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M. A. AROSTEGUI

1,831,734

MEANS FOR SUSTAINING PIANO NOTES IN CHORDS OR OCTAVES

Filed July 15, 1930

4 Sheets-Sheet 1

Fig. 1.

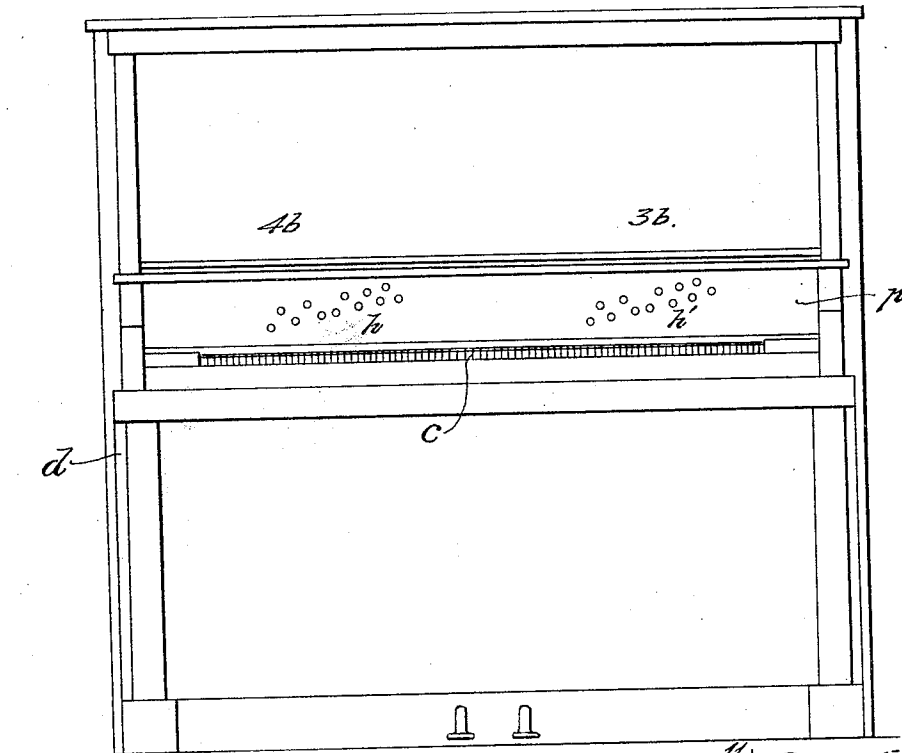


Fig. 2.

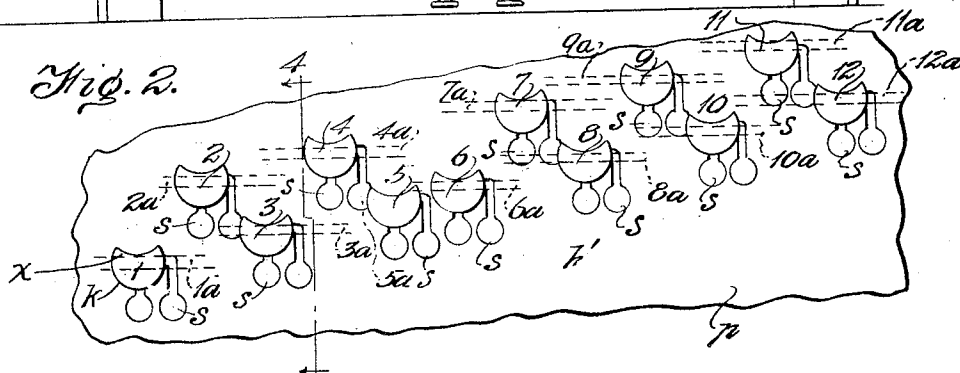
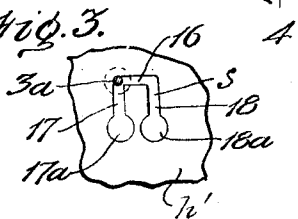


Fig. 3.



