

No. 651,998.

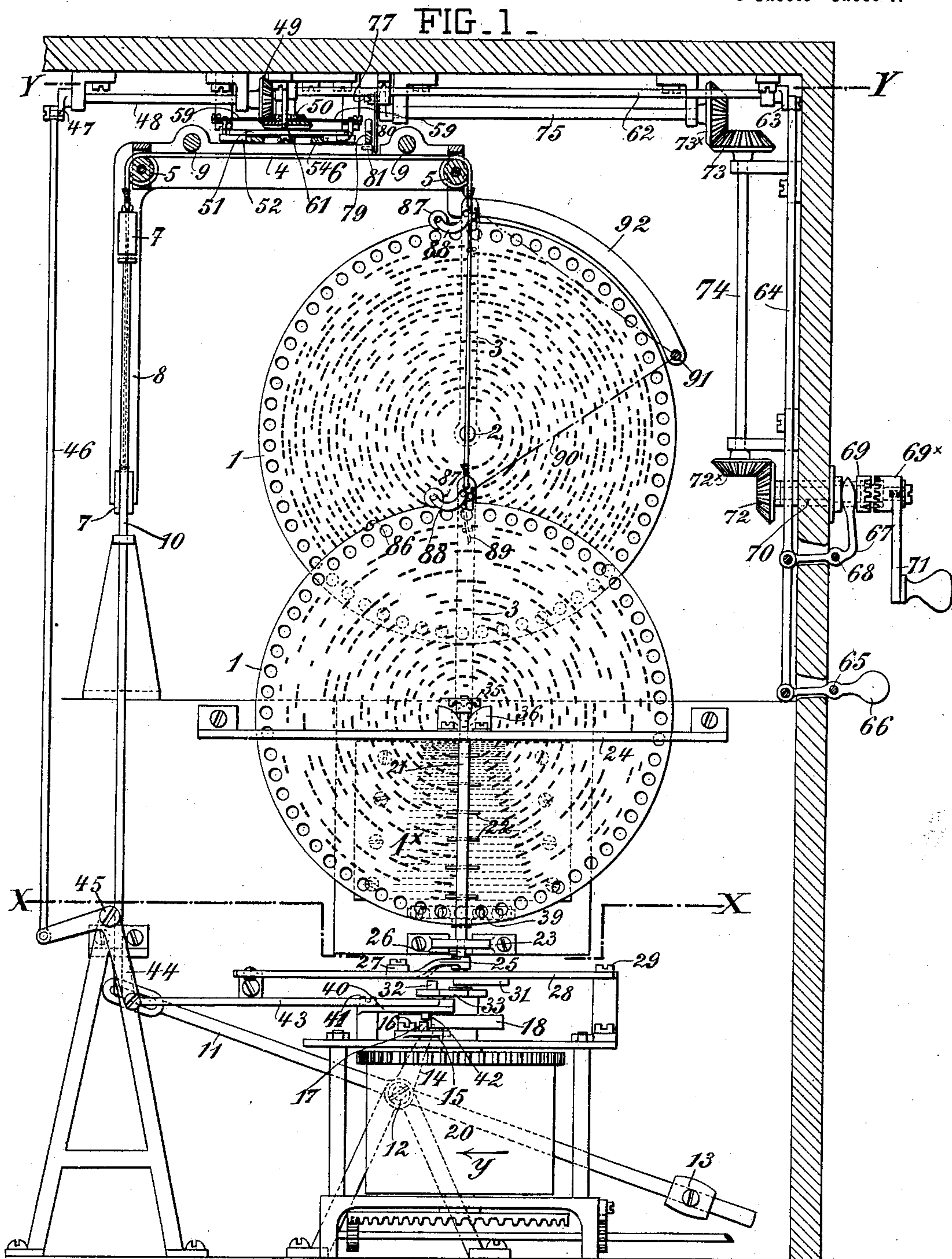
Patented June 19, 1900.

A. JACCARD-ROD.  
MUSICAL INSTRUMENT.

(Application filed Oct. 28, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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3 Sheets—Sheet 2.

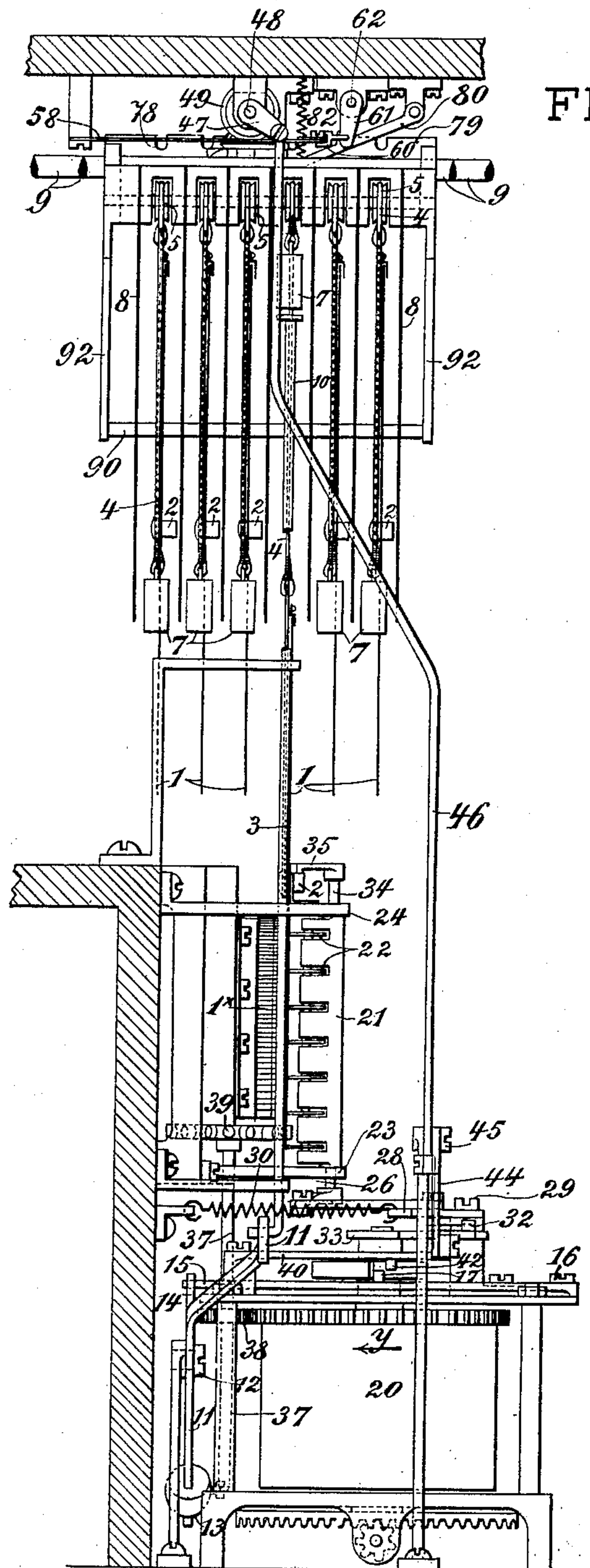


FIG. 2.

FIG. 8.

