

No. 666,834.

Patented Jan. 29, 1901.

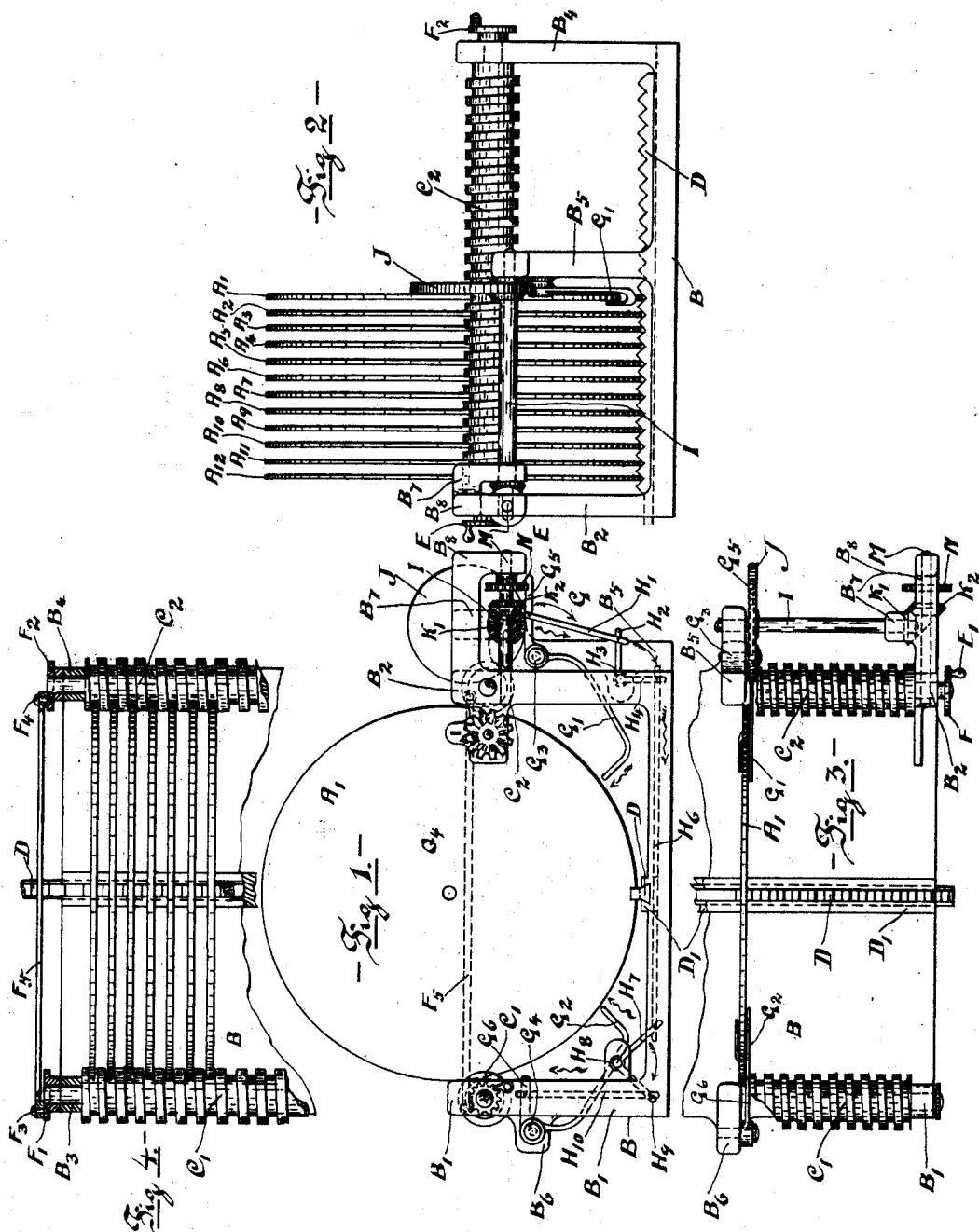
J. WELLNER.

MECHANICAL MUSICAL INSTRUMENT.

