

F. A. PILCHER.  
TRIP STOP ACTION FOR AUTOMATIC MUSICAL INSTRUMENTS.  
APPLICATION FILED FEB. 19, 1906.

952,546.

Patented Mar. 22, 1910.

3 SHEETS—SHEET 1.

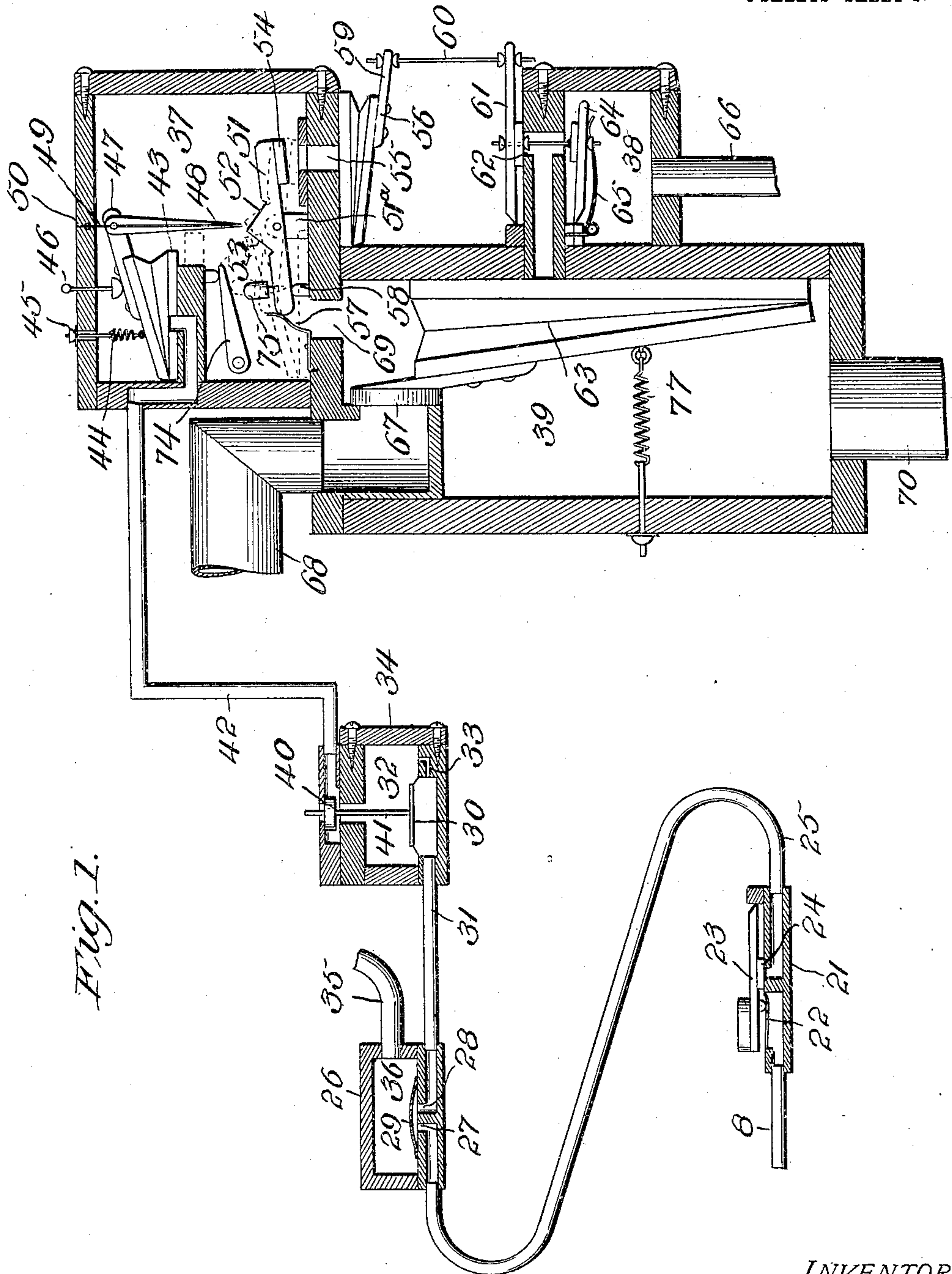


Fig. 1.

