

E. E. WELTE.
AUTOMATIC PLAYER PIANO.
APPLICATION FILED MAY 24, 1909

946,297.

Patented Jan. 11, 1910.

Fig. 1.

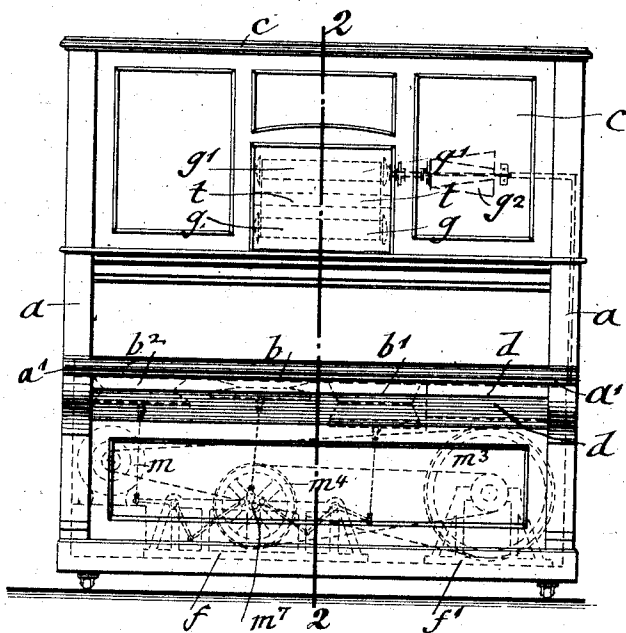


Fig. 2.

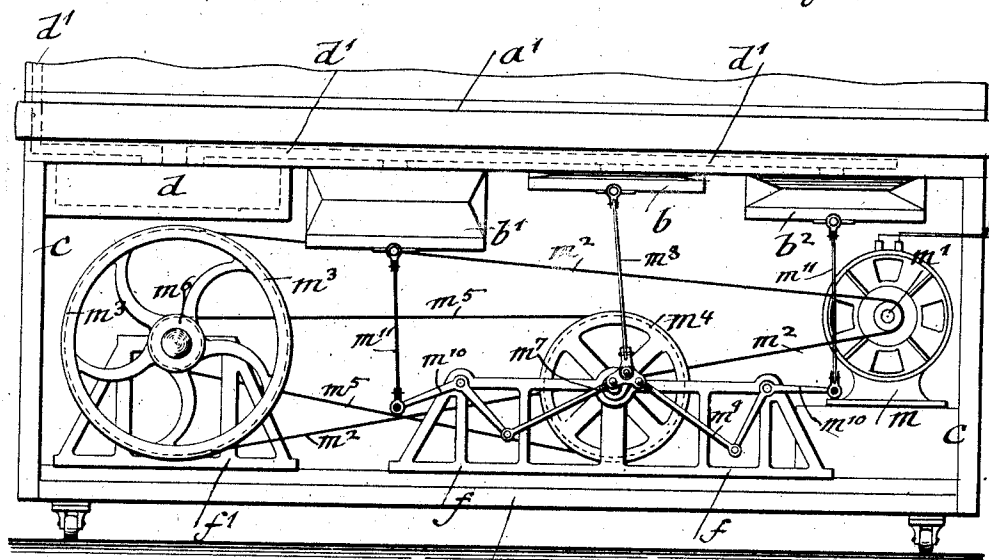
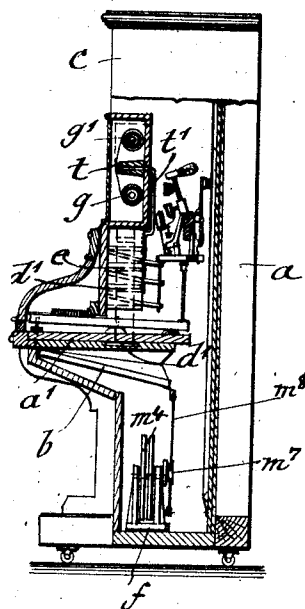


Fig. 3.

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AUTOMATIC PLAYER-PIANO.

946,297.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed May 24, 1909. Serial No. 497,849.

To all whom it may concern:

Be it known that I, EDWIN E. WELTE, a citizen of the Empire of Germany, residing in New York, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Automatic Player-Pianos, of which the following is a specification.

This invention relates to an improved automatic player-piano in which the power-bellows are arranged below the key-bottom of the piano and in which the space below the same in the front-part of the case is utilized for the motor-mechanism by which the power-bellows are actuated, while the pneumatic valve-actions are located above the rear-ends of the key-levers adjacent to and in front of the piano-actions, the tracker, music-roll and winding-up roll being in the upper front-part of the piano, with a view of disposing all the parts of the automatic piano-playing attachment in such a manner that they take up the available spaces at the inside of an upright piano-case and can be readily placed in position in the same without altering the construction of the same; and for this purpose the invention consists of an automatic piano-player which comprises a number of power-bellows and a wind-chest attached to the under-side of the key-bottom of an upright piano, motor and motion-transmitting mechanism arranged in the lower part of the piano-case and connected with said power-bellows, rows of pneumatic valve-actions and pneumatics connected with the piano-actions, located above the inner ends of the key-levers, while the tracker, music-roll; winding-up roll and the motor for driving the winding-up roll or music-roll are located in the upper front-part of the piano-case and connected with the pneumatic valve-actions and the piano-actions in the usual manner.