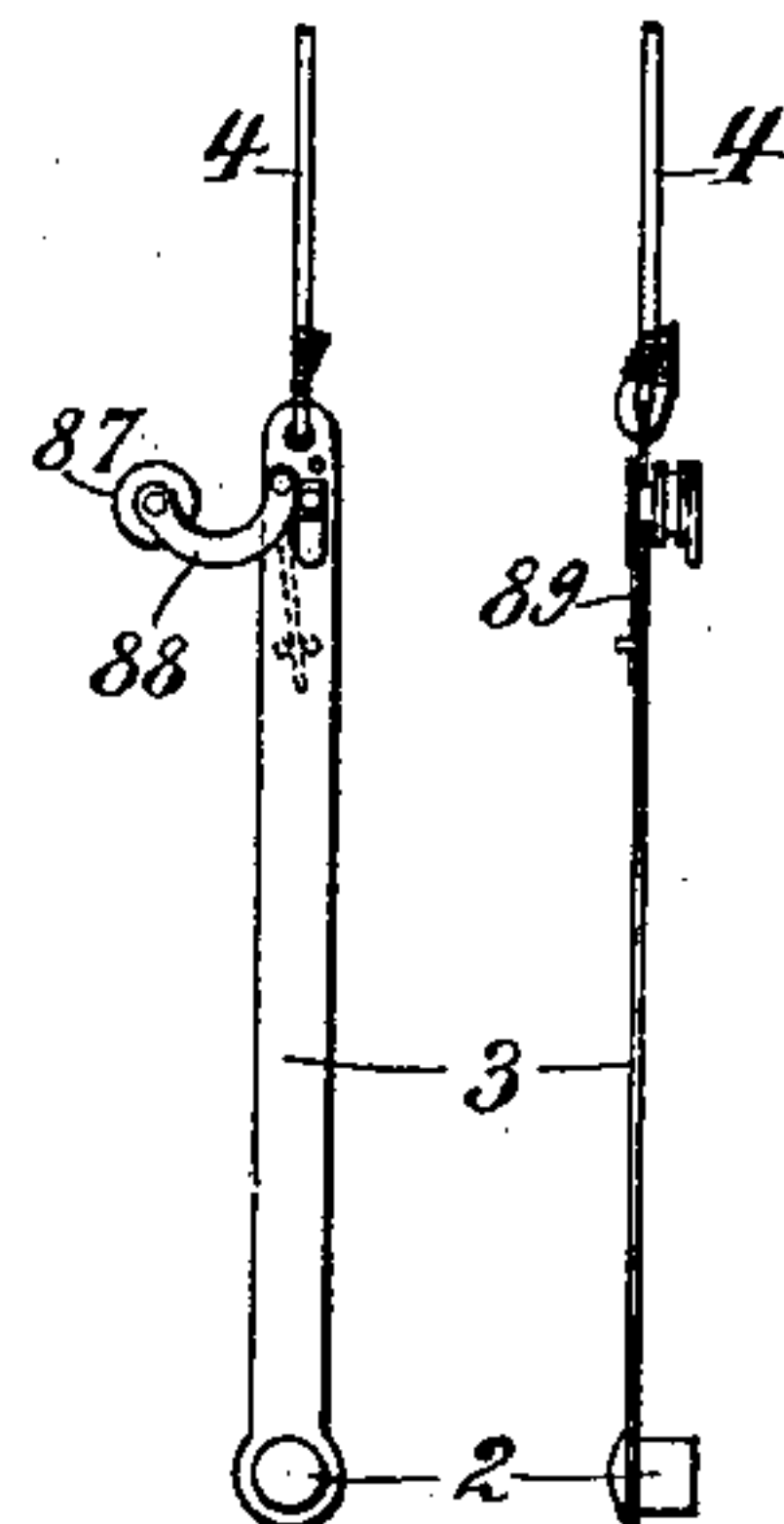


FIG. 9.

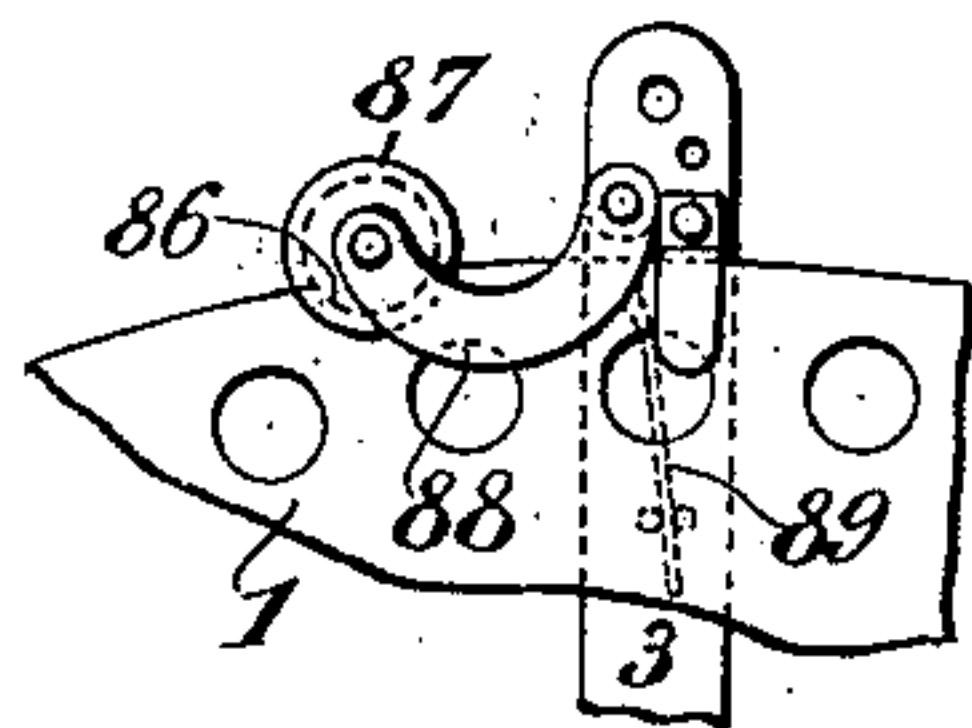
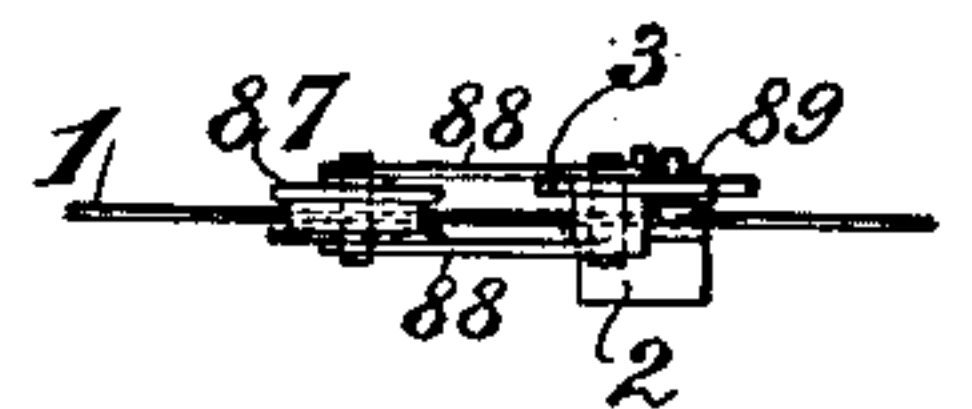


FIG. 10.



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3 Sheets—Sheet 3.