INVENTOR.
M. A. Arostegui
BY
Robert Watson
ATTORNEYS.

Nov. 10, 1931.

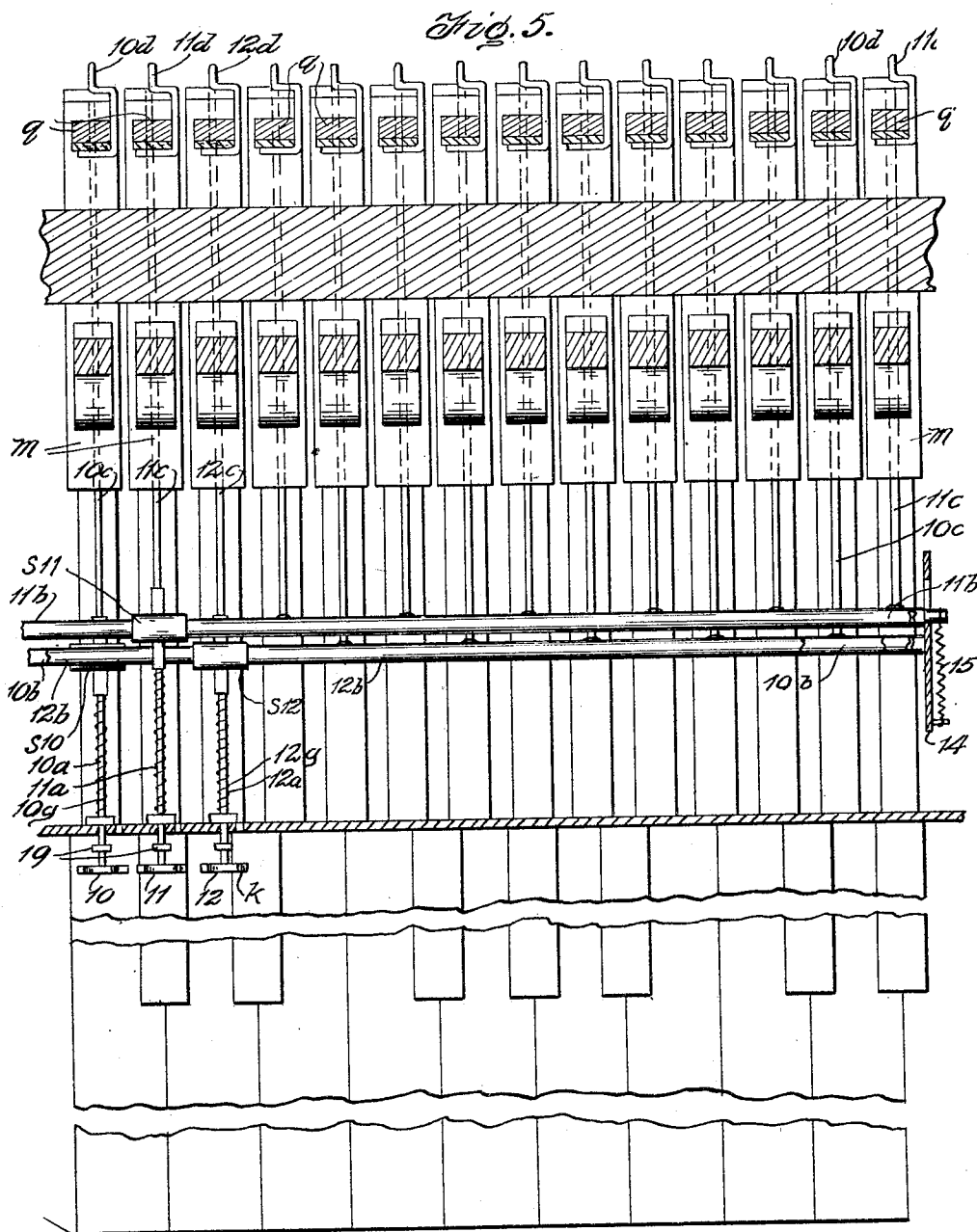
M. A. AROSTEGUI

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4 Sheets-Sheet 3



INVENTOR.

