

1,265,792.

Patented May 14, 1918.
 3 SHEETS—SHEET 1.

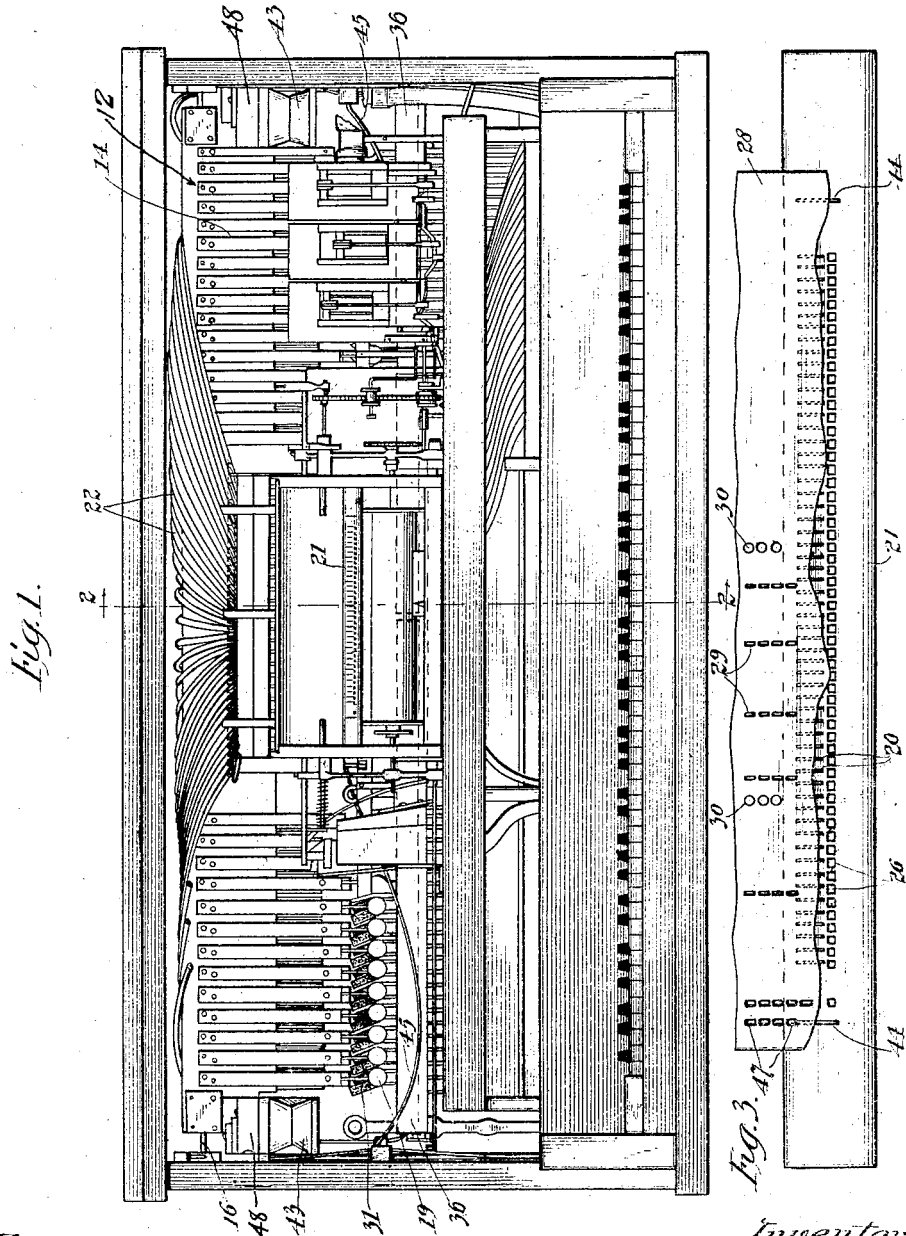


Fig. 1.

Fig. 2.

Fig. 3.

