

(No Model.)

3 Sheets—Sheet 1.

J. McTAMMANY, Jr.

MECHANICAL MUSICAL INSTRUMENT.

No. 273,870.

Patented Mar. 13, 1883.

Fig 1.

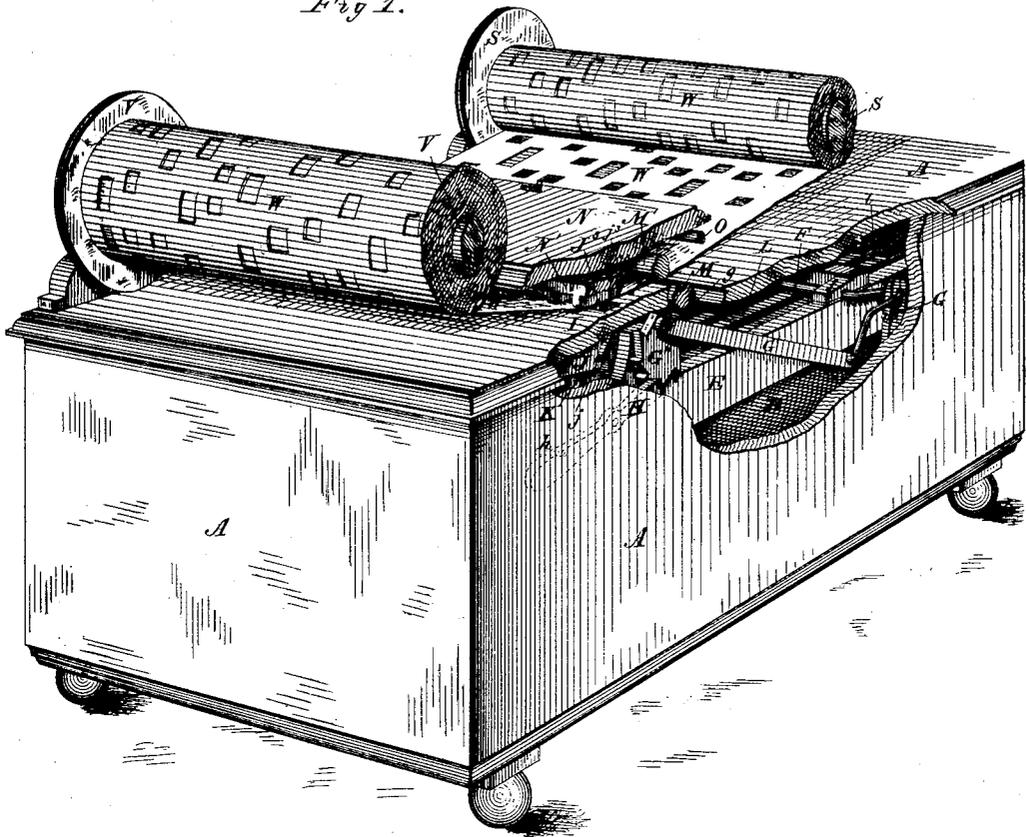
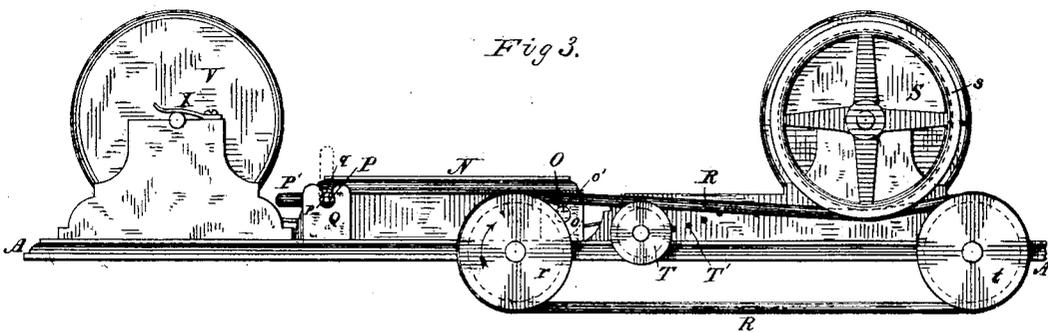


Fig 3.



