No. 723,820. PATENTED MAR. 31, 1903.

T. P. BROWN.

AUTOMATIC PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

APPLICATION FILED MAY 22, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

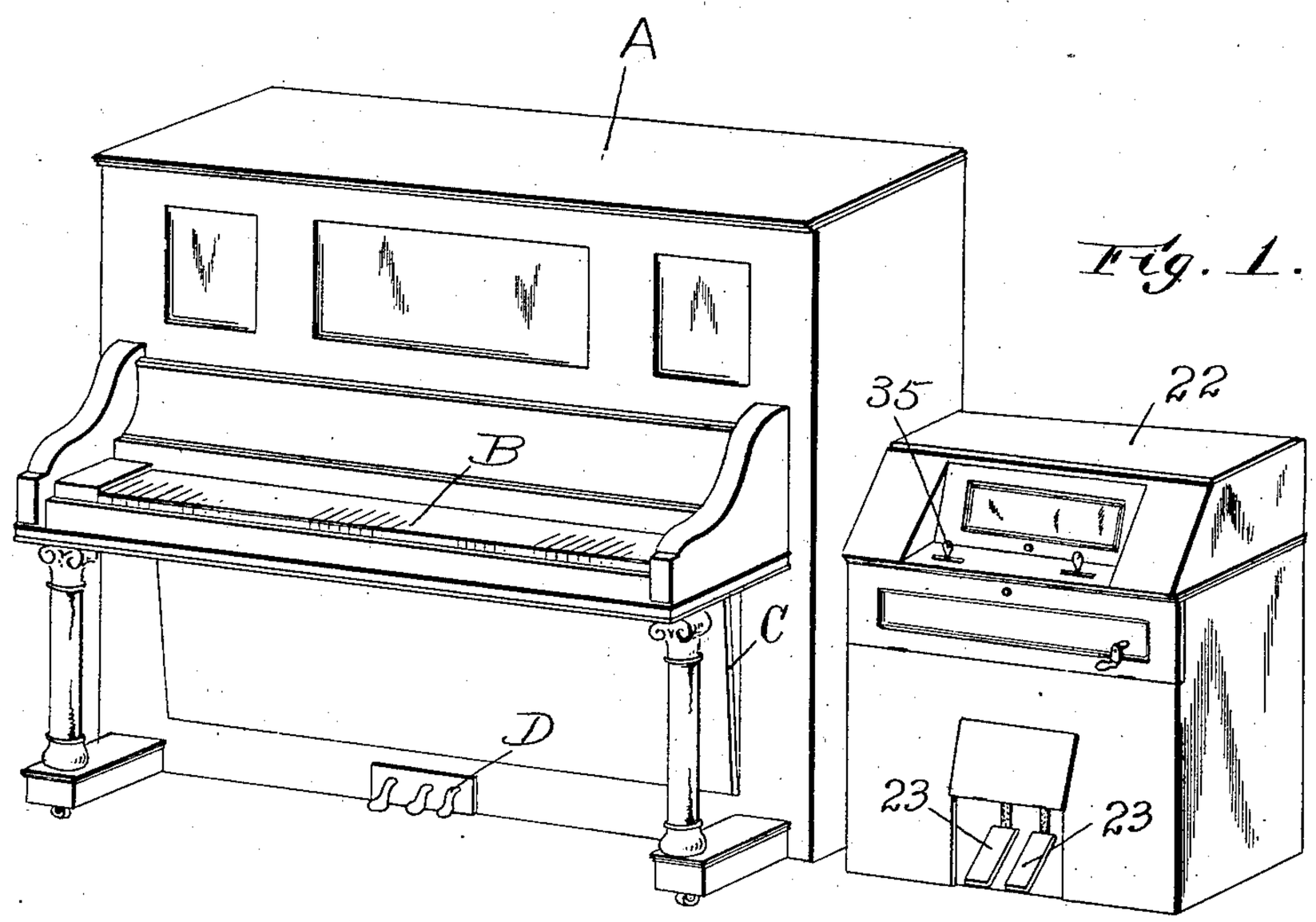

Fig. 1.

