

A. J. OSSWALD.

PIANO.

APPLICATION FILED MAY 23, 1912.

1,063,584.

Patented June 3, 1913.

4 SHEETS—SHEET 2.

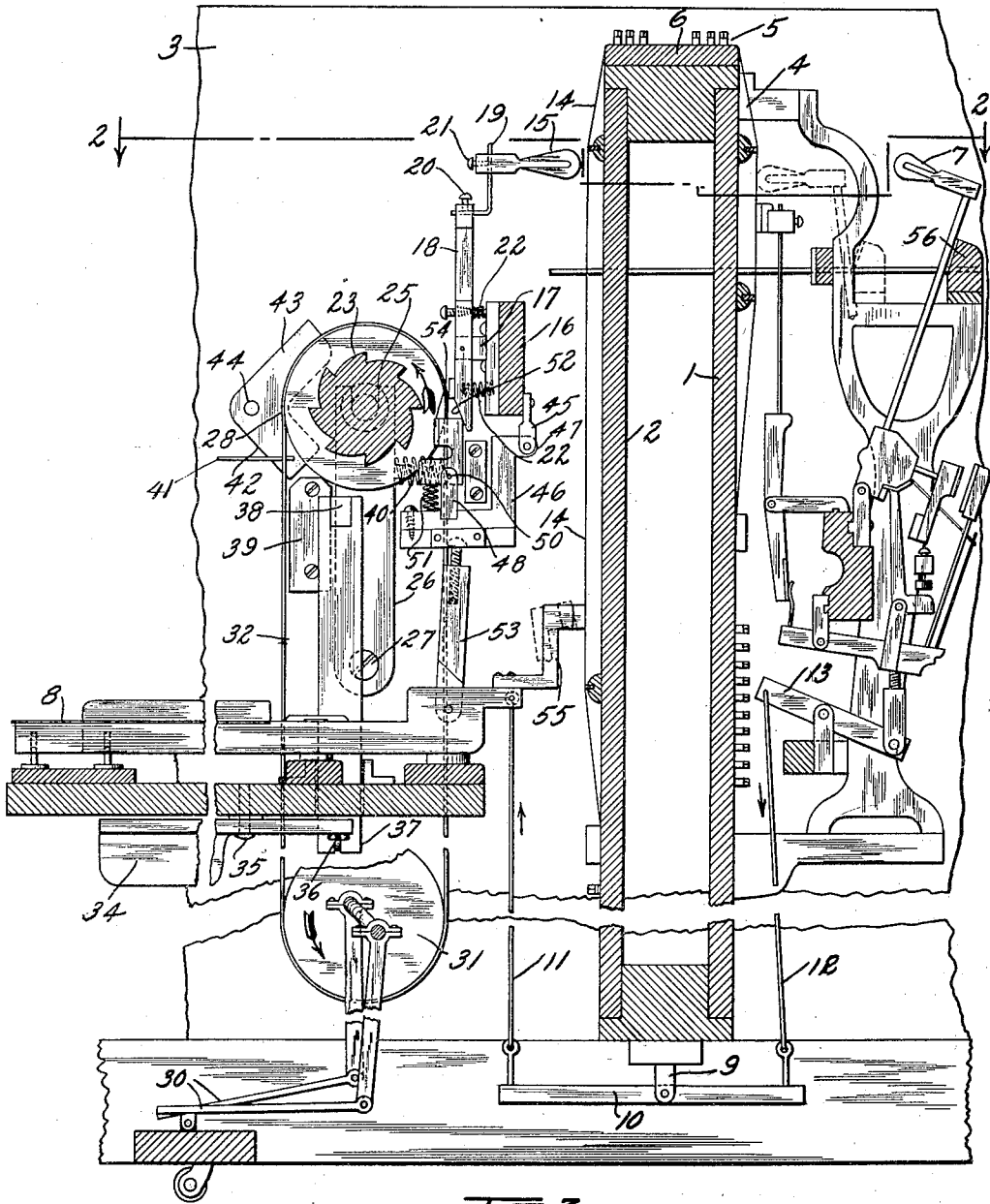


FIG. 3.

