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VARIABLE AUTOMATIC STOP CONTROL FOR MUSICAL INSTRUMENTS.

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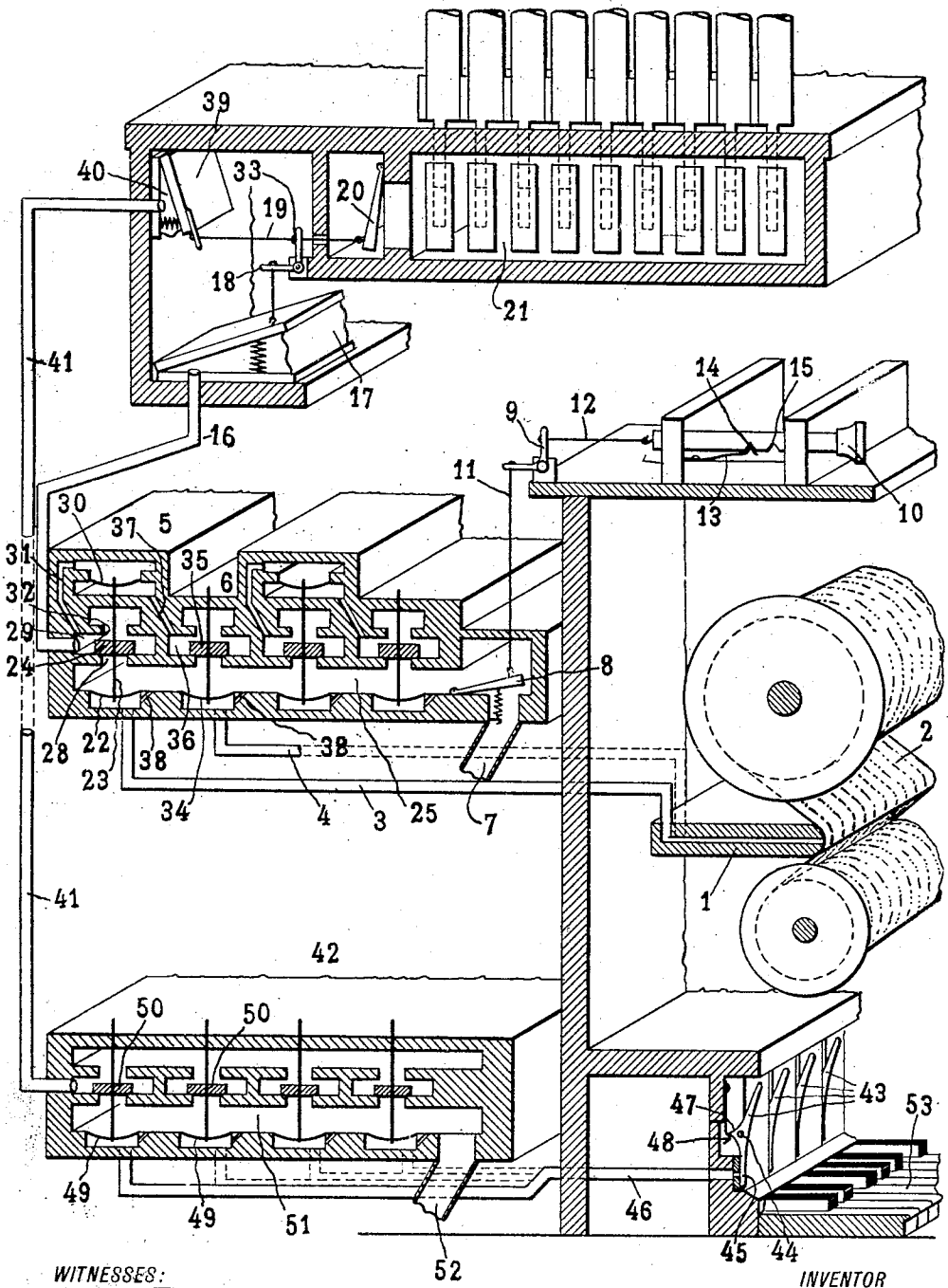

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VARIABLE AUTOMATIC STOP-CONTROL FOR MUSICAL INSTRUMENTS.