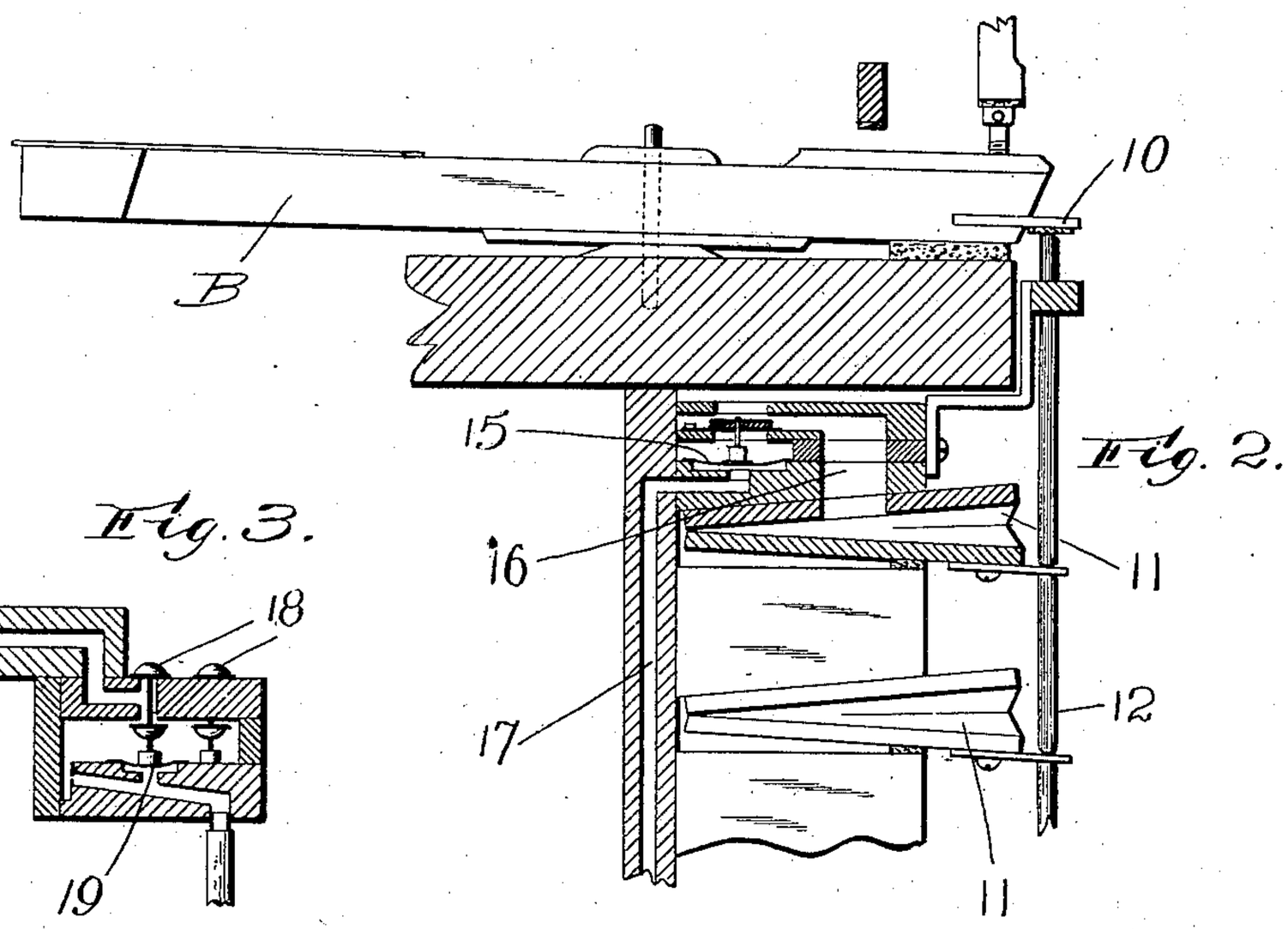

Fig. 2.

Fig. 3.

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NO MODEL. 2 SHEETS—SHEET 2.

