



1,183,739.

Patented May 16, 1916.  
 2 SHEETS—SHEET 2.

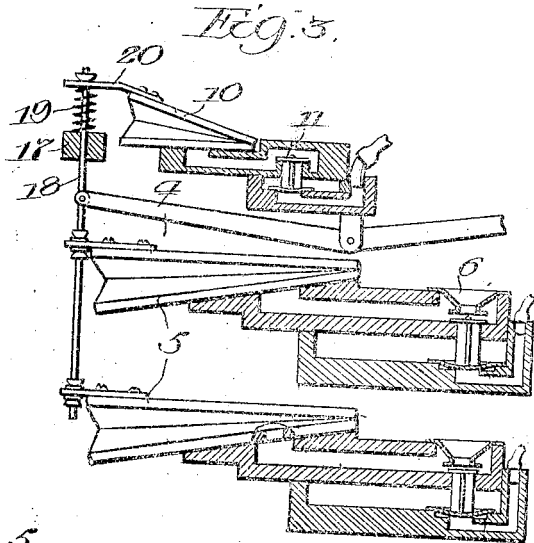


Fig. 3.

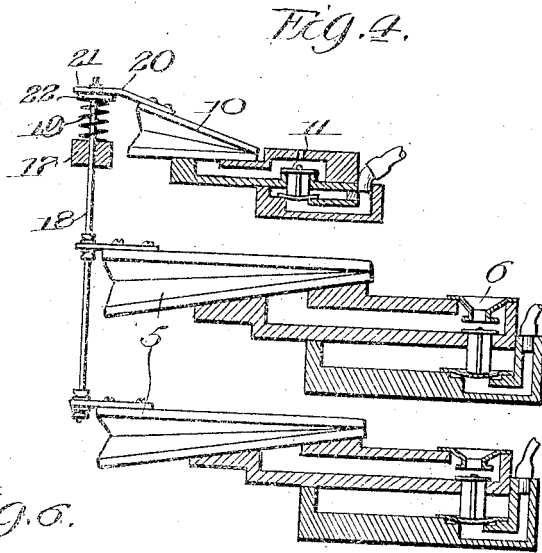
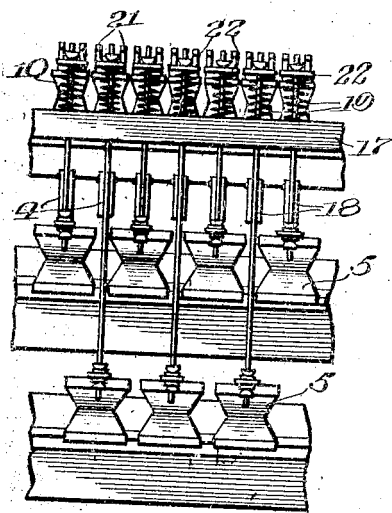
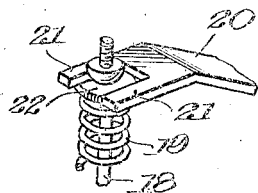


Fig. 4.

Fig. 6.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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

MECHANICAL MUSICAL INSTRUMENT.

1,183,739.

Specification of Letters Patent.

Patented May 16, 1916.

Application filed November 19, 1910, Serial No. 593,204. Renewed October 13, 1915. Serial No. 53,594.

*To all whom it may concern:*

Be it known that I, PAUL BROWN KLUGH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Mechanical Musical Instruments, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to mechanical musical instruments and especially to a type of instrument commonly called a player piano or piano player.

The present invention relates more particularly, although not exclusively, to the accentuation of certain notes or series of notes to bring out solo effects.

The object of the invention, when applied to piano players or player pianos, is to provide means for producing the aforesaid solo effects in an improved manner. Certain broad features of the solo device herein set forth are claimed in my copending application, Serial No. 554,140, filed April 8, 1910.

I have shown in co-pending applications Serial Nos. 593,203 and 593,205, filed of even date herewith (Nov. 19, 1910), systems in which I use power pneumatics to operate the piano action, and supplemental means, preferably in the nature of removable stops, to limit the stroke either of the piano action or the pneumatics, by the operation of which solo effects may be produced. The supplemental means are preferably operated by what I term auxiliary or solo pneumatics. Both power and auxiliary or solo pneumatics are preferably under the control of the tracker board. In my present invention, I accomplish the same or similar results by the use of what I term resilient abutments, against which operating portions of the action act, and the control of these resilient abutments by supplemental means, preferably in the form of solo pneumatics, to thereby secure the solo effects as set forth in my aforesaid application Serial No. 554,140.

I will describe my invention more in detail by reference to the accompanying drawings, in which:

Figure 1, is a side elevation, partly in section, showing the piano action, the keys, tracker board, and other associated mecha-

nism; Fig. 2 is a detail view of the special tracker board and music sheet; Fig. 3 is an enlarged detail view of the apparatus of my invention as shown in Fig. 1; Fig. 4 shows a modification of the apparatus set forth in Fig. 3; Fig. 5 is an end view of the apparatus of Fig. 4; and Fig. 6 is a detail view to illustrate more clearly the apparatus of Figs. 4 and 5.

