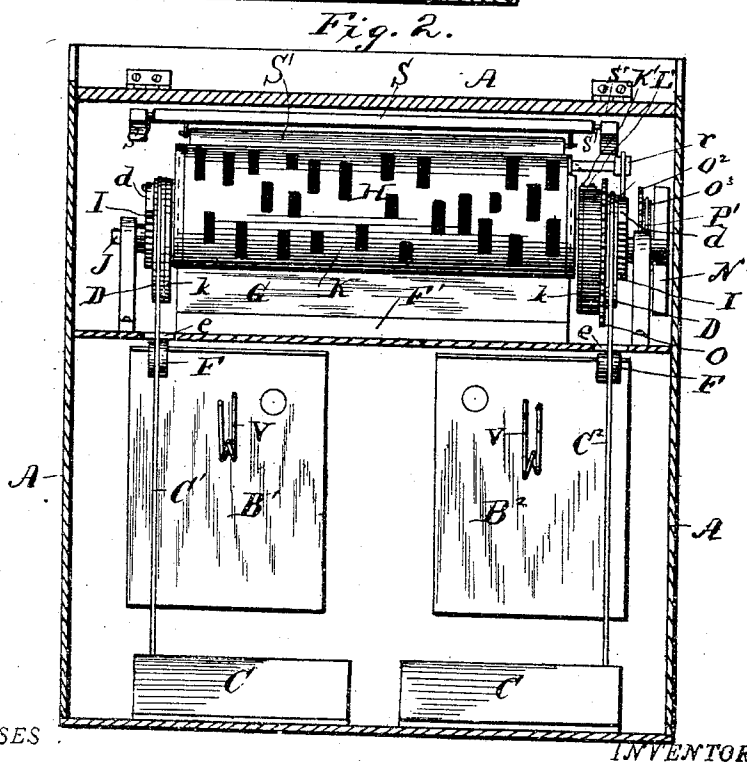
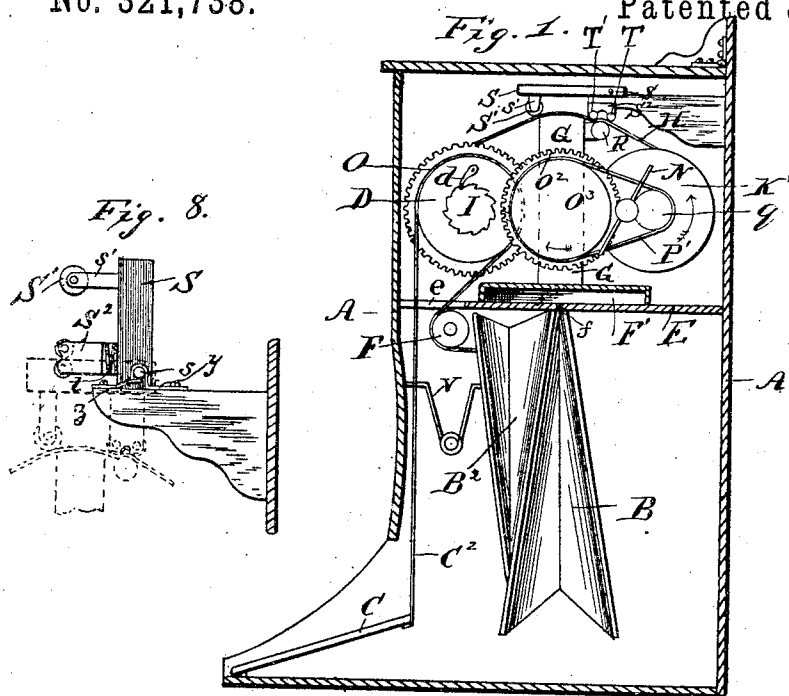


J. McTAMMANY.

MECHANICAL MUSICAL INSTRUMENT.

No. 321,738.

Patented July 7, 1885.



WITNESSES

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(No Model.)

