A. N. GRIMES.

PNEUMATIC ACTION FOR PIANO PLAYERS.

APPLICATION FILED NOV. 10, 1913.

1,166,455.

Patented Jan. 4, 1916.

Fig. 3.

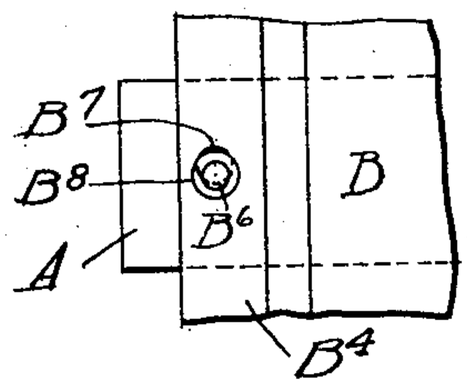
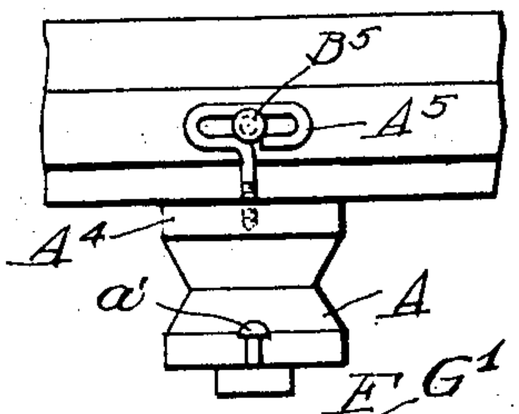


Fig. 4.



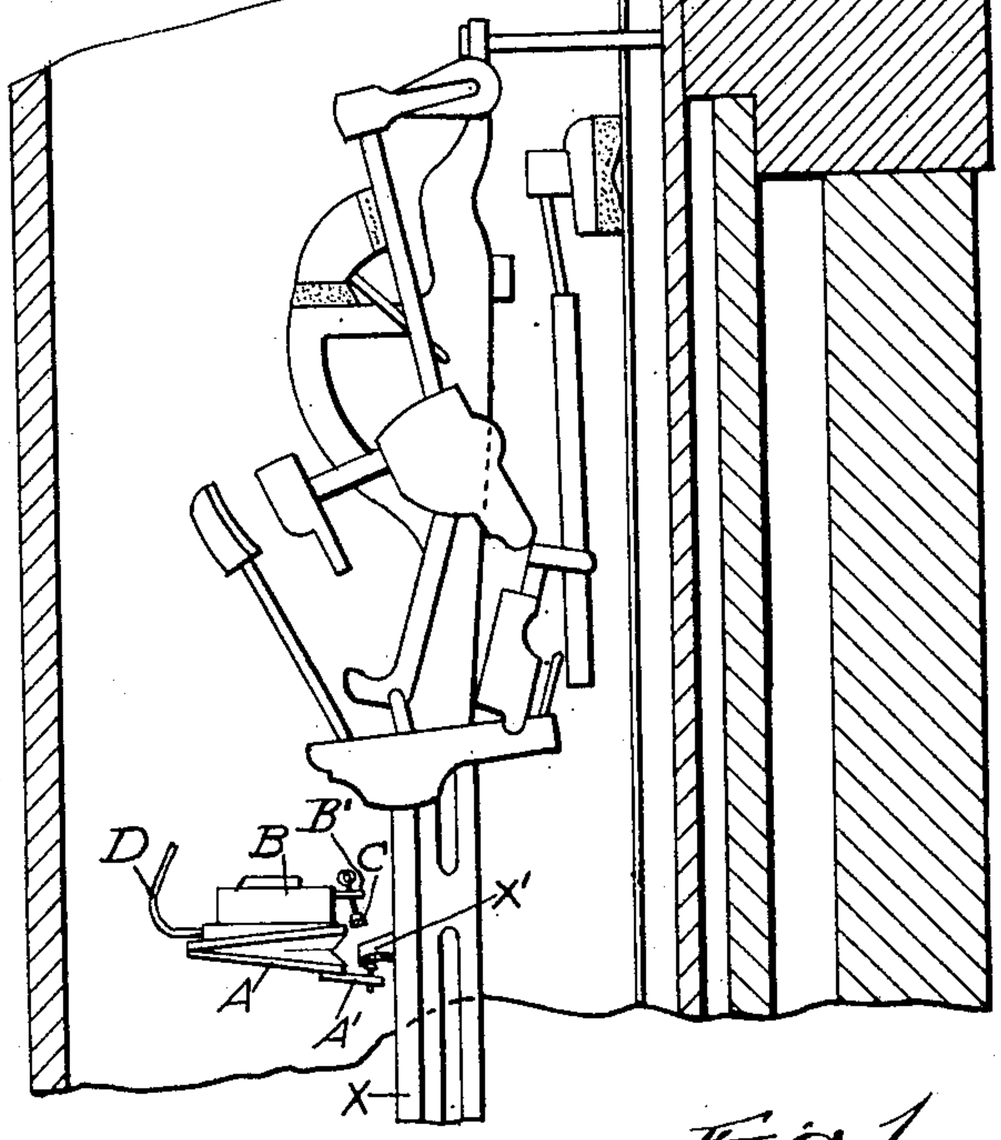


Fig. 1.

