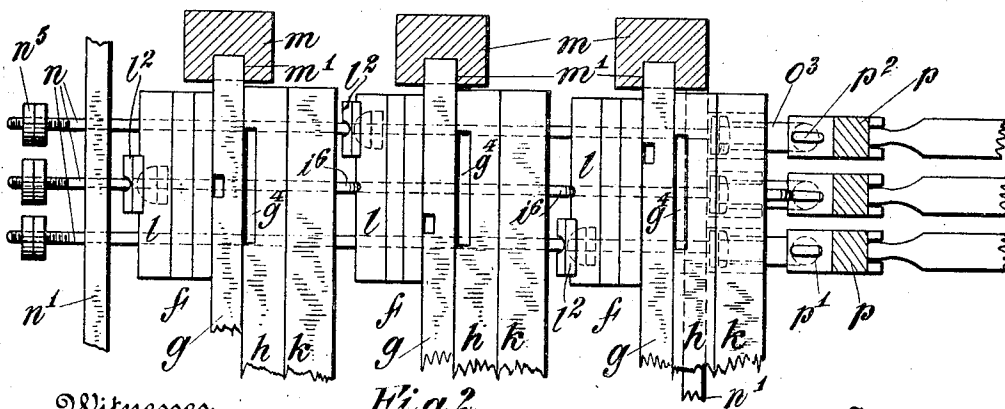
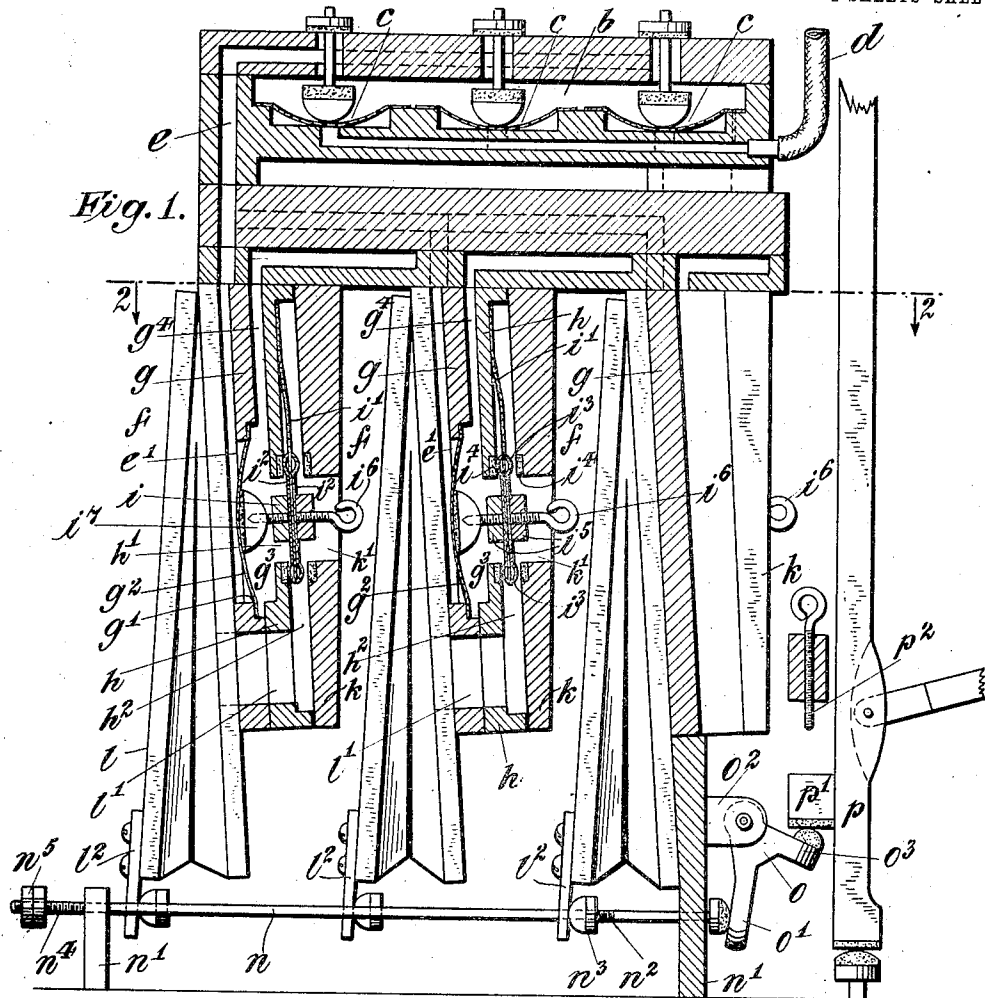


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MECHANICAL MUSICAL INSTRUMENT.  
APPLICATION FILED OCT. 26, 1909.

996,100.

