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PATENTED APR. 7, 1908.

L. H. MAIER.

TRACKER OR BRIDGE FOR SELF PLAYING MUSICAL INSTRUMENTS.

APPLICATION FILED JAN. 29, 1906.

2 SHEETS—SHEET 1.

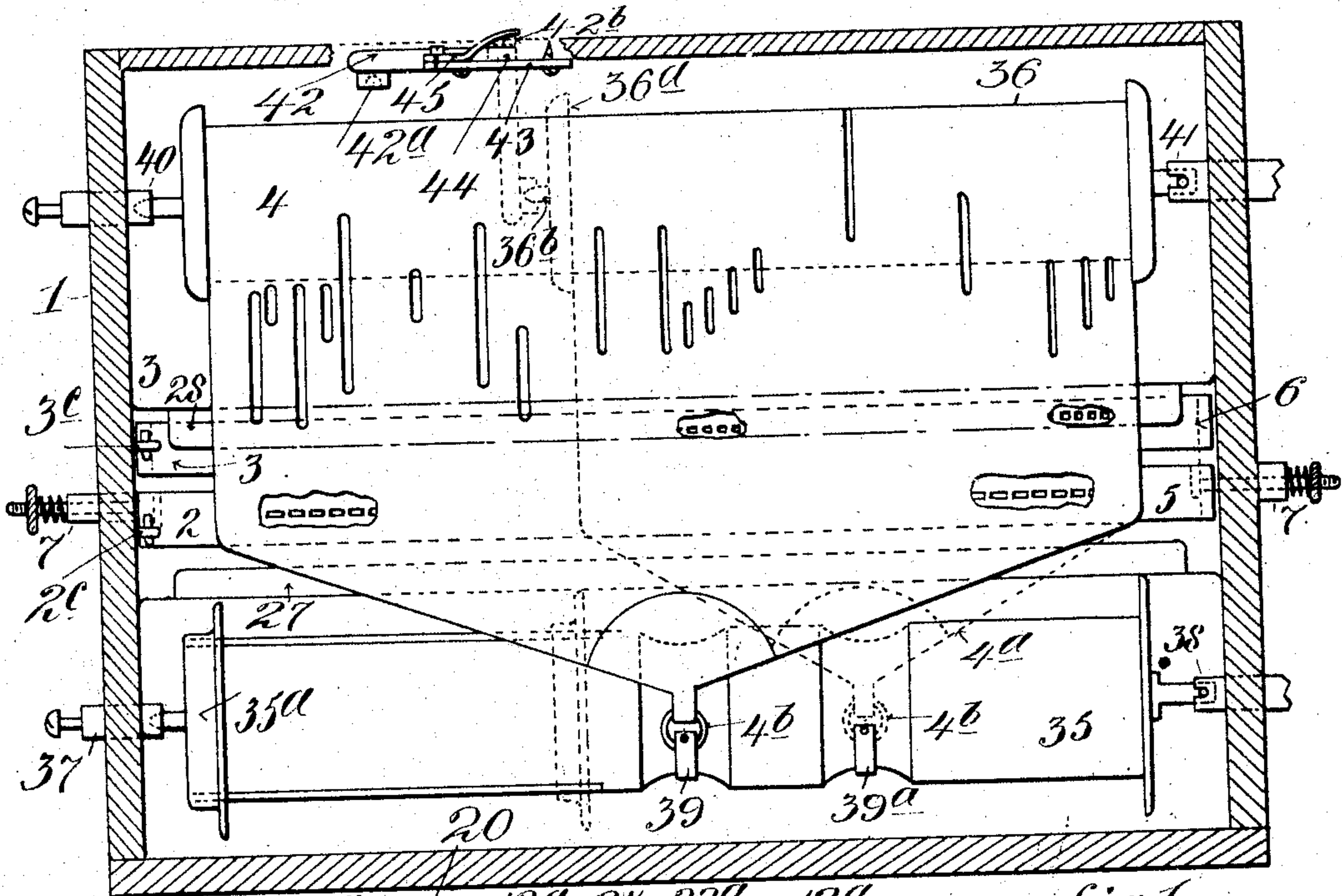


fig. 1.