Witnesses.

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(No Model.)

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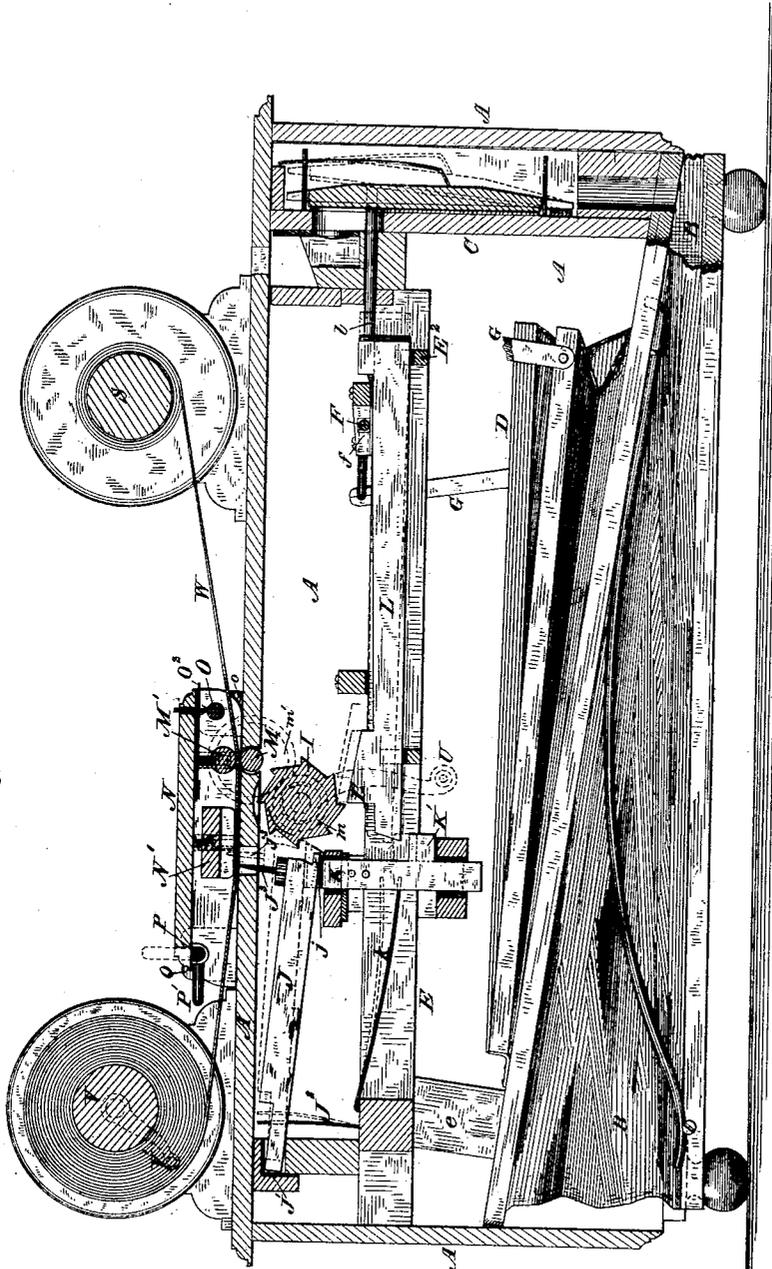
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Fig 2



Witnesses.

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(No Model.)

3 Sheets—Sheet 3.

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Fig 4.