INVENTOR.
BY *M. A. Arastegui*
Robert Heaton
ATTORNEYS.

Robert Heaton

ATTORNEYS.

Nov. 10, 1931.

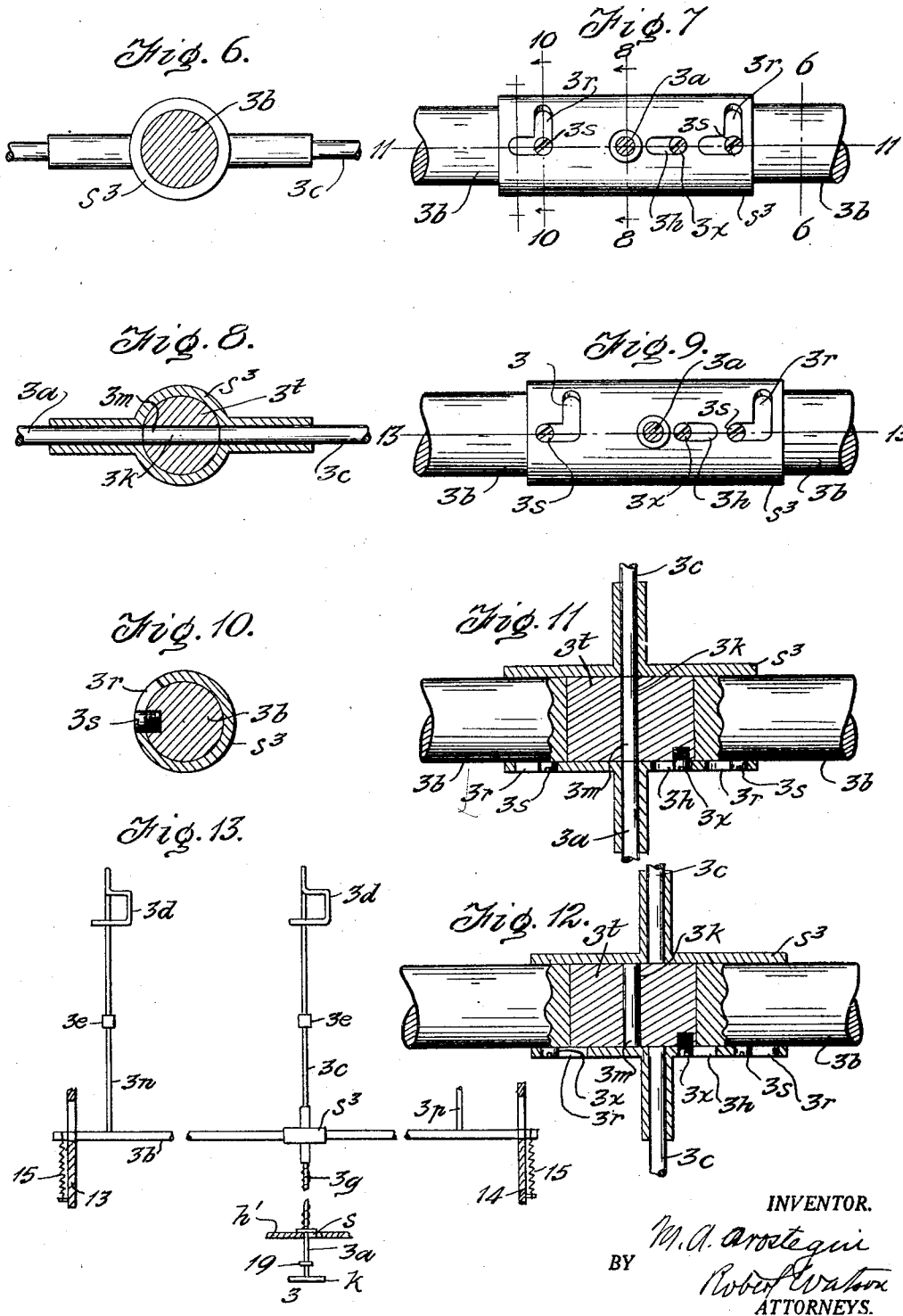
M. A. AROSTEGUI

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MEANS FOR SUSTAINING PIANO NOTES IN CHORDS OR OCTAVES

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

MARIA A. AROSTEGUI, OF MATANZAS, CUBA

MEANS FOR SUSTAINING PIANO NOTES IN CHORDS OR OCTAVES

Application filed July 15, 1930. Serial No. 468,158.

This invention relates to improvements in pianos, whereby the sounds of single notes, or of groups of notes in chords or octaves may be sustained, while the hands of the operator are free to play on the keyboard and the feet are free to operate the pedals in the accustomed manner.

In carrying out the invention, I provide two groups of auxiliary keys, one above the bass side of the piano keyboard, and the other above the treble side, each group consisting of twelve keys. Each auxiliary key is movable into one position to operate a single piano action, and into another position to operate two or more actions, for playing chords or octaves. When moved to these positions and pushed inwardly, the dampers of the piano actions are held off of the piano strings so that the strings may continue to vibrate, and in these positions the auxiliary keys are locked, so that both of the operator's hands are free to play on the keys of the main keyboard and the feet are free to operate the pedals in the usual manner, while the notes caused by the operation of the auxiliary keys will be sustained.

Each auxiliary key is connected to a clutch sleeve on a shaft which extends transversely of the main keys in front of the piano actions, and these shafts are mounted for rocking movement and also horizontal sliding movement. The clutch sleeve may be rocked without moving the shaft by a straight downward movement of the auxiliary key, and connected to the sleeve is a rod which operates a piano action and is also movable by the key to hold the damper of said action off of the piano strings. If the auxiliary key is moved laterally from its normal position, and then downwardly, the clutch sleeve interlocks with the shaft and rocks it. To the shaft are connected several rods which operate several piano actions corresponding to octaves, and an inward movement of the auxiliary key, which is made simultaneously with the downward movement, causes these rods to hold the dampers of the several actions out of engagement with the piano strings. The keys automatically lock in the lowered positions, so that the notes are sustained.