FIG - 3 -

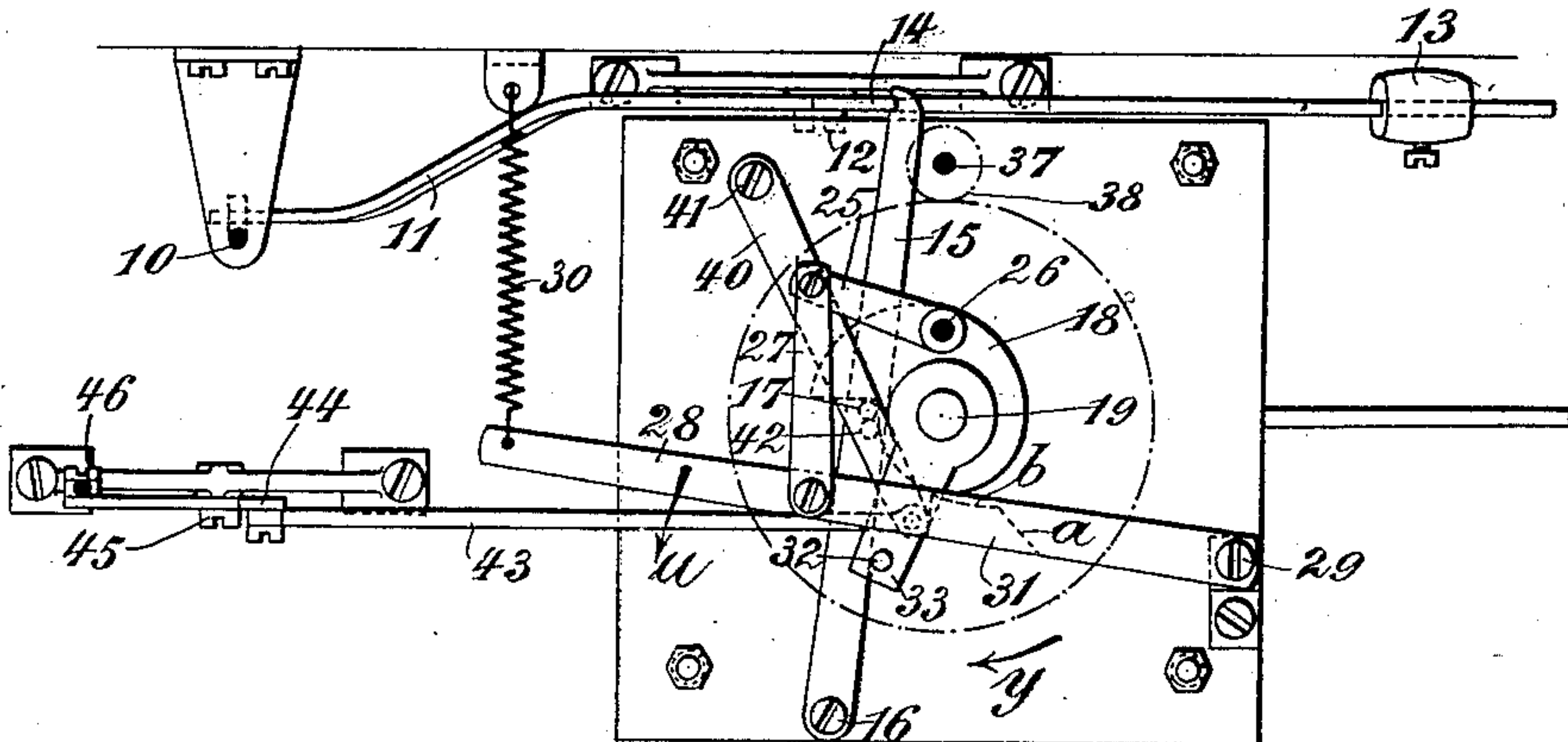


FIG - 4 -

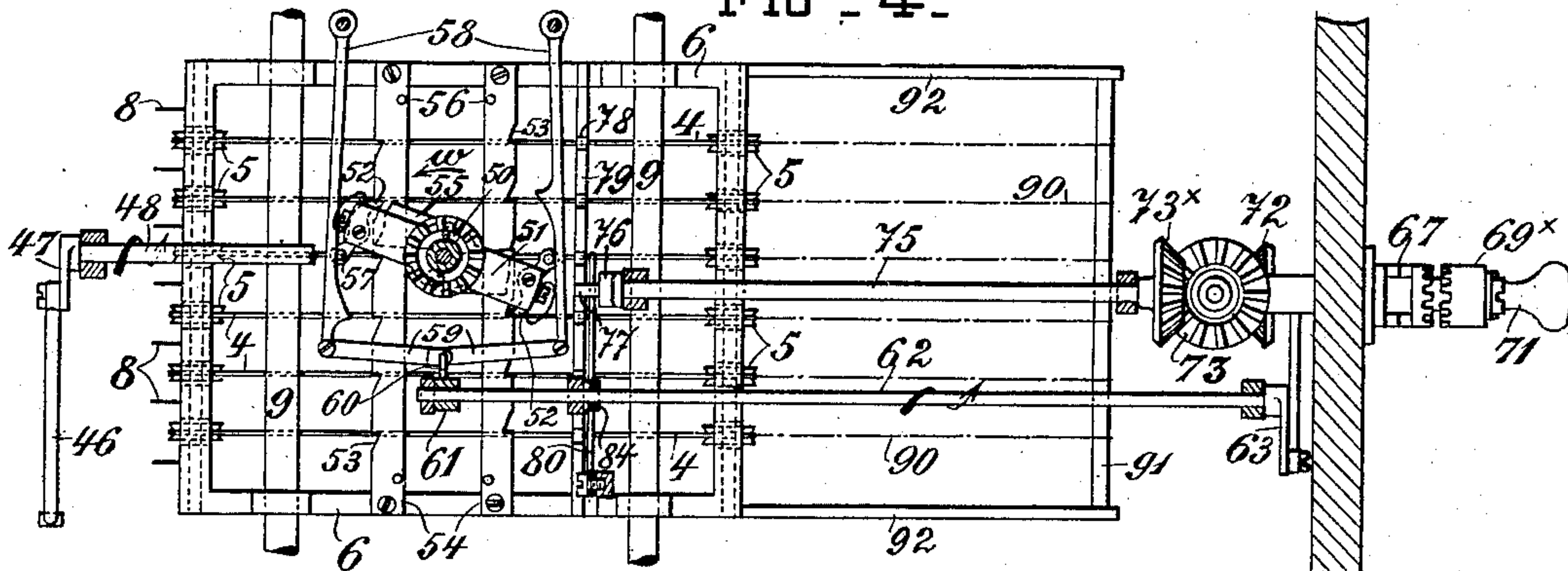


FIG - 5 -

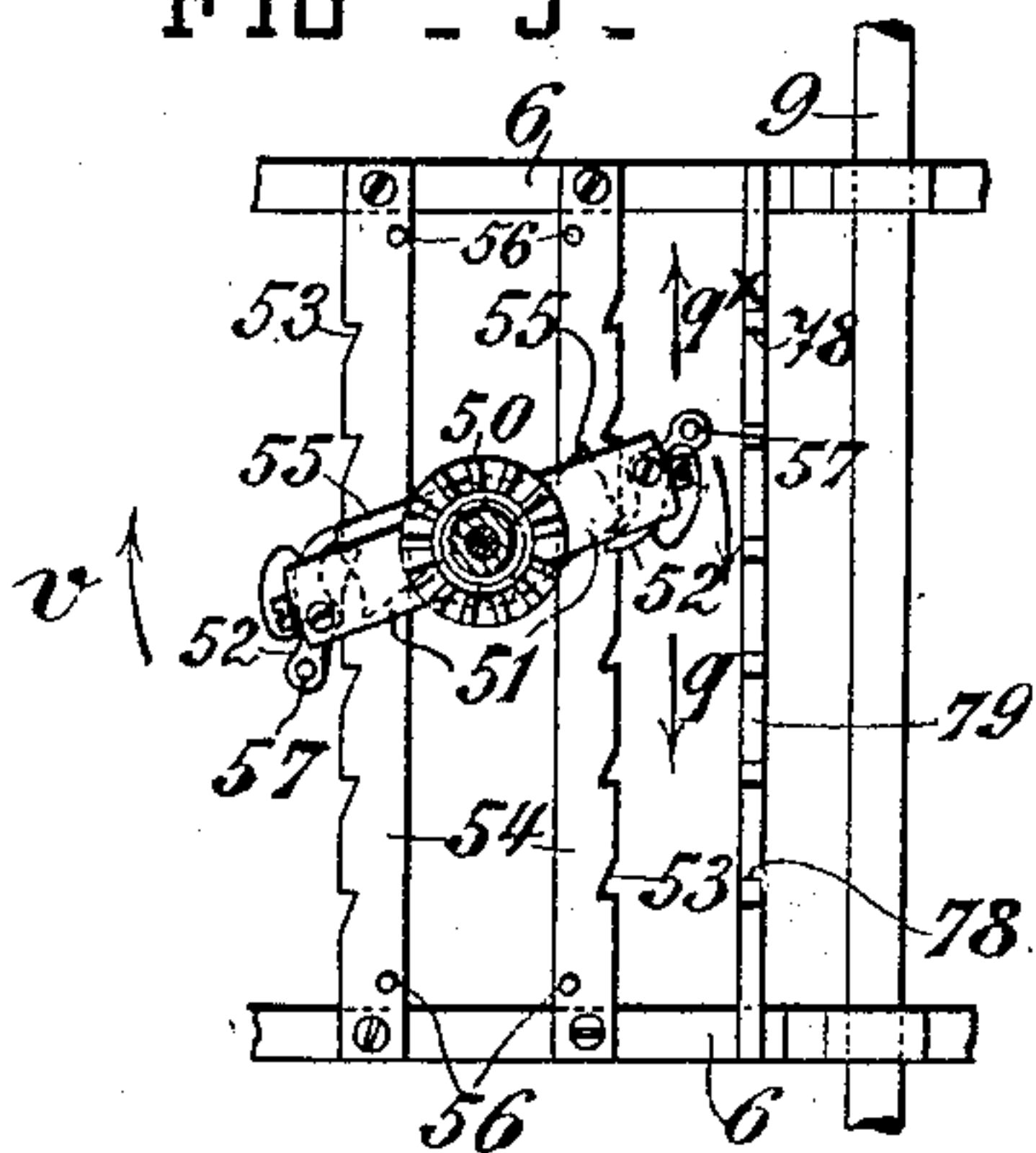


FIG - 6 -

