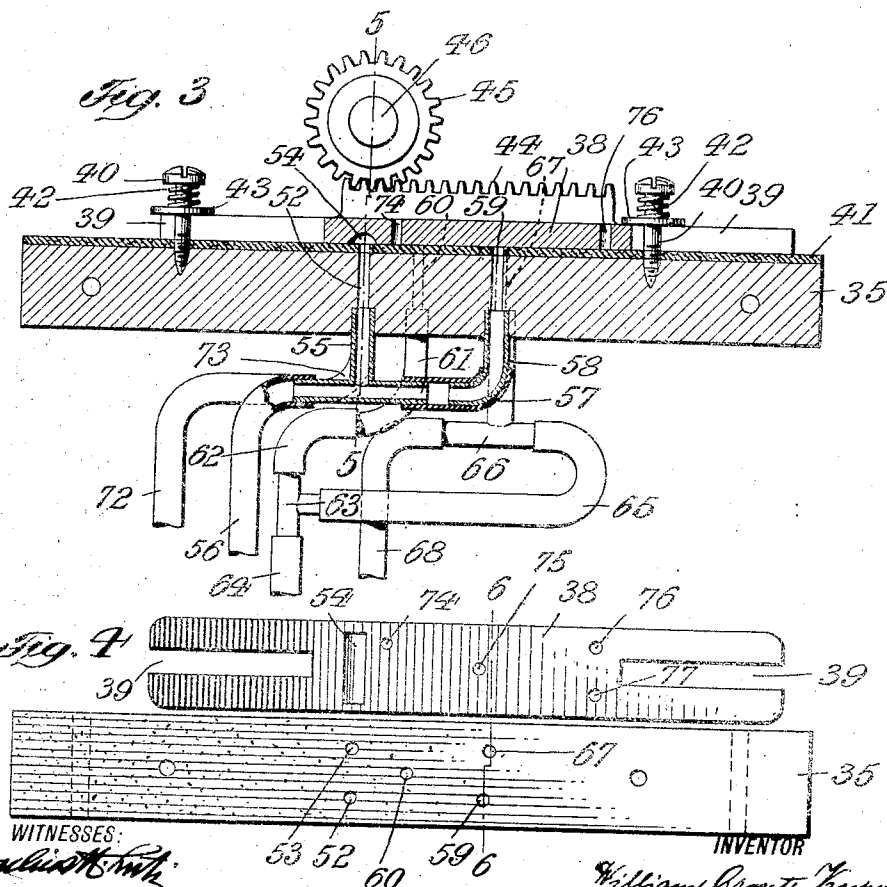
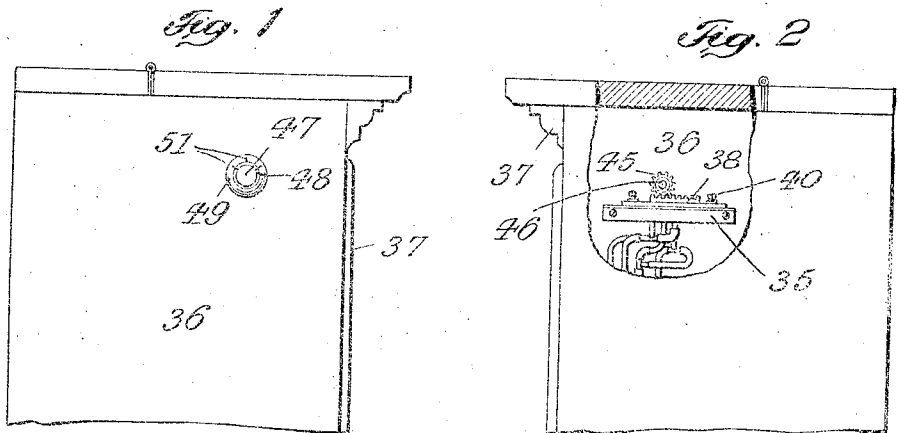


W. A. KUPP,
TONE SOFTENING MECHANISM FOR AUTOPNEUMATIC PIANOS.
APPLICATION FILED JUNE 17, 1912.

1,056,034.