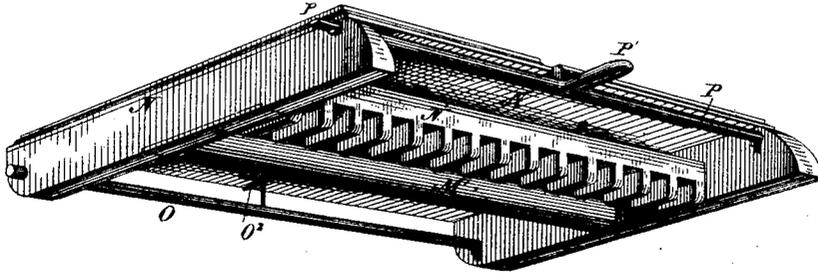


Fig 5.

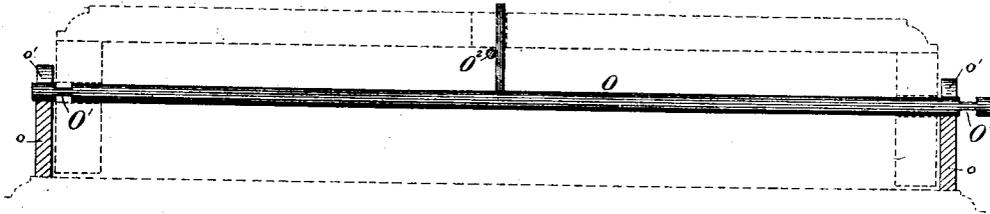
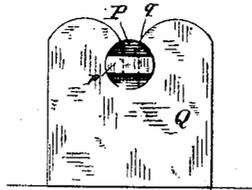


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 273,870, dated March 13, 1883.

Application filed March 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN MCTAMMANY, Jr., a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Automatic 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 or figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of automatic musical instruments in which the music-sheet is not used as a valve-sheet through which the air passes, but is used with projecting points or fingers adapted to protrude through the holes in said music-sheet, and with other intermediate devices whereby the valves are controlled. Some of the improvements hereinafter described may, however, be used with or on instruments in which the music-sheet is a valve-sheet through which the air passes.

The said invention consists in the combination of a music-sheet with a set of longitudinally-sliding bars having fingers adapted to protrude through the holes in said music-sheet, and means for depressing said bars and fingers when the sheet has drawn the latter forward, and replacing-springs operating on said bars; also, in vertically-sliding spring-pressed bars or supports, in combination with the longitudinally-moving bars that carry the fingers, the music-sheet, and the fluted roll or other depressing device, which acts on said longitudinally-sliding bars when the music-sheet has drawn them into their most forward position; also, in combination with a set of finger-carrying levers or bars and a set of valve-operating levers or bars, a fluted roll which is arranged to operate simultaneously on bars of both series; also, in divers additional improvements set forth in the appended claims.

In the accompanying drawings, Figure 1 represents a perspective view of an automatic musical instrument, a part of the side being removed. Fig. 2 represents a vertical longitudinal section taken through the same. Fig.

3 represents a rear view of the top of the casing, showing the driving-belt pulleys and tension device for the winding-roll. Fig. 4 represents as detached the rack in under perspective view, showing the pivot-rod, locking-rod, and other devices attached thereto. Figs. 5 and 6 represent detail views of various parts of the instrument.

In said drawings, A designates the casing of the instrument, having within it, at the bottom, the reservoir-bellows B, the reed-board C, and the two feeder-bellows, D D, being supported on the top of said reservoir-bellows. These devices are of ordinary construction, suction-bellows being preferred. A frame, E, is also supported by standards *e* on the top of bellows B, and affords in its turn support to most of the remaining interior parts of the instrument. Bearings *f*, secured to the said frame or formed therewith, allow crank-shaft F to turn in them, said shaft being arranged transversely to the instrument, and having at each end a crank which actuates a pitman, G, whereby one of the feeder-bellows is operated. These pitmen, and consequently the feeder-bellows, operate alternately. One of the said cranks is also connected to an additional pitman, G', which has its other end attached to a stud, *g*, arranged eccentrically on a ratchet-wheel, G'', on the driving-shaft of the instrument. This driving-shaft is journaled in bearings on standards erected on frame E, and as it rotates the pitman G', moving approximately in a horizontal longitudinal plane, turns crank-shaft F and operates the vertical pitmen for the feeder-bellows.

