

G. H. CHINNOCK & W. W. BENNETT.  
Mechanical Musical-Instrument.

No. 226,279.

Patented April 6, 1880.

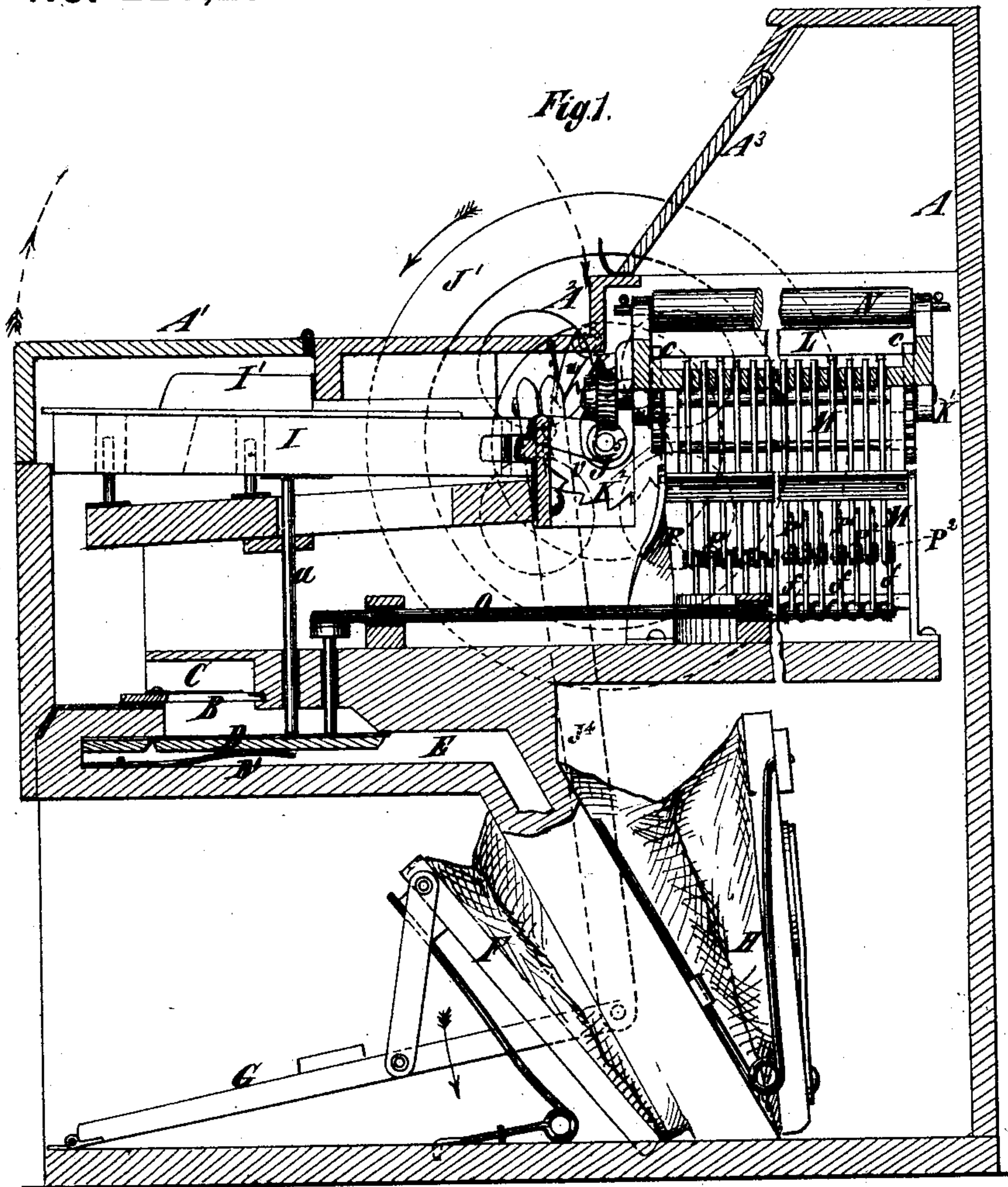
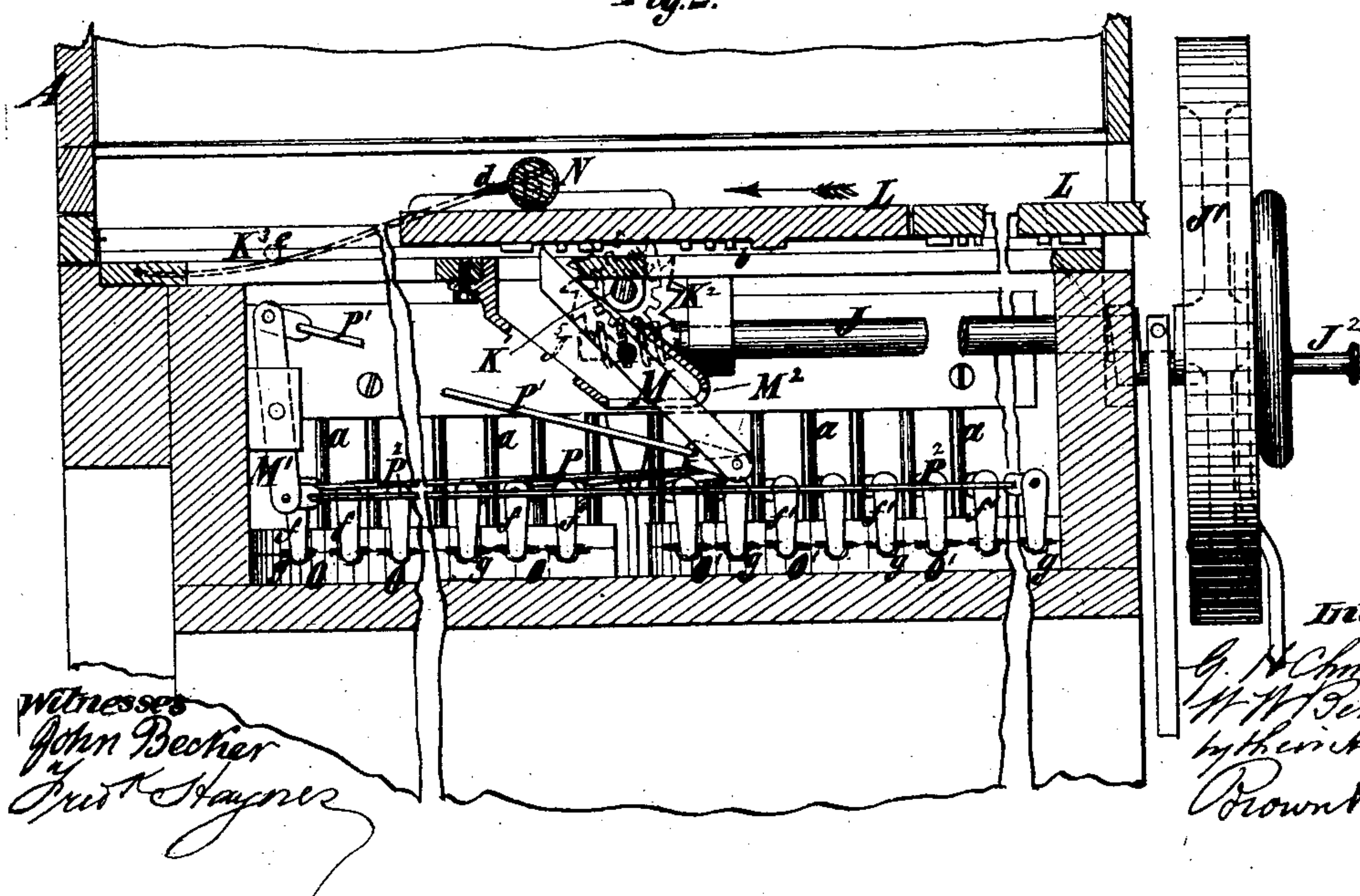


Fig. 2.