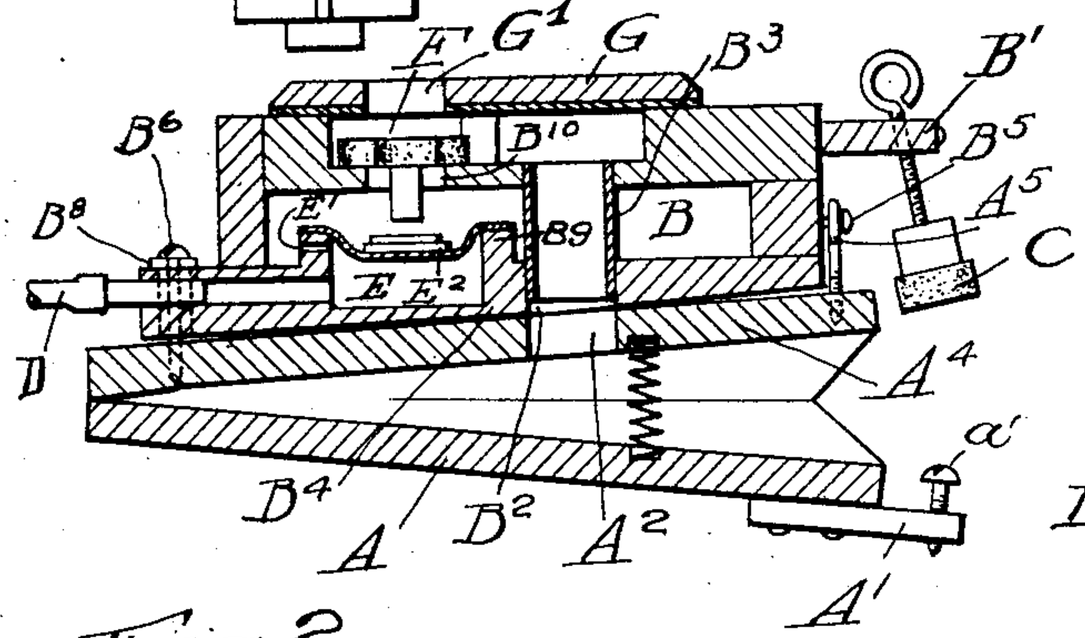


Fig. 2.

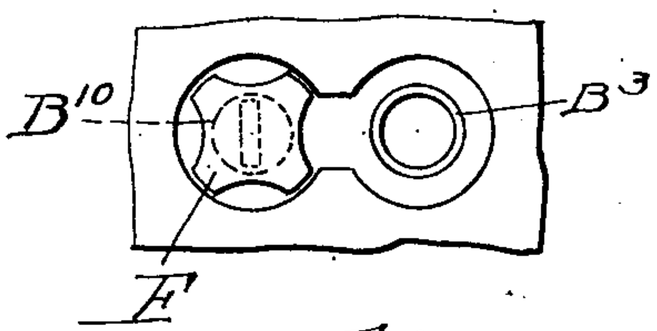


Fig. 5

Witnesses:

C. F. Pennie

Robt. L. Burton.

Inventor

Archie N. Grimes:

by Burton & Burton

his Attys:

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ARCHIE N. GRIMES, OF CHICAGO, ILLINOIS.

PNEUMATIC ACTION FOR PIANO-PLAYERS.

1,166,455. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed November 10, 1913. Serial No. 800,060.

To all whom it may concern:

Be it known that I, ARCHIE N. GRIMES, 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 Pneumatic Actions for Piano-Players, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to improvements in pneumatic player actions particularly related to the mounting of the motor pneumatics upon the tension chamber, but including certain other details of the mechanism.

It consists of the features and elements described and shown in the drawings as indicated by the claims.

In the drawings:—Figure 1 is a partial side elevation of a piano action fitted with a pneumatic player action embodying this invention. Fig. 2 is an enlarged detail section of the player action illustrated in Fig. 1. Fig. 3 is a detail plan view showing the means of attaching one end of the pneumatic to the tension chamber. Fig. 4 is a detail elevation indicating the means of attaching the other end of the pneumatic to the tension chamber. Fig. 5 is a detail plan of a special form of valve.

In the piano action conventionally represented in Fig. 1 the motor pneumatic, A, of the present invention is shown mounted for actuating the abstract, X, of the piano action by upward collapse and the encounter of the screw or button, a^1, adjustably held by the extending arm, A^1, of the pneumatic with an extension, X^1, on the abstract. The pneumatic, A, itself is mounted on the under-side of a tension chamber, B, which as will be understood extends throughout the length of the piano action or throughout that portion of it to which the pneumatic action is coupled, and for limiting the upward stroke of the abstract, X, the tension chamber, B, is fitted with a series of adjustable stop buttons, C, carried in a rail, B^1, extending from the rear face of the tension chamber.

