

No. 780,078.

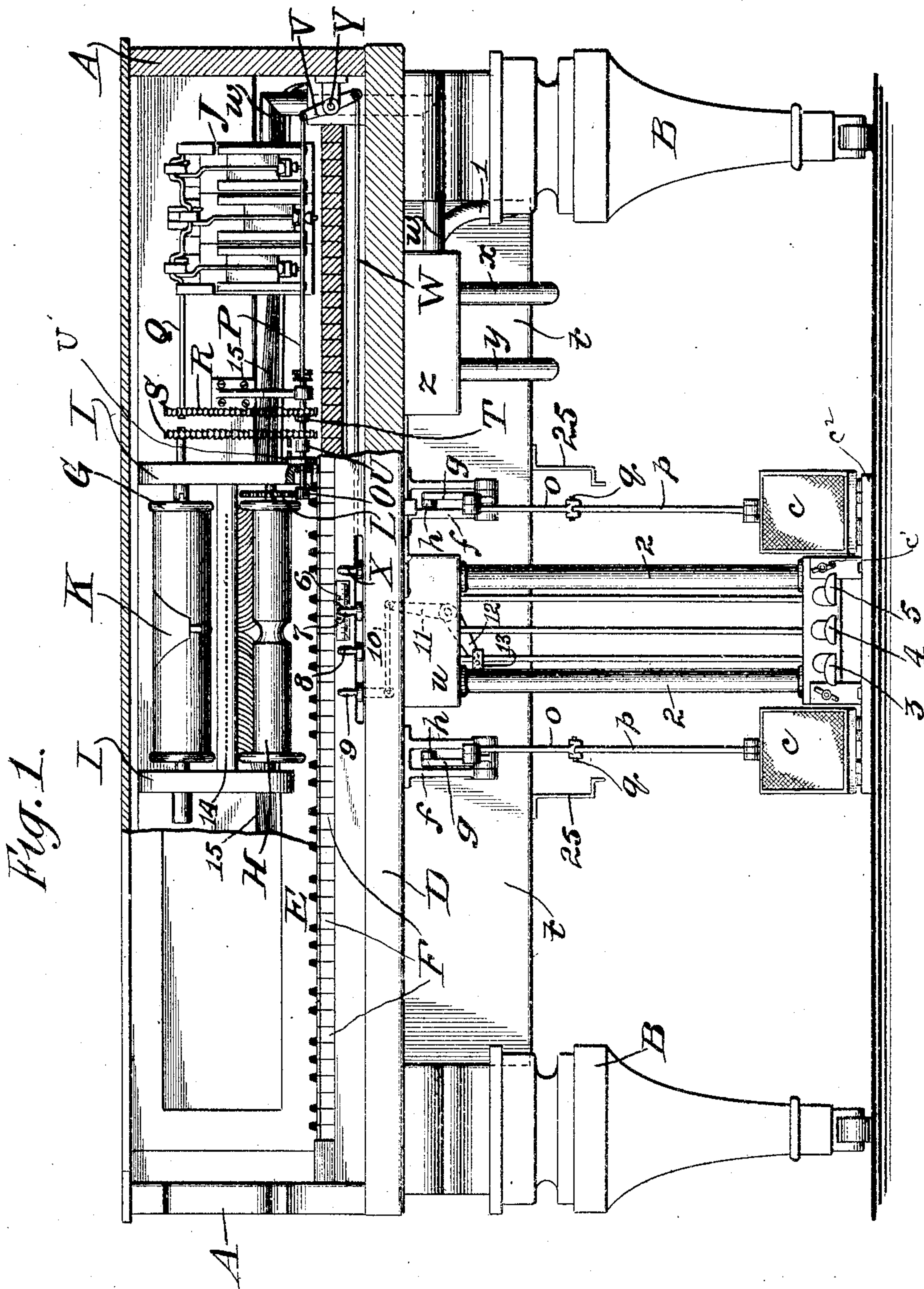
PATENTED JAN. 17, 1905.

E. S. VOTEY.

PIANO.

APPLICATION FILED FEB. 15, 1904.

3 SHEETS—SHEET 1.



WITNESSES:

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3 SHEETS—SHEET 2.