(Application filed Aug. 26, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses—

Alfred B. Van Liew

Charles W. Brower

Inventor—  
Julius Wellner  
—by his Attorney—  
August M. Treschner

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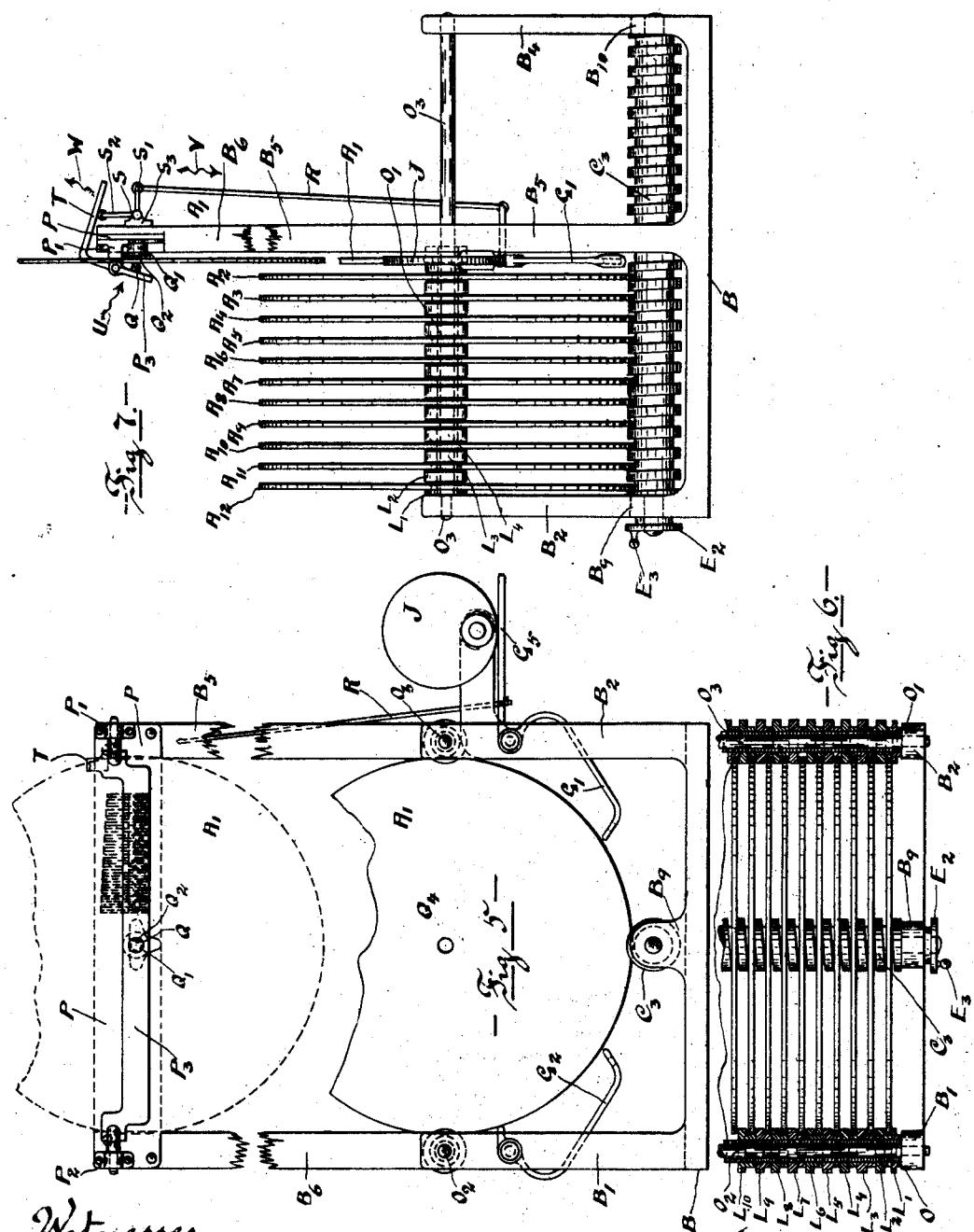
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Witnesses

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# UNITED STATES PATENT OFFICE.

JULIUS WELLNER, OF JERSEY CITY, NEW JERSEY.

## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 666,834, dated January 29, 1901.

Application filed August 26, 1899. Serial No. 728,582. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS WELLNER, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Mechanical 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

15 My invention relates to the means of feeding the toothed disk, technically known as the "tune-sheet," into the operative position it occupies in front of the comb in a mechanical musical instrument. Inasmuch as my 20 feeding device is a distinct and separate mechanism capable of being explained and understood without reference to any of the other parts included in the construction of a mechanical musical instrument and, further, as 25 mechanical musical instruments are as well known in the art as they are and have been made the subject of Letters Patent at various times, I shall omit any description of such parts, confining myself to the elements that 30 form my mechanism.