1,173,905. Specification of Letters Patent. Patented Feb. 29, 1916.

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To all whom it may concern:

Be it known that I, EDWIN WELTE, a subject of the Grand Duke of Baden, and a resident of Freiburg, in the Grand Duchy of Baden, German Empire, have invented certain new and useful Improvements in Variable Automatic Stop-Controls for Musical Instruments, of which the following is a full, clear, and exact description, whereby any one skilled in the art may make and use the same.

The invention relates to musical instruments and more particularly to the control of the stops of an organ wherein the stops may be controlled automatically from a music sheet or manually or wherein during the control by the automatic action of the music sheet, a manual operation may be effected.

The object of the invention is to provide a mechanism by which the stop effects of an organ may be produced automatically from the perforated music sheet or manually.

A further object is to provide a mechanism by which during the automatic operation of the organ, the stop effects may be automatically controlled from the music sheet or manually controlled with the automatic control of the music sheet inoperative or manually controlled during the automatic control from the music sheet.

Referring to the drawings: Figure 1 is a diagrammatic view shown in partial perspective illustrating the various elements employed in conjunction with the tracker-board.

In automatic musical instruments including organs, it has been common practice to employ a perforated music sheet in conjunction with a tracker-board and perforated music sheets have been employed for pneumatically actuating mechanism to produce stop effects with provisions for causing the automatic control to be inactive so that manual stops might be used in the ordinary manner.

The invention herein described is directed to the automatic control for stop effects which may be made inoperative and with a method of manual control which may be made effective even during the automatic actuation.

The mechanism hereinafter described illustrates in diagrammatic form a tracker-board and perforated music sheet as one means for automatically operating an instrument.

It is one of the principal objects of the present invention to arrange a mechanism by which the stop effects will be automatically secured or may be made inoperative during the automatic operation of the instrument and providing in conjunction therewith manually controlled mechanism which will secure stop effects either with the automatically controlled stop mechanism in action or in inoperative condition.

Referring to the drawings, the numeral 1, denotes a tracker-board over which passes the punched music-sheet 2, which, of course, has suitable mechanism, for moving it over the tracker-board. Conveniently arranged in the tracker-board are openings connecting through suitable tubes 3, 4, with valve mechanisms 5, 6, arranged in suitable relation with reference to a main suction or pressure device not specifically shown herein, but connected with the valve mechanisms through a suitable conduit 7.

The valve mechanisms 5, 6 referred to are shown in conjunction with a duplicate set of valves not herein specifically described but which obviously may be used in conjunction with a second series or bank of pipes or reeds in conjunction with a separate stop chamber not illustrated herein, the description herein set forth being confined to one stop chamber and its bank of pipes or reeds.

The suction or pressure through the conduit 7, and its action upon the valve mechanism is controlled as illustrated herein by suitable valves 8, which, through levers 9, may be moved by stops 10. (Only one stop and appurtenant parts is illustrated.) These stops, for convenience, are arranged to have two positions. One position is illustrated in the drawings, wherein the valve 8, is pulled away from its seat by the connections 11, 12, and is maintained in open position by a spring or detent 13, coöperating with a notch 14, in the spindle of the stop. A second notch 15, makes it possible to press the stops 10, inward, closing the valve 8, and retaining the parts in closed position.

The valve mechanism 5, is connected, through a conduit 16, with a collapsible bellows 17, which has its movable board connected through a lever 18, with the connec-

tion 19, of a valve 20. These valves control stop chambers 21 appurtenant to each of the sets of playing pipes of the instrument.