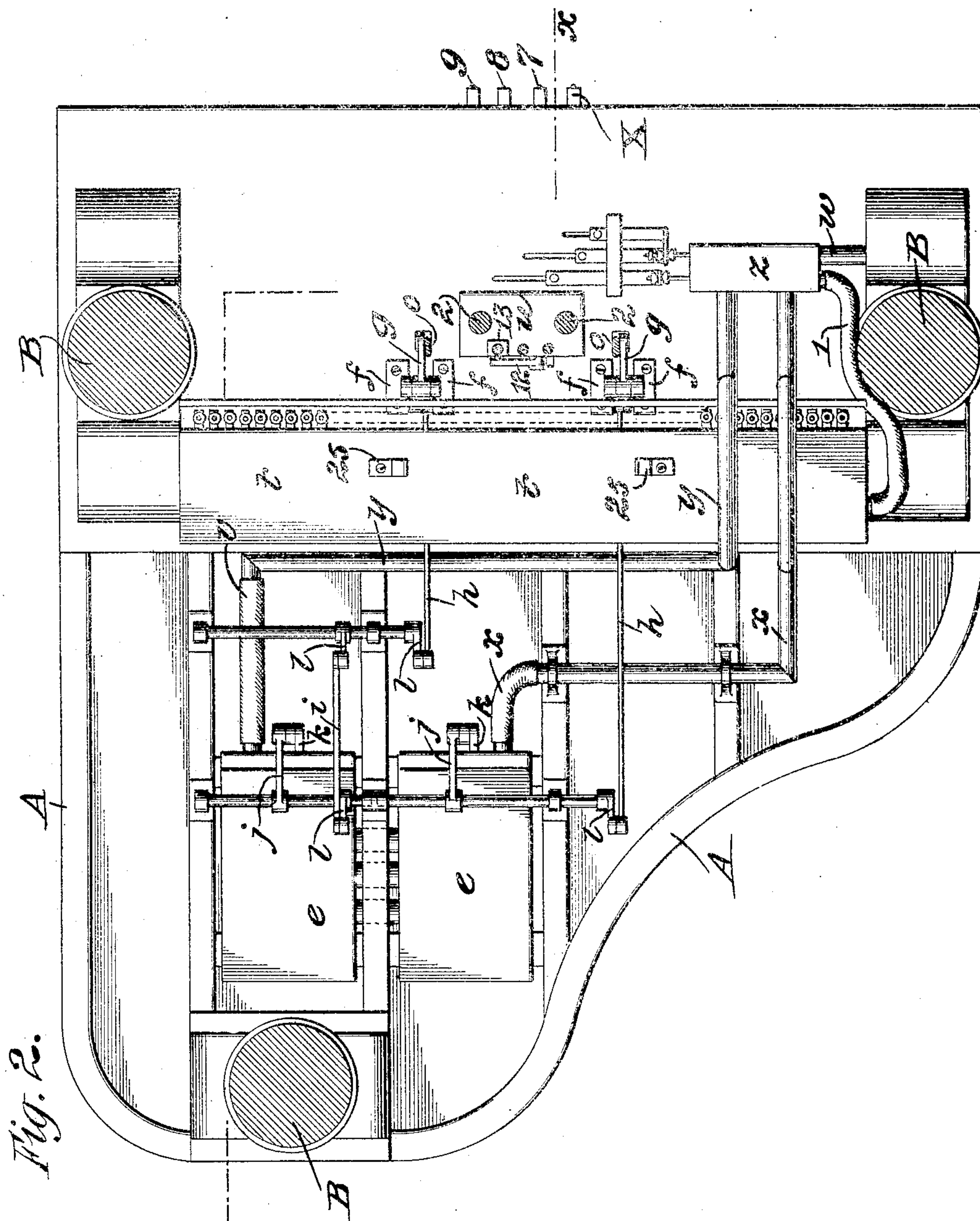


Fig. 2.

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3 SHEETS—SHEET 3.