A pawl, H, is employed to prevent the ratchet-wheel G'' from turning backward. This pawl is pivoted, and is prevented from dropping out of position with said ratchet-wheel by means of a stop-pin, *h*, arranged above its tail, or any other suitable device. The said driving-shaft carries a fluted roll, I, which is adapted to engage with forwardly-extending ledges *j* on longitudinally-moving bars J, which are arranged in series corresponding in number to the reed-valves of the instrument. These bars J are guided at their rear ends in ways J', erected on frame E or some attachment thereto. Springs J², one of which is applied to each bar J, tend to force

said bars back into said ways. The terms "forward" and "rearward" are used in this description of the interior operative parts with reference to the direction of motion of the music-sheet. The forward ends of said bars J are provided with vertical fingers or points J^3 , which extend upward through longitudinal slots j^3 in the top of the casing A of the instrument. The forward ends of bars J rest upon the tops of a corresponding series of vertical longitudinally-moving bars or supports, K, which are guided in pieces attached to frame E, said bars K being pressed upward by springs k , one of which is used for each bar. The forward side of each upright bar or support K is provided with a lug or shoulder, K' , adapted to sustain the rear end of a longitudinally-movable horizontal bar, L. These bars L are arranged in series corresponding in number to the bars J K, already described—that is, one bar L for each bar K and each valve—and they operate directly on the valve-rods l of the reed-valves. They are guided in a grooved or recessed supporting-bar, E^2 , attached to frame E and extending transversely across it. On the upper face or side of each bar L, at the rear end thereof, is formed a shoulder, L' , having a vertical rear face adapted to engage with the broad teeth or ribs of the aforesaid fluted roll.

The operation is as follows: While the solid part of the music-sheet passes over any of the points J^3 said point is depressed, thereby forcing down with it the bars J K. While in this position the flange or ledge j of the appropriate bar J is too far rearward for engagement with the fluted roll, and the rear end of the corresponding bar, L, is too low for its shoulder L' to engage with the said fluted roll. When, however, an opening in the music-sheet comes above said point, the spring k forces all said parts K, J, L, and J^3 upward, so that said point J^3 protrudes through the opening in the music-sheet, and the shoulder L' of said valve-operating bar, L, is in position to be engaged by said fluted roll. The action of the latter on said shoulder forces said bar forward and opens the valve that it controls, so that the desired note is sounded. When the material of the music-sheet at the end of said opening comes into contact with said finger it carries said finger and its bar J along until the end of the longitudinal slot j^3 (wherein said point moves) is reached. The forward ledge, j , of said bar J is then engaged by said fluted roll I and depressed, thus freeing the music-sheet from said finger. The same motion necessarily depresses the bars K and L, so that shoulder L' is freed from said fluted roll. Bar L is then forced back by the action of the valve-spring on the valve-rod l .

The above construction relieves the music-sheet from the strain requisite to force down the protruding point. It also enables me to make the points more slender and straight, as no gradual incline is necessary. The latter advantage involves another—namely, that the

holes in the music-sheet need not be so large, and the sheet itself may have equal value in every respect, with less size.

