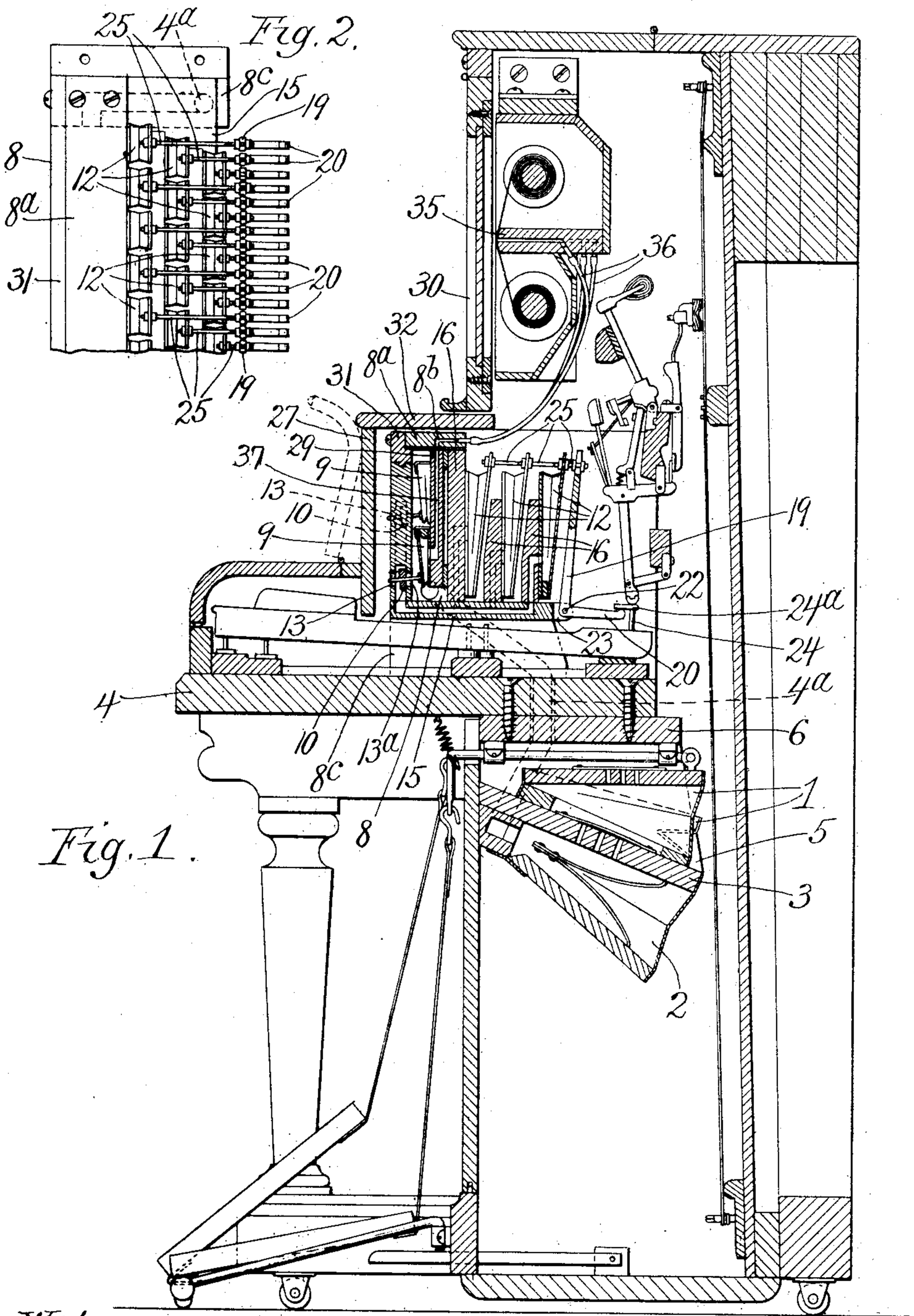
No. 869,230. PATENTED OCT. 29, 1907.

M. CLARK.

COMBINED AUTOMATIC AND MANUALLY OPERATED PIANO.

APPLICATION FILED JUNE 5, 1907.

Fig. 1.



Witnesses,
Edward T. Wray
M. Gertrude Ady

Inventor.
Melville Clark
by Burton & Burton
his Attys

UNITED STATES PATENT OFFICE.

MELVILLE CLARK, OF CHICAGO, ILLINOIS.

COMBINED AUTOMATIC AND MANUALLY-OPERATED PIANO.