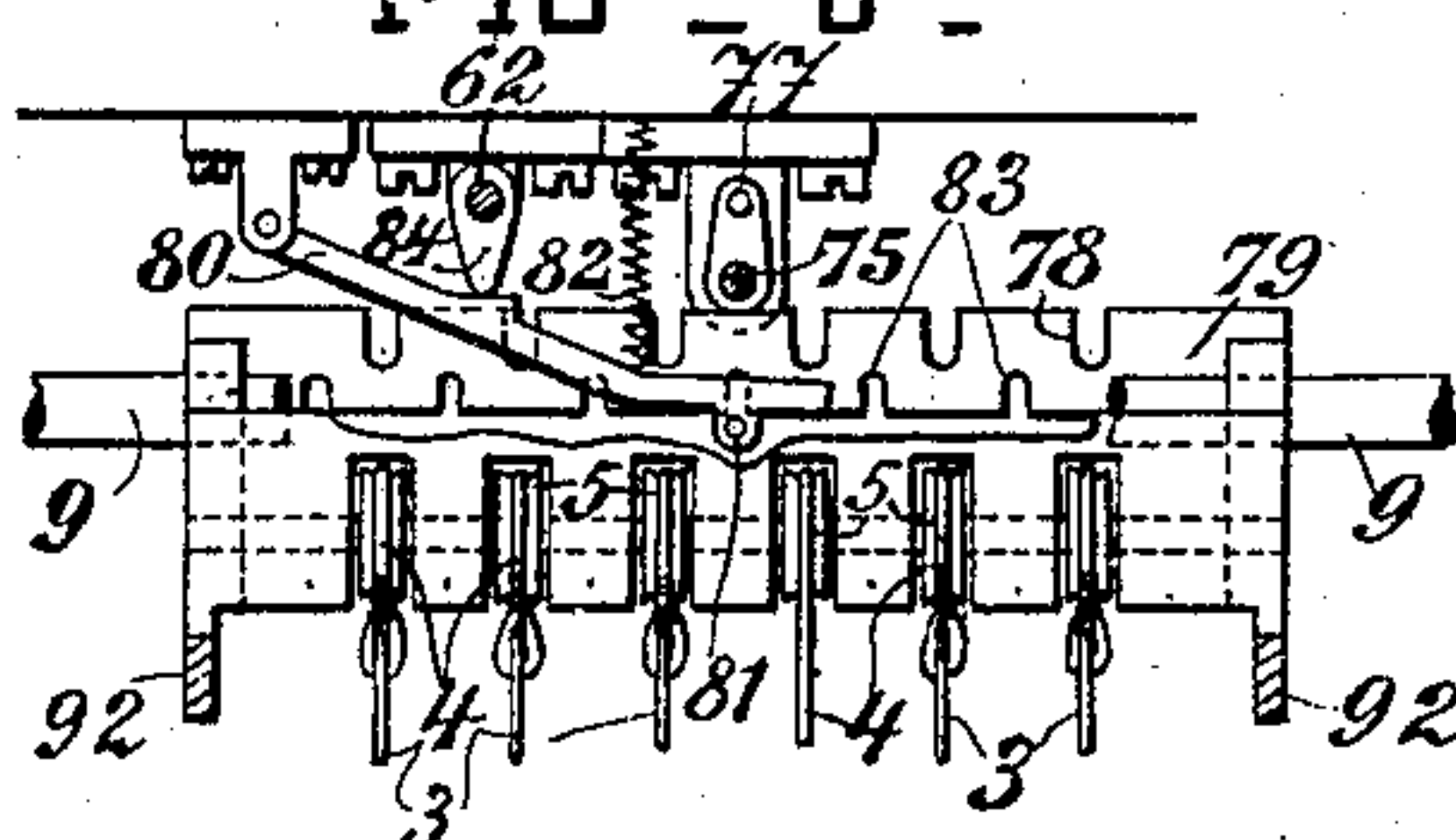
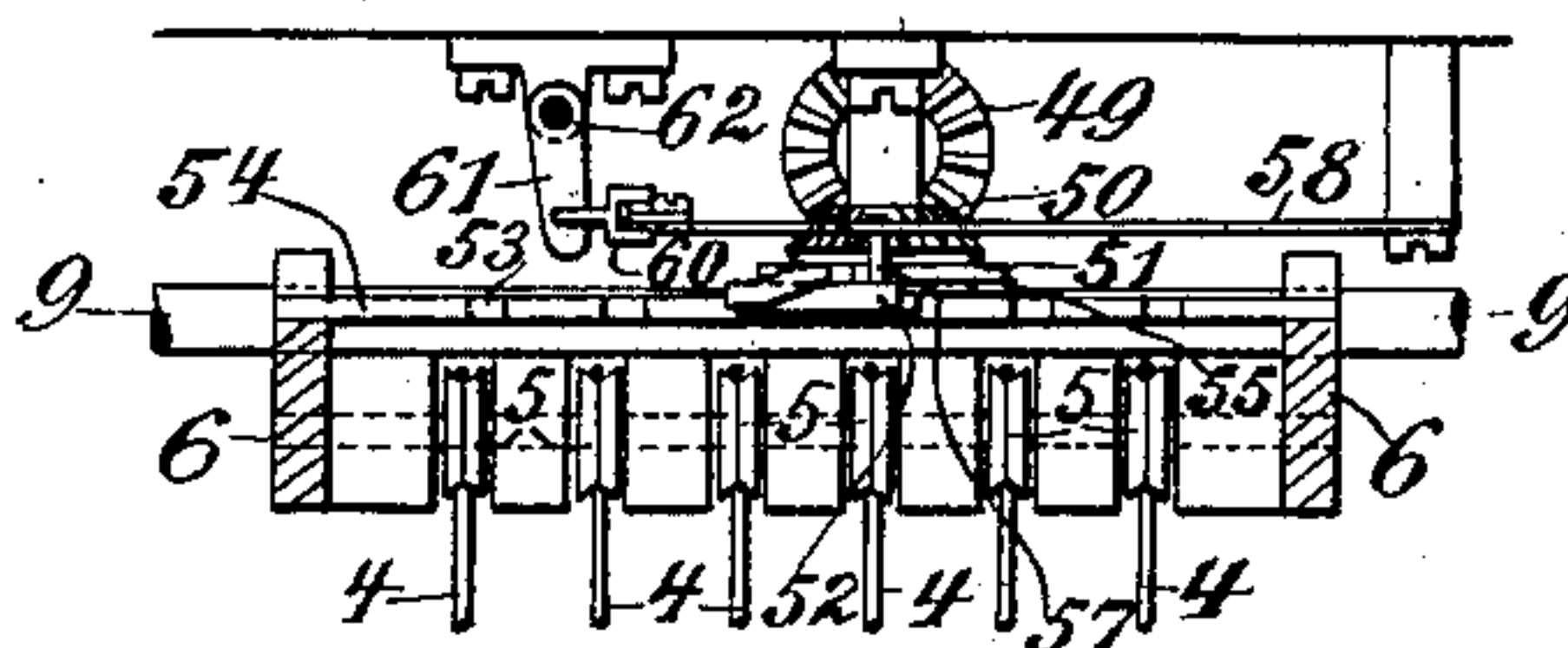


FIG - 7 -



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# UNITED STATES PATENT OFFICE.

