(No Model.)

A. WALES.

MECHANICAL MUSICAL INSTRUMENT.

No. 339,237. Patented Apr. 6, 1886.

Fig. 1

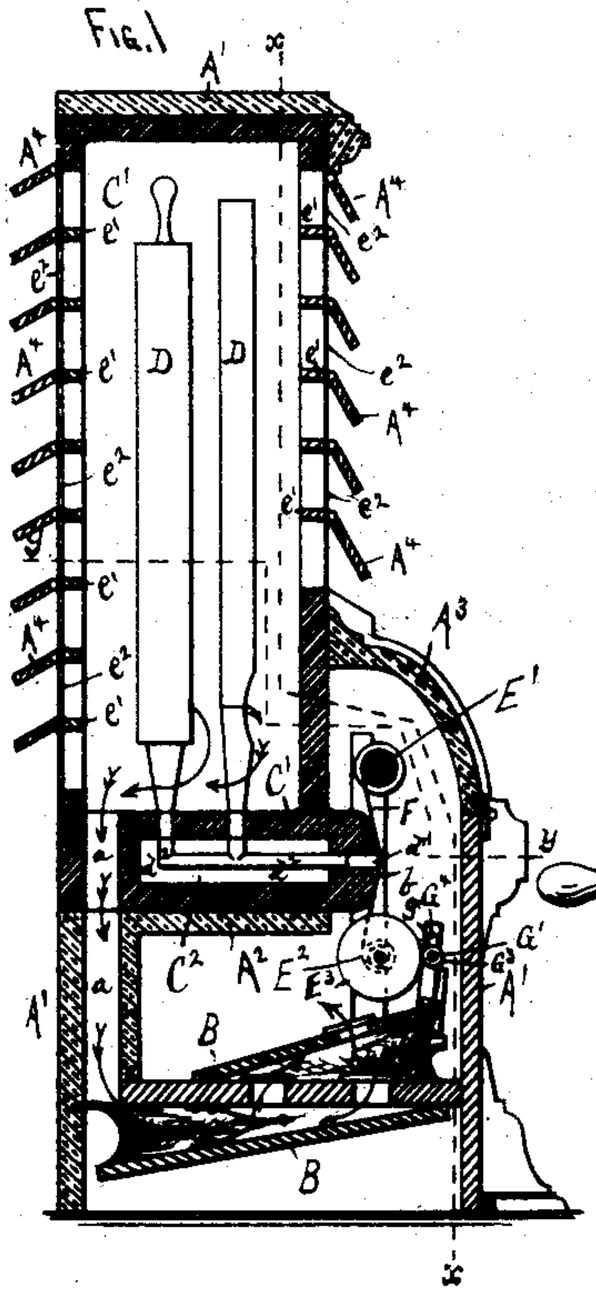


Fig. 2

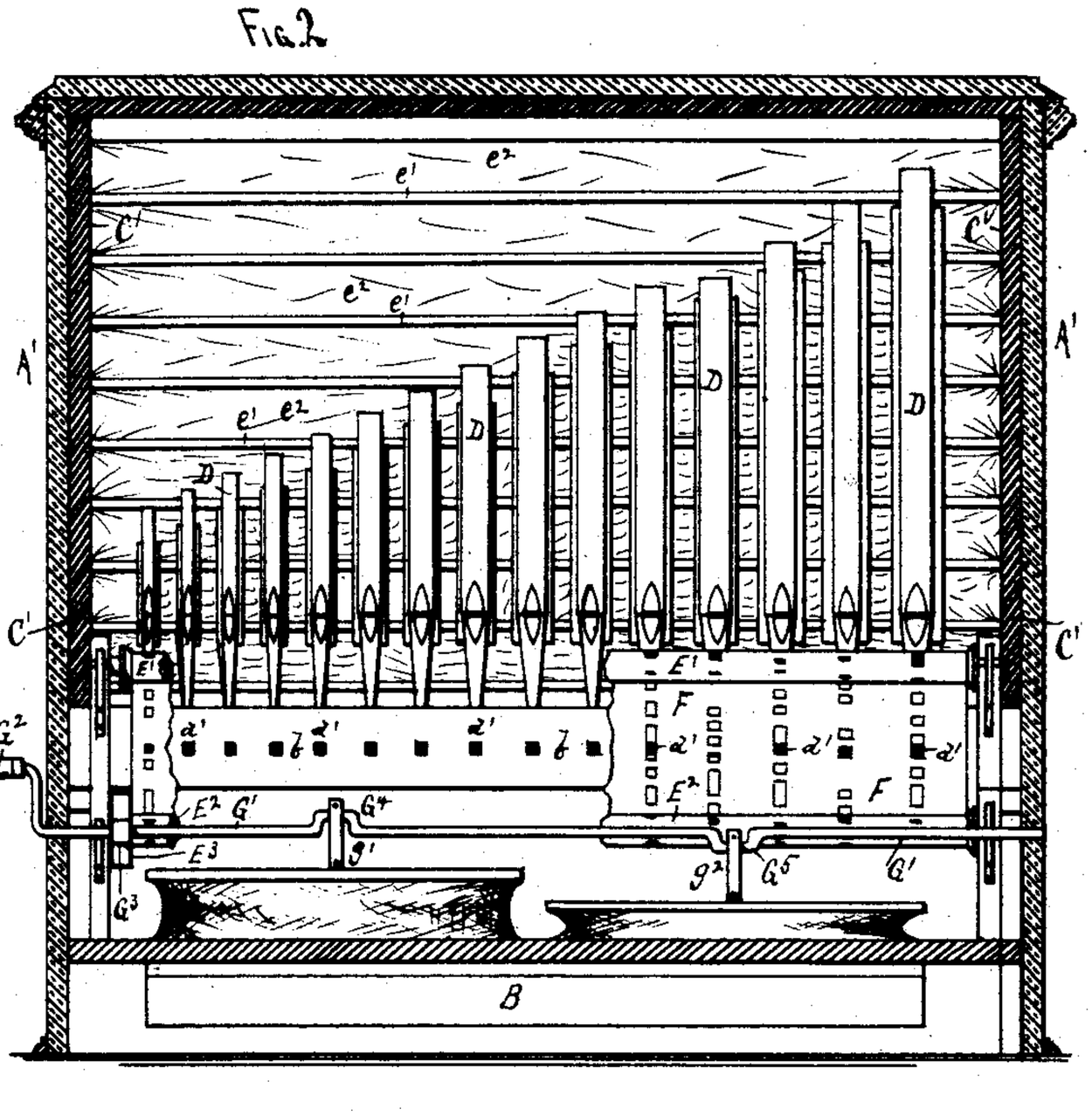


Fig. 3

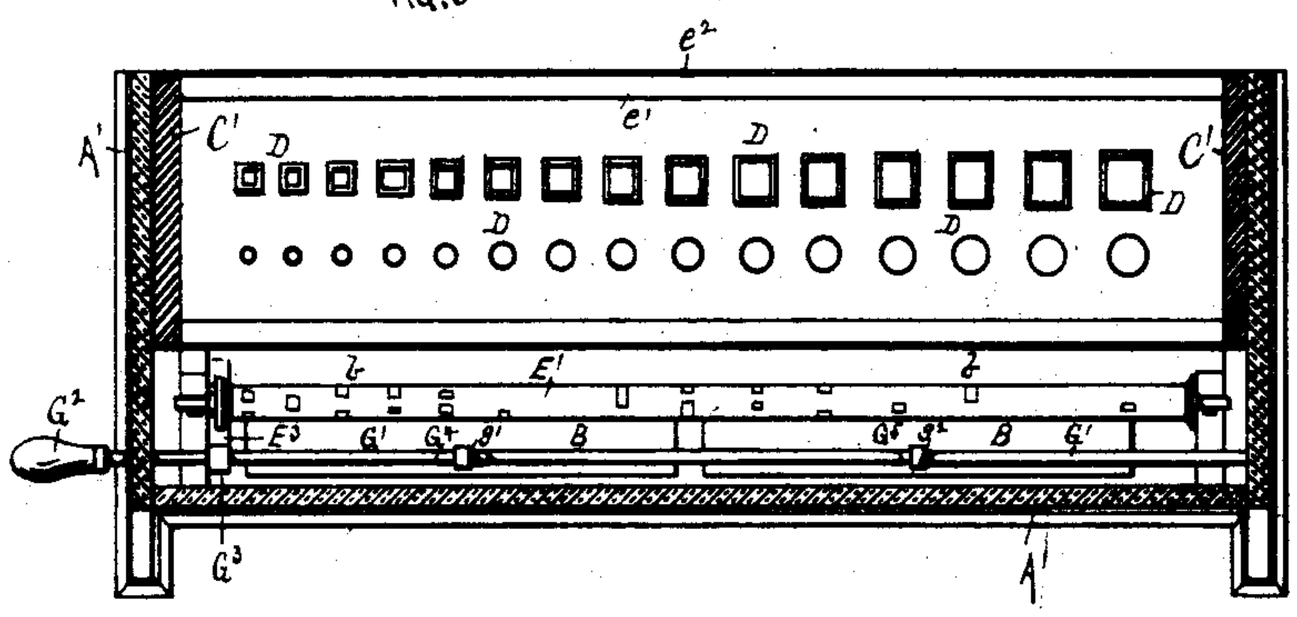
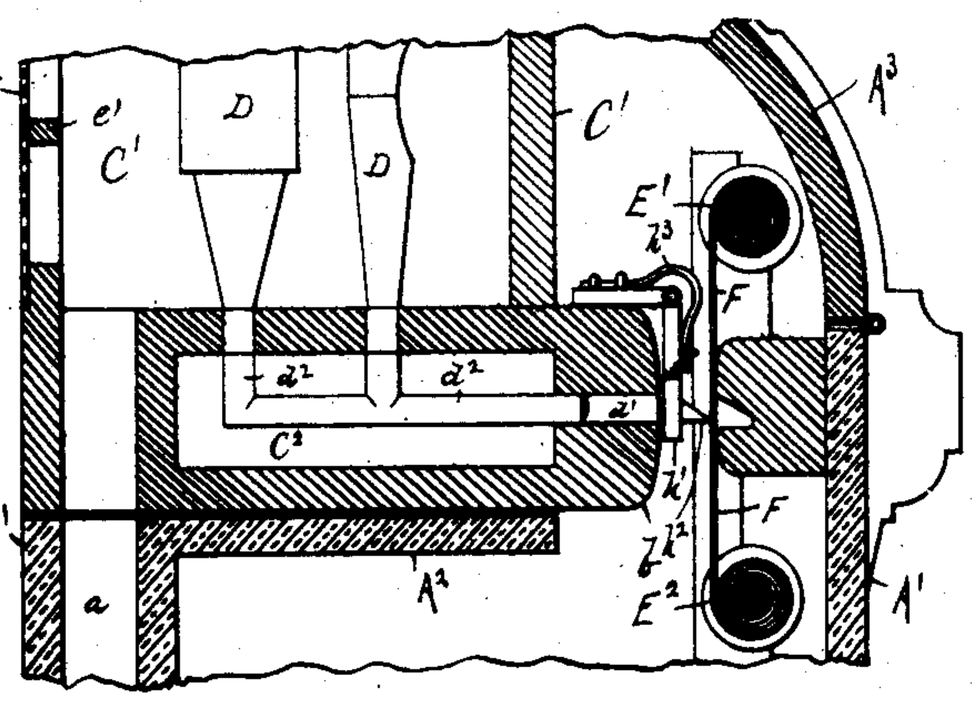


Fig. 4



WITNESSES:
C. K. Woodward
Louis Fraser Jr.

Arthur Wales,
INVENTOR. BY
Louis Fraser & Co.
attys.

UNITED STATES PATENT OFFICE.

ARTHUR WALES, OF MINNEAPOLIS, MINNESOTA.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 339,237, dated April 6, 1886.

Application filed September 1, 1885. Serial No. 175,883. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR WALES, a citizen of the United States, and a resident of Minneapolis, county of Hennepin, and State of Minnesota, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following specification is a full, clear, and exact description, reference being also had to the accompanying drawings.

