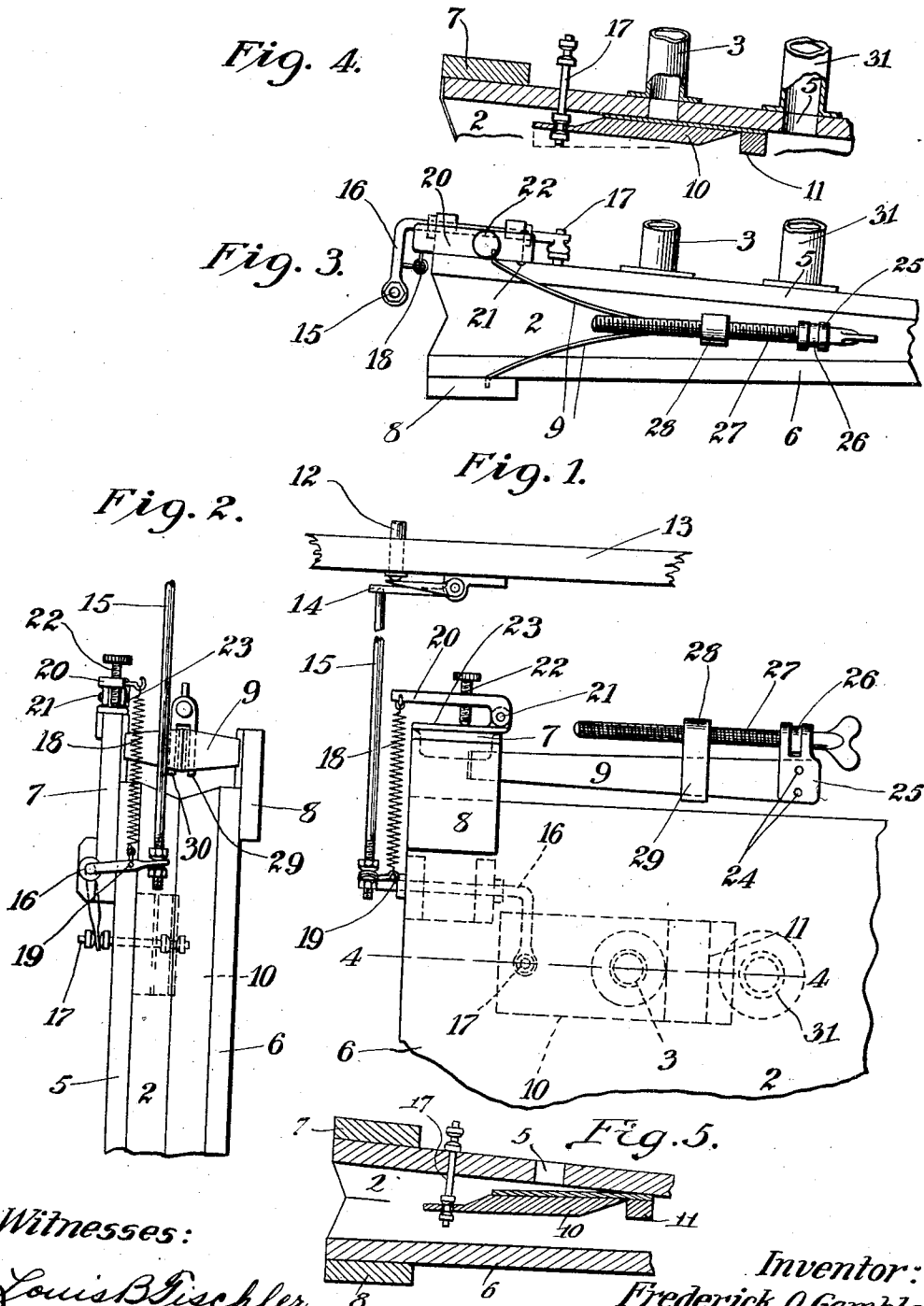


F. O. GAMBLE.
TENSION REGULATOR.
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1,051,878.

Patented Feb. 4, 1913.



Witnesses:

Louis B. Fischer
Chas. W. La Rue

Inventor:
Frederick O. Gamble
by Wilbur M. Stone
Attorney

UNITED STATES PATENT OFFICE.

FREDERICK O. GAMBLE, OF FORT WAYNE, INDIANA, ASSIGNOR TO THE PACKARD COMPANY, OF FORT WAYNE, INDIANA, A CORPORATION OF INDIANA.

TENSION-REGULATOR.

1,051,878.

Specification of Letters Patent.

Patented Feb. 4, 1913.

Application filed March 24, 1911. Serial No. 616,610.

To all whom it may concern:

Be it known that I, FREDERICK O. GAMBLE, a citizen of the United States, and a resident of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Tension-Regulators, of which the following is a specification.

This invention pertains to tension regulators for pneumatically actuated musical instruments.