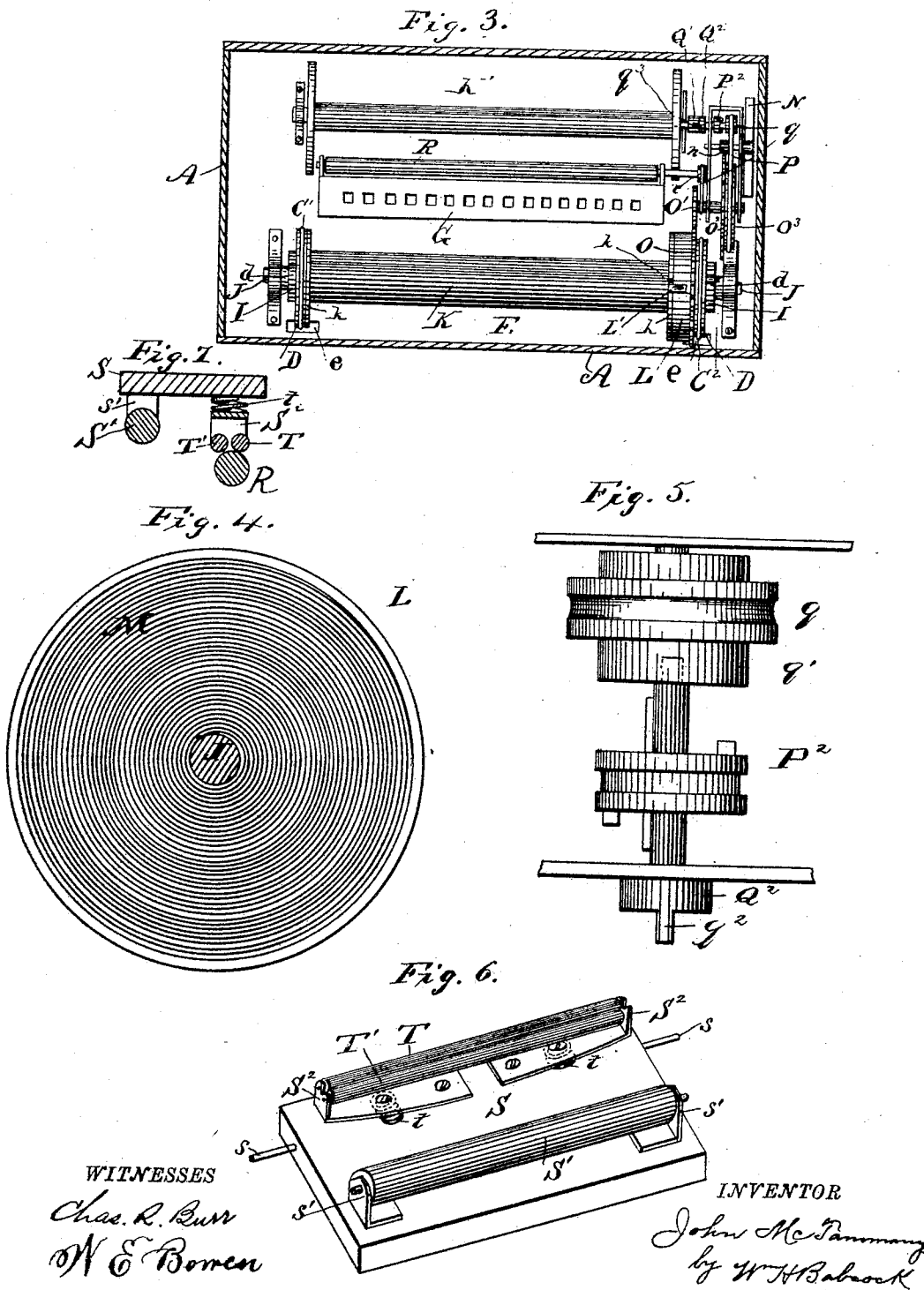
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHN MCTAMMANY, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO ALEX-
ANDER MCTAMMANY, OF SAME PLACE.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 321,738, dated July 7, 1885.

Application filed November 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN MCTAMMANY, 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 automatic musical instruments which are operated by perforated music-sheets, and is an improvement on the instrument shown in my Patent No. 290,697, granted December 25, 1883, the application for which was filed March 6, 1879. In that patent two treadles are shown, one of which operates the bellows, while the other winds, by pawl and ratchet, a spring which gives rotary motion to the winding-roll for the music-sheet. In the present improvement I still use two treadles, as well as the other parts above mentioned; but both of them operate the bellows and both of them wind the spring which rotates the winding-roll, the said treadles acting alternately, whereby an approximately-continuous action is produced.