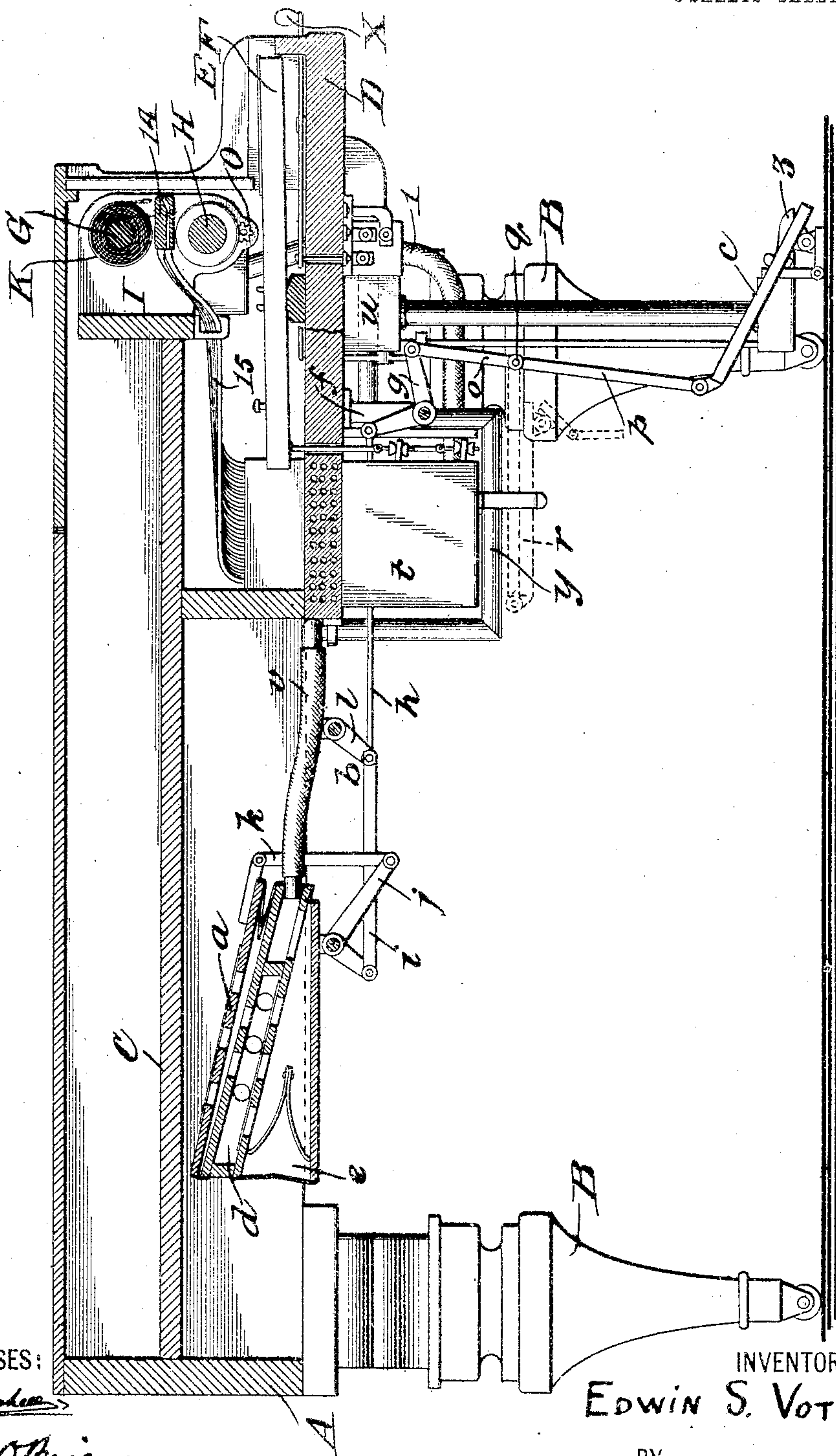


Fig. 3.

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UNITED STATES PATENT OFFICE.

EDWIN S. VOTEY, OF SUMMIT, NEW JERSEY, ASSIGNOR TO THE AEOLIAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF CONNECTICUT.

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SPECIFICATION forming part of Letters Patent No. 780,078, dated January 17, 1905.

Application filed February 15, 1904. Serial No. 193,517.

To all whom it may concern:

Be it known that I, EDWIN S. VOTEY, a citizen of the United States, and a resident of Summit, New Jersey, have invented certain new and useful Improvements in Pianos, of which the following is a specification accompanied by drawings.

This invention relates to pianos, more particularly to combined pneumatic and manually-operated grand pianos; and the objects of the invention are to enable a grand piano to be played by pneumatic apparatus and devices incorporated in the construction of the piano, while at the same time affording provision for playing the piano manually, if desired, without removing or altering any of the pneumatic playing devices.

Another object of the invention is to construct the playing apparatus as a permanent part of the grand piano without altering to any great degree the general form of the construction, so that the instrument as a whole forms a complete pneumatic and manually-operated grand piano pleasing in appearance, readily controlled, easily interchanged, and efficient in operation.

Further objects of the invention will hereinafter appear; and to these ends the invention consists of a combined pneumatic and manually-operated grand piano for carrying out the above objects embodying the features of construction, combinations of elements, and arrangement of parts, having the general mode of operation substantially as hereinafter fully described and claimed in this specification and shown in the accompanying drawings, in which—

Figure 1 is a front elevation of a grand piano constructed in accordance with this invention. Fig. 2 is a bottom plan view of a piano, partly in section. Fig. 3 is a longitudinal sectional elevation on the line *x x* of Fig. 2.

Referring to the drawings, A represents the frame or casing of a grand piano having the usual legs B, sounding-board C, key-bed D, and the keyboard E, comprising the keys F. The casing or frame and the general arrangement of parts are those of a grand piano of

the usual construction, and the pneumatic playing apparatus is applied to the piano in such manner that the arrangement or position of the keys is not altered. Music-roll mechanism, comprising the music-rolls G and H, supported in the frame I and provided with suitable driving connections, is arranged above the key-bed, and a suitable pneumatic motor J for actuating the music-roll mechanism is secured laterally of said mechanism, also above the key-bed of the instrument, as shown in Fig. 1.

The general shape and construction of a grand piano has not heretofore been found suitable for the application of mechanical playing apparatus, and in order to afford provision for the application of music-roll mechanism to the piano in position to be readily accessible it will be seen that the upper front portion of the piano has been somewhat altered to enable the music rolls and motor to be carried at the front of the piano and above the keys. The music-roll mechanism and motor driving the same are built into the piano and arranged in the desired position, while the front portion of the piano-casing is constructed to cover said mechanism and for this purpose is brought forward and extended farther than in the ordinary grand-piano construction, as will be seen from an inspection of Fig. 3. As shown in the drawings, the motor J is of the usual pneumatic form and is connected to drive the roll H in one direction for operating the music-sheet K, while the driving connections may be controlled to operate the other roll, G, to rewind the music-sheet. As shown, the roll H is provided with a gear L, meshing with a pinion O on the longitudinally-movable driven shaft P. The driving-shaft Q of the motor J is connected to the driven shaft P by the chain R, while said driven shaft is adapted to be connected to the spindle of the roll G by the chain S. On the driven shaft P is the sprocket T, which operates when the pinion O is in engagement with the gear L to rotate the roll H. When the shaft P has been longitudinally moved to move the pinion O out of engagement with the gear L, the clutch member

U' is at the same time brought into engagement with the pin on the sprocket U, loosely mounted on the shaft P, which through the chain S acts to rotate the roll G in the direction to rewind the music-sheet. The driven shaft P is suitably operated and controlled from the front of the piano by means of the pivoted lever V, connecting-rod W, and handle X. Manipulation of the handle X rocks the lever V on its pivot Y to control the driving mechanism of the music-rolls. Suitable operative connections have been described for controlling the music-rolls; but it is to be understood that any connections adapted to this purpose may be used.

