

M. GALLY.

MECHANICAL MUSICAL INSTRUMENT.

No. 351,171.

Patented Oct. 19, 1886.

Fig. 2.

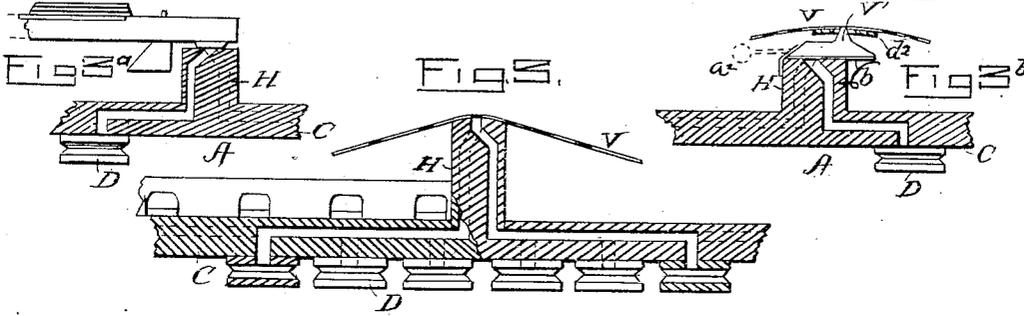
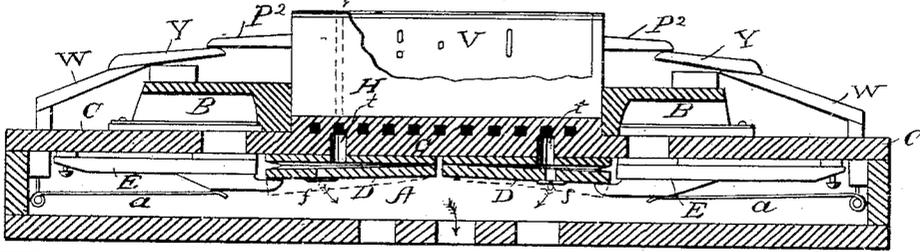
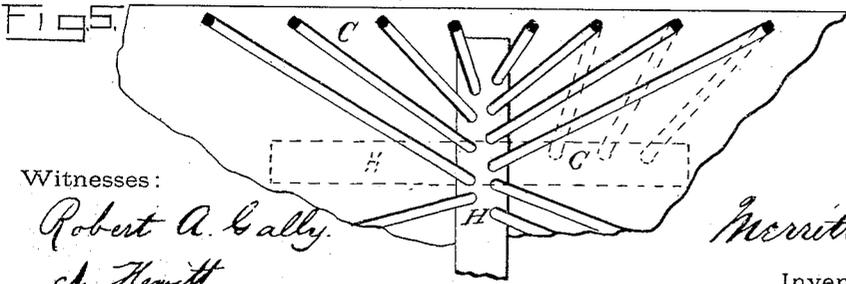
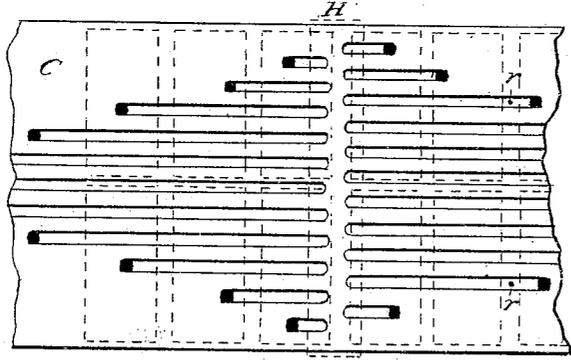


Fig. 4.



Witnesses:

Robert A. Gally.
A. Heritt

Merritt Gally
 Inventor.

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Fig. 6.

