

(No Model.)

L. T. STANLEY.  
MECHANICAL MUSICAL INSTRUMENT.

No. 322,566.

Patented July 21, 1885.

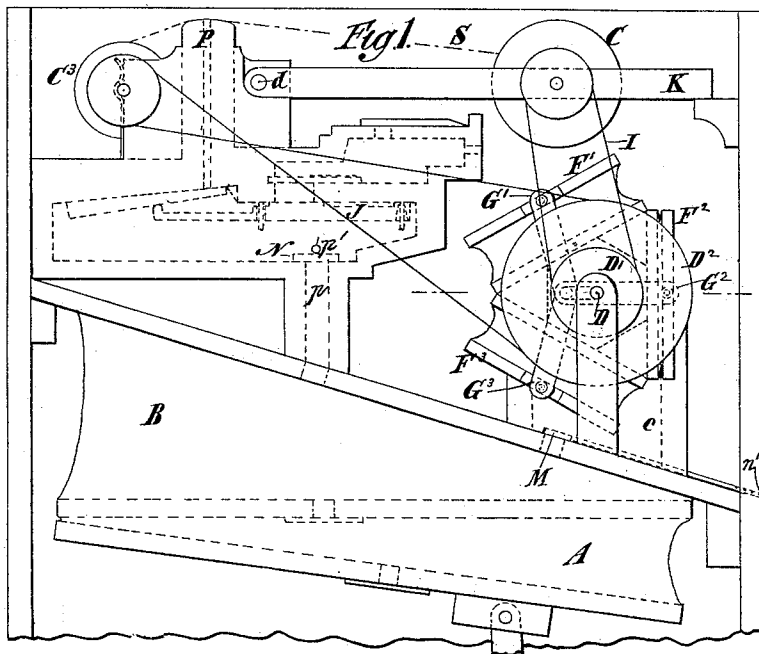


Fig. 3.

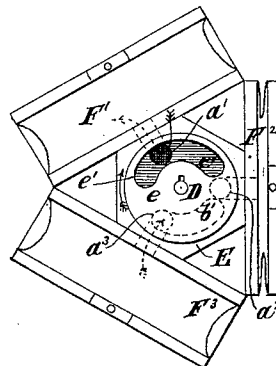


Fig. 6.

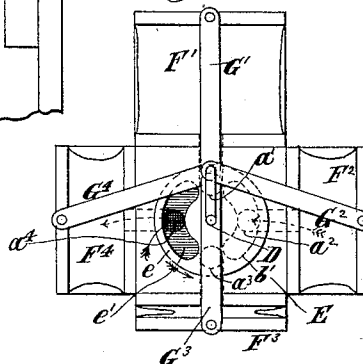


Fig. 2.

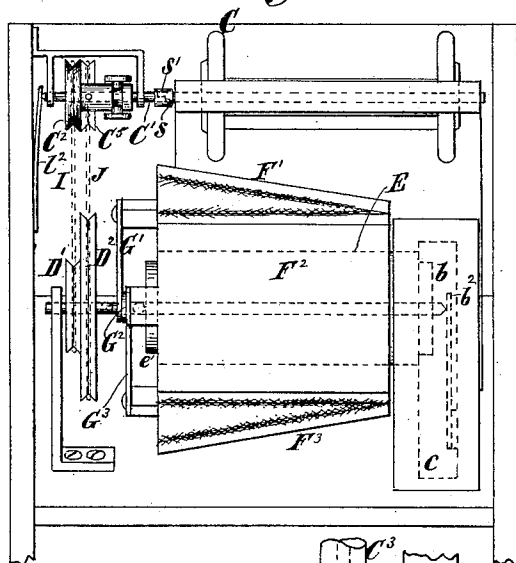


Fig. 4.