One of the features of this invention consists of the arrangement of the pumping mechanism *a* beneath the sounding-board C of the instrument. Said pumping mechanism *a* is secured and supported upon the frame A, as indicated, while actuated mechanisms *b* extend longitudinally of the frame and connect with the actuating-treadles *c*. The usual air-chamber *d* and equalizers *e* are in communication with the pumping mechanism *a* and are also secured and supported upon the frame beneath the sounding-board C.

The actuated mechanisms connected to be operated by the treadle *c* may consist of any suitable connections for operating the pumping mechanism. As shown in this instance, supports or hangers *f* are suitably secured to the frame of the instrument and provided with pivoted bell-crank levers *g*, to the upper arms of which are pivoted the rods *h*, operating the links *i*, which in turn are connected to actuate the bell-crank levers *j*, having the pivoted links *k* for actuating the pumping mechanism *a*. The pivotal connection between the rod *h* and link *i* is pivotally hung from the frame A of the piano by the link *l*.

The ends of the bell-crank levers *g* opposite to those to which the rods *h* are connected are pivoted to foldable members comprising the links *o* and *p*, pivoted to each other at the point *q*, the lower links *p* being connected to the treadle *c*. This construction of treadles and linkage affords provision for folding the treadles upwardly into the position shown in dotted lines at *r* in Fig. 3 when it is desired to play the piano manually. Any other suitable arrangement may be provided to afford provision for the adjustment of the treadles into a position such that they will not interfere with the player when it is desired to have them supported out of playing position. The actuated mechanisms described afford suitable provision for operating the pumping mechanism from the treadles. The action-case *t*, as shown, is secured to the frame between the pedal-support comprising the part *u* and the lyre 2 and the pumping mechanism *a*, and one or more wind-ducts *v* are provided, which, together with the passages *w*, *x*, and *y*, connect the air-chamber *d* with the valve-casing *z*,

(shown in Figs. 1 and 2,) the casing *z* being connected with the action-case by means of the pipe 1, as well understood in the art. The lyre 2 for the pedals is shown in Fig. 1 as in the usual grand piano, and operative connections are provided from the pedals 3, 4, and 5 for controlling the operation of the instrument. The usual indicator 6 is arranged, as shown in Fig. 1, adjacent the case, while a tempo hand-lever 7 is connected to control the tempo. Another hand-lever, 8, is connected to control the expression, while the hand-lever 9 extends beneath the piano-keys and is provided with connections 10, 11, 12, and 13 for actuating the pedal movement 3 of the piano. It is understood that similar connections are pivoted to the frame beneath the key-bed and between the levers 7 and 8 and the tempo and expression mechanisms, respectively.

From the tracker-board 14 tracker connections 15 extend downward and rearward to the action-case *t*. Operative connections are provided in the usual manner controlled by the action for operating the keys F.

According to this invention it will be seen that the pneumatic apparatus for operating the grand piano has been distributed to obtain the best results and at the same time prevent an unsightly structure. The arrangement of the different devices is such that the most direct connections are provided between the operative mechanisms compatible with the peculiar form of a grand piano. Interference with the sounding-board and with the operation of the keys is guarded against, while all of the apparatus is concealed from view as much as possible in the frame of the piano without the addition of heavy casings. The pumping mechanism is secured and supported upon the frame beneath the sounding-board, as are the air-chambers and equalizers, while the action-case is secured to the frame between the pedal-support thereof, and the said pumping mechanism is arranged to be in communication with the air-chamber. The music-roll mechanism and motor for actuating the music-rolls are supported above the piano-keys and provided with valve-controlled passages communicating with the air-chamber of the pumping mechanism. It will be seen that the action-case is beneath and at the rear of the key-bed and forms the center or starting-point for all of the operative connections and mechanisms for operating the instrument. The expression-valve mechanism for the action-case is separate from the said action-case and, as shown, is secured to the frame, while means have been described for actuating the said mechanism. It will be seen that the treadles *c* are detachably fixed to the pedal-support by means of set-screws *c'* engaging in a bar *c''*, connecting the treadles, and are provided with folding connections and with means for supporting them beneath the

frame when detached from the pedal-support. In Fig. 1 the hooks 25 are shown for this purpose. The frame of the piano, as hereinbefore described, has an extended fore portion for receiving the tracker-board and music-roll mechanism, while the piano-keys are elongated to extend beneath the said extended fore portion, with means controlled by the tracker for actuating the rear ends of the keys.

Obviously some features of this invention may be used without others and the invention may be embodied in widely-varying forms.

Therefore, without limiting the invention to the constructions shown and described nor enumerating equivalents, I claim, and desire to secure by Letters Patent, the following:

1. In a combined pneumatic and manually-operated grand piano and in combination with the frame and sounding-board thereof, pumping mechanism secured and supported upon said frame beneath the said sounding-board and provided with actuated mechanisms extending longitudinally of the frame and connected with actuating-treadles.

2. In a combined pneumatic and manually-operated grand piano and in combination with the frame and sounding-board thereof, pumping mechanism secured and supported upon said frame beneath the said sounding-board and provided with actuated mechanisms extending longitudinally of the frame and connected with actuating-treadles, and an air-chamber and equalizers in communication with the said pumping mechanism and secured and supported upon the frame beneath the sounding-board.