The valve mechanisms 5, and 6, are cooperative in their relation one with the other, whenever the valve 8, is open and the instrument is subjected to the automatic action of the perforations of the music-roll and its tracker-board 1. As an example: When an opening in the music-sheet passes the opening in the tracker-board corresponding with the connection 3, a diaphragm 22, connected with a valve spindle 23, and valve 24, is subjected to atmospheric pressure and by preponderance of atmospheric pressure over the exhaust of the tube 7, through the wind-chest 25, causes the diaphragm to rise, carrying the valve 24, away from its seat 28, and subjecting the wind-chest 29, to the pressure of the wind-chest 25. As soon as the valve 28, leaves its seat, a suction is created upon the upper side of the diaphragm 30, through the connecting passage 31, and said valve 24, is held in its upper position against a seat 32. The conduit 16, connects the bellows 17, with the wind-chest 29, and therefore said bellows 17, are collapsed, due to the suction of the wind-chest. The collapsing of the bellows 17, through its lever 18, pulling against the stop 33, upon the connecting member 19, opens the valve 20, and inasmuch as, the wind-chest controlled by said valve 20, is connected with the main pressure or suction device, the playing pipes or reeds thereof will be influenced. This position of the parts will be maintained until an opening in the music-sheet passing a corresponding opening in the tracker-board opens the tube 4 to atmospheric pressure. Thereupon, the diaphragm 34, will rise, due to preponderance of atmospheric pressure over the suction in the chest 25, and will carry with it the valve 35, which, subjecting the wind-chest 36, to the suction of the chamber 25, will cause an equal pressure or suction through an opening 37, upon the under side of the diaphragm 30. The pressures being thus equalized on opposite sides of the diaphragm 30, the lower side of the diaphragm 22, through a "bleed-hole" 38, which is connected with the wind-chest 25, will cause the valve 24, to drop. Just as soon as this is effected, the valve 35, will be returned to its normal position, inasmuch as, the lower side of its diaphragm 34, is subjected to the suction of the chamber 25, through the "bleed-hole" 38.

From the above, it is apparent that the openings in the music-sheet will cause an automatic opening of the valve 20, and a corresponding closing thereof through the action of the valve-mechanisms 5, 6, whenever the valves 8, are held in open position by virtue of the position of the controlling stops 10.

It is understood that there is a controlling stop and appurtenant valve mechanism such as described for controlling each set of reeds or pipes to secure stop effects thereof, and there may be such a controlling stop and valve mechanism to each manual of the instrument or for any desired series of ordinary organ stops so that various stop effects and combinations thereof may be secured in automatic playing and may likewise be varied by the manual operation.

The connections 19, of the valve or valves 20, extend to the movable board 39, of a pneumatic bellows 40, which latter, through a conduit 41, is connected with a valve action 42. This valve action has a valve corresponding to each of the valves above described in connection with the stops 10, and each of its valves are correspondingly connected with pivoted levers 43, which might well be termed console stops and which are located appurtenant to the console of the instrument. These stops 43, as illustrated, are pivoted as at 44, and have one end 45, acting as valves, at the end of the conduits 46. For convenience they are illustrated as controlled, as to their position, by a projection 47, coöperating with a spring 48, so that they may be held in either open or closed position with reference to the conduits 46.

The conduits 46, lead to the under side of the diaphragms 49, which control the action of the valves 50. These valves are seated in such manner as to control the wind-chest 51, which is connected through a conduit 52, with the main source of power or suction. Whenever the console-stops 43, are opened and the under side of the diaphragms 49, are subjected to atmospheric pressure, the preponderance of pressure raises the valves 50, thus connecting the tubes 41, with the main pressure of the chest 51, and subjecting the pneumatics 40, to the full suction action. Thereupon, the collapsing of the pneumatics 40, will open the valves 20, and subject the corresponding sets of pipes or reeds of the stop chambers 21, to the full action of the main suction irrespective of the automatic opening effects produced by the collapsing of the bellows 17.