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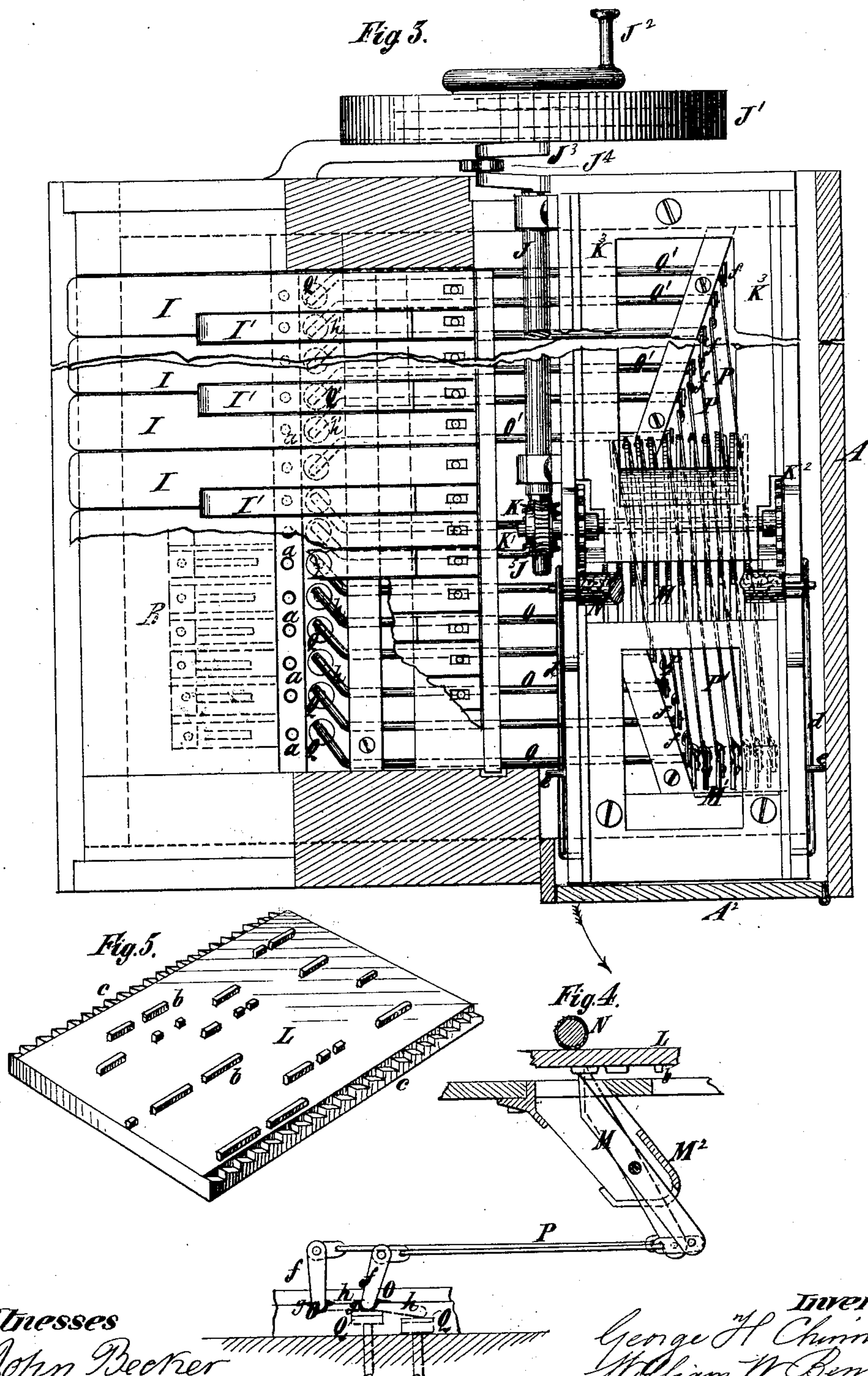


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# UNITED STATES PATENT OFFICE.

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## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 226,279, dated April 6, 1880.

Application filed January 26, 1880.