Patented June 27, 1911.

2 SHEETS—SHEET 1.



Witnesses  
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Inventor  
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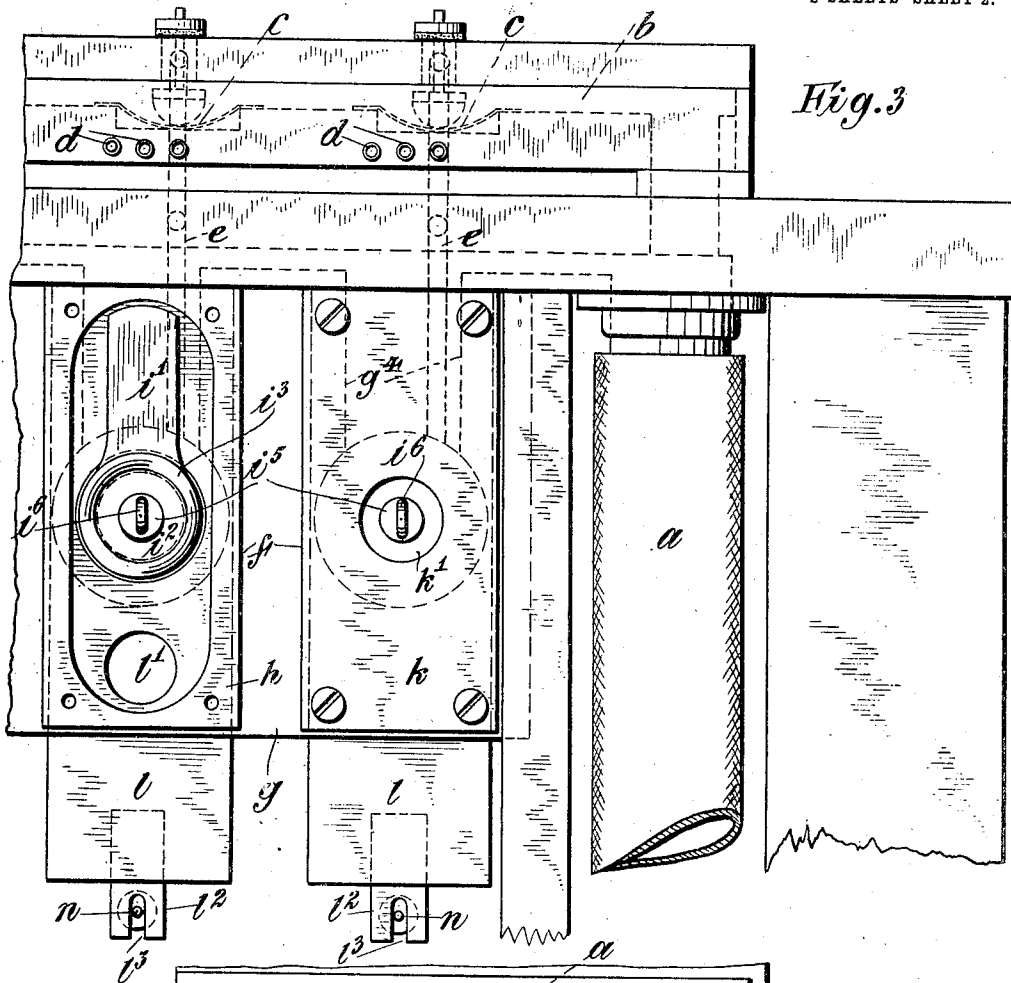
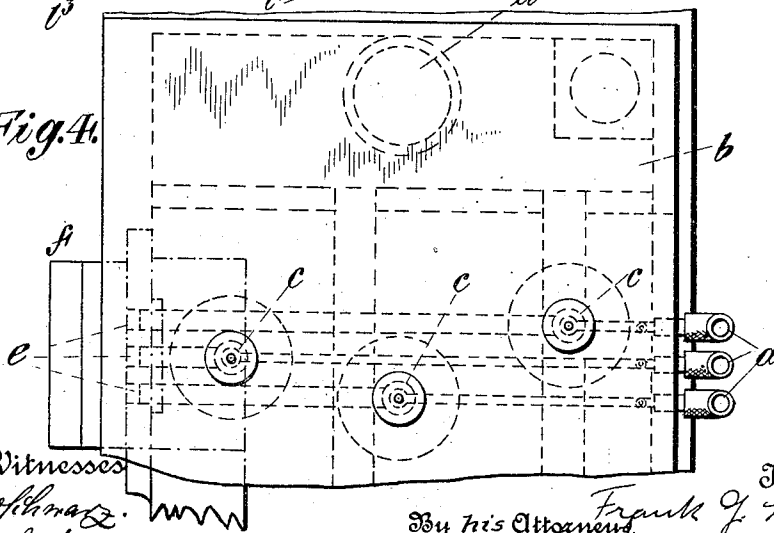


Fig. 3

Fig. 4.



