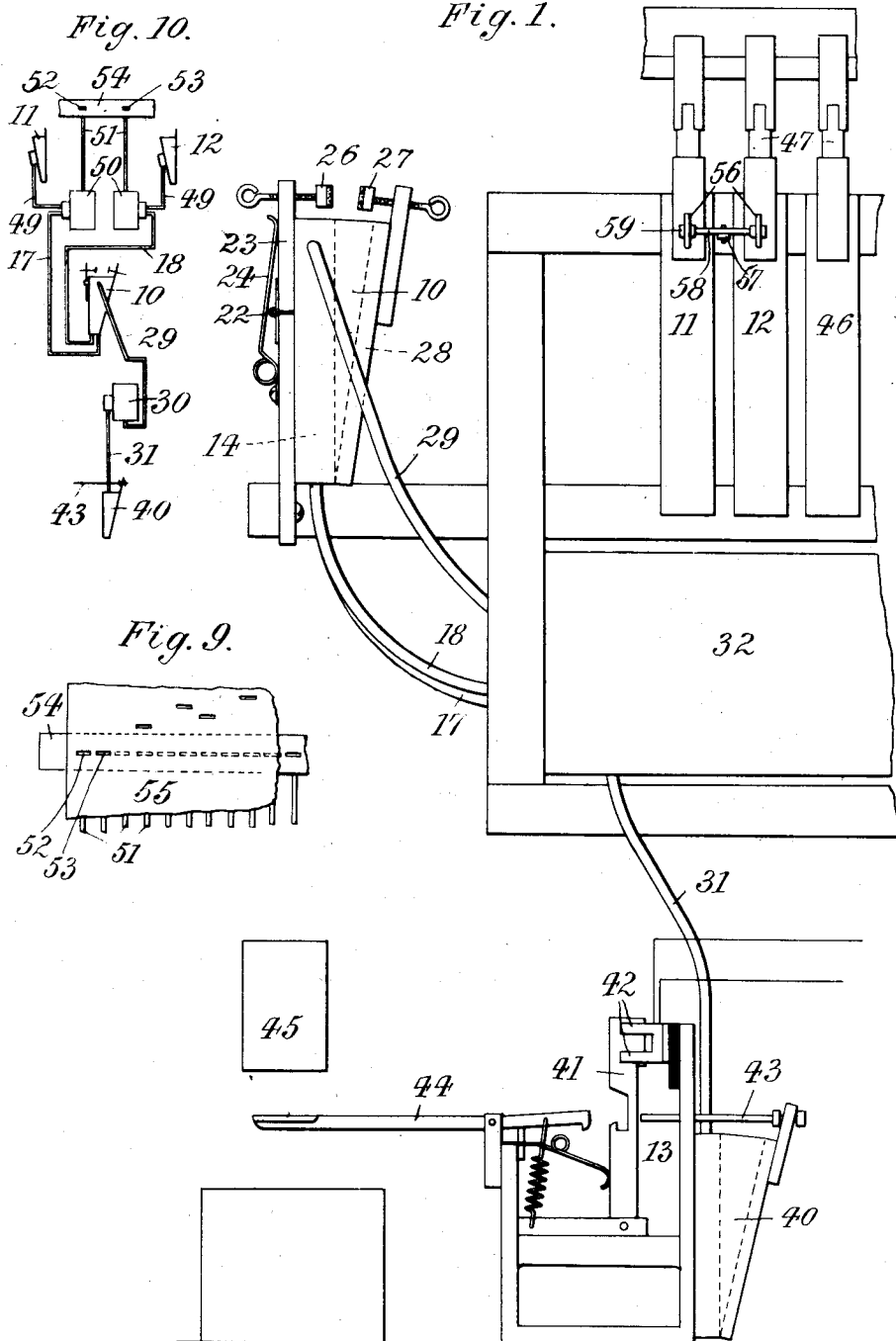


B. C. PECK.

STOP MECHANISM FOR SELF PLAYING MUSICAL INSTRUMENTS.

APPLICATION FILED APR. 23, 1907.