By reason of slight differences in the interior design of different piano actions it is desirable that the motor pneumatics, A, be so mounted upon the tension chamber, B, as to be capable of limited lateral adjustment thereon, so that they may be accurately positioned with relation to the respective abstracts of the piano action which they are intended to actuate, even though these abstracts be spaced or grouped somewhat differently in different pianos. With this purpose in view the pneumatics, A, are not glued to the wall of the tension chamber, B, in the usual manner but are merely clamped against it, each with its port, A^2, in approximate registration with the port, B^2, at the end of a tube, B^3, which extends through the tension chamber, B, from its upper to its lower wall. To insure an airtight seating of the upper wall, A^4, of the pneumatic, A, upon the lower wall, B^4, of the tension chamber the latter is made slightly convex, and the wall of the pneumatic is sprung into a slight curve against it, one end being held in place by an eye, A^5, on a stud, B^5, and the other end or heel being drawn toward the convex surface of the chamber wall by a screw, B^6. As indicated in Fig. 4, the eye, A^5, is elongated to permit lateral adjustment of the pneumatic, A, with respect to the stud, B^5, and as shown in Fig. 3 the screw, B^6, passes through an enlarged hole, B^7, in a rearwardly extending portion of the wall, B^4, the said hole being capped by a washer, B^8, of sufficient size to give proper bearing for the head of the screw, B^6. This construction permits lateral shifting of either or both ends of the motor pneumatic to bring its operating arm, A^1, into proper relation with the abstract, X, which it is designed to actuate.

For the sake of compactness of construction vertically the lower wall, B^4, of the tension chamber is tapered in thickness from its forward edge to its rear edge, said rear edge serving merely to close the chamber while the forward edge is utilized for the support of the motor pneumatics as already explained, and also for containing the ducts, D, leading from the tracker board to the primary chambers, E. Within the tension chamber, B, the wall, B^4, is provided with a longitudinally extending bead or upraised rib, B^9, and the primary pneumatic chambers, E, comprise cavities formed in this rib, B^9, and extending into the main body of the wall, B^4, while a small bleeder or leak port, E^1, in the exposed edge of the rib, B^9, furnishes communication between each of the chambers, E, and the exhaust chamber, B. A diaphragm, E^2, across the top of the cavity, E, is adapted to bulge up when the

chamber, E, is vented through the duct, D, and thus to move the valve, F, in a well understood manner for connecting the motor pneumatic, A, with the exhaust chamber, B, such connection being made by way of the port, B^{10}, and the tube, B^3.

To render the valve, F, as quick and certain in its action as possible it is made star-shaped with parts of its periphery cut back from the circular wall of the valve chamber, as indicated in Fig. 5, so that the friction of the valve on said circular wall will be reduced to a minimum. The valve chamber is conveniently sunk in the upper surface of the top wall of the tension chamber, B, and is extended beyond the valve itself for communication with the tube, B^3, which leads across the chamber, B, and directly into the pneumatic, A. These cavities are capped by a cover board, G, provided with suitable ports, G^1, for admitting atmospheric pressure as usual.

I claim:—

1. In a pneumatic action for piano players, in combination with an exhaust chamber, a primary pneumatic therein, a motor pneumatic mounted upon one wall of the exhaust chamber, a valve chamber in the opposite wall and a valve therein operated by the primary pneumatic, and a tube connecting the valve chamber with the motor pneumatic extending through the exhaust chamber.

2. In a pneumatic action for piano players, an exhaust chamber, a motor pneumatic mounted upon one wall thereof, a valve chamber communicating with the exhaust chamber through its opposite wall, a valve controlling such communication, and a tube extending through the exhaust chamber affording communication between said motor pneumatic and the valve chamber.

3. In a pneumatic action for piano players, a pneumatic tension chamber, pneumatic devices positioned at opposite sides of said chamber, and a tube extending through said chamber and connecting the said devices at opposite sides thereof to afford communication between them independently of the chamber.

4. In a pneumatic action, in combination with a ported duct board, motor pneumatics having their fixed walls mounted against the surface of such board, having ports for registering with the ports of the board, said surface of the board being slightly convex longitudinally of the pneumatics, and devices securing the pneumatics to the board at the ends of the fixed walls of said pneumatics respectively, said fixed walls having their surfaces which seat upon the board normally straight longitudinally whereby they are sprung slightly upon being drawn to their seats on the board.

In testimony whereof I have hereunto set my hand at Chicago, Illinois, this 4th day of November, 1913.

ARCHIE N. GRIMES.

Witnesses:
EDNA M. MACINTOSH,
LUCY I. STONE.