The invention consists further of certain details of construction which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a front-elevation of my improved automatic player-piano, showing the panel closing the lower part of the upright piano-case and the panel for the upper front-part of the same in closed position and showing the operating parts in dotted lines. Fig. 2 is a vertical transverse section on line 2, 2, Fig. 1, and Fig. 3 is a rear-view of the lower part

of the piano-case, with the front-panel removed, showing the power-bellows and the driving mechanism for the same.

Similar letters of reference indicate corresponding parts throughout the figures.

Referring to the drawings, *a* represents an upright piano and *c* the case of the same. To the under-side of the key-bottom *a*¹ are attached three power-bellows *b*, *b*¹, *b*², the key-bottom forming the stationary member of said power-bellows. A wind-chest *d* is also attached to the under-side of the key-bottom sidewise of the power-bellows, as shown clearly in Figs. 2 and 3. The wind-chest *d* is connected by a channel *d*¹ with the power-bellows *b*, *b*¹, *b*² in the usual manner. The power-bellows are alternately actuated by a driving mechanism which consists of an electric motor *m* which is arranged at one side of and in the lower front-part of the piano-case, a large transmitting pulley *m*³ driven by a belt *m*² from a pulley *m*¹ on the armature-shaft of the motor, and a second pulley *m*⁴ connected by a belt *m*⁵ with a small pulley *m*⁶ on the shaft of the pulley *m*³. The pulley *m*⁴ is mounted on a crank-shaft *m*⁷ which is connected with the intermediate power-bellows *b* by a connecting rod *m*⁸, and by connecting rods *m*⁹ with fulcrumed elbow-levers *m*¹⁰ the outer ends of which are connected by pivot-rods *m*¹¹ with the power-bellows *b*¹, *b*², the location of the connecting rods with the elbow-levers *m*¹⁰ being so arranged that for every rotation of the crank-shaft three alternating actuations of the bellows *b*, *b*¹, *b*² take place. The crank-shaft *m*⁷ and the fulcras of the elbow-levers *m*¹⁰ are supported in bearings of a frame *f*, while the shaft of the transmitting pulley *m*³ is supported in bearings of a separate frame *f*¹.

Above the rear-ends of the key-levers are arranged, in the space in front of the piano-actions, as many pneumatic valve-actions *e* as there are piano-actions to be actuated, said valve-actions being preferably arranged in the usual manner in horizontal rows and connected with the tracker *t* by flexible tubes *t*¹ of rubber, metal or other material. The pneumatic valve-actions operate pneumatics which are connected with the lower parts of the piano-actions so as to operate the same at the proper time.

Vertically above the pneumatic valve-actions are arranged, in the upper front-part of the piano-case *c*, the horizontal tracker *t*, a music-roll *g*, which is supported

in bearings below the tracker, a winding-up roll g^1 , and the pneumatic motor g^2 for operating the winding-up roll or music-roll, and the expression devices. The pneumatic motor g^2 is arranged at one side of the tracker, and the expression devices at the other side of the tracker, in the usual well-known manner, also the rewinding mechanism for the perforated music-sheet.

The connections between the wind-chest, tracker and the pneumatic valve-actions are made in the usual manner, as the essential feature of this construction is the arrangement of the power-bellows below the key-bottom of the upright piano, in connection with the operating parts described. By locating the power-bellows below the key-bottom, the space in the lower part of the piano-case is available for locating the motor and motion-transmitting mechanisms below the power-bellows and wind-chest, while the pneumatic valve-actions and the tracker, with the winding-up roll and the music-roll, are located at the upper front-part of the case in the usual manner. The forwardly-extending ends of the power-bellows are inclosed by an inclined wall so as to be out of sight. When the power-bellows are located below the key-bottom as described they are not in the way when playing the piano by the hands, while when it is desired to play the piano automatically the music-roll is placed in position, the music-sheet extended over the tracker and connected with the winding-up roll, and current for the motor switched in. By coupling the shaft of the winding-up roll with the pneumatic motor, the music represented by the music-sheet is played automatically, the music-sheet being rewound, after the piece of music has been played, on the music-roll, and the same replaced by a new one, as desired. In the front-wall is arranged a hinged panel or door for closing the space where the music-roll, tracker and winding-up roll are located, this panel or door being opened, when the automatic playing is desired so as to permit the insertion of the

music-roll and its connection with the tracker and winding-up roll in the well-known manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In an automatic player-piano, the combination, with the case of an upright piano, of a supporting board, a plurality of bellows carried by said board, a rotary shaft having a shaft-crank, a bell-crank lever, a pivot-link connecting one arm of the lever with said shaft-crank, and pivot-links connecting the other arm of the lever and the shaft-crank with said bellows respectively.

2. In an automatic player-piano, the combination of a key-bottom, a plurality of bellows secured to the bottom-face of the key-bottom and depending therefrom, a rotary shaft having a shaft-crank, a plurality of bell-crank levers, pivot-links connecting one arm of the bell-crank levers to the shaft-crank, pivot-links connecting the bellows respectively with the other arm of the bell-crank levers and the shaft-crank, and wippen operating mechanism communicating with the bellows.

3. In an automatic player-piano, the combination of a key-bottom, a plurality of bellows secured to the bottom-face of the key-bottom and depending therefrom, a rotary shaft having a shaft-crank, a plurality of bell-crank levers, pivot-links connecting one arm of the bell-crank levers to the shaft-crank, pivot-links connecting the bellows respectively with the other arm of the bell-crank levers and the shaft-crank, a motor located in the space below the bellows, and transmission means connecting the motor and said shaft.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EDWIN E. WELTE.

Witnesses:

PAUL GOEPEL,
J. COOK.