The object of my invention has been to furnish means, first, to convey the tune-sheets to a certain specified point, and, secondly, to elevate them from that point into operative 35 connection with the comb. The most important thing to be secured in this part of mechanical musical instruments is a mechanically simple, frictionless, easily-controlled, and manipulated means for bringing any desired tune-sheet of the series contained in the 40 instrument into operative connection with the comb. Various mechanisms have from time to time been devised covering this mode of operation, but none to my knowledge containing so few elements and operated and constructed so simply as the mechanism herein 45 described.

In describing my invention I shall call attention to the accompanying drawings, where 50 like letters of reference indicate corresponding parts in the different views.

Figure 1 is a front view of my improved

feeding mechanism having a tune-sheet supported therein ready for elevation to the comb. Fig. 2 is a side view of the mechanism as shown in Fig. 1, illustrating tune-sheets to the number of twelve arranged in regular rotation, the one marked A' being in a line with the elevating-levers. Fig. 3 is a top view of the front part of the mechanism 55 broken off toward the center line, showing tune-sheet A' lying in the elevating-levers. Fig. 4 is a top view of the rear part, showing part of the tune-sheets as they have been used in succession. Fig. 5 is a front view 60 taken from the same point of view as Fig. 1, showing a modification of my screw conveying means and also showing means for attaching the tune-sheet after being raised by means of the levers into the position shown 65 in dotted lines. Fig. 6 is a top view of the front part of the mechanism as seen in Fig. 5, broken off toward the center, and more particularly showing the action of the single screw and the sliding guides at the side; and 70 Fig. 7 is a side view of the mechanism as seen in Fig. 5, where, it may be remarked for the sake of clearness in illustration, the top part 75 of the standard B<sup>5</sup> is removed to show my improved tune-sheet-attaching means better. 80

B indicates the frame, having six upright standards B', B<sup>2</sup>, B<sup>3</sup>, B<sup>4</sup>, B<sup>5</sup>, and B<sup>6</sup>. Pivoted rotatively between the standards B' and B<sup>3</sup> and B<sup>2</sup> and B<sup>4</sup> are two screw-cut rods C' and C<sup>2</sup>. These two screws C' and C<sup>2</sup> and the single 85 screw C<sup>3</sup> (illustrated in Figs. 5, 6, and 7) form the nucleus of my invention and constitute the operative means that convey the sheets to their point of elevation. As a matter of fact they possess two functions—one as a 90 means of conveyance, the other as a means of support.

In order that the tune-sheets A may not topple over forward or backward and may be enabled to maintain an absolute perpendicular position, a guide-rack D is furnished in the bottom of the frame B, said guide-rack fitted with teeth, between a pair of which teeth each disk has the lowest part of its circumference located, and as the said guide-rack has a dovetailed formation fitting into a similarly - dovetailed channel running throughout the bar D', forming part of the bottom of frame B, and as said rack D is 95 100

fitted very loosely in such channel the rack will move simultaneously with the disks.

Referring to the manipulation of the screws C' and C<sup>2</sup>, C<sup>2</sup> will be seen to have a disk or wheel E, attached on the outside of standard B<sup>2</sup>, said disk having an arm E', by the manipulation of which arm a rotary motion is given to the screw C<sup>2</sup>. At the rear of the frame B, as best seen in Fig. 4, two disks F' and F<sup>2</sup> are mounted on the ends of, respectively, C' and C<sup>2</sup>. These disks are fitted with a crank-pin each, F<sup>3</sup> on F' and F<sup>4</sup> on F<sup>2</sup>, and connecting said pins is a connecting-rod F<sup>5</sup>. It can now be readily observed that by these means the rotary motion given to screw C<sup>2</sup> will be transmitted to screw C', and as they are either both right-handed or both left-handed they will move the tune-sheets A either backward or forward. The single-screw action, as illustrated by the screw C<sup>3</sup> in Figs. 5, 6, and 7, shows that the functions of support and conveyance as described formerly in the case of screws C' and C<sup>2</sup> are equally applicable in this instance. The screw C<sup>3</sup> is supported in the diminutive standards, or what might be more properly termed "lugs," B<sup>9</sup> and B<sup>10</sup> and is rotated by means of the disk E<sup>2</sup>, having the handle E<sup>3</sup>. Inasmuch as the guide-rack D furnishes a guiding means for the tune-sheets in the double-screw system, equally so a guiding means is desirable in the case of the single screw. Said guide-rack D could be utilized in precisely the same manner as shown in Figs. 1 to 4 by supporting the bar D', duplicated between standards B' and B<sup>3</sup> and B<sup>2</sup> and B<sup>4</sup>; but another and possibly better means, mechanically speaking, is a series of bushes L, mounted on tubes O and O', said tubes slidably secured on the rods O<sup>2</sup> and O<sup>3</sup>. The said rods are supported between the standards B' B<sup>3</sup> and B<sup>2</sup> B<sup>4</sup>, the tubes O and O' only being half the length of the rods in order to guide the tune-sheet series back and forth on the rods between the standards. Various means can be applied to control the revolutions of the screws, as well as indicators to announce the turning of the screws one complete revolution, one revolution being the rotation necessary to bring, for instance, tune-sheet A<sup>2</sup> within reach of the elevating-levers, as in the position it occupies in Fig. 2. Consequently if tune-sheet A<sup>8</sup> is desired it would require eight turns of the handle E' to bring said sheet forward to the elevating-levers. From this it can be seen that there must be an equal number of threads on the front and rear side of the elevating-levers, as shown in Fig. 2, insomuch as if, for instance, tune-sheet A<sup>12</sup> were desired the screws C' and C<sup>2</sup> would have to be furnished with twelve threads to take up the disks as they passed successively by the elevating-levers until A<sup>12</sup> was reached.

