(No Model.) 2 Sheets—Sheet 1.

# P. EHRLICH.

## MECHANICAL MUSICAL INSTRUMENT.

No. 308,242. Patented Nov. 18, 1884.

Fig. 1.

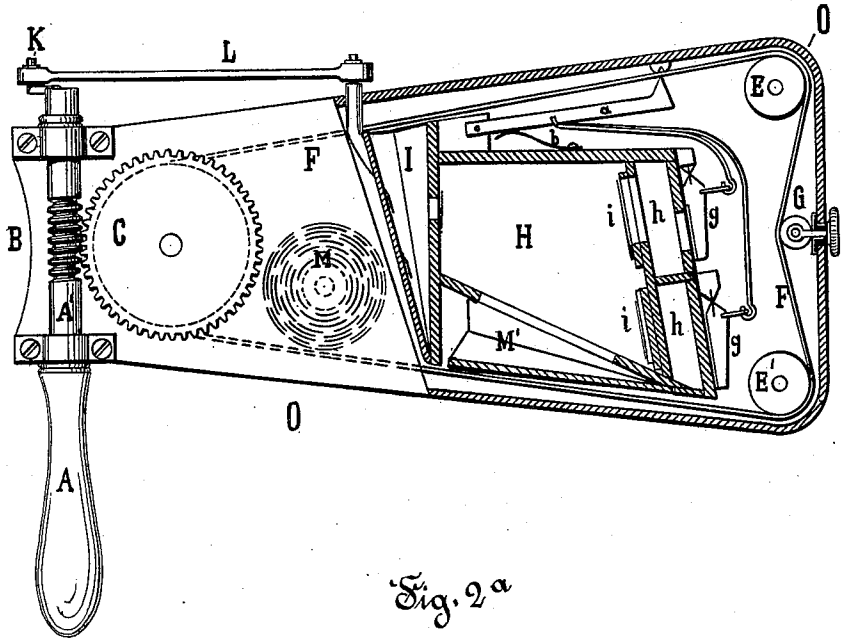



Fig. 2a

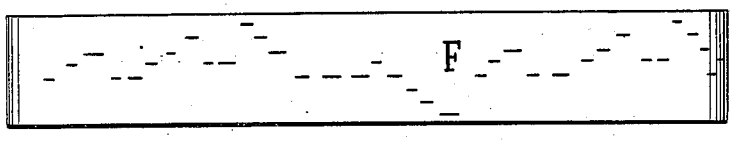
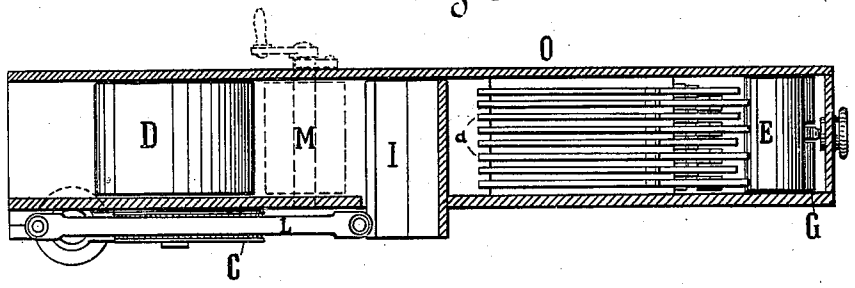



Fig. 2.




Witnesses:
Ewellasick
J. Walter Blandford

Inventor:
Paul Ehrlich
by Marcellus Bailey
Attorney

(No Model.) 2 Sheets—Sheet 2.

# P. EHRLICH.

## MECHANICAL MUSICAL INSTRUMENT.

No. 308,242. Patented Nov. 18, 1884.

Fig. 4.

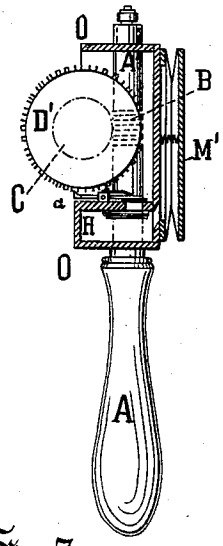



Fig. 3.