3. In a combined pneumatic and manually-operated grand piano and in combination with the frame and sounding-board thereof, pumping mechanism secured and supported upon said frame beneath the said sounding-board and provided with actuated mechanisms extending longitudinally of the frame and connected with actuating-treadles, an air-chamber and equalizers in communication with the said pumping mechanism and secured and supported upon the frame beneath the sounding-board, and an action-case secured to the said frame between the pedal-support thereof and the said pumping mechanism and provided with one or more wind-ducts in communication with the said air-chamber.

4. In a combined pneumatic and manually-operated grand piano and in combination with the frame and sounding-board thereof, pumping mechanism secured and supported upon said frame beneath the said sounding-board and provided with actuated mechanisms extending longitudinally of the frame and connected with actuating-treadles, and an air-chamber and equalizers in communication with the said pumping mechanism and secured and supported upon the said frame beneath the sounding-board, and a pneumatic motor for

actuating the music-rolls supported above the piano-keys provided with valve-controlled passages communicating with the said air-chamber.

5. In a combined pneumatic and manually-operated grand piano and in combination with the frame and sounding-board thereof, pumping mechanism secured and supported upon said frame beneath the said sounding-board and provided with actuated mechanisms extending longitudinally of the frame and connected with actuating-treadles, and an air-chamber and equalizers in communication with the said pumping mechanism and secured and supported upon the frame beneath the sounding-board, and a pedal-support extending down from the frame of the piano and to which the said treadles are detachably fixed.

6. In a combined pneumatic and manually-operated grand piano and in combination with the frame and sounding-board thereof, pumping mechanism secured and supported upon said frame beneath the said sounding-board and provided with actuated mechanisms extending longitudinally of the frame and connected with actuating-treadles, and an air-chamber and equalizers in communication with the said pumping mechanism and secured and supported upon the frame beneath the sounding-board, and a pedal-support extending down from the frame of the piano and to which the said treadles are detachably fixed, and a manual lever extending beneath the piano-keys and provided with connections for actuating one of the pedal movements of the piano.

7. In a combined pneumatic and manually-operated grand piano and in combination with the frame and keyboard thereof, pumping mechanism secured to and supported upon the said frame beneath the sounding-board and an action-case also secured to the said frame beneath and at the rear of the key-bed and provided with pneumatic connections to the said pumping mechanism.

8. In a combined pneumatic and manually-operated grand piano the combination with the frame and sounding-board thereof, of pumping mechanism secured and supported upon the said frame beneath the sounding-board, an action-case secured to the said frame behind the pedal-supports thereof and beneath the sounding-board, and a tracker-board and music-roll mechanism secured to the frame above the piano-keys and provided with tracker connections leading downward and rearward to the action-case.

9. In a combined pneumatic and manually-operated grand piano the combination with the frame and sounding-board thereof, of pumping mechanism secured and supported upon the said frame beneath the sounding-board, an action-case secured to the said frame behind the pedal-supports thereof and beneath the sounding-board, and a pneumatic motor for actuating the said music-roll mechanism.

anism and secured laterally thereof above the key-bed of the instrument.

10. In a combined pneumatic and manually-operated grand piano the combination with the frame and sounding-board thereof, of pumping mechanism secured and supported upon the said frame beneath the sounding-board, an action-case secured to the said frame behind the pedal-supports thereof and beneath the sounding-board, and a pedal-support extending downward from the said frame and treadles detachably fixed thereto and provided with connections for actuating the said pumping mechanism therefrom.

11. In a combined pneumatic and manually-operated grand piano the combination with the frame and sounding-board thereof, of pumping mechanism secured and supported upon the said frame beneath the sounding-board, an action-case secured to the said frame behind the pedal-supports thereof and beneath the sounding-board, a tempo-valve mechanism mounted upon the said frame, a motor controlled thereby and pneumatic connections from the said valve mechanism to the said pumping mechanism.

12. In a combined pneumatic and manually-operated grand piano the combination with the frame and sounding-board thereof, of pumping mechanism secured and supported upon the said frame beneath the sounding-board, an action-case secured to the said frame behind the pedal-supports thereof and beneath the sounding-board, a tempo-valve mechanism mounted upon the said frame, a motor controlled thereby and pneumatic connections from the said valve to the said pumping mechanism, and means for changing the roll-driving connection of the said motor at will.

13. In a combined pneumatic and manually-operated grand piano and in combination with the frame and horizontal sounding-board and the key-bed and keys thereof, pumping mechanism secured and supported upon the said frame beneath the said sounding-board, and a pneumatic motor for actuating the music-rolls, said motor secured to the frame above the key-bed, a valve mechanism for controlling the said motor and pneumatic connections controlled by the said valve mechanism and connecting the said motor with the said pumping mechanism.

14. In a combined pneumatic and manually-operated grand piano and with the frame, horizontal sounding-board, key-bed, and keys thereof, pumping mechanism secured and supported upon the frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured above the key-bed and provided with a controlling-valve mechanism, pneumatic connections for the said motor, a pedal-support extending downward from the frame and treadles detachably fixed thereto

and provided with operative connections for the said pumping mechanism.

15. In a combined pneumatic and manually-operated grand piano and with the frame, horizontal sounding-board, key-bed, and keys thereof, pumping mechanism secured and supported upon the frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured above the key-bed and provided with a controlling-valve mechanism, pneumatic connections for the said motor, a pedal-support extending downward from the frame and treadles detachably fixed thereto and provided with operative connections for the said pumping mechanism, and a manual lever pivotally mounted beneath the keys and connected to actuate one of the piano-pedal mechanisms.

