

No. 674,334.

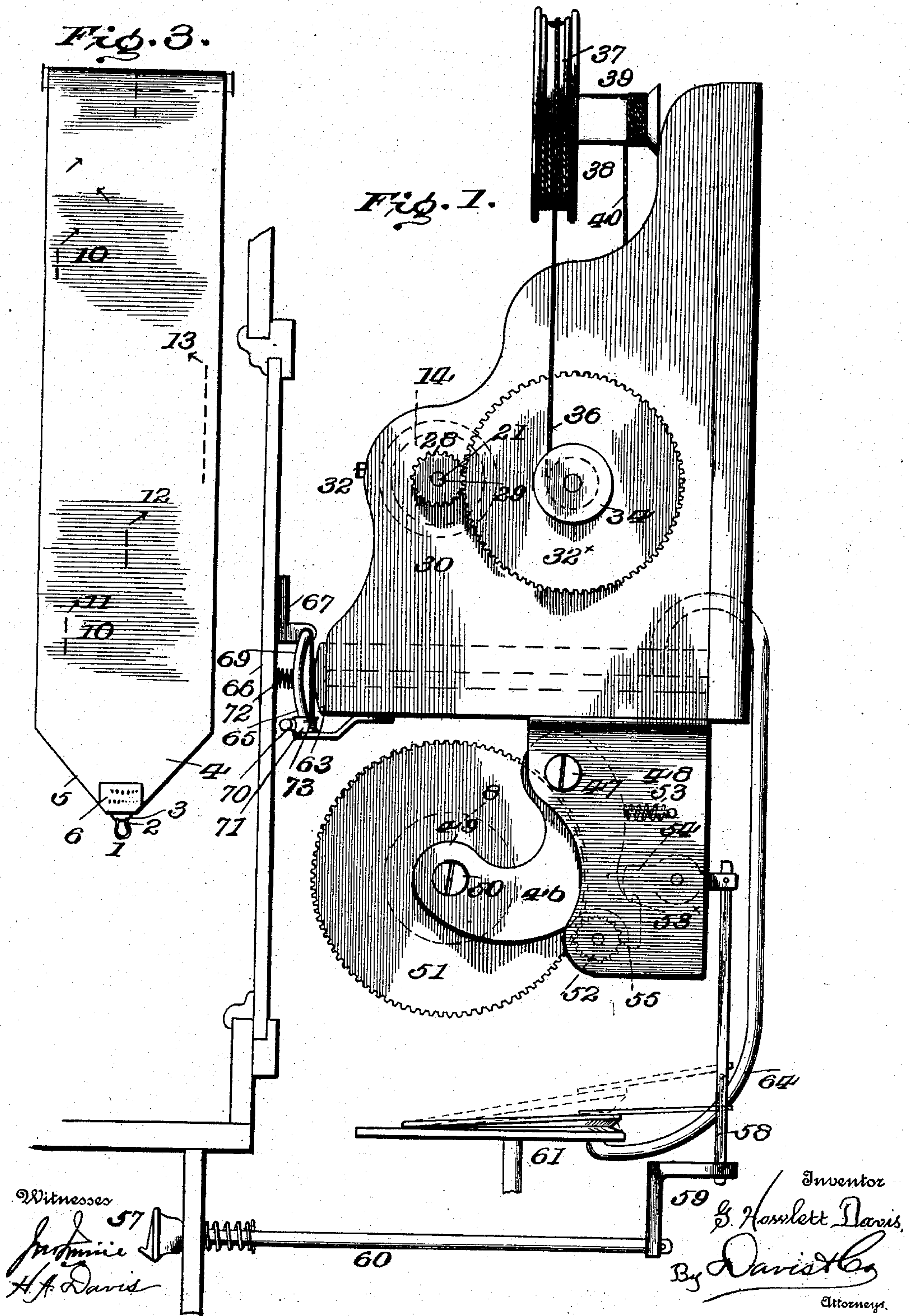
Patented May 14, 1901.

G. H. DAVIS.
MUSICAL INSTRUMENT.

(No Model.)

