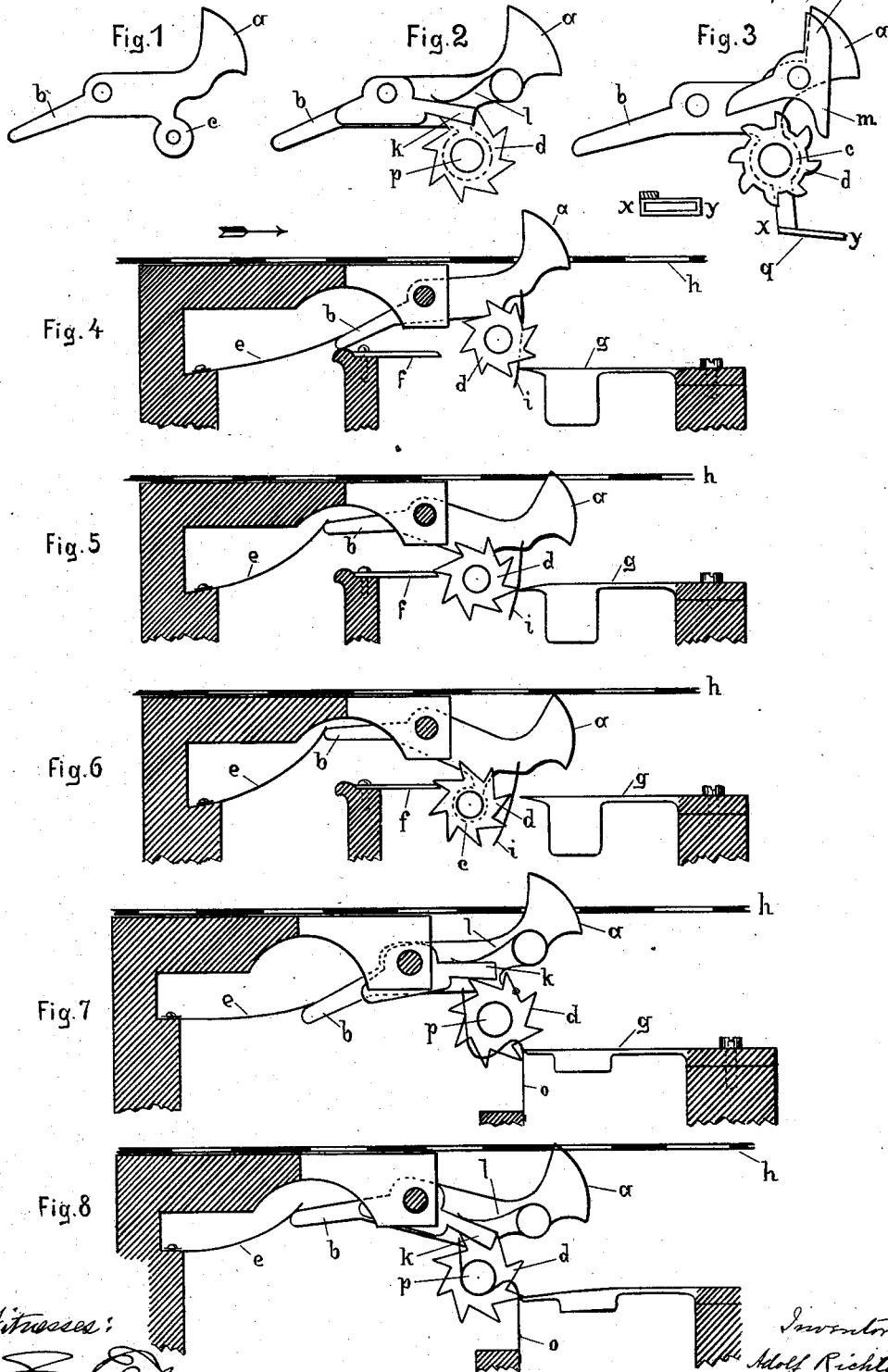


A. RICHTER.
MECHANICAL MUSICAL INSTRUMENT.

No. 605,134.

Patented June 7, 1898.



