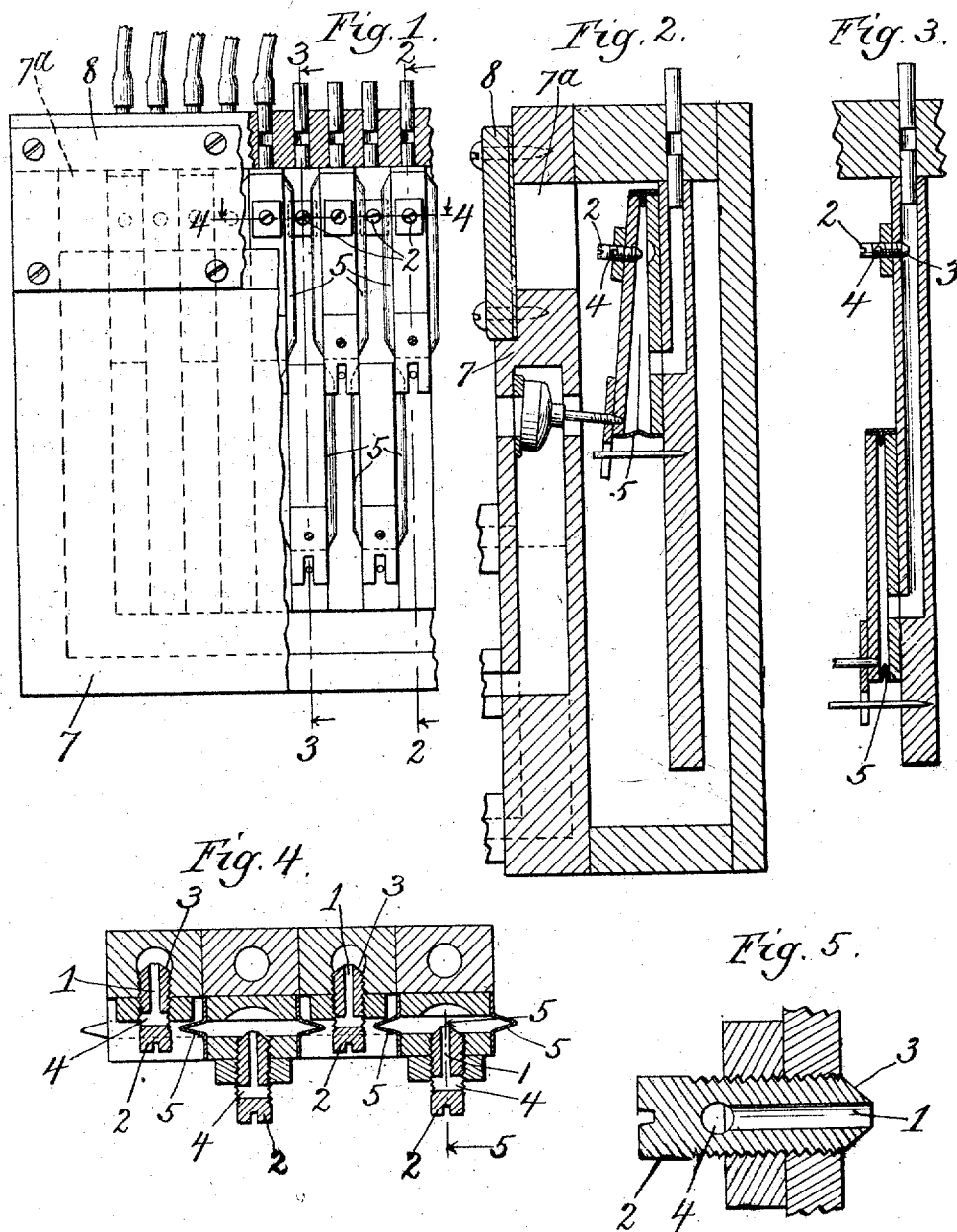


M. CLARK.
LEAK REGULATOR FOR PRIMARY PNEUMATICS.
APPLICATION FILED DEC. 8, 1909.

986,442.

Patented Mar. 14, 1911.



Witnesses.
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Inventor.
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UNITED STATES PATENT OFFICE.

MELVILLE CLARK, OF CHICAGO, ILLINOIS.

LEAK-REGULATOR FOR PRIMARY PNEUMATICS.

986,442.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MELVILLE CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Leak-Regulators for Primary Pneumatics, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved device for controlling what is called the "leak" of the primary pneumatic in an auto-pneumatic mechanism, which is governed by a perforated controller sheet.

It consists of the features of construction shown and described as indicated in the claims.

In the drawings:—Figure 1 is a front elevation of a portion of the primary pneumatic chamber of a pneumatic action of the character to which this invention is adapted, having primary pneumatics provided with the features constituting this invention. Fig. 2 is a detail section at the line 2—2 of Fig. 1, through one of the primary pneumatics to the duct bar, on which it is mounted on a scale. Fig. 3 is a similar view at the line 3—3 of Fig. 1. Fig. 4 is a section of the line 4—4 on Fig. 1. Fig. 5 is a detail section at the line 5—5 on Fig. 4.