(Application filed June 3, 1897. Renewed Oct. 18, 1900.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

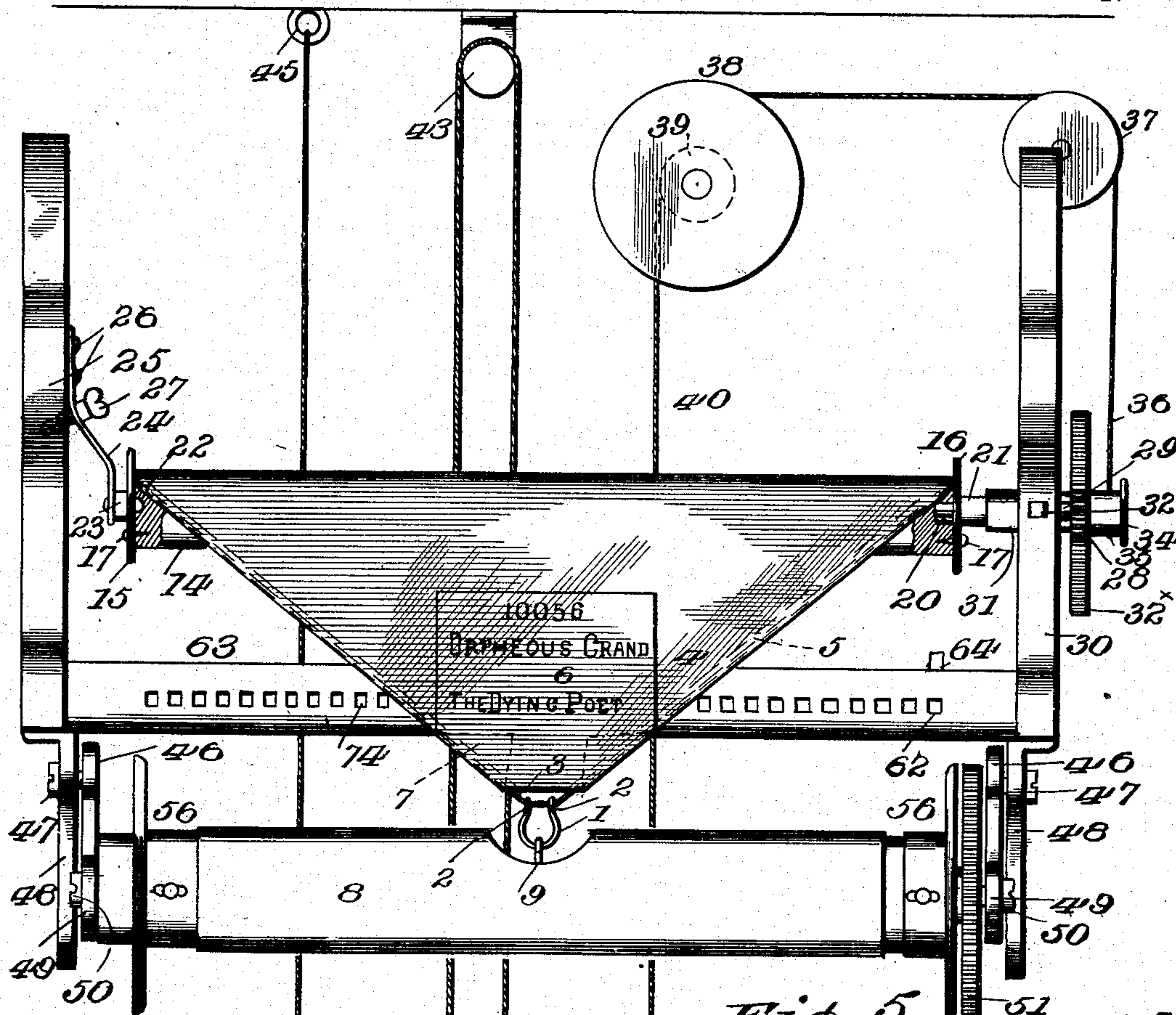


Fig. 2

Fig. 5.