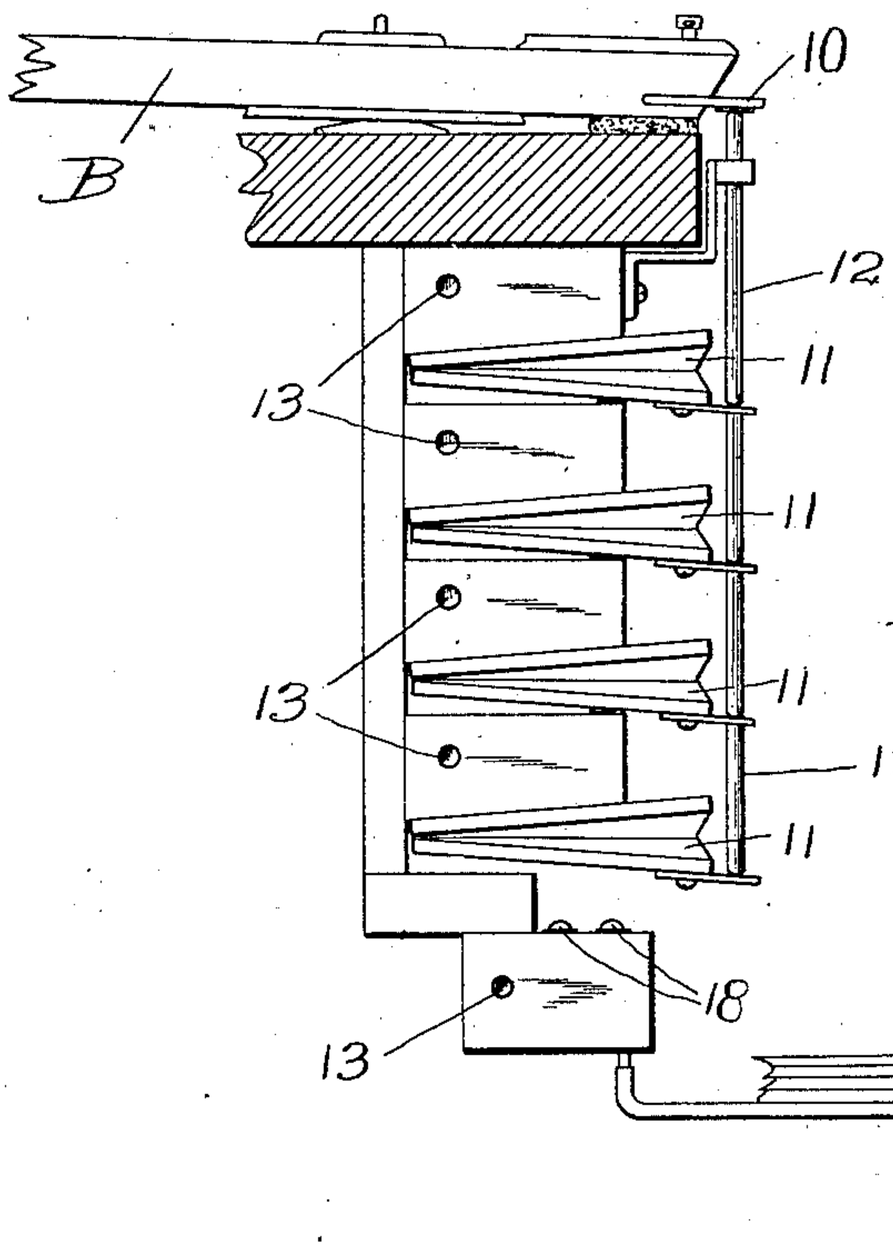


Fig. 4.

