′ are bent arms connected with or attached to the bellows B, and carrying clicks *h h′*, which engage with the wheels F F′, to cause the rotation of the shaft C.

I is a bent lever, having free movement on a pivot at its elbow, and provided with an intermediate arm, *i*, which is pressed against by the edge of the valve-sheet K, and serves to throw the click *h′* out of contact with the teeth of wheel F′. There may be more than one of these accelerating-wheels F′ and accompanying bent levers I.

The valve-sheet K is made of card-board or other suitable thin material. It has on each side a row of equidistant perforations, *k k*, to receive the teeth of the wheels E E when it is applied to the instrument, the two working after the manner of a rack and pinion.

Other perforations, k^1 k^2, &c., of equal width with the mouths of the pipes, are made at suitable intervals and in proper places longitudinally of the valve-sheet, and in line with the pipes, for the purpose of allowing the air expelled by the bellows to issue from each pipe at proper times, and cause it to produce its appropriate note. These openings may be made of various lengths, so as to govern the duration of the note, making a semibreve, crotchet, quaver, &c., as may be required. That portion of the valve-sheet not thus cut away, being pressed firmly down by the disks G G G, closes the mouths of all the pipes except the one which may be immediately under one of the openings, and prevents air from escaping from them; consequently they emit no sound. A separate valve-sheet is provided for each tune. The number, length, and position of the openings k^1 k^2, &c., in each correspond to those of the notes in the tune, which are sounded successively as each opening comes over the proper reed-cell.

The edge of the sheet has indentations *l l′*, &c., at those places where a more than ordinarily rapid succession of the notes is required, and in pieces demanding a quick movement it may be made narrower throughout its length, so that the click *h′* may constantly engage the wheel F′.

When it is desired to perform a tune, the appropriate valve-sheet is placed over the reed-board B, so that the perforations *k k* at the edges of the sheet may be engaged by the teeth of the wheels E E. Working the bellows A reciprocates the arms H H′, causing the click *h* to successively engage the teeth of the wheel F, rotating the shaft C, and advancing the valve-sheet K. Each of the openings k^1 k^2, &c., is thus brought in its due order over the corresponding reed-cell b^1 b^2, &c., permitting the escape of air therefrom, and the note is sounded. Where the valve-sheet K is of full

width, its edge, pressing against the middle arm *i* of the bent lever I, presses that lever back, and the click *h'* does not engage the wheel F'; but where the edge of the sheet is cut away, the horizontal arm of the lever falling by gravity, the upper edge of the vertical arm *i'* is brought into contact with the under side of the click *h'*, throwing it up, so that it engages with the wheel F', which then acts alternately with the wheel F, imparting more rapid rotation to the shaft C, and, by accelerating the motion of the valve-sheet, quickens the movement of the piece.

Though I have only represented my invention as applied to an accordion, yet it is obvious that it is applicable to instruments in general having a plurality of pipes, tubes, or reeds, and that the devices shown may be modified in various particulars without departing from the essential features of the invention. For example, in certain cases a pedal or treadle might be used to operate the devices which move the valve-strip, or the same might be actuated by automatic mechanism. The arrangement of the click-bearing arms, clicks, spur-wheels, and disks, or substitutes therefor, may also be variously modified.

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

1. The valve-sheet K, constructed upon one or both sides with lateral indentations *l l'*, &c., to give a quick movement to the music, substantially as described.

2. The valve-sheet K, constructed with apertures *k k*, note-apertures k^1 k^2, &c., and lateral indentations *l l'*, &c., substantially as and for the purposes described.

3. In combination with the valve-sheet K, constructed with apertures *k k*, the cog-wheels E E and disks G G, mounted on shaft C, for holding the valve-sheet down in place and advancing it over the pipes, substantially as described.

4. In combination with the cog-wheels E E, the ratchet-wheels F F' and clicks *h h'*, for operating the valve-propelling mechanism and giving a quick movement thereto, substantially as described.

5. In combination with the bellows A, the arms H H', secured thereto and operated thereby, and provided with clicks *h h'*, substantially as and for the purposes described.

6. In combination with arm H' and click *h'*, the bent lever I, substantially as and for the purposes described.

7. The combination and arrangement of arm H', click *h'*, bent lever I, and wheel F', for giving a quick or alternate movement with the wheel F to the valve-sheet, substantially as described.

8. The combination and arrangement of the arms H H', clicks *h h'*, bent lever I, shaft C, wheels E E F F', and disks G G G, substantially as shown and described, and for the purposes specified.

9. In combination with the wind-chest or bellows A A', the reed-board B', made readily detachable from the body of the instrument, substantially as and for the purposes described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY B. HORTON.

Witnesses:

CHS. G. DAY,

WM. J. TOTTEN.