

(No Model.)

2 Sheets—Sheet 1.

C. KRETSCHMAR.
MECHANICAL MUSICAL INSTRUMENT.

No. 471,559.

Patented Mar. 29, 1892.

Fig. 1.

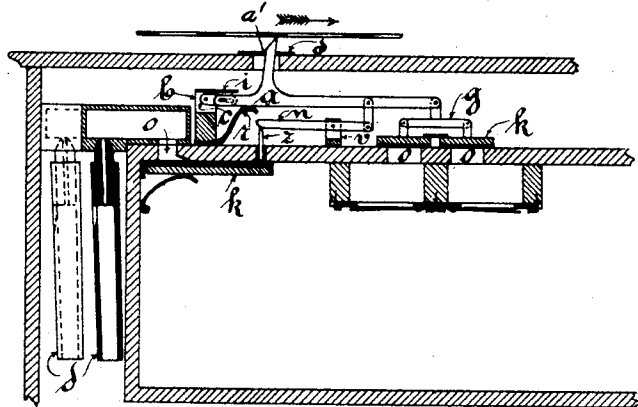


Fig. 2.

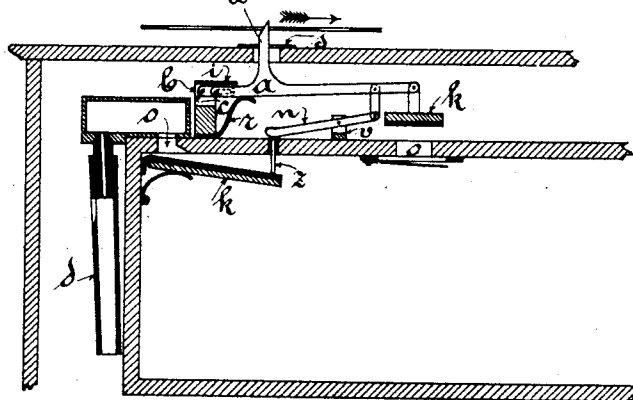
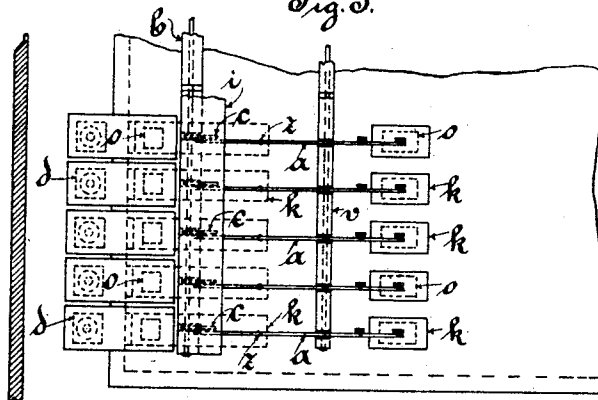


Fig. 3.