My present invention consists partly in the combination, with the aforesaid devices, of two disks on the shaft of the winding-roll, and having a pawl-and-ratchet connection therewith, and a drum arranged to engage with and turn said winding-roll, said spring being attached at one end to the shaft and at the other to the said drum, each cord being carried over one of said disks and then down to one of said feeder or pump bellows, in order that the operation may be as stated.

The said invention also consists in a winding music-roll having a radial stud or projection, in combination with a spring-operated drum and a bar or plate, which is carried by said drum, and adjustable at will to extend beyond the periphery thereof for the purpose of engaging with said stud.

The said invention also consists in a wind-

ing-roll at one end of an automatic musical instrument, in combination with a disk of larger diameter, having a radial stud, in combination with a spring-operated drum provided on its periphery with a slotted bar or plate, which is movable longitudinally, so that it may be in or out of position for contact with said stud.

The said invention also consists in an automatic musical instrument having a rewinding roll-shaft in two sections, one of said sections being fixed in a frame and the other being attached to the rewinding-roll, said sections being provided at their proximate ends with disks, which are united to one another by a tongue-and-groove joint, whereby the rewinding-roll and the shaft-section attached thereto are left free to be removed.

It also consists of a rack, which is provided with two upper feed-rolls or pressure-rolls, which bear against the lower feed-roll or feed-roll proper, in addition to the pressure-roll which holds the sheet in proximity to the reed-ducts.

It also consists in the combination of the lower feed-roll with two upper feed-rolls, one of which is in the same vertical plane with the axis of the rack which carries it and the other is in advance of that plane, these positions being held when the rack and the rolls attached thereto are in position for the machine to operate.

The invention also consists in additional improvements hereinafter more particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a vertical section from front to rear, taken through an instrument embodying my invention at the side where the operating-gearing is located, some of the supports and gearing being removed and the wind-chest being shown in section to more clearly illustrate the interior construction of the instrument. Fig. 2 represents a front view of the same with the front of the case removed. Fig. 3 represents a plan view of the machine with the top of the case removed. Fig. 4 represents a detail view of the interior of the drum and the spring contained therein. Fig. 5 represents a detail view of the shaft of the re-

winding-roll Fig. 6 represents a detail perspective view, taken from below, of the rack and the rolls attached thereto. Fig. 7 represents a vertical section through the rack, the rolls attached thereto, and the lower feed-roll. Fig. 8 represents a detail view of the bearings for the pivot or gudgeon on one side of the rack and the bracket which supports them.

A designates the case of the instrument, in the lower part of which the usual reservoir-bellows, B, and the two feeder or pump bellows, B' B², are located. These feeder-bellows are operated alternately by means of cords C' C², which are attached at one end to each of said bellows, respectively, and at the other end to two treadles, C, one cord to each treadle. These treadles extend through the front of the case at the bottom thereof, and are arranged side by side, as usual, so that the feet of the performer will operate alternately with convenience. Each cord passes up and over a pulley, D, which is loose on the shaft of the winding-roll, each end of said winding-roll being provided with one of said pulleys; thence said cord passes down through an opening, e, in a horizontal partition, E, and around a guide-pulley, F, which turns in bearings attached to the under side of said partition, and thence to its feeder-bellows, as stated. Each cord, its pulley, and the opening through which it passes are the counterparts of the corresponding contrivances at the other side of the instrument. The partition E divides the instrument into an upper and a lower part. On said partition is supported the wind-chest F', which has communication by means of an opening, f, in said partition with the reservoir-bellows B, and communicates through an opening or openings, f', (indicated by dotted lines in Fig. 1,) with the reed-ducts in the reed-board G above said wind-chest. Over the top of this reed-board the music-sheet H passes from right to left. As the openings in said music-sheet allow the passage of air through the reeds under the draft or impulsion of the bellows in the usual and well-known manner, the production of music by said instrument is controlled by said music-sheet. Each pulley D carries a pawl, d, which is arranged to engage a ratchet-wheel, I, fast on the shaft of the winding-roll, when said pulley D is turned forward. The two ratchet-wheels I, arranged, respectively, beside said pulleys, are fast upon the winding-roll shaft J, on which the winding-roll K is loosely sleeved. This roll has at each end a disk, k, and in contact with the outer face of one of said disks is arranged a hollow drum, L, having a detachable attachment to said disk—or, more exactly, contact devices—hereinafter to be described, whereby, when said devices are in proper position the forward rotary motion of said drum is communicated to said disk and winding-roll. Within said drum is a clock-spring, M, having one end attached to said shaft and the other end to the interior of the drum.

