

No. 638,709.

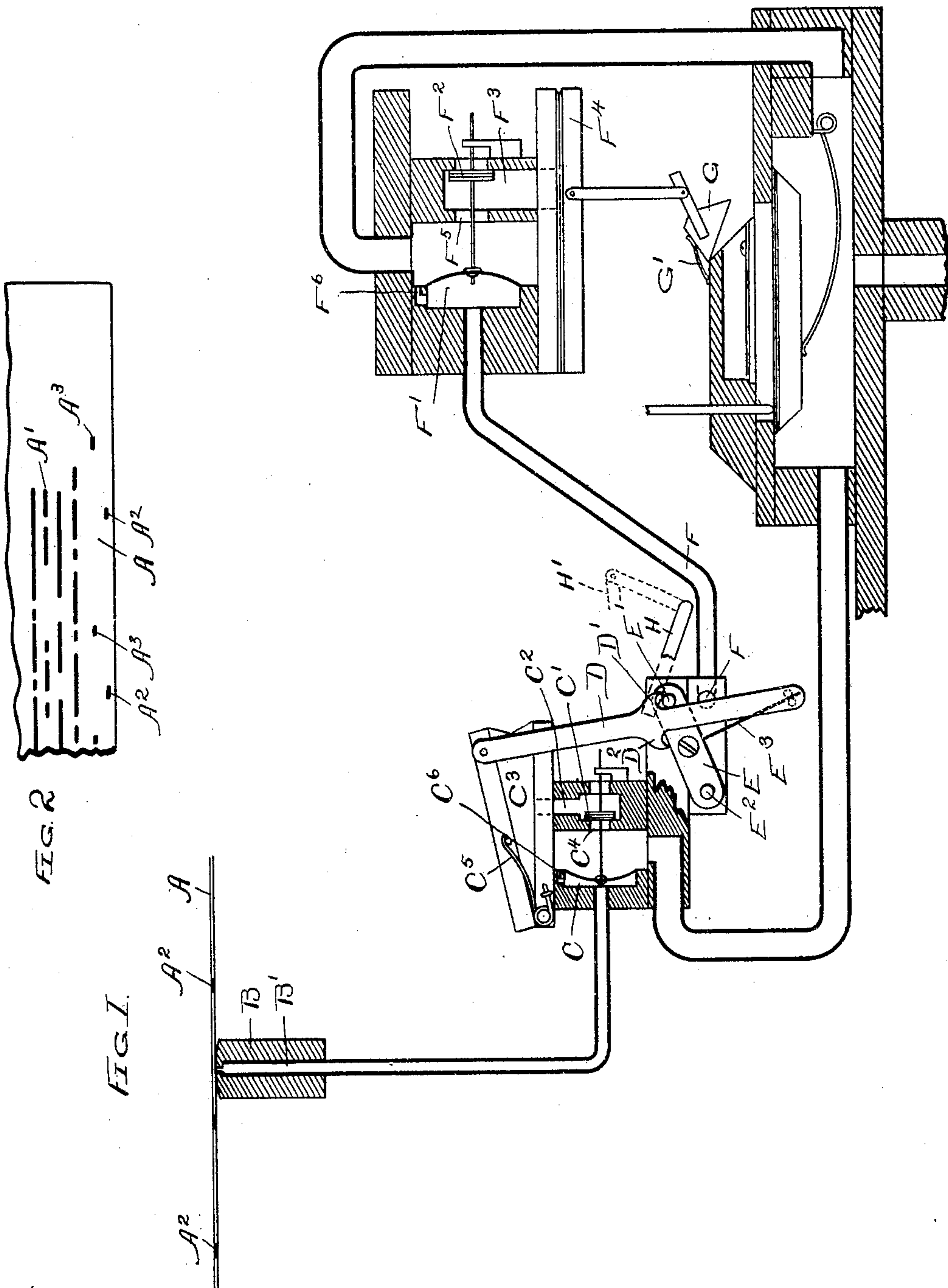
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F. W. HEDGELAND.

MEANS FOR CONTROLLING REGISTRATION OF SELF PLAYING ORGANS.

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(No Model.)



WITNESSES:

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MEANS FOR CONTROLLING REGISTRATION OF SELF-PLAYING ORGANS.

SPECIFICATION forming part of Letters Patent No. 638,709, dated December 12, 1899.

Application filed February 13, 1899. Serial No. 705,398. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. HEDGE-
LAND, a citizen of the United States, residing
in Chicago, in the county of Cook and State
5 of Illinois, have invented a new and useful
Improvement in Means for Controlling the
Registration of Self-Playing Organs, of which
the following is a specification.