Witnesses:
J. O. Moore
Charles O. Smith

Inventor
Adolf Richter
 By *Briesen & Mautz*
 his Attorneys

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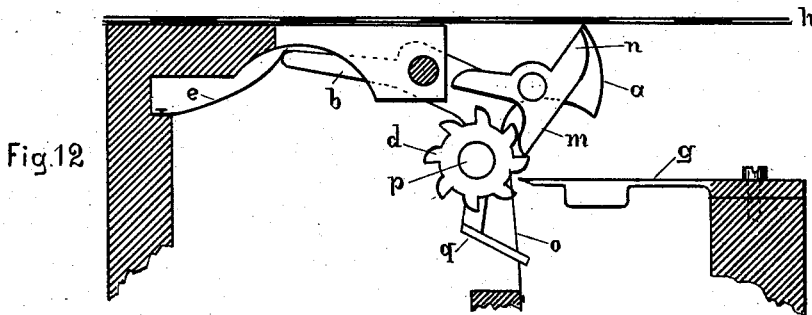
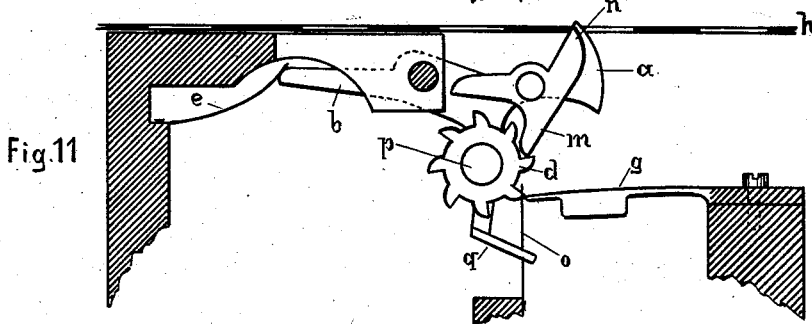
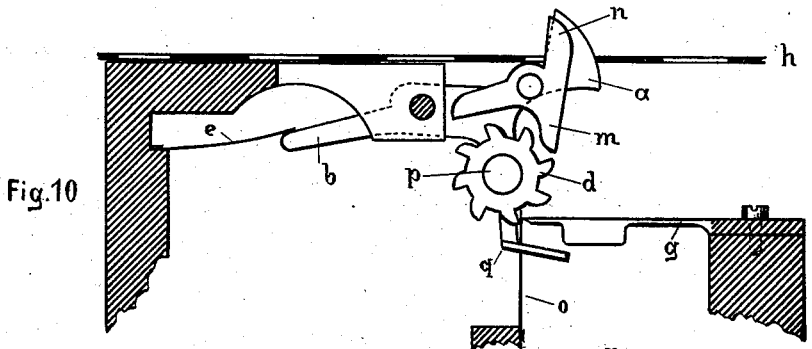
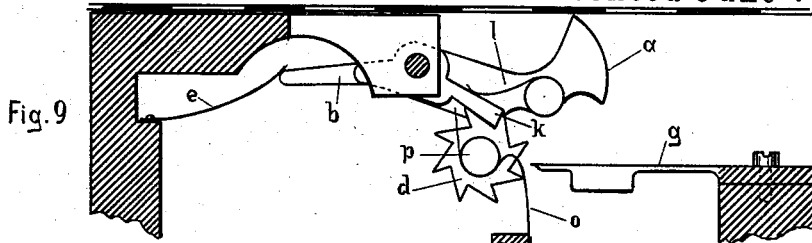


Fig. 13

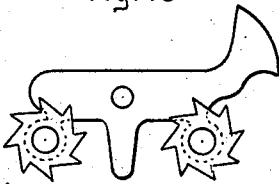
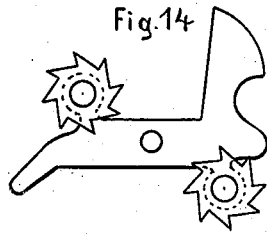


Fig. 14



Witnesses:

Ed. Chase,
Charles C. Smith

Inventor
Adolf Richter

By Brieson Knaut,
his Attorney.

(No Model.)

3 Sheets—Sheet 3.

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Fig. 15.

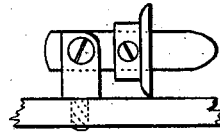


Fig. 17.