It is apparent from the above that even though the automatically actuated valve mechanisms 5, 6, are in operation, the manually operated console stops 43, may be moved to collapse the bellows 40, and vary the action with reference to the playing of any set of pipes or reeds. On the other hand, if the controlling stops 10, are pushed inward, closing the valves 8, the manually operable console stops 43, may be moved, controlling the valves 20, independently of the valve actions 5, and 6.

From the above description, it is apparent that the apparatus provides for the automatic operation for the stop effects during the automatic operation of the instru-

ment (as shown through the perforated music roll and tracker-board) and at the same time provides for a manual control of said stop effects either in conjunction with or independently of the automatic operation. Furthermore, the automatic action to produce any of the stop effects may be completely cut off through the controlling stops 10, and a direct manual control to secure any stop effect may be obtained through the console stop levers 43.

Obviously, the details of construction and the arrangement may be varied without departing from the spirit or intent of the invention and it may be applied to an instrument having one or more manuals, giving practically all combinations of stop effects. For convenience and to simplify the showing of the mechanism, it has been illustrated in simple diagrammatic form.

What I claim as my invention and desire to secure by Letters Patent is:

1. A stop control for organs embodying a tracker-board adapted to have passed over it a perforated music sheet, valve actions automatically controlled by said tracker-board and music sheet; a stop chamber, a valve for said chamber, pneumatically actuated means connected with said valve and valve actions and manually controlled means by which the said stop chamber valve may be actuated without interfering with the operation of the said automatically operating means that control it.

2. A stop control for organs embodying a tracker-board adapted to have passed over it a perforated music sheet, valve actions automatically controlled by said tracker-board and music sheet, a stop chamber, a valve for said chamber, pneumatically actuated means connected with said valve and valve actions, manually controlled means by which the said stop chamber valve may be actuated without interfering with the operation of the said automatically operating means that control it, and means for rendering inoperative the said automatic valve actions at will.

3. A stop control for organs comprising in combination a stop chamber, a valve for said chamber, automatic valve actions for controlling the position of said valve, a tracker-board adapted to have passed over it a perforated music sheet for controlling said automatic valve actions, a manually controlled cut-off for the automatic valve actions and a manually controlled pneumatically actuated means for operating the valve of the stop chamber.

4. A stop control for organs having a stop chamber and valve therefor, comprising automatic valve actions, a tracker-board adapted to have passed over it a perforated music sheet for controlling said valve actions, pneumatically operated means connected with the valve and the automatic valve actions for moving the valve of the stop chamber and pneumatically actuated means connected with said valve and provided with manual means of control, and arranged to actuate the said valve without interfering with the operation of the said automatically operating means that control it.

5. A stop control for organs having a stop chamber and valve therefor, comprising automatic valve actions, a tracker-board adapted to have passed over it a perforated music sheet for controlling said valve-actions, pneumatically operated means connected with the valve and the automatic valve actions for moving the valve of the stop chamber, pneumatically actuated means connected with said valve by which it may be actuated without interfering with the operation of the said automatically operating means that control it and provided with manual means of control, and means for controlling the automatically actuated valve mechanism and making it inoperative.

6. In a stop control for organs, in combination with a stop chamber and a valve therefor, a bellows controlling the position of said valve, pneumatically actuated valve actions controlling said bellows, a tracker-board adapted to have passed over it a perforated music sheet controlling the operation of said valve actions, manually controlled means for rendering said automatic valve actions inoperative with respect to the tracker-board and music sheet, a pneumatic device operatively connected with the valve of the stop chamber, valves for controlling said pneumatic means and a manual control for said valves.

7. In a stop control for organs having a stop chamber and a valve therefor, automatically actuated valves and connections for moving said valve, a tracker adapted to have passed over it a perforated music sheet for controlling said automatically actuated valves, pneumatic devices operatively connected with said valve and a manual control for said devices for moving the valve of the stop chamber irrespective of the automatically actuated devices.

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Witnesses:
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