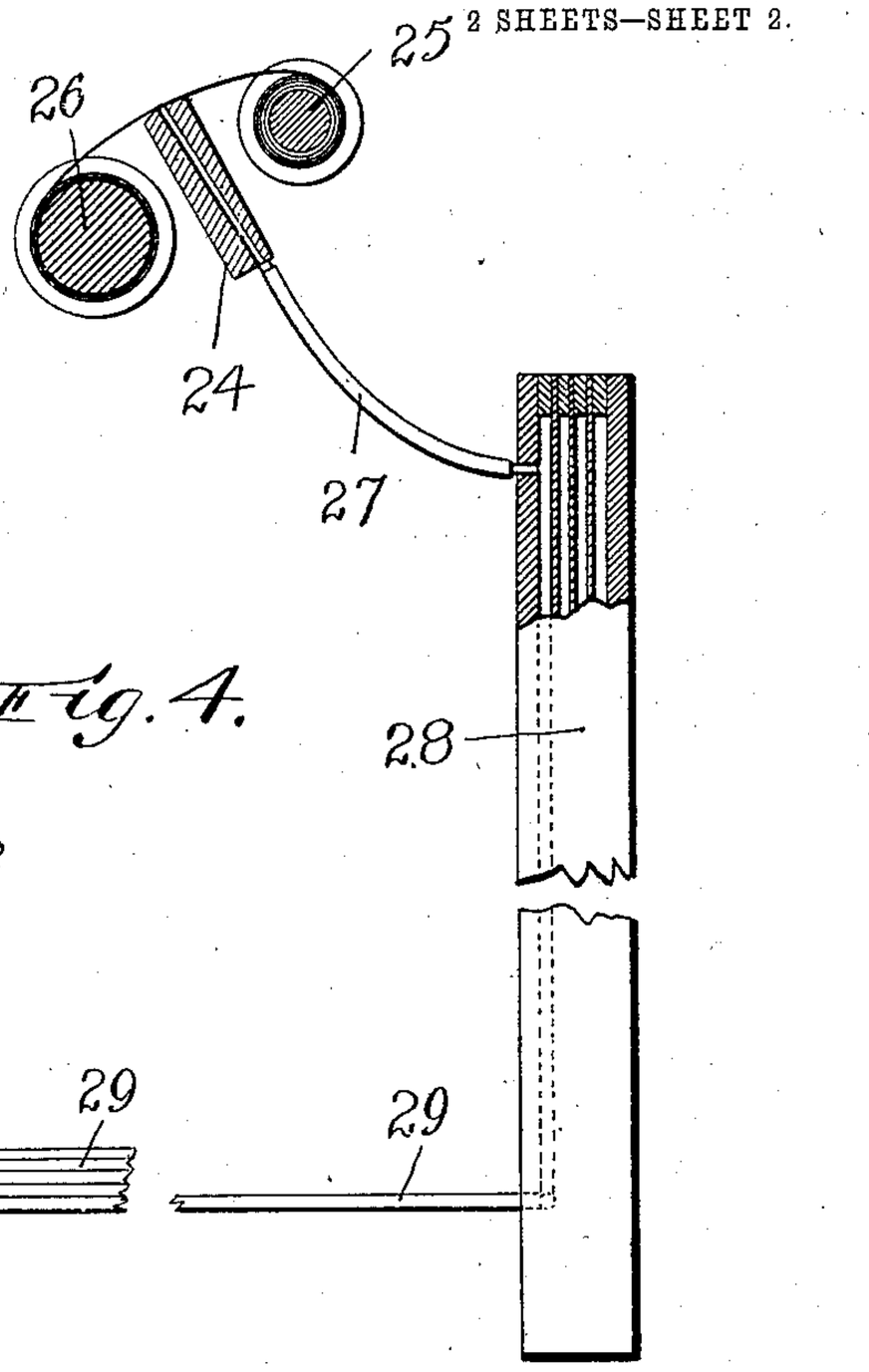
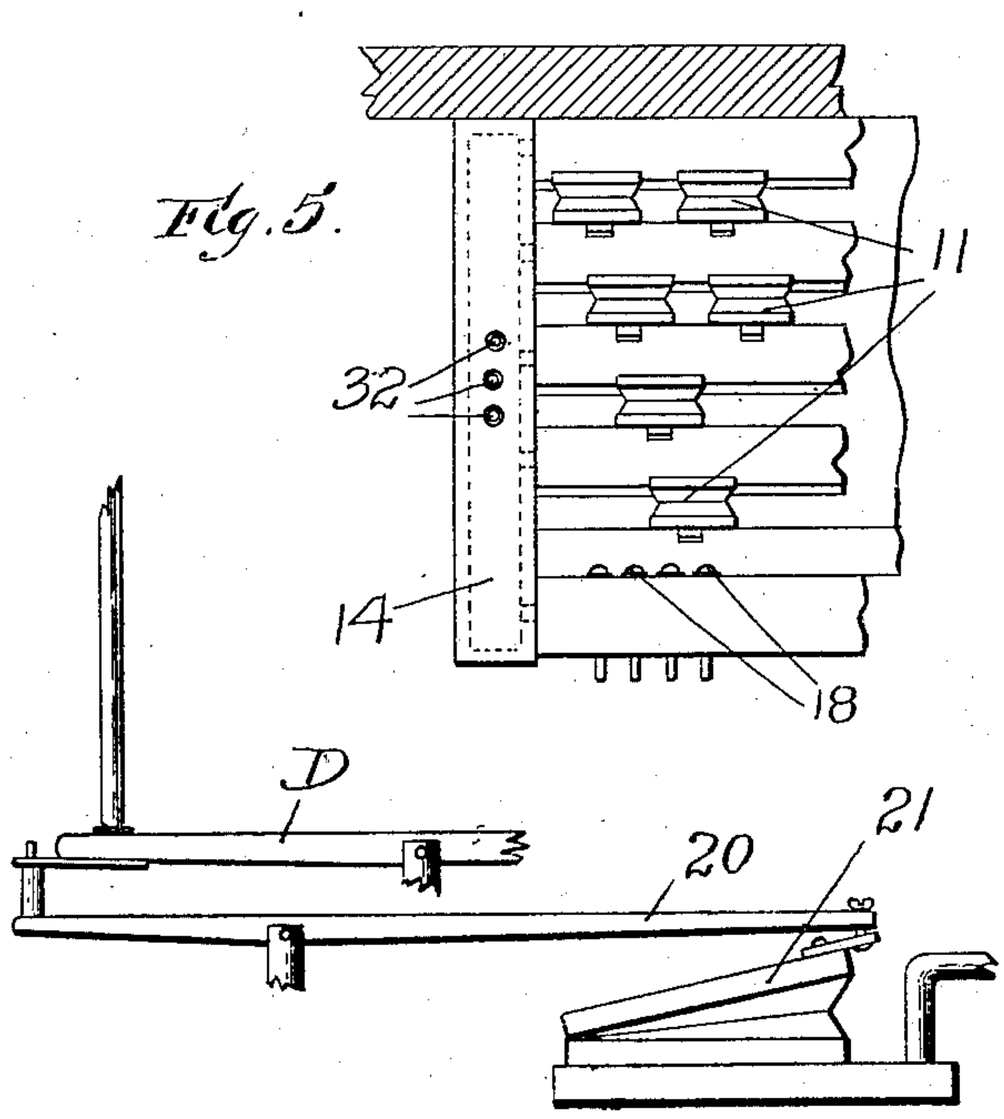