Referring initially to Fig. 1, I show a mechanical musical instrument having strings 1 to be struck by a piano action 2 which may be under the control of a series of keys 3. As illustrating the invention, I show arms 4 which likewise serve to actuate the piano action to strike the strings 1.

The arms or members 4 are actuated by power pneumatics 5 which are controlled through suitable valve mechanisms 6, tubes 7 leading therefrom to the tracker board 8 at the openings 9. Supplemental or solo pneumatics 10 are controlled by valve mechanisms 11 which are connected by tubes 12 with the openings 13 in the tracker board 8. A music sheet 14, having narrow openings 15 which cooperate only with the openings 9 and wide openings 16 cooperating with both openings 9 and 13, is used to selectively control the actuation of pneumatics 5 and 10 in accordance with the operation set forth in my aforesaid co-pending application #554,140.

A rail 17 is provided as shown, through which the rods 18 project. There is preferably one solo pneumatic 10 for each power pneumatic 5, and a single rod passing through the rail 17 is associated with both of said pneumatics of that particular group or set. An arm 4 is likewise associated with each rod 18. Now, when a narrow music sheet opening 15 uncovers a tracker opening 9, and a power pneumatic 5 collapses, in the operation of the device, it acts against a spring 19 interposed between the arm 20 of the respective solo pneumatic 10 and the rail 17 and also collapses the solo pneumatic. In this manner an accompaniment note is sounded, that is, a note that is not so loud as a solo note, as will be apparent from the further description.

In order to sound a solo note or loud note to bring out, for instance, a certain melody, both openings 9 and 13 of the tracker board are uncovered by a wide opening 16 of the music sheet 14 to cause the actuation of not

only the power pneumatic 5 of a given note, but also the previous actuation of its associated solo pneumatic 10, which solo pneumatic thereupon first presses the spring 19 downwardly so that, as the power pneumatic 5 collapses, a loud note is sounded, as the pneumatic 5, does not, in that case, have to operate against the full tension of the spring 19.

10 In the modification of the device set forth in Figs. 4, 5 and 6, the arm 20 has a forked extension comprising the prongs 21, 21 which rest on top of a washer 22, which washer is in association with the spring. In  
15 this form of carrying out the invention, the power pneumatic operates against the spring 19 but in this operation does not collapse the supplemental or solo pneumatic 10 as is the case with the construction set forth in Figs.  
20 1 and 3.

The tracker board and music sheet disclosed herein are set forth and claimed in a copending application of mine, Serial No. 554,142, filed April 8, 1910, tracker board  
25 and music sheet.

Certain broader features of the invention herein set forth and claimed are also disclosed and claimed broadly in my copending application, Serial No. 593,203, filed November 19, 1910, mechanical musical instruments.  
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While I have herein shown and particularly described the preferred embodiment of my invention, I do not mean to limit myself to the precise construction and arrangement as herein set forth, but  
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Having thus described one form of my invention, what I claim as new and desire to secure by Letters Patent is:

40 1. In a device of the class described in combination, a power pneumatic, a rod connected to said pneumatic, an abutment through which said rod runs, a plate, a spring having one end bearing against said  
45 abutment and having the other end bearing against said plate for engaging said rod to oppose said power pneumatic, and a solo pneumatic for compressing said spring.

50 2. In a device of the class described in combination, a power pneumatic, a rod connected to said pneumatic, an abutment through which said rod runs, a spring having one end bearing against said abutment and having a plate at its other end, a stop  
55 on said rod cooperating with said plate, and a solo pneumatic having engagement with said plate for compressing said spring independently of said rod.

60 3. In a device of the class described in combination, a power pneumatic, a rod connected to said pneumatic, an abutment, a spring surrounding said rod and having one end resting against said abutment, a plate associated with the other end of said spring,  
65 a stop on said rod for contacting with said

plate, and a solo pneumatic for compressing said spring having an arm for engaging said plate.