The operation of the treadles, pulleys, pawls,

and ratchet-wheels above described is to continuously wind this spring, which exerts at its outer end a corresponding regular action in rotating the drum and winding-roll. Each pulley, pawl, and cord is replaced after each pressure on the treadle by the action of a spring, V, on its bellows B' or B². To make this action still more regular I provide a regulating-fan, N, which is operated from a gear-wheel, O, carried by said drum, through the medium of gear-wheels O' O² on a supplemental shaft and pinion, n, on the shaft of said fan. The latter acts as a fly-wheel, regulating by its momentum the rotation of the winding-roll. After the music-sheet has been entirely wound upon the said roll the operation of re-winding to withdraw it therefrom and wind it on the rewinding-roll ordinarily becomes necessary. This requires the winding-roll to turn freely backward. To provide for such backward rotation I have made use of the contact devices hereinbefore referred to, which consist of a stud, k', projecting radially from one of the disks k, and a slotted bar or plate, L', which is secured to said drum L by screws passing through the slot in said bar, which allow the latter to be moved laterally in or out, as desired. When said bar is in its extreme position in one direction, it will come into contact with said stud k' and turn the disk k and the winding-roll, as stated; but when said bar is withdrawn so as not to come into contact with the said stud the rotation of shaft J will not be communicated to said winding-roll, and, further, the latter will be quite free to be turned backward, allowing the music-sheet to be drawn rapidly and without strain from said roll.

K' designates the rewinding-roll on which the music-sheet is wound under the circumstances last stated, and from which it is drawn by the winding-roll K during the normal operation of the instrument. This rewinding-roll receives its rewinding motion from the winding-roll through the gear-wheels O O' O², before mentioned, a pulley, O³, carried by O², and an endless belt or chain, P', which passes around said pulley, and also around a pulley, q, on the shaft of said rewinding-roll. This latter pulley is normally loose on said shaft, leaving the rewinding-roll K' free to be drawn forward by the draft of the winding-roll on the music-sheet; but when rewinding is to take place the said pulley q is locked to said rewinding-roll shaft by a clutch, P², which is splined on said shaft and adapted to be moved into engagement with a suitably-formed drum, q', on which said pulley is formed, or to which it is permanently attached.

The rewinding-roll shaft aforesaid consists of two sections, one (which carries said clutch and pulley) being stationary and journaled in bearings supported on the partition E. The other section is short and directly connected to the rewinding-roll. The contiguous ends of these sections are provided with disks Q' Q², one of which has a tenon or rib, q², ex-

tending diametrically across its face, while the other has a groove or mortise, q^a , of corresponding shape and arrangement. By reason of the engagement of this tenon or rib and this mortise or groove the two sections of the shaft rotate together; but the rewinding-roll K' may readily be withdrawn from the machine by turning its shaft until said rib and groove are vertical, and then lifting said rewinding-roll. This removal is often convenient for the substitution of one music-sheet for another. As the top of the reed-board is higher than the winding and rewinding rolls the draft of the winding-roll upon the music-sheet and the inevitable slight frictional resistance of the rewinding-roll will usually keep the music-sheet against the mouths of the reed-ducts, and no additional holding or feeding devices are absolutely required. I have, however, found it best in some instances to use additional feeding and holding devices of the following construction:

R designates the lower feed-roll or feed-roll proper, which turns in bearings attached to the reed-board, and is driven by gear-wheel O' and a gear-wheel, r , meshing therewith, on the shaft of said lower feed-roll.

