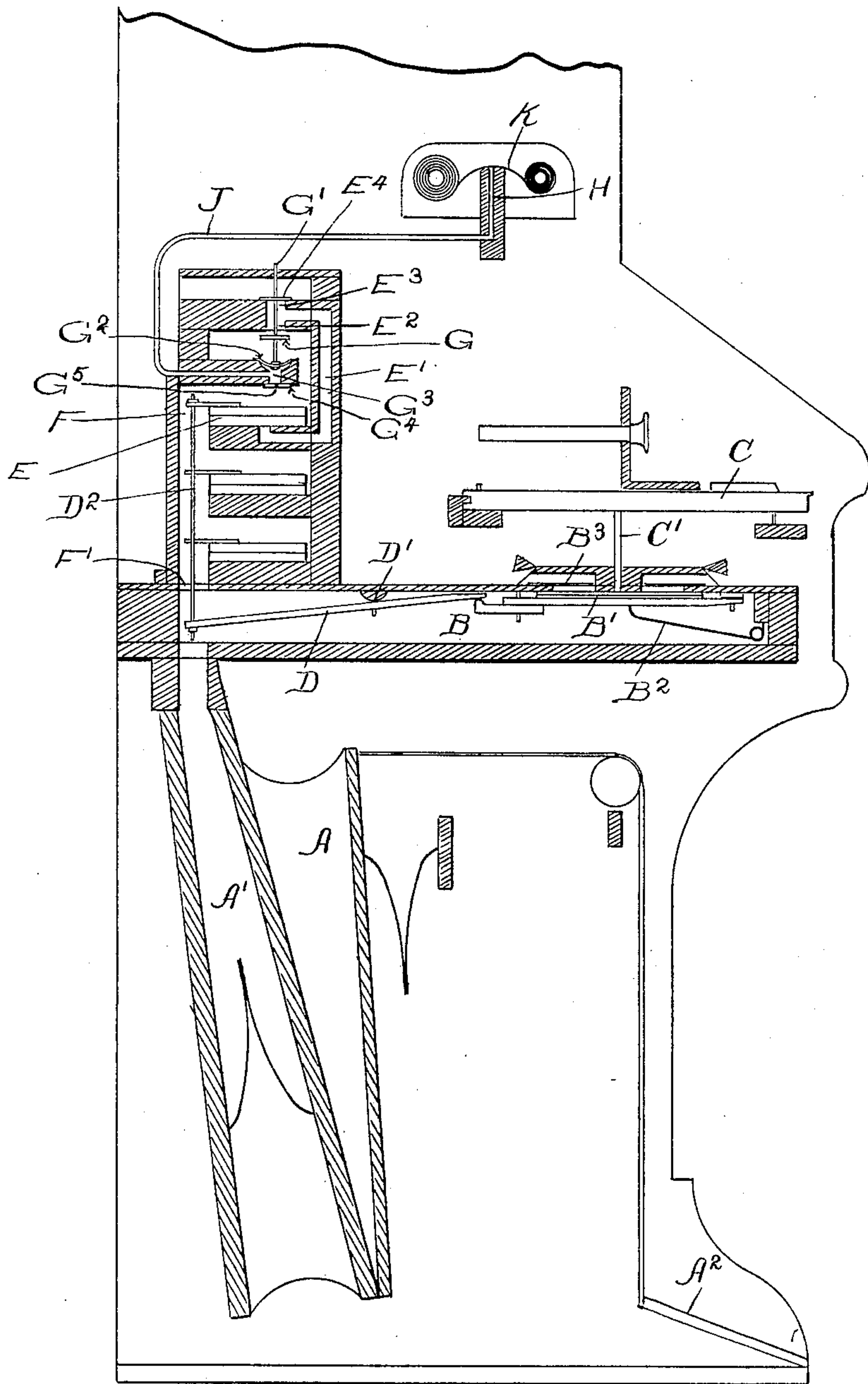


(No Model.)

F. W. HEDGELAND.
SELF PLAYING INSTRUMENT.

No. 593,216.

Patented Nov. 9, 1897.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK W. HEDGELAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE
W. W. KIMBALL COMPANY, OF SAME PLACE.

SELF-PLAYING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 593,216, dated November 9, 1897.

Application filed January 23, 1897. Serial No. 620,421. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. HEDGELAND, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Self-Playing Instruments, of which the following is a specification.

This invention relates to certain improvements in pneumatically-operated actions of self-playing instruments. One of the main objects I have had in view therein has been to produce a very compact action by adapting both the pneumatic-motors which operate the reed-valves and the action which controls the motors so they may be placed in a single box or exhaust-chamber of such small dimensions as to permit of its being located within the space back of the keyboard in any instrument of the ordinary height. By thus compacting the action I also obtain an important advantage, because I thereby bring the parts so close together as to shorten in a marked degree the air-passages, relieve a large percentage of the friction upon the air, and quicken the action.

I also embody in the invention other features of novelty, which will appear from the detailed description thereof given below.

In the drawing I show a vertical section of a self-playing organ embodying my improvements.