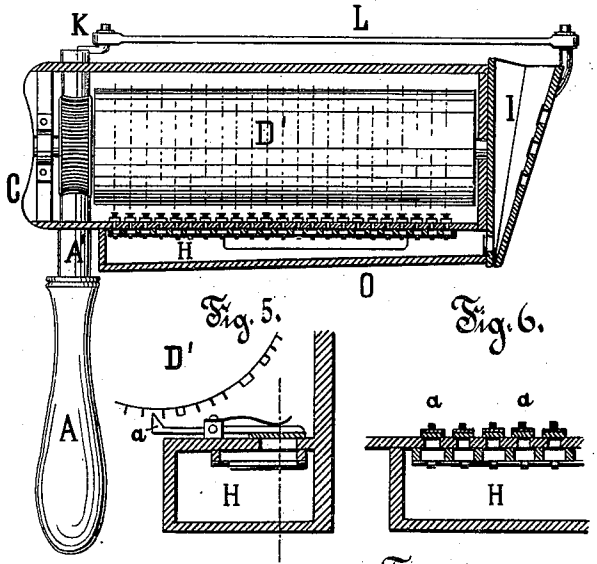



Fig. 5.




Fig. 6.




Fig. 7.

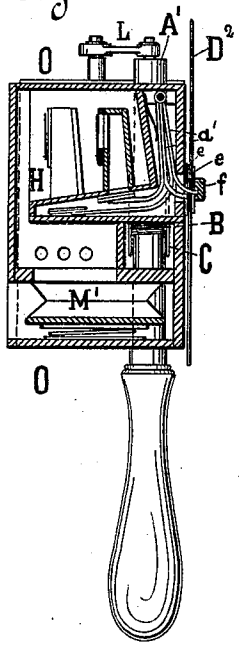



Fig. 8.

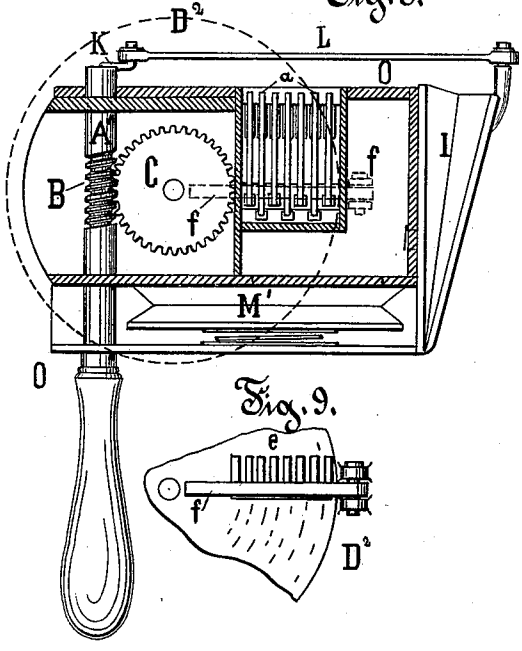



Fig. 9.

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# UNITED STATES PATENT OFFICE.

PAUL EHRLICH, OF GOHLIS, NEAR LEIPSIC, SAXONY, GERMANY, ASSIGNOR TO THE FABRIK LEIPZIGER MUSIKWERKE, VORMALS PAUL EHRLICH & CO., OF SAME PLACE.

## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 308,242, dated November 18, 1884.

Application filed January 14, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL EHRLICH, residing at Gohlis, near Leipsic, in the Kingdom of Saxony, German Empire, have invented a new Mechanical Musical Instrument, of which the following is a specification.

My invention relates to musical instruments in which reeds or pipes or other devices suitable for bringing forth musical notes are caused to sound by mechanical means so as to produce a melody; and its object is to so construct the instrument that it will act, by being bodily swung around on a non-rotating axle, more effectually than has been attained by the devices heretofore employed. For this purpose the parts operating to produce the notes are inclosed in or attached to a box or frame arranged to be rotated upon an axle passing through the instrument at a certain distance from the center of gravity thereof, and one end of which is adapted to be held in the hand, a worm and wheel and a crank being provided by which the operating parts are actuated when they are caused to rotate around the axle.