In the accompanying drawings,

Fig. 1 is a front elevation of an upright piano showing the groups of stops for controlling the dampers;

Fig. 2 is an enlarged front view of part 55 of the piano casing and one group of stops;

Fig. 3 is a detail view showing one of the slots through which the damper controlling rods extend;

Fig. 4 is a section on the line 4—4 of Fig. 60 2, showing the three left hand stops of a group;

Fig. 5 is a horizontal section through a part of the piano about on the line 5—5 of Fig. 4, but showing only the three right hand 65 stops of a group;

Fig. 6 is a section through one of the rocking bars, on the line 6—6 of Fig. 7;

Fig. 7 is a front elevation of parts of a rocking bar, with the coupling sleeve in normal position;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a view similar to that shown in Fig. 7, showing the coupling sleeve in position to rock the bar;

Fig. 10 is a section on the line 10—10 of Fig. 7;

Fig. 11 is a section on the line 11—11 of Fig. 7;

Fig. 12 is a section on the line 13—13 of 80 Fig. 9; and,

Fig. 13 is a plan view, on a small scale, of one of the auxiliary keys and associated parts.

In Fig. 1 of the drawings, the piano P 85 is shown with two groups of auxiliary keys h and h' on the front board p , above the main keyboard, the group h being arranged over the bass side of the keyboard and the group h' being arranged over the treble side. One of the groups, h' , is shown on a larger scale in Fig. 2 and for convenient reference these are numbered from 1 to 12, inclusive.

The individual keys of the boards which they operate are alike, so that a description 95 of one key and the parts associated with it will answer for all, and for this reason and also because to show all of the parts associated with all of the keys would complicate and obscure the drawings, I have shown in 100

Fig. 4 only the first three keys in the group h , and in Fig. 5 the last three keys of this group.