WITNESSES:

A. J. Oswald

Ernest Miller

INVENTOR

Alfred J. Oswald

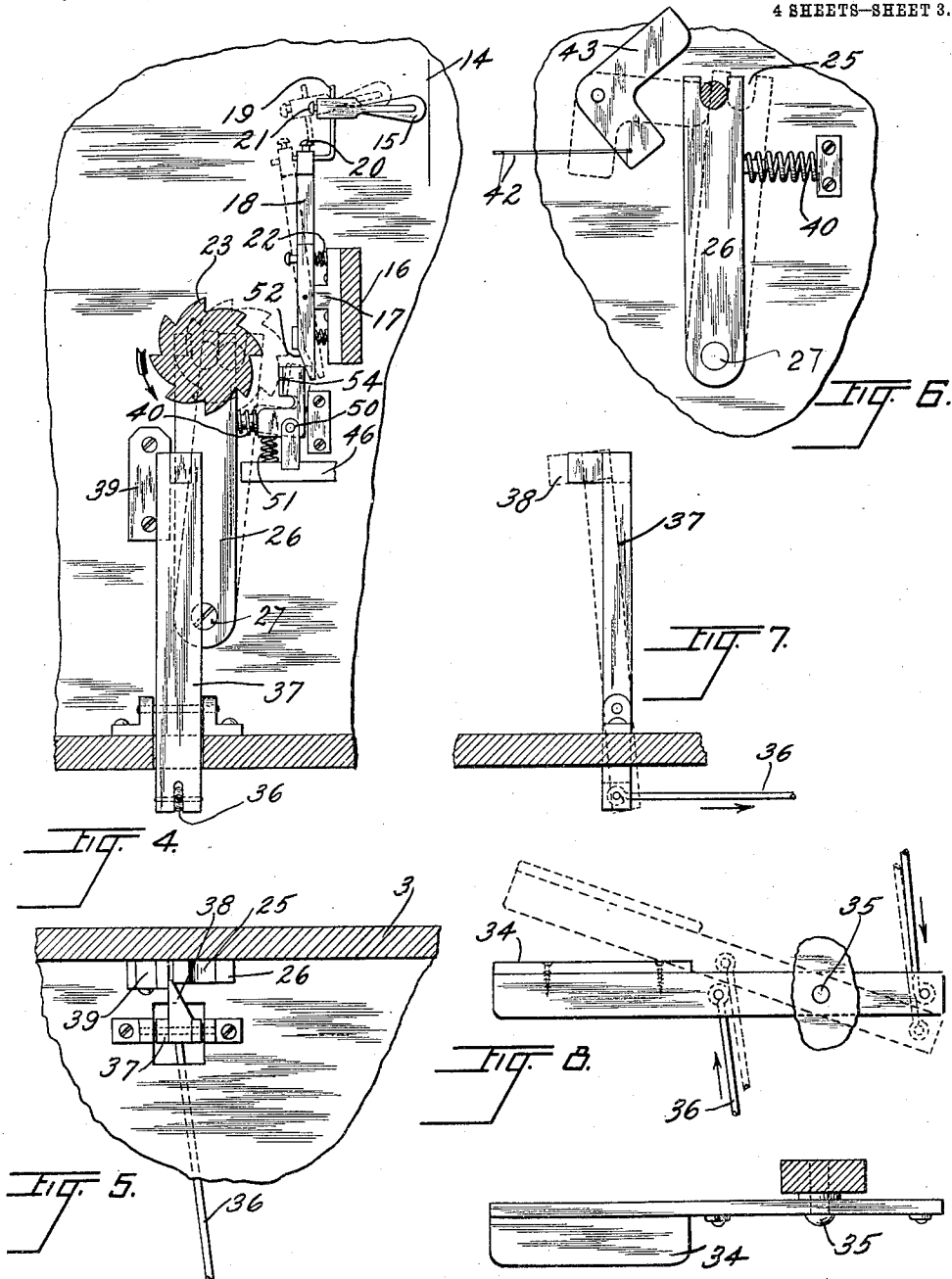
BY *Rolla Klaty*

ATTORNEY

1,063,584.

Patented June 3, 1913.

4 SHEETS—SHEET 3.



WITNESSES:

R. J. Owen

Ernest Keller

FIG. 9.

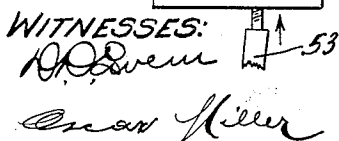
INVENTOR
Alfred J. Oswald

BY *Robert Klotz*
ATTORNEY

PIANO.

1,063,584.

