(No Model.) 2 Sheets—Sheet 1.

E. G. STURM.

MECHANICAL MUSICAL INSTRUMENT.

No. 353,434. Patented Nov. 30, 1886.

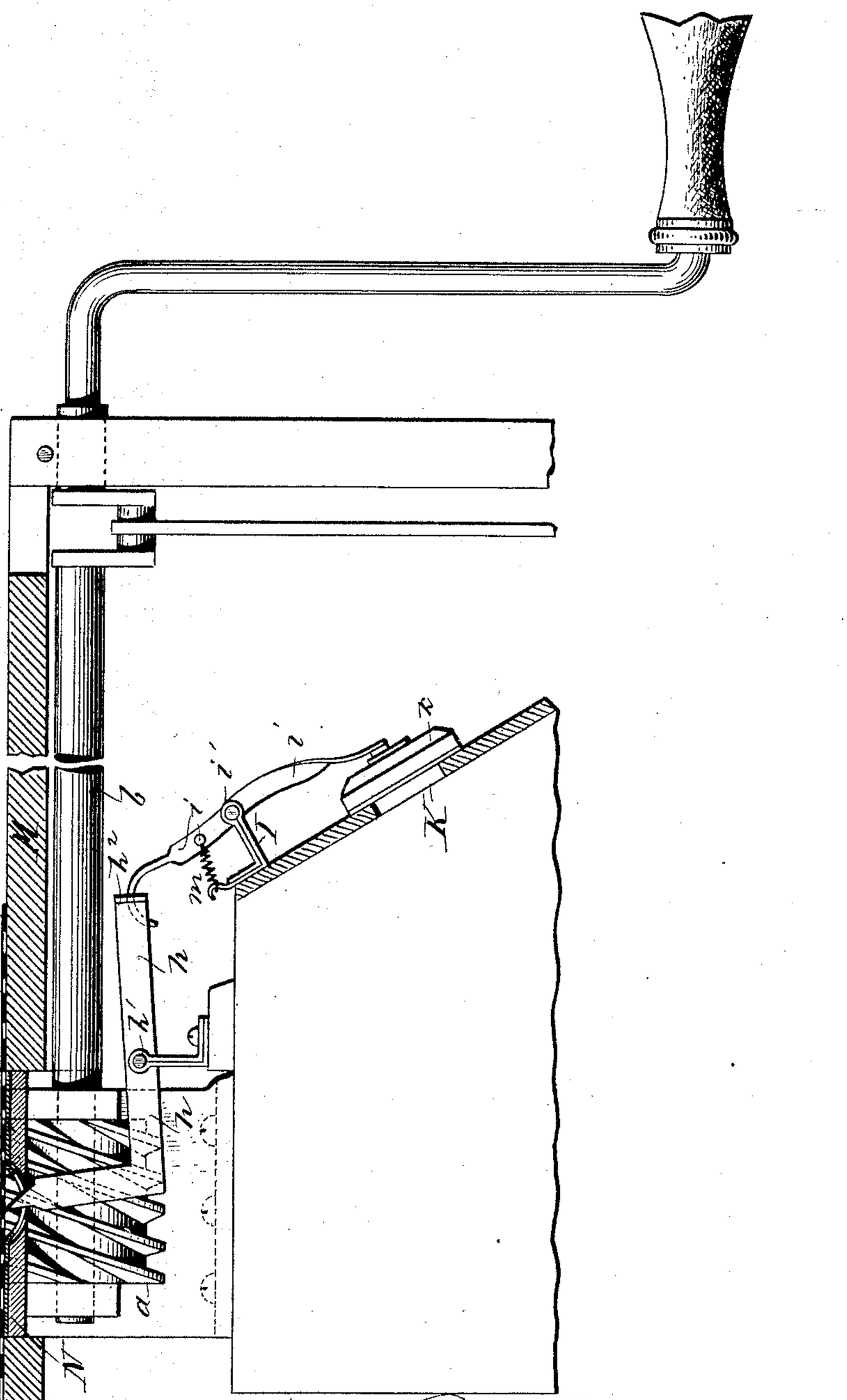

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

E. G. STURM.

MECHANICAL MUSICAL INSTRUMENT.