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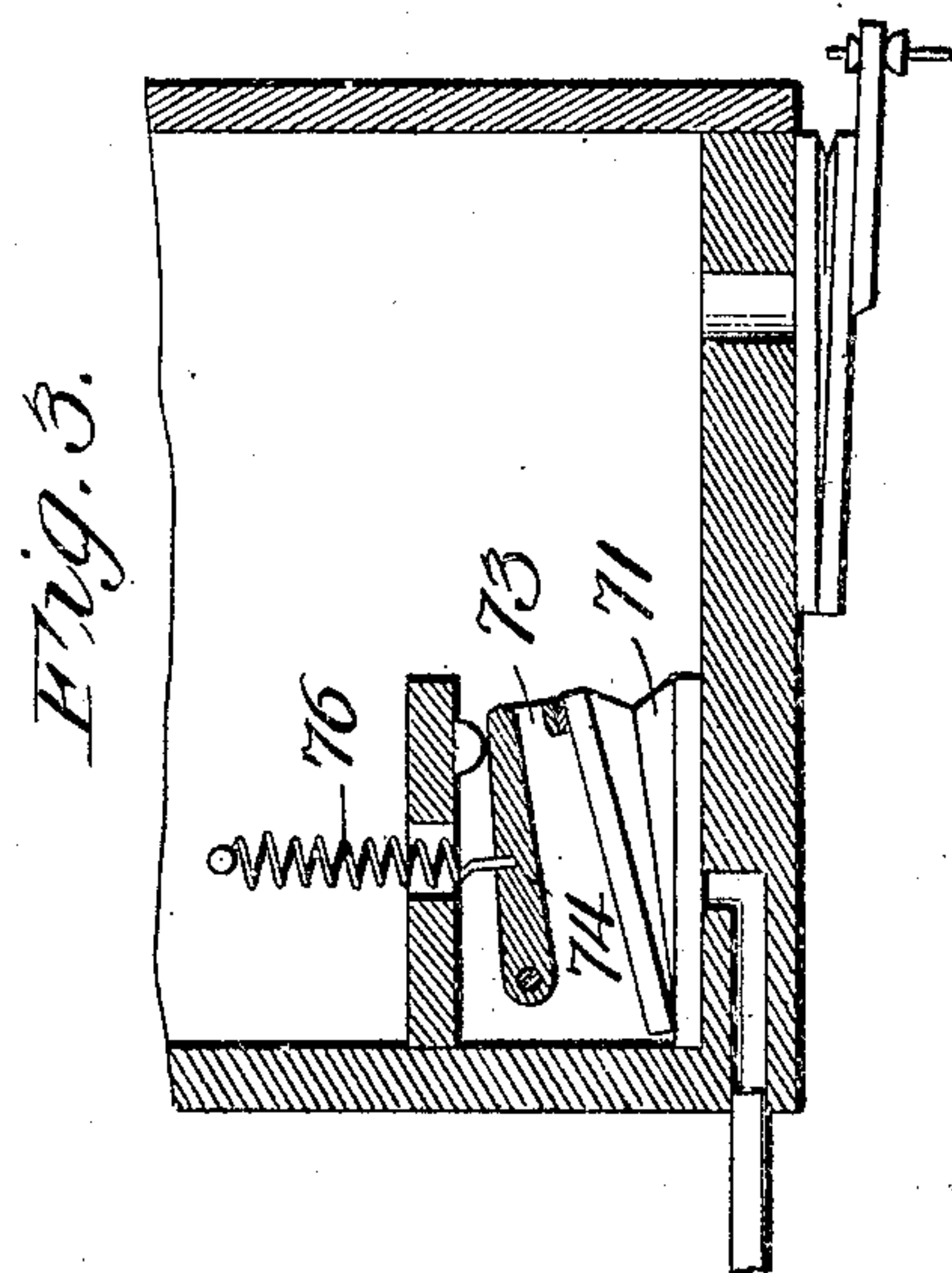
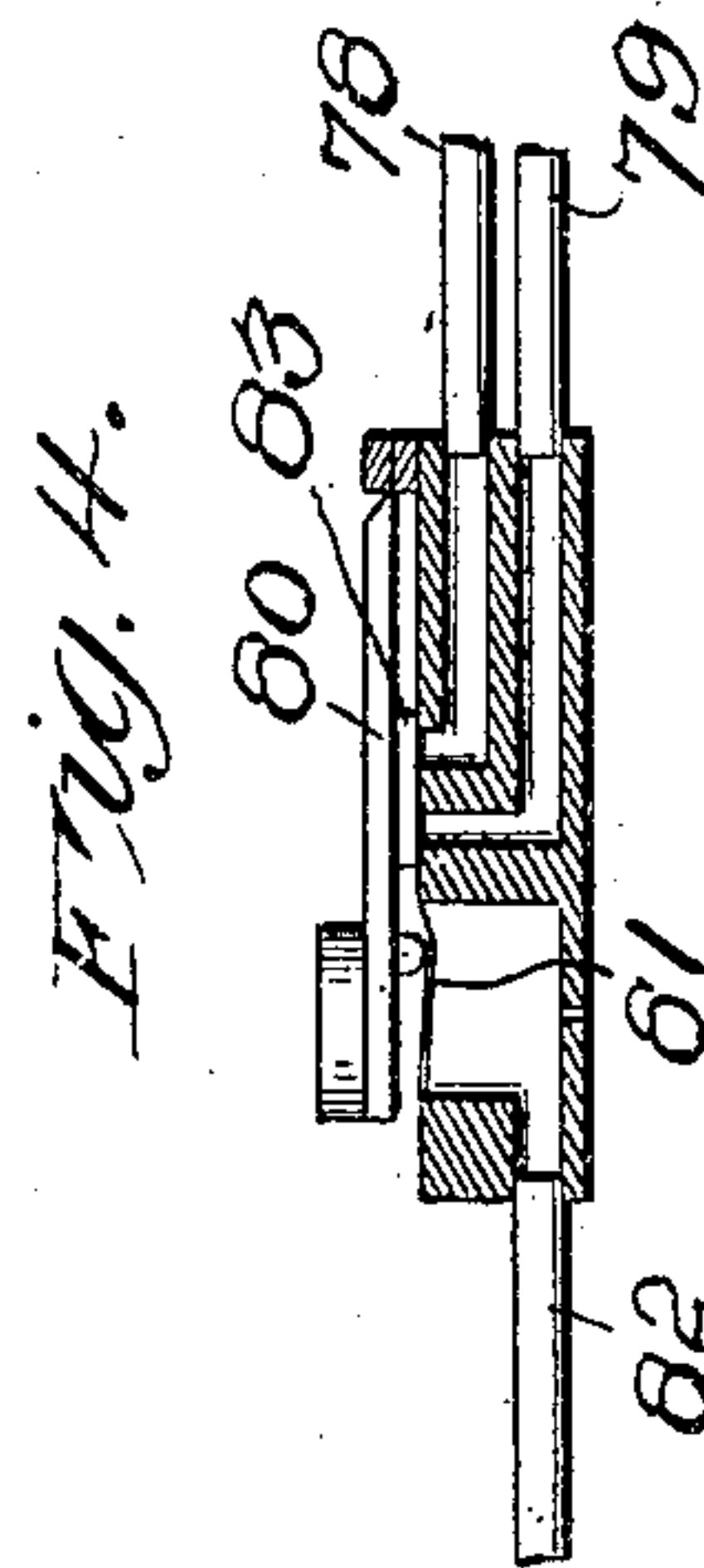