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HERMANN THORENS, OF SAME PLACE.

## MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 651,998, dated June 19, 1900.

Application filed October 28, 1899. Serial No. 735,028. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED JACCARD-ROD, a citizen of the Swiss Republic, and a resident of Ste. Croix, canton of Vaud, Switzerland, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification.

This invention relates to the class of automatically-played musical instruments where- in rotatably-mounted interchangeable disks or tune-sheets are employed, one for each tune or air, for actuating the sound-producing devices or musical combs of the instrument; and the object of the invention is to provide mechanical devices whereby one disk or tune-sheet may be conveniently substituted for another.

In the accompanying drawings, which serve to illustrate the invention, Figure 1 is a front elevation of the mechanism, partly in vertical section. Fig. 2 is a side elevation of the same, also partly in section. Fig. 3 is a horizontal section at line X X in Fig. 1. Fig. 4 is a horizontal section at line Y Y in Fig. 1. Figs. 5 to 10 are fragmentary views illustrating details of the mechanism which will be hereinafter described.

In this construction each disk 1 is rotatively mounted on an axial stud 2 on a bar 3, suspended by its upper end from a cord 4 or other flexible connector, which passes over guide-pulleys 5 on a supporting frame or carriage 6, which is common to all of the disks 1. The bar 3 and stud 2 form the disk-holder. To the other end of each connector 4 is attached a weight 7, which serves to support its disk suspended. The carriage or frame 6 is slidably mounted on two horizontal fixed rods 9, which form a guideway, and is adapted to be shifted along said guideway either by hand or mechanically, as will be hereinafter explained. Thin upright pendent partitions 8, fixed to the frame 6, guide the weights 7 in their vertical movements and compel them to shift properly with the said frame. A vertical sliding rod 10, Fig. 1, serves to lift that weight 7 which is connected to the particular disk 1 which it is desired to lower into working or operative position, the raising of the weight permitting the disk to descend by

gravity. The lower end of the lifting-rod 10 is coupled to one arm of a lever 11, fulcrumed at 12, the other arm of said lever carrying a counterweight 13, which tends to move the rod 10 upward and to cause a laterally-projecting finger 14 on the lever 11 to bear continuously on an arm 15, Fig. 3, pivoted at 16 and provided with a stud 17, which latter, by the pressure from the weight 13, is kept up to the periphery of a volute cam 18 on an arbor 19, which turns with a spring-barrel 20. This cam during the rotation of the spring-barrel in the direction of the arrow *y* imparts a to-and-fro or vibrating motion to the lever 11.

A bar 21, Figs. 1 and 2, which carries rollers 22, that are applied to the outer face of the operating-disk 1, is journaled in supporting-brackets 23 and 24, so that by turning the bar 21 its rollers may be moved toward or from the disk, as the case may be. For effecting this movement of the bar 21 the latter carries on its lower journal 26, Fig. 3, an arm 25, connected by a link 27 with an arm 28, pivotally mounted at 29 and connected at its other end to a spring 30, which latter tends to hold the arm 28 in the position seen in Fig. 3, and by so doing to hold the rollers 22 of the bar 21 pressed up elastically against the operating-disk 1, and thus keep this disk in operative contact with the devices which actuate the combs 1<sup>x</sup> of the instrument.

The arm 28 is provided at its under side with a projection 31, which is in the circular path of a stud 32 on an arm 33, fixed to the arbor 19, and at each rotation of said arbor this stud impinges on the projection 31 and swings the arm 28 in the direction of the arrow *u*, Fig. 3, thereby, through the intermediate mechanism described, rocking the bar 21 on its journals away from the disk 1 to allow said disk to be replaced by another. The bar 21 carries on its upper journal 34 a segment 35, which when the rollers bear on the disk 1 is situated over the axial stud 2, resting in a notch of a support 36, and thus preventing the said stud and disk from rising.

Assuming the parts to be primarily in the positions seen in the drawings, the rotation of the spring-barrel 20 in the direction of the



arrow  $y$  in Fig. 3 imparts a rotary motion to the disk 1 which is at the time in operative position, the motion being imparted through the arbor 37 and wheels 38 and 39, and the disk acts on the combs of the instrument in the usual way. During this rotation of the spring-barrel the cam 18, by its action on the stud 17 of the arm 15, gradually lowers the rod 10, so that the disk 1 in operation is subjected to the lifting action of its weight 7, which tends to elevate it to its position of rest; but the movement upward of the disk is for the moment prevented by the segment 35. As soon, however, as the continued rotation of the barrel 20 shall have brought the stud 32 up to the inclined face  $a$  of the projection 31 on the arm 28 this latter and the arm 25 will be moved in the direction of the arrow  $u$ , which has the effect of turning the bar 21 and rollers 22 away from the face of the operative disk 1 until the stud 32 rides onto the face  $b$  of the projection 31. During this movement as soon as the segment 35 releases the axial stud 2 of the disk the weight 7 of the latter elevates it to the position of rest. The rollers 22 are held in their inoperative position so long as the stud 32 remains in contact with the face  $b$  of the projection 31.

By sliding the frame 6 along the guide-rods 9 any one of the suspended disks 1 may be brought to the horizontal position for being lowered into operative position. The stud 17, actuated by the counterweight 13 and cam 18, is caused to move suddenly from the higher to the lower part of the cam. The rod 10 is suddenly elevated, thus elevating the weight 7 which is now above it, and the disk 1 connected with that weight 7 descends by gravity to the operative position. The stud 32 at this moment passes from the face  $b$  of the projection 31, and the arm 28, arm 25, and bar 21 are returned to the position seen in the drawings by the spring 30, and this again brings the rollers 22 to bear on the disk 1 now in operative position. This position of the parts will be maintained until the barrel 20 shall have made a complete rotation, when the operation above described will be repeated.

The counterweight 13 may of course be substituted by a spring and the spring 30 be substituted by a weight, as in the construction described a spring and weight are known equivalents. Any suitable flexible connectors may also be substituted for the cords 4—as chains, for example.