Patented Mar. 18, 1913.

2 SHEETS—SHEET 1.



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Daniel H. [Signature]

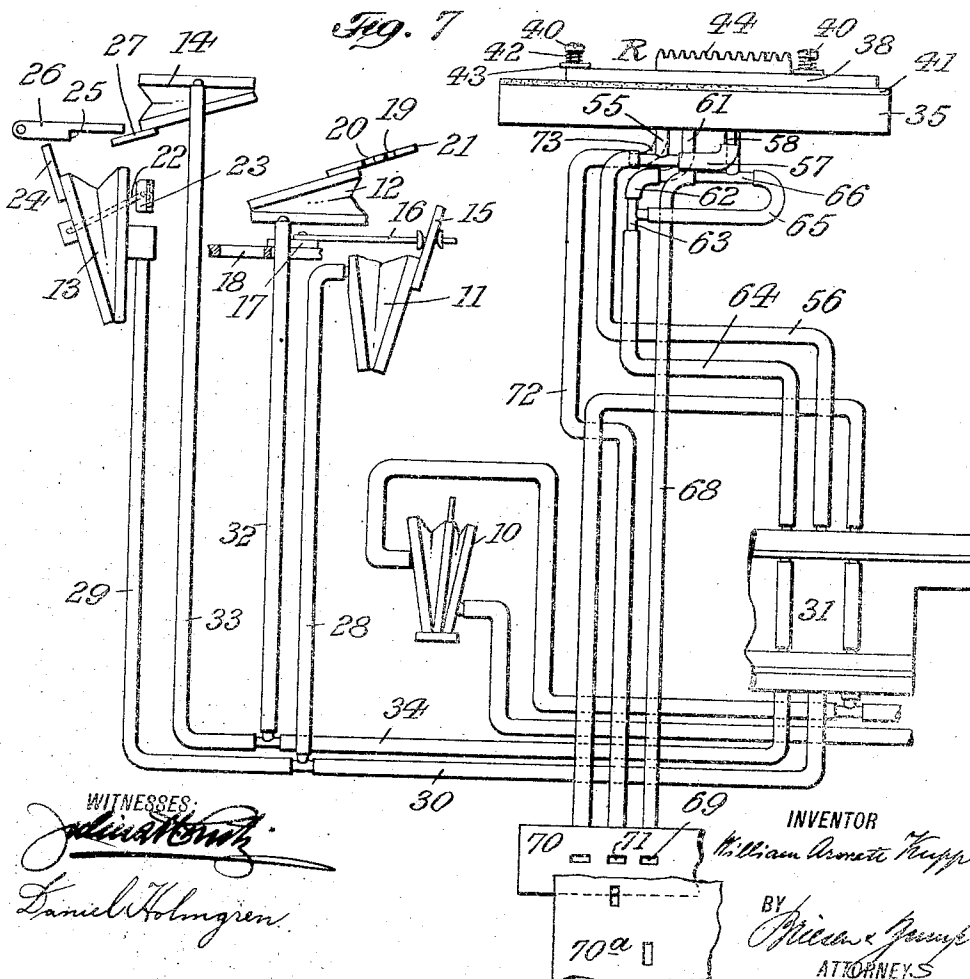
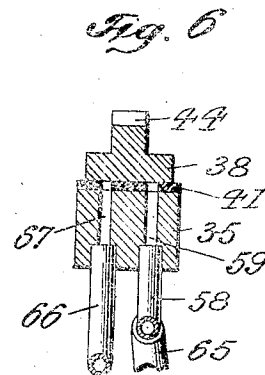
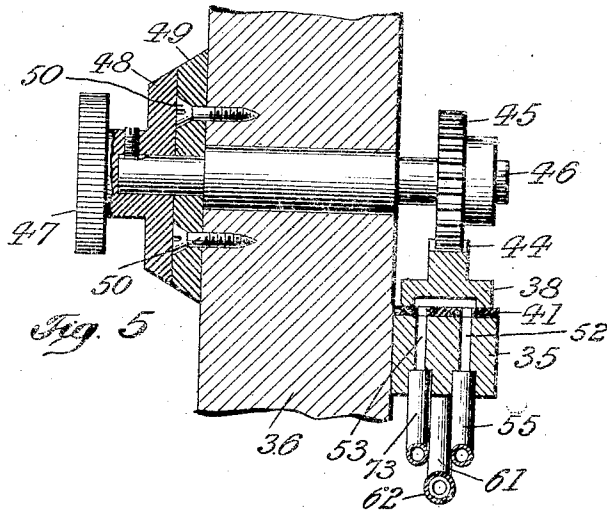
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2 SHEETS—SHEET 2.