2 SHEETS—SHEET 1.



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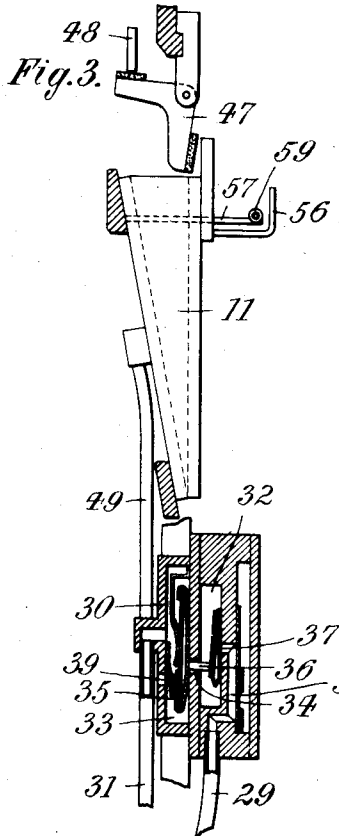


Fig. 2.

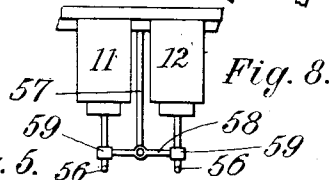
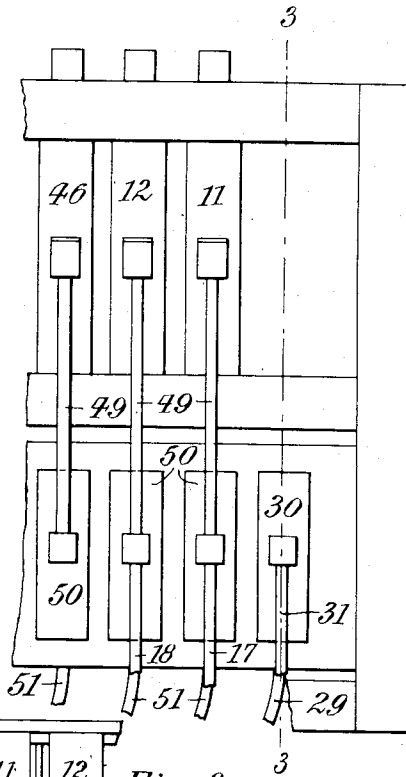


Fig. 8.

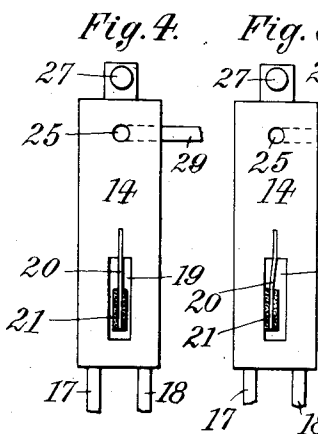


Fig. 4.

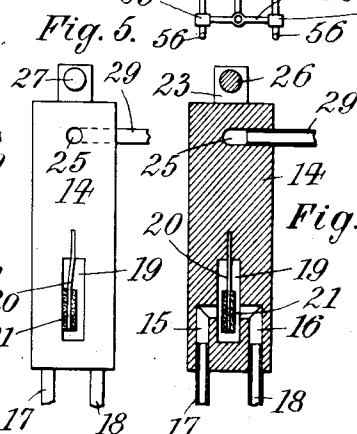


Fig. 5.

Fig. 6.

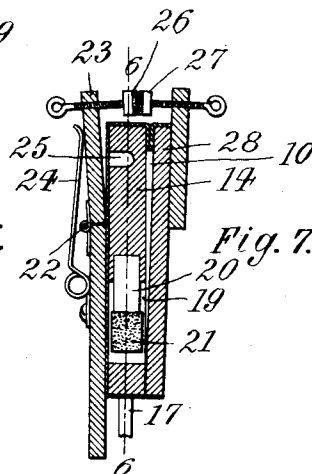


Fig. 7.

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UNITED STATES PATENT OFFICE.

BENJAMIN C. PECK, OF NEW YORK, N. Y., ASSIGNOR TO ROTH & ENGELHARDT, OF NEW YORK, N. Y., A FIRM.

STOP MECHANISM FOR SELF-PLAYING MUSICAL INSTRUMENTS.

