(No Model.)

F. E. P. EHRLICH.

MUSIC SHEET FOR MECHANICAL MUSICAL INSTRUMENTS.

No. 425,935. Patented Apr. 15, 1890.

Fig. 1.

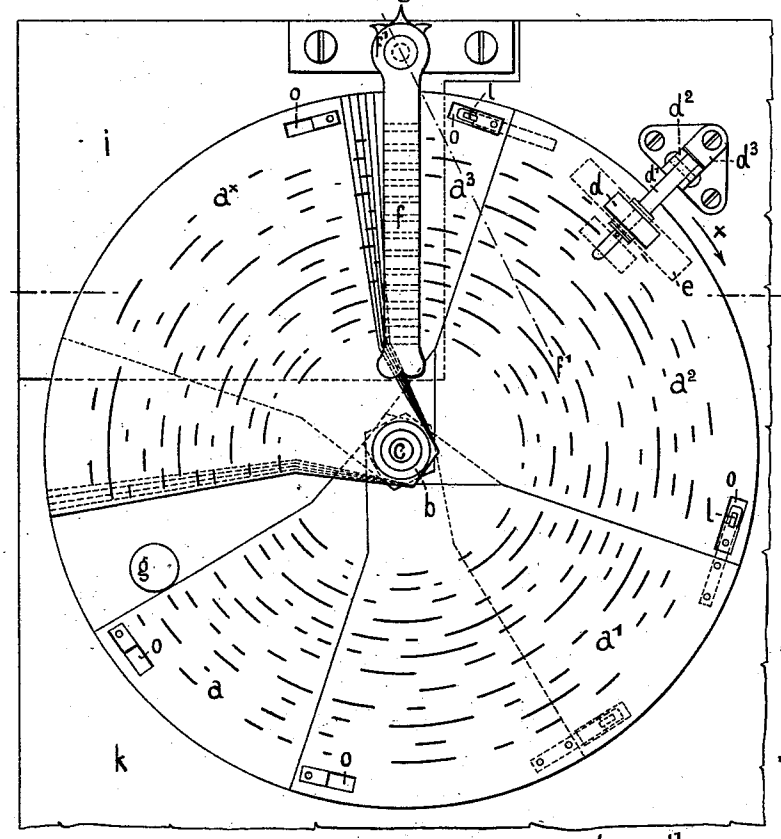


Fig. 2.

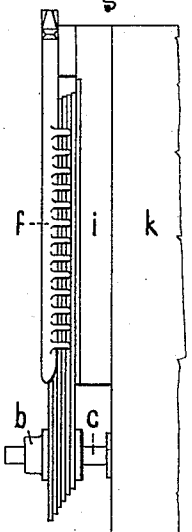


Fig. 4.

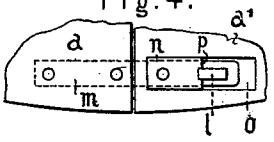


Fig. 5.

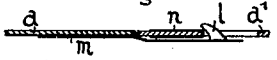


Fig. 6.

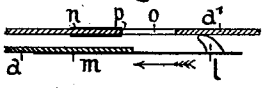


Fig. 3.

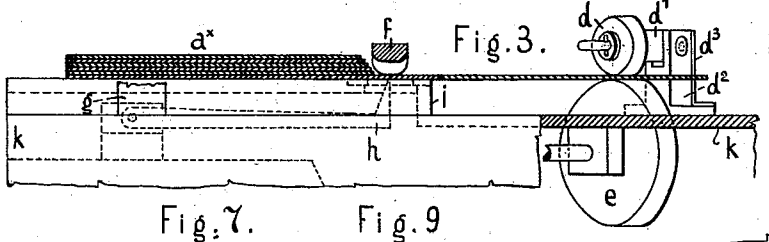


Fig. 11.

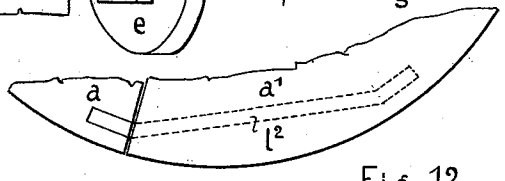


Fig. 7.