Each auxiliary key comprises a knob k which is preferably in the form of a disk having a concave upper edge, as shown, so that the operator's fingers may readily position themselves on the keys to depress them either singly or in groups. These knobs are mounted on the ends of rods or stems which project through slots s , of inverted U-form, in the front board p , one of the slots being shown in detail in Fig. 3, with one of the rods 3^a in its normal position in the slot. The key 3 in Figs. 2, 4 and 13 may be referred to for illustration. It comprises the knob k mounted on the end of the rod or stem 3^a which projects through one of the slots and extends into a tubular fitting on a clutch sleeve s^3 , which is mounted on a rock shaft 3^b . This clutch sleeve is shown in detail in Figs. 6-12, inclusive, of the drawings, and will be hereinafter more fully described. From the opposite side of the clutch sleeve s^3 , a rod 3^c extends below the lever m , which operates the hammer n and the damper o in an ordinary piano action, and thence extends upwardly behind said lever and has a hooked end 3^d which extends in front of the damper lever q . The rod 3^c is provided with a boss 3^e , below the lever m , as shown. This auxiliary key mechanism does not interfere with the operation of the piano action by the corresponding piano key d on the main key-board.

It will be evident that if the rod 3^a is rocked downwardly in one arm of the U-shaped slot through which it extends, the damper controlling rod 3^c will be rocked upwardly and the boss 3^e , striking the lever m of the piano action, will cause the hammer to strike the wire 3^f and the damper o to be moved away from the wire. Simultaneously with the downward movement of the auxiliary key 3, the operator pushes the key inward against the pressure of a spring 3^g and the rod 3^c is pushed rearward so that its hooked end 3^d operates to hold the damper o out of engagement with the wire 3^f , thus causing the note to be sustained.

The rock shaft 3^b is in two parts, as shown in Figs. 11 and 12, and the clutch sleeve s^3 surrounds the adjacent ends of the shaft. Within the sleeve is a cylindrical part 3^i , of the same diameter as the shaft and against which the ends of the shaft abut. The sleeve is connected to this part by a set screw 3^j which extends through a longitudinal slot 3^h . Hence the sleeve may slide longitudinally on the shaft from the position shown in Fig. 11 to the position shown in Fig. 12; but if the key stem 3^a is moved vertically the part 3^i will rock with it. The part 3^i has a diametrical bore 3^k which is in alinement with the stem 3^a and the rod 3^c when the sleeve is in

the position shown in Fig. 11, and in this perforation is a short rod 3^m through which backward movement of the stem 3^a is transmitted to the damper controlling rod 3^c . If the sleeve is moved to the right, as indicated in Fig. 12, the short rod or pin 3^m will be out of line with the stem 3^a and rod 3^c , and hence, a backward movement of the stem will cause the shaft to move backward. To permit of this movement, the outer ends of the shaft are mounted in horizontally slotted supports 13 and 14 and are held in forward position by springs 15. In addition to the damper controlling rod 3^c the shaft carries two other damper controlling rods 3^n and 3^p , spaced so as to control the dampers of keys an octave below and an octave above the key with which the rod 3^c is associated. The clutch sleeve has two right-angled slots 3^r near its ends, and set screws 3^s extend through these slots into the ends of the shaft sections, as shown. When the sleeve is in normal position, shown in Figs. 7 and 11, these set screws will be at the angles of the slots, and it will be evident that if the key stem 3^a is rocked downwardly, the sleeve will turn about the shaft without rocking the latter; but if the sleeve is moved to the right, so that the set screws 3^s will lie in the horizontal parts of the slots, as illustrated in Figs. 9 and 12, and the key stem is then rocked downwardly, the shaft sections will rock with the sleeve and stem and the several damper controlling rods on the shaft will rock in unison to operate the piano actions of keys an octave apart, and if the key stem is pushed rearwardly the damper controlling rods will hold the several dampers away from the piano wires.