In such drawing, A represents one of the feeders, and A' the equalizer of the bellows, and A² is the pedal for operating said feeder. The equalizer exhausts the air from the chamber B, in which the reed-valves are located, and one of which is shown at B'. The usual spring for closing the reed-valve is shown at B². One of the keys is shown at C, and C' is the tracker-pin through which the key operates the valve B'. The reeds B³ are shown just above the valves.

To adapt the organ to be played automatically, a lever D, rocking upon the fulcrum D', is placed with one end resting upon the end of valve B' and the other end is connected to an operating-pneumatic E in the box F by the connecting-rod D². The normal condition of the pneumatic is one of collapse. The box F is constantly exhausted of air while the organ is being used by reason of

the opening F' between it and chamber B, and a passage E' connects the interior of the pneumatic with the interior of box F, so that the collapse of the pneumatic will take place after each inflation as soon as the valve controlling the opening E² between the suction-chamber F and the passage is opened. This valve is shown at G, and it is mounted upon the stem G', which rests upon and is lifted by the flexible membrane G² when air is admitted to the chamber G³ immediately under the membrane. Opposite the port E² is another port E³, connecting passage E' with the outer air, and a valve E⁴ controls it, this valve being also upon stem G' and in such relative position thereon that when it is closed valve G will be open and when it is open valve G will be closed. These valves are thus adapted in one position to admit atmospheric air to the pneumatic and in the other to cause the exhaustion of the air so admitted.

The chamber G³ is connected to the tracker-range H by an air passage or tube J, and by means of it air is admitted to said chamber whenever a perforation in the music-sheet K registers with the mouth of said passage, and such air being admitted raises the membrane and lifts the valve-stem, thereby closing valve G and opening valve E⁴ and admitting the air to the interior of the pneumatic, which is thereby inflated and causes the operating of the reed-valve. The bottom of chamber G³, dividing it from the chamber of box F, is formed by a cardboard strip G⁴, in which is a single fine perforation G⁵, and consequently as soon as the supply of outer air to passage J is shut off by the continued movement of the music-strip the exhaust will be felt in chamber G³ sufficiently to cause the membrane to fall and allow the valves G and E⁴ to shut off the outer air from the pneumatic and to permit the exhaust to draw the air therefrom. It will thus be seen that these valves are operated upwardly by suction-pressure upon the membrane G² and downwardly by the weight of the parts, assisted somewhat by the suction existing in the box F acting upon valves G and E⁴.

The pneumatic when inflated has only to overcome the gravity of its movable side, the connecting-rod and the rocking lever, and the

spring of the reed-valve, and when it is exhausted these parts are returned to their normal positions by their own gravity, assisted by the power of the spring.

5 I have shown in the drawing and described only the automatic means employed in operating a single reed-valve, but it will be understood that similar agencies are employed in the case of all the reed-valves and that all are
10 inclosed in the same box F.

The action-chest is supported upon the sounding or cavity board of the instrument, and the opening F' between the chest and the reed-valve chamber is located at the bottom
15 of the chest and is substantially continuous from end to end of the action, as the corresponding rods D² of all the pneumatics pass through it, as plainly shown. Said passage is also located directly over and only a short
20 distance from the mouth of the bellows-equalizer, so that the force of the exhaust is not weakened in the chest by deviations in the direction of the current and so that all parts of the chest are exhausted completely
25 and equally. The interior of the chest is not divided by partitions or subchambers, and a vertical clear space extends directly upward from said opening along the rear of the pneumatics and affords the exhaust unobstructed
30 access to the valves G, the board in which the membrane-motors are located being made narrow, so as to leave a wide opening at its end also extending from end to end of the chest. These features, together with the fact
35 that the air-passages are all short and comparatively straight, render the action very quick and certain.

I claim—

1. The combination with the tracker-range

and the reed-valves of a self-playing instru- 40
ment, of an exhaust action-chest F located below the range and above the reed-valve chamber, a series of pneumatics arranged in horizontal rows in the lower part of said chest, mechanical connections between the pneu- 45
matics and the reed-valves passing through the opening whereby the chest is exhausted valves for controlling said pneumatics located in the upper part of said chest and above the pneumatics, membrane-motors for operat- 50
ing said valves, and ducts leading from the tracker-range to said motors, substantially as specified.

2. The combination with the exhaust-bellows and reed-valve chamber B, of a pneu- 55
matic-action chest or box F, communicating with said chamber by an opening F', and connections for carrying power from the operating-pneumatics in the chest to the reed-valves in the chamber, such connections passing 60
through said opening F', substantially as specified.

3. In a self-playing action for instruments, the valves G and the stems G', the membrane-motors located below the valves, the board 65
supporting said motors being made narrower than the chest, so as to leave a side air-passage extending throughout the chest, in combination with the exhaust-producing apparatus and an inclosing chest having a bottom 70
communication throughout its length with the exhaust, and also having a clear way for the air from said side passage to the exhaust, substantially as specified.

FREDERICK W. HEDGELAND.

Witnesses:

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