S designates the rack, which is pivoted by gudgeons s to the case of the machine or bearings attached to said case. The forward part of this rack is provided on its under side with brackets s' , that serve as bearings for the pressure-roll S' , that bears against the forward edge of the reed-board and holds the music-sheet against the same. The rear part of said rack is provided with two flexible bearing-plates, S^2 , attached to the under side thereof, which serve as bearings for two parallel upper feed-rolls, $T' T'$, springs t being interposed between these plates, respectively, and the under face of said rack, and serving to hold these latter rolls in place against the music-sheet on each side of the center of the lower feed-roll. When in position for the instrument to operate, the axial line of the rear roll, T , as shown in Fig. 1, is directly under (that is, in the same vertical plane with) the axial line of the rack, which passes through gudgeons s , aforesaid. As the music sheet is drawn forward between the lower feed-roll and this smaller roll T , arranged obliquely above it and behind it, as shown in Fig. 1, the oblique upward and backward strain of said music-sheet on the last-named roll will tend to turn said rack forward and downward on its axis, thus holding the pressure-roll S' against the forward edge of the reed-board or any other convenient part thereof. The springs t have no effect in bringing this result about. The roll T' , parallel to T , holds the music-sheet against the lower feed-roll on the other side of the center thereof, and insures accuracy of operation. The oblique upward and backward strain above referred to is caused by the upward and forward travel of the music-sheet in an inclined path, as shown in Fig. 1, and by the position of the rear roll, T , obliquely above and behind

the feed-roll R . As the sheet moves between said rolls R and T the motion of said sheet inevitably exerts an upward and rearward pressure against said roll T in the direction of a line drawn from the point of contact to the axis of said roll—that is to say, very nearly in a line drawn from the axis of roll R to the axis of roll T . When the music-sheet is drawn backward, as in rewinding, it tends to raise the rack by its backward and upward draft on the roll T' , so that there will be no obstruction to rewinding and no injury to the paper.

The bearings for the pivots of the rack are formed by plates arranged in pairs, the upper plate, y , in each instance, having a curved end, which is raised to allow the pivot or gudgeon to be inserted below the curvature, while the lower plate, Z , is a spring, and bears upward to close the neck of the latter. By raising the rack to a vertical position, Fig. 8, and then pressing it down so that the pintles, pivots, or gudgeons will force the said lower spring-plate away from the upper plate, I am enabled to easily remove the rack.

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

1. In an automatic musical instrument, the combination of two treadles and their cords with two feeder or pump bellows, two disks on the shaft of a winding-roll and having a pawl-and-ratchet connection therewith, a drum arranged to engage with and turn said winding-roll, and a coiled spring attached at one end to the shaft and at the other to said drum, each cord being carried over one of said disks and then down to one of said feeder or pump bellows, in order that each motion of its treadle may operate the winding-roll shaft as well as the bellows, substantially as set forth.

2. In an automatic musical instrument, a winding-roll having the radial stud or projection k' , in combination with a spring-operated drum and a bar or plate, L' , which is adjustable, so as to extend at will beyond the periphery of said drum for the purpose of being brought into contact with said stud, substantially as set forth.

3. In an automatic musical instrument, a winding-roll provided on one end thereof with a disk of larger diameter having a radial stud, k' , on its periphery, in combination with a spring-operated drum provided on its periphery with a slotted bar or plate, L' , which is movable longitudinally of said roll, so that it may be adjusted into or out of position to come in contact with said stud, substantially as set forth.

4. In an automatic musical instrument, the combination, with a lower feed-roll and a music-sheet, of a pivoted rack provided with two upper feed-rolls which bear against said lower feed-roll, substantially as described.

5. In an automatic musical instrument, a pivoted rack provided with a pressure-roll

arranged to bear against the music-sheet in
proximity to the reed-ducts, and two upper
feed-rolls, in combination with the lower feed-
roll, the reed-ducts, and the sound-producing
5 devices, one of said upper feed-rolls being in
the same vertical plane with the axis of the
rack when the instrument is in readiness to
operate, and said upper feed-roll being ob-
liquely above and behind the central line of
10 the lower feed-roll, substantially as set forth.

6. The combination of the case and sound-
producing mechanism with a rack pivoted
to said case or fixed attachments thereof, and

adapted to hold the music-sheet in position,
and bearings for the pivots of said rack, each 15
bearing consisting of a fixed downwardly-
curved piece and a spring-plate which bears
up against said curved piece to close the bear-
ing, though allowing the easy removal of said
rack, substantially as set forth. 20

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

JOHN MCTAMMANY.

Witnesses:

WM. H. BABCOCK,
GEORGE TILGHMAN.