WITNESSES:
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WILLIAM ARMETT KUPP, OF ST. JOHNSVILLE, NEW YORK, ASSIGNOR TO F. ENGEL-
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TONE-SOFTENING MECHANISM FOR AUTOPNEUMATIC PIANOS.

1,056,034.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed June 17, 1912. Serial No. 704,032.

To all whom it may concern:

Be it known that I, WILLIAM ARMETT KUPP, a citizen of the United States, residing at St. Johnsville, county of Montgomery, and State of New York, have invented a new and Improved Tone-Softening Mechanism for Autopneumatic Pianos, of which the following is a specification.

This invention relates to improvements in coin-controlled autopneumatic pianos and comprises more particularly novel means for subduing the sound whenever desired. An instrument to which the invention is applicable is for instance described in Patent #989,152 granted to A. J. Hobart on April 11th, 1911 in which additional sets of perforations in the tune sheet control corresponding openings in the tracker bar that are in turn connected to the valves and bellows of the expression device.

According to the present invention novel manually operable means are interpolated between the tracker bar-openings and said valves and bellows, which permit a regulation of the expression at will and independent of the automatic regulation performed by the music sheet.

In the accompanying drawings: Figure 1 is a left hand side view of a part of a piano embodying my invention; Fig. 2 a right hand side view partly in section thereof; Fig. 3 a longitudinal section through the expression regulator proper and cooperating parts; Fig. 4 a plan of the duct block, showing the slide detached and reversed; Fig. 5 a cross section on line 5-5, Fig. 3; Fig. 6 a similar section through the block and slide on line 6-6, Fig. 4, and Fig. 7 a diagram showing the tubing between the several pneumatics.

The pneumatics or bellows 10, 11, 12, 13, 14, illustrated in Fig. 7 correspond in all respects to the bellows 137, 161, 167, 172, 178 illustrated in Fig. 19 of the patent hereinabove referred to, the bellows 10 being actuated for rewinding the tune sheet and not forming part of the present invention. The movable board of bellows 11 carries a finger 15 which is by rod 16 connected to a slide valve 17 constituting an expression regulator and adapted to partially or fully close an opening 18 which is in turn adapted to establish communication between the main vacuum chamber and the hammer actuating bellows. This chamber and the bel-

lows are not shown because not forming part of the present invention, they being however fully disclosed in the patent above cited. Valve 17 is adapted to be locked either in a half-closed or in a fully-closed position by its finger 15 engaging respectively the first notch 19 or the second notch 20 of an arm 21 carried by the movable board of trip bellows 12.

The movable board of bellows 13 is by link 22 connected to the hammer rail 23 of the piano action, said board also carrying a finger 24 which is adapted to engage the shoulder 25 of a gravity lever 26. The free end of this lever rests upon a plate 27 projecting from the movable board of trip bellows 14. Bellows 11, 13 are respectively connected by tubes 28, 29 and a common tube 30 to the box 31 containing the bellow-actuating valves, while trip bellows 12, 14 are respectively connected by tubes 32, 33 and a common tube 34 to corresponding valves of box 31, all as fully disclosed in the above cited patent. In the latter however, the bellow-actuating valves are shown to be directly connected to the tracker bar, while with the present invention, a manually operable sound controller R is interpolated between said valves and the tracker bar. Controller R consists of a perforated block 35 secured preferably to the inner face of one of the side plates 36 that form part of a piano case 37. Upon block 35 is slidably mounted a valve 38 provided at each end with a guide slot 39 adapted for the accommodation of screws 40, tapped into block 35, a layer 41 of felt or similar soft material being advantageously interposed between the block and valve. In order to permit an easy play of the latter while maintaining a close contact between the valve and block, springs 42 are fitted on screws 40 between the screw-heads and washers 43. Valve 38 is provided with a rack 44 into which meshes a pinion 45 fast on a spindle 46 that passes through plate 36 and carries at its outer end a knob 47. The latter is preferably provided with a beveled circular plate 48 abutting against a similarly beveled disk 49 secured to plate 36 by screws 50, the bevels of parts 48, 49 carrying suitable markings 51 that visibly indicate the position of slide valve 38.