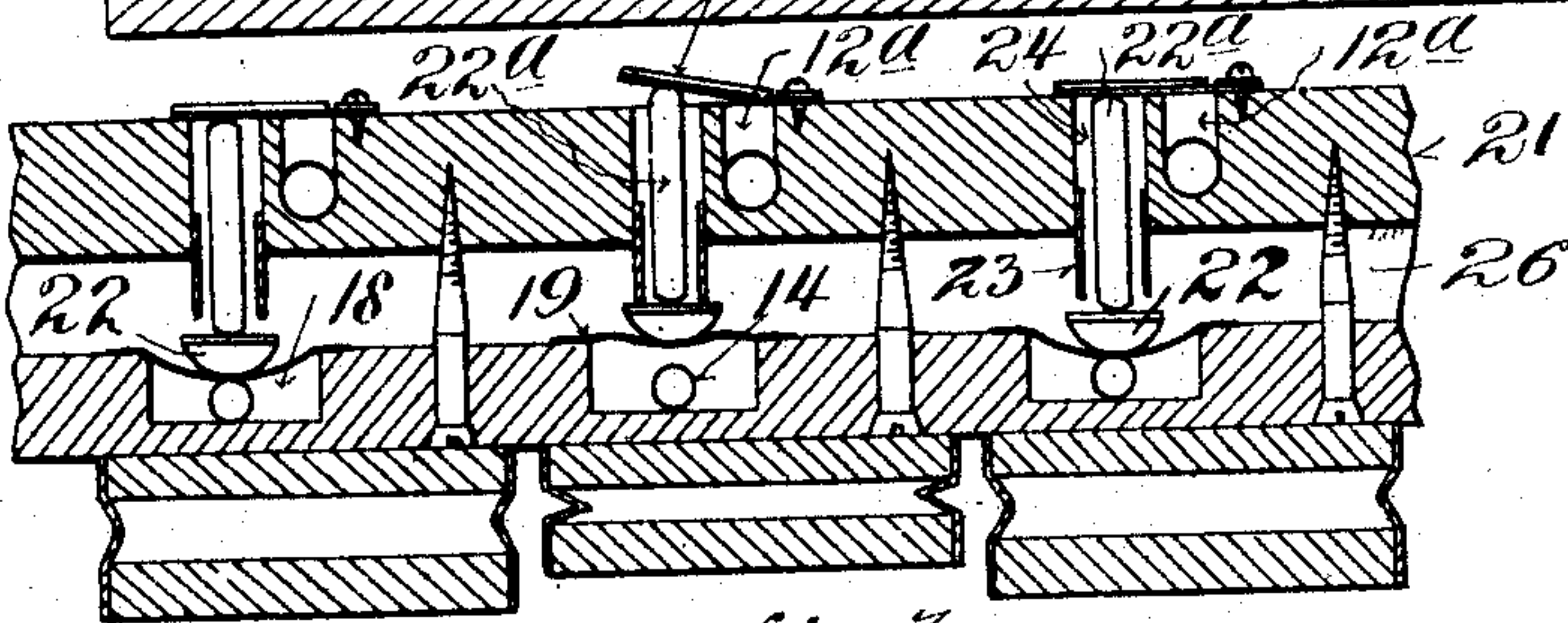


fig. 3.