On the driving-shaft is a pinion, m , which gears into a cog-wheel, m' , on the shaft of the lower feed-roll, M, which turns within a transverse slot or groove in the top of the casing of the instrument, the bearings of the shaft of said feed-roll being formed with or attached to the casing or some part of the frame-work. The "upper feed-roll," M' , as it is generally called, (though more properly an idle-roll,) which holds the paper against said feed-roll M, is attached to a hinged frame or rack, N, that also carries a presser-bar, N' , for holding the music-sheet against the top of the instrument, over the fingers or points J^3 . Both roll M' and presser-bar N' are forced down by springs which bear against their terminal gudgeons, said springs being located in sockets or recesses in the frame or rack N. There is no novelty in the construction and application of these springs, bar, and upper roll, nor in the construction of the lower feed-roll or the means for operating it. Of course belt-gear might be substituted for cog-gear as such means. A broad transverse slot or opening in the top of the case of the instrument may be substituted for the longitudinal slots through which the points or fingers play.

On the top of the casing, at each side thereof, is attached a bracket, o , each bracket having in its top a narrow opening or neck leading down into an enlargement or eye, o' , which receives one of the ends of a pivot-rod, O, whereby the hinging of the rack M is effected. The said brackets therefore serve as bearings for the said rod or pintle O. Said pintle or rod is movable endwise transversely through the rear end of the said rack, and has each of its ends formed with a terminal cylindrical head and a diminished neck, O' . When the rod O is moved endwise into such position that the necks O' enter the eyes o' of the brackets or bearings, the said rod may be easily raised, its necks O' passing up through the necks or openings of said brackets. Thus the rack can be easily separated from the body of the instrument. The rod or pintle O is normally held by the action of a spring, O^2 , in such position that the terminal heads of said rod or pintle are within the eyes o' of the brackets or bearings. They then serve as journals or gudgeons, and, in addition, prevent the separation of the rack from the body of the instrument. When the rack is to be attached to the body of the instrument said spring is pressed back so as to bring the necks of the rod opposite the necks or openings of the brackets. It is then easy to turn the rod into such position that the necks O' will pass through the necks of the brackets. The pressure then being removed, the spring O^2 moves the rod into such position as to prevent separation.

At the other end of the rack is another rod, P, which has flattened ends pp and an intermediate handle, P' , whereby it can be partly rotated.

The said flat ends enter the eyes *q q* of supplemental brackets *Q Q*, attached to the casing of the instrument, and having eyes or openings like those of the brackets before described.

5 This rod turns in staples or other bearings attached to said rack. When turned into one position its necks or flat ends present their flat sides to the necks of the brackets and will not pass up through them. The rack is
10 thereby locked to the casing of the instrument. When turned in the other direction the edges or thin sides of these flat ends come opposite the necks in the brackets, and there is no difficulty in separating the parts.

15 By employing the above-mentioned locking-rod and brackets *I* am enabled to dispense with all devices for holding down the rack by pressure. It is also more conveniently operated and more certain and strong in operation
20 than ordinary spring-catches and the like.

Small gudgeons with heads and necks have been used with brackets as means for detachably hinging the rack, such gudgeons being fastened into the rack and turning therein.
25 I have found, however, in them a liability to catch and jam in the brackets under some conditions. They will then wear loose or strain loose in the rack and become inoperative. My longitudinally-movable pintle or rod *O* is of
30 course free from all such objections, as it has independent motion, while serving as a support for said rack.

R designates the band or belt whereby the motion of the driving-shaft is transmitted to the
35 forward winding-roll, or winding-roll proper. (Marked *S*.) Hitherto such transmission has been effected by passing said belt from a pulley, *r*, on said driving-shaft to and around a pulley or belt-wheel, *s*, on the shaft of said
40 winding-roll. This method of belting has some disadvantages, as a very large part of the belt is in contact with wheel *s*, and the latter will necessarily become gummed from the materials employed in or on the belt, while the belt itself becomes strained and stretched injuriously.
45 I therefore pass the belt *R* from the pulley *r* to and around a pulley, *t*, which turns in bearings on or in the casing, these pulleys *r* and *t* being so arranged that the belt is brought
50 against the under side of the wheel *s*, and will turn the same, although in contact with only a small part of its periphery.