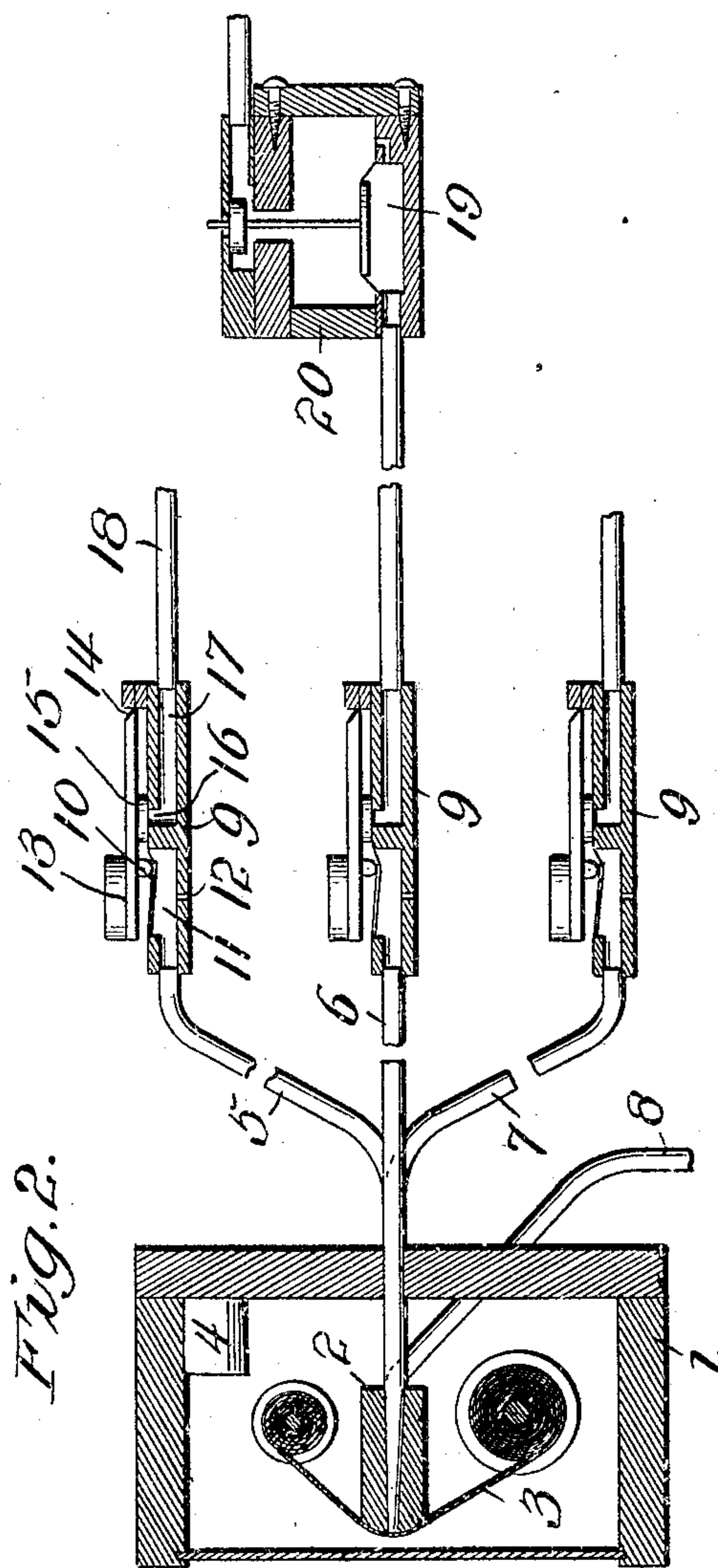
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 6.