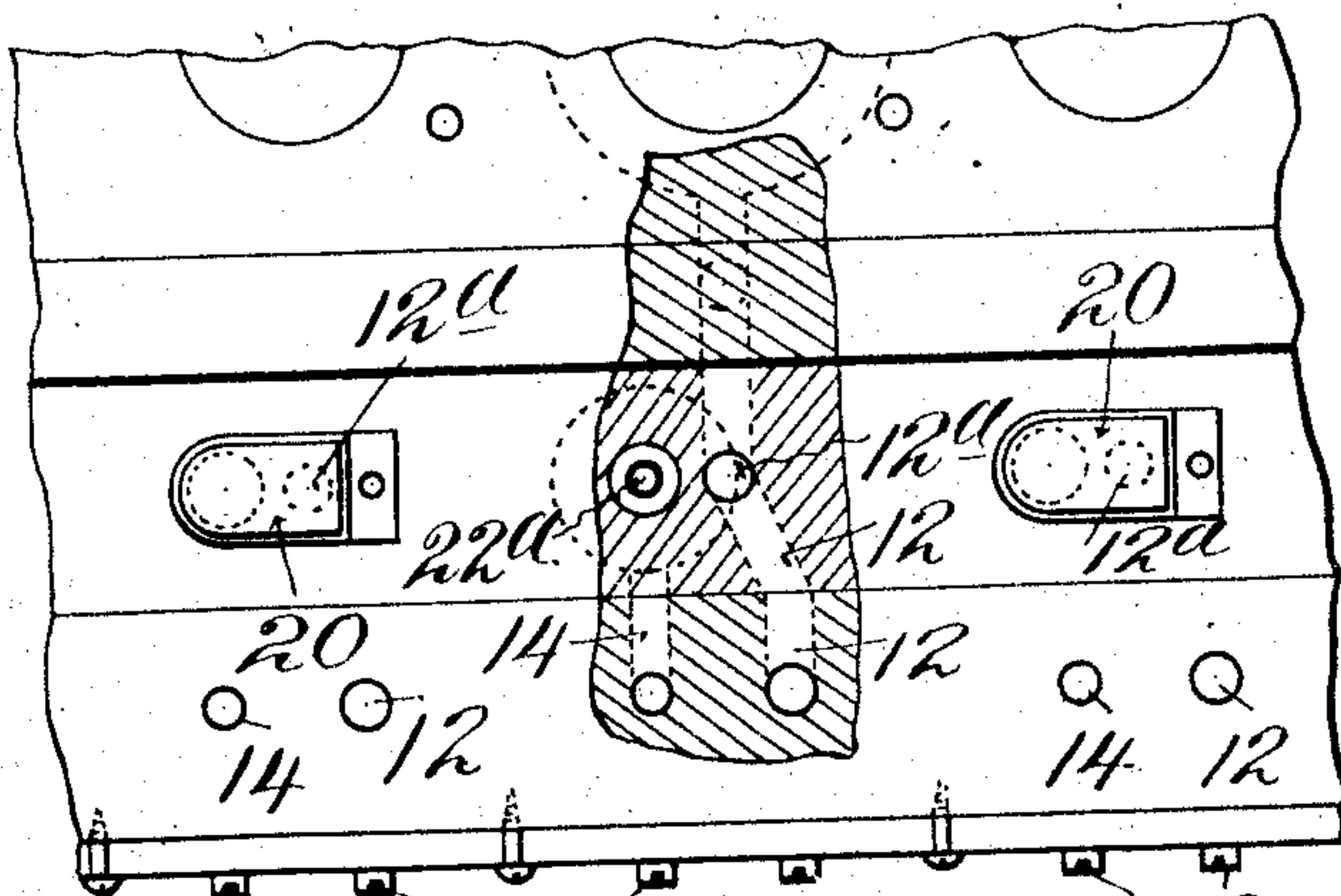


fig. 4.