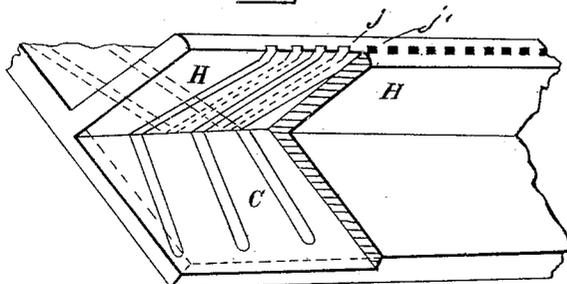
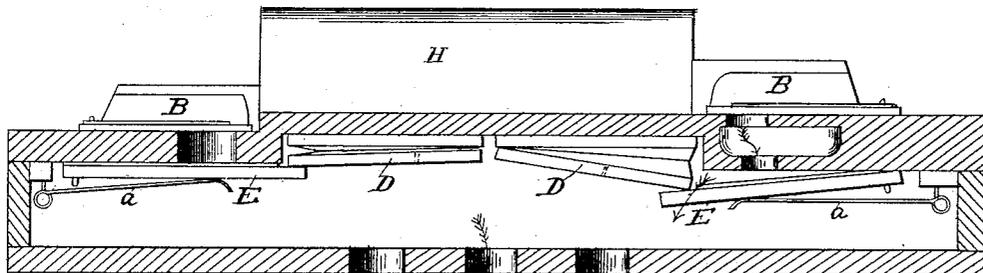


Fig. 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

MERRITT GALLY, OF NEW YORK, N. Y.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 351,171, dated October 19, 1886.

Application filed December 23, 1884. Serial No. 151,047. (No model.)

To all whom it may concern:

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

In the accompanying drawings, Figure 1 is a side view of an instrument embodying the features of my invention. Fig. 1^a is a transverse section showing the construction of the swell-motor. Fig. 2 is a transverse section of the exhaust-air chest, showing the bellows, pneumatics, and reed-valves, also the tracker-range, inclosed grooves, reeds, &c. Fig. 3 is a transverse section of a tracker-range, showing its ducts leading into inclosed grooves, which terminate in pneumatic motors. Fig. 3^a is a modification showing tracker-range ducts operated by finger-keys. Fig. 3^b is a modification showing tracker-ducts operated by means of music-sheet and valves connected directly therewith. Fig. 4 is a plan of the grooved board with parallel grooves; Fig. 5, a modification of grooved board having diverging grooves. Fig. 6 is a perspective of combined tracker and grooved board, both having diverging grooves; and Fig. 7 is a modification of the construction of Fig. 2.

In a small organ it has been found very difficult to construct and arrange the exhaust-pumps of the bellows in a manner to produce sufficient exhaust for the perfect operation of the instrument. It is also necessary, when pumps are operated by crank, as shown in drawings, Fig. 1, to have at least three pumps, in order to secure a steady motion to the crank. Three pumps, placed on the surface of reservoir F, would be so narrow that their folds would injure their capacity for properly exhausting the instrument. To obviate this defect I use only two pumps, G K, on the face of the reservoir F, and place a third pump, L, at the end of the reservoir, as shown. The dotted lines show the position of the leader from reservoir F to pump L. Pump L is shown attached for support to the end of wind-chest A; but it may be attached, if preferable, directly to the end of reservoir F. Motion is given to pumps G and K by means of pitmen N and M, operated by cranks P of crank-shaft

e. I make a slot in pitman N, or in a piece attached thereto. A pin, *d*, projecting from the side of pump L, enters the slot of pitman N. The moving pitman, in connection with the pin, produces the movement of the pump L, the three pumps operating in proper time to secure a steady motion to the crank-shaft, and also producing a proper amount of exhaust.