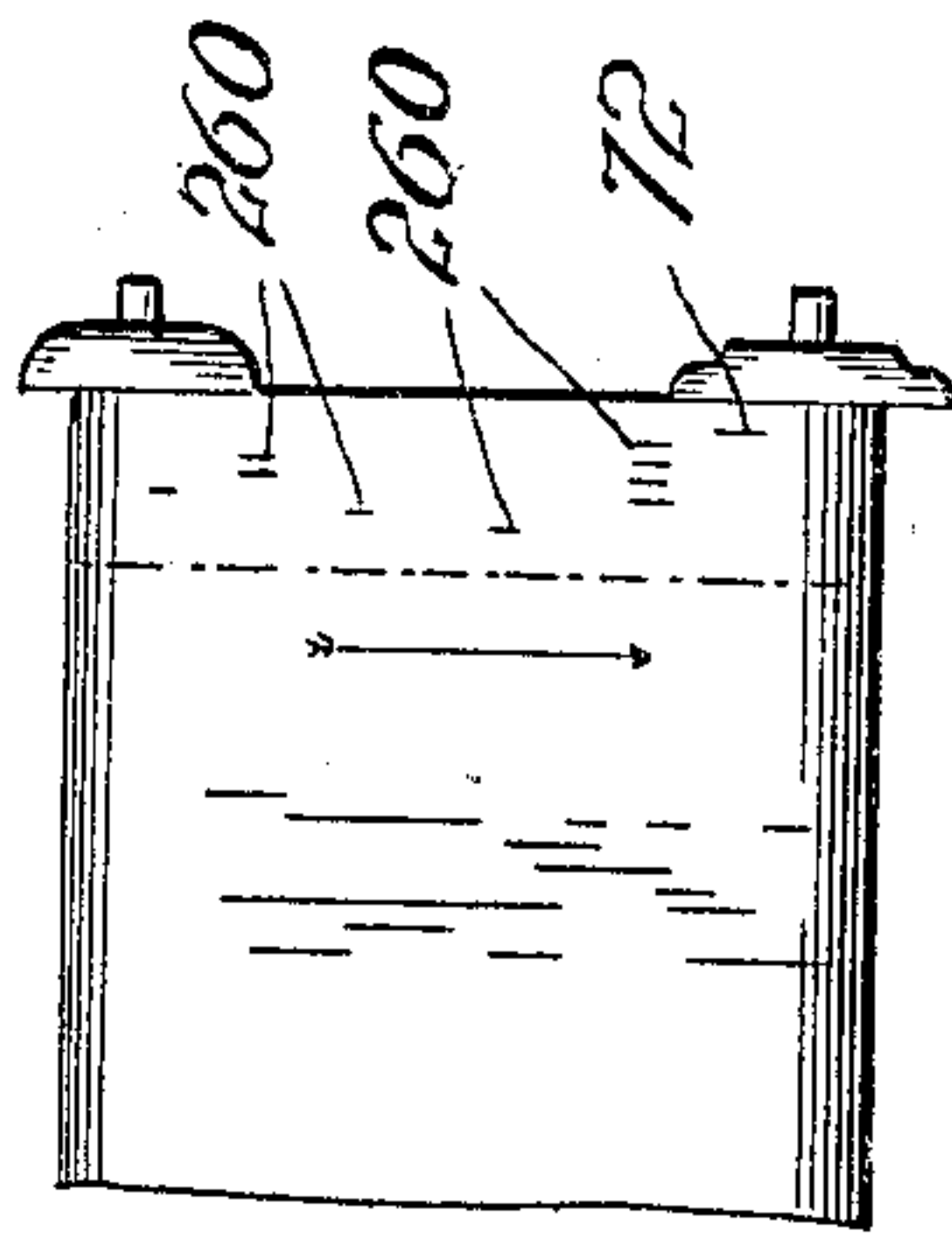