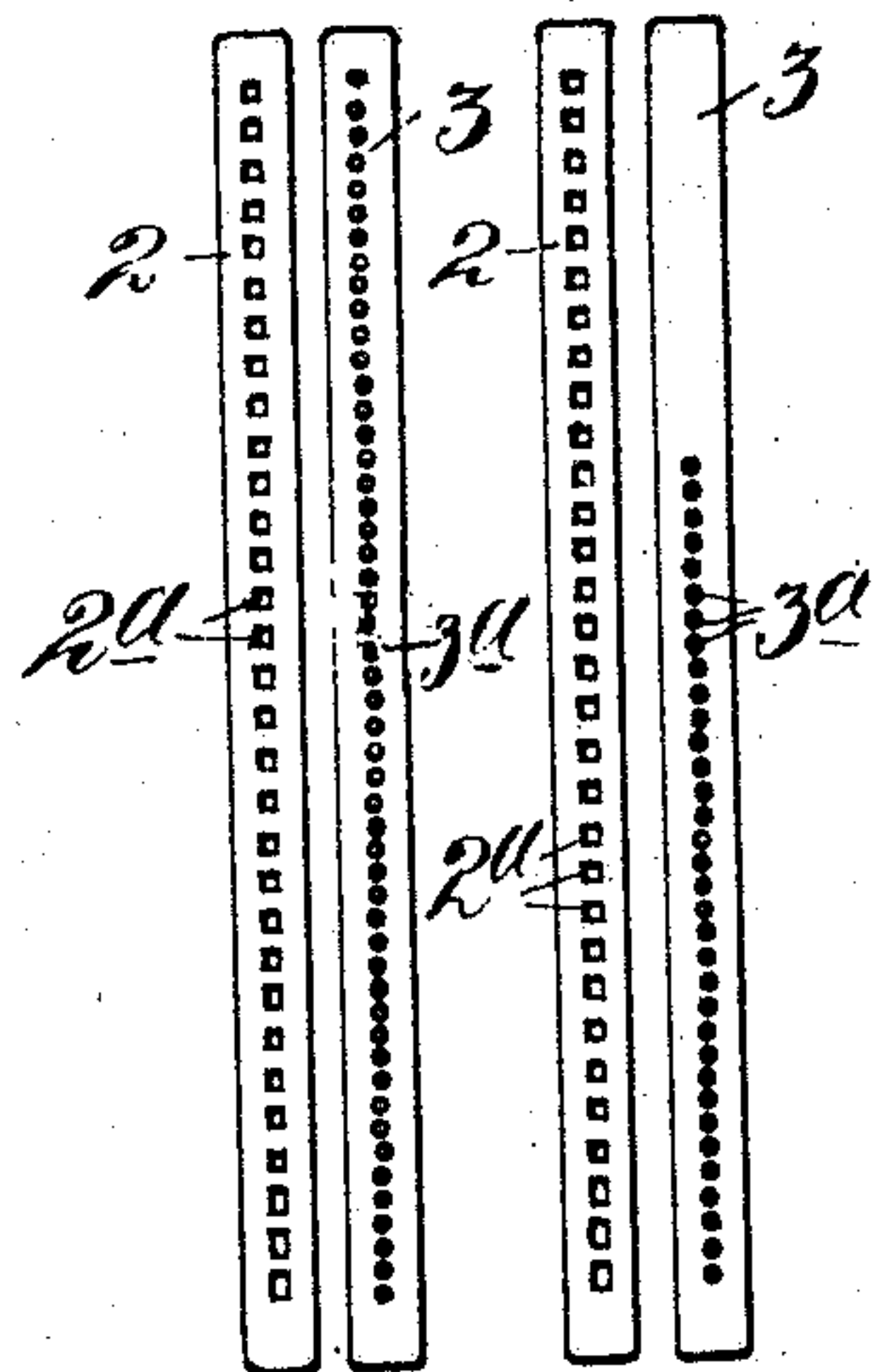


fig. 5. fig. 6.

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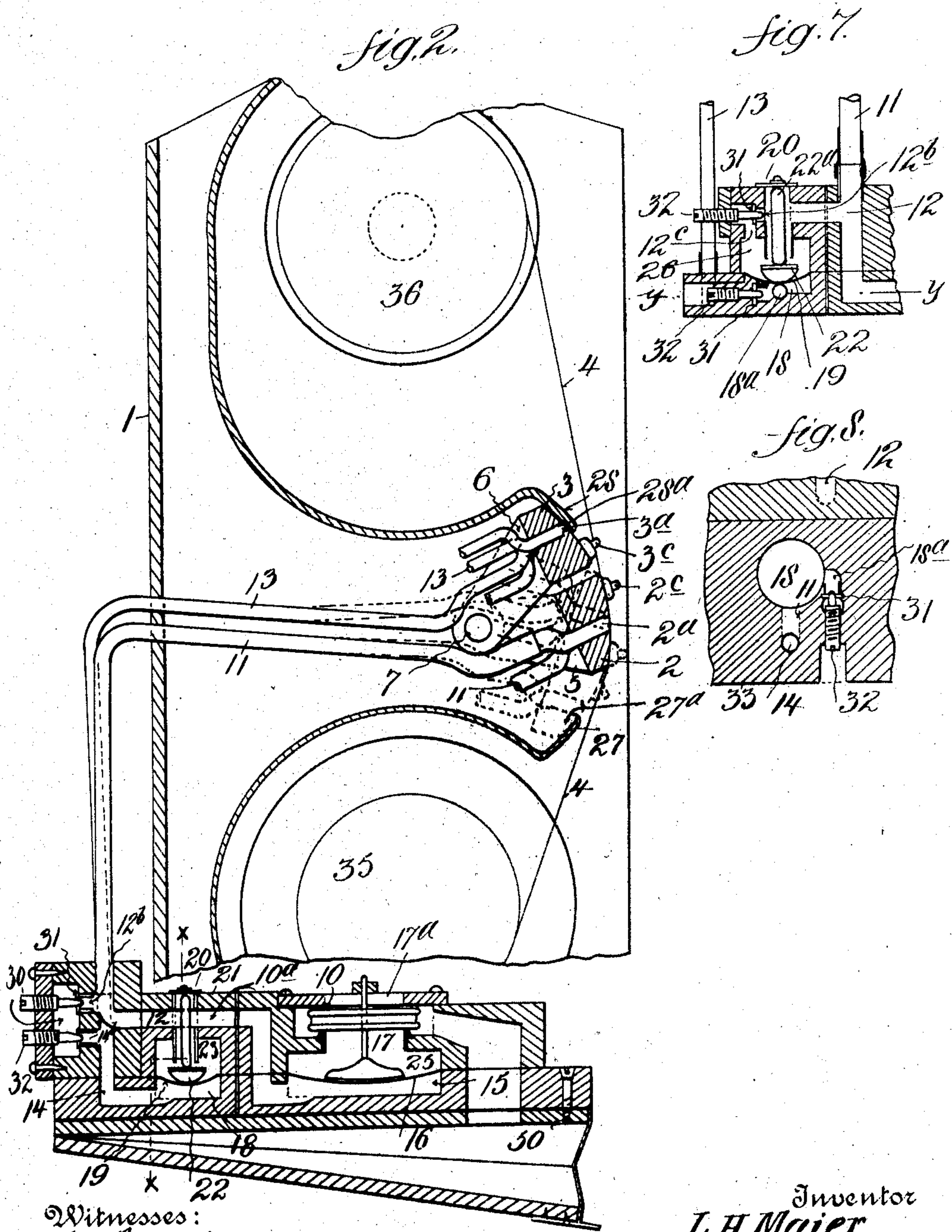
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2 SHEETS—SHEET 2.



