(No Model.)

M. GALLY.

MECHANICAL MUSICAL INSTRUMENT.

No. 387,635. Patented Aug. 14, 1888.

Fig. 1.

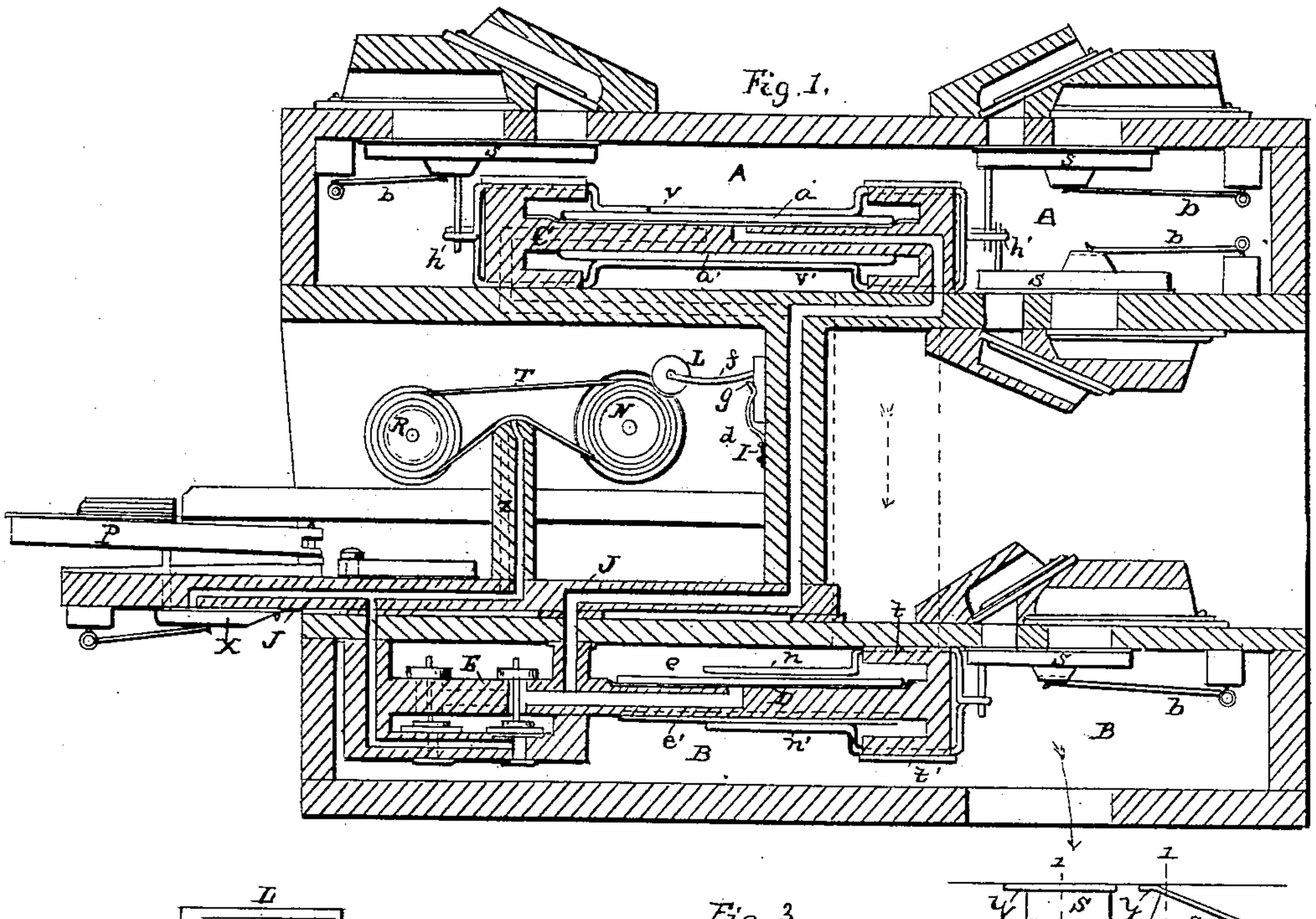


Fig. 2.