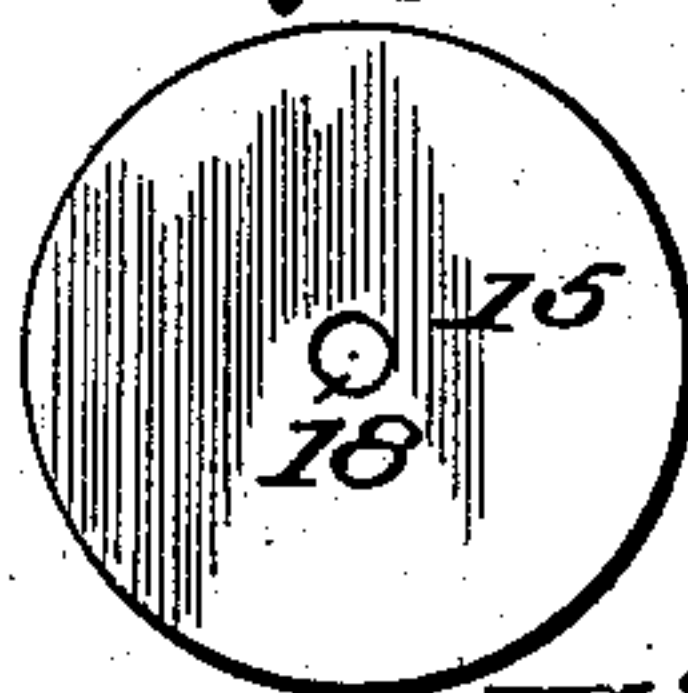


Fig. 4

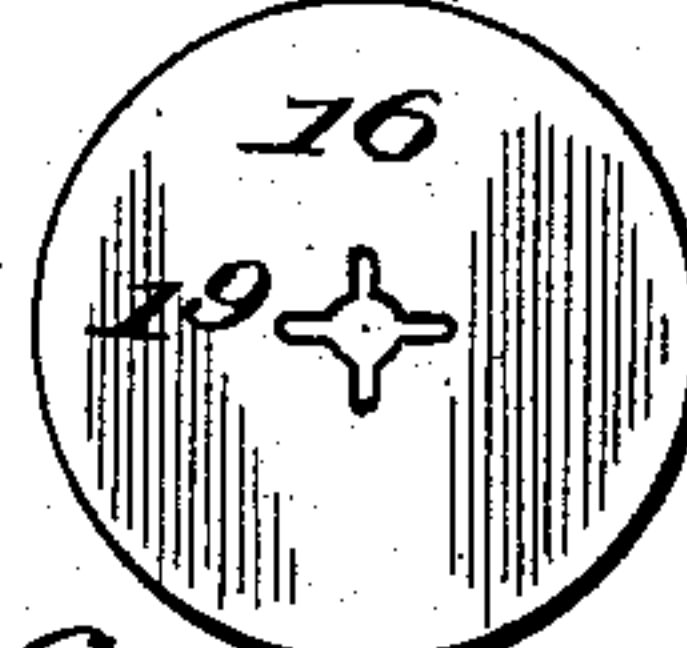