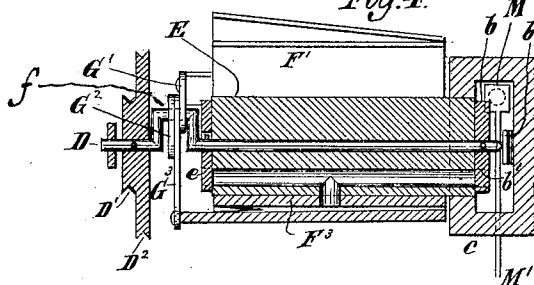
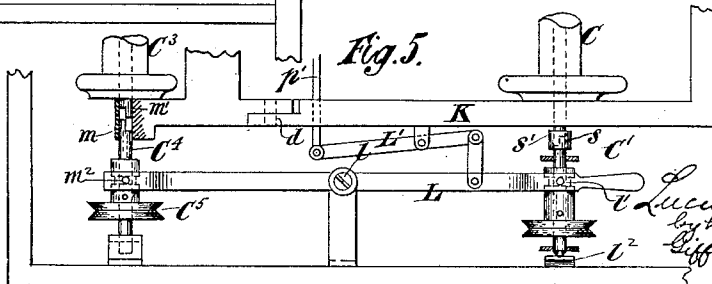


Fig. 5.



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## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 322,566 dated July 21, 1885.

Application filed July 28, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, LUCIUS T. STANLEY, of New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Mechanical Musical Instruments, of which the following is a specification.

The object of my improvement is primarily to produce a motor whereby the traveling music sheets of mechanical musical instruments may be propelled.

In the accompanying drawings, Figure 1 is an end view of a motor embodying my improvement and an elevation of certain parts of a mechanical musical instrument with the side of the case removed. Fig. 2 is a front view of the same parts, the front of the case being removed. Fig. 3 is an end view of the motor with certain parts removed. Fig. 4 is a longitudinal horizontal section of the motor. Fig. 5 is a plan view of certain parts of the instrument, and Fig. 6 is an end view of a motor of slightly modified form.

Similar letters of reference designate corresponding parts in all the figures.

A designates the bellows of a mechanical musical instrument. It may be of any suitable construction. As shown, it is of the kind known as a "suction-bellows." Any desirable number of bellows may be used.

B designates an equalizer of the ordinary or any other suitable form in communication with the bellows.

C designates a roller whereby a traveling music-sheet, S, is propelled during the playing of the instrument. The music-sheet may act as a valve to the ducts of sound-producing devices, or it may control the operation of devices whereby valves acting in conjunction with the ducts of sound-producing devices may be opened and shut. The sound-producing devices may consist of reeds arranged in a reed-board, P, or they may be of any other kind. The roller C is driven by a shaft, C', provided with a belt-pulley, C<sup>2</sup>.

C<sup>3</sup> designates a roller on which the music-sheet is wound up after the playing of the instrument. This roller C<sup>3</sup> is driven by a shaft, C<sup>4</sup>, provided with a belt-pulley, C<sup>5</sup>.

D designates the shaft of a motor, whereby the traveling music-sheet is propelled. This

shaft is journaled in suitable supports and extends through a trunk, E. Near one end it is provided with belt-pulleys, D' D<sup>2</sup>. Belts I J extend from the belt-pulleys D' D<sup>2</sup> to the belt-pulleys C<sup>2</sup> C<sup>5</sup>. The belt J is crossed, but the belt I is not crossed.

The trunk in the motor illustrated in Figs. 1, 2, 3, and 4 is provided with three ports, a' a<sup>2</sup> a<sup>3</sup>, communicating under control of a valve, b, with a duct or passage, c, extending between the trunk E and the equalizer B. The valve b consists of a disk of metal or other appropriate material affixed to the shaft D and rotating with said shaft. It has a port, b', which during its rotation successively establishes communication between the several ports a' a<sup>2</sup> a<sup>3</sup> and the duct or passage c. A spring, b<sup>2</sup>, acting against the end of the shaft D, forces the valve tightly against the end of the trunk.