4 SHEETS--SHEET 4.



BY *Rockwell*
ATTORNEY

UNITED STATES PATENT OFFICE.

ALFRED J. OSSWALD, OF CHICAGO, ILLINOIS.

PIANO.

1,063,584.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed May 23, 1912. Serial No. 699,124.

To all whom it may concern:

Be it known that I, ALFRED J. OSSWALD, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Pianos, of which the following is a specification.

The essential object of this invention is to provide a piano which is provided with two sounding boards and two sets of hammers operated from a single set of keys, the musical effect produced by one set of strings differing from that produced by the other set of strings and the hammers engaging the same.

In the drawings, Figure 1 is a perspective view of the front of a piano constructed as hereinafter described; Fig. 2 is a horizontal sectional view taken on the line 2—2, Fig. 3; Fig. 3 is a vertical sectional view taken on the line 3—3, Fig. 2; Fig. 4 is a view partly in section and partly in elevation of part of the mechanism shown on the left hand side of Fig. 3; Fig. 5 is a view of one of the devices for controlling the rotating wheel shown in section in Figs. 3 and 4; Fig. 6 is a detailed view of another member serving the same purpose; Figs. 7, 8, and 9 are detailed views showing the mechanism for controlling the device depicted in Fig. 5; Fig. 10 is a top plan view showing the arrangement of the pegs to which the strings are secured and by which they are tuned; Fig. 11 is an elevation of the toothed wheel shown in section in Figs. 3 and 4; Figs. 12 and 13 are views showing the mechanism for driving the member depicted in Fig. 11; and Figs. 14 and 15 are detailed views of a part of the action.

The piano differs from the ordinary instrument in that it is provided with two sounding boards 1 and 2 which are suitably retained within the casing 3. Sounding-board 1 is provided with strings 4 secured upon pegs 5, which pegs are conveniently retained upon the wrest plank 6 which is set at right angles to the sounding-boards 1 and 2 and above the space between the sounding-boards. The hammers 7 which strike the strings 4, which are carried upon that sounding board on the side of the piano opposite to the keys 8, are controlled by the action best shown in Fig. 3, the same being an ordinary or standard piano action. The keys 8 are mounted in the usual way. Beneath the sounding-boards are the yokes 9

in which the levers 10 are pivotally mounted. Links 11 connect levers 10 to the keys 8, and links 12 connect the levers 10 to the levers 13. As any key 8 is depressed, therefore, its movement is communicated to the appropriate hammer 7, as will clearly appear from Fig. 3 of the drawings, and said hammers 7 are moved from the full line position in said Fig. 3 to the dotted line position, thus engaging the strings 4 and causing same to sound. The various devices depicted on the right-hand side of Fig. 3 constitute an ordinary piano, and the hammers 7 will produce the same tone and same musical effect as any ordinary piano. The fact that the hammers 7 and the action controlling the same are at the back of the instrument instead of in front as is usual is merely incidental and has no effect upon the tone of the instrument. The strings 4, which are engaged by the hammers 7 are upon the side of the sounding board opposite to the performer instead of upon the side nearest him, and each hammer 7 moves toward the performer when advancing to strike the string, instead of moving away from him. Viewing the instrument from the back, the strings 4 increase in length from left to right, whereas, in an ordinary piano, and even in this instrument with the strings 14, they decrease in length from left to right when looking toward the sounding board.

The sounding-board 2 which is upon the side adjacent the keyboard 8 is provided with strings or wires 14, the ends of which are wound upon pegs 5, and said wires 14 are adapted to be struck from time to time by the hammers 15. Extending longitudinally of the instrument is a plate 16 which bears as many yokes 17 as there are hammers 15, and to each yoke 17 a lever 18 is pivoted. The arm 19 is preferably made of some resilient substance, such as wire, and is clamped by adjusting screws 20 to lever 18 and by similar screws 21 to the hammer 15, it being obvious, therefore, that the hammer 15 is supported upon the rocking lever 18. Helical springs 22 are provided; there being one on each side of the yoke 17 and disposed between each lever 18 and the plate 16, the function of said springs being normally to hold the parts in the position shown in Fig. 3 and to return the hammer to that position after it has been moved. When the hammer, for example, is moved to the dotted line position in Fig. 15, one of the springs

22 will be compressed and the other will be expanded, and the tendency of said springs will be to return all parts to the full line position of said Fig. 3.