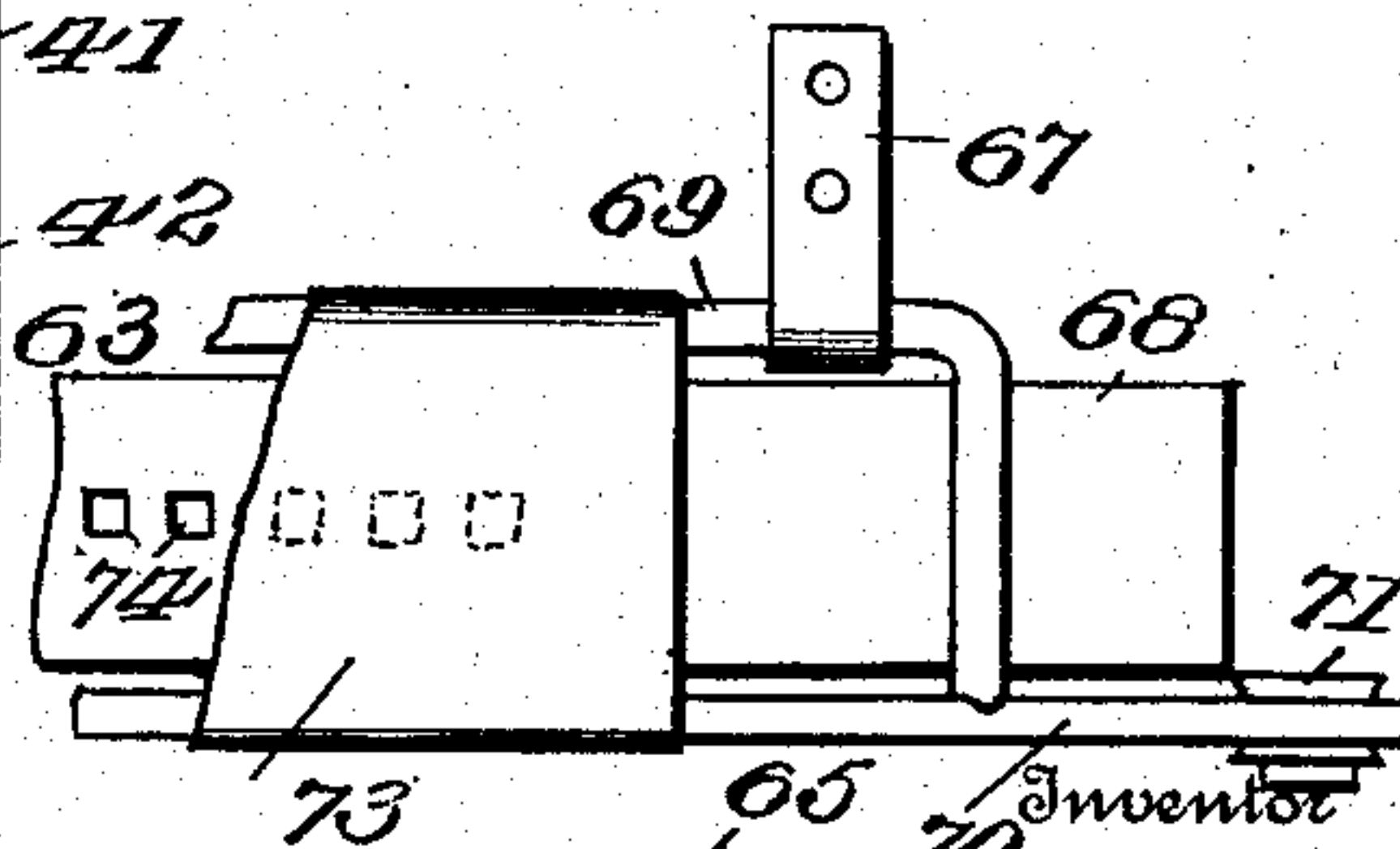
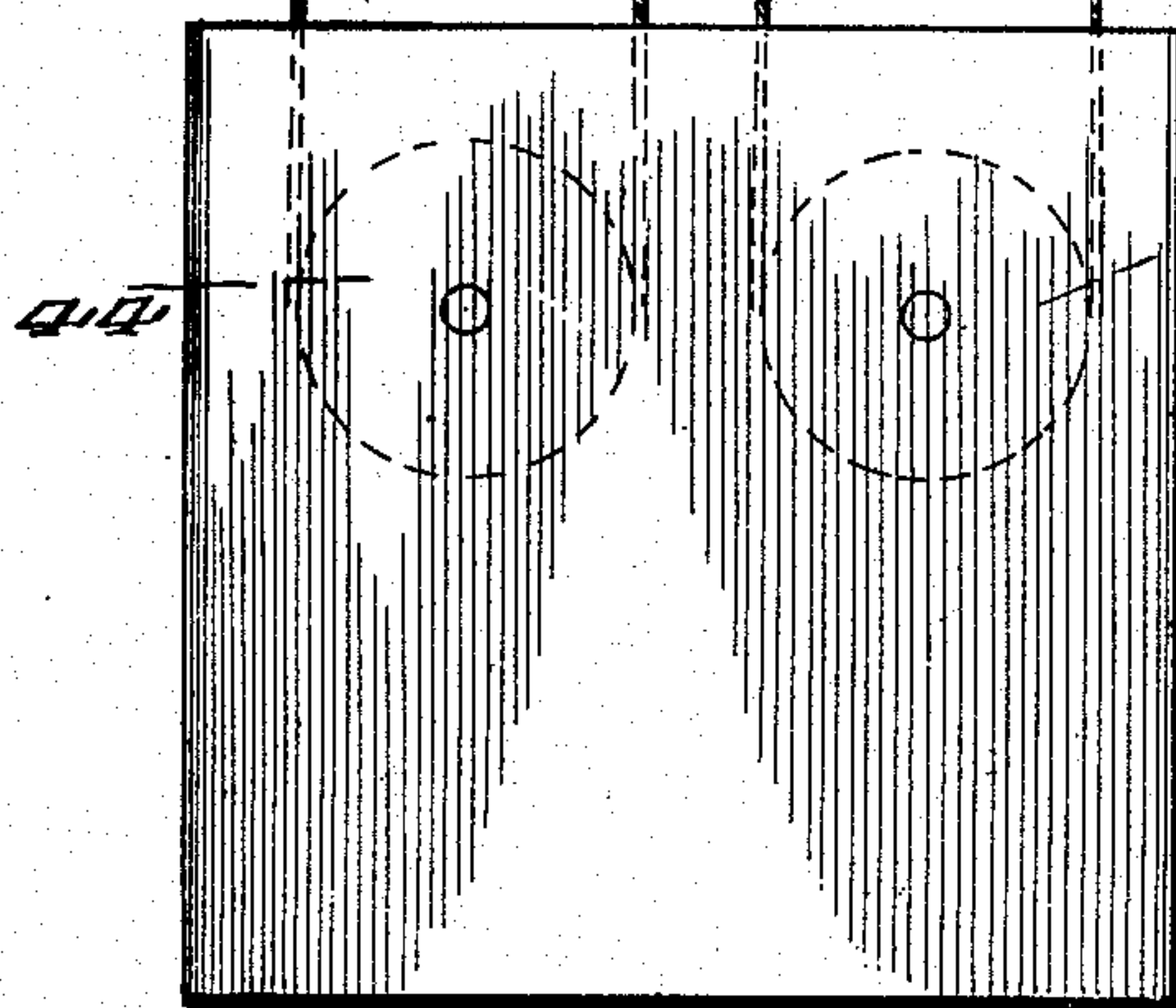