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Fig. 4.

Fig. 3.

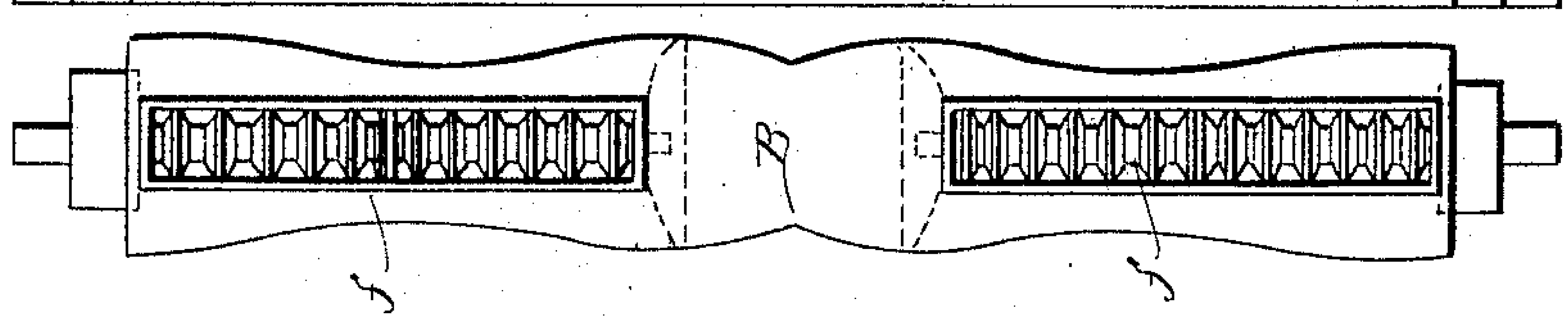
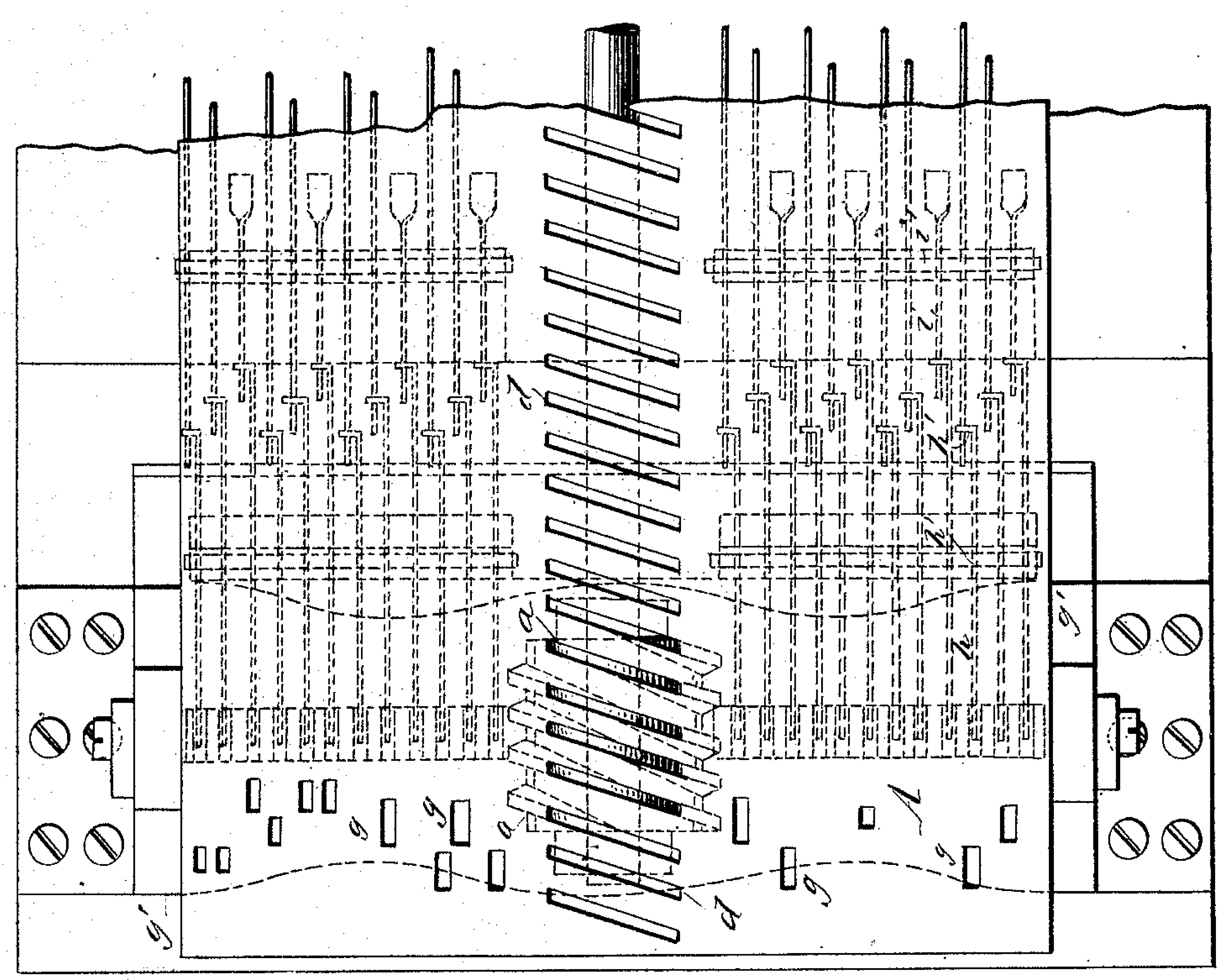