*To all whom it may concern:*

Be it known that we, GEORGE H. CHINNOCK, of Brooklyn, in Kings county and State of New York, and WILLIAM W. BENNETT, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following is a specification.

Our invention relates to mechanical musical instruments to be operated by music cards or tablets, of any suitable shape and style, having a surface provided with projections, perforations, or indentations representing notes to be played, and acting on mechanism to effect the operation of the sound-producing devices.

The object of our invention is to provide a simple, cheap, compact, and reliable means for operating such an instrument, whether it is or is not provided additionally with keys for manual playing.

Our invention consists in the combination, in a musical instrument, of manual keys, whereby the sound-producing devices may be operated, a series of levers extending transversely to the keys connected, independently of said keys, with the means for effecting the operation of the sound-producing devices, a music card or tablet for actuating said levers, and means for effecting the travel of said music card or tablet in the direction of the length of the instrument at the back thereof, transversely to the keys, whereby a simple and compact instrument is produced, which may be played manually or mechanically at will, using the same sound-producing devices.

It also consists in the combination, in a musical instrument, of massed and preferably approximately-upright levers, a music card or tablet for actuating the same, and rock-shafts or levers connected to said levers and controlling the operation of the sound-producing devices.

It also consists in novel means for feeding the music card or tablet in such an instrument.

It also consists in various features and combinations of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a transverse vertical section of a reed-organ

embodying our improvements. Fig. 2 is a longitudinal section of the upper portion of the same close to the back. Fig. 3 is a top view of the same with the top of the case and certain of the keys removed. Fig. 4 is a longitudinal section, showing the music card or tablet, some of the upright levers operated thereby, and the rock-shafts and their appurtenances actuated by said upright levers; and Fig. 5 is a perspective view of a music card or tablet turned upside down.

Similar letters of reference designate corresponding parts in all the figures.

The case A of the instrument may be of any suitable form and material.

Reeds B, of the ordinary or any suitable form, arranged in trays or in cells C, are employed to produce the musical notes. These cells C, as here shown, communicate, under control of pallet-valves D, with a wind-chest, E, the flow of air through which for causing the operation of the reeds is effected by a bellows, F, actuated by a treadle, G. Two such bellows may be used, and the one nearest the connecting-rod J<sup>1</sup> may be made smaller than the other, so as to make the work of both feet of the operator more uniform, and the bellows-springs may be made so as to aid in attaining this.

A receiver, H, may be employed, as usual. Keys I I', acting through push-pins or tracker-pins a on the pallet-valves D, to depress and open them to cause the sounding of the reeds in a well-known manner, provide for playing the instrument manually.

The case A is provided with a cover, A', which may be swung back to expose the said keys for use without exhibiting other parts, and thus the instrument is afforded the appearance of an instrument of ordinary style to be played only manually.

J designates a rotary shaft arranged within the case A, along the front part thereof, near what is ordinarily termed the "name-board" A<sup>2</sup>. This shaft is preferably provided with a balance-wheel, J', which, though here shown as arranged outside the case, may be inside the same. Usually a crank, providing for rotating the shaft by hand, will be arranged on the shaft outside the case. Here a crank, J<sup>2</sup>, is



shown as mounted on the balance-wheel J' for such purpose. The shaft is also shown as connected, by means of a crank, J<sup>3</sup>, and a pitman or connecting-rod, J<sup>4</sup>, with an arm extending  
5 from the treadle G.

It will be readily understood that we provide thus for working the bellows by the hand-crank J<sup>2</sup>, or rotating the shaft J by the treadle in addition to actuating the bellows. Preferably a ratchet-wheel, *v*, and pawl *u* are employed to prevent the rotation of the shaft J in the wrong direction.