This invention relates to mechanical musical instruments; and it consistst in the construction, combination, and arrangement of parts, as hereinafter shown and described, and then sought to be specifically defined by the claims.

In the drawings, Figure 1 is a sectional side elevation. Fig. 2 is a longitudinal sectional elevation on the line *x x* of Fig. 1. Fig. 3 is a plan view in section on the line *y y* of Fig. 1. Fig. 4 is a sectional detail illustrating a slight modification in the construction.

A′ is the outer casing or frame-work, in the lower part of which is arranged a suction-bellows, B, adapted to exhaust the air from the upper part of the casing through an air-duct, *a*, the latter opening upward through a board, A^2, which forms a horizontal partition across the frame A′, near its lower part, as shown.

Within the upper part of the frame A′ an air-tight casing, C′, is adapted to be inserted, with its lower side resting on the partition-board A^2, the contiguous surfaces of the casing C′ and board A^2 being provided with a sheep-skin or other suitable packing to render the joint air-tight. The lower part of the casing C′ is formed with a chamber, C^2, into the upper part of which a series of suitably-pitched organ-pipes, D, are inserted, the lower ends of the pipes opening down into the chamber C^2. The side of the chamber C^2, next to the front of the casing A′, is formed projecting slightly, as at *b*, and with a rounded outer surface, as shown. Through this projecting portion *b* a series of horizontal perforations or ports, *d′*, are formed, leading into the chamber C^2, and from the interior of each of these perforations a tube, d^2, leads to the mouths of the pipes D, each pair of the pipes D being thus connected to one of the ports *d′*, so that when the air is exhausted from the casing C′ by the bellows B the pipes D will be sounded by the air rushing in through the ports *d′* and tubes d^2.