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE HOWLETT DAVIS, OF NEW YORK, N. Y.

MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 674,334, dated May 14, 1901.

Application filed June 3, 1897. Renewed October 18, 1900. Serial No. 33,516. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HOWLETT DAVIS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new, useful, and valuable Improvement in Musical Instruments, of which the following is a full, clear, and exact description.

My present invention relates to musical instruments, and particularly to those adapted to be operated automatically through the medium of perforated note-sheets.

The objects of my invention are, first, to provide a note-sheet with simple and practical means whereby it can be attached to or detached from its take-up roller; second, to provide means whereby the music-sheet is rewound automatically at the end of each piece; third, to provide means for supporting the take-up roller in suitable position in the musical instrument and for automatically disengaging it from the mechanism which propels the same; fourth, to provide means for automatically disengaging said take-up roller at the end of each piece of music and allowing the rewind mechanism to operate, and, fifth, to provide means for automatically covering the inlet-openings of the tracker-board, so that the instrument may be operated manually. To accomplish these ends, I have provided the combination and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the various mechanisms above mentioned. Fig. 2 is a front elevation of the same. Fig. 3 is a detail view of a partly-unwound music-sheet having my improved notation-marks thereon. Fig. 4 is a view of the right-hand flange of my music-roller. Fig. 5 is a view of the left-hand flange of same. Fig. 6 is a detail front view of the right-hand end of my tracker-board cover.

Proceeding with a detail description of the several mechanisms referred to, I will first take up and describe my improved means for attaching and detaching the note-sheet, which comprises a piece of wire 1, having eyes or loops 2 formed in each end. Through these eyes is passed a piece of cord 3, which latter is secured to the music-sheet 4 by enfolding each end in the folds 5, formed on either side

of the music-sheet by folding the paper back on itself and pasting it to the body of the sheet, and in order to prevent the cord from tearing out from the fold I contemplate printing the label 6 upon tough strong paper and folding its outer opposite corners 7 also around cord 3, as clearly shown in Fig. 2. The ring 1 after being thus secured can readily be secured to the take-up roller 8 by passing said ring 1 over the hook 9, when the note-sheet will be wound upon said take-up roller when revolved.

The notation-marks 10 (see Fig. 3) are imprinted upon a note-sheet by a stamp or stencil in the form of arrows, preferably in broken lines or dashes, the relative lateral degree of slant of the arrows indicating whether the music at the next succeeding mark shall be played loud or soft—as, for example, the first arrow 11 at the left-hand side of a sheet indicates that the music at that point shall be played soft, while the arrow 12 by its position indicates that the volume of music shall be medium, and the arrow 13 by its position indicates that the music at that point and during the continuation of the arrow shall be played loud, each of the arrows being bent or pointed in the direction of the next succeeding arrow, which indicates a change in volume or sound.