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## TRACKER OR BRIDGE FOR SELF-PLAYING MUSICAL INSTRUMENTS.

No. 883,728.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed January 29, 1906. Serial No. 298,328.

*To all whom it may concern:*

Be it known that I, LOUIS H. MAIER, a citizen of the United States, residing in New York city, borough of Manhattan, New York, have invented certain new and useful Improvements in Trackers or Bridges for Self-Playing Musical Instruments, of which the following is a specification.

In self-playing musical instruments, as known to me, the perforated music sheets for one make of instrument sometimes vary in width from the music sheets adapted for a different make of musical instrument, so that the music sheets for a given instrument will not operate properly with some other make of instrument, and it is the object of my invention to provide means to enable music sheets of different widths, or having different arrangements of perforations or holes, to be used in a given self-playing musical instrument or mechanical player.

In carrying out my invention, I provide a plurality of movable or adjustable trackers or bridges, having different arrangements of tracker holes or orifices, whereby a music sheet that is perforated for a given note compass of an action may be used with one of the trackers and a music sheet that is perforated for a different note compass may be used with the other tracker, and whereby also such trackers may be utilized in connection with perforated music sheets that may vary in width.

A further object of the invention is to provide an improved arrangement of connection between the pneumatic operating devices of a self-playing musical instrument or mechanical player and the different series of holes or orifices of the trackers, whereby one series of such holes may be connected with the secondary pneumatics for a certain character of perforated music sheet and the associate primary pneumatics may be connected with a different series of tracker holes or orifices.

The invention also comprises the novel details of improvement and arrangement of parts that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof wherein,

Figure 1 is a face view of trackers and music sheet rolls embodying my invention. Fig. 2 is a vertical section thereof, enlarged, illustrating the connection of the trackers with pneumatics for operating the action of a musical instrument, Fig. 3 is a section

through the primary pneumatics on the line  $x, x$ , in Fig. 2, Fig. 4 is a plan view, partly broken away, of the action chest of Figs. 2 and 3, Fig. 5 is a diagrammatic view of the trackers arranged for different note compasses and similar widths of music sheets, Fig. 6 is a similar view illustrating the trackers arranged for music sheets of different width and different note compass, Fig. 7 is a sectional detail view of the primary pneumatics illustrating a modified form of means for "bleeding" or venting the pneumatics, and, Fig. 8 is a horizontal section thereof, on the line  $y, y$ , in Fig. 7.

In the accompanying drawings, in which similar numerals of reference indicate like parts in the several views, the numeral 1 indicates a suitable support or housing in which trackers or bridges 2, 3 are adjustably supported in position to permit the passage along the same of the music sheet 4 in well known manner. As shown in the drawings, the trackers 2, 3 are provided, preferably near opposite ends, with extensions or brackets 5, 6 which are movably supported upon pivots 7 carried by support 1 so as to be rocked in proper relation to the music sheet 4, and thus said trackers are mounted to turn on a common pivotal axis. The trackers 2, 3, respectively, have series of holes or orifices  $2^a$ ,  $3^a$  that are connected with corresponding pneumatics in such manner that corresponding holes  $2^a$ ,  $3^a$  connect with the appropriate parts of a corresponding pneumatic. Where it is desired to adapt the trackers to music sheets having different characters of perforations, as for instance, one music sheet having relatively wide perforations and another music sheet having relatively narrow perforations, one of the trackers, as 2, will have relatively large holes  $2^a$  and the other tracker will have relatively small holes, as  $3^a$ . As shown in the drawings, I preferably connect the holes of one of the trackers, as 2, with the secondary pneumatics 10, and the holes of the other tracker with the primary pneumatics, as  $10^a$ . To this end I connect the holes  $2^a$  of the tracker 2, by pipes 11, with channels or the like 12 in the body or chest that communicate directly with the secondary pneumatics independent of the primary pneumatics, and I connect the holes  $3^a$  of the other tracker 3, by pipes 13 with channels 14 leading to the corresponding primary pneumatics independent of the secondary pneumatics. The channels 12 lead to the