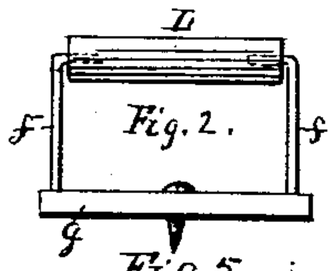


Fig. 3.

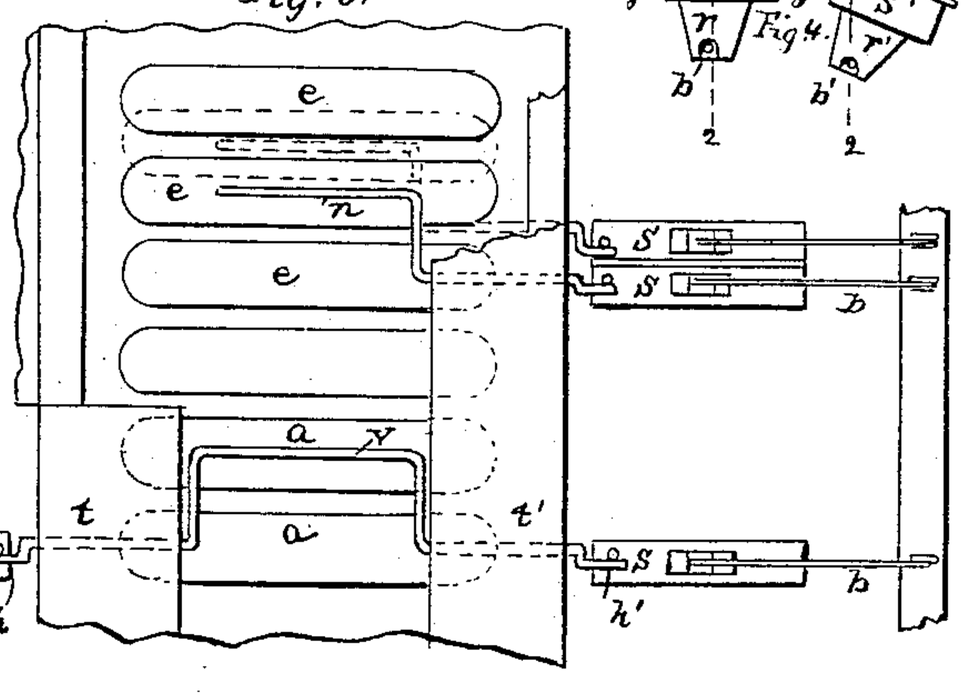


Fig. 4.

Fig. 5.

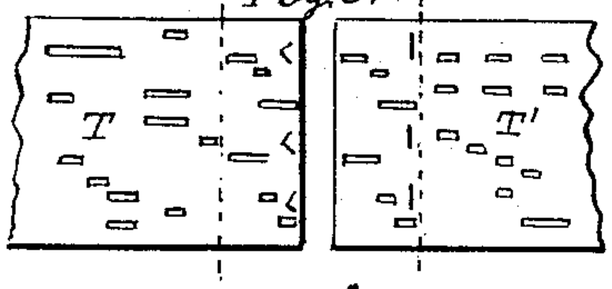
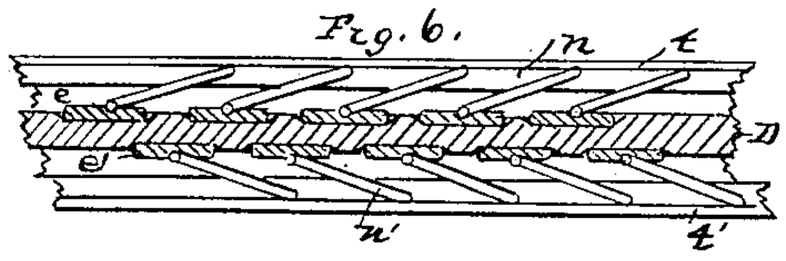


Fig. 6.



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MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 387,635, dated August 14, 1888.

Application filed April 17, 1888. Serial No. 270,980. (No model.)

To all whom it may concern:

Be it known that I, MERRITT GALLY, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to mechanical musical instruments.

The invention consists in certain constructions and combinations of parts, hereinafter referred to.

The object of the invention is to produce a very compact action; also to extend the range and power of an instrument in proportion to the size thereof; also to improve, generally, on several former constructions.

