

No. 849,831.

M. CLARK.

PATENTED APR. 9, 1907.

ROLL CARRYING MECHANISM FOR AUTOMATIC MUSICAL INSTRUMENTS  
OR PLAYERS.

APPLICATION FILED FEB. 16, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

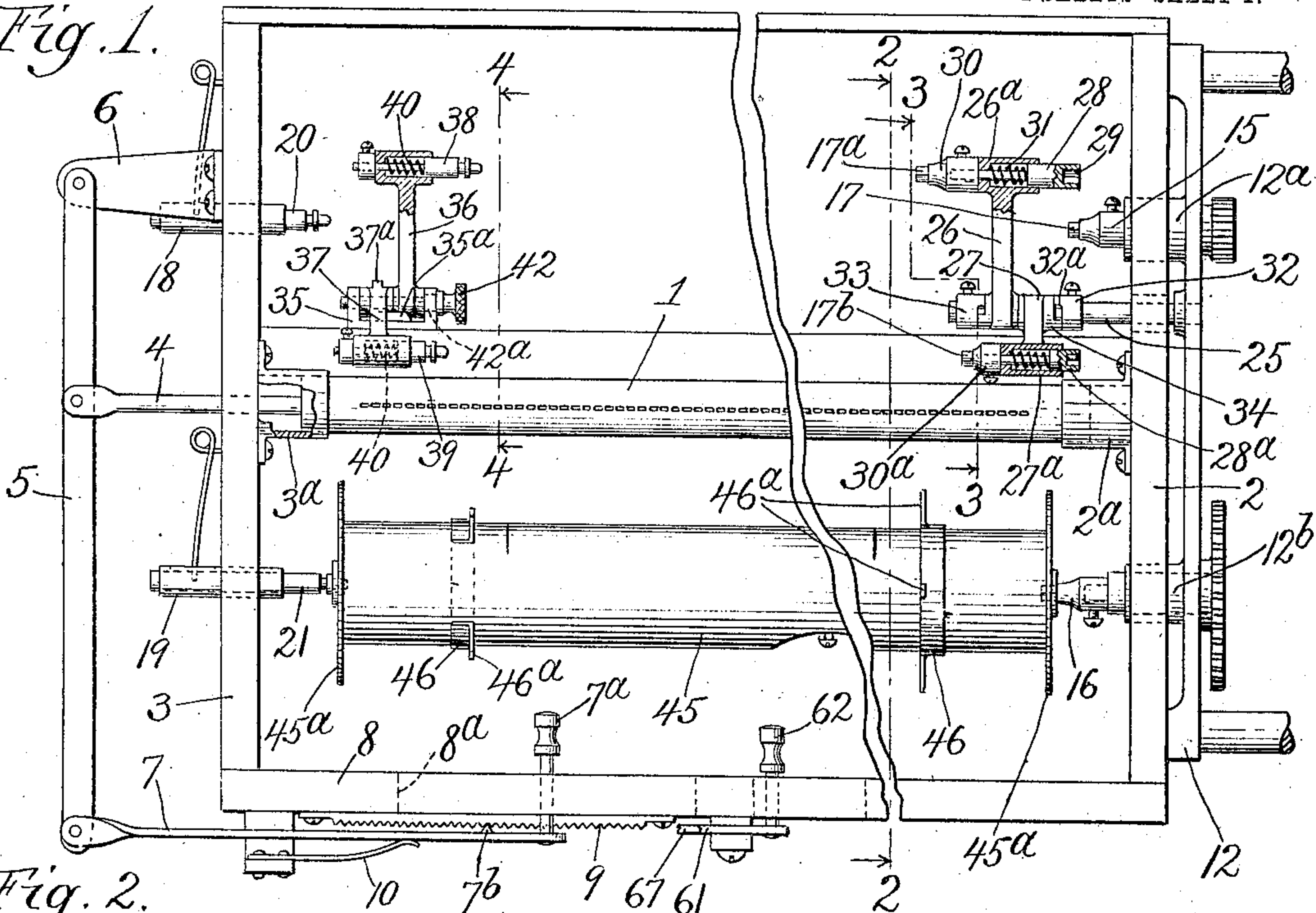


Fig. 2.