Fig. 5.



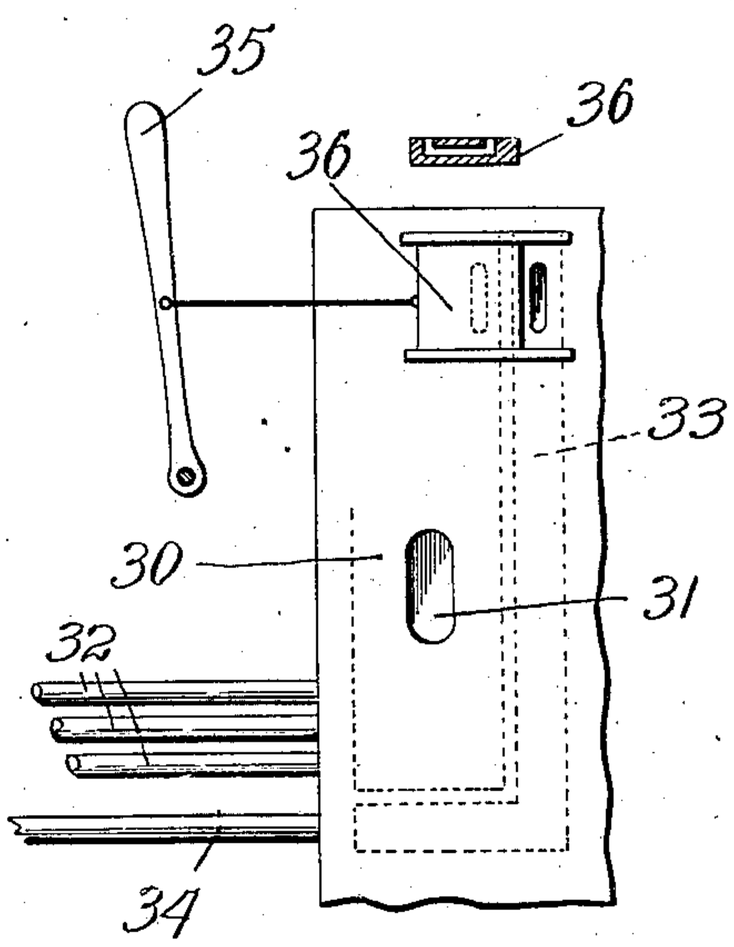


Fig. 6.