The shifting of the frame 6 may be effected in two ways—that is, this frame may be shifted automatically by the spring-barrel 20 at the end of each revolution thereof, as described, or said frame may be shifted by hand, so that any selected disk can be brought into the operative position. The means which permits of this to-and-fro motion of the frame 6 is combined with a mechanism for disengaging one shifting mechanism when the other shall be engaged. This device or means

comprises an arm 40, Fig. 3, pivoted at 41 and provided with an operating-stud 42, adapted to bear on the cam 18. This arm 40 is coupled by a rod 43 to one arm of an elbow-lever 44, Fig. 1, fulcrumed at 45, the other arm of said lever being coupled by a rod 46 to a crank 47 on a shaft 48, rotatably mounted in bearings on the top plate of the instrument-box. The weight of the rod 46 tends to hold the stud 42 up to the cam 18. On the shaft 48 is a bevel-wheel 49, which gears with a similar wheel 50, fixed on a rocking pawl-plate 51, Fig. 5, which latter carries near its ends two spring-pawls 52. This plate 51 is rocked at each rotation of the cam 18, and the pawls 52 engage, respectively, the teeth 53 on two rack-bars 54, which are fixed to the frame 6. The shoulders of the teeth on the bars 54 face in opposite directions, and they are spaced to correspond to the distance apart of the suspended disks 1. Therefore at each rocking movement of the pawl-plate 51 the pawls thereon are caused to shift the frame 6, one pawl serving to shift it in one direction and the other pawl in the opposite direction, the movement in each case being equal to the distance between two adjacent disks 1. On the rocking plate 51 are pivotally mounted two unlocking dogs or pieces 55, one for each pawl, whereby one pawl is thrown out of engagement with its rack when the other is engaged. Each bar 54 carries near each end a stud 56, which at the end of the course or travel of the frame 6 impinges upon the corresponding unlocking-dog 55 and through it throws the corresponding operating-pawl out of engagement. Each pawl carries a stud 57, on which acts an arm 58, Fig. 4, which is pivotally mounted on the top plate of the instrument-box at one end and at the other end is coupled by a link 59 to a piece 60 common to both links 59 and through this piece 60 to an arm 61, mounted on a shaft 62. On the other end of this shaft 62 is fixed another arm 63, coupled by means of a rod 64 to an operating-lever 65, which has a knob or handle 66 projecting out at the side of the instrument-box, Fig. 1, so that by raising the rod 64 by hand, with the aid of said handle, the connected ends of the arms 58 may be made to approach each other, whereby these arms impinge upon the studs 57 and press the pawls 52 out of engagement with the teeth on the bars 54, so that the frame 6 will not be shifted by said pawls until by the drawing down of the rod 64 the pawls will be again permitted to engage.

On the rod 64 is jointed an elbow-lever 67, Fig. 1, fulcrumed at 68, the upright arm of said lever engaging a circumferential groove in a member 69 of a clutch, said member being splined on a shaft 70, which has bearings in the side of the instrument-box. The other member 69<sup>x</sup> of the clutch is rotatable on the shaft 70 and has fixed to it a crank 71. Thus when the rod 64 is moved upward the mem-



ber 69 of the clutch will be moved or shifted into engagement with the other member 69,<sup>x</sup> whereby the crank 71 is connected operatively to the shaft 70. This latter shaft is 5 connected operatively by bevel-wheels 72 72<sup>x</sup> and 73 73<sup>x</sup> and an upright shaft 74 with a shaft 75, which carries a crank-arm 76, Fig. 4, with a stud or pin 77. This stud 77 is adapted to engage at each rotation of the 10 shaft 75, Fig. 6, with one of the several notches 78 in a bar 79, fixed on the upper side of the frame 6, and by this engagement to shift said frame step by step a distance equal to that between any two adjacent disks 1. The num- 15 ber and spacing of the notches 78 correspond to the number and spacing of the disks 1, carried by the frame 6. To insure that each rotation of the shaft 75 shall shift the frame 6 to just the proper extent, an arm 80, Figs. 4 and 6, is pivoted on the top plate of the in- 20 strument-box and has a stud 81 and spring 82. The spring tends to keep the stud 81 pressed up against the underside or edge of the bar 79 and to cause said stud to engage 25 at the proper time one of a series of locking-notches 83 in the lower edge of the bar 79. At each revolution of the shaft 75 the stud 77 depresses the arm 80 and disengages its stud 81 from the notch 83; but after the stud 30 77 passes the spring 82 will again be free to cause the stud 81 to engage the next locking-notch 83 as soon as the frame 6 shall have been moved to the proper extent. If, how- 35 ever, the clutch on the shaft 70 be disengaged and the frame 6 be shifted automatically by the cam 18, an arm 84, Figs. 4 and 6, on the shaft 62 will press down the arm 80, and thus disengage the stud 81 from the lock- 40 ing-notches in the bar 79.

When the different parts of the mechanism occupy the positions seen in the drawings, the shifting of the frame 6 will be operated mechanically. Under these conditions when 45 the barrel 20 rotates in the direction of arrow *y* the stud 42 of the arm 40, Fig. 3, bearing on the cam 18, will be actuated by said cam, so as to cause the rocking plate 51, Fig. 4, to rock in the direction of the arrow *w* until it occupies the position seen in Fig. 5. As soon 50 as the higher part of the cam 18 passes the stud 42 the plate 51 will be rocked back again in the direction of the arrow *v* in Fig. 5, so that the pawl 52 at the right will shift the frame 6 for a distance of two notches in the 55 direction of the arrow *q*. Then the plate 51 will be again rocked in the direction indicated by arrow *w*, and so on, until the studs 56 strike the unlocking-pieces 55 and bring the latter into such a position that the right- 60 hand pawl will be disengaged and the left-hand pawl put into engagement. It will be noted that from this time on each rocking movement of the plate 51 in the direction of the arrow *v* will move the frame 6 in the di- 65 rection of the arrow *q*<sup>x</sup> in Fig. 5 until the other studs 56 engage the unlocking-pieces

55 to shift the pawls and again change the direction of movement of the frame 6. The arm 40 and stud 42 are so placed that the shifting of the frame 6 takes place immediately after 70 a disk 1 has been elevated to its position of rest.

If a certain disk or tune-sheet of the series has been selected and this selection requires that the frame 6 shall be shifted to an extent 75 greater than the space between two adjacent disks in either direction, the operating end 66 of the lever 65 will be pressed down, so as to couple the crank 71 with the shaft 70, and simultaneously the shaft 62 will be rocked, 80 thus, on the one hand, disengaging the pawls 52 from their rock-bars and, on the other hand, releasing the arm 80, which is now moved into operative position by its spring 82. Now on 85 turning the crank 71 the frame 6 may be shifted in either direction. The rotation of the shaft 75, as before stated, not only shifts the frame step by step, but also depresses the arm 80 and disengages the stud 81 from 90 the locking-notches, so as to leave the frame 6 free to move. When the frame 6 shall have been thus shifted, pressure on the arm or knob 66 is removed and the weight of the rod 64 disengages the clutch 69 69<sup>x</sup>. Simul- 95 taneously with this the shaft 62 is rocked and the pawls 52 allowed to engage, and the arm 84 on said shaft 62 presses down the arm 80 and moves its stud 81 out of operative en- 100 gagement with the locking-notches. The frame 6 is now again adapted for being shifted mechanically.

Each disk or tune-sheet 1 has in its periphery a notch 86, Figs. 9 and 10, and a roller 87 105 bears and rolls on the edge of the rotating disk. This roller and the notch in the disk are so placed that at the termination of the piece of music played by the disk the roller 110 engages the said notch and holds the disk from rotating. This roller 87 is carried by an arm 88, pivotally mounted on the bar 3, carrying the disk, and a rather weak spring 89 tends to press the roller up elastically to the edge 115 of the disk. This device is not designed to lock the disk against the driving action of the rollers 22, but to hold the disk against incidental rotation when suspended and at rest and to stop it, after playing, at exactly the proper time.

In order to hold the bar 3 of the lowered operative disk when the latter is about to be- 120 gin its rotation for playing, each bar 3 is attached by a cord or connector 90 to a rod 91, supported in arms 92 on the frame 6. Thus the traction which the disk tends to exert on its bar 3 at the beginning of its rotation will 125 be resisted by said connector 90.