In the accompanying drawings, Figure 1 is a sectional view of an organ-action, showing the several parts of an invention in operating position. Fig. 2 is a plan view of the device for adapting the sheet-rolling mechanism to the use of belt-music. Fig. 3 is a plan view of the pneumatic board. Fig. 4 is an end view, enlarged, showing the construction and operation of the valves of the sounding devices. Fig. 5 is a part of music-sheet, showing its construction adapting it for lapping its ends to form a continuous belt, and Fig. 6 is a sectional view showing the construction of the pneumatic board and the arrangement of its pneumatics and levers.

In a former patent I describe and claim diaphragm pneumatic motors in connection with the valve-board of an organ, and in another patent I describe and claim, in combination with a grooved board having inclosed grooves, supplemental grooved boards extending into the wind-chest of an organ, the supplemental grooved boards being provided with diaphragm pneumatic motors. In the first case any repair of the pneumatic motors requires the removal and handling of the whole or a large part of the valve-board, and in the second case repair is made difficult by the necessary close proximity of the several supplemental grooved boards. In the present case I arrange the pneumatic motors alternately on the two sides of a single removable board, as C or D, Fig. 1, which when removed from the action exposes within immediate reach and view the pneumatic motors. This construction not only facilitates adjustment and repairs, but is comparatively cheap and simple, easily handled in the process of manufacture, and being removable from the instrument can be sent without the remainder of the action for repairs.

Fig. 1 represents the action of an orchestral organ having two wind-chests and two sets of pneumatic motors, both of which are operated by the manual-keys P or the mechanical tracker-range and music-sheet Z T. The pneumatic boards C and D are supplemental to the grooved boards J, but each pneumatic board is complete in itself and independent of the other.

As each complete board, C or D, has only two lines of pneumatic motors, as shown in Fig. 1, these motors are necessarily narrow, as shown in Fig. 3, and in order that they may be sufficiently powerful must be made of considerable length. These motors have free movement at both ends, and in case that either end should move more freely than the other there would be a cramped motion of the lever *v* or *n*, did it take its bearing only on a single point on the face of the pneumatic follower as ordinarily constructed. To avoid this difficulty, I bend the lever, as *n*, at an angle, and extend it in a long arm longitudinally on the face of the follower, as shown. With this construction the follower and lever have a direct and easy movement.

The lever *n*, Fig. 3, has its bearing in the bearing-pieces *t*, the end of the lever connecting with the sounding-valve *s*. The lever *v*, Fig. 3, has two bearings, *t t'*, and connects with a valve at each end, both valves being operated by a single pneumatic motor. This lever may be parted in its portion which is in contact with the pneumatic follower, forming two levers, if desirable, both operated by the same follower.

Fig. 6 is a longitudinal sectional view of the pneumatic board, showing the arrangement of the several levers and pneumatic motors, the levers arranged in line with the horizontal pneumatic motors. As shown on the board D, Fig. 1, the two lines of pneumatic motors, one line on each side of the board, operate the levers which connect with one line of valves *s*, thus allowing the valves to be in ordinary close proximity.

In Fig. 4 the construction of the valve

is shown, enlarged view. The valves *s s'* are hinged at *y*, and are held to their seats by the springs *b b'*. Valve-springs are ordinarily arranged to take their bearing directly on the valve, and the tension of the spring increases as the valves are forced away from their seats. This is undesirable in instruments operated by automatic action; and to obviate this difficulty of operation I construct the valve *s* with a projection, *r*, having a bearing for the spring *b* at a distance from the body of the valve, as shown. When the valve *s* is in contact with its seat, the pressure of the spring is in the direction of the dotted lines, passing directly at right angles to the face of the valve and exerting its greatest pressure. When the valve is moved from its seat, at *s'*, the spring-tension is diminished instead of increased, as the spring bears nearly in line with the hinge of the valve. This result is very desirable, as it nearly corresponds with the change of air-tension on the face of the valve by the opening of the windway, and thus makes the movement of the valve approximately equal in resistance at the several positions in its movement.