My improved music-roller 14, upon which the note-sheet 4 is wound, comprises a wooden spindle having metallic flanges 15 and 16 secured to either end thereof, preferably by tacks 17, the flange 15 having a perfectly round opening 18 made in its center, while flange 16 has formed in its center a notched opening 19, which notched opening is engaged by a similarly-shaped end 20 of the spindle 21, thus causing the flange 16 and the roller 14 to revolve with the said spindle 21. The opening 18 of the opposite flange 15 similarly sets over the round end 22 of the lug 23, formed upon the end of the spring 24, said spring being secured to the wooden side piece 25 by the two screws 26, and screw 27 acts to prevent lug 23 from bearing too hard against the flange 15. The music-roller is placed in position by first setting the opening 18 of the flange over the pin 22 and then pressing the spring 24 back sufficiently to allow the flange 16 to be set over the toothed or winged pin

20 of the spindle 21. The above-described music-roller and supporting mechanism are far superior to the music-rollers now generally in use, which employ thick flanges at each
 5 end, with long bearing-pins projecting therefrom, thus requiring longer boxes than is necessary to pack them in.

The means which I provide for rewinding the music-sheet automatically at the end of
 10 each piece comprises a pinion 28, secured to the end 29 of the spindle 21, which projects through and to the right-hand side of the side frame 30, said side frame having a bushing 31 set therein, so as to form a suitable bearing for the spindle 21, said bushing being retained in position by the nut 32. Meshing
 15 with said pinion-gear 28 is a large gear 32, having extended therefrom a drum 34, and secured to said drum at the point 35 is a cord 36, which passes upward over the pulley 37 and a number of times around the drum 38. Made rigid and revolving with said larger
 20 drum 38 is a smaller drum 39, to which is secured a cord 40, which extends downwardly and around the pulley 41; set in the weight 42, and from thence a cord passes upward and around the pulley 43, from thence downwardly and around the pulley 44, also set into the weight 42, and from thence the cord again
 25 passes upward and is secured to a screw-eye 45. This arrangement of drums, cords, and weight being devised simply to allow a long note-sheet—say one ninety feet long, which is not an unusual length—to gradually wind up
 30 the weight 42 during the entire time that the said note-sheet 4 is being unwound from its roller 14 by the movement of the take-up roller 8, which latter is revolved by any suitable motive power, such as a wind or spring motor,
 35 and supposing said take-up roller 8 to be disengaged in any suitable manner from its driving mechanism, then it is obvious that the weight 42 would through the medium of the cords and drums heretofore described
 40 cause the said note-sheet 4 to be rapidly unwound from the take-up roller 8 onto its own roller 14, which, as already described, is so engaged with the spindle 21 as to cause it to partake of its movements imparted by the unwinding of the cord 36 from the drum 35, or
 45 when said note-sheet is being advanced the roller 14, through its engaging flange 16, causes the spindle 21 to revolve as the note-sheet is being propelled forward by the take-up roller 8, and thus wind the cord 36 upon the drum 35, as is obvious. In all other musical instruments it has generally been necessary to rewind the music-sheet by either foot
 50 or hand power or else by the antique method which is still in vogue in even such a generally-used instrument as the aeolian, which instruments, however, all employed a drag upon the delivery-roller, so as to keep the note-sheet taut while being advanced by the take-up roller, which drag causes a loss of power,
 55 while with my present improvement the act of winding up the weight keeps my note-

sheet sufficiently taut, and as all of the power employed in winding up the weight is given back thereby in the rewinding of the note-sheet there is absolutely no power lost, and
 70 the great advantage of having the note-sheet rewind rapidly upon simply releasing the take-up roller without the necessity of working the feet to accomplish this end is too clear
 75 and important an advantage to require further claims.

The means I employ for supporting the take-up roller 8 in any suitable position and disengaging it at any desired time from its propelling mechanism consists of two swinging
 80 arms 46, each pivotally secured at one end by the pivot-screw 47, and the side brackets 48, screwed to the side frames 25 30, as shown, while the take-up roller 8 is pivotally secured
 85 to the free ends 49 of said swinging arms by the screw-pivots 50. Now at the right hand of said take-up roller 8 I secure a large gear 51, which is adapted to engage with a smaller gear 52 whenever said take-up roller is pressed
 90 inward against the spring 53, engaging the arms 46, and at the same time the inward movement of said take-up roller causes its gear 51 to mesh with the gear 52, the lug 53 engaging the latch 54, and the two gears are
 95 thus held into mesh. Whenever said lug 53 is released, the arms 46 and take-up roller are again sprung forward until the engaging tooth 55, also formed in the arm 46, locks with the small gear 52 upon the motor-shaft,
 100 and thereby not only prevents a further revolution of the latter, but also acts as a stop for the forward movement of the take-up roller. At either end of said take-up roller 8 I provide flanges 56, said flanges being laterally
 105 adjustable upon said take-up roller; but as these flanges form the subject-matter of a previous application I will not further describe them here.