No. 869,230. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed June 5, 1907. Serial No. 377,436.

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 Combined Automatic and Manually-Operated Pianos, 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 construction for interior automatic playing devices in a piano designed both for manual and automatic operation, the construction being contrived with special reference to more compact disposition of the several parts and access to such portions thereof as require attention from time to time, and for the easier removal of the entire automatic action bodily when such removal may be necessary or desirable to facilitating access to the ordinary piano action.

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

In the drawings:—Figure 1 is a vertical fore-and-aft sectional view of a portion of a piano having the improved interior playing devices of this invention. Fig. 2 is a top plan view of the pneumatic action.

The customary or essential parts of the piano, so far as shown, are of ordinary construction. The parts of the piano and case will be referred to by their customary names, so far as necessary to mention them in locating or defining the position of the parts concerned in the present invention. The pumpers, 1, and exhaust air bellows or receiver, 2, are mounted upon opposite sides of the foundation board, 3, all being detachably secured to the under side of the key table, 4, the specific construction being the same as more particularly described in my Patent No. 795,817, dated Aug. 1, 1905, involving the employment of the hanger boards, 5, interposed between the foundation board, 3, below the pumpers, and a board, 6, which extends above the pumpers, and which being removably secured to the under side of the key table serves to connect the entire bellows construction, comprising pumpers and receiver removably with the key table below the latter.

The pneumatic action, comprising the primary pneumatics, 9, and their chamber, 8, and the motor pneumatics, 12, and the parts by which the primary pneumatics control them and by which said motor pneumatics operate upon the keys, is mounted entirely above the key table, and not only above the key table but above the manual keys themselves, except that for connection of the primary pneumatic chamber with the exhaust air bellows or receiver, 2, hollow legs, 8^e, extend down from the end portions of the primary pneumatic chamber past the keys at both ends of the manual, and at their lower ends register with the ports, 4^a, extending through the key table in connection with the hanger boards, 5, as above mentioned. These legs serve to support the entire action directly upon the key table, other support or bracing being provided, if found necessary, by means of blocks or brackets extending from the end cheeks of the case. The entire pneumatic action thus constitutes a unitary structure adapted for removal bodily from the piano case whenever desirable for affording convenient access to the piano action or for any other purpose. Of this unitary structure, the primary pneumatic chamber or case, 8, constitutes the front part, the motor pneumatics, 12, being mounted in erect position behind this chamber and being connected therewith by means of a horizontal duct board, 15, in which are formed ducts leading from the front wall of the primary pneumatic chamber to the upright duct boards, 16, on which the motor pneumatics are mounted in staggered arrangement in a plurality of courses.

The front wall of the primary pneumatic chamber having the ducts as stated, it will be observed, has the ports, 13, 13^a, which are controlled by the valves, 10, operated by the primary pneumatics respectively in the familiar manner of control of motor pneumatics by primaries in constructions of this class; and it will be observed that the ports, 13, for access of atmospheric air, being at the front side of this front wall of the front element of the pneumatic action, the most convenient access is afforded to the valves for adjusting them to cause them to seat accurately and similarly, as is necessary for uniformity of operation of such devices. This primary pneumatic chamber is constructed as shown in my Patent No. 846,090, dated March 5, 1907, with its front wall having a removable strip, 31, through which access is obtained to the leak ports, 29, for such attention as they require in order to produce uniformity of action of all the primaries. Thus all the attention the primary pneumatic chamber requires is obtained readily at the forward side upon the removal of the front panel or name board, 27, of the case, which, as usual, is made removable for that purpose. The motor pneumatics have their movable element hinged at the lower end and vibrating at the upper end in the expansion and collapse of said pneumatics; and for giving the stroke to the keys there is provided for each motor pneumatic a bell-crank lever, 19—20, having its upstanding arm, 19, extending up behind the pneumatic by which it is to be operated, and its horizontal arm, 20, extending off rearward overhanging the key upon which it is to operate, all said bell-crank levers being fulcrumed on a rod, 22, suitably supported by brackets, 23, mounted upon the rear edge of the duct board, 15. The coöperating movement of these bell-crank levers, it will be seen, is performed by the forward movement of the upstanding arm upon the collapse of the motor pneumatic and the upward movement of the rearwardly extending horizontal arm, 20. This necessitates connection of said