The valves E for the sounding devices, as shown in Fig. 2, are placed within the exhaust-chest A, and are held to their seats by means of springs *a*. These valves are operated by means of bellows-shaped pneumatics D. Two reed-boards, B B, each contain a part of the scale represented by the range of the tracker H. In an ordinary manual reed-organ the reeds are placed as near together as possible, in order to correspond in position with the finger key-board. Pneumatic motors made narrow enough to correspond with such an arrangement and would not open the reed-valves unless very nicely and carefully adjusted. To avoid the necessity of such careful adjustment I make the pneumatic motors wider and space the reeds to correspond, as shown in Fig. 3. With only one reed-board for the entire scale, the instrument, with these spaced reeds, would be much too long. I therefore divide the scale and use two reed-boards, B, placed opposite each other, as shown in Figs. 2 and 7, and place the pneumatic motors in two lines between them, one line of motors for each reed-board.

In Fig. 2 the pneumatic motors D are shown attached directly to the plane face of the valve-board; but in Fig. 7 a recess is shown in the valve-board in which the two lines of pneumatics are placed, allowing the valves to project directly under them.

In my application for patent filed October 30, 1882, I describe inclosed grooves leading from pneumatic motors toward the tracker-range or operating-keys. In Figs. 2 and 3 of the present case I show a similar construction of grooves having tracker-range H attached to the grooved board, the ducts of the tracker leading directly into the grooves. Fig. 4 shows a plan of the grooves arranged parallel to each other, the position of the pneumatics being shown by dotted lines. Fig. 5 is a modi-

5 fication, showing diverging grooves. Fig. 6
is a perspective, showing the tracker-range H,
having diverging ducts leading into diverging
grooves in grooved board C. I use this con-
struction when the scale of the instrument is
very long. To attempt to reach directly the
pneumatics of a long scale by means of diver-
ging ducts in the tracker-range would require
a tracker-range too high to be conveniently
placed in an ordinary instrument, and to de-
pend alone on diverging inclosed grooves in
the grooved board with parallel ducts in the
tracker-range would make the grooved board
for a long scale too wide for an ordinary in-
strument. I therefore use, when desirable,
the modification shown in Fig. 6, combining
the tracker-range having diverging ducts with
the grooved board having diverging grooves.
The ducts of the tracker-range may pass into
the diverging grooves of the board only on one
side of the tracker-range, or may alternate,
passing into grooves on both sides of the track-
er-range, as indicated by the dotted lines.

15 In using the tracker-range and grooved
board combined I employ either the parallel
or the diverging grooves or ducts, as the case
may require.

20 To operate the pneumatic motors I use either
the perforated music-sheet V, Fig. 2, directly
in connection with the tracker-range or the
music-sheet in connection with valves on the
face of the tracker-range, as shown in modifi-
cation, Fig. 3^b, or operate them by means of
finger-keys, as shown in modification, Fig. 3^a.

25 In using the valves V' on the face of the track-
er-range, I hinge them on one side, as shown.
The valve is held open by means of a spring,
a², unless held closed by means of the pres-
sure of the music-sheet V. When a perfora-
tion in the music-sheet passes over the spur
of valve V' the spur passes into the perfora-
tion and the valve opens.

The letter d² indicates the music-sheet rest.

30 In Fig. 1 is shown the large pneumatic mo-
tor X, which operates the swell or swells of
the instrument. This motor is operated indi-
rectly from the tracker-range through a small
sensitive pneumatic, Y. The construction is
more particularly shown in Fig. 1^a. As I de-
scribe and claim, broadly, in previous patents
this method of operating the swells, I will only
describe specifically the present construction
and arrangement. The large pneumatic X is
placed on the valve-board C outside of the air-
chest A, and the small operating-pneumatic
Y is placed within the chest, as shown. The
duct e leads to the tracker-range and the small
duct p to the interior of the air-chest A. This
duct p may lead through the movable board
of the pneumatic, if desired. The operation
will be the same. When the pneumatic Y
opens valve n, the large motor-pneumatic X is
exhausted and opens the swell W.