The object of this invention has been to
10 provide more practical means for automatic-
ally controlling stop and swell actions in self-
playing organs than has heretofore been used.
In some of the constructions heretofore em-
ployed to accomplish this result the perforated
15 music-sheet by which the instrument is con-
trolled has been provided with perforations
controlling ducts in the tracker-range which
lead to valves controlling the several actions
by which the swells or stops are thrown into
20 and out of service. Inasmuch as the swells
or stops are usually in service for consider-
able lengths of time, the perforations have
either been made very long or numerous short
perforations have been used, so close together
25 that the uncut portions of the sheet between
them do not as they pass over the tracker-
ducts wholly shut off the air from the latter.
In both of these constructions the opening of
the tracker-duct throws the stop into action
30 and the closing of the duct throws the stop
out of action, and in both the music-sheet is
very much weakened and danger to its integ-
rity greatly increased by the character of the
perforations. I have overcome this objection
35 by the following construction: I form in the
main music-sheet a series of short or small
perforations, all arranged in the same line, so
they will pass over the same duct, and spaced
to open the duct only at times when the stop
40 or swell is to be put into action and when it
is to be put out of action, and to close the duct
between the opening and closing operations
as well as between the closing and opening
operations—that is to say, these short perfo-
45 rations, which do not injuriously weaken the
sheet, act alternately as they pass the duct
to put the stop or swell controlled by them
into and out of service, the first one putting
it into service and the second throwing it out
50 of service, the third bringing it into action
again, the fourth throwing it out of action,

and so on through the series of perforations.
With the duct thus controlled and the stop or
swell and its actuating devices I combine
means controlling the latter whereby the suc- 55
cessive impulses received from the tracker-
range are caused to alternately open and close
the stop or swell. These means are not merely
adapted to reverse the actuating devices of
the stop or swell, but to render the latter in- 60
dependent of the tracker-range and music-
sheet, so that the closing of the tracker-duct
during the period the stop or swell is in action
will not cause the closing of the latter, as it
does in prior constructions. The mechanism 65
by which these results are obtained has two po-
sitions of rest, and at each actuation it moves
from one to the other, so that it is always ready
for the next actuation. Each swell and stop
action is provided with this regulating mech- 70
anism and with its own tracker-duct, and of
course the music-sheet is provided with a row
of perforations for each of the ducts.

The nature of my invention will be more
fully understood from the description given 75
below and from the accompanying drawings,
in which—

Figure 1 is a vertical section of that portion
of an organ to which my invention relates,
and Fig. 2 is a partial plan of the music-sheet. 80

In the drawings, A represents the music-
sheet through which the instrument is con-
trolled, and B the tracker-range. The former
is provided with the usual perforations A' for
causing the speaking of the reeds or pipes 85
and also with one or more series of perfo-
rations A² A³, &c., for controlling the stops and
swell, and the range has a separate duct B'
for each series of the last-mentioned perfo-
rations. All the perforations of each series are 90
placed in the same row or plane and at such
distances apart longitudinally of the sheet as
correspond to the commencement and the
close of each period of service of the stop or
swell controlled by them. The first perfo- 95
ration in each row brings its stop (or swell) into
action and the next one in the same row
throws it out of action, and the same is true
of the third and fourth perforations, and so
on, the perforations thus acting alternately 100
in causing the operation and the cessation of
action by the stops or swell. This result will

be understood from the description now to be given.

Each duct B' connects with the chamber of a membrane motor C, attached to the stem of a shifting valve C', controlling the air-passage C² of a pneumatic C³. The passage C² connects in one position of said valve with the outer air and in the other position of the valve with a passage C⁴, which is constantly exhausted. A spring C⁵ tends to expand the pneumatic, and a bleeding or minute passage C⁶ permits the exhaustion of duct B'. Attached to the moving side of pneumatic C³ is a swinging lever D, having projections D' and D² at its opposite sides. These projections engage buttons E' and E² on a centrally-pivoted lever E, one end of which serves as a valve to open and close the mouth of a duct F. A spring E³, secured to the lever E and changing position with the latter, acts upon the lower end of the lever D and swings the latter into position where its side projections will engage one or the other of said buttons. Thus in the drawings it is shown as in position to engage button E', and at the next actuation of the lever E the spring will shift the lever D, so it will engage the button E². By this construction the reversing of lever E is insured, each collapse of the pneumatic C³ causing a downward movement of the lever D, so that the latter engages one or the other of said buttons, and said lever being shifted each time from one button to the other.

The duct F leads to the chamber behind the membrane motor F', attached to the stem of a shifting valve F², controlling the air-passage F³ of a power-pneumatic F⁴, whose swinging side is attached to a mute G, controlling the reeds in the reed-board shown. The valve F² in the position shown connects the pneumatic with the passage F⁵, which is constantly exhausted, so that the pneumatic is deflated, and in its other position the valve admits the outer air to and inflates the pneumatic. A bleeding-passage F⁶ causes the exhaustion of duct F when its mouth is closed by the valve-lever E.