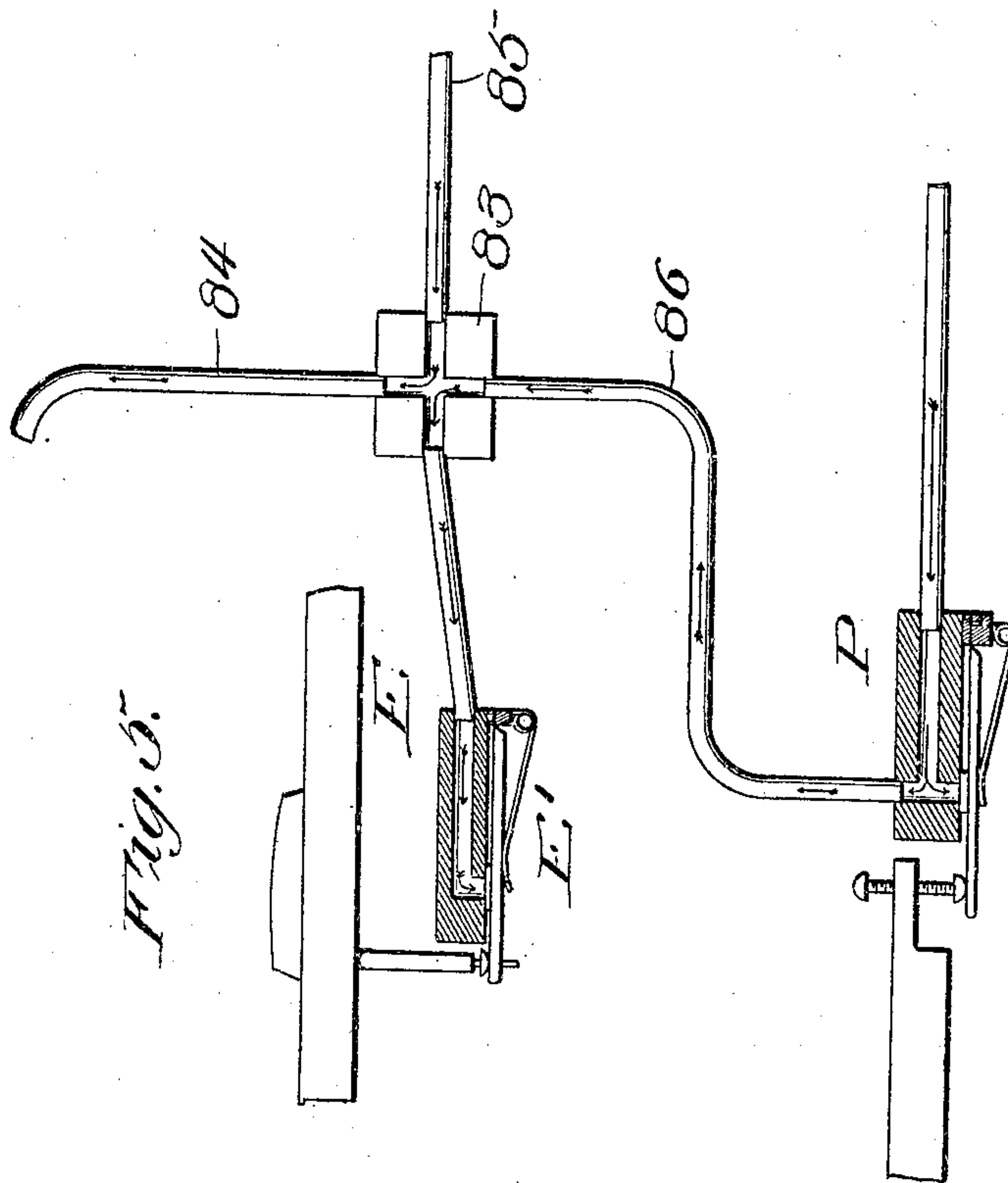