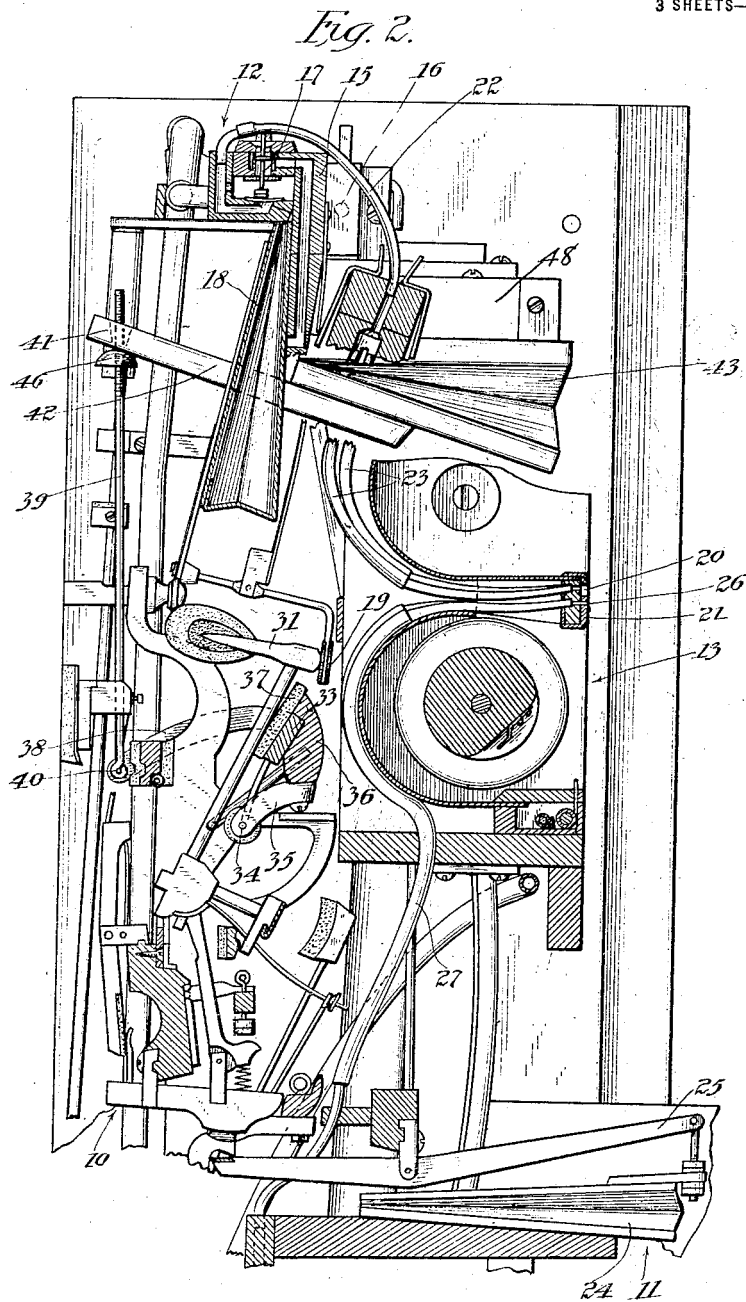
Witnesses:
 W. L. Smith

Inventor:
 Paul B. Klugh.
 by Jones, Addington, Ames & Seibold.
 Attys.

P. B. KLUGH.
 EXPRESSION DEVICE FOR AUTOMATIC MUSICAL INSTRUMENTS.
 APPLICATION FILED APR. 3, 1916.

1,265,792.

Patented May 14, 1918.
 3 SHEETS—SHEET 2.



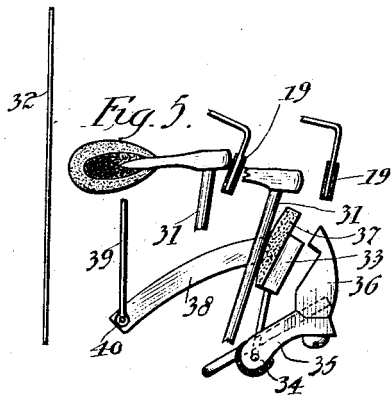
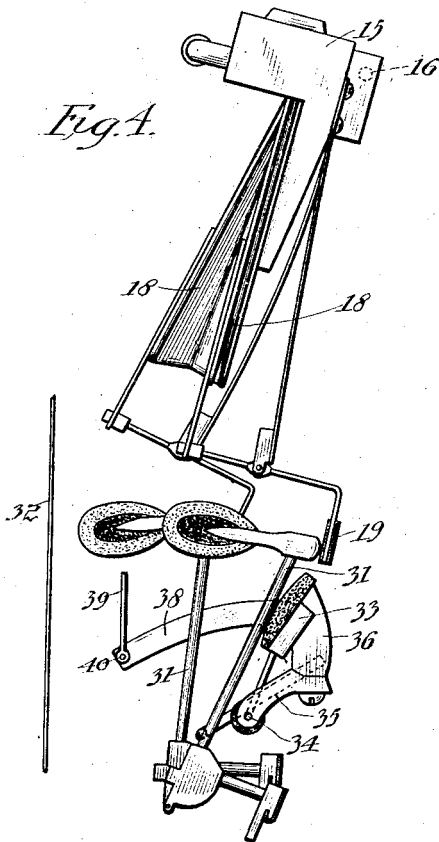
Witnesses:
 W. E. Smith

Inventor:
 Paul B. Klugh
 by Jones, Addington, Ames & Seibold.
 Attys.