spaces or pockets 15 under the diaphragms 16 of the valves 17 of the secondary pneumatics, and the channels 14 lead to the spaces or pockets 18 under the diaphragms 19 of the primary pneumatics. The channels 12 have openings 12<sup>a</sup> adapted to communicate with the atmosphere, and said openings are normally closed by valves 20, suitably held upon the top board 21 of the primary pneumatic chests. Said valves are moved to admit air to channels 12 by means of stems 22<sup>a</sup> of valves 22, operated by the diaphragms 19, as by resting thereon, and valves 22 are adapted to close against seats or tubes 23 leading to openings 24 in the board 21, which openings are normally closed by valves 20. The arrangement is such that when air enters one of the tracker holes 2<sup>a</sup>, as the music sheet 4 passes thereover, said air is thereby admitted to the corresponding channel 12 and passing to the pocket 15 permits the suction or exhaust maintained in chamber 25 to raise the corresponding diaphragm 16 and valve 17 to cause collapsing of the corresponding bellows 50 to operate the corresponding part of the action of the musical instrument in well known manner, and when said tracker hole is next closed by the music sheet the valve 17 will move back and open the port 17<sup>a</sup> to the atmosphere to permit expanding of the bellows with the assistance of a vent or bleed. It will thus be seen that the operation described is independent of the primary pneumatics. When tracker 3 is used with the music sheet the air that enters a hole 3<sup>a</sup> passes to the pocket 18 of the corresponding pneumatic and permits the suction in chamber 26 to raise diaphragm 19 and causes valve 22 to seat against tube 23 and at the same time stem 22<sup>a</sup> will open valve 20 and permit air to enter the corresponding channel 12 through opening 12<sup>a</sup> to cause the collapsing of the corresponding bellows 50 in manner before described. When tracker hole 3<sup>a</sup> is next closed by the music sheet, diaphragm 19 and valve 22 will move back with the assistance of a vent or bleed and cause valve 20 to again close opening 12<sup>a</sup>, and the pneumatic 50 will expand.

As the trackers 2, 3 are adjustable with respect to the music sheet 4 either tracker may be used as desired, and when a tracker is not in use during operation its holes or orifices are to be closed against the admission of atmosphere. For this purpose I provide springs or shields 27, 28 in position to respectively overlie and close the corresponding holes of trackers 2, 3 as desired, according to the position of adjustment of said tracker. For instance, when the tracker 2 is to be used the tracker 3 will be moved back under the spring or shield 28 and tracker 2 moved into position to co-act with music sheet 4, as indicated in Fig. 2, and when tracker 3 is to be used tracker 2 will be adjusted against its

spring or shield 27, as in dotted lines in Fig. 2, and tracker 3 adjusted into position to co-act with sheet 4. By preference I provide felt or the like 27<sup>a</sup>, 28<sup>a</sup> on springs or shields 27, 28 to cover the holes 2<sup>a</sup>, 3<sup>a</sup> of the trackers to exclude the atmosphere. By using flexible tubes 11 and 13 the trackers may be adjusted readily to the desired positions. The springs or shields 27, 28 may be suitably supported upon the support or casing 1. Handles 2<sup>c</sup>, 3<sup>c</sup>, on the trackers may be provided for moving the trackers.

In order to "bleed" or vent the channels 12 and 14 of the pneumatics, I have (in Fig. 2) shown openings 12<sup>b</sup>, 14<sup>b</sup> leading from the corresponding channels 12, 14 to an exhaust or suction chamber 30, and said openings are provided with apertured seats or ferrules 31 adapted to co-act with screws 32 having tapering ends to enter said seats or ferrules, whereby the area of the vent openings 12<sup>b</sup>, 14<sup>b</sup> may be regulated according to the speed of venting of pockets 15 and 18 that may be desired.

In Figs. 7 and 8 I have shown a simplified arrangement for "bleeding" or venting the pockets 15 and 18, wherein the suction, or exhaust chamber 30 is dispensed with and the vent openings 12<sup>b</sup> communicate by ports 12<sup>c</sup> with exhaust chamber 26, the vent being controlled by screw 32 and seat or ferrule 31 as before described; and the chambers 18 are vented by ports 18<sup>a</sup> in which seats or ferrules 31 are placed and controlled by screws 32 as before described. The ports 18<sup>a</sup> may be made by boring vertically and horizontally in the material 33 and then passing the seats 31 down into the vertical bores and moving them sidewise into the horizontal bores as in Fig. 8.