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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TRIP STOP-ACTION FOR AUTOMATIC MUSICAL INSTRUMENTS.

952,546.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed February 19, 1906. Serial No. 301,863.

*To all whom it may concern:*

Be it known that I, FRANK A. PILCHER, a citizen of the United States, residing at Marietta, in the county of Washington and State of Ohio, have invented a certain new and useful Improvement in Trip Stop-Actions for Automatic Musical Instruments, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to automatic musical instruments and instrument players, employing paper rolls or note sheets.

The object of the invention is to secure compactness and durability of construction, with certainty in operation; and to have the action so arranged that the necessity of having continuous openings in the rolls to keep certain stops in commission, may be obviated.

A further object of the invention is the provision of means for automatically resetting at the start of a piece and at the end of a piece, all stops used throughout the rendition.

Heretofore, in devices of this character the stop actions have been liable to get in alternate set and unset condition, and either had to be re-set manually or through a manually operated stop. If the operator happened to forget this at the start of the piece the action of the stops and the rendition of the piece might be rendered at variance with the functions desired to be accomplished.

My invention is designed to obviate the above difficulties by providing means whereby the stops are automatically set and reset during the entire rendition, and also to return all the stops to normal automatically after the piece has been finished.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view of the player stop action, its controller box, the primary thereof and the reversing action of the stop mechanism. Fig. 2 is a diagram showing the tracker-board and note sheet and a plurality of the main player actions.

Fig. 3 is a sectional view of one of the compartments in the stop action apparatus and showing the pneumatic for controlling the stop actions. Fig. 4 is a modification of the main player actions which is used with a double manual apparatus. Fig. 5 is a diagrammatic view of a coupler used in

connection with manual and pedal connections, and Fig. 6 is a plan view of the note sheet.

Referring now to the drawings, 1 represents a suitable casing in which is located the tracker-board, 2, and the note sheet, 3, of the usual construction. This casing, 1, is air-tight and receives wind from any suitable source through an opening, 4. Connected to the tracker range in the regular way and leading out of the box, 1, are the tubes, 5, 6, 7 and 8, the three first ones of which are connected with the main player actions, 9, all of which are identical therefore needing only a single description.

10 represents a membrane diaphragm covering a chamber, 11, connected to either tube, 5, 6 or 7, and vented at 12 to the atmosphere. The diaphragm, 10, forms a puff pneumatic upon which rests the forward end of a weighted lever, 13, hinged to the body of the player action at 14 and provided with a valve cap, 15, adapted to close the vent, 16, leading to the channel, 17, which is in connection with the tube, 18, connected to the ordinary primary used in pipe organ construction. The advantage of this resides in furnishing the tracker-board case, 1, with wind under pressure, so that as the perforations in the roll pass over the vents in the note sheet, 3, the pressure escapes through the tracker-channel into the tubes, thereby raising the puff diaphragm, 10, and thus venting the pneumatic, 19, of the primary, 20, thereby causing the primary to act to release all pneumatics in the wind chest controlled by this single vent and causing all reeds, pipes, etc., to sound. After the perforation in the note sheet has passed over the tracker-channel the pressure in chamber, 11, is exhausted through the opening, 12, and the weighted lever closes, through the valve, 15, the vent to the channel, 17. The player stop action, 21, shown in Fig. 1, is identical with the main player actions in that it is provided with a puff pneumatic, 22, a weighted lever, 23, operated thereby, and a valve, 24, closing a venting exit to the tube, 25. This pneumatic, 22, is controlled by marginal openings, 260, in the note sheet, 3, in the same manner as are the main player actions before described, it being clearly understood that it takes one of these stop actions to release each stop just the same as it takes one of each of them to release the primaries or the main player action of a



given register. The tube, 25, is connected to the controller box, 26, which is provided with two channels, 27, 28, covered by a single diaphragm, 29, which is normally raised by the pressure under diaphragm, 30, which passes through the tube, 31, from the chamber, 32, and the bleeding duct, 33, in the stop action primary, 34. This controller box is provided with a wind trunk, 35, which receives wind from any suitable source so that the chamber, 36, above the diaphragm, 29, may be flooded with wind. The wind trunk, 35, is controlled by the ordinary stop which can be operated at the will of the operator to flood the chamber, 36. This chamber will be seldom so flooded, and as long as it is not the pressure in the tubes 25 and 31 will keep the membrane diaphragm, 29, raised and thus let the pressure have exit to the atmosphere whenever the lever, 23, is raised. Should the operator wish to control the action irrespective of the marginal perforations, 26, he may flood the chamber, 36, by pulling the stop which controls the wind to the wind trunk, 35, thereby flooding the chamber, 36, and causing the membrane diaphragm, 29, to close the exits, 27 and 28, which prevents the venting of the chamber underneath the diaphragm, 30, in the primary, 34.

37, 38 and 39 represent the different sections in the reversible stop action. By venting the chamber underneath the diaphragm, 30, the valve, 40, connected thereto by the rod, 41, is reversed, thereby venting the tube, 42, connected to the pneumatic, 43, in the section, 37. This pneumatic is normally raised by a spiral spring, 44, the tension of which is adjusted by a thumb-nut, 45, on the outside of the box. A buffer, 46, is provided, which limits the upward movement of the pneumatic, 43. Rigidly secured to the top of the pneumatic, 43, is an arm, 47, to which is pivoted a vertical depending plunger, 48, which is held in vertical position by a flexible rod, 49, sliding through an eyelet, 50, in the box. This plunger when the pneumatic is vented acts upon a reversing lever, 51, which is pivoted to a standard, 51<sup>a</sup>, on the bottom part of the box. The lever, 51, is provided with two cams, 52 and 53, slanting each way from a median line drawn through the pivot of the lever and the pivotal point of the plunger, 48, on the arm, 47, so that when the lever lies in one position the plunger will engage the cam, 52, and when in the opposite direction the plunger will engage the cam, 53, to return the lever to normal and open a valve, 54, which closes the exit, 55, to a pneumatic, 56, which is in the open. The lever, 51, is held with the valve, 54, off the exit, 55, by a spring, 57, and is limited in its downward movement by a stop, 58. To an arm, 59, connected to the pneumatic, 56, is connected a