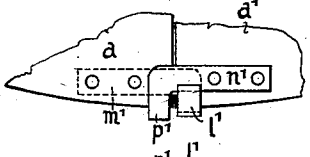


Fig. 9

Fig. 8.

Fig. 10.

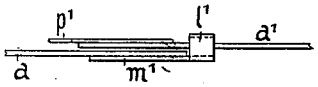


Fig. 12.

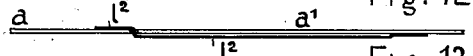


Fig. 13.

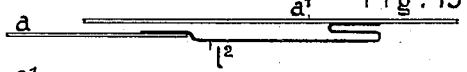
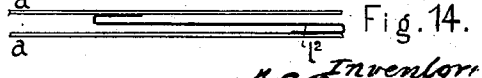


Fig. 14.



Witnesses:
Estell A. Dick
William H. Shipley.

Inventor
F. E. P. Ehrlich
by Munn & Co
his Attorneys

UNITED STATES PATENT OFFICE.

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

MUSIC-SHEET FOR MECHANICAL MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 425,935, dated April 15, 1890.

Application filed January 18, 1890. Serial No. 337,404. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH ERNST PAUL EHRLICH, a subject of the King of Saxony, residing at Gohlis, near Leipsic, Kingdom of Saxony, Germany, have invented a new and useful Improvement in Music-Sheets for Mechanical Musical Instruments, whereof the following is a specification.

My invention relates to perforated rotative music-sheets serving to control or actuate the mechanisms whereby in mechanical musical instruments the sound-producing parts—such as tongues, reeds, strings, and the like—are caused to emit the required notes.

The improvement consists in the construction of the said sheets of a plurality of sector-like parts superposed and pivotally connected at their centers and adapted to be slid one over the other, or to be spread out, like the parts of a fan, the individual sectors being provided with connecting or engaging devices, whereby on one hand each sector on being drawn forward is enabled to pull the succeeding one after it, while on the other hand the said devices allow each sector to slide upon the preceding one as soon as the latter is stopped by any resistance. By this construction a music-sheet for melodies of considerable length is obtained, which may, nevertheless, be brought into a small compass.

In the annexed drawings, Figure 1 is a plan of the box of a musical instrument, together with a music-sheet of the improved kind. Fig. 2 is a fractional side elevation, and Fig. 3 a like front view (partly in section) corresponding to Fig. 1. Fig. 4 is a plan, and Figs. 5 and 6 are sectional views, of the device for connecting the sectors of the said sheet. Figs. 7, 8, and 9 are respectively plan, front view, and sectional side view of a modified construction of the connecting device. Fig. 10 shows the parts thereof out of engagement. Fig. 11 is a plan, and Fig. 12 an edge view, of portions of two sectors with another arrangement of connecting device, Figs. 13 and 14 showing the two sectors in different positions.

In Figs. 1, 2, and 3, k is the box of the instrument, and a a' a^2 a^3 $a^\times$ are five of the said sectors. These sectors are pivotally connected together at their centers by a sleeve b, arranged to be slipped on a pin c, fixed to the box k. On the top of the said box there is an elevation i, designed to support the pile of sectors previous to their operation.

f is a swiveling bar such as is usually employed in like instruments, the same having on its lower surface ribs that bear on the full portions of the music-sheet and serve to keep it down, while the parts of the mechanisms to be acted upon press against the sheet from below. In Fig. 3 one such part—viz., a lever h—is shown by dotted lines. d and e are two rollers by which the sector, being at the time under the action of the same, is drawn forward in the direction of the arrow x, Fig. 1. The roller e is actuated by any suitable mechanism connected to the crank of the instrument, but not shown in the drawings. The roller d is mounted on the end of a small lever d', pivoted to a standard d^2, and acted upon by a spring d^3 in such manner that the roller d presses against the roller e any sector brought between the rollers, so that when the roller e rotates it will draw along the sector through the medium of the friction between it and the latter.