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Frank G. Lynde  
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# UNITED STATES PATENT OFFICE.

FRANK G. LYNDE, OF NEW YORK, N. Y.

MECHANICAL MUSICAL INSTRUMENT.

996,100.

Specification of Letters Patent. Patented June 27, 1911.

Application filed October 26, 1909. Serial No. 524,713.

*To all whom it may concern:*

Be it known that I, FRANK G. LYNDE, a citizen of the United States, residing in the borough of Manhattan of the city of New York, in the 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 to the accompanying drawings, forming a part hereof.

This invention relates especially to the player pneumatics by which the hammers of pneumatic player pianos and piano players are actuated, although some features are applicable to pneumatics or similar devices employed in instruments of this character for other specific purposes.

One object of the invention is the attainment of compactness in the construction and arrangement of such pneumatics, as well as economy in construction. Another object is to enable the pneumatics to be completely inclosed so that their operation shall be less audible than is frequently the case.

Still another object is to secure greater facility of adjustment, both with respect to the transmission of movement from the movable member of the pneumatic to the actuated part and with respect to the valve.

The invention will be more fully explained hereinafter with reference to the accompanying drawings in which it is illustrated and in which—

Figure 1 is a view partly in elevation and partly in vertical section showing the improved pneumatics in their relation to the primary pneumatics and the wind chest and the actuating mechanism. Fig. 2 is a view in horizontal section on the plane indicated by the line 2—2 of Fig. 1 looking in the direction of the arrows. Fig. 3 is a view in elevation from the rear, the back plate of one of the pneumatics being removed. Fig. 4 is a top view.

In the construction shown in the drawings, the bellows mechanism or wind trunk, not shown, is connected through a tube *a* with the common wind chest *b* of the primary pneumatics *c*, the operations of which

are controlled, individually, by connections *d* to the tracker board. Each primary pneumatic *c* is connected through a passage *e* with the diaphragm chamber *e'* of the corresponding player pneumatic *f*. Each player pneumatic is constructed substantially as usual, comprising a vertical diaphragm board *g* which may be common to a longitudinal series of player pneumatics and is provided with a series of apertures *g'* in which are secured the diaphragms *g<sup>2</sup>*; a separate valve board *h* for each pneumatic, such valve board having an aperture *h'* with which the valve *i* coöperates; a cap *k*, having an aperture *k'* with which the valve *i* also coöperates, and vertical bellows *l*. The chamber *g<sup>2</sup>* on the opposite side of the diaphragm *g<sup>2</sup>* from the chamber *e'*, is connected with the vacuum system through a conduit *g<sup>4</sup>*, as usual. The chamber *h<sup>2</sup>*, between the valve board *h* and the cap *k*, communicates, according to the position of the valve *i*, either with the vacuum system through the aperture *h'* and the conduit *g<sup>4</sup>*, or with the atmosphere through the aperture *k'*. The bellows *l* communicates through the conduit *l'* and the chamber *h<sup>2</sup>*, either with the vacuum system or with the atmosphere, according to the position of the valve *i*, and is collapsed or expanded accordingly.

Each player pneumatic, as will be observed, is disposed vertically and the common board *g* which carries and forms a part of the pneumatics of a longitudinal series, is mounted in vertical grooves *m'* in guide blocks *m* at the ends of the main frame or casing, so that when the structure which comprises the primary pneumatics and wind chest is removed, as indicated in Fig. 2, each board *g*, with its player pneumatics, can be withdrawn vertically for adjustment or repair of the pneumatics.

Each movable member *l* of the bellows *l* has extended downwardly from it a finger *l<sup>2</sup>* which is slotted, as at *l<sup>3</sup>*, to straddle the corresponding transmitting rod *n*. The latter is mounted horizontally in guides *n'* below the pneumatics and is threaded, as at

$n^2$ , to receive adjustably a nut  $n^3$  for co-operation with the finger  $l^2$ . At its front or left hand end, at the left of the guide support  $n^1$ , each rod  $n$  is threaded, as at 5  $n^4$ , to receive adjustably a locking nut  $n^5$  by which the movement of the rod to the right, as the corresponding bellows  $l$  is collapsed, is limited. At its rear or right hand end each rod bears against the vertical arm  $o'$  10 of a jack or bell crank  $o$  which is pivoted in a suitable support  $o^2$ , its horizontal arm  $o^3$ , standing under a block  $p'$  secured to the vertical rod or abstract  $p$  by the movement of which the hammer is actuated. An ad- 15 justable stop  $p^2$  overlies each block  $p'$  to limit the upward movement of the rod or abstract  $p$ . Great nicety of adjustment in the movement of the rod or abstract  $p$  thus becomes possible through the adjustment of 20 the stop  $p^2$  by which the movement of the rod or abstract  $p$  is limited and by adjustment of the nut or stop  $n^5$ , by which the movement of the actuating rod  $n$  is limited.