By means of my improvements music sheets having different note compass, or sheets having different widths, or both, may be utilized in the same instrument. For instance, tracker 2 may have holes of one character, as for a 65 note compass, and tracker 3 may have holes for a different note compass, as 85 holes, extending through the same length of the tracker as the holes 2<sup>a</sup>, as indicated in Fig. 5, or, one tracker, as 2, may have holes extending substantially across the same and the other tracker 3 may have holes extending a less distance to accommodate a narrow music sheet (see Figs. 1 and 6). Where the trackers are to be adapted for operation with music sheets of different widths (as arranged in Fig. 6), I provide the following arrangement for supporting the music sheet rolls 35, 36. The winding or take-up roll 35 may be of suitable length to take the wide music sheet and be supported and operated in the usual manner as by the pivots 37, 38, and to make connection with both the wide sheet 4 and the narrow sheet 4<sup>a</sup>, I provide roll 35 with a plurality of hooks or the



like 39, 39<sup>a</sup>, one of which hooks will be near the center of the roll and the other hook 39<sup>a</sup> nearer the end of the roll, as indicated in Fig. 1.

1. The usual pivots 40 and 41 for the music sheet roll 36 may be provided, and when a wide music sheet 4 is to be used its roll may be connected with said pivots and its eye 4<sup>b</sup> connected with the centrally disposed hook 39 of roll 35, in well known manner. When a narrow music sheet 4<sup>a</sup> is to be used its relatively short roll, indicated by dotted lines at 36<sup>a</sup> in Fig. 1, may be adjusted to pivot or shaft 41, and to support said short roll at the other end I provide an adjustable arm 42 pivotally supported upon casing 1, as by a plate 43 and pivot 44, and said arm has a bearing or socket 42<sup>a</sup> to receive the stud 36<sup>b</sup> of roll 36<sup>a</sup>. Said arm 42 may be held in the inoperative position by a spring 45 carried by plate 43, and in the operative position, shown in the dotted line in Fig. 1, also by said spring. For this purpose said arm has a projection indicated in Fig. 1 at 42<sup>b</sup> to bear against spring 45, and the end of said arm may also bear against said spring, projection 42<sup>b</sup> extending at an angle to arm 42. Thus, when a long roll 36 is to be used, arm 42 will be swung upwardly and held by spring 45, as in full lines in Fig. 1, and when a short roll 36<sup>a</sup> is to be used arm 42 will be swung down, as in dotted lines in Fig. 1, and its end will bear against spring 45 to hold the arm in operative position, and roll 36<sup>a</sup> will have its stud 36<sup>b</sup> engaged with the bearing 42<sup>a</sup> of arm 42 and its other end connected with shaft 41, and the ring 4<sup>b</sup> of the narrow sheet 4<sup>a</sup> will be connected with the hook 39<sup>a</sup> of roll 35, as in dotted lines in Fig. 1. By this means wide or narrow music sheet rolls may be readily adjusted with respect to the trackers 2, 3, as desired, and both will wind and rewind in well known manner. The guiding flange 35<sup>a</sup> of roll 35 is made adjustable along said roll, so as to be used near the end of the roll, as in full lines in Fig. 1, and may be adjusted along said roll to guide a narrow sheet 4<sup>a</sup> as in dotted lines in said figure.

Having now described my invention what I claim is:—

50 1. The combination of a plurality of separate trackers adjustably supported so that either may co-act with a music sheet located in the same position at will, a plurality of series of pneumatics, and means for connecting the orifices of one of said trackers with one series of pneumatics and those of the other tracker with the other series of pneumatics.

60 2. The combination of a plurality of trackers having orifices, primary and secondary pneumatics, and means for separately connecting one series of tracker orifices with the primary pneumatics and the other series of tracker orifices with the secondary pneumatics.

3. The combination of a plurality of trackers each provided with orifices, primary and secondary pneumatics, and means for connecting the orifices of one tracker with the primary pneumatics and the orifices of another tracker with the secondary pneumatics.

4. The combination of a plurality of trackers having orifices, primary and secondary pneumatics, means for connecting one series of orifices with the secondary pneumatics, means for connecting other series of orifices with the primary pneumatics, and means for causing the primary pneumatics to admit the atmosphere to the secondary pneumatics.