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UNITED STATES PATENT OFFICE.

THEODORE P. BROWN, OF WORCESTER, MASSACHUSETTS.

AUTOMATIC PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 723,820, dated March 31, 1903.

Application filed May 22, 1902. Serial No. 108,471. (No model.)

To all whom it may concern:

Be it known that I, THEODORE P. BROWN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Playing Attachment for Musical Instruments, of which the following is a specification.

This invention relates to that class of automatic piano-players which are operated pneumatically; and the especial object of this invention is to provide a piano-playing attachment of this class which is combined with a piano in such a manner as to leave the piano-keyboard unobstructed to permit the manual use of the piano whenever desired without the removal or disconnection of the playing attachment.

To accomplish this object, this invention consists of the piano-playing attachment and of the combinations of parts therewith, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying two sheets of drawings, Figure 1 is a perspective view of a piano combined with a playing attachment constructed according to this invention. Fig. 2 is a fragmentary sectional view illustrating the relation of the main pneumatics to the key-levers. Fig. 3 is a fragmentary view illustrating the primary pneumatics. Fig. 4 is a diagrammatic view of the connections between the tracker-board and the key-operating connections. Fig. 5 is a fragmentary rear view of the bank of main pneumatics, and Fig. 6 is a diagrammatic view of the pedal-operating devices.

Heretofore in manufacturing that class of automatic piano-players in which the piano-keys are pneumatically operated it has been thought to be essential to have the paper-winding connections and tracker-board closely associated with the main pneumatics, and in order to accomplish this result it has heretofore been thought essential to have the main operating-pneumatics and tracker-board arranged in the same casing or at least located in close proximity with each other.

I have found in practice that the main pneumatics may be arranged a considerable distance from the tracker-board without materially diminishing the power of the playing attachment or interfering with the artistic effects produced thereby—that is to say, I have found in practice that I am enabled to employ pipes or passages several feet in length between the tracker-board and main pneumatics without materially injuring the prompt response of an automatic piano-player of the class to which this invention relates, and by reason of this fact I have been enabled to provide an automatic playing attachment for pianos which will leave the piano-keyboard entirely unobstructed. In accomplishing this result I have arranged the operating parts of my playing attachment considerable distances apart, the main pneumatics being arranged in a bank within the piano-casing, while the tracker-board, paper-winding devices, and bellows-operating devices are located in an independent casing which may be placed at the end of the piano.

To connect the tracker-board with the main pneumatics, I have employed small flexible rubber tubes, and in actual use I have demonstrated that the air impulses will traverse the flexible tubes with sufficient rapidity to produce substantially instantaneous results, even though keyboard is located some distance from the tracker-board.

To provide for operating the pedals of the piano, I preferably provide pneumatic devices arranged within the piano-casing, and I control such pneumatic devices by a valve or other connections located in the casing, which contains the tracker-board and paper-winding devices.

Referring to the accompanying drawings for a detail description of an automatic piano-player constructed according to my invention, A designates a piano-casing of any of the ordinary or preferred constructions provided with a keyboard B.

In applying my playing attachment to an ordinary upright piano I have found in practice that substantially the required amount of room may be obtained below the keyboard B, although in practice I have found it desirable to set out the front panel C of the piano-casing a slight distance in order to leave room for the main pneumatics, which are located in a bank below the keyboard B. The main pneumatics and their connections with the

key-levers B are most clearly illustrated in Figs. 2 to 4, inclusive.

As shown in Fig. 2, each of the key-levers B is provided at its rear end with a spline 10.

The main pneumatics are arranged in tiers over each other—in the present instance four tiers of main pneumatics 11 being shown, which are connected by rods 12 to operate the key-levers B. Over each layer of main pneumatics 11 is an exhaust chamber or channel, which is connected at one end through a passage 13 to an end exhaust-chamber 14. (Shown in Fig. 5.)

As shown in Fig. 2, each of the exhaust-passages contains valve-operating pneumatics 15, which control valves for connecting the main pneumatics 11, through passages 16, to the external air or to the exhaust-chamber, before referred to.