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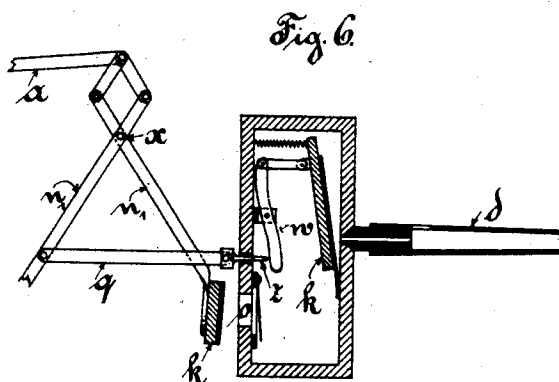
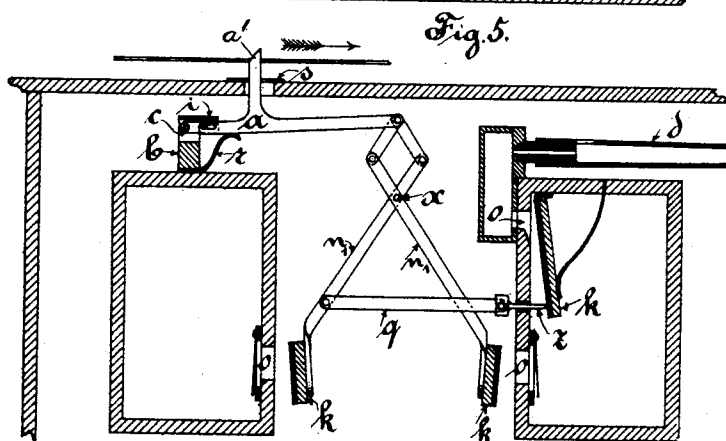
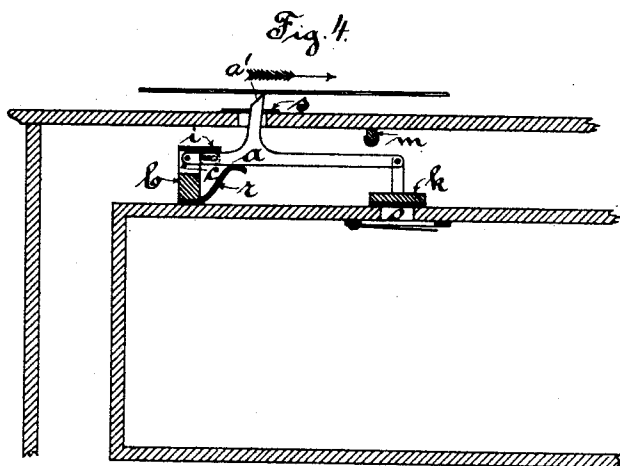
(No Model.)

2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

CARL KRETSCHMAR, OF LEIPSIC, GERMANY.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 471,559, dated March 29, 1892.

Application filed October 27, 1891. Serial No. 410,126. (No model.)

To all whom it may concern:

Be it known that I, CARL KRETSCHMAR, a subject of the Emperor of Germany, and a resident of Leipsic, Entritzsch, Germany, have invented new and useful Improvements in Mechanical Musical Instruments, of which the following is a specification.

This invention relates to mechanical musical instruments in which a perforated music-sheet is caused to pass over a row of key-levers, so that the points of such key-levers are adapted to move into the holes in such music-sheet, and thus open valves, causing the respective notes to sound.

In all instruments of this class it is necessary to press the levers against the music-sheet, so that the latter is subjected to friction against the points of such levers, and more than this the pressure against the music-sheet must be greater than that due solely to the springs required to move the levers into the holes of the music-sheet by reason of the necessity of keeping all the valves very tightly closed when they are to be silent—that is to say, when the solid parts of the music-sheet are moving over the respective keys. This “overpressure,” as it is termed, is very detrimental to the music-sheet, causing the latter to be quickly worn out.

The object of this invention is to reduce this unavoidable overpressure as far as possible. Usually this pressure has to be very strong to allow for wear of the parts, since the counter-pressure of the music-sheet acts at all times against the springs which move the levers to open the valves, and in tightly closing the valves acts with a direct force without intervention of any spring-pressure other than obtained from such natural elasticity as the felt of the valve, the lever, or the sheet itself may possess. According to this invention I provide that the overpressure shall act through springs—namely, the same springs that cause the valves to be opened when the music-sheet allows.

The accompanying drawings illustrate the invention as applied to different arrangements of mechanical musical instruments of this class.

Figure 1 is a section of an instrument with two series of reeds and one of pipes. Fig. 2 is a section of an instrument with one set of

reeds and one of pipes. Fig. 3 is a plan view of the latter. On Sheet 2 Fig. 4 is a section of an instrument with one set of reeds only. Fig. 5 is a section of an instrument with two wind-chests, with reeds, and one set of pipes. Fig. 6 is a modification of the instrument shown in Fig. 5.

It will be understood that so far as the parts of the instrument are concerned to which this invention does not relate they are of the usual construction.