No. 870,744.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed April 23, 1907. Serial No. 369,769.

To all whom it may concern:

Be it known that I, BENJAMIN C. PECK, a citizen of the United States, residing at New York city, Manhattan, county and State of New York, have invented 5 new and useful Improvements in Stop Mechanism for Self-Playing Musical Instruments, of which the following is a specification.

This invention relates to an improved mechanism for opening the power-controlling switch of an electrically operated piano or similar musical instrument 10 by means of the perforations in the tune-sheet. The switch-operating perforations of such sheet are the same as are used for actuating the tone producers, so that the width of the sheet need not be increased for the accommodation of additional switch-operating 15 perforations. The construction is such that in order to open the switch, not a single, but two hammer-operating ducts of the tracker-bar must be simultaneously uncovered, said ducts being so selected as to 20 control adjoining notes which are not sounded simultaneously. If either one of such ducts is uncovered, without uncovering the other duct, the note corresponding thereto will be sounded, but no effect will be had upon the switch. When, however, both ducts 25 are simultaneously uncovered, neither of the notes corresponding thereto will be sounded, but the switch will be opened. In this way the switch is readily controlled by the sound-producing perforations of the music sheet, while a discord at the end of the music 30 played is prevented.

In the accompanying drawings: Figure 1 is a front elevation showing the principal parts of my improved stop mechanism; Fig. 2 a rear view of part thereof; Fig. 3 a vertical section on line 3—3, Fig. 2; Fig. 4 a 35 face view of the auxiliary bellows with the clack-valve removed; Fig. 5 a similar view showing the parts in a different position; Fig. 6 a section on line 6—6, Fig. 7; Fig. 7 a longitudinal section of the auxiliary bellows complete; Fig. 8 a detail of the locking means 40 for the hammer-actuating bellows; Fig. 9 a detail of part of the duct-bridge and tune-sheet, and Fig. 10 a diagram illustrating the relative arrangement of the parts.

An auxiliary bellows 10 is arranged intermediate 45 two key-operating bellows 11, 12, and the switch 13. The fixed board 14 of bellows 10 is provided with a pair of ducts 15, 16, that communicate by tubes 17, 18, with primary pneumatics 50 intermediate bellows 11, 12, and bellows 10, and which will be hereinafter more fully described. Ducts 15, 16 open into opposite 50 sides of a common intermediate chamber 19 of board 14, which, in turn, communicates with the interior of bellows 10. Within chamber 19 is contained a movable member shown to consist of a valve or tongue

20 having a felted head 21 which projects across the 55 inner ends of ducts 15, 16. This head is somewhat narrower than the width of chamber 19, and is free to be deflected laterally by suction within either one of ducts 15, 16, so as to draw the valve against such 60 duct and prevent a vacuum to be formed in chamber 19 and bellows 10. If, however, suction simultaneously takes place in both ducts 15, 16, valve 20 will remain centered and suction will thus be produced in chamber 19 and bellows 10, to collapse the latter. This collapse of bellows 10 will actuate the switch 13 65 by an intermediate pneumatic 30, in manner hereinafter described.

To fixed board 14 is hinged at 22, a clack-valve 23 70 influenced by a spring 24 and adapted to normally close the opening of an elbow-shaped air inlet 25 70 formed in said board. Through the free end of valve 23 passes the stem of an adjustable button or abutment 26 cooperating with a similar button or abutment 27 of movable board 28. When bellows 10 is 75 expanded (Fig. 1), valve 23 will close inlet 25. When, however, the bellows is contracted, valve 23 will be opened by buttons 26, 27, to admit air into inlet 25, (Fig. 7). This inlet communicates by tube 29 with a 80 pneumatic 30, so constructed, that when air is admitted thereto by tube 29, an exhaust tube 31 will be placed under suction. The pneumatic 30 is preferably of the same construction as that shown in Patent No. 741,072, granted to A. P. Roth, October 13, 1903.