Block 35 is provided with a pair of transversely aligned perforations or ducts 52, 53

that are connected by a transverse bottom groove 54 of valve 38 during the normal play of the instrument, in which event the parts occupy the position illustrated in Fig. 3.

5 Duct 52 communicates with a T-shaped coupling-member 55 fitted into block 35. Coupling 55 is by a tube 56 connected to corresponding valves contained in box 31, which valves are in turn connected to the tube 30 hereinabove referred to. Coupling 10 55 is further by tube 57 connected to an elbow 58 fitted into block 35 and communicating with a duct 59 thereof. When the parts occupy the position illustrated in Fig. 3, duct 59 is closed by an imperforate portion of valve 38, so as to prevent air from entering tube 56.

Intermediate ducts 52, 53 and duct 59, there is provided in block 35 an additional duct 60 which communicates with an elbow 20 61. The latter is in turn by tube 62 connected to a T-shaped coupling 63 which is by tube 64 connected to those valves in box 31 that cooperate with the tube 34. Coupling 63 is further connected by tube 65 with a T-shaped coupling 66 which is fitted into block 35 and communicates with a duct 25 67 thereof. Coupling 66 is by tube 68 connected to an opening 69 of tracker bar 70, said opening being controlled by the usual tune sheet 70^a. Another opening 71 of this bar is by tube 72 connected to an elbow 73 fitted into block 35 and communicating with the duct 53 hereinabove referred to.

35 It will be seen that when the parts occupy the position illustrated in Fig. 3, permanent communication will be established between tracker bar-opening 69 and the valves of box 31 pertaining to bellows 12 and 14, said communication being formed through 40 the parts 68, 66, 65, 63 and 64. In like manner, a permanent communication will be established between tracker bar-opening 71 and the valves pertaining to bellows 11 and 13 through the parts 72, 73, 53, 54, 52, 55 and 56. It is thus evident that the addition of controller R does in no wise interfere with the normal play of the instrument whenever the openings 69, 71 are uncovered by 45 corresponding perforations of the tune sheet in order to automatically alter the expression of the instrument as fully described in the above cited patent #989,152.

If it is desired to mellow the tone of the 55 instrument for a certain length of time, so as not to interfere with say the use of a telephone or for other reasons, knob 47 is turned to an extent indicated by a corresponding marking on plate 18 and disk 49 during 60 which movement a vent 74 of valve 38 will have temporarily registered with duct 52, to admit atmospheric air in said duct. Owing to the entrance of air into duct 52 and tube 56, the corresponding valves (not 65 shown) of box 31 will be actuated to collapse

bellows 11 and 13, bellows 11 being maintained in their partly collapsed condition by the engagement of their finger 15 with first notch 19 of arm 21, while bellows 13 are maintained collapsed owing to the engagement of their finger 24 with shoulder 25 of lever 26. By the partial collapse of bellows 11, valve 17 is partly closed, so as to reduce the vacuum in the action bellows, thereby reducing the force of the hammer stroke. Through the collapse of bellows 13, the hammer rail 23 is raised to reduce the hammer-stroke, so that by the joint action of bellows 11, 13; the loudness of the tone will be reduced corresponding to a 80 "soft" or "piano" playing. If it is desired to still further reduce the expression of the piano by playing "pianissimo" instead of "piano", knob 47 is turned so as to bring valve 38 into its terminal left hand position, during which movement a vent 75 of said valve will have temporarily registered with duct 60, so as to admit air into tube 64 and thus actuate the corresponding valves in box 31 and thereby cause a collapse 90 of trip bellows 12, 14. The fingers 15, 24 will thus be freed to permit an expansion of bellows 11, 13 thereby returning the parts 17 and 23 to their original positions. After vent 75 has cleared duct 6, a pair of transversely aligned vents 76 and 77 will come into alinement with ducts 59 and 67 respectively. 95