The valve  $i$  comprises a flexible supporting strip  $i'$  which is secured at its upper 25 end to the valve board  $h$ , and disks  $i^2$  of metal, such as aluminum, or other suitable stiff material, which are secured on opposite sides of the flexible strip  $i'$  and are suitably formed, as with annular bosses  $i^3$ , to 30 make a tight closure against the valve board  $h$  or the cap  $k$  around the apertures  $h'$  or  $k'$ , as the case may be, an annular valve cushion  $i^4$  being set in the valve board  $h$  or cap  $k$  about the aperture therethrough. 35 Nuts  $i^5$  are placed on opposite sides of the disks or plates  $i^2$  and all parts are secured firmly together by a screw  $i^6$  which carries at its inner end a button  $i^7$  to bear on the diaphragm  $g^2$ . Sufficient inclination is 40 given to the valve board  $h$  to cause the valve  $i$ , which hangs from the point of support at the upper end of the flexible strip  $i'$ , to rest normally against the valve board  $h$ , 45 closing the aperture  $h'$  and opening the bellows  $l$  to atmospheric pressure through the aperture or port  $k'$ .

The vertical disposition of each pneumatic permits the several pneumatics to be 50 set very close together from front to rear, so that a full set occupies very much less space than is usual and can be conveniently boxed in or inclosed completely so that the operation of the pneumatics is inaudible. 55 The corresponding pneumatics of the several series may also be placed directly in line, one behind another, the fingers  $l^2$  being staggered or offset to cooperate with the several transmitting rods. For purposes 60 of adjustment or repair, the structure which comprises the primary pneumatics and their wind chest is lifted off and each longitudinal series of player pneumatics may then be withdrawn without disturbing connec- 65 tions; since the slotted fingers  $l^2$  lift off from

the rods  $n$ . If relative adjustment of the diaphragms and valves is then required, it may be readily effected by the screws  $i^6$  which are then exposed, the caps  $k$  being 70 removed, if necessary, so as to permit each valve to be turned up. The adjusting screws  $p^2$ , which limit the upward movement of the abstracts  $p^2$ , as well as the adjusting 75 nut  $n^5$  for the transmitting rods  $n$ , are accessible for adjustment without removing the pneumatics, while the nuts  $n^3$  on the rods  $n$  are readily accessible when the pneumatics have been withdrawn.

I claim as my invention:

1. In a mechanical musical instrument, 80 the combination of a series of vertically disposed player pneumatic actions having a common vertical diaphragm board with its diaphragms and valves and vertical bel- 85 lows each coöperating directly with its valve and a primary pneumatic structure above and resting upon the ends of the player pneumatic actions, and comprising primary 90 pneumatics with channels for communication with the player pneumatic actions.

2. In a mechanical musical instrument, the combination of a series of vertically dis- 95 posed player pneumatic actions having each a vertical diaphragm and a vertical valve depending freely from its point of support at the upper end, and a primary pneumatic 100 structure above and resting upon the ends of the player pneumatic actions and comprising primary pneumatics with channels communicating with the player pneumatic 105 actions.

3. In a mechanical musical instrument, the combination of a longitudinal series of 110 vertically disposed player pneumatics having each a vertical valve depending freely from its point of support at the upper end, said series of pneumatics comprising a 115 common supporting board, substantially vertical guides to receive said supporting board, and a series of primary pneumatics 120 superimposed upon the player pneumatics and communicating therewith.

4. In a mechanical musical instrument, the combination of a series of vertically dis- 125 posed player pneumatics, horizontal transmitting rods below the pneumatics and supported independently thereof, vertical ab- 130 stracts and bell crank jacks between the transmitting rods and the abstracts, the movable member of each of the pneumatic bellows having an actuating finger with an 135 open slot to straddle the corresponding transmitting rod.

5. In a mechanical musical instrument, the combination of a plurality of longitudi- 140 nal series of player pneumatics, each pneumatic being disposed vertically and having a downwardly projecting actuating finger, the corresponding pneumatics of the several 145 series being arranged in line one behind an-

other and the actuating fingers of said pneumatics being staggered or offset, a plurality of transmitting rods below each set of pneumatics in line from front to rear and  
5 severally engaged by the actuating fingers of the corresponding pneumatics, and means for supporting said rods independently of the pneumatics.

This specification signed and witnessed this 25th day of October, A. D., 1909.

FRANK G. LYNDE.

Signed in the presence of—

AMBROSE L. O'SHEA,  
W. B. GREELEY.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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