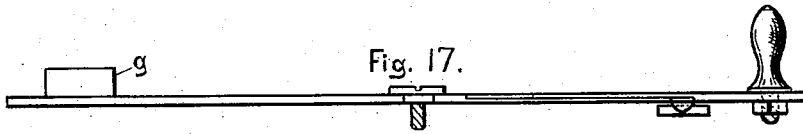


Fig. 16.

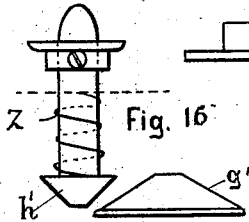


Fig. 18.

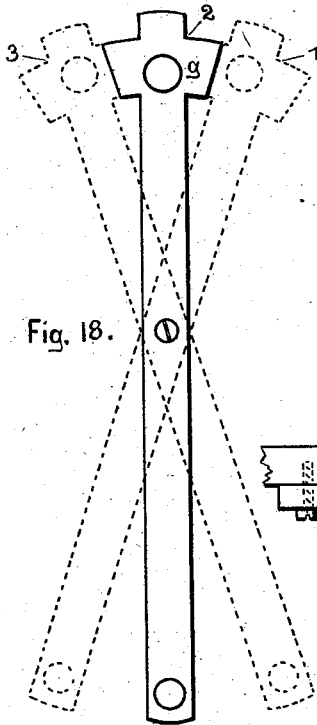
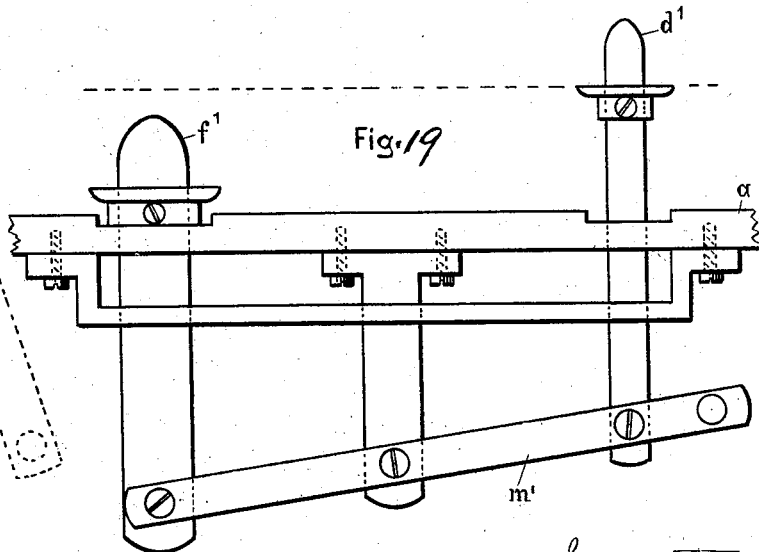


Fig. 19.



Witnesses:

Ed. Morse
Charles E. Smith

Inventor
Adolf Richter
By Briesen & Knantz
his Attorneys

UNITED STATES PATENT OFFICE.

ADOLF RICHTER, OF RUDOLSTADT, GERMANY.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 605,134, dated June 7, 1898.

Application filed September 21, 1896. Serial No. 606,565. (No model.)

To all whom it may concern:

Be it known that I, ADOLF RICHTER, a subject of the King of Bavaria, residing at Rudolstadt, in the Principality of Schwarzburg-Rudolstadt, Germany, have invented certain new and useful Improvements in or Connected with Mechanical Musical Instruments, of which the following is a specification.

This invention relates to improvements in or connected with mechanical musical instruments. The said improvements have reference to various parts and devices of a mechanical musical instrument; and the object of the invention is that by adopting the said improvements mechanical musical instruments of a superior quality may be obtained.

My invention consists in mechanism for vibrating steel reeds or tongues, the pivoted lever of which instead of having a fixed point is provided with one or two small star-wheels, each capable of revolving about its own axis. By this arrangement the vibration of the reeds is effected with certainty and also a smooth entrance or gliding of the engaging nose in the perforations of the music-sheet is obtained, while two reed-combs can be vibrated simultaneously, which has not been possible heretofore when using perforated sheets.