rod, 60, which connects the pneumatic, 56, and a valved lever, 61, controlling the vent, 62, of the main pneumatic, 63, in the section, 39. This lever, 61, is also connected to a valved lever, 64, in the section, 38, which is normally held open, through its connections, by the pneumatic, 56, allowing pressure from the wind-trunk, 66, to have access to the main pneumatic, 63. This main pneumatic, 63, has on its upper end a valve, 67, which controls the wind-trunk, 68, and the opening, 69, to the section, 37. Wind pressure is always in the sections, 39, 38 and 37, it being supplied to section 38 by the wind-trunk, 66, and to sections, 39 and 37 through the wind-trunk, 70. Located within the section, 37, is a pneumatic, 71, which is vented through the tracker range in any suitable manner by a supplemental opening, 72. To the upper portion of this pneumatic is secured a flexible strip, 73, which is connected with a lever, 74, adapted to bear against buffers, 75, adjustably secured upon the top of all the reversing levers, 51. These openings, 72, in the note sheet are arranged at the first part of the sheet and at the last part of the sheet so that when these openings vent the pneumatic, 71, through the tracker-board it is forced down and forces the lever, 74, into engagement with the buffer, 75, and restores all the reversible levers, 51, to their normal position, thus preventing any alternate set and unset condition which would otherwise exist, should they not be reset.

The operation is as follows: When an opening, 260, registers with an opening in the tracker-board it permits pressure in the box, 1, to enter the channel, 8, and puff the pneumatic, 22, thereby raising the lever, 23, and the valve, 24, so as to vent the chamber under the diaphragm, 30, in the primary, 34, through the exits 27 and 28 in the controller box, 26. This action reverses the valve, 40, venting the pneumatic, 43, through the tube, 42, to the atmosphere. The pressure in the section, 37, now collapses the pneumatic and forces the plunger, 48, downward, so that the point engages the cam, 52, and forces the lever, 51, into the position shown in dotted lines. The valve, 54, now closes the wind-way, 55, and the spring 65 now acts to collapse the pneumatic, 56, raise the valved lever, 61, open the exit, 62, and close the wind-way from the section, 38, by the valved lever, 64. This action cuts off pressure from section 38, which goes to the pneumatic, 63, and also vents the pneumatic, 63, to the atmosphere through the exit, 62. The pressure in section 39 now tends to collapse the pneumatic, 63, and thereby releases the valve, 67, from its seat, thereby opening the exit, controlling pressure to the wind-trunk, 68, which leads to the wind-chest of a register or stop described and claimed in my application, Serial No. 201,955, filed April 7, 1904 and



allowed September 5, 1905. When the piece has been played the pneumatic, 71, is vented through a primary, not shown, by one of the openings, 72, in note sheet 3, registering with an additional opening in the tracker-board, thereby resetting all the stops which have been used. This pneumatic, 71, and the lever which it operates is held in its normal position by a spiral spring, 76, and the pneumatic, 63, is provided with a spiral spring, 77, which normally holds the valve, 67, against its seat.

In Fig. 4 I have shown two tubes, 78 and 79, running to the same venting valve, 80, operated by the puff pneumatic, 81, which is in communication with the tracker-board, 2, and note sheet, 3, through the tube, 82. This suggests the idea of having a double manual instrument operated from the same piece of player apparatus, it being a duplicate of that shown in Fig. 2; only the valve 83 is made large enough to cover both openings. There can be separate valves attached to the inside of the lever, 80, instead of one valve as shown. The tube, 78, is supposed to come from the upper manual through the controller box and the primary and the lower tube, 79, is supposed to come from the lower manual in the same manner, although they could be reversed.

In Fig. 5 there is shown a junction bar, 83, which connects the manual key, E, and its venting apparatus, E', and the pedal venting apparatus, P, with their respective primaries and also connects the tracker-range with its primary. The tube, 84, connects with the tube, 18, shown in Fig. 2. Thus it will be seen that pressure in tubes 85 and 86 has opportunity to vent itself at the exit, 16, by the valve, 15. In this way the primary of the wind-chest can be vented at three points, the pedal vent, P, the manual key vent, E', and at the tracker-range, 2.