Referring to the construction, combination, and operation of the elevating-levers, (designated by letters G' and G<sup>2</sup>,) it will be seen that

said levers are pivoted by means of pivot-pins G<sup>3</sup> and G<sup>4</sup> to the standards B<sup>5</sup> and B<sup>6</sup>, located toward the center of the frame B. These levers are connected by a series of links or connecting-rods, as follows: To the horizontal arm G<sup>5</sup> of the lever G' there is pivoted a link H', said link pivoted to the arm H<sup>2</sup> of the swing-lever H<sup>3</sup>, pivotally affixed to the standard B<sup>5</sup>. The other arm H<sup>4</sup> of said swing-lever is pivoted to the link H<sup>6</sup>. H<sup>6</sup> is pivoted to the arm H<sup>7</sup> of a second swing-lever H<sup>8</sup>, pivotally affixed to the standard B<sup>6</sup>, whose other arm H<sup>9</sup> is pivoted to the link H<sup>10</sup>, which link H<sup>10</sup> is finally pivoted to a horizontal arm G<sup>6</sup> on the lever G<sup>2</sup>. By following the course of the attached arrow-heads it will be seen that when a power is applied so as to depress the horizontal arm G<sup>5</sup> of the lever G' said lever will be raised and by the succession of links just enumerated the second lever G<sup>2</sup> will be equally raised, so as to perform the functions they were intended for—viz., to elevate the tune-disk between their prongs to its operative location. The means immediately acting upon the horizontal arm G<sup>5</sup>, causing the necessary depression, is an eccentric disk J, whose eccentricity of course will be regulated commensurate with the vertical height to which it is necessary to elevate the tune-sheets so as to bring them into operative connection with the comb. The said eccentric disk J is keyed on a shaft I, supported between the standard B<sup>5</sup> and an arm B<sup>7</sup>, forming part of the front standard B<sup>2</sup>. Secured on the end of the shaft I is one of a pair of miter-gears K', meshing with its companion gear K<sup>2</sup>, affixed to a shaft M, said shaft M supported between the arm B<sup>8</sup> and the standard B<sup>2</sup>. Finally, there is also secured a spur-pinion N to the shaft M, which spur-pinion N can be made the recipient of any kind of motive power directly or indirectly, and thus cause motion to be given to the eccentric disk J, which disk at each revolution will move the elevating-levers in the manner and for the purposes already described. These two means—the tune-sheet conveying and tune-sheet elevating means—can of course be operated individually, as here described, or they could by very simple mechanical elements be connected with each other, and thus be operated in harmony with each other, the motive power either being administered by hand or by connection with any kind of automatic machinery.

With regard to the ultimate connection between the tune-sheet, the star-wheels, and the comb I shall now proceed to describe one means of connecting these into operative connection and in so doing will refer to Figs. 5 to 7. These means will only be described here briefly as a necessary connecting-link between my improved conveying and elevating means and the final operative position of the tune-sheets, inasmuch as I propose at a later period to apply for a special patent on the said tune-sheet-attaching means.