The connecting device (shown in Fig. 1 and more in detail by Figs. 4, 5, and 6) consists for each sector in a small inclined tappet l, projecting upward from the end of a strip of metal m, which is fixed to the rear outer corner of the sector, and in an edge p, being the front edge of hole o, punched into the other outer corner of the said sector and arranged to register with the tappet l of the preceding sector when both sectors are in juxtaposition. If the sectors are made of card-board, the said edge p is preferably provided with a mounting n, of metal, for the purpose of preventing its abrasion.

When a tune is to be played, the bar f is turned aside into the line f' f', Fig. 1, the pile of sectors forming the music-sheet is placed with its sleeve b on the pin c, the lowest sector, whose front portion is without perforations, is drawn forward by hand and brought in engagement with the rollers d e, and the bar f is returned to its normal position, all the sectors except the lowest one, which is under the bar f, being then in rear of the lat-

ter. If the roller *e* is now put in rotation by the operating mechanism of the instrument, the said lowest sector (sector *a*, Fig. 6) will be advanced, and when its tappet *l* comes into register with the hole *o* of the sector being above the former (sector *a'*, Fig. 6) the tappet engages with the hole, as shown especially by Figs. 4 and 5, and draws the second sector along. In like manner all the other sectors are drawn forward one after the other. As soon as any sector—say the sector *a*—has left the rollers *d e* it will bend down a little by its weight, so that it has then a tendency to disengage from the following sector *a'*, and although it may still be pushed forward by the latter through the medium of friction its tappet *l* will certainly come out of engagement with the co-operating edge *p* as soon as the sector *a* meets any resistance—such as the post *g*, provided for this purpose—the sector *a'* then sliding upon the sector *a*. Similarly all the succeeding sectors are pushed one upon the other, and thus gathered again in a pile.

In the modified arrangement of the connecting device shown by Figs. 7 to 10 one of the co-operating parts consists in a tappet *l'*, formed at the end of the angular strip of metal *m'*, fixed to the sector *a*, the said tappet projecting upward outside of the periphery of the sector, while the other part is constituted by the portion *p'* of a strip of metal *n'*, secured to the sector *a'*, the portion *p'* projecting radially from the latter, so as to be in the path of the tappet *l'* when the same is moving. Preferably the tappet *l'* is bent to embrace the edge of the disk *a'*. (See Fig. 9.) Figs. 7 and 8 show the two sectors in juxtaposition, the parts *l'* and *p'* being in engagement with each other, while Fig. 10 shows the sector *a'* partly slid upon the sector *a*.

The connection between the two sectors (represented by Figs. 11 to 14) is produced by a tape l^2, fixed with one end to the sector *a* at its rear edge, and with its other end in the middle of the sector *a'*, the tape having such length as to be stretched out when the sectors are in juxtaposition. (See Figs. 11 and 12.) If under these conditions the sector *a* is moved forward, it will draw the sector *a'* along with it, whereas if sector *a* is stopped and sector *a'* is advanced the latter will slip upon the former, (see Fig. 13,) the tape then becoming slack and folding together until, when the sector *a'* has been pushed completely on sector *a*, it will lie entirely between them, as shown by Fig. 14.

I claim as my invention—

1. In a rotating music-sheet for mechanical musical instruments, the combination of a plurality of sectors superposed and pivotally united at their centers and having connecting devices, whereby each sector on being moved forward is enabled to draw along the following one and to slide upon the sector that precedes, substantially as described.

2. In a rotating music-sheet for mechanical musical instruments, the combination of a plurality of sectors superposed and pivotally united at their centers, the said sectors having tappets, such as *l* and *l'*, and edges, such as *p* and *p'*, against which the tappets of the preceding sectors act, substantially as specified.

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

FRIEDRICH ERNST PAUL EHRLICH.

Witnesses:

CARL BORNGRAEBER,

HENRY W. DIEDERICH.