Each of the slots s in the front part of the piano, through which the auxiliary key stems extend, as best shown in Fig. 3, has a horizontal part 16 connecting two downwardly extending parts 17 and 18, and the latter having enlargements 17^a and 18^a at their lower ends. The key stem normally rests at the left hand end of the horizontal part of the slot, from whence it can quickly be moved downwardly in the left hand leg of the slot, or horizontally, and then downwardly in the right hand leg of the slot. When the key stem is moved downwardly in the leg 17 and then pushed rearwardly, only the rod 3^c will be operated; but if the key stem is moved to the right and then downwardly and inwardly in the leg 18 of the slot, the shaft 3^b will be moved backwardly and rocked so that the several rods attached to the shaft will be simultaneously operated.

When a key stem is moved downwardly and pushed inwardly, it will lock in its lower position by the entrance of a collar 19 on the stem into one of the enlargements 17^a or 18^a of the slot, and thus the notes will be sustained while the operator's hands are free

to play on other keys of the piano and the feet are free to operate the pedals.

In Fig. 5, the auxiliary key 11 is shown with its key stem 11^a connected to the clutch sleeve s¹¹ on a sectional shaft 11^b, to which two damper controlling rods 11^c, an octave apart, are connected; and the key 12 has its stem 12^a connected to the clutch sleeve s¹² on a sectional rod 12^b, to which several damper controlling rods 12^c, an octave apart, are connected. Similarly, the key 10 has its stem 10^a connected to the clutch sleeve s¹⁰ on a sectional rod 10^b, to which the damper controlling rods 10^c, an octave apart, are connected. The shafts may have two or more damper controlling rods, so as to control dampers in one or several octaves as may be desired.

The auxiliary keys can be actuated by a quick downward movement and released by a quick upward movement of the fingers, a slight backward pressure being applied to the keys when they are being depressed and a forward pull being applied when they are released.

While I have shown the invention applied to an upright piano, it will be evident that it can be applied with suitable modification to other types, such as grand pianos. It will also be evident that the necessary parts can be made and applied to any piano at relatively small expense.

In the drawings groups of auxiliary keys, twenty-four keys in all, are shown, and by means of these all of the octaves can be played; but if desired the number of auxiliary keys may be made to correspond with the number of keys on the keyboard and each auxiliary key can be made to play only one octave, or one individual note.

What I claim is:

1. In a piano, an auxiliary key adapted to operate an individual piano action, and means controlled by said key for operating several piano actions in chords or octaves, and for holding the dampers associated with said actions off of the piano strings.

2. In a piano, a group of auxiliary keys, each adapted to operate an individual piano action, and means operable by each key for actuating several piano actions in chords or octaves.

3. In a piano, a group of auxiliary keys, each adapted to operate an individual piano action, and means operable by each key for actuating several piano actions in chords or octaves and for holding the dampers associated with said actions off of the piano strings.

4. In a piano, an auxiliary key, a rock shaft movable by said key and rods movable with the shaft for operating several piano actions simultaneously in chords or octaves.

5. In a piano, an auxiliary key, a rock shaft movable by said key and rods movable with the shaft for operating piano actions in chords

or octaves and adapted to hold the dampers associated with said actions off of the piano strings.

6. In a piano, a rock shaft extending transversely over the keyboard, rods connected to said shaft for operating piano actions in chords or octaves and adapted to hold the dampers of said actions away from the piano wires, and an auxiliary key for rocking said shaft and moving it rearwardly.

7. In a piano, a two-part rock shaft extending transversely over the keyboard, a clutch sleeve surrounding the adjacent ends of said shaft, an auxiliary key adapted to rock said sleeve and move it laterally, means for locking said sleeve to the shaft when the sleeve is moved laterally from normal position, and rods on said sleeve and shaft for operating piano actions in chords or octaves.

In testimony whereof I affix my signature.

MARIA A. AROSTEGUI.