horizontal arm with the key which is to be operated with an upward pull on said key; and for this purpose each key has secured to it a headed stud or finger, 24, under whose head, 24ª, the rear end of the horizontal arm, 20, of the bell-crank lever is engaged when the pneumatic action is inserted in position above the manual. The upstanding arm, 19, of the bell-crank lever is connected with the pneumatic by means of a threaded stud, 25, projecting rearward from the upper end of the moving wall of the pneumatic, which extends beyond the bellows portion for that purpose, the upper end of the bell-crank lever arm being apertured to permit the stud to pass through it, and an adjusting nut being provided on the stud at both sides of said arm, so that each individual bell-crank lever can be adjusted to bring the end of the horizontal arm, 20, into accurate relation with the head, 24ª, of the stud by which it engages the manual key which it is to operate. These adjusting nuts being at the upper end of the pneumatics are in plain view and easy access for the purpose of the adjustment described, whenever the pneumatic action, as a whole, is exposed by removing the front board or music desk, 30, which may be removed together with the ledge or shoulder board, 32. In order that the flexible tubes, 36, leading from the primary pneumatics to the tracker board, 35, may extend off rearward from their connection with the primary pneumatic ducts, as is desirable in view of the position of the primary pneumatic chamber so far forward as it is shown located, I make the top board, 8ª, of the primary pneumatic chamber with angle ducts, 8ᵇ, whose horizontal rearward branch ends at the rear edge of said top board and receives the ends of the flexible tubes, 36, while its vertical member ends at the lower face of said top board and registers with the upper end of the primary pneumatic duct, 37. The under side of the top board, 8ª, is faced, where the angle ducts open through it, with suitable packing material so that an air-tight joint is formed between the angle ducts, 8ᵇ, and the primary pneumatic ducts, 37, when the top board is fastened in place. For greater convenience in obtaining access to the upper ends of the motor pneumatics for adjusting the connections of the bell-crank levers therewith, this top board, 8ª, may be detached and without detaching therefrom the flexible tubes, 36, may be lifted out of the way for access to the upper ends of the bell-crank levers.

I claim:—

1. In a combined manually operated and automatic piano, the pneumatic action located above the manual keys rearward of the portion thereof exposed for manual playing, comprising motor pneumatics and their respective controlling primary pneumatics, and connections operated by the motor pneumatics engaging the keys at the rear of said pneumatics for pulling the rear ends of the keys upward.

2. In a combined manually operated and automatic piano, a pneumatic action located above the manual keys rearward of the portion thereof exposed for manual playing, comprising motor pneumatics and their respective controlling primary pneumatics, the motor pneumatics being mounted in upright position above the manual keys; bell-crank levers having upstanding arms behind the motor pneumatics respectively, and rearwardly extending arms overhanging the keys respectively, and means by which the upper ends of the upstanding arms are engaged by the motor pneumatics, and the rear ends of the rearwardly extending arms engage the keys.

3. In a combined manually operated and automatic piano, a pneumatic action located above the manual keys rearward of the portion thereof exposed for manual playing, such connection comprising a primary pneumatic chamber at the forward part and upstanding motor pneumatics behind said chamber, and means rearward of said upstanding motor pneumatics by which they engage and operate the manual keys with upward pull thereon.

4. In a combined manually operated and automatic piano; a pneumatic action located above the manual keys rearward of the portion thereof exposed for manual playing, comprising a primary pneumatic chamber at the forward part of said pneumatic action and primary pneumatics therein, the forward wall of said primary pneumatic chamber having the ducts and ports for connection with the motor pneumatics respectively; a duct board at the lower end of said primary pneumatic chamber extending rearward thereunder and therebeyond; dudt boards upstanding from said rearwardly extending duct board at the rear of the primary pneumatic chamber; motor pneumatics on said upstanding duct boards; bell-crank levers fulcrumed on the rear side of said horizontal duct board having upstanding arms rearward of the motor pneumatics respectively, and rearwardly extending arms overhanging the keys respectively, and connections by which said bell-crank levers are actuated by the motor pneumatics and actuate the keys.

5. In a combined manually-operated and automatic piano, in combination with the manual keys, a pneumatic action located above the manual keys rearward of the portion thereof exposed for manual playing, comprising a primary pneumatic chamber at the forward part; motor pneumatics rearward of such chamber and levers rearward of such motor pneumatics respectively; means by which the levers actuate the keys respectively and adjustable connections from said levers to the moving walls of the respective motor pneumatics at the upper ends of said levers and pneumatics.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 18th day of May, A. D., 1907.

MELVILLE CLARK.

Witnesses:
J. S. ABBOTT,
M. GERTRUDE ADY.