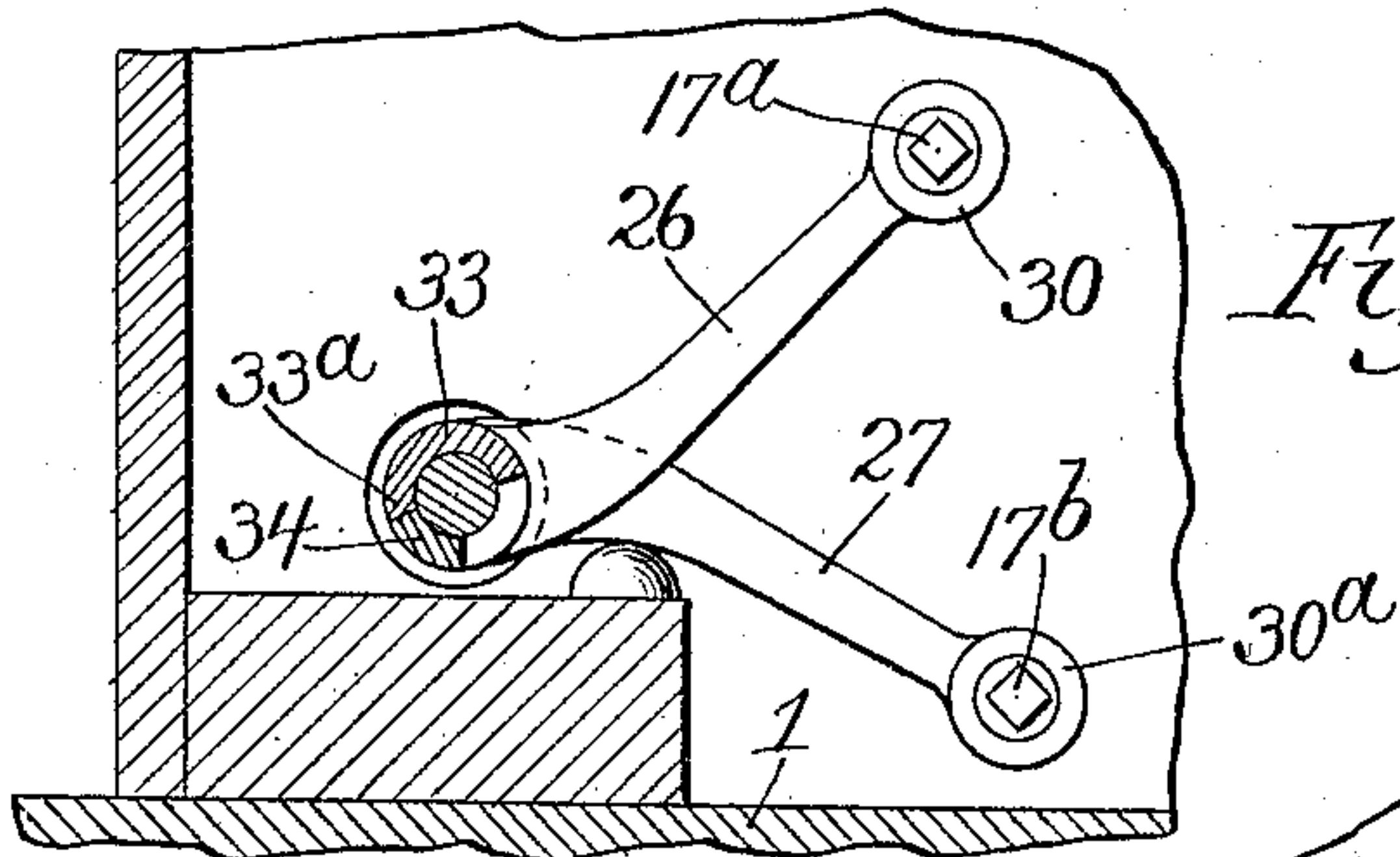
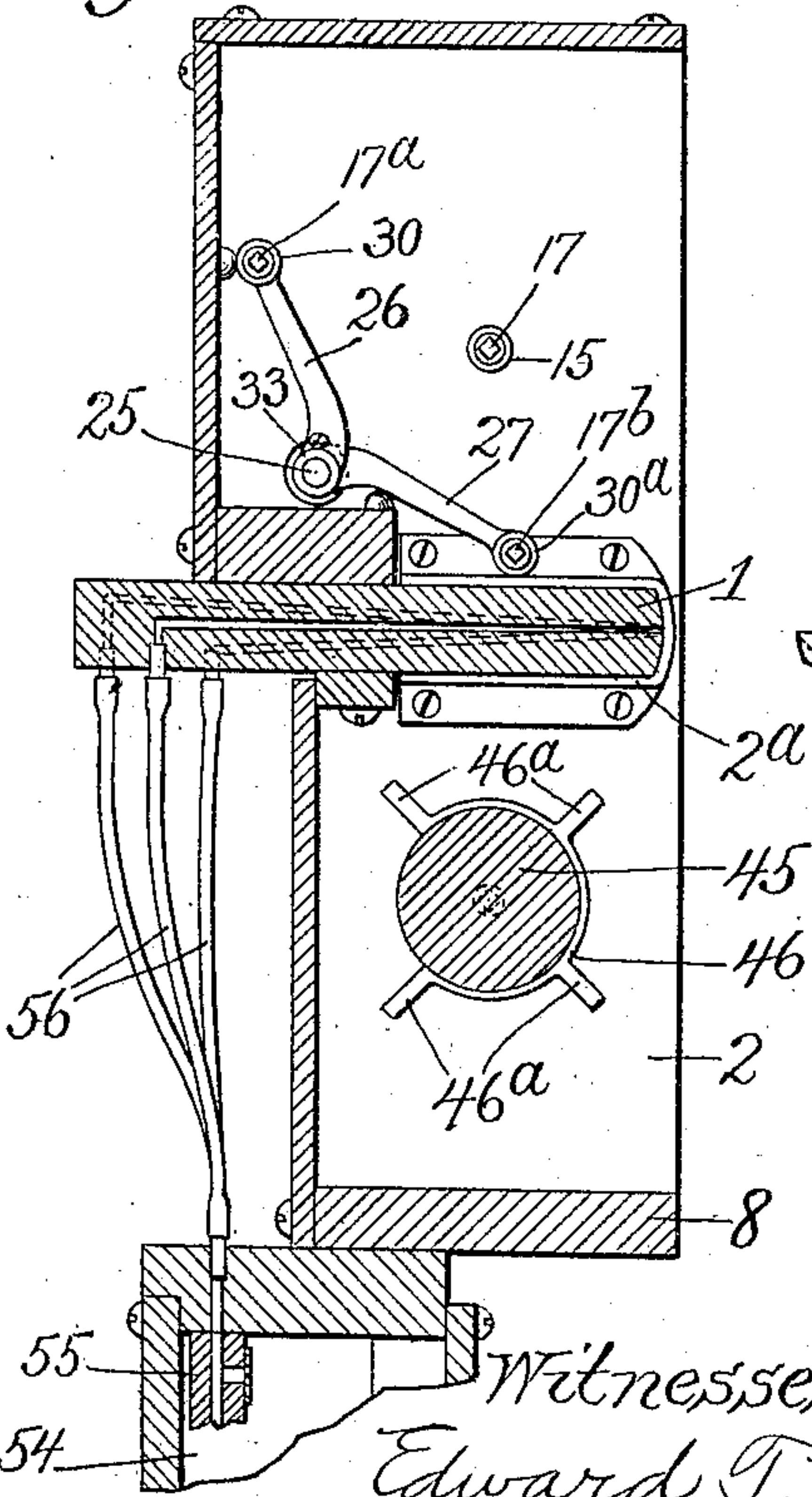