This invention is particularly designed to be applied to pneumatic actions of auto-pneumatic musical instruments, which are controlled by a perforated note sheet, but it is applicable to any auto-pneumatic mechanism which is similarly controlled. It is well understood that in the operation of this form of automatic mechanism primary pneumatics corresponding to the several motor pneumatics to be brought into action by the registration of the perforations on the controller sheet, with ducts of a tracker, are mounted within a chamber from which the air is partially exhausted by the devices provided for that purpose, each primary pneumatic being normally in collapsed condition and having its interior cavity in communication with the primary pneumatic chamber,—that is the chamber within which all the primary pneumatics are assembled,—through what is known as a "leak-port", which is a small aperture leading from the cavity of the primary pneumatic into the main chamber, called the "primary pneumatic chamber", this aperture, or leak-port being so

much smaller than the duct by which the primary pneumatic communicates through the tracker board with the outer air when the registration of the proper aperture on the controller sheet with the tracker duct mouth occurs, that the pneumatic will be inflated by atmospheric air entering through such duct, notwithstanding the leakage through the leak-port, such leak-port, however, being sufficient when the inlet through the tracker duct is closed to cause the primary pneumatic to promptly resume its collapsed condition by the equalizing of the tension of air within it with that of the primary pneumatic chamber in which it is situated.

In order that the action of the primary pneumatic may be prompt, both in inflation and collapse, the size of the leak-port must be very carefully regulated. A common difficulty in such constructions arises from the fact that this small leak-port is liable to become obstructed with specks of dust, or most frequently by small fragments of paper from the controller sheet, consisting of the punchings made in the perforations, some of which sometimes adhere to the margins of the perforations and become pulled off in the use of the sheet and sucked through the tracker duct into the primary pneumatics and become lodged over the leak-port, operating as minute valves, closing said ports, being held in said position by the suction. For the purpose of overcoming this difficulty, I make the leak-port as an axial aperture, 1, in a screw, 2, which is screwed through the wall either of the primary pneumatic or of the duct leading to it. The end of the screw protrudes well into the duct or pneumatic cavity so as to terminate off from the wall through which it extends, the end protruding being preferably tapered as seen at 3, so that any fragments of paper which might constitute a valve or stopper, lodging on the end, will not be retained, but will tend to slide along the inclined or tapered end to escape from obstructive position. The axial duct, 1, does not extend through the entire length of the screw, but is connected by a lateral or radial branch, 4, which leads out through the side of the screw. The diameter of this lateral mouth, or at least its dimension longitudinally of the screw, is such as to adapt it to afford a maximum leak-port, and preferably considerably more than any ordi-

nary leak opening which would be required, and the amount of available opening is regulated by screwing the screw more or less into the wall through which it is set, leaving only 5 so much of the diameter of the lateral mouth, 4, of the leak duct exposed beyond the outer surface of such wall as will afford the necessary leakage. The proper amount of such opening will vary with a variety of 10 conditions, principal of which is the density or closeness of the leather, 5, which forms the bellows wall of the primary pneumatic; for the unavoidable leakage through such bellows wall, in some instances, will be 15 almost enough to dispense with a leak-port, and in other cases the leather will be found of such close fiber as to almost totally prevent leakage through it. This variation in the unavoidable leakage through the tissue 20 of the primary pneumatic will be compensated by the adjustment of the leak-port screw, 2, as described. Also as the condition of the instrument changes by use, readjustment of the leak-port may be made in 25 the same manner from time to time, or differently with different pneumatics in the same instrument, the leather of some of the pneumatics becoming in time thoroughly filled up with an accumulation of fine dust 30 that is constantly drawn into the pneumatics in service, while the texture of the leather of the pneumatics may become more porous from varying atmospheric conditions; but 35 whatever the cause of porousness or the amount of variation, the correction can readily be made by means of the leak-port screw, 2, turning in or out as the case requires.

40 In order that the adjustment of the leak-port screws may be made without necessi-

tating any dismantling of the instrument, the primary pneumatic chamber should be mounted so as to expose the outer wall, 7, in which an opening, 7^a, may be made to expose a suitable point in the several primary 45 pneumatics or their duct bars, for receiving the leak-port screws, 2; and such opening, 7^a, being provided with a movable cover plate, 8, the removal of the same gives ready access to all the leak-port screws, as seen in 50 Fig. 1.

I claim:—

1. In combination with a primary pneumatic a screw screwed directly through a side-wall of the pneumatic, having an axial 55 aperture leading from its inner end outwardly past the plane of the outer surface of side-wall, and a transverse port from said axial aperture, positioned so as to be cut by said plane, whereby the portion of its area 60 exposed outside said wall may be varied by the adjustment of the screw in the wall.

2. In combination with a primary pneumatic, a screw set through a side-wall thereof and protruding into the cavity of the 65 pneumatic, such screw having its inner end conically tapered, and having an axial aperture leading from the apex of the conical end outward with respect to the pneumatic, past the plane of the outer surface of said 70 wall, and opening outside said wall to afford a leak-port.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this second day of De- 75 cember 1909.

MELVILLE CLARK.

In the presence of—

CHAS. S. BURTON,
M. GERTRUDE ADY