I provide two means for operating the latch
 110 54 and causing it to disengage the arm 46. One of said means consists in connecting said latch 54 with the stop 57, located in any convenient position, of the musical instrument, the connection between the two being formed
 115 by the rod 58, bell-crank lever 59, and the stop-rod 60, it being obvious that with this arrangement the take-up roller will be released at any time that the stop 57 is drawn, as it is sometimes desired to stop and rewind
 120 a piece of music before it is finished. The other method I employ for releasing the latch 54 comprises a small pneumatic bellows 61, which has a connection with an extra inlet 62 at the extreme right-hand side of the tracker-
 125 board 63 through the medium of the connecting-tube 64, said pneumatic bellows 61 being in connection with the main exhaust-bellows, so that whenever a hole passes over said inlet 62 the bellows 61 is caused to expand in
 130 the well-known manner of pneumatics and cause the connecting-rod 58, on which it is secured, to operate the latch 54 in the same manner as when operated by the stop 57. The

inlet 62 is placed so that the extreme right-hand edge of the note-sheet 4 passes thereover, so that the regular note-perforations therein do not pass over said inlet 62; but it is only when a perforation is cut at the extreme end of the note-sheet and close to its right-hand edge that air is admitted through said inlet 62, thus releasing the take-up roller, as heretofore described. By this means I not only automatically release the take-up roller and allow it to be rewound by the weight, but I also obviate the necessity of a performer charging his mind with the operation of a rewind-stop directly when the piece of music is finished, and I also obviate the tearing of a note-sheet, which heretofore occurred in all other musical instruments whenever the performer neglected to draw the rewind-stop at the end of the piece.

My improved tracker-board cover comprises a wire frame 65, which is pivotally secured to the slide-door 66 of the musical instrument by the brackets 67, which door 66 is removed in the detail view, Fig. 6, showing the end of the tracker-board 68 and also the right-hand end of the tracker-board cover, which, as aforesaid, comprises a wire frame 65, having an upwardly-extending section 69. Near its corners are the said brackets 67 and the lower wire of the frame, having an extended portion 70 bent upward at its extreme end and which extended portion 70 rides over a pulley 71, secured to the tracker-board, whenever the slide-door is closed, the spring 72 serving to normally press the leather 73 stretched between the upper and lower sections of the wire frame against the mouth of the tracker-board 68, the pulley 71, however, preventing actual contact of the leather with the tracker-board except when the door 66 is moved to the extreme left or closed, at which point the bent-up extension 71 of the frame rides upon the pulley 70 and permits the spring 72 to press the lower part of the frame inward sufficiently to cause the leather 73 to lie directly over the inlets 74 of the tracker-board 68. However, as soon as the door 66 is slid to the right the lower part of the frame 65 again rides up over the pulley 71 and forces the frame away from the tracker-board. Heretofore tracker-board covers have been thrown into or away from position by operating specially-located stops connected to said tracker-board cover; but with the present arrangement no such stops are necessary, as the mere act of closing the sliding door 66 serves to cover up the inlets 74, so that the instrument may be operated manually, which could not be done unless said inlets 74 were closed in some way.

Having now described the various features of my invention and the manner in which they are to be employed, what I claim as new, and desire to secure by Letters Patent, is—

1. A note-sheet for musical instruments having opposite portions thereof at one end folded back upon the body of the sheet and

secured thereto, a cord 3, having its opposite ends inclosed by and secured between said folds so as to provide a projecting loop in the cord, and a strengthening-strip secured to the end of the music-sheet and having its outer opposite corners folded back and secured to the end folds of the music-sheet, said folded corners of the strengthening-strip embracing opposite portions of the cord at the two points where the cord enters between the said folded portions of the music-sheet so as to prevent the cord from tearing out at such points.

2. A note-sheet for musical instruments having the corners thereof at one end folded back upon the body of the sheet and pasted thereto, a cord 3, having its ends inclosed and secured along the greater part of their length by the said folds, a strengthening-strip bearing a label, secured to the end of the music-sheet and having its lower opposite corners folded over and pasted upon the end folds of the said music-sheet to more firmly secure the cord in position between the folds and prevent the same from tearing out, the parts being arranged to provide an exposed loop in the cord, and a wire loop having its opposite ends bent into eyes through which the said cord is passed, substantially as described.

