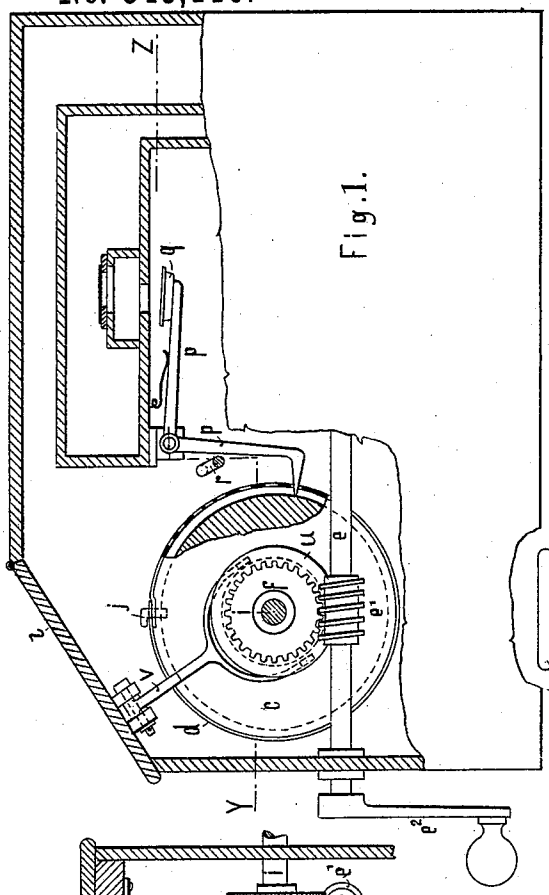
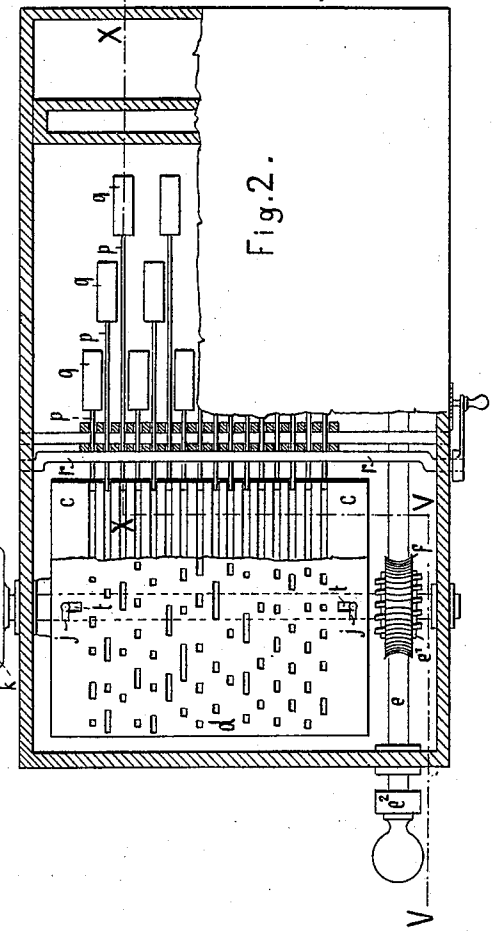
(No Model.)

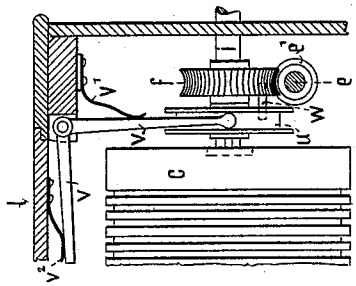
F. E. P. EHRLICH.

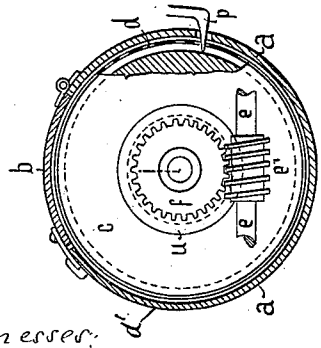
MECHANICAL MUSICAL INSTRUMENT.

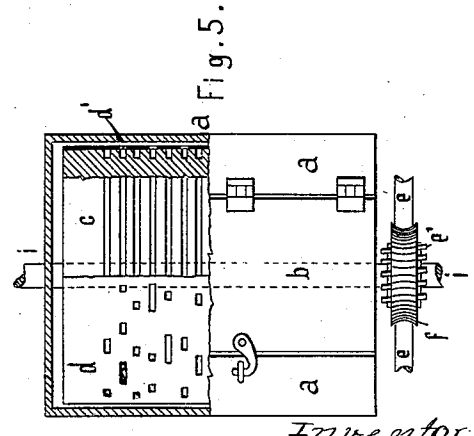
No. 343,116. Patented June 1, 1886.











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UNITED STATES PATENT OFFICE.

FRIEDRICH ERNST PAUL EHRLICH, OF GOHLIS, NEAR LEIPSIC, SAXONY, GERMANY.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 343,116, dated June 1, 1886.

Application filed July 11, 1885. Serial No. 171,282. (No model.) Patented in Germany December 24, 1884, No. 32,391, and June 16, 1885, No. 34,254; in France February 9, 1885, No. 166,911; in England May 30, 1885, No. 6,585; in Belgium August 14, 1885, No. 69,908, and in Austria-Hungary November 12, 1885, XIX, 2,258, XXXV, 2,225.

To all whom it may concern:

Be it known that I, FRIEDRICH ERNST PAUL EHRLICH, a subject of the King of Saxony, and residing at Gohlis, near Leipsic, Kingdom of Saxony, German Empire, have invented new and useful Improvements in Mechanical Musical Instruments Operated by Means of Perforated Music-Sheets, of which the following is a specification.