Having thus described my invention, I claim—

1. In a musical instrument of the character described, mechanism for changing and plac- 130 ing in operative position the rotatable disks or tune-sheets thereof, comprising a guide-



way, a horizontally-shiftable support or carriage thereon for the disks, pulleys on said carriage, flexible connectors over said pulleys, a disk-elevating weight on one end of each of said connectors and a disk-holder on the other end thereof, the spring-barrel of the instrument, means intermediate the spring-barrel and the elevating-weight of the disk that is in operative position, whereby said barrel elevates the weight at proper times, mechanism for holding the operating-disk in position while playing, and intermediate mechanism between the spring-barrel and said holding mechanism, whereby the barrel actuates the latter.

2. In a musical instrument of the character described, mechanism for changing and placing in operative position the rotatable disks or tune-sheets thereof, comprising a guideway, a horizontally-shiftable support or carriage thereon for the disks, pulleys on said carriage, flexible connectors over said pulleys, a disk-elevating weight on one end of each of said connectors and a disk-holder on the other end thereof, a vertically-movable lifting-rod adapted to raise the elevating-weight of the disk that is in operative position, the spring-barrel of the instrument, mechanism between said barrel and said lifting-rod whereby the former operates the latter at proper times, and mechanism which holds the operating-disk in position while playing and which is adapted to be actuated at proper times by said spring-barrel.

3. In a musical instrument of the character described, mechanism for changing and placing in operative position the rotatable disks or tune-sheets thereof, comprising a guideway, a horizontally-shiftable support or carriage thereon for the disks, pulleys on said carriage, flexible connectors over said pulleys, a disk-elevating weight on one end of each of said connectors and a disk-holder on the other end thereof, a vertically-movable lifting-rod adapted to raise the elevating-weight of the disk that is in operative position, the spring-barrel of the instrument, mechanism between said barrel and said lifting-rod whereby the former operates the latter at proper time, said mechanism comprising a volute cam driven by said spring-barrel, and mechanism between said cam and lifting-rod, and means for holding the disk in operative position while playing, said means being actuated at proper times by the said spring-barrel.

4. In a musical instrument of the character described, mechanism for changing and placing in operative position the rotatable disks or tune-sheets thereof, comprising a guideway, a horizontally-shiftable support or carriage thereon for the disks, pulleys on said carriage, flexible connectors over said pulleys, a disk-elevating weight on one end of each of said connectors and a disk-holder on the other end thereof, a vertically-movable

lifting-rod adapted to raise the elevating-weight of the disk that is in operative position, the spring-barrel of the instrument, mechanism between said barrel and said lifting-rod whereby the former operates the latter at proper times, a rocking bar provided with rollers to bear upon the operating-disk, said bar carrying means for holding said disk against the weight tending to elevate it, and mechanism between said bar and the spring-barrel whereby the latter operates the former at proper times.

5. In a musical instrument of the character described, mechanism for changing and placing in operative position the rotatable disks or tune-sheets thereof, comprising a guideway, a horizontally-shiftable support or carriage thereon for the disks, pulleys on said carriage, flexible connectors over said pulleys, a disk-elevating weight on one end of each of said connectors and a disk-holder on the other end thereof, a vertically-movable lifting-rod adapted to raise the elevating-weight of the disk that is in operative position, the spring-barrel of the instrument, mechanism between said barrel and said lifting-rod whereby the former operates the latter at proper times, said mechanism comprising a volute cam driven by said spring-barrel and mechanism between said cam and lifting-rod, a rocking bar provided with rollers to bear upon the operating-disk, said bar carrying means for holding said disk against the weight tending to elevate it, and mechanism between said bar and the spring-barrel whereby the latter operates the former at proper times.

6. In a musical instrument of the character described, a mechanism for changing and placing in operative position the rotatable disks or tune-sheets thereof, said mechanism comprising a guideway, a horizontally-movable carriage thereon, a flexible connector for each disk of the series, led over pulleys on said carriage, a disk-holder, consisting of a bar 3 and axial stud 2, secured to one end of each of said connectors, a weight 7 secured to the other end of each connector, the spring-barrel 20, a cam 18, connected to and rotating with said barrel, a weighted lever 11, having a finger 14, an arm 15, having a stud which is pressed up to the cam by said lever 11, a vertically-movable lifting-rod 10, coupled to the lever 11 and actuated by the latter, a roller-carrying, rocker-bar 21, adapted to keep the disk or tune-sheet pressed up to the mechanism for producing the musical sounds, and provided with a segment 35, for holding the stud 2 in position, a spring-lever 28 connected with the bar 21 and provided with a projection 31, and an arm 33, connected with the spring-barrel and provided with a stud which actuates the lever 28, substantially as set forth.

7. In a musical instrument, having a guideway, a horizontally-shiftable carriage or frame



thereon supporting a series of vertically-movable, suspended disks or tune-sheets, a mechanism for automatically shifting said carriage after each revolution of the spring-barrel of the instrument in order to move said disks successively into position, said mechanism comprising two rack-bars mounted on the carriage, a rocking pawl-plate 51, provided with two spring-pawls adapted to engage alternately the respective rack-bars, means between the spring-barrel and pawl-plate whereby the former rocks the latter for shifting the carriage, unlocking-dogs 55 on the pawl-plate, for disengaging the pawls, and studs 56, at the ends of the rack-bars and adapted to act upon said pawls for reversing the carriage, substantially as set forth.

8. In a musical instrument of the character described, a mechanism for effecting mechanically the change of the disks or tune-sheets, said mechanism comprising a carriage movable along a horizontal guideway, the said guideway, and means for suspending the disks from said carriage, of means for shifting said carriage by hand, so as to bring any one of the disks to the point for lowering it into operative position, comprising a notched bar 79, on said carriage, a shaft 75, carrying a single crank-pin 77, adapted to engage one of the notches in said bar at each rotation of said shaft 75, whereby a complete rotation of the shaft is necessary to move the bar one step, and mechanism adapted for hand operation for rotating said shaft.

9. In a musical instrument of the character described, a mechanism for effecting mechanically the change of the disks or tune-sheets, said mechanism comprising a carriage movable along a horizontal guideway, the said guideway, and means for suspending the disks from said carriage, of means for shifting said carriage by hand, so as to bring any one of the disks to the point for lowering it into operative position, comprising a notched bar 79, on said carriage, a shaft 75, carrying a single crank-pin 77, adapted to engage one of the notches in said bar at each rotation of said shaft 75, whereby a complete rotation of the shaft is necessary to move the bar one step, mechanism for rotating the shaft 75 by hand, and a spring-arm 80, adapted to be depressed by the crank-pin 77, and provided with a stud to engage locking-notches in the lower part of the bar 79, for locking the shifted carriage during the time the crank-pin 77 is out of engagement.

10. In a musical instrument, a mechanism for changing the disks or tune-sheets thereof, comprising a guideway, a carriage for supporting the disks and movable along said guideway, a rocking pawl-plate 51, provided with two spring-pawls, two rack-bars mounted on said carriage and adapted to be engaged alternately by the respective pawls, the spring-barrel of the instrument, intermediate mechanism whereby said barrel imparts a rocking movement to said pawl-plate for shift-

ing the carriage, unlocking-dogs 55, cooperating with studs 56 on the rack-bars and acting on the pawls to reverse the shifting direction of the said carriage, a notched bar 79, rigidly mounted on the carriage, a shaft 75, provided with a crank-pin 77 to engage the notches in the bar 79, hand-operable mechanism for rotating the shaft 75, and means for disconnecting one of the carriage-shifting mechanisms, said means comprising the two arms 58, adjacent to the respective pawls on the pawl-plate, and coupled to an intermediate crank-shaft 62, the said shaft, a vertical rod 64, coupled to a crank on the shaft 62, a clutch for connecting and disconnecting the hand-operable mechanism, and an intermediate device between the rod 64 and said clutch for operating them simultaneously, whereby the hand-operable mechanism is made operative at the same time that the mechanically-operable mechanism is made inoperative, all combined and arranged substantially as set forth.