P. B. KLUGH.
 EXPRESSION DEVICE FOR AUTOMATIC MUSICAL INSTRUMENTS.
 APPLICATION FILED APR. 3, 1916.

1,265,792.

Patented May 14, 1918.
 3 SHEETS—SHEET 3.



Witnesses:

W. F. Smith

Inventor:

Paul B. Klugh

by Jones, Addington, Ames & Seibold

Attys.

UNITED STATES PATENT OFFICE.

PAUL B. KLUGH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CABLE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

EXPRESSION DEVICE FOR AUTOMATIC MUSICAL INSTRUMENTS.

1,265,792.

Specification of Letters Patent.

Patented May 14, 1918.

Application filed April 3, 1916. Serial No. 88,675.

To all whom it may concern:

Be it known that I, PAUL B. KLUGH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Expression Devices for Automatic Musical Instruments, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to expression devices for automatic musical instruments.

One of the objects of my invention is to provide an improved device controlled by the note sheet whereby, in an instrument in which means are provided for emphasizing the solo notes of a musical composition, the emphasized notes may be modulated.

Further objects will appear from the detailed description to follow, taken in connection with the appended claims.

In the drawings, in which I have shown one embodiment of my invention—

Figure 1 is a front view of the upper part of a player piano, the upper front panel being removed;

Fig. 2 is a vertical section substantially on the line 2—2 of Fig. 1;

Fig. 3 is a view, on an enlarged scale, of the tracker bar and note sheet;

Fig. 4 is a detail view showing parts of the piano action, solo action and modulating device; and

Fig. 5 is a detail view of parts shown in Fig. 4, showing the modulating device in a different position.

Referring now to the drawings in detail, the invention is shown in connection with a pneumatic player piano comprising a piano action 10, which may be of any usual or suitable type, a pneumatic action 11 for actuating the piano action, a sheet controlled solo action 12 whereby the solo notes of a musical composition can be emphasized, a selector 13 for controlling the pneumatic action 11 and the solo action 12, and a motor 14 for causing the music sheet to travel over the tracker bar.

The piano action 10, the pneumatic action 11, and the solo action 12 may be of any

suitable type, no claim to any specific novelty of these parts being made in this application.

The solo action shown comprises a wind chest 15 mounted to be moved about a pivot 16 from the position shown in Fig. 2, in which the piano hammers are permitted to fall back against the rest rail, to the position shown in Fig. 4, in which the piano hammers are normally held in short stroke position, a plurality of valve actions 17 in the wind chest 15, a plurality of pneumatics 18 secured to said wind chest and controlled by said valve actions, and a plurality of rests, or abutments, 19 actuated by the pneumatics 18 and each located in a position to engage two adjacent hammers, as shown in Figs. 1 and 2.

The valve actions 17 are connected with elongated openings 20 in the tracker bar 21 through the tubes 22 and 23.

As shown in Fig. 2, each tube 22 is in communication with two of the tubes 23, so that each valve action is connected with two of the openings 20.

Any suitable means may be provided for moving the wind chest from the position shown in Fig. 2 to the position shown in Fig. 4.

The pneumatic action shown comprises a plurality of pneumatics 24, one for each piano action unit, and a plurality of levers or keys 25 actuated by said pneumatics for individually actuating the piano action units. The pneumatics 24 are controlled from the openings 26 in the tracker bar through the tubes 27.

The music or note sheet 28 is provided with narrow note perforations 29, which are located so as to pass between the elongated openings 20 of the tracker bar and register with the openings 26, and is also provided with wide perforations 30 which register with the elongated openings 20 and also with the openings 26 as the sheet passes over the tracker.

The perforations 29 correspond to the accompaniment notes, or notes which are not to be emphasized, and the perforations 30 correspond to the solo notes, or the notes which are to be emphasized.

The operation of the parts of the instrument thus far described is, briefly, as follows:

Assuming that the instrument is to be used as an automatic solo player, the wind chest 15 is swung to the position shown in Fig. 4, causing the piano hammers 31 to move nearer the strings 32 to short stroke position. The instrument is then operated to cause the music sheet 28 to travel over the tracker 21, the accompaniment perforations 29 passing between the openings 20 and registering with the openings 26, and the solo perforations registering, first, with the openings 20 and, later, with the openings 26. The accompaniment perforations simply cause the corresponding action pneumatics 24 to collapse to actuate the keys 25 to cause the corresponding hammers 31 to move from short stroke position to strike the strings 32 to cause the notes to be sounded.