My invention also consists in the arrangement of two or more guide-pins for the center of the music-sheets, said guide-pins being mounted movably in the instrument and capable of being moved by hand in their bearings to and from operative position to suit the diameter of the music-sheet, so that music-sheets of different sizes can be employed in one and the same instrument.

In the accompanying drawings, Figure 1 shows the lever which carries the star-wheels. Figs. 2 and 3 show the lever with the star-wheel in combination with two several kinds of pawls for stopping the star-wheels. Figs. 4, 5, and 6 show the several positions of the lever during the movement of the music-sheet. The stop for the star-wheel is formed of a fixed arm *f*. Figs. 7, 8, and 9 represent several positions of the lever shown in Fig. 2, and Figs. 10, 11, and 12 represent several positions of the lever shown in Fig. 3. Figs. 13 and 14 show the lever in combination with

two star-wheels. Fig. 15 is an elevation of a jointed guide-pin. Fig. 16 is an elevation of a guide-pin having an inclined lower end, Fig. 17 being an elevation, and Fig. 18 a plan view, of a hand-lever with inclined head to contact with the guide-pin; and Fig. 19 shows a lever mechanism for adjusting the guide-pins.

With reference to Figs. 1 to 14, Fig. 1 shows an operating-lever with the engaging nose *a*, the arm *b*, and the arm *c*, by which latter arm the small star-wheel *d*, Figs. 2 and 3, is carried.

Fig. 2 illustrates the lever with a pawl *k*, the latter of which is pressed by means of the spring *l* into the teeth of the small star-wheel *d*.

Fig. 3 shows the lever carrying a pawl *m*, which is rocked by the music-sheet (that acts upon the arm *n*) and which is thus brought into engagement with the teeth of the small star-wheel *d*.

Figs. 4, 7, and 10 show applications of the levers and star-wheels, the lever being in its position of rest and provided with the small star-wheel *d*. In these figures the lever has its engaging nose (and in Fig. 10 also with the arm *n* of the pawl *m*) in the perforation of the music-sheet *h*, and is kept in that position by the pressure of the spring *e* until it is moved by the onwardly-moving music-sheet into the position shown by Figs. 5, 8, or 11. In this latter position the teeth of the star-wheel, as shown at Fig. 5, bear against the fixed-stop *f*, which may consist of a wire, a strip of sheet metal, or the like, or, as shown in Figs. 8 and 11; the teeth of the small wheel bear against the pawl *k* or *m*; and thereby obtain the requisite support for vibrating the reed. When the reed is vibrated, the star-wheel is moved out of the path thereof by the backward movement of the lever to enable the reed to vibrate without hindrance, Figs. 6, 9, and 12. In the upward movement of the lever the star-wheel slides with a revolving motion past the reed, which is damped by the damping-spring *i* or *o*, the said wheel touching the said reed gently with one tooth.

Instead of the spring *i*, which is fixed to the lever, there may be employed a spring disconnected from the lever to act as a damper,

which spring bears elastically against the front edge of the reed. In this case the damping-spring *o*, Figs. 7 to 9, is formed at its upper end with a bent-out portion, which takes
 5 around the head *p* of the pivot of the star-wheel or around another projection on the plucking-lever in such a manner that the damping-spring is drawn away from the reed during the downward movement of the lever
 10 and is held back, Fig. 9, until the lever moves upward again. The damping-spring *o* may in some cases be employed without an outward bend; but in such a case the arm *c* of the lever is prolonged and bent over at *q*, Figs.
 15 3, 10, 11, and 12, in the manner indicated by the sectional plan *xy*, Fig. 3. The slot (shown in the said plan at *xy*) takes over the damping-spring *o* and draws it back from the reed just before the latter is vibrated, as shown by
 20 Fig. 12.

When the reeds or two reed-combs are to be vibrated by one lever at one and the same time, the said lever is provided with two star-wheels, which are arranged either in the position shown by Fig. 13 or in that shown by
 25 Fig. 14, according as the reeds are arranged.

The object of the arrangement shown in Figs. 15 to 19 is to enable the sheets to be suited to the length of the music-piece, so that,
 30 for instance, for musical compositions with a smaller number of beats smaller and therefore cheaper music-sheets can be employed.