The action of the reversing mechanism is as follows: When the pneumatic, 43, is vented through the primary, 34, and the stop action apparatus, 21, the plunger, 48, is made to engage a cam, 52, and close the opening, 55, communicating with the pneumatic, 56, through the box, 37. This is done by one of the marginal openings, 260, and the stop is thus kept in commission until an opening corresponding to the one which set the stop registers with another similar opening in the tracker-range. At this time the pneumatic, 43, is again vented through the primary, 34, the stop action apparatus, 21, and the plunger again descends, but instead of engaging the cam, 52, it engages the cam, 53, and returns the stop to normal position. If, however, any one stop is in commission at the time of completion of the piece a supplemental stop opening, 72, is provided in the note sheet, which vents through a suit-

able primary the pneumatic 71, which through its flexible connection, 73, with the lever, 74, operates to push all stop levers, 51, back to their normal positions, thus putting the entire lot of automatic stop actions in normal position. As the pneumatic, 63, is collapsed and its valve, 67, unseated thereby, wind from the wind-trunk, 70, rushes through the wind-way, 69, into the compartment or section, 37, this pressure is maintained therein until the plunger, 48, acts to re-set the lever, 51, and unseat its valve, 54, from the wind-way, 55. The pressure in 37 now tends to puff the pneumatic, 56, and restore the levers, 61 and 64 to their normal position. When the lever, 64, is in normal position, wind from the trunk, 66, has access to the pneumatic, 63, and thereby puffs it and closes the right of way to the wind-trunk, 68.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An automatic stop action for musical instruments comprising individual operating means for throwing each stop action into or out of commission, and a common automatic operating means engaging all of the individual operating means, and adapted to be operated at the end of a piece to throw all stops out of commission simultaneously.

2. In an automatic musical instrument player, the combination with a stop device, a primary controlling the same, means controlling the primary, a tracker range and a perforated note sheet controlling the last named means, of a supplemental primary held inoperative during the passage of the body of the note sheet over the tracker range, an extra perforation in the note sheet at its end adapted to operate said supplemental primary, and means controlled thereby engaging the stop action independently of the action of the first primary, to put it out of commission after the completion of the piece.

3. In an automatic musical instrument player, the combination with a plurality of stop devices, of a primary controlling each stop device, means governing each primary, a tracker range and note sheet with individual perforations for throwing the individual stop actions in and out of commission, a supplemental primary common to a plurality of stop devices, a special perforation at the end of the note sheet for said supplemental primary, and connections from the supplemental primary to said stop devices, whereby at the conclusion of a piece, when the special opening vents its primary, all the stop actions are thrown out of commission simultaneously.

4. An automatic musical instrument player having stop actions, means for auto-



5 matically throwing all stops out of commission, means for actuating the same prior to the commencement of a piece, means for throwing any individual stop into action during the playing of the piece and means for again actuating the first named means to throw all the stops out of commission at the end of a piece.

10 5. An automatic musical instrument player having stops, means for throwing all the stops out of commission at the commencement and end of a piece, and means for throwing any individual stop into and out of commission during the playing of the  
15 piece.

20 6. In combination with a tracker range and note sheet having note perforations and additional openings, a stop action valve means controlled by said additional openings for opening said stop action valve, said  
25 means also adapted to close said stop action valve, supplemental openings in the tracker range and note sheet and supplemental means for opening said valve after a piece has been finished.

30 7. In combination with a tracker range and note sheet having note perforations and additional openings, of a pivoted lever having a valve on one end adapted to close a vent opening, means for operating said lever in one direction when an additional opening in the note sheet registers with an additional opening in the tracker range, said means also adapted to return said lever  
35 to normal when a succeeding additional opening in the note sheet registers with the additional opening in the tracker range, supplemental openings in the tracker range and note sheet, means vented thereby, and  
40 means operated by said last-named means to restore said lever to normal at the end of a piece.

8. In an automatic musical instrument, the combination with a tracker range and

note sheet, a plurality of stop controlling valves, operating levers governed by said tracker range and note sheet for individually controlling said valves, and means independently controlled for restoring said valves to normal inoperative position. 45 50

9. In an automatic instrument, the combination with a tracker range and note sheet, a plurality of stop controlling valves, operating levers governed by said tracker range and note sheet for controlling said valves, means engaging all of said valve levers, and means controlled automatically for operating said last named means to restore all valves to normal. 55

10. In an automatic musical instrument, the combination with a tracker range and note sheet, a plurality of stop controlling valves, operating levers governed by said tracker range and note sheet for controlling said valves, a restoring lever adjacent all of said valve levers, and means controlled by the tracker range and note sheet to cause said restoring lever to bear on said valve levers and return the valves to normal. 60 65

11. In an automatic musical instrument, the combination with a tracker range and note sheet, a plurality of stop controlling valves, operating levers governed by said tracker range and note sheet for controlling said valves, a restoring lever positioned to engage all of said valve levers, a pneumatic automatically operated at the end of a piece, and a connection between the pneumatic and said restoring lever whereby when the pneumatic is operated the restoring lever engages all valve levers and restores the valves to normal inoperative position. 70 75 80

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

FRANK A. PILCHER.

Witnesses:

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