The solo perforations first register with the elongated openings 20, causing the corresponding solo pneumatics 18 to collapse and the corresponding rests 19 to move away from the strings, thus allowing the corresponding hammers 31 to fall back to long stroke position. The solo perforations next register with the openings 26, causing the corresponding pneumatics 24 to collapse to actuate the keys 25 to cause the selected ones of the hammers 31, which have fallen back to long stroke position, to move to strike the strings 32 to cause the notes to be sounded. The notes which are caused to be sounded by the hammers moving from long stroke position will, of course, be emphasized with respect to those which are caused to be sounded by hammers moving from short stroke position.

As it is seldom desired, in a musical selection, that two notes only a semi-tone apart be sounded simultaneously with different degrees of tonal power, it is practicable to have a single rest 19 control the length of stroke of two adjacent hammers.

In combination with the parts of the automatic instrument thus far described, means controlled by the note sheet are provided whereby the solo notes may be modulated. These means comprise a pair of rest rails, 33—33, for the treble and bass, respectively, of the piano action. These rest rails 33—33 and their controlling mechanism are substantially similar, and a description of one will suffice for both. Each is pivotally mounted at 34 on a bracket 35, which bracket is secured to the main hammer rest rail 36. A layer of felt 37 may be secured to the rest rail 33 for the shanks of the hammers 31 to rest against. Each rail 33 has an arm 38 secured thereto and extending rearwardly therefrom to which a rod or link 39 is pivotally connected at 40. This rod 39

extends upwardly through an opening 41 in an arm 42 secured to the pneumatic 43, which pneumatic is controlled through the usual or any suitable type of valve action, indicated herein at 48 but not shown in detail, this valve action being connected with an opening 44 in the tracker by means of a tube 45.

The upper part of the rod 39 may be threaded to receive a threaded button 46 for securing the proper adjustment between the pneumatic 43 and the rail 33.

The music sheet is provided with perforations 47 for controlling the pneumatics 43, which perforations register with openings 44 as the sheet passes over the tracker. These perforations 47 are located in the sheet substantially in transverse alinement with the front ends of those solo perforations 30 corresponding to solo notes which it is desired should be modulated, or sounded with less than the full emphasis given to other solo notes.

The operation of this solo modulating means is as follows:

Assuming that a perforation 30, such as that shown on the left hand half of the music sheet (Fig. 3), corresponding to a solo note which is to be modulated, is about to traverse the tracker bar, the perforation 47 at the left hand edge of the music sheet will first register with the opening 44, causing the left hand pneumatic 43 to collapse and the left hand rest rail 33 to move from the position shown in Fig. 4 to the position shown in Fig. 5. Later, the perforation 30 registers with one of the openings 20, causing one of the pneumatics 18 to collapse to permit two of the hammers 31 to fall away from the strings. These two hammers will fall back until they rest against the left hand rail 33, which has been moved toward the strings. Later, the perforation 30 registers with one of the openings 26, causing one of the action pneumatics 24 to collapse and move one of the two hammers 31, which have fallen back against the rail 33, to strike the string to cause a note to be sounded. The note thus sounded will be sounded louder than if the rest 19 had not been withdrawn, and not so loud as if the rail 33 had not been moved forward.

By means of the two rails 33, it is possible to modulate the solo notes in the bass without modulating the solo notes in the treble which are simultaneously sounded, and vice versa.

By adjusting the buttons 46, the extent to which the solo notes are modulated may be varied.

In the claims, where the word "number" is used, it is to be understood that the number may be one or more.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent is:—

1. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable devices, each acting mechanically on a number of piano action units, and sheet controlled modulating means for varying the emphasis.

2. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable devices, each acting mechanically on a number of piano action units, and sheet controlled modulating means for varying the emphasis, comprising a device acting mechanically on a plurality of piano action units.

3. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable devices, each acting mechanically on a number of piano action units, and sheet controlled modulating means for varying the emphasis, comprising a rest acting on a plurality of piano action units and movable from one position to another to vary the stroke of the piano hammers.

4. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable devices, each acting mechanically on a number of piano action units, and sheet controlled modulating means for varying the emphasis, comprising a rest acting on a plurality of piano action units and movable from one position to another to vary the stroke of the piano hammers, and a sheet controlled actuator for said rest.

5. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable rests, each engaging a number of piano hammers and movable from one position in which the corresponding hammers are held in short stroke position to another position in which the corresponding hammers are permitted to fall back to long stroke position, a plurality of sheet controlled actuators, one for each rest, and sheet controlled modulating means for varying the emphasis, comprising a rest rail for engaging a plurality of hammers, movable from a position in which it does not prevent

the corresponding hammers from falling back to long stroke position to another position in which it prevents the piano hammers from falling back of a position intermediate the short stroke and long stroke positions, and a sheet controlled actuator for said rest rail.

6. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable devices, each acting on a number of piano action units and each movable from one position in which the corresponding piano hammers are held in short stroke position to another position in which the corresponding piano hammers are permitted to fall back to long stroke position, and modulating means for varying the emphasis, comprising a device acting on a plurality of piano action units, movable from one position in which it does not prevent the corresponding piano hammers from falling back to long stroke position to another position in which it prevents the piano hammers from falling back of a position intermediate the short and long stroke positions, pneumatic actuators for said piano action units, said emphasizing devices, and said modulating device, and a tracker bar having openings corresponding to said actuators.

7. A note sheet controlled player piano comprising a piano action, sheet controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently movable devices, each acting on a number of piano action units and each movable from one position in which the corresponding piano hammers are held in short stroke position to another position in which the corresponding piano hammers are permitted to fall back to long stroke position, and modulating means for varying the emphasis, comprising a device acting on a plurality of piano action units, movable from one position in which it does not prevent the corresponding piano hammers from falling back to long stroke position to another position in which it prevents the piano hammers from falling back of a position intermediate the short and long stroke positions, pneumatic actuators for said piano action units, said emphasizing devices, and said modulating device, and a tracker bar having openings corresponding to said actuators, and a note sheet having apertures for registering with said openings.

8. A player-piano having means for producing solo effects by automatically controlling the length of stroke of the hammers by acting upon the hammer-operating action between the strings and the striking

pneumatics, and also having sheet-controlled means for modulating the solo theme by varying the effective length of hammer-stroke.

5 9. The combination with the piano-hammers and an adjustable hammer-rest rail, of means mounted for movement independently of said rail to provide a rest for one or more of said hammers, and sheet-controlled means for actuating said hammer-rest rail.

10 10. In an instrument of the class specified, the combination of note-sounding mechanism, a tracker having a plurality of parallel rows of apertures, means controlled through one or more apertures of one of said rows for operating said mechanism, means controlled through one or more apertures of the other of said rows for adjusting said mechanism to vary the effect of the first-named means upon said mechanism, and tracker-controlled means for controlling the degree or extent of such adjustment of said mechanism.

15 11. The combination with blow-striking members, of a tracker having front and rear rows of apertures, pneumatics connected with one of said rows of apertures for operating said blow-striking members, a second set of pneumatics connected with the other row of apertures and combined with means for changing the length of stroke of said blow-striking members, and tracker-controlled means for controlling the effect of said second set of pneumatics.

20 12. The combination with blow-striking members, of a tracker having front and rear rows of apertures, a first set of pneumatics connected with one of said rows of apertures for operating said blow-striking members, a second set of pneumatics connected with the other row of apertures and combined with means for changing the effect of said first set of pneumatics, and tracker-controlled means for controlling the effect of said second set of pneumatics.

25 13. In a sheet-controlled player-piano, a traveling music-sheet, means controlled by

certain note-sounding perforations of said sheet for adjusting the position of the hammers preparatory to the actuation of said hammers to sound a note, and sheet-controlled means for controlling the effect of said adjusting means.

30 14. In a sheet-controlled musical instrument, the combination with a traveling music-sheet and note-sounding mechanism, of means controlled by note-sounding perforations of said music-sheet for automatically setting said mechanism preparatory to operation, means for operating said mechanism after being set, and sheet-controlled means for controlling the effect of said setting means.

35 15. A note-sheet-controlled player-piano comprising a piano-action, sheet-controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently-movable devices each acting on a relatively-small number of piano-action units, and sheet-controlled modulating means for varying the emphasis comprising a movable device acting mechanically on a relatively-large number of piano-action units.

40 16. A note-sheet-controlled player-piano comprising a piano-action, sheet-controlled means for emphasizing one part of the musical composition with respect to another part, comprising a plurality of independently-movable devices each acting on a relatively-small number of piano-action units, and sheet-controlled modulating means for varying the emphasis, comprising a plurality of movable devices each acting mechanically on a relatively-large number of piano-action units.

45 In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

PAUL B. KLUGH.

Witnesses:

A. SWENSEN,
J. CLARKE HAGEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."