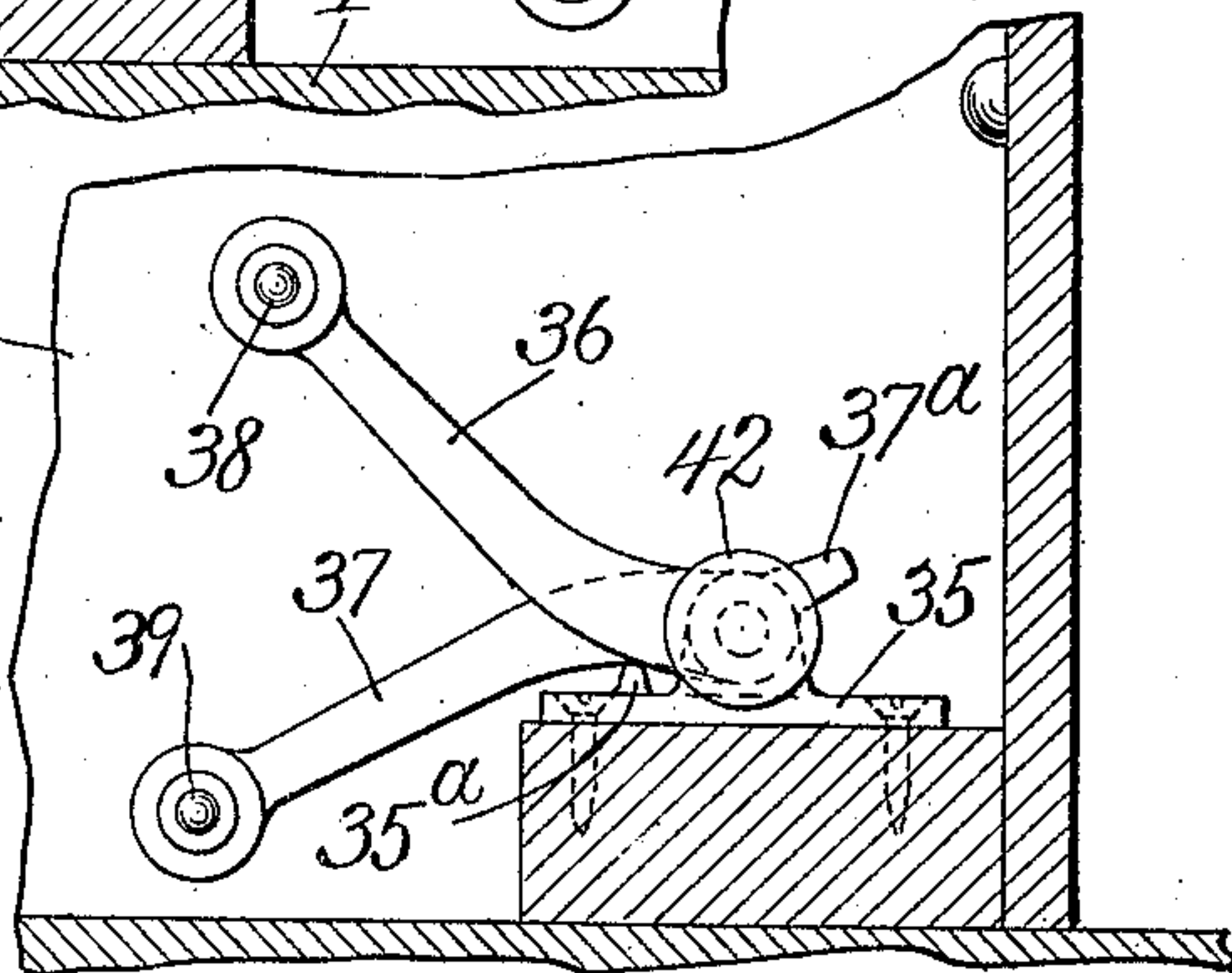