16. In a combined pneumatic and manually-operated grand piano and with the frame, horizontal sounding-board, key-bed, and keys thereof, pumping mechanism secured and supported upon the frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured above the key-bed and provided with a controlling-valve mechanism, pneumatic connections for the said motor, and a tempo-lever pivotally secured to the key-bed beneath the keys thereof and connected to actuate the said valve mechanism.

17. In a combined pneumatic and manually-operated grand piano and with the frame, horizontal sounding-board, keyboard, and keys thereof, pumping mechanism secured and supported upon the frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured above the keyboard and provided with a controlling-valve mechanism, pneumatic connections for the said motor, and means for reversing the music-roll-actuating connections of the said motor and a controlling-lever therefor extending beneath the said keys.

18. In a combined pneumatic and manually-operated grand piano, the combination of the frame, horizontal sounding-board, pedal-support depending from the frame and pedals thereof, a pumping mechanism secured and supported upon the frame beneath the sounding-board, treadles detachably connected with the said pedal-support and operative connections from the said treadles to the said pumping mechanism.

19. In a combined pneumatic and manually-operated grand piano, the combination of the frame, horizontal sounding-board, pedal-support depending from the frame and pedals thereof, a pumping mechanism secured and supported upon the frame beneath the sounding-board, treadles movably mounted upon the said pedal-support and operative connections from the said treadles to the said pumping mechanism, and a manual lever pivoted to the frame of the piano beneath the keys

thereof and provided with connections for actuating one of the piano-pedal mechanisms.

20. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case and pneumatic connections extending from the said chamber to the said action-case.

21. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, pneumatic connections between the said air-chamber and the said action-case, a tracker-board and music-roll mechanism secured above the piano-keys and tracker connections extending rearward and downward from the said tracker-board to the said action-case.

22. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, a pneumatic motor for actuating the music-rolls secured to the frame above the piano-keys and a controlling-valve mechanism and pneumatic connections therefor.

23. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, a pneumatic motor for actuating the music-rolls secured to the frame above the piano-keys and a controlling-valve mechanism and pneumatic connections therefor, and a tempo-lever pivoted to the frame beneath the piano-keys and connected to control the said valve mechanism.

24. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-

supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, a pneumatic motor for actuating the music-rolls secured to the frame above the piano-keys and a controlling-valve mechanism and pneumatic connections therefor, and a tempo-lever pivoted to the frame beneath the piano-keys and connected to control the said valve mechanism, and means for reversing the drive of the said motor.

25. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, a pneumatic motor for actuating the music-rolls secured to the frame above the piano-keys and a controlling-valve mechanism and pneumatic connections therefor and means for reversing the music-roll-actuating connections of the said motor.

26. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, and an expression-controlling-valve mechanism secured to the said frame and provided with connections to the said action-case.

27. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board, depending pedal-supports and pedals thereof, of an action-case secured to the said frame behind the pedal-supports thereof and beneath the said sounding-board, an air-chamber and equalizers secured and supported upon the said frame beneath the said sounding-board independently of the said action-case, an expression-controlling-valve mechanism secured to the said frame and provided with connections to the said action-case, and an expression-lever therefor pivoted to the frame beneath the piano-keys and connected to actuate the said expression-valve mechanism.

28. In a combined pneumatic and manually-operated grand piano and in combination with the frame, sounding-board, depending pedal-supports, pedals, and keys thereof, an air-chamber and equalizers secured and supported upon said frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured to the frame above the said keys, and valve-controlled pneumatic connec-

tions between the said air-chamber and the said motor.

29. In a combined pneumatic and manually-operated grand piano and in combination with the frame, sounding-board, depending pedal-supports, pedals, and keys thereof, an air-chamber and equalizers secured and supported upon said frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured to the frame above the said keys, and valve-controlled pneumatic connections between the said air-chamber and the said motor, a tempo-lever mounted beneath the piano-keys and provided with actuating connections for adjusting the valve mechanisms of said valve-controlled connections.

30. In a combined pneumatic and manually-operated grand piano and in combination with the frame, sounding-board, depending pedal-supports, pedals, and keys thereof, an air-chamber and equalizers secured and supported upon said frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured to the frame above the said keys, and valve-controlled pneumatic connections between the said air-chamber and the said motor, a tempo-lever mounted beneath the piano-keys and provided with actuating connections for adjusting the valve mechanisms of said valve-controlled connections, and means for reversing the said motor.

31. In a combined pneumatic and manually-operated grand piano and in combination with the frame, sounding-board, depending pedal-supports, pedals, and keys thereof, an air-chamber and equalizers secured and supported upon said frame beneath the sounding-board, a pneumatic motor for actuating the music-rolls secured to the frame above the said keys, and valve-controlled pneumatic connections between the said air-chamber and the said motor, and a reversing-lever pivoted adjacent the piano-keys and provided with connections for reversing the music-roll-actuating connections of said motor.

32. In a combined pneumatic and manually-operated grand piano, the combination of a frame, a horizontal sounding-board, keys, depending pedal-supports, action-case secured to the said frame behind the said pedal-supports and beneath the said sounding-board, a tracker-board and music-roll mechanism mounted on the frame above the piano-keys, and tracker connections leading rearward and downward from the said tracker-board to the said action-case.