4. A device of the character described comprising an action, a resilient abutment therefor, power pneumatics to operate said action and act against said abutment, and independently movable solo pneumatics also acting against said abutment to change the stroke of said action.  
70

5. A device of the character described comprising an action, a resilient abutment therefor, power pneumatics for operating said action, independently movable solo pneumatics to change the condition of said abutment to thereby increase the stroke of said action, and an operating spindle common to the power and solo pneumatics of a given group.  
75 80

6. A device of the character described comprising an action, a resilient abutment therefor, power pneumatics to operate said action and act against said abutment, independently movable solo pneumatics also acting on said abutment to change the stroke of said action, and an operating spindle common to the power and solo pneumatics of a given group.  
85 90

7. A device of the character described comprising an action, a power pneumatic to operate said action, a spring against which said power pneumatic normally operates, and independent pneumatic means controlled from the tracker board to change the opposing effect of said spring upon said power pneumatic.  
95 100

8. A device of the character described comprising an action, a power pneumatic to operate said action, a spring against which said power pneumatic normally operates, and solo pneumatics controlled from the tracker board to change the opposing effect of said spring independently movable upon said power pneumatic.  
105

9. In an automatic piano in combination, an action, a rod forming part of said action, and a plurality of pneumatics for acting on said rod, one of said pneumatics having a fast connection with said rod and another of said pneumatics having a loose connection therewith.  
110 115

10. A device of the character described comprising in combination, an action, power pneumatics to operate said action, solo pneumatics movable independently of said power pneumatics, rods forming part of said action to which said power pneumatics are connected, an abutment exterior to said pneumatics through which said rods pass, and a spring having one end resting against said abutment and arranged to be compressed by the movement of said rods, said solo pneumatics having means for compressing said springs when they collapse.  
120 125

11. In an automatic piano in combination, 130

a power pneumatic, a rod connected to said pneumatic, an abutment through which said rod passes, a spring surrounding said rod resting against said abutment, a plate bearing against said spring, a stop carried by said rod for contacting with said plate, and a solo pneumatic having a forked arm engaging said plate but disconnected therefrom whereby said power pneumatic may operate independently of said solo pneumatic.

12. A device of the character described comprising in combination, an action including a rod, a power pneumatic directly attached to said rod for operating it in one direction, a support, a spring abutting against said support at one end for opposing the action of said pneumatic on said rod, and a solo pneumatic provided with means for compressing said spring independently of the movement of said rod.

13. A device of the class described comprising in combination, a tracker board having two sets of apertures, there being an aperture in each set for each note controlled by the tracker board, an action including rods, power pneumatics for operating said rods connected thereto, a support, springs for opposing said power pneumatics abutting against said support at one end and having lost motion connections with said rods, solo pneumatics for collapsing said springs independently of the movement of said rods and connections between the apertures of one set and said power pneumatics and between the apertures of the other set and said solo pneumatics.

14. The combination with a piano action; of pneumatics for actuating the same, resilient abutments opposing the actuation of said piano action by said pneumatics, and means for changing the opposing action of said abutments without actuating said pneumatics.

15. The combination of a power pneumatic, a rod connected to said pneumatic, an abutment, a spring surrounding said rod and having one end resting upon said abutment, a plate associated with the other end of said spring, a projection on said rod for contacting with said plate, and a second pneumatic for compressing said spring having an arm for engaging said plate.

16. The combination with blow striking members, of resilient abutments opposing the blow striking movements of said mem-

bers, and pneumatic means for acting upon said abutments to change their opposition to said blow striking member movements without actuating said blow striking members.

17. The combination with blow striking members, of pneumatics for actuating the same, spring means forming resilient abutments opposing the striking movements of said blow striking members, and other pneumatics for acting upon said spring means to lessen their opposition to the blow striking movements of said members without actuating said blow striking members or said first mentioned pneumatics.

18. The combination of a tracker having two rows of apertures, note sounding mechanism, pneumatic means connected with one of said rows of apertures for actuating said note sounding mechanism, other pneumatic means connected with the other row of apertures, and resilient abutments opposing the operation of said first mentioned pneumatics means and acted upon by said second mentioned pneumatic means to lessen said opposition.

19. The combination of a tracker having two rows of apertures, blow striking members, mechanism connected with the apertures of one of said rows for actuating said blow striking members, mechanism connected with the apertures of the other of said rows and resilient abutments opposing the blow striking movements of said members and acted upon by said last mentioned mechanism to change the extent of said opposition.

20. The combination with a piano action, of a pneumatic action including a set of pneumatics for operating the piano action and also including other pneumatics combined with spring means opposing the actuating movements of the first mentioned set of pneumatics and acted upon to change said opposition by said other pneumatics, and a tracker having front and rear rows of apertures whereof the front row is connected with the first mentioned set of pneumatics and the rear row with said other pneumatics.

In witness whereof, I hereunto subscribe my name this 2nd day of November A. D., 1910.

PAUL BROWN KLUGH.

Witnesses:

W. N. JOHNSON,  
N. D. TOBIN.

It is hereby certified that in Letters Patent No. 1,183,739, granted May 16, 1916, upon the application of Paul Brown Klugh, of Chicago, Illinois, for an improvement in "Mechanical Musical Instruments," errors appear in the printed specification requiring correction as follows: Page 2, line 106, claim 3, before the word "solo" insert the words *independently movable*; same page and claim, line 108, strike out the words "independently movable;" and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2d day of January, A. D., 1917.

[SEAL.]

R. F. WHITEHEAD,  
*Acting Commissioner of Patents.*

Cl. 84—160.