In the position of the parts shown in Fig. 1 the mute has just been opened by one of the perforations A², and it will be noticed that in this position the duct F is charged with outside air, so that the valve controlling the power-pneumatic operating the mute is in the position in which it causes the collapse of said pneumatic, and of course the pneumatic will now remain collapsed until the duct F is closed to the outer air, so that it can be exhausted through the bleeding-passage F⁶, and by this means I retain the mute in its operating position until the tracker-duct is again opened by the next following perforation A², the mute and its actuating means being thus rendered so far independent of the tracker-range and music-sheet that the closing of the duct by the portion of the sheet intervening between the adjacent perforations A² has no effect upon the mute

or its operating-pneumatic. When the next perforation A² reaches the tracker duct, the exhaust condition of the duct will be destroyed, and the valve C' will then be thrown over to its other seat, thereby excluding the outer air from the pneumatic C³ and connecting it with the exhaust-passage C⁴, so that said pneumatic will collapse. This causes a downward movement of the lever D, and in such downward movement said lever reverses the valve-lever E, thereby closing the mouth of the duct F, so that said duct becomes exhausted through the passage F⁶, and the valve F² is shifted to its other position and admits outer air to the pneumatic F⁴. The opening of said pneumatic, which now takes place in obedience to spring G', closes the mute. As soon as this second perforation A² passes beyond the tracker-duct, the latter will be exhausted, so that valve C' is returned to the position shown in the drawings, and the pneumatic C³ is again inflated and lifts the lever D, and when this occurs the spring E³, by reason of the changed position of the lever E, shifts the lower end of the lever D from the position shown in the drawings to a position over the button E², and consequently when the third perforation A² reaches the duct and causes the deflation of pneumatic C³ the lever D will descend and return the lever E to the position shown in the drawings, thereby opening the duct F and causing the throwing of the mute into action again. The spring attached to the moving side of the pneumatic C³ opens said pneumatic and should be strong enough to lift the lever D. Subsequent operations are mere repetitions of those described.

It is desirable, of course, that the stops and swells should all be in their non-acting positions when the instrument is started in playing a piece of music, and consequently I provide means for throwing them all out of acting positions at the time the rewinding of the sheet commences. A swinging lever H may be employed for this purpose and connected to the rewind-stop rod H'. This lever H is adapted to bear upon the button E' of lever E, and when the rewind-stop is actuated it will shift lever E from the position of Fig. 1 to the position in which it closes the duct F, and of course the lever D will also be shifted at the same time.

While I have shown my invention as applied to a mute controlling a reed-board, it will be understood that it may be used with any stop action or with any swell action embodied in the instrument. In positioning the perforations controlling the stops and swells in the music-sheet they should be located slightly in advance of the perforations controlling the pipes or reeds which are to be sounded while the stops or swells are in active service.

I claim—

1. In a self-playing instrument a music-sheet having separated short perforations ar-

ranged in a row longitudinal of the sheet and acting in alternation to throw a stop or swell into and out of service, in combination with a tracker-range, means acting under the control of the sheet and range to throw the stop or swell into and out of action, and mechanism whereby each alternate perforation causes a reverse action by said means, substantially as specified.

10 2. In a self-playing instrument a music-sheet having a row of separated short perforations for controlling a stop or swell, a tracker-range, and devices for opening and closing said stop or swell, in combination
15 with means whereby said perforations act alternately to cause the opening and the closing of the stop or swell, substantially as specified.

20 3. In a self-playing instrument, a music-sheet having a row of separated short perforations for controlling a stop, a tracker-range, and devices for operating the stop, in combination with means whereby said perforations are made to act alternately to cause the opening and closing of the stop, said means also
25 rendering the stop and its operating devices temporarily independent of the tracker-range and sheet, substantially as specified.

4. In a self-playing instrument, a music-

sheet having a row of separated short perforations for controlling a stop, a tracker-range, and devices for operating the stop in combination with an auxiliary reversing mechanism acting to cause each of said perforations to reverse the action of the next preceding
35 perforation, substantially as specified.

5. In a self-playing instrument, a music-sheet having a row of separated short perforations for controlling a stop, a tracker-range, and devices for operating the stop, in combination with reversing means whereby said
40 perforations are made to act alternately to cause the opening and closing of the stop, substantially as specified.

6. In a self-playing instrument, a music-sheet having a row of separated short perforations for controlling a stop, a tracker-range, and devices for operating the stop, in combination with a valve and duct controlling said
45 stop-operating devices, a reversing-lever for opening and closing said valve, and a pneumatic controlled by the tracker-range and operating said lever, substantially as specified.

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Witnesses:

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