Fig. 2.



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UNITED STATES PATENT OFFICE.

EMIL GUSTAV STURM, OF LEIPSIC, SAXONY, GERMANY.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 353,434, dated November 30, 1886.

Application filed March 17, 1886. Serial No. 195,558. (No model.) Patented in France February 9, 1886, No. 174,051, and in England February 10, 1886, No. 1,971.

To all whom it may concern:

Be it known that I, EMIL GUSTAV STURM, a subject of the King of Saxony, German Empire, residing at the city of Leipsic, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Mechanical Musical Instruments, (for which I have obtained foreign patents as follows: in England, No. 1,971, February 10, 1886; France, No. 174,051, February 9, 1886,) of which the following is a specification.

This invention relates to that class of mechanical musical instruments in which a music chart or sheet is moved over a number of levers operating valves controlling the passage of wind through reeds, the mechanism for producing the wind being operated by the same mechanism that shifts the music-charts.

The object of my invention is to simplify the devices for moving the music chart or sheet, guiding the same, keeping it in the proper position, and also to provide a special mechanism for operating the valves.

The invention consists in a worm formed on the end of the crank-shaft, which worm engages with inclined slots in the music chart or sheet.

The invention further consists in said chart having inclined slots, and in the construction and combination of the levers for operating the valves, all as will be fully described and set forth hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a cross-sectional view of my improved mechanical musical instrument, parts being broken out. Fig. 2 is a plan view of the same, parts being broken out and the guide-bar being removed. Fig. 3 is a plan view of the under side of the guide-bar, under which the music-sheet passes; and Fig. 4 is a face view of the guide-bar.

Similar letters of reference indicate corresponding parts.