Fig. 3.

Fig. 4.



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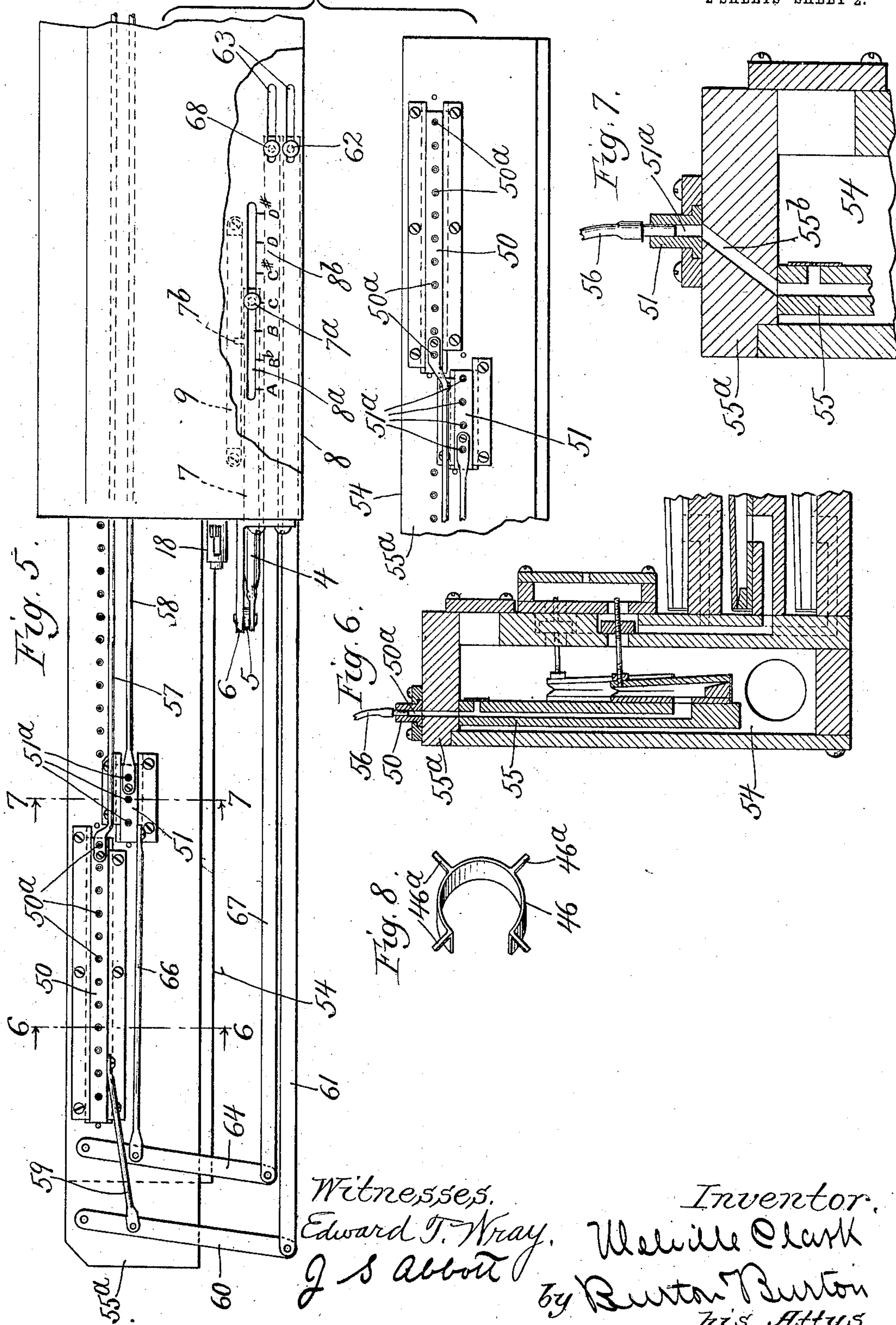
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