In Fig. 1 the music-sheet is shown as wound upon a delivery-roll, R, and connected with a take-up roller, N. It is sometimes desirable to repeat over and over a short tune many times, as for dancing, and for such purposes some instruments are adapted only to this style of playing, being adapted to the use of an endless belt of music instead of using a take-up roller. In Fig. 1 the instrument is shown as adapted for both systems. When it is desirable to use an endless belt, it is passed under the delivery-roll R, over the tracker-range, thence partly around the take-up roll N, and then backward, as T, and connected as an endless belt. To secure the movement of this belt by the action of roller N, I use a friction-roller, L, pressing the belt in contact with take-up roller N. The friction device is removable to adapt the instrument to the use of the roller-sheet when long tunes are to be played. The device is constructed as follows: From a bar, *g*, Figs. 1 and 2, are projected two arms, *f f*, made of spring-wire or other suitable material. The roller L turns on bearings at one extremity of the spring-arms, and the bar is attached to the support, as I. As shown in Fig. 1, the bar is placed in such position on support I that when its face is drawn in contact with the support tension is given to the arms *f*, and roller L is thus made to press on belt T. The bar *g* is removably attached to support I by means of screw or clamp, a spring-clamp, *d*, shown in the drawings for the purpose.

Various means have been devised for joining the ends of a music-sheet to form a continuous belt, and I do not here describe any particular means for this purpose.

The ordinary difficulty experienced in the use of endless music-belts is that at the part of the belt where the ends of the sheet are joined together there is a break in the time of the music. To avoid this I repeat in one end of the music a sufficient number of notes of the other end of the sheet, so that the ends can be placed one on the other, forming a substantial lap and at the same time such a register of the notes that the music is continuous without any break in the time. The notes in the ends of the sheet, Fig. 5, which are intended to register for the lap are those following between the dotted lines.

In Fig. 1 the tracker-range and music-rollers are shown as placed between the grooved board J and air-chest, and pneumatic action A C placed above the tracker-range. This construction brings the parts of the action A C above the key-board, where they are most accessible, but secures the best results as to the tone of the organ. This construction also allows of the use of two actions, one in the wind-chest A above the tracker-range and another in wind-chest B under the tracker-range.

The pneumatic motors in wind-chest A and the pneumatic motors in wind-chest B are shown in the drawings as both operated by means of the primary pneumatic valve E. The pneumatic motors may, however, be operated directly from the tracker-range Z or manual-keys P, or a distinct set of primary pneumatic valves E may be used for each set of pneumatic motors.

The pneumatic action C or D may be used not only for operating organ-valves, but also for striking upon strings or bells or other sound-producing devices, or may be used as an attachment for performing upon musical instruments.

I claim—

1. In a mechanical musical instrument or an attachment for performing upon musical instruments, the combination, with a series of sound-producing devices, of a board having pneumatic motors disposed on opposite sides thereof and alternately connecting with and to operate the series of sound-producing devices.

2. The pneumatic action composed of a board having pneumatic motors disposed on opposite sides thereof, and a series of levers alternately disposed and to be operated by the duplex series of pneumatic motors.

3. The combination, with the organ-action, of the pneumatic board having pneumatic motors disposed on opposite sides thereof and made removable, substantially as and for the purpose specified.

4. The combination, with the oblong pneumatic follower, as *e*, of the operating-lever having the angle-arm, as *v*, placed longitudinally with the follower.

5. The combination, with the oblong pneumatic follower, as *a*, of the operating angle-lever, as *v*, the lever having two bearings, as *t t'*, and two operating ends, as *h h'*.

6. The valve, as *s*, having the projecting bearing for its spring *b*, arranged substantially as and for the purpose described.

7. The combination, in a mechanical musical instrument, of a winding or take-up roll

and mechanism for driving the same, substantially as described, and a spring presser-roll having its axis parallel with that of the take-up roll and its periphery in contact with the take-up roll until pressed away by the winding of the sheet on the rolls, all co-operating substantially as described.

8. The combination, with the take-up roller for the music-sheet, of the music-belt and the pressure device, the pressure device consisting of the removable bar, as *g*, having spring-arms, as *f*, and roller, as L, substantially as specified.

9. The music-sheet for forming a continuous belt having openings in one end thereof to register with the notes of the other end thereof in lapping the ends to form an endless belt.

10. The combination, with the tracker-range for a mechanical music-sheet, of two organ-actions, one placed above and the other under the tracker-range.

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

MERRITT GALLY.

Witnesses:
D. B. GALLY,
HORACE S. FOWLER.