As the band *R* becomes stretched by long use, a tension device becomes necessary. For
55 this purpose I employ a small grooved pulley, *T*, which is fastened into some one of a series of holes, *T'*, in the side of the casing. As this series of holes inclines upward and forward, and as the pulley *T* is in contact with the nearly-
60 horizontal belt, it is evident that by moving the pulley forward from one hole to another the belt can be tightened as may be desired.

The pulley *r* is external to the cog-wheel or other gear which drives the feed-roll, and the
65 driving-shaft is provided with a crank, *U*, outside of both of them, whereby motion may be

given to the said shaft and the operative mechanism of the instrument.

The rewinding-roll or rear winding-roll, *V*, is connected to the winding-roll *S* only by the
70 music-sheet *W*, and has a crank and handle, *V'*, for winding said sheet back thereon when the sheet has been played through. The said sheet passes from one of said rolls to the other, between the feed-rolls, and under the presser-
75 bar, in the usual manner. The bearings for said winding-rolls are in side walls or standards attached to the top of the casings, and their journals or gudgeons are held in place by pivoted horizontally-movable spring-plates *X*,
80 which allow said winding-roll to be removed from the body of the instrument at will, yet normally hold it there.

Of course many of the devices hereinbefore described may be modified in shape, size, and
85 arrangement, and equivalents may be substituted without departing from the spirit of my invention. Thus a roughened or rubber-covered roll might be used, instead of a fluted roll, for acting on the valve-controlling levers and
90 withdrawing the points or fingers from the music-sheet.

The pivot rod or pintle, with its attachments, which form the hinge for the rack, the locking-rod or device for fastening the rack to the casing, and the spring-plates and attachments
95 thereof for holding the gudgeons or shafts of the winding-rolls to their bearings may all form part of another application, the said devices not being the subject of the present ap-
100 plication.

The gearing hereinbefore described may form the subject-matter of another application.

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

1. In an automatic musical instrument, a set of fingers adapted to protrude through the openings in the music-sheet, a set of sliding bars which open the reed-valves by positive
110 pressure, a fluted roll adapted to engage with attachments of said fingers and said valve-operating bars alternately, and devices which raise said fingers and valve-operating bars, for the purpose set forth.
115

2. The combination of a music-sheet with fingers adapted to protrude through holes therein, a set of longitudinally-sliding bars to which said fingers are attached, a roll for depressing said bars, and suitable replacing-
120 springs, substantially as set forth.

3. A set of vertically-sliding spring-pressed bars or supports, a set of longitudinally-sliding bars provided with fingers or points, a music-sheet, and a fluted roll which acts on said longitudinally-sliding bars when the music-sheet, engaging with the fingers, has drawn said bars into their most forward position, substantially as set forth.
125

4. In an automatic musical instrument, a set
130 of fingers adapted to protrude through the openings in the music-sheet, a set of sliding

bars for operating the reed-valves, said bars being unconnected with said fingers and their attachments, a fluted roll adapted to engage with attachments of said fingers and said valve-operating bars alternately, and devices which raise said fingers and valve-operating bars, for the purpose set forth.

5. A fluted roll, in combination with a series of fingers adapted to protrude through the music-sheet, a series of sliding bars which press against and open the reed-valves, horizontally-acting replacing-springs for said fingers and bars, and a series of vertically spring-raised bars which are adapted to lift said valve-bars and fingers, substantially as set forth.

6. The combination of the fingers j^3 , the hori-

zontally and vertically movable bars J, to which they are attached, and the springs j^2 , which force said bars inward with the positively-acting valve-operating bars L, the vertically-movable bars K, adapted to raise said bars J and L, the spring k , which forces said bar K upward, and the fluted roll which is adapted to operate alternately on shoulders of said bars J and L, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN MCTAMMANY, JR.

Witnesses:

WM. H. BABCOCK,
J. C. LATHROP.