Briefly stated, a common vacuum chest 32, from 85 which air is constantly exhausted, is adapted to communicate with a channel 33 through a duct 34 controlled by a valve 35. The latter is actuated by a pin 36 on bellows 37, the interior of which communicates with tube 29 through duct 38. Thus, if air is admitted 90 to the latter, bellows 37 will expand to open valve 35 and simultaneously close a vent 39. In this way channel 33, and consequently tube 31 which communicates therewith, is placed under vacuum. Tube 31 communicates, in turn, with a bellows 40 which is adapted 95 to open an electric switch by which the power is cut off from the instrument. This switch is preferably of the construction shown in Patent No. 786,899, granted to A. J. Hobart, April 11, 1905. It consists, essentially, 100 of a switch-knife 41 adapted to engage contacts 42 to close the circuit. When bellows 40 is collapsed, it will, by plunger 43, tilt knife 41 to open the switch and thereby stop the music. Knife 41 is held in its open position by a coin-operated lever 44, until the latter is tilted by the introduction of a coin through chute 45.

The switch-operating device above described may 105 be used on any pneumatic instrument controlled by a music-sheet, the drawings showing it applied to an autoneumatic piano.

The two adjoining bellows 11, 12 selected for operating the switch have, in common with all the other hammer-actuating bellows 46, the function to normally operate the hammers of the piano by means of bell crank 47 and abstract 48. Each of the bellows 11, 12, 46, etc., communicates through a tube 49, with a pneumatic 50, which is in all respects similar to pneumatic 30. These pneumatics are connected by tubes 51 with two adjoining openings 52, 53, of the duct-bridge 54. When either one of these openings is uncovered by the perforated music-sheet 55, such opening will admit air into tube 51 and thereby place the tube 49 under suction in manner previously described, so that the hammer-actuating bellows is collapsed and the note is sounded.

The two pneumatics 50 which communicate with bellows 11, 12, respectively, are not only connected to such bellows, but also to bellows 10 by the tubes 17 and 18. That is to say, pneumatic 50 of bellows 11 communicates through tube 17 with duct 15, while pneumatic 50 of bellows 12 communicates through tube 18 with duct 16. In this way, when two adjoining and laterally alined openings in the tune-sheet 55 simultaneously uncover the two openings 52, 53 of the duct-bridge, air will, through tubes 51, be admitted to pneumatics 50, which will, in turn, simultaneously exhaust air in both of the ducts 15, 16. In this way bellows 10 will collapse to admit air through tube 29 into bellows 37, and thus place tube 31 under suction, whereby bellows 40 will be collapsed to tilt switch-knife 41 by plunger 43. The playing of the instrument will thus be immediately stopped, which is the result desired.

Means are provided for preventing both bellows 11, 12, from being simultaneously collapsed, so that any discords produced by the simultaneous sounding of the two notes controlled by said bellows is prevented at the end of each piece of music played. These means are as follows: From each of the bellows 11, 12 projects a hook 56. Intermediate bellows 11, 12 there is fulcrumed to a fixed support 57, a two-arm lever 58 having cushioned ends 59, which extend across the paths of hooks 56, and are arranged at a slight distance therefrom. If air is exhausted from bellows 11 only, it is free to collapse, by reason of the play of lever 58, in order to sound the note. In like manner, if bellows 12 is collapsed alone, its note will be freely sounded. But, if both bellows are simultaneously exhausted, they will not collapse sufficiently to sound the notes, owing to the engagement of their hooks 56 with the headed ends 59 of lever 58. In this way the two pneumatics 50, 50 which are connected to bellows 11, 12 and also to bellows 10 will either sound one of the notes without sounding the other note, or they will open the switch to stop the piano, in which case neither of the notes will be sounded. Thus, it will be seen, that the perforations of the duct-bridge that normally sound the notes, assume the additional function of shutting off the power at the end of the piece played, without in any way impairing the true and correct rendering of such piece.

I claim:

1. In a device of the character described, a bellows having a pair of ducts, and a valve adapted to be sucked against one and also against the other of said ducts, substantially as specified.

2. In a device of the character described, a bellows having a pair of ducts that communicate with the interior of such bellows, combined with a valve adapted to be sucked against one and also against the other of said ducts, substantially as specified.

3. In a device of the character described, a bellows having a fixed board, a pair of ducts within the same, and a chamber that communicates with said ducts and the interior of the bellows, combined with a valve adapted to be sucked against one and also against the other of said ducts, substantially as specified.