According to my invention and with reference to Figs. 15 to 19 of the drawings I provide the instruments with two or more guide-pins, each of which is adapted to constitute
 35 a pivot for the note-disk, and means are provided to cooperate with said pins to move one of them to the operative position and to maintain the others out of the operative position.
 40 The smaller the music-sheet is to be the nearer the guide-pin should be to the star-wheels *b'* and the reeds *c'*; but if the sheet is to comprise a greater number of beats a guide-pin farther away from the reeds is thrown into
 45 operative position, according to the length of the music-piece. The shifting of the guide-pin may be effected by fastening a number of folding guide-pins, as shown in Fig. 15, on the
 50 bed-plate, the arrangement being such that the pin suitable for the particular music-sheet is then simply turned up. In some cases and with reference to Figs. 16, 17, and 18 the guide-pin may be controlled by a lever, which latter
 55 is formed at one end with a cam-face or inclined surface such as shown in end view at *g'*, Fig. 16, for the purpose of facilitating the raising of the guide-pin, which is likewise preferably provided with a cam-face *h'* at its lower
 60 end. As the lever is moved into either of the positions 1, 2, or 3 of Fig. 18 the guide-pin which passes through one of the holes is raised against the tension of its spring *z* to a position where it can receive the music-sheet
 65 thereon. Finally the guide-pins may also be shifted by means of a lever *m'*, Fig. 19, the

arrangement being such that one of the two guide-pins *d' f'* is always ready to receive the music-sheet, while the other guide-pin is depressed to such an extent as to enable the
 70 music-sheet to pass freely over it.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim as my improvements
 75 in or connected with mechanical musical instruments is as follows:

1. In a mechanical musical instrument, the combination with a steel comb, of a vibratory lever, a star-wheel carried thereby and adapted
 80 to rotate thereon and an abutment adapted to engage a tooth of said star-wheel and hold the same against movement to enable the vibratory lever to move the star-wheel into contact with a tongue of the comb to vibrate the
 85 same.

2. In a mechanical musical instrument, the combination with a steel comb, of a vibratory lever, a star-wheel carried thereby and adapted
 90 to rotate thereon and a pawl adapted to engage a tooth of the star-wheel and hold the same against movement to enable the vibratory lever to move the star-wheel into contact with a tongue of the comb to vibrate the
 95 same.

3. In a mechanical musical instrument, the combination of a steel comb, a vibratory lever, a star-wheel carried thereby and adapted
 100 to rotate thereon and a pawl pivoted to said lever and controlled by the note-sheet, said pawl being adapted to engage a tooth of the said star-wheel and hold the same against movement to enable the vibratory lever to move the star-wheel into contact with a
 105 tongue of the comb to vibrate the same.

4. In a mechanical musical instrument, the combination with a plurality of steel combs, of a vibratory lever, a plurality of star-wheels carried thereby and adapted to rotate thereon,
 110 an abutment adapted to engage a tooth of each of said star-wheels and hold the same against movement to enable the vibratory lever to move the star-wheels into contact with a plurality of tongues of the combs to vibrate the same.
 115

5. In a mechanical musical instrument, the combination with a steel comb, of a vibratory lever, a star-wheel carried thereby and adapted
 120 to rotate thereon, an abutment adapted to engage a tooth of said star-wheel and hold the same against movement to enable the vibratory lever to move the star-wheel into contact with a tongue of the comb and vibrate the same and a damper controlled by the
 125 movement of said lever.

6. In a mechanical musical instrument, the combination of a plurality of guide-pins each of which is adapted to constitute a pivot for
 130 a note sheet or disk and means for throwing one of said pins into operative position and for maintaining the other pin or pins out of operative position, substantially as described.

7. In a mechanical musical instrument, the
combination of a plurality of movable guide-
pins each of which is adapted to constitute
a pivot for a note sheet or disk and mechan-
5 ical means for moving said guide-pins to
throw one of said pins into operative position
and to maintain the other pin or pins out of
the operative position.

In testimony whereof I have signed my
name to this specification in the presence of 10
two subscribing witnesses.

ADOLF RICHTER.

Witnesses:

A. VOGT,
W. HAUPT.