33. In a combined pneumatic and manually-operated grand piano, the combination of a frame, a horizontal sounding-board, keys, depending pedal-supports, action-case secured to the said frame behind the said pedal-supports and beneath the said sounding-board, a tracker-board and music-roll mechanism mounted on the frame above the piano-keys, tracker connections extending from the

tracker rearward and downward to the said action-case, and a pneumatic motor for actuating the music-roll mechanism secured to the frame above the piano-keys.

34. In a combined pneumatic and manually-operated grand piano, the combination of a frame, a horizontal sounding-board, keys, depending pedal-supports, action-case secured to the said frame behind the said pedal-supports and beneath the said sounding-board, a tracker-board and music-roll mechanism mounted on the frame above the piano-keys, tracker connections extending from the tracker rearward and downward to the said action-case, a pneumatic motor for actuating the music-roll mechanism secured to the frame above the piano-keys, and a tempo-valve mechanism and connections for the said motor.

35. In a combined pneumatic and manually-operated grand piano, the combination of a frame, a horizontal sounding-board, keys, depending pedal-supports, action-case secured to the said frame behind the said pedal-supports and beneath the said sounding-board, a tracker-board and music-roll mechanism mounted on the frame above the piano-keys, tracker connections extending from the tracker rearward and downward to the said action-case, a pneumatic motor for actuating the music-roll mechanism secured to the frame above the piano-keys, and means for reversing the drive of said motor.

36. In a combined pneumatic and manually-operated grand piano, the combination of a frame, a horizontal sounding-board, keys, a depending pedal-support, action-case secured to the said frame behind the said pedal-support and beneath the said sounding-board, a tracker-board and music-roll mechanism mounted on the frame above the piano-keys, tracker connections extending from the tracker rearward and downward to the said action-case, expression-valve mechanism secured to the frame beneath the piano-keys and in pneumatic connection with the action-case.

37. In a combined pneumatic and manually-operated grand piano, the combination of a frame, a horizontal sounding-board, keys, a depending pedal-support, action-case secured to the said frame behind the said pedal-support and beneath the said sounding-board, a tracker-board and music-roll mechanism mounted on the frame above the piano-keys, tracker connections extending from the tracker rearward and downward to the said action-case, expression-valve mechanism secured to the frame beneath the piano-keys and in pneumatic connection with the action-case, and a controlling-lever therefor pivoted to the frame beneath the piano-keys.

38. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board and piano-keys thereof, of an action-case secured to the frame

behind the pedal-support thereof and beneath the sounding-board, expression-valve mechanism for the said action-case separable from the said action-case and secured to the said frame and means for actuating the said mechanism.

39. In a combined pneumatic and manually-operated grand piano, the combination with the frame, sounding-board and piano-keys thereof, of an action-case secured to the frame behind the pedal-support thereof and beneath the sounding-board, expression-valve mechanism for the said action-case separate from the said action-case and secured to the said frame, and an expression-lever secured to the said frame beneath the piano-keys and provided with connections for actuating the said expression mechanism.

40. In a combined pneumatic and manually-operated grand piano and in combination with the frame, depending pedal-support and pedals and piano-keys thereof, a tracker-board and music-rolls mounted upon the said frame above the piano-keys, a pneumatic motor and connections for actuating the said music-rolls mounted upon the said frame above the said keys, and means for actuating and controlling the said motor.

41. In a combined pneumatic and manually-operated grand piano and in combination with the frame, a depending pedal-support and pedals and piano-keys thereof, a tracker-board and music-rolls mounted upon the said frame above the piano-keys, a pneumatic motor and connections for actuating the said music-rolls mounted upon the said frame above the said keys, and tempo-valve mechanism for the said motor and a tempo-lever pivoted beneath the said keys and connected to actuate the said tempo-valve mechanism.

42. In a combined pneumatic and manually-operated grand piano and in combination with the frame, depending pedal-support and pedals and piano-keys thereof, a tracker-board and music-rolls mounted upon the said frame above the piano-keys, a pneumatic motor and connections for actuating the said music-rolls mounted upon the said frame above the said keys, and tempo-valve mechanism for the said motor and a tempo-lever pivoted beneath the said keys and connected to actuate the said tempo-valve mechanism, and means for reversing the music-rolls.

43. In a combined pneumatic and manually-operated grand piano and in combination with the frame, depending pedal-support and pedals and piano-keys thereof, a tracker-board and music-rolls mounted upon the said frame above the piano-keys, a pneumatic motor and connections for actuating the said music-rolls mounted upon the said frame above the said keys, means for actuating and controlling the speed of the said motor and means for reversing the music-rolls.

44. In a combined pneumatic and manually-

operated grand piano and in combination with the frame, and piano-keys thereof, of a tracker-board and music-roll mechanism carried by the said frame above the said keys an actuating-motor therefor and controlling mechanism therefor extending beneath the said keys to be manually operated.

45. In a combined pneumatic and manually-operated grand piano and in combination with the frame and piano-keys thereof, of a tracker-board and music-roll mechanism carried by the said frame above the said keys, an actuating-motor therefor and controlling mechanism therefor including a tempo-lever pivoted to the said frame beneath the said keys.

46. In a combined pneumatic and manually-operated grand piano, and in combination with the frame and piano-keys thereof, of a tracker-board and music-roll mechanism carried by the said frame above the said keys, an actuating-motor therefor and controlling mechanism therefor, and means for reversing the operation of the rolls.