4. In a device of the character described, a bellows having a pair of ducts, a communicating chamber, and a laterally vibrating tongue within said chamber which projects across said ducts, substantially as specified.

5. In a device of the character described, a bellows having a pair of ducts, an intermediate valve, an air inlet, and means for opening said inlet upon the collapse of the bellows, substantially as specified.

6. In a device of the character described, a bellows having a pair of ducts, an intermediate valve, an air inlet, a check-valve controlling the same, and a pair of abutments for opening said valve upon the collapse of the bellows, substantially as specified.

7. In a device of the character described, a bellows having a pair of ducts, and means for establishing communication between both of said ducts and the interior of the bellows by a simultaneous exhaust of air from both ducts and for disconnecting either of said ducts from said interior of the bellows by an exhaust of air from said duct unaccompanied by a simultaneous exhaust of air from the other duct, substantially as specified.

8. In a device of the character described, a bellows having a pair of ducts, an intermediate valve, an air inlet, means for opening said inlet upon the collapse of the bellows, a switch, and means controlled by the air inlet for opening said switch, substantially as specified.

9. In a device of the character described, a first bellows having a pair of ducts, an intermediate valve, an air inlet, means for opening said inlet upon the collapse of the bellows, a second bellows controlled by the air inlet, and an electric switch having a movable member adapted to be actuated by said second bellows, substantially as specified.

10. In a device of the character described, a pair of primary pneumatics, a first bellows, a hammer operated thereby, a second bellows, a switch operated thereby, means for operatively connecting the pneumatics with the first bellows, and means for operatively connecting said pneumatics with the second bellows, substantially as specified.

11. In a device of the character described, a pair of primary pneumatics, a pair of bellows, a pair of hammers operated thereby, means for operatively connecting the pneumatics with the bellows, and means for locking said bellows against simultaneous movement, substantially as specified.

12. In a device of the character described, a pair of primary pneumatics, a pair of first bellows, a pair of hammers operated thereby, a second bellows, a switch operated thereby, means for operatively connecting the pneumatics with the pair of first bellows, means for locking said bellows against simultaneous movement, and means for operatively connecting the pneumatics with the second bellows, substantially as specified.

13. In a device of the character described, a pair of bellows, a pair of hammers operated thereby, hooks secured to the bellows, and a two-arm lever centrally pivoted between the bellows and arranged in the path of said hooks, substantially as specified.

14. In a device of the character described, a duct-bridge having a pair of adjoining openings, a switch, a pair of hammers, means controlled by the openings for opening the switch by the simultaneous uncovering of both such openings, and means controlled by the openings for operating the hammers by the separate uncovering of such openings, substantially as specified.

15. In a device of the character described, a duct-bridge having a pair of adjoining openings, auxiliary bellows having a pair of ducts controlled by said openings, a valve adapted to be sucked against either of said ducts, a

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switch, and means controlled by said bellows for opening the switch, substantially as specified.

16. In a device of the character described, a duct-bridge having a pair of adjoining openings, a hammer, means for actuating the hammer, a switch, means for opening the switch, means for operatively connecting said openings to the hammer-actuating means, and separate means for connecting said openings to the switch-opening means, substantially as specified.
17. In a device of the character described, a duct-bridge having a pair of openings, a pair of pneumatics connected thereto, a pair of bellows controlled by the pneumatics, a pair of hammers actuated by said bellows, an auxiliary bellows also controlled by the pneumatics, and a switch controlled by said auxiliary bellows, substantially as specified.

18. In a device of the character described, a duct-bridge having a pair of openings, a pair of pneumatics connected thereto, a pair of bellows controlled by the pneumatics, a pair of hammers actuated by the bellows, an auxiliary bellows also controlled by the pneumatics, an additional pneumatic controlled by the auxiliary bellows, a switch, and a bellows for opening the switch connected to the additional pneumatics, substantially as specified.

Signed by me at New York city, (Manhattan,) N. Y., 25 this 22nd day of April, 1907.

BENJAMIN C. PECK.

Witnesses:

FRANK V. BRIESEN,
WILLIAM SCHULZ.