5. The combination of a plurality of trackers each provided with a series of orifices, primary and secondary pneumatics, means for connecting the orifices of said trackers separately, respectively, with said primary and secondary pneumatics, and means controlled by one of the pneumatics to admit atmosphere to the other of the pneumatics.

6. The combination of a plurality of trackers each having a series of orifices, primary and secondary pneumatics, tubes connecting the orifices of one tracker directly with the secondary pneumatics, and tubes connecting corresponding orifices of the other tracker with the corresponding primary pneumatics.

7. The combination of a plurality of trackers each having a series of orifices, primary and secondary pneumatics, tubes connecting the orifices of one tracker directly with the secondary pneumatics, tubes connecting corresponding orifices of the other tracker with the corresponding primary pneumatics, and means operated by one of the pneumatics to admit atmosphere to the other of the pneumatics.

8. The combination of a plurality of trackers each having a series of orifices, with primary and secondary pneumatics, tubes connecting the orifices of one tracker with the secondary pneumatics, tubes connecting the orifices of the other tracker with the primary pneumatics, the secondary pneumatics having openings to communicate with the atmosphere, valves for said openings, and means controlled by the primary pneumatics for operating said valves.

9. The combination of a plurality of trackers each having a series of orifices, with primary and secondary pneumatics provided with channels, tubes connecting the orifices of one tracker with the channels of the secondary pneumatics, tubes connecting the orifices of the other tracker with the channels of the primary pneumatics, the channels of the secondary pneumatics being provided with openings to admit atmosphere, valves to control said openings, and means controlled



by the primary pneumatics to operate said valves.

10. The combination of a plurality of trackers provided with orifices arranged in 5 different note compasses, primary and secondary pneumatics, means for connecting the orifices of one tracker with the secondary pneumatics, and means for connecting the corresponding note orifices of the other 10 tracker with the corresponding primary pneumatics.

11. The combination of a plurality of trackers provided with orifices arranged in 15 different note compasses, primary and secondary pneumatics, means for connecting the orifices of one tracker with the secondary pneumatics, means for connecting the corresponding note orifices of the other tracker with the corresponding primary pneumatics, 20 and means controlled by one of the pneumatics for admitting atmosphere to the other of the pneumatics.

12. The combination of a plurality of trackers each provided with a series of orifices, the orifices of one tracker extending a 25 greater length than the orifices of the other tracker, a series of primary and a series of secondary pneumatics, and means for connecting the orifices of one tracker with one 30 series of the pneumatics and for connecting the orifices of the other tracker with the other series of the pneumatics.

13. The combination of a plurality of trackers each provided with a series of orifices, the orifices of one tracker extending a 35 greater length than the orifices of the other tracker, a series of primary and a series of secondary pneumatics, and means for connecting the orifices of one tracker with one 40 series of the pneumatics and for connecting the orifices of the other tracker with the other series of the pneumatics, and means controlled by one of the pneumatics for admitting atmosphere to the other of the pneu- 45 matics.

14. The combination of a plurality of trackers each provided with a series of orifices, the orifices of one tracker extending a greater length than the orifices of the other

tracker, a series of primary and a series of 50 secondary pneumatics, means for connecting the orifices of one tracker with one series of the pneumatics and for connecting the orifices of the other tracker with the other series of the pneumatics, means for supporting 55 a music sheet of width corresponding to the tracker having orifices of greater length, and means for supporting a narrower music sheet for co-action with the tracker having orifices of less length. 60

15. The combination of trackers each provided with a series of orifices, the orifices of one tracker extending a greater length than the orifices of the other tracker, a series of 65 primary and a series of secondary pneumatics, means for connecting the orifices of one tracker with one series of the pneumatics and for connecting the orifices of the other tracker with the other series of the pneumatics, a music sheet roll having a hook substan- 70 tially centrally disposed and another hook at one side of the first named hook to engage a narrower music sheet.

16. The combination of trackers having orifices arranged according to different note 75 compasses, pneumatics, means for connecting said trackers with said pneumatics, a support having means for sustaining a music sheet roll of one width, an arm provided with a bearing to sustain a music sheet roll of less 80 width than the first named roll, and means for holding said arm in operative and inoperative positions.

17. The combination of a plurality of separate trackers adjustably supported so that 85 either may co-act with a music sheet at will, series of primary and secondary pneumatics, means for connecting the orifices of said trackers separately with primary and secondary pneumatics respectively, and shields 90 at distances apart adapted to close the orifices of one tracker while the other tracker is co-acting with a music sheet.

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