11. In a musical instrument, a mechanism for changing the disks or tune-sheets thereof, said mechanism comprising a horizontal guideway, a disk-supporting carriage 6 movable along said guideway, means for suspending each of the disks from said carriage, a disk-holder on one end of each suspending device and consisting of a bar 3 and an axial stud 2, a weight 7 attached to the other end of said suspending device, the spring-barrel 20 of the instrument, a cam 18 rotating with said barrel, a weighted lever 11, having a finger 14, an arm 15, having a stud which bears on the cam 18, being pressed up thereto by the lever 11, an upright, movable rod 10, coupled to the lever 11, the rocking bar 21, provided with rollers to bear on the operating-disk during the playing, a segment 35 on the bar 21 and adapted to hold the disk-axis in position while playing, a spring-lever 28, connected to the bar 21 and provided with a projection 31, an arm 33, on the spring-barrel and provided with a stud to engage the projection 31, mechanism for mechanically shifting the carriage 6, consisting of the rocking pawl-plate 51, provided with spring-pawls, the two rack-bars 54, having studs 56 at each end, said bars fixed to the carriage 6 and the teeth of the respective bars facing in opposite directions, two unlocking-dogs 55, for the respective pawls, the bevel-wheels 49 and 50, a crank-shaft 48, a vertical rod 46, the elbow-lever 44, the link 43, and the arm 40, having a stud which bears on the cam 18, all combined and arranged to operate, substantially as set forth.

12. A mechanism for changing the disks or tune-sheets of a mechanical musical instrument, comprising a horizontal guideway, a disk-supporting carriage 6, movable along said guideway, pulleys on said carriage, flexible connectors over said pulleys, one for each disk, a disk-holder, comprising the bar 3 and axial stud 2, secured to one end of each con-



necter, a weight 7 secured to the other end of each connector, the spring-barrel 20 of the instrument, the cam 18, connected to and rotating with said barrel, the weighted lever 11 5 having a finger 14 which bears on the arm 15, said arm 15, having a stud which bears on the cam 18, being pressed up thereto by said weighted lever, an upright, movable rod 10, connected to the weighted lever 11, the rock- 10 ing bar 21, provided to bear on the operating-disk during the playing, a segment 35, on the bar 21, and adapted to hold the disk-axis in position while playing, a spring-lever 28, connected to the bar 21 and provided with a pro- 15 jection 31, an arm 33 on the spring-barrel and provided to engage the projection 31, when the barrel rotates, and actuate the lever 28, and mechanism for shifting the carriage 6 by hand, said mechanism consisting of the 20 notched bar 79, on said carriage, a shaft 75, having a crank-pin 77 to engage the notches in said bar, the upright shaft 74, the shaft 70, the gears connecting the shafts 70, 74 and 75, and the crank 71 on the shaft 70, substan- 25 tially as set forth.

13. A mechanism for changing the disks or tune-sheets of a mechanical musical instru- ment, comprising a horizontal guideway, a disk-supporting carriage 6 movable along said 30 guideway to bring the disks, one by one, into operative position, pulleys on said carriage, flexible connectors, one for each disk, over said pulleys, a disk-holder, comprising a bar 3 and axial stud 2, attached to one end of each 35 of said connectors, a weight 7 attached to the other end of each connector, the spring-barrel 20 of the instrument, a cam 18 secured to and rotating with said barrel, a weighted lever 11 having a finger 14, which bears on an arm 40 15, the said arm 15, having a stud bearing on the cam 18, a lifting-rod 10, connected to the weighted lever, a rocking bar 21, provided with rollers to bear on the operating-disk, a segment 35 on the bar 21, adapted to hold the 45 axis of the operating-disk in position, a spring-lever 28 connected with the bar 21 and provided with a projection 31, an arm 33 on the barrel 20 and adapted to engage the projection 31 when the barrel rotates, thus actuat- 50 ing the arm 28, and mechanism for shifting the carriage 6 by hand, said mechanism consisting of a notched bar 79 on said carriage, a shaft 75, having a crank-pin 77 to engage the notches in the bar 79, when the shaft 75 55 is rotated, an actuating-shaft 70, provided with a crank, the intermediate shaft 74, the gears connecting the shafts 70, 74 and 75, and a spring-arm 80, provided with a stud to engage notches 83 in bar 79, said arm 80 adapted 60 to be moved into inoperative position by the crank-pin 77, substantially as set forth.

14. A mechanism for changing the disks or tune-sheets of a mechanical musical instru- 65 ment, comprising a horizontal guideway, a disk-supporting carriage 6 movable along said guideway to bring the disks, one by one, into operative position, pulleys on said carriage,

flexible connectors, one for each disk, over said pulleys, a disk-holder, comprising a bar 3 and axial stud 2, attached to one end of 70 each of said connectors, a weight 7 attached to the other end of each connector, the spring-barrel 20 of the instrument, a cam 18 secured to and rotating with said barrel, a weighted lever 11 having a finger 14, which bears on an 75 arm 15, the said arm 15, having a stud bearing on the cam 18, a lifting-rod 10, connected to the weighted lever, a rocking bar 21, provided with rollers to bear on the operating-disk, a segment 35 on the bar 21, adapted to 80 hold the axis of the operating-disk in position, a spring-lever 28 connected with the bar 21 and provided with a projection 31, an arm 33 on the barrel 20 and adapted to engage the projection 31 when the barrel rotates, thus 85 actuating the arm 28, a rocking pawl-plate 51, provided with two pawls, two rack-bars 54, on the carriage, and provided with studs 56, two unlocking-dogs 55 for the pawls, the bevel- 90 wheels 49 and 50, the crank-shaft 48, the vertical rod 46, the elbow-lever 44, the link 43, an arm 40, having a stud which bears on the cam 18, a notched bar 79 fixed on the carriage 6, a shaft 75, having a crank-pin engaging 95 the notches in the bar 79, the operating-shaft 70, the intermediate upright shaft 74, the gearing connecting the shafts 70, 74 and 75, the crank 71 on the shaft 70, and mechanism for disconnecting the hand-operated mechan- 100 ism, the same comprising the upright rod 64, the clutch for coupling the crank 71 to its shaft, the clutch-operating lever 67, one arm of which is coupled to the rod 64, a lever for 105 lifting the rod 64, the crank-shaft 62, rocked by the rod 64, the two arms 58, connected together and to a crank-arm on the shaft 62, and adapted to impinge upon studs on the pawls for simultaneously disengaging the lat- 110 ter, substantially as set forth.

15. In a mechanism for the purpose speci- 110 fied, the combination with means for suspending, carrying and lowering the disks or tune-sheets, of means for preventing the accidental rotation of the disk on its axis, said means consisting of a spring-arm pivotally 115 mounted on the disk-holder and provided with a roller adapted to roll on the edge of the rotating disk and to engage a notch or recess in said edge, substantially as set forth.

16. In a mechanism for the purpose speci- 120 fied, the combination with the guideway, the carriage movable thereon, the suspending-connectors for the disks, and the disk-holders, each comprising a bar 3 and axial stud 2, of the arm 88, pivotally mounted on the bar 3, 125 the spring 89 of said arm, and the roller 87, carried at the free end of said arm and adapted to engage a notch in the edge of the disk, substantially as set forth.

17. In a mechanism for the purpose speci- 130 fied, the combination with the guideway, the disk-supporting carriage movable thereon, the flexible suspenders for the disks, and the disk-holders, each consisting of a bar 3 and



axial stud 2, of means for preventing the displacement of the lowered disk when about to begin its rotation, said means consisting of supporting-arms 92, on the carriage, a rod 91  
5 carried by said arms, and cords or connectors 90, one connecting each bar 3 with the rod 91, substantially as set forth.

In witness whereof I have hereunto signed my name, this 7th day of October, 1899, in the presence of two subscribing witnesses.

ALFRED JACCARD-ROD.

Witnesses:

ERNEST SCHNEIDER,  
EUGÈNE FAVRE.