On the sides of the trunk E of the motor shown in Figs. 1 and 2 are arranged collapsible chambers F' F<sup>2</sup> F<sup>3</sup>, which may be constructed similarly to organ-bellows, with movable boards and flexible sides and ends of india-rubber, cloth, or analogous materials. The ports a' a<sup>2</sup> a<sup>3</sup> communicate with the interior of these chambers. The ports a' a<sup>2</sup> a<sup>3</sup> extend through the trunk E from end to end. At the end which is the farther from the valve b a valve, e, is arranged. This valve is loosely fitted to the shaft D, so that it can slide lengthwise thereof; but it is caused to rotate with the shaft by means of a pin or spur extending from the shaft and entering a slot in the said valve. The valve e is provided with ports e'. The port of the valve e is arranged at the opposite side of the shaft D to the port of the valve b. Links G' G<sup>2</sup> G<sup>3</sup> connect a crank, f, arranged on the shaft D near the end where the belt-pulleys D' D<sup>2</sup> are located, with the movable boards of the chambers F' F<sup>2</sup> F<sup>3</sup>. Whenever air is exhausted wholly or partially from the equalizer, whichever of the chambers F' F<sup>2</sup> F<sup>3</sup> happens to be in communication with the same will be exhausted of air to about the same extent as said equalizer, and whichever of said chambers shall have been collapsed will be in position to be expanded by the entrance of air into it, and thus motion will be imparted to the shaft D. The valve e

will be held to the adjacent end of the trunk E by air-pressure. The chambers F' F" F" will then successively be collapsed and expanded, and a continuous motion will be imparted to the said shaft D.

Arrows are used to indicate the direction of the rotation of the shaft of this motor.

The motor illustrated in Fig. 6 is the same as the one shown in Figs. 1, 2, 3, and 4, except that it has an additional chamber, F', and additional port *a'*. The arrows which are used to illustrate the direction of the motion of its shaft indicate that its shaft turns reversely to the shaft of the motor shown in Figs. 1, 2, 3, and 4. By rearranging the ports of its valves *b* *e* its shaft may be made to turn in the same direction as the shaft of the motor shown in Figs. 1, 2, 3, and 4.

Instead of suction-bellows force-bellows may be used.

As the belt J is crossed and the belt I is not crossed, it is obvious that the motor is adapted to rotate the rollers C C<sup>3</sup> in reverse directions. The motor of course is not intended to operate the two rollers in opposite directions simultaneously, but only to impart motion to the roller C for the purpose of winding up the music-sheet during playing, and subsequently to impart motion to the roller C<sup>3</sup> for the purpose of rewinding, the music-sheet on the latter after playing. When either roller is rotated by the motor, the music-sheet is unwound from the other roller, and in being unwound causes the latter to rotate.

I will now describe means whereby the motor may be caused to impart motion to either roller at pleasure. The roller C is journaled in a frame, K, which is hinged at *d*, so that by disengaging the said roller from its driving-shaft C', the said frame may be elevated above its normal position to facilitate access to parts below it. The shaft C' is journaled in bearings in such way that it may be slid longitudinally. It has at one end a male clutch, *s*, and the end of the adjacent journal of the roller C has a corresponding female clutch, *s'*. By shifting the shaft C' lengthwise it may be engaged with and disengaged from the roller C. The shaft may be so shifted by means of a lever, L, fulcrumed at *l*, and provided with a pin, *l'*, entering a circumferential groove in the shaft. A spring, *l''*, acting against the end of the shaft C' normally forces it toward the roller C, and causes it to maintain engagement with the said roller. The shaft C' is also supported in bearings so that it can be adjusted lengthwise. It is provided with a clutch, *m*, adapted to engage with a clutch, *m'*, on the journal of the roller C<sup>3</sup>. A pin, *m''*, extending from the lever L, enters a circumferential groove in the shaft C', and hence said lever will, when oscillated, move this shaft lengthwise, as well as the shaft C'. When the lever moves one shaft into engagement with its roller, said lever moves the other shaft out of engagement with its roller. A slide-valve, M, serves to control the passage of air through the duct or