MELVILLE CLARK, OF CHICAGO, ILLINOIS.

ROLL-CARRYING MECHANISM FOR AUTOMATIC MUSICAL INSTRUMENTS OR PLAYERS.

No. 849,831.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed February 16, 1906. Serial No. 301,363.

*To all whom it may concern:*

Be it known that I, MELVILLE CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Roll-Carrying Mechanism for Automatic Musical Instruments or Players, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention is designed to provide improved means for supporting the rolls which carry the perforated controlling-sheets of automatic musical instruments or players adapted to receive rolls of different lengths, so that an instrument having its tracker-board constructed for playing the entire range of a piano, eighty-eight notes, may be used with perforated controlling-sheets constructed for operating instruments whose tracker-boards have only the number of ducts necessary for playing a limited portion, as fifty-eight or sixty-five notes of the piano.

It consists in the features of construction set out in the claims.

In the drawings, Figure 1 is a front elevation of a roll-carrying mechanism embodying my improvements. Fig. 2 is a section at the line 2 2 on Fig. 1. Fig. 3 is a detail section, on a larger scale, at the line 3 3 on Fig. 1, with swing-brackets in different position from those in Fig. 2. Fig. 4 is a detail section at the line 4 4 on Fig. 1. Fig. 5 is a top plan view of the pneumatic-action chamber which contains the primary pneumatics of the pneumatic-action for operating the playing devices. Fig. 6 is a section at the line 6 6 on Fig. 5. Fig. 7 is a detail section at the line 7 7 on Fig. 5. Fig. 8 is a perspective view of an adjustable paper-stop for use on the take-up roll.

The tracker-board 1 I have shown mounted so as to be movable longitudinally between the cheeks 2 and 3 for the purpose of adjusting its ducts to the perforations of the controlling-sheet, either to make correction for the shrinking or swelling of the paper or for transposing. For this purpose the cheeks 2 and 3 have sockets or slideways 2<sup>a</sup> and 3<sup>a</sup>, in which the opposite ends of the tracker-board are seated and movable toward and from the cheeks. The tracker-board has a stem 4, which extends out through the left-hand cheek 3 and is connected to a lever 5, which is fulcrumed at the upper or rear end in a post 6, mounted on the cheek 3, and at its

lower or forward end is connected to one end of a link or operating-rod 7, the other end of which is provided with an operating-handle 7<sup>a</sup>, which extends through the lower bar 8 of the roll-frame, said bar having a longitudinal slot in which said handle may be moved. A finely-serrated ratchet-plate 9 is mounted upon the under side of the frame bar or board 8 and engaged by a tooth 7<sup>b</sup> on the operating-rod 7, which is held into engagement with the bar by a spring 10, which is supported on the bar 8 and bears up against the under side of the rod 7, as seen in Fig. 1. The whole length of the lever 5 being about three times the distance from its fulcrum to its connection with the tracker-board stem, the movement of the tracker-board resulting from the movement of the handle 7<sup>a</sup> in the slot 8<sup>a</sup> will be only one-third as great as the movement of said handle, and the serrations of the ratchet-bar 9 being made, for example, about one-tenth of an inch apart the tracker may be adjusted in steps of one-thirtieth of an inch, which is slight enough to effect any desired correction to compensate for change of width of the paper by shrinking or swelling. The upper surface of the frame-bar 8 may have a graduated scale 8<sup>b</sup> along the slot to guide the operator in transposition.