My invention relates to mechanical musical instruments in which the notes are produced by reeds having valves that are actuated by the medium of a perforated music-sheet, together with levers adapted to engage with the perforations of the said sheet and with the grooves of a roller supporting the sheet; and the improvements consist in the combination, with the said parts, of means for causing the music-sheet, after having been laid around the cylinder, to rotate therewith. Moreover, the improvements comprise mechanism which allows the cylinder to be rotated independently of the driving-gear when a music-sheet is to be laid on.

On the annexed sheet of drawings, Figure 1 shows in sectional elevation, according to line V V X X of Fig. 2, a musical instrument to which my invention is applied. Fig. 2 is a sectional plan on line Y Z of Fig. 1, a portion of the music-sheet being removed. Fig. 3 is a view of the disengaging device. Figs. 4 and 5 represent a modification of the invention.

As shown by Figs. 1 and 2, the music-sheet *d*, which is of rectangular form, is laid around a cylinder, *c*, having grooves that register with the beaks of the levers *p*, to which the valves *q* are attached. The cylinder is provided near its ends with turn-buckles *j*, (which may consist in small hooks screwed into the cylinder,) and the sheet at its corners with holes *t*, corresponding to the said turn-buckles in such a manner that when the sheet is placed with its holes over the latter and the buckles suitably turned, the sheet will be kept in contact with the surface of the cylinder. According as the ends of the sheet are made to overlap each other or not, two or four turn-buckles will be required. The holes *t* must of course be so adjusted relatively to the buckles *j* that the sheet, when put on the cylinder, will present its perforations to the beaks of the levers *p*.

The sheet and the cylinder are actuated by a crank, e^2, through the medium of the shaft *e*, worm *e'*, and worm-wheel *f*, the said shaft at the same time operating the bellows of the instrument, which, however, are not shown, because they do not form a part of the invention.

In order to allow the cylinder to be rotated by hand independently of the gearing *f e'*, when a sheet is to be removed or put on, the cylinder is coupled to the worm-wheel *f* in such a manner that it may be disengaged therefrom. The device shown for this purpose in the drawings consists of a disk, *u*, arranged to slide on a feather fixed to the shaft *i*, and having a number of holes with any one of which may engage a pin, *w*, screwed into the worm-wheel *f*. With the disk *u*, which is grooved, engages a lever, *v*, acted upon by a spring, *v'*, in the direction toward the cylinder, whereas another spring, v^2, fixed to the lid *l*, and strong enough to counteract the force of *v'*, presses lever *v* the other way. Consequently, when the lid *l* is closed and the disk *u* has been pushed by means of spring v^2 and lever *v* with one of its holes on the pin *w*, the rotation of shaft *e* will be transmitted through *e'*, *f*, *w*, and *u* to the shaft *i*, whereas when the lid *l* is opened for exchanging a sheet, the horizontal arm of the lever *v* is relieved of the pressure of the spring v^2, and the vertical arm of the same, together with the disk *u*, pushed toward the cylinder, so that *u* will be disengaged from the pin *w*. The cylinder, which is fixed on the shaft *i*, may then be rotated by the small hand-wheel *k*, keyed on *i* outside of the instrument. The spring v^2 has the special purpose of allowing the lid *l* to be closed even when a hole in *u* does not register with the pin *w*, the subsequent rotation of *f* soon fetching the pin opposite to a hole, whereupon spring v^2 will cause the parts to engage with each other.

For the purpose of keeping the beaks of the valve-levers *p* out of the way when a sheet is to be exchanged, there is a cranked bar, *r*, extending along the front of the vertical arms of the

levers *p*, and fitted with a handle, *r'*, by which it may be turned so as to press against the levers, and to keep their beaks at some distance from the cylinder.

In the modified arrangement shown by Figs. 4 and 5 the cylinder *c* is inclosed in a drum, *d'*, having such diameter that between its inner surface and the outer surface of the cylinder a space will be left having just sufficient width for slipping the music-sheet thereinto. The drum is provided at the top with a door, *b*, for the insertion of the sheet into the said space and the removal of the same, and at its side there is a slit, through which the beaks of the levers *p* press against the music-sheet. For preventing the sheet from being displaced on the cylinder, it is hooked on studs (not shown) fixed to the surface of the latter. By means of the said drum, also, the music-sheet is kept in contact with the surface of the cylinder during its rotation.

I claim as my invention—

1. In a mechanical musical instrument, the combination, with the valve-levers *p*, provided with beaks and a cylinder, *c*, having grooves registering with the said beaks, of a perforated music-sheet, *d*, laid around the cylinder *c*, and means for causing the sheet *d* to rotate with the cylinder, substantially as and for the purpose described.

2. The combination, with the valve-levers *p*, of a grooved cylinder, *c*, having studs, a perforated music-sheet, *d*, having holes registering with the said studs, and a drum, *d'*, inclosing the cylinder *c* and provided with a door, *b*, substantially as and for the purpose specified.

3. The combination, with the valve-levers *p*, grooved cylinder *c*, fixed on the shaft *i*, a perforated music-sheet, and means for keeping the sheet in contact with the surface of the cylinder, of mechanism for disengaging the cylinder from the driving-gear *f c'* and rotating it independently thereof by means of its shaft *i*, substantially as and for the purpose set forth.

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

FRIEDRICH ERNST PAUL EHRLICH.

Witnesses:

ERNST SCHMUNTZSCH,

CLEMENS RICHTER.