On the shaft J is a worm or screw, J<sup>5</sup>, which engages with a worm-wheel, K, serving to  
15 feed or impart motion to music cards or tablets, whereby the instrument may be played mechanically. Though the music cards or tablets may consist of drums or cylinders having upon their peripheries projections representing notes to be sounded, or disks having upon their sides projections representing such notes, we have only deemed it necessary to illustrate  
20 here one form, consisting of a flat piece or pieces, L, or plates of wood, metal, or other suitable material, provided on one face with projections *b* of the kind alluded to. These music cards or tablets L, of which one or more may be necessary to complete a tune, are fed forward by means of a shaft, K', carrying the worm-wheel K, and to insure a reliable feed they are  
30 preferably provided with toothed racks *c*, one or more, and the shaft K' is preferably provided with gear-wheels K<sup>2</sup>, corresponding in number, engaging with said racks, and thereby impelling the music cards or tablets forward. These pieces of music travel along  
35 ways K<sup>3</sup>, arranged in the back part of the case A transversely to the keys of the instrument, and may be placed in position on said ways from above, and taken out in the same way after use, or delivered from a door, A<sup>2</sup>, at one end of the case A. This door is shown as hinged to the case at one end only; hence the music cards or tablets may force it  
40 open automatically and pass from the instrument. The ways K<sup>3</sup> preferably are so supported and secured in place that they may be readily removed to afford access to the other parts of the instrument.

A cover, A<sup>3</sup>, hinged or otherwise connected to the front of an elevated portion of the case A, inclosing the ways K<sup>3</sup>, so that it may be readily opened and closed, affords access to these ways for the insertion or removal of a  
55 piece of music, and conceals the same and adjacent parts while it is desired to play the instrument manually and when the instrument is not in use.

M designates a series of levers arranged so  
60 as to be nearly upright, though slightly inclined, arranged side by side in a serrated or mortised frame, M<sup>2</sup>, transversely to the keys of the instrument, and in such close proximity with each other that they may appropriately be termed "massed levers." They are preferably arranged about midway of the length of the case A, and occupy positions

under the path of travel of the music cards or tablets L, their upper ends projecting sufficiently high to be acted upon by the projection *b* of the music cards or tablets L as the  
70 latter pass over them. Preferably their upper ends are pointed, so that the levers may be only swung and held aside for a length of time corresponding to the length of the projections *b*. The advantage of locating these  
75 levers close together is, that the music cards or tablets may thus be made more narrow.

N designates a clamp or guide consisting of a roller arranged above the upper ends of  
80 these levers M, and impelled downward by springs *d*, here shown as consisting of rods fastened rigidly in place at one end, extending under pins *e*, and at the other end passing over and bearing upon the journals of the roller.  
85 This roller holds the music card or tablet in the proper position to actuate the levers M in passing over their upper ends.

The levers M, at the lower ends, are connected to rock-shafts O O', whereby the pallet-valves D may be opened to cause the sounding of the reeds B. As here shown, the levers M, which serve to effect the sounding of the bass notes, are connected at the lower end directly to arms *f*, extending from rock-shafts  
90 O, by means of rods or wires P or their equivalents, the rock-shafts being of different lengths, so that their arms *f* will be opposite said levers. Others of the levers M, for causing the sounding of the treble notes, are connected at  
95 the lower end, by rods or by wires P' or their equivalents, with the upper ends of secondary upright levers M', pivoted near one end of the case A, and whose lower ends are connected, by other rods or wires P<sup>2</sup>, with arms *f'*, extending from the other rock-shafts O', also of  
100 varying lengths.

The rock-shafts O O' are mounted in suitable bearings *g*, and at their forward ends are provided with arms *h* and *h'*, which extend  
110 over the pallet-valves D and, through push-pins or tracker-pins Q, open said valves when suitably oscillated.

The springs D', closing the pallet-valves, readjust the rock-shafts, and through them the  
115 levers M, to their normal position.

It will be understood that the rock-shafts O O' and their arms *f f'* and arms *h h'* in effect constitute levers.

It will be seen that by our invention we produce a simple and convenient mechanism,  
120 which is little liable to derangement, and whereby a musical instrument may be operated mechanically with almost as good effects as if played manually by the best musicians. The simplicity and compactness of this mechanical action enable it to be arranged in an  
125 instrument, in addition to the usual manual action, so as to be concealed from view except when the case is opened to insert or withdraw a music card or tablet, and this without materially changing the shape of the case of the instrument.  
130

Our invention, though only here illustrated



and described in connection with reed-organs, is applicable to pipe-organs, to piano-fortes, and other wind and string or concussive instruments. Stops of any desirable kind may be used, and may, when the instrument is played mechanically, be operated by projections on the pieces of music.