3. In a note-sheet-rewinding mechanism for musical instruments, the combination with a delivery-roller carrying the note-sheet, of a rotary spindle upon which said roller is mounted, a pinion fixed to said spindle, a drum-gear with which said pinion meshes, a cord secured at one end to a drum on the drum-gear, and arranged to wind itself upon the drum during the unwinding of the note-sheet from the delivery-roller, and a weight or spring normally exerting a tension upon the cord in a direction opposite to that of its wind upon said drum, substantially as described.

4. In a note-sheet-rewinding mechanism for musical instruments, the combination with a delivery-roller carrying a note-sheet, of a rotary spindle upon which said roller is removably mounted, a pinion fixed to said spindle, a drum-gear with which said pinion meshes, a cord secured at one end to the drum on the drum-gear, and having its other end secured to a drum 38, a drum 39, fixed to said drum 38, a cord 40, fixed at one end to the drum 39, and having its opposite end secured to a stationary support, and a weight movably suspended upon said cord 40, as and for the purpose described.

5. In a musical instrument the combination with a delivery music-roller of a take-up roller pivotally supported in two swinging arms, a latch adapted to engage a projection upon said arms so as to retain the latter in such position that a gear affixed to the take-up roller will then mesh with the stationarily-located gear, and a means for disengaging said latch.

6. In a pneumatically-operated musical instrument, the combination with a tracker-board, of a door moving to and from said

tracker, and a cover arranged to close the openings in the tracker, said cover being operated and controlled by the opening and closing of the door, substantially as described.

5 7. In a pneumatically-operated musical instrument, the combination with a tracker-board, of a door sliding to and from said tracker, a cover for the tracker hinged to the sliding door, and a spring arranged to force
10 the cover in contact with the tracker when the door is moved in front of the same, substantially as described.

8. A pneumatically-operated musical instrument having a slide-door located in front
15 of the tracker-board, in combination with a tracker over which a perforated note-sheet passes, a cover for said tracker-board and means whereby said cover is thrown over its inlets by the closing of the slide-door.

20 9. In a musical instrument, the combination with a delivery music-sheet roller, of a swinging frame, a take-up roller journaled in said frame, a gear carried by the said take-up roller, a latch-keeper carried by the swing-
25 ing frame, a pinion arranged to communicate motion to the said gear, a latch adapted to engage with the keeper and hold the frame in such position that the pinion will mesh with the gear, and pneumatic means for re-
30 leasing the latch from the keeper, substantially as described.

10. In a musical instrument, the combination with a delivery sheet-roller, of a swing-
35 ing frame, a take-up roller journaled in said frame, a power-wheel arranged to rotate said take-up roller, and a stop device carried by the swinging frame and adapted to engage with the power-wheel to hold the same against rotation when the said power-wheel is out of
40 operative connection with the take-up roller.

11. In a musical instrument, the combination with a delivery sheet-roller, of a swing-
45 ing frame, a take-up roller journaled in said frame, a power-wheel arranged to rotate said take-up roller, a spring normally acting to force the take-up roller out of operative re-

lation to the said power-wheel, a latch normally acting to hold the power-wheel and take-up roller in operative connection, means for disengaging the latch, and a stop device
50 carried by the frame and adapted to engage the power-wheel to hold the same against rotation when the said power-wheel is out of operative connection with the take-up roller.

12. In a musical instrument, the combina-
55 tion with a delivery sheet-roller, of a swinging frame, a take-up roller journaled in said frame, a gear carried by the said take-up roller, a latch-keeper carried by the swinging frame, a pinion arranged to communicate
60 motion to the said gear, a latch adapted to engage with the keeper and hold the frame in such position that the pinion will mesh with the gear, means for releasing the latch from the keeper, and an engaging tooth or
65 stop device carried by the swinging frame and adapted to contact with the said pinion and hold the same against rotation, substantially as described.

13. In rewinding mechanism for note-sheets
70 of musical instruments, the combination with the delivery and take-up rollers, of a perforated note-sheet arranged to be wound and rewound upon said rollers, means for causing the rotation of said take-up roller to wind
75 the note-sheet thereon, means cooperating with the delivery-roller to store up power to rewind the note-sheet thereupon, and pneumatic means controlled by the perforated note-sheet for causing a disengagement of
80 said rotating means for the take-up roller whereby said delivery and take-up rollers will be free to travel in a reverse direction under the influence of the power stored up by the delivery-roller to rewind the note-sheet
85 upon said roller.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE HOWLETT DAVIS.

Witnesses:

S. A. EMANUEL,

THOMAS J. REILLY.