Extending from the valve-operating pneumatics 15 are passages 17, which are controlled at their lower ends by valves 18, operated by small primary pneumatics 19.

The pedal-operating connections, which are located within the piano-casing A, are most clearly illustrated in Fig. 6. As shown in this figure, a pedal D is connected to a lever 20, so as to be operated by a pneumatic 21.

The parts as thus far described are all located within the piano-casing A.

At one end of the piano-casing, as illustrated in Fig. 1, I provide a separate casing 22, and mounted in the casing 22 are bellows-operating pedals 23, and, as shown in Fig. 4, a tracker-board 24, with paper-winding rolls 25 and 26 for moving a strip of perforated paper over the tracker-board.

In practice the paper-winding devices are operated by a spring-motor, which may be controlled and regulated in any of the ordinary manners.

The tracker-board 24 is connected by flexible tubes 27 to a channel-board 28.

The passages of the channel-board 28 are connected by flexible tubes 29 to the primary pneumatics.

In practice the flexible tubes 27 and 29 have simply been ordinary small rubber pipes. Also arranged in the separate casing 22 is a main suction-chamber 30, from which the air is exhausted by the bellows through a suction-port 31. Extending from the main suction-chamber 30 are the pipes 32, which are connected to the suction-chamber 14 at the end of the bank of main pneumatics, as illustrated in Fig. 5. At one end of the main suction-chamber 30 is a suction-channel 33, which is connected by a pipe 34 to the pedal-operating pneumatic 21.

The main suction-chamber 30 and the passage 33 may be connected by means of a slide-valve 36, operated by a controlling-handle 35.

The operation of an automatic piano-playing attachment constructed according to this invention is substantially the same as that of other instruments of this class—that is to say, the passage of the perforated paper over the tracker-board admits impulses of air which are transmitted through the flexible rubber tubes referred to to operate the primary pneumatics, which in turn control the valve-operating pneumatics to connect the main pneumatics with the suction-passages. In practice I preferably arrange the tracker-board casing at the right-hand end of the piano, because in an ordinary upright-piano construction the right-hand end of the sounding-board can be cut into or bored through without injuring the tone of the piano to such an extent as would be the case if the free or left-hand end of the sounding-board was cut into. In some cases, however, the casing may be arranged at the other end of the piano, and the connecting pipes or passages may be carried across the rear face of the piano before being carried into the piano-casing.

I am aware that other changes may be made in practicing my invention by those who are skilled in the art without departing from the scope thereof as expressed in the claims. I do not wish, therefore, to be limited to the special construction I have herein shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of a piano-casing, a bank of main pneumatics located below the key-levers, and arranged to lift the rear ends of the key-levers without interfering with the manual operation thereof, a separate casing arranged at one end of the piano, a tracker-board, paper-winding devices and bellows-operating devices mounted in said casing, and connections for controlling the main pneumatics from the tracker-board.

2. The combination of a piano-casing, a bank of main pneumatics located below the key-levers, and arranged to lift the rear ends of the key-levers without interfering with the manual operation thereof, a separate casing arranged at one end of the piano, a tracker-board, paper-winding devices and bellows-operating devices mounted in said casing, and flexible tubes for connecting the tracker-board to control the main pneumatics.

3. The combination of a piano-casing, a bank of main pneumatics located within the piano-casing, and arranged not to interfere with the manual operation of the piano-keys when desired, a pedal-controlling pneumatic arranged within the piano-casing, a separate casing at one end of the piano, a tracker-board, paper-winding devices, bellows-operating devices, and means for controlling the pedal-operating pneumatic mounted in said casing, and connections from the tracker-board to the main pneumatics.

4. The combination of a piano-casing, a bank of main pneumatics located below the key-levers, and arranged to lift the rear ends of the key-levers without interfering with the manual operation thereof, a separate casing arranged at one end of the piano, a main exhaust-chamber in said casing, pipes connect-

ing the main exhaust-chamber with the exhaust-passages of the main pneumatics, a tracker-board, paper-winding devices and bellows-operating devices mounted in the separate casing, and flexible tubes connecting the tracker-board to control the main pneumatics.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THEODORE P. BROWN.

Witnesses:
LOUIS W. SOUTHGATE,
PHILIP W. SOUTHGATE.