I have shown in the drawings the tubes d^2, connecting the ports *d′* and the pipes D; but of course it will be readily understood that mere passages in the wood of the casing C′ may be substituted for this construction. I have also shown in the drawings each of the tubes d^2 connected to two of the pipes D; but under some circumstances each pipe may be supplied with its own independent air-conduit, or one or more of the pipes may be connected to one air-conduit, as required.

The fronts and backs of the casing C′ are formed of open slats *e′*, covered with rubber, cloth, or other suitable fabric, e^2, which is impervious to air, so that the sound of the pipes will freely pass through, while the air will be excluded.

The front of the frame A′, opposite the casing C′, will be either left entirely open or filled in with any fanciful or ornamental design; but such design or filling should be of an open pattern to admit the passage of sound freely.

"Swell-shutters" A^4 will be arranged in the front of the cloth covering e^2 of the casing C′, adapted to be opened and closed in the ordinary manner, to increase or decrease the tone.

Across the lower part of the frame A′ are pivoted two drums, E′ E^2—one above and one below the projection *b*—and upon these drums is secured a perforated music-strip, F, of paper or other similar suitable material. The drums E′ E^2 are set slightly back of the face of projection *b*, so that as the paper strip F is wound from one drum to the other it will not run in a straight line from one drum to the other, but will be curved slightly outward and caused to run in positive contact with the curved outer surface of the projection *b*, so that the solid or unperforated portion of the paper serves as a valve to close the ports *d′* and admit the air to the pipes D only when the perforations in the paper strip come opposite to the ports.

In Fig. 2 the paper strip F is shown in front of the projection *b*, a portion of the central part of the strip being shown broken out to show the relative positions of the strip and projection.

Any suitable means may be employed to revolve the drums E′ E²; but for the purpose of illustration I have shown in the drawings an approved method for accomplishing this result, consisting in a horizontal shaft, G′, journaled across the frame A′ parallel with the drum E², and having a crank, G², outside the frame A′, by which it may be revolved. On this shaft G′, inside the frame A′, is a small friction-pinion, G³, adapted to engage with a larger friction-drum or disk, E³, on the drum E², so that the revolution of the shaft G′ by the crank G² will revolve the drum E², and thus wind the paper strip F from the drum E′ to the drum E² and cause it to pass over the projection *b* and alternately shut off and admit the air to the pipes D.

In the shaft G′ is formed one or more cranks, G⁴ G⁵, connected by rods *g′ g²* to the bellows B, so that the same motion which operates the perforated music-strip also operates the bellows.

A hinged cover, A³, will be arranged on the front of the frame A′, to cover and protect the paper rolls and the bellows-operating mechanism, while at the same time affording free access to the interior of the frame when required.

In Fig. 4 is shown a slight modification of the construction, consisting of the arrangement over each of the ports *d′* of a valve, *h′*, each valve adapted to be held closed by the pressure of the solid or unperforated portions of the paper F upon the point *h²* of the valve while passing over them, and each valve will be provided with a spring, *h³*, which serves to force it outward when the perforations come opposite the points *h²*, and thus open the valves and sound the pipes. The solid portions of the paper then close the valves again as the paper strip continues to move downward. The operation and results obtained, however, are the same in both the forms of mechanism shown.

As before stated, the casing C′ is arranged to be inserted into the frame A′, and it will be arranged to be easily inserted into or removed therefrom. This is an important feature of my invention, as it enables me to remove the casing C′ and insert another having pipes voiced to a different quality of tone, so that the same frame A′, paper strip F, and bellows B may be adapted to any required variety of sets of pipes D.

I have shown in the drawings an ordinary construction of exhaust-bellows; but it is evident that a suction air-pump may be used in place of the bellows, if preferred.

Having described my invention and set forth its merits, what I claim is—

1. In combination with the main case, perforated strip, and bellows of a mechanical musical instrument, an air-tight case containing a series of organ-pipes and conduits leading into the said organ-pipes, the said air-tight case being removable from and replaceable in the main case, for the purpose herein specified.

2. In combination with the main case, perforated strip, and bellows of a mechanical musical instrument, a removable air-tight case provided with a series of organ-pipes located therein, the said air-tight case having swell-shutters outside of its walls or close sides, substantially as and for the purpose herein set forth.

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

ARTHUR WALES.

Witnesses:
LOUIS FEESER, Jr.,
W. J. RODGERS.