Outside the right-hand cheek 2 the motor-frame is mounted with its left-hand end plate 12 adjacent to said cheek, and the cheek is apertured to admit the protruded bearing-bosses 12<sup>a</sup> and 12<sup>b</sup> of the roll-operating shafts or spindles 15 and 16, which protrude from the left-hand ends of their bearings within the roll-frame and are suitably terminated to effect driving engagement with the rolls. As shown, this is effected by a square terminal 17, the rolls being designed to have a corresponding square socket to engage the terminal. The opposite cheek 3 has mounted in it the spring-chambers 18 and 19 for the yielding bearing-spindles 20 and 21 for the left-hand ends of the rolls. The opposed driving and bearing spindles, mounted as described in the opposite cheeks 2 and 3, are at suitable distance to receive between them the longest rolls for which the instrument is designed. In order to accommodate shorter rolls, I provide a construction which will now be described. From the motor-frame plate 12 a rigid post 25 projects through the right-hand cheek behind or above the tracker-board, and on this post



there are mounted side by side two swing-brackets 26 and 27 of similar construction. The bracket 26 has at its swinging end a transverse bearing and spring-pocket 26<sup>a</sup>, in which there is journaled a spindle 28, having at the right-hand or outer end a square socket 29, adapted to engage the square terminal 17, and having fast at the inner end a driving-head 30, with a square terminal 17<sup>a</sup>, adapted to engage the driving end of the roll in the same manner as the square terminal 17 of the spindle 15. The spindle 28 is reduced in diameter within the pocket, and a spring 31, coiled on the reduced portion, reacts against the bottom of the pocket and the shoulder caused by the reduction to yieldingly hold the spindle thrust outward—that is, in direction for engagement with the square ends 17 of the spindle 15. The construction of the swing-bracket 27 is in all respects similar, except that the spindle-bearing 27<sup>a</sup>, the spindle 28<sup>a</sup>, and the driving-head 30<sup>a</sup> are shorter than the corresponding parts 26<sup>a</sup>, 28, and 30 of the bracket 26, so that the square terminal 17<sup>b</sup> on the bracket 27 does not stand so far within the right-hand cheek as the corresponding terminal 17<sup>a</sup>. The two swing-brackets are retained on the post 25 between the two stop-collars 32 and 33, which are cut away at their inner ends throughout a part of their circumference to form stop-shoulders 32<sup>a</sup> 33<sup>a</sup>, and the outer ends of the hubs of the swing-brackets are similarly cut away to form encountering shoulders at the ends of the resulting segmental projections 34, whose angular extent is less than the angular extent of the cut-away portion of the collars by an amount sufficient to permit the brackets 26 and 27 to swing from positions at which they are alined with the spindle 15 for engagement with its square terminal 17 to positions respectively above and below such engaging positions, as seen in Fig. 2. On any convenient support—as, for example, upon the upper or rear side of the tracker-board toward the left-hand end—there is mounted a bracket 35, in which there are pivoted two swing-brackets 36 and 37, corresponding to the brackets 26 and 27, respectively, and similarly adapted to swing from positions alined with the spindle 20 to positions respectively above and below such alined positions. The swing-bracket 36, which is designed to swing from the alined position upward, is stopped at its lower alined position by encounter with a stop-lip 35<sup>a</sup> on the bracket 35, and the swing-bracket 37, designed to swing upward from its alined position, is stopped at its said upper position by a lug 37<sup>a</sup> encountering the bracket 35. In the swing-brackets 36 and 37 there are mounted yielding center pins 38 and 39, respectively, held protruded by their respective springs 40, lodged in the pocket formed in the cross-

head of the bracket, as clearly shown, and requiring no further description. The distance between the spindle 38 and the terminal 17<sup>a</sup> is that which is necessary to accommodate a roll carrying a perforated controlling-sheet for playing fifty-eight notes. The distance between the spindle 39 and the terminal 17<sup>b</sup> is that which is necessary to accommodate a sixty-five-note roll, while, as above stated, the distance between the spindle 20 and the terminal 17 is that which is necessary to accommodate an eighty-eight-note roll. It will be observed that all the swing-brackets when in their respective upper and lower positions out of alinement with the spindle 15 are entirely out of the way of the music-roll, for which when centered on the spindles 17 and 20 ample accommodation is allowed between the upper and lower positions of said swing-brackets. At the alined position of either of the swing-brackets 26 and 27 they are sufficiently held by the engagement of the square notches of their respective spindles with the square driving-terminal 17. The brackets 36 and 37 are stopped at their respective alined positions, as already indicated, but are preferably secured in such positions by means of the clamp-screw 42, which serves as their pivotal support and which is threaded for engagement with one of the lugs of the bracket 35 and has a shoulder 42<sup>a</sup> extending through the other lug, so that it may operate to clamp the hubs of the two swing-brackets together and bind them tight to the bracket 35 with whichever one is in service at proper alined position.