35 In my patents of April 8, 1879, I produce
the return movement of the motor-pneumatic
by means of the return movement of the
primary pneumatic Y, and in my patent of No-

70 vember 25, 1879, I produce the return move-
ment of the motor-pneumatic X by means of a
duct from the tracker-range directly to the mo-
tor-pneumatic. In the present case I either
connect the motor-pneumatic by a duct to the
tracker-range for the return movement, or use
the more-quickly-acting device shown in Fig.
1^a. The small primary pneumatic h connects
with the tracker-range through duct m. This
primary pneumatic operates the valve n²,
which opens a duct from the interior of the
motor X to the external atmosphere. Thus
the motor may remain collapsed after the re-
turn movement of pneumatic Y until it is de-
sirable to inflate it, when it may be quickly
or slowly done by means of the primary pneu-
matic h.

80 The operation of the pneumatic motors D,
Figs. 2 and 7, depends upon the difference in
air-pressure on the two sides of the follower
or movable board of the pneumatic, caused by
the opening of duct t' to the external atmos-
phere, duct f being much smaller than duct t,
in order that the air passing through the mu-
sic-sheet may be in excess of that passing
through duct f. This is broadly covered by
claim 3 of my patent of April 8, 1879. The
position of duct f is immaterial, whether
shown in Fig. 2 or as p, Fig. 1^a, the effect
is the same. I sometimes lead the duct p di-
rectly into the duct t, near the pneumatic, as
shown at r, Fig. 4.

90 The principal feature of the pneumatic ac-
tion in the present case is its arrangement and
combination with other parts to produce a
compact instrument of cheap and durable con-
struction.

100 The pneumatic motor for the swells is shown
in Fig. 1^a, arranged to operate two swells.
This is advantageous where an exact simulta-
neous or equal movement is desirable.

What I claim as my invention is—

1. The grooved board bearing the tracker-
range, and having passages therefrom, and
also bearing the reeds and reed-valves, com-
bined with a series of pneumatics which con-
nect with the grooves in the board and also
with the reed-valves.

2. The combination, with the reservoir-bel-
lows, of a pump operated by crank and pit-
man, and the supplemental pump L, arranged
substantially as specified.

3. The combination, with two reed-boards
and valves for each board, of the recess in the
valve-board between the reed-boards contain-
ing pneumatic motors for operating the valves.

4. The combination, with the grooved valve-
board having inclosed grooves, of the tracker-
range attached thereto, the inclosed grooves
leading from the ducts of the tracker-range to
the pneumatic motors.

5. The grooved board having air-passages
and reed-apertures therein and tracker-range
attached thereto, in combination with pneu-
matic motors in the wind-chest, connected with
said passages and serving to operate the reed-
valves, which are also in the wind-chest, a

single board thus constituting the support for the entire system of reeds and valves, substantially as described.

5 6. The combination, with a grooved reed and valve board and a tracker-range placed transversely thereof, of a series of pneumatic motors on said board, each connected with its proper groove in the reed-board, and a line of reeds at each side of said board outside the pneumatics, substantially as described.

7. The combination, with the tracker-range, of the grooved board having diverging grooves.

15 8. The combination, with the tracker-range having diverging ducts, of the grooved board having diverging grooves.

20 9. The combination, with the reservoir-bellows, of a pump arranged horizontally, connected with the reservoir, and a pump placed vertically at the end of the reservoir, with a crank and slotted pitman, said pitman attached to the horizontal bellows and operating the vertical bellows by means of a pin working in the slot.

10. The combination, with the swell or swells W and the pneumatic motor X, of the primary pneumatic Y, all attached to the reed-board, substantially as specified.

11. The combination, with the tracker-range, of a reed-board countersunk on the under side, the pneumatics inclosed in said countersunk portion, and the reed-valves pivoted directly to the board and bearing on said pneumatics, as set forth.

12. The combination, with the tracker-range, of a valve hinged thereon, a spring connected with the valve and range to lift said valve, and a projection on said valve to hold the same down until permitted to rise by a perforation in the sheet, as set forth.

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

MERRITT GALLY.

Witnesses:

ANNA M. WAITE,
ROBERT A. GALLY.