In Figs. 5 to 7 it will be observed that the standards  $B^5$  and  $B^6$  have been raised to a greater height than as they are shown in Figs. 1 to 4. Between these extensions there is secured a plate  $P$ , to which the star-wheel support and the comb are attached in the customary manner. Secured to this plate  $P$  are further two bearings  $P'$  and  $P^2$ , between which bearing a bar  $P^3$  is pivotally attached. Between said bar  $P^3$  and the plate  $P$  the tune-sheet is elevated to its proper height by the already-described elevating means. There consequently remains one more operation yet before the tune-sheet can be brought into contact with the star-wheels necessary for the production of music. The means for this operation are as follows: A pin  $Q$  is provided in the bar  $P^3$ , and attached to the plate  $P$  by any ordinary means is a corresponding seat  $Q'$ , the said seat being furnished with a hole  $Q^2$ , adapted to receive the pin  $Q$ . It will thus be seen that the sheet  $A'$ , having the hole  $Q^4$ , will, when lying between the bar  $P^3$  and the plate  $P$  and the bar is moved around its pivots from the open position in which it is shown in Fig. 7, be supported on the pin  $Q$ , the pin  $Q$  first passing through the hole  $Q^4$  and then into the hole  $Q^2$  in the seat  $Q'$ , thus locking the tune-sheet in a position where the teeth on the said tune-sheet will contact with the star-wheels and these in turn with the comb-dents. When reopened, the pin will by reason of its slanting position release the tune-sheet, which will then be lowered by means of the elevating-levers. The opening-and-closing movement of the bar is operated from the horizontal arm  $G^5$  of the elevating-lever  $G'$ , as follows: Attached pivotally directly or indirectly to the horizontal arm  $G^5$  is a connecting-rod  $R$ , whose other end is pivoted to one arm  $S'$  of a right-angled lever, said lever pivoted to a bearing  $S^3$ , attached to the standard  $B^5$ , the other arm  $S^2$  of said lever having a roller mounted in the end of it bearing against an arm  $T$ , which arm  $T$  forms a rigid part of the bar  $P^3$ . It can now be seen that when the horizontal arm  $G^5$  of the lever  $G'$  is depressed it will pull the rod  $R$  downward in the direction of the arrow-head  $V$  and simultaneously therewith through the medium of the lever  $S$  elevate the arm  $T$  of the bar  $P^3$  in the direction of the arrow-head  $W$ , consequently closing the bar in the direction of the arrow-head  $U$ , which was the desired object.

That more screws or means having screw action of the character of  $C'$ ,  $C^2$ , and  $C^3$  could be employed under somewhat different circumstances and a different arrangement without departing from the spirit of my invention

will be apparent. That likewise minor combination details, such as the connecting means between the two screws  $C'$  and  $C^2$  or the link system connecting the elevating-levers, could be modified and altered will be evident, but

What I particularly claim in view of the foregoing description, and desire to secure protection for by Letters Patent, is—

1. In a mechanical musical instrument with separate tune-sheets for operating the same, the combination of one or more screws moving said tune-sheets by means of the threads engaging directly with the edges of the tune-sheets; with means for elevating said tune-sheets into their playing position, substantially as described. 75

2. In a mechanical musical instrument, separate vertical tune-sheets for operating the same; one or more horizontal screws below the sounding device for conveying said tune-sheets to and from their elevating position by 80 having the edge of said sheets placed between the threads of the said screw or screws substantially as described.

3. In a mechanical musical instrument, separate tune-sheets for operating the same, one 85 or more screws moving said tune-sheets to and from their elevating position, each sheet lying between two consecutive threads, and guides supporting the tune-sheets substantially as described. 90

4. In a mechanical musical instrument, separate tune-sheets for operating the same; one or more screws having two consecutive screw-threads engaging the edge of each sheet so as to move said sheets to and from their elevating 95 position, elevating means for attaching said tune-sheets in their operative position, substantially as and for the purposes described.

5. In a mechanical musical instrument having separate vertical tune-sheets operating 100 the same, the combination of horizontal, parallel screws supported in a frame having a tune-sheet lying between a pair of their oppositely-lying screw-threads, means connecting said screws rotatively, two elevating-levers, 105 links and pivoted levers connecting said elevating-levers, an eccentric disk attached to a shaft, gearing means connecting said eccentric-disk shaft with a driving-shaft substantially as and for the purposes described. 110

In testimony that I claim the foregoing I have hereunto set my hand this 18th day of August, A. D. 1899.

JULIUS WELLNER.

Witnesses:

CHARLES W. BROWER,  
AUGUST M. TRESCHOW.