The take-up roll 45 is mounted in the usual manner between the spindles 16 and 21, its total length between its guard-flanges 45<sup>a</sup> being such as to accommodate an eighty-eight-note perforated roll. Preferably, though not of necessity, movable guard-flanges are provided on the take-up roll adapted to be set at positions corresponding to the width of the narrower fifty-eight and sixty-five note rolls. These guard-flanges are preferably made in the form of spring-clasps 46, (see Fig. 8,) clasping more than one-half of the circumference of the shank of the roll and elastic enough to open for entering them on the roll and withdraw them and adapted to retain their position longitudinally on the roll by the friction of their spring grasp thereon. To form the lateral guards for the paper and serve the purpose of flanges, these clasps have at their proximate edges radially-projecting fingers 46<sup>a</sup>, which may be regarded as an interrupted flange, a continuous flange being objectionable, because it would defeat or materially interfere with the elasticity of the clasp. Mere pins, as shown, are sufficient, though the circumferential extent or width of the pins is not material, so long as it is not so great as to prevent proper spreading



and elastic closing of the clasps. The shank of the roll may be marked to denote the position at which the clasps should be located for the rolls of different width.

5 In employing upon the same tracker-board perforated controlling-sheets of different width it is necessary to provide for closing the unused ducts of the tracker-board or the ducts leading thereto. This is most conveniently done by making the closure at the point at which the connection of the ducts is made with the primary pneumatic chamber, and for that purpose there may be mounted upon said chamber at the end portions, one 15 end portion being illustrated, (see Fig. 5,) valve-slides 50 and 51, having duct-passages corresponding to the notes which are unused. The slide 50 has these duct-passages 50<sup>a</sup> for the twelve extreme notes—that is, upper or 20 lower, according to which end of the chamber is being considered—and the slide 51 has the ducts 51<sup>a</sup>, corresponding to three notes next higher than the twelve notes of the slide 50 at the bass end and to four notes 25 next lower than the twelve notes of the slide 50 at the treble end. For convenience and to have adequate range of movement, as more fully hereinafter explained, the primary pneumatic ducts corresponding to the 30 three notes and to the four notes of the slides 51 are offset from the line in which the remaining ducts terminate, so that their terminal mouths at the top of the primary pneumatic chamber are forward of said line sufficiently to allow space on top of the chamber 35 for the slides 51 to lap by the proximate ends of the slides 50. Fig. 7 shows the primary pneumatic chamber having the primary blocks 55, on which the primary pneumatics individually are mounted and in which the 40 primary pneumatic duct is formed, these ducts being continued on directly through the top board 55<sup>a</sup> in the case of all the other ducts except the two groups of three and 45 four, respectively, which are to be served by the slides 51, and for these two groups the ducts are continued on from the stop-board 55<sup>a</sup> obliquely, as seen at 55<sup>b</sup>, so as to offset their upper mouths, as stated, sufficiently to 50 accommodate the slides 51. As the flexible tubes 56 are connected into the upper ends of the primary pneumatic ducts which correspond to the fifty-eight notes at the middle of the range, so the flexible tubes are connected to the ducts in the valve-slides 50 and 55 51 for the notes outside of that middle portion. It will be seen that if the slides 50 and 51 are moved longitudinally, so that their ducts do not register with the mouths of the 60 ducts emerging at the top of the primary pneumatic chamber, all these ducts will be closed, the slides operating as valves for that purpose. The two slides 50 and 51 are operated together for the purpose of opening and closing 65 the ducts, being connected by a rod 57,

made fast at its ends to the valve-slides respectively and extending along the top of the primary pneumatic chamber past the intermediate ducts. Similarly, the two slides 51 51 are connected by a rod 58. The slide 50 70 at the right-hand end is connected by a link 59 with the lever 60, fulcrumed on the top of the chamber 54, and this lever at its forward end is connected with an operating-bar 61, 75 extending toward the middle of the instrument and there provided with a stem 62, operating in a slot 63 in the board 8, the length of the slot being such as to permit the necessary movement from registered to unregistered position. A similar connection is made 80 by means of a link 66, lever 64, operating-rod 67, and stem 68 for moving the slides 51.