We are aware that prior to our invention there have been musical instruments which could be operated in the ordinary manner through manual keys, or mechanically by devices independent of and out of the way of the keys, so as not to interfere with their use. Some of these instruments have had revolving barrels and others revolving disks arranged in rear of the manual keys within the cases of the instruments, and actuating levers extending in the same direction as the keys, and effecting the operation of the sound-producing devices.

We are also aware that there have been musical instruments provided with levers extending transversely to the keys, arranged outside the cases of the instruments and acting through the agency of push-pins upon the manual keys to effect the operation of the sound-producing devices, said levers being actuated by a music card or tablet traveling outside the cases of the instruments above the manual keys and transversely to them. We do not, of course, desire to make any claim for any of these.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a musical instrument, the combination of manual keys, whereby the sound-producing devices may be operated, a series of levers extending transversely to the keys, connected, independently of said keys, with the means for effecting the operation of the sound-producing devices, a music card or tablet for actuating said levers, and means for effecting the travel of the music card or tablet in the direction of the length of the instrument and at the back thereof, transversely to the keys, whereby a simple and compact instrument is produced, which may be played manually or mechanically at will, using the same sound-producing devices.

2. In a musical instrument, the combination, with valves whereby the operation of wind sound-producing devices is controlled, of rock-shafts, whereby said valves may be opened, levers connected with said rock-shafts, so as to actuate the same, and a music card or tablet for operating said levers in passing over the upper ends thereof.

3. In a musical instrument, the combination of rock-shafts, whereby the operation of the sound-producing devices is effected, massed levers connected, by rods or wires or their equivalents, with arms extending from the rock-shafts, and a music-card or music-tablet for actuating the said levers.

4. In a musical instrument, the combination of rock-shafts, whereby the operation of the sound-producing devices is effected, of massed

levers, a music card or tablet for actuating the latter, secondary upright levers, and connections between said levers, and arms extending from the rock-shafts.

5. In a musical instrument, the combination of massed levers, a music card or tablet for actuating said levers, rock-shafts of varying lengths connected to said levers and controlling the operation of the sound-producing devices.

6. In a musical instrument, the combination of massed levers, a music card or tablet for operating said levers, rock-shafts connected to said levers and extending forward under the manual keys of the instrument, to act on push-pins or tracker-pins to open pallet-valves controlling the operation of the sound-producing devices.

7. In a musical instrument, the combination, with levers for controlling the operation of sound-producing devices, and a music card or tablet provided with a toothed rack for feeding it along, of guides for said music card or tablet, a gear-wheel for engaging with the rack, and a worm and worm-wheel for imparting motion to said gear-wheel.

8. In a musical instrument, the combination, with levers for controlling the operation, of sound-producing devices and a music card or tablet provided with a toothed rack for feeding it along, of guides for said music card or tablet, a gear-wheel for engaging with the rack, a worm and worm-wheel for imparting motion to said gear-wheel, and a roller clamp or guide for holding said music card or tablet in contact with the ends of said levers.

9. In a musical instrument, the combination, with levers for controlling the operation of sound-producing devices and a music card or tablet for actuating said levers, and means for feeding said music card or tablet along, of a door in the case of the instrument capable of being opened by the music card or tablet, so as to permit the exit of the latter from the instrument.

10. In a musical instrument, the combination of manual keys, whereby the sound-producing devices may be operated, a series of levers extending transversely to the keys, connected, independently of said keys, with the means for effecting the operation of the sound-producing devices, a music card or tablet for actuating said levers traveling in the direction of the length of the instrument at the back thereof, transversely to the keys, a rotary shaft employed in feeding said music card or tablet along, and a treadle for operating said shaft.

11. In a musical instrument, the combination of the massed levers M and the recessed or serrated frame M<sup>2</sup>.

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