The music-chart A is provided with the slots *g*, in the usual manner, and at its center it is provided with a longitudinal row of inclined slots, *d*, the slots *g* being arranged at opposite sides of the row of slots *d*. The shaft *b*, journaled in the frame of the instrument, carries a worm, *a*, the pitch of the thread of which is such that the spiral rib forming the thread can engage the slots *d* in the music chart or sheet A, as shown in Fig. 2, whereby by turning the crank-shaft the sheet is shifted in the direction of its length as the thread of the worm successively passes into the slots *d*. As the longitudinal row of slots *d* is at the middle of the music sheet or chart, it is evident that the valve mechanism must be arranged at both sides of the shaft *b*.

The sheet A passes over the table M and under a cross-piece, B, secured between the guides *g'* on the top plate, M. The cross-piece B is provided with slots, in which rollers *f* are pivoted, said rollers having a series of annular ribs, which serve to press the sheet A upon the table M. In place of providing the rollers *f* with a number of annular ribs, a number of disks and washers may be mounted alternately on shafts placed in the slots of the cross-piece B. The above-mentioned guides *g'* are separated from each other a distance equal to the width of the sheet A, and thus serve to guide the sheet in its passage over the plate M. Valves *k*, for closing the reed-apertures K, are secured to the levers *i*, pivoted by pivots *i'* on standards I, each lever *i* being provided at its upper end with a hook passed through an aperture in a laterally-projecting lug, h^2, of a corresponding lever, *h*, pivoted on a standard, *h'*, said levers *h* being L-shaped, and having their upper ends passed through slots in a plate, N, inserted in the plate M, as shown in Fig. 1. A spring, *m*, is fastened to each lever *i* above its pivot *i'*, and to a hook on the wind-chest. When the solid parts of the sheet pass over the upper ends of the levers *h*, the L-shaped ends of said levers are pressed down and the ends provided with the lugs h^2 raised, whereby the valves *k* are pressed on the apertures K. Whenever a slot *g* comes over the upper end of a lever *h*, no resistance is offered to the spring *m*, and the same pulls the upper end of the lever *i* toward the wind-chest, whereby that end of the lever *h* provided with the lug h^2 is swung down and the upper end raised and passes up through the slot in the sheet. As the sheet continues to move it strikes the upper end of the lever *h* and presses the same down, whereby that end of the lever

h provided with the lug h^2 is raised and the valve k pressed over the aperture, thus cutting off the wind, and so on.

By using a worm-wheel the thread of which engages with the inclined slots of the music-sheet, the pressure exerted by the driving mechanism on the edges of the slots in the sheet is distributed over a greater surface, and there is less danger of tearing the sheet.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A mechanical musical instrument provided with a worm for direct engagement with the music-chart for the purpose of shifting the same, substantially as shown and described.

2. A mechanical musical instrument having a worm mounted on the crank-shaft, the threads of said worm projecting above the surface over which the slotted music chart or sheet passes, substantially as shown and described.

3. A mechanical musical instrument constructed with a worm mounted on a shaft, the threads of said worm projecting above the plate over which the chart or sheet passes, and a cross-piece having rollers for pressing the music chart or sheet on the surface over which it passes, substantially as shown and described.

4. A mechanical musical instrument constructed with a worm for moving the music chart or sheet, and of valve-levers at both sides of the worm-shaft, substantially as shown and described.

5. A mechanical musical instrument constructed with the valves k, the levers i, to which the valves are secured, the pivoted levers h, having lugs h^2, through which hooks on the upper ends of the levers i pass, and the springs m, substantially as shown and described.

6. A music sheet or chart for mechanical musical instruments, provided with a longitudinal row of inclined slots for engagement with the threads of a worm, substantially as shown and described.

7. A music chart or sheet for mechanical musical instruments, having a central longitudinal row of inclined slots for engagement with the thread of a worm, and with rows of longitudinal slots at both sides of the said longitudinal row of inclined slots, substantially as shown and described.

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

EMIL GUSTAV STURM.

Witnesses:

C. BORNGRAEBER,

HERMANN STOECKEL.