As is apparent from Fig. 4, the duct 59 is slightly out of transverse alinement with duct 67, so that during the movement of valve 38 toward the left, duct 67 will be uncovered by vent 77 slightly prior to the uncovering of duct 59 by vent 76, the mutual arrangement of the ducts however being such that both ducts are jointly uncovered for a certain length of time. 100 105

It will be seen that while valve 38 is slid toward the left (Fig. 3) air will first be admitted through parts 77, 67, 66, 65, 63, 64 to the valves of trip bellows 12, 14. Immediately after the completion of this operation, duct 59 will be uncovered to admit air through the parts 76, 59, 58, 57, 55, 56 to the valves of bellows 11 and 13. As trip bellows 12 are thus collapsed prior to the collapse of bellows 11, finger 15 will pass over the first notch 19 and will engage the second notch 20 of lever 21. As bellows 12 as well as bellows 14 are expanded prior to the expansion of bellows 11, 13, the latter will be locked in their collapsed state by notch 20 and shoulder 25 respectively. In this way, valve 17 is completely closed, the air being thus permitted to be withdrawn 125 from the hammer actuating bellows through a permanently opened additional port which is not shown because not forming part of the present invention, said port being fully disclosed in the above cited patent. In addi- 130

tion to the closing of valve 17, hammer rail 23 is raised to reduce the hammer stroke, thus causing the desired "pianissimo" play of the instrument. If the expression is to be again automatically regulated by the tune sheet, knob 47 is turned in the reverse direction, thereby returning slide valve 38 to its original position illustrated in Fig. 3.

It will be seen that by my invention novel and effective means are provided for mel-
lowing the tone of a selfplaying pneumatic piano to a greater or less extent, and also for any length of time desired, so that the volume of tone may at all times be controlled without regard to the expression regulation of the tune sheet.

I claim:

1. A tone-softening mechanism for auto-pneumatic pianos comprising an expression regulator, first bellows operatively connected thereto, second bellows having means for locking the first bellows in their partly or fully collapsed position, a block having ducts that are operatively connected to both of said bellows, a valve controlling said ducts, and manually operable means for setting said valve.

2. A tone-softening mechanism for auto-pneumatic pianos comprising an expression regulator, first bellows operatively connected thereto, second bellows having means for locking the first bellows in their partly or fully collapsed position, a tracker bar having passages, a tune sheet controlling said passages, a block having first ducts that are operatively connected to the passages and second ducts that are connected to said first and second bellows, a valve controlling said

first and second ducts, and manually operable means for setting said valve.

3. A tone-softening mechanism for auto-pneumatic pianos comprising first bellows, tone-softening means controlled thereby, second bellows having means for maintaining the first bellows in the position to which they have been set, a tracker bar having passages, a tune sheet controlling said passages, a valve box connected to said first and second bellows, and a manually operable valve provided with first means for establishing free communication between the tracker bar-passages and valve box so as to render said bellows operable by the tune sheet, and with second means for rendering the bellows operable independent of the tune sheet.

4. A mechanism of the character described, comprising a valve block having a pair of transversely aligned first perforations, a second perforation, and a pair of transversely overlapping third perforations, a valve slidably engaging said block and provided with a groove that is adapted to establish communication between the first perforations, and with a number of perforations that are adapted to consecutively connect the second and third ducts with the atmospheric air, a rack on said valve, a pinion engaging said rack, a knob, a spindle on which said pinion and knob are mounted, and means cooperating with the knob for visibly indicating the position of the valve.

WILLIAM ARMETT KUPP.

Witnesses:

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MARVIN FLANDERS.