I claim—

1. An automatic playing mechanism for musical instruments comprising, in combination, a take-up roll, driving and centering 85 spindles for the same spaced for a longer music-roll and supports for such spindles; swing-brackets and driving and centering spindles carried thereby spaced for a shorter 90 roll, the driving-spindle on the swing-bracket being adapted to be engaged and driven by the first-mentioned driving-spindle; means for stopping and securing the swing-bracket carrying the centering-spindle with said spindle 95 alined with the first-mentioned driving-spindle.

2. An automatic playing mechanism for musical instruments comprising, in combination, a take-up roll, driving and centering 100 spindles spaced for a longer music-roll; two pairs of swing-brackets, the brackets of each pair having respectively a driving and a centering spindle, said spindles of the two pairs being spaced for shorter rolls of different 105 lengths, the driving-spindles on said swing-brackets being both adapted to be engaged and driven by the first-mentioned driving-spindle, the corresponding spindles of the 110 two pairs being mounted for swinging from opposite directions into alinement with the longer-spaced spindles.

3. An automatic playing mechanism for musical instruments comprising, in combination, a take-up roll, driving and centering 115 spindles spaced for a longer music-roll and supports for such spindles; two pairs of swing-brackets, one bracket of each pair having a driving-spindle and the other a centering-spindle, said spindles of the two pairs being 120 spaced for different-length shorter rolls, the driving-spindles on said swing-brackets being adapted to be engaged and driven by the first-mentioned driving-spindle, and a 125 fulcrum or pivot-post upon which both said last-mentioned swing-brackets are mounted.

4. In an automatic playing mechanism for musical instruments, in combination, a take-up roll, driving and centering spindles spaced 130 for a longer music-roll and supports for said



spindles; posts projecting inwardly from said supports parallel with the spindle-axis; two pairs of swing-brackets, the brackets of each pair having respectively a driving and a centering spindle, said spindles of the two pairs being spaced for different-length shorter rolls, the driving-spindles on said swing-brackets being adapted to be engaged and driven by the first-mentioned driving-spindles, and both said brackets carrying driving-spindles being mounted upon the same post, the two brackets carrying the centering-spindles being mounted on the other post, said posts being below or back of the first-mentioned spindles, the two brackets on each post being mounted for swinging from opposite directions into alinement with the first-mentioned spindles and at their remote positions having the music-roll embraced in the angle between them.

5. An automatic playing mechanism for musical instruments comprising, in combination, a take-up roll, driving and centering spindles spaced for a longer music-roll and supports for said spindles; posts projecting from said supports below or back of said spindles; two pairs of swing-brackets, the brackets of each pair having respectively driving and centering spindles, the two driving-spindle brackets being mounted on one post and the two centering-spindle brackets on the other post; stop-collars on the post having the driving-spindle brackets, said brackets and collars having cooperating stop-shoulders which limit the swing of the brackets in opposite directions away from the position at which the driving-spindles on said brackets are alined with the first-mentioned driving-spindles.

6. An automatic playing mechanism for musical instruments comprising, in combination, a primary pneumatic chamber having primary pneumatic ducts issuing therefrom; two valve-slides having ducts adapted to regis-

ter with a limited number of the primary pneumatic ducts at the opposite end portions of the chamber; a second pair of valve-slides having ducts adapted to register with a limited number of ducts of the pneumatic chamber next inward from said ducts at the opposite end portions; a tracker-board and flexible tubes connecting said valve-slides with corresponding ducts of the tracker-board; connections for moving the two first-mentioned slides into and out of registering position, and other connections for moving the second pair of valve-slides into and out of registering position of their respective ducts; all in combination with the take-up roll, music-roll supports spaced for longer music-rolls, and means for interposing music-roll supports spaced for shorter rolls.

7. An automatic playing mechanism for musical instruments comprising, in combination with a tracker-board, a take-up roll; driving and centering spindles for the music-roll adapted for the full range of the tracker-board; means for carrying driving and centering spindles adapted to interpose said spindles between the first-mentioned driving and centering spindles for carrying shorter rolls; a primary pneumatic chamber and flexible ducts leading therefrom to the corresponding ducts of the tracker-board, and corresponding valve-slides at the two end portions of the system interposed in said flexible connections for closing at will the air-passages from the primary pneumatics to the tracker-board, said corresponding slides being connected for simultaneous movement into and out of duct-closing position.

In testimony whereof I have hereunto set my hand, at Chicago, Illinois, this 14th day of February, A. D. 1906.

MELVILLE CLARK.

Witnesses:

CHAS. S. BURTON,  
J. S. ABBOTT.