47. In a combined pneumatic and manually-operated grand piano and in combination with the frame and piano-keys thereof, of a tracker-board and music-roll mechanism carried by the said frame above the said keys, an actuating-motor therefor and controlling mechanism therefor, and means for reversing the operation of the rolls including a reversing-lever pivoted to the frame adjacent said keys.

48. In a combined pneumatic and manually-operated grand piano and in combination with the frame and keys thereof, a motor for actuating the music-rolls secured to the said frame and above the said keys and controlling mechanism for the said motor extending beneath the said keys.

49. In a combined pneumatic and manually-operated grand piano and in combination with the frame and keys thereof, a motor for actuating the music-rolls secured to the said frame and above the said keys and controlling mechanism for the said motor extending beneath the said keys, including a manually-operated lever pivoted to the frame adjacent the said keys.

50. In a combination pneumatic and manually-operated grand piano and in combination with the frame and keys thereof, a motor for actuating the music-rolls secured to the said frame and above the said keys and controlling mechanism for the said motor extending beneath the said keys, including a manually-operated lever pivoted to the frame adjacent the said keys, and means for reversing the driving connections from the said motor for reversing the actuation of the said music-rolls.

51. In a combination pneumatic and manually-operated grand piano and in combination with the frame and keys thereof, a motor for actuating the music-rolls secured to the said frame and above the said keys and controlling mechanism for the said motor extending be-

neath the said keys, including a manually-operated lever pivoted to the frame adjacent the said keys, and means for reversing the driving connections from the said motor for reversing the actuation of the said music-rolls, comprising a lever pivoted adjacent the said keys.

52. In a combined pneumatic and manually-operated grand piano and in combination with the frame and depending pedal-support, thereof, of treadles and connections for actuating the pneumatic mechanism, said treadles being detachably secured to said pedal-support and provided with folding connections and means for supporting them beneath the frame when detached from the said pedal-supports.

53. In a combined pneumatic and manually-operated grand piano and in combination with a frame and keys therefor, a pneumatic motor mounted upon the said frame above the said keys, music-rolls mounted above the said keys, connections from the said motor for actuating either one of the said music-rolls, and manual means for controlling the said connections extending beneath the said keys, affording provision for manual control at the front of the keyboard.

54. In a combined pneumatic and manually-operated grand piano and in combination with a frame and keys therefor, a pneumatic motor mounted upon the said frame above the said keys, music-rolls mounted above the said keys, connections from the said motor for actuating either one of the said music-rolls, manual means for controlling the said connections extending beneath the said keys for manual control at the front of the keyboard, and manual means for controlling the said motor extending beneath the said keys, affording provision for manual operation at the front of the said keyboard.

55. In a combined pneumatic and manually-operated grand piano and in combination with a frame and keys therefor, a pneumatic motor mounted upon the said frame above the said keys, music-rolls mounted above the said keys, connections from the said motor for actuating either one of the music-rolls, and connections for controlling the said motor from the front of the keyboard, said connections including a manually-operated lever extending beneath the said keys.

56. In a combined pneumatic and manually-operated grand piano, the combination of the frame and horizontal sounding-board, a pedal-support extending downward and at a right angle with the plane of the said sounding-board, pedals mounted in the said support, piano-keys and a bell-crank lever and connections for actuating one of the pedals.

57. In a combined pneumatic and manually-operated grand piano, the combination of the frame and horizontal sounding-board, a pedal-

support extending downward and at a right angle with the plane of the said sounding-board, pedals mounted in the said support, piano-keys and a bell-crank lever and connections for actuating one of the pedals, said connections including a manually-operated lever pivoted beneath the said keys and extending to the front of the said keyboard.

58. In a combined pneumatic and manually-operated grand piano and in combination with the frame and horizontally-extending sounding-board and depending pedal-support secured to the frame, an air-chamber and equalizers supported beneath the said sounding-board and secured upon the said frame at the rear of the said pedal-support, and mechanical connections extending forward from the said air-chamber, for substantially the purposes set forth.

59. In a combined pneumatic and manually-operated grand piano and in combination with the frame, depending pedal-support and horizontally-extending sounding-board, the case for the said pneumatic action of the piano secured to the said frame beneath the said sounding-board and in the rear of the said pedal-support, for substantially the purposes set forth.

60. In a combined pneumatic and manually-operated grand piano, a frame having an elongated front portion, a horizontally-disposed sounding-board in said frame, and a tracker-board and music-rolls mounted in the elongated front portion of said frame in the rear of the exposed portions of the keys.

61. In a combined pneumatic and manually-operated grand piano, a frame, a horizontally-disposed sounding-board in said frame, a casing in front of the sounding-board and in the rear of the exposed portions of the keys, and a tracker-board and music-roll mechanism mounted in said casing.

62. In a combined pneumatic and manually-operated grand piano, a frame, a horizontally-disposed sounding-board in said frame, a casing in front and in the plane of said sounding-board, and a tracker-board, music-roll mechanism and pneumatic motor for actuating the same mounted within the said casing.

63. In a combined pneumatic and manually-operated grand piano, a frame, a horizontally-disposed sounding-board in said frame, a casing in front and in the plane of said sounding-board, and a pneumatic actuating-motor mounted on said frame within said casing.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EDWIN S. VOTEY.

Witnesses:

FRANCIS YOUNG,
SAML. A. KROSS.