It has for one of its objects, to provide means for modifying the exhaust tension by which the instrument is actuated, through varying the resistance against the collapse of the reservoir or choker bellows.

A further object is to provide means for modifying the amount of pressure required to operate the choker button in the key bed of the instrument.

Some performers prefer to operate an instrument under relatively heavy tension, others prefer a lighter tension and the present invention provides simple and easily operated means for adjusting that tension at will.

To these ends my improvements comprise parts and combinations of parts illustrated in their preferred form in the drawings accompanying this specification, wherein—

Figure 1 is a side elevation of portions of a pneumatic player-piano embodying my improvements. Fig. 2 is an end elevation corresponding with Fig. 1. Fig. 3 is a plan view, with the key bed removed, of what is shown in Fig. 1. Fig. 4 is a section on line 4—4 of Fig. 1. Fig. 5 is a sectional elevation illustrating the operation of some of the parts.

The usual reservoir or choker bellows 2 has the usual duct 31 leading thereto from some means of exhaust not shown, and the usual duct 3 leading therefrom to the pneumatically operated devices of the instrument, not shown. Wall 5 of bellows 2 is fixed and wall 6 is movably hinged thereto at the right, Fig. 1, beyond the limit of the drawing, all in the usual manner. Walls 5, 6 are provided with the usual ears 7, 8 respectively for the engagement of the outer ends of two leaved spring 9. Bellows 2 is provided with the usual valve 10 therein hinged at 11 to the inner face of wall 5 and when closed, as in Fig. 4, covering the entrance to exhaust duct 3. Said valve 10 is operated

from push button 12 in key bed 13 through rock arm 14, push rod 15, crank arm 16 and valve stem 17, all well known in the art. In Fig. 2 valve 10 is shown open and in Fig. 4 it is shown closed. For maintaining said valve normally open and said arms and rods in their normal positions spring 18 is provided. One end thereof is attached at 19 to crank arm 16 and the other end to some fixed part of the frame; or preferably to an adjustable member as arm 20 pivoted at 21 in bracket 23 on ear 7. Push screw 22 is threaded through said arm 20 and bears against the upper face of brackets 23. By this means the tension of spring 18 may be increased or diminished at will to afford greater or less resistance to the pressure of the finger on button 12, and greater or less resistance of valve 10 against being closed.

Turning now to the means for varying the tension of spring 9, head 25 fixed to said spring by rivets 24, 24 is bifurcated to receive collar 26 of adjusting screw 27 threaded through slide 28. Said slide is provided with downwardly reaching arms 29, 30 between which lie the two leaves of spring 9. By moving said slide by means of screw 27 toward or away from spring head 25 the effective portion of said spring 9 is lengthened or shortened and the resistance against collapse of bellows 2 thereby increased or diminished all respectively. Thus, an operator in commencing to use the instrument finds that the bellows tension is insufficient to produce the intensity of tone desired, whereupon he turns screw 27 to move slide 28 toward spring head 25 thereby increasing the effective length of spring 9 which causes an increased expansion of bellows 2 and permits choker valve 10 therein to swing farther away from its seat thus causing a freer flow through duct 3. Or by reversing the direction of rotation of screw 27, slide 28 will be caused to move away from head 25 thereby shortening the effective length of spring 9, decreasing the tension on the bellows and holding choker valve 10 closer to its seat; the resultant effect being to reduce the intensity of tone in the instrument. It will also be seen that any change in the tension of spring 18 will act through valve 10 collaterally with the adjustment of slide 28 to affect the bellows tension by the increased or diminished resistance of said valve to being closed by the

collapse of bellows 2. The action of member 6 of bellows 2 to close valve 10 will be understood by reference to Fig. 5 where it will be seen that as said member 6 collapses toward the fixed wall of the bellows it will strike the inner end of stem 17 thereby pushing valve 10 to or toward its seat. The two spring adjusting devices are therefore seen to be related in their operation.

10 I claim:—

1. A tension regulator for pneumatically actuated musical instruments including in combination, a bellows, a leaf spring for opening the bellows, and means for varying the effective length of said spring.

2. A tension regulator for pneumatically actuated musical instruments including in combination, a bellows, a leaf spring for opening the bellows, a slide on the spring for varying the effective length of said spring, and means for moving the slide.

3. A tension regulator for pneumatically actuated musical instruments including in combination, a bellows, a bellows opening spring, a slide thereon, a screw mounted for free rotation but against endwise movement on said spring, and means for moving the slide from the screw.

4. A tension regulator for pneumatically actuated musical instruments including in combination, a bellows, a valve therein, a valve opening spring, means for varying the pull of said spring, means for closing the valve by the collapse of the bellows, a bellows opening spring and means for varying the effective length of said spring.

Signed this 15th day of March 1911 before two subscribing witnesses.

FREDERICK O. GAMBLE.

Witnesses:

ELLEN M. MURPHY,
H. MITCHELL.

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