The pivotal point of the lever *a* is unfixed, being movable within limits to and from the music-sheet in the general plane of movement of the lever, and the spring *r*, which operates to lift the lever or rotate the same about its pivotal center, so as to open the valve or valves, which are controlled by the lever at or near its outer end, is brought to bear upon the lever at a point between its pivotal center and the nose *a'* of the lever, which presses against the music-sheet. By this construction the said nose *a'* becomes a secondary fulcrum, the fulcrum being in the pivotal connection of the lever when the nose rises into a hole in the music-sheet, and the pressure of the spring being then applied on the valve side of the fulcrum opening the valve, and the fulcrum becoming changed to the nose of the lever when the said nose bears against a solid part of the music-sheet, the spring then being on the side of the fulcrum opposite to the end of the lever controlling the valve or valves, and thus acting to close the valves. An elastic overpressure due to this position of the spring is thus obtained.

In the constructions shown the lever *a* is connected by pin and slot to a short pivoted bar *c*, the pivot of which is stationary in the cross-bar *b*. On the side of the line of bars or levers nearest the music-sheet is a cross-rail *i* of any suitable kind, acting as a stop to limit the upward movement of the end of the levers *a* or of the bars *c*, which consequently limits the upward movement of the levers.

When a solid part of the music-sheet moves over the nose *a'* of the lever *a*, the lever is bodily depressed, the valve end pressing the valves into their closed position first, and afterward the other end of the lever being pressed down away from the resting-rail *i*,

against which it had been pressed, thus allowing of the necessary overplus of movement to insure absolute sufficiency of movement to entirely close the valves without any straining of the mechanism and simply against compression of the spring *r*, which, tending to rock the lever on its nose as a pivot, presses the valves firmly in place.

When the nose of the lever *a* rises into a slot in the music-sheet, the spring *r* moves up the back end of the lever *a* against the rail *i*, taking up the aforesaid overplus of movement, and thus making the rail *i* a back fulcrum, so that the further rise of the lever *a* lifts only the outer end, to which the valve mechanism is connected.

In the drawings, *ooo* are wind-passages, and *k* the valves which close them. *d* are pipes. The end of the lever *a* may be directly connected to the valve *k*, as in Fig. 4, *m* being a cloth-covered stop-rail to limit the rise of the lever *a*; or the lever may be connected to two sets of valves by a beam *g*, Fig. 1, and may open another set of valves by pressing down a lever *n* upon a pin *z*, such lever being pivoted at *v* and connected to the main lever *a* by a small link, Figs. 1 and 2; or the lever *a* may rock a pair of pivoted levers *n'n'* upon fixed point *x*, as in Figs. 5 and 6, controlling, also, other valves by the rod *q*, carrying the pins *z*, and acting direct on such valves or through a lever *w*, Fig. 6. Where the lever *n* or rod *q* is used, these may limit the rise of the lever *a* in place of the stop *m*.

The nose of each lever *a* may be guided and supported by the sides of slits in a metal plate *s*.

Having now described this invention and methods for practically applying it, I claim—

1. In a mechanical musical instrument, a

pivoted lever having a limited movement loosely with regard to its pivot, valve-operating mechanism connected to said lever, a nose on said lever adapted to engage in slots in a music-sheet, and a spring bearing on said lever between its loose pivot and the nose thereon and adapted to rock said lever on its pivot as a fulcrum when the nose rises into a slot in the music-sheet and on its nose as a fulcrum when said nose is in contact with a solid part of the music, the whole in combination substantially as and for the purpose set forth.

2. The combination of a lever *a*, a nose *a'* on said lever, a link *c*, connecting said lever to a fixed pivot, a spring *r*, bearing on said lever between the nose *a* and the link *c*, and valve-operating mechanism connected to the lever, whereby the spring *r* operates to close the valve when the fulcrum of the lever is in the nose *a'* and to open the valve when the fulcrum of the lever is in the link *c*, substantially as and for the purpose set forth.

3. The combination of a lever *a*, valve-operating mechanism connected to one end of said lever, a pivoted link *c*, connected to the other end of said lever, a nose *a'* above said lever midway between its ends, a spring *r*, bearing on the side of said lever opposite to the nose *a'* and at a point between said nose and the link *c*, and a cross-bearing *i* above the link *c*, the whole substantially as and for the purpose set forth.

In witness whereof I have signed this specification in presence of two witnesses.

CARL KRETSCHMAR.

Witnesses:

JULIUS MORGUETT,
CARL BORNGRAEBER.