On the annexed two sheets of drawings, Figure 1 shows in sectional elevation, and Fig. 2 in sectional plan, a mechanical musical instrument with my invention applied thereto. Fig. $2^a$ is a plan view of the perforated band F, Fig. 1. Figs. 3 and 4 are respectively a sectional elevation and transverse sectional view of another instrument comprising my invention. Figs. 5 and 6 are details thereof. Fig. 7 shows in sectional elevation, and Fig. 8 in transverse section, an instrument of the kind described in the specification of my United States Letters Patent No. 290,672, and also involving my present invention. Fig. 9 is a part in detail.

In all these instruments the box O, in which the operating parts are inclosed or to which they are attached, is rotatively connected to an axle, A′, having at one end a handle, A. By this handle the instrument is held in the hand while it is swung around on its axle. On the said axle there is a screw thread or worm, B, engaging with a worm-wheel, C, from which motion is conveyed to certain valve-operating devices, and to the end of the axle is fixed a crank, K, on which turns one end of the connecting-rod L, whose other end acts on the bellows I. It will be seen that by these means the wheel C is rotated and the connecting-rod operated when the instrument is handled as described.

The other portions of the instruments represented by drawings do not in themselves constitute any part of the invention; but I shall briefly describe them in order to completely show how the invention may be applied in practice.

According to Figs. 1, 2, and $2^a$ there is fixed upon the axle of the aforesaid wheel C a roller, D, over which and the auxiliary rollers E and E′ runs a continuous traveling band, F, having perforations corresponding with the notes to be produced, and adapted to register with the beaks of levers *a*, connected to the valves of reeds *h*, provided with vibrating tongues *i*, the parts being so arranged that when a perforation is opposite to the beak of a lever, *a*, this lever and the valve attached to it will be lifted by a spring, *b*, and the corresponding note will be sounded by the air fed into the chamber H by the bellows I, and the pressure whereof is regulated by the bellows M′. G is a tension-roller for the band F. If preferred, the said band may also be operated by the wheel C when it is coiled on an axle, M, and attached with one end to the roller D.

In the instrument shown by Figs. 3 to 6 the axle of the wheel C carries a cylinder, D′, adapted to actuate the valve-levers *a* by means of pins and cams fixed on its surface, or in grooves turned into the surface. The cylinder may, however, also be constructed with notches in which engage the beaks of valve-levers constructed as in Fig. 1; or the cylinder is made hollow and provided with perforations for the same purpose.

In order to allow various tunes to be played on one instrument, the cylinder D′ may be made with an exchangeable sleeve carrying the pins, notches, or perforations; or the said pins, notches, or perforations are attached to or

formed in flat sheets of any suitable material adapted to be fastened on the surface of a smooth cylinder. Moreover, sheets of this kind may be caused to run over two or more cylinders or rollers, in a similar manner as in the instrument shown by Figs. 1 and 2, the beaks of the valve-levers being in this case opposite to one of these cylinders or rollers.

According to Figs. 7 to 9 the axle of the worm-wheel C has a perforated disk, $D^2$, attached thereto for operating the valve-levers *a*, the said disk rotating between two rows of tines, *e*, Figs. 8 and 9, by which, besides, the levers *a* are guided. The outer row of these tines is fixed to a bar, *f*, that may be turned up for allowing the disk to be exchanged. The bellows I are actuated in the latter two instruments in the same manner as in the one described first.

The invention, may, however, also be applied to instruments in which the notes are produced in other manner, or in which motion is conveyed to the operating parts by other means than those shown in the drawings, and described.

I claim as my invention—

In a mechanical musical instrument pivoted on an axle, A′, not passing through its center of gravity, and having a handle, A, adapted to hold the instrument by, the combination, with the said axle, of a worm, B, engaging with the worm-wheel C, from which motion is conveyed to the reed-operating devices, and of a crank, K, connected by the rod L to the bellows I, the said worm-wheel C and rod L being actuated when the instrument is swung round on its axle, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PAUL EHRLICH.

Witnesses:

ERNST SCHMUNTZSCH,
*Firma Beck & Co.*

F. WILKIE.