passage *c* for varying the speed of the motor to give expression to the music being played. This valve may be operated by a rod, M', extending from it through the front of the case of the instrument. It is desirable to propel the music-sheet by a motor in this manner; and to control the speed of the music-sheet without varying the force or speed with which the bellows are operated for causing the speaking of the sound-producing devices; the stem of the valve M is provided with notches or suitable graduations, *n n'*, &c., each of which corresponds to some particular time for the music when pulled out even with the casing. By this scale the operator can easily control the speed of the music-sheet, as, for instance, to prolong a note, the valve is pushed in, as shown in Fig. 1, which causes the motor to stop entirely. For slow music the valve is partially opened, and for quick music it is wholly opened. The valve is kept tight on its seat by the suction or pressure induced by the bellows. The notches or marks *n n'*, &c., are lettered or otherwise indicated.

N is a valve adapted to close the port *p*, and thereby prevent the reeds speaking during the rewinding of the sheet on the roller C<sup>3</sup>. As here shown, this valve is moved sidewise by the rod *p'*, whose outer end is connected by a lever, L', operated by the lever L, as shown in Fig. 5; but this valve may be operated independently or in other suitable manner. When the motor is operating the roller C, the valve N is open, and when rewinding becomes necessary this valve is closed, and the work of the motor transferred from the roller C to the roller C<sup>3</sup>, both operations being effected simultaneously and by one movement of the lever L.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a mechanical musical instrument, of a wind-motor operated by a current of wind caused by the bellows or other wind-inducing apparatus and serving to propel the traveling music sheet, card, or tablet, substantially as specified.

2. The combination, with a mechanical musical instrument, of a motor operated by the wind-inducing apparatus and consisting of a number of collapsible and expansible chambers, a number of ports communicating therewith, valves for such ports, a shaft carrying said valves, a crank on said shaft, and links connecting the crank with the said chambers, substantially as specified.

3. The combination, with a mechanical musical instrument, of a wind-motor operated by a current of wind caused by the bellows or other wind-inducing apparatus and serving to propel the traveling music sheet, card, or tablet of the instrument, and a valve for varying the speed of the motor, substantially as specified.

4. The combination, with a mechanical musical instrument, of a wind-motor operated by a current of wind caused by the bellows or

other wind-inducing apparatus and serving to propel the traveling music sheet, card, or tablet of the instrument, and a valve for varying the speed of the motor, having an index connected therewith for indicating the time of the music, substantially as specified.

5 5. The combination, with a mechanical musical instrument, of a wind-motor operated by a current of wind caused by the bellows or  
10 other wind-inducing apparatus and serving to propel the traveling music sheet, card, or tablet of the instrument, and a valve adapted to prevent the passage of wind to the reed-cells during rewinding of the music-sheet, substantially  
15 tially as specified.

6. The combination, with a mechanical musical instrument, of the bellows A, the trunk E, ports  $a'$   $a^2$ , &c., shaft D, chambers  $F'$   $F^2$ , &c.,

links  $G'$   $G^2$ , &c., and valves  $b$   $e$ , substantially as specified. 20

7. The combination, with a mechanical musical instrument, of the bellows A, the trunk E, ports  $a'$   $a^2$ , &c., shaft D, chambers  $F'$   $F^2$ , &c., links  $G'$   $G^2$ , &c., valve  $b$ , fixed to the shaft, valve  $e$ , loose on the shaft, substantially as  
25 specified.

8. The combination, with a mechanical musical instrument, of the bellows A, the trunk E, ports  $a'$   $a^2$ , &c., shaft D, chambers  $F'$   $F^2$ , &c., links  $G'$   $G^2$ , &c., valve  $b$ , fixed to the shaft, 30 spring  $b^2$ , and the valve  $e$ , loose on the shaft, substantially as specified.

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Witnesses:

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