5 Extending longitudinally of the piano, with its axis in a substantially horizontal plane, is the toothed member 23 which carries the journals 24, which journals are received within the recesses 25 on the upper
10 ends of the yokes 26, each yoke 26 being pivoted at 27 upon the inside of the end-casing 3. The member 23 supports pulley 28, and the shaft 29, which is driven by the treadle 30, also bears a pulley 31. The belt 32 passes
15 over said pulleys 28 and 31 and thereby translates the motion of said treadle 30 into continuous rotation of the member 23, the shaft 29 being suitably journaled in the legs 33 of the piano or otherwise.

20 The yokes 26 are adapted to swing upon their pivots 27 so as to carry the member 23 toward or away from the sounding board 2. When the parts are in the full-line position shown in Figs. 4 and 5, the member 23
25 will rotate without producing any effect whatsoever, but when the parts are in the dotted line position of said Fig. 4, the same will be in operative position. Upon the under side of the keyboard the knee-piece 34
30 is pivoted at 35. The link 36 connects said knee piece to the lever 37. At its upper end said lever 37 carries the wedge 38 which is provided with one flat face and one beveled face. Upon the inner side of the end wall 3
35 the stud 39 is fixed, and the wedge 38 is adapted to be driven into the space between stud 39 and the rocking yoke 26. When the knee-piece is moved, said wedge 38 is forced toward the end 3 of the piano, advancing
40 from full line to dotted line position, Fig. 7, and thus the members 26 and the rotating toothed member 23 are likewise advanced and are carried from the full line position, Fig. 4, to the dotted line position in said
45 figure. The members 26 are adapted to move against the resistance of helical springs 40, which tend to return all parts to the full line positions of the various figures on the third sheet of the drawings, and
50 said springs will operate and return all parts to normal position as soon as the knee of the operator is withdrawn from engagement with the knee-piece 34.

It may be desirable from time to time to
55 keep the various members in the dotted line positions, Figs. 4 and 6, for a considerable length of time or for a longer time than would be convenient or comfortable for the operator to remain with his knee pressed
60 against the knee-piece 34. A stop or handle 41 projects outwardly above the keyboard, which stop 41 is connected by link 42 to the bell-crank 43, which is pivoted at 44 to the end wall 3. If the stop 41 be
65 pulled outwardly, the bell-crank is rocked

to the dotted line position in Fig. 6, thus forcing the yoke 26 to the dotted line position and the yoke 26 will be held in dotted line position until the stop 41 is released. If the stop 41 be pushed inwardly, the parts
70 are permitted to return to normal position, the return movement of the yokes 26 being effected by the helical spring 40.

The plate 16 carries ears 45, there being as many ears 45 and connected parts as there
75 are hammers 15. (See Fig. 15). In each ear 45 an L-shaped arm 46 is pivoted at 47. The horizontal arm of said L 46 supports a yoke 48 in which is pivoted the block 49, said block being adapted to have a limited
80 rotary or rocking movement upon the pin or pivot 50. A helical spring 51 is interposed between block 49 and the L 46. The lower end 52 of each member 18 is beveled and each block 49 bears against the beveled
85 face 52 of the appropriate member 18. When the outer end of any particular key 8 is depressed, the inner end is thereby lifted. To each key 8, adjacent its inner end is the
90 rod 53, there being a rod 53 between each key 8 and the L 46 which that key controls. (See Fig. 3.) Depression of any particular
95 key 8, therefore, causes the rod 53 to move in the direction of the arrow in Fig. 15, and this advances all parts from the position shown in full lines to the position shown in
100 dotted lines in said figure. It is obvious, of course, that no block 49 will be moved to the dotted line position in Fig. 15 unless the particular key 8 with which that block
105 is connected is depressed by the player.

The blocks 49 are set in alinement with each other, the axial line of the pins 50 being substantially parallel to the axis of the
110 rotatable member 23. When said member 23 is advanced to the dotted line position in Fig. 4, the teeth of said member 23 will ride over the edge 54 of each and every block 49 which may have been raised to the
115 dotted line position, Fig. 15. Each block 110 which has thus been raised is rocked upon its pivot and given a vibrating movement, the frequency of the vibrations depending upon the speed at which the operator is driving the treadle 30. Each vibration of
120 the block 49 will be communicated to the lever 18 which bears against said block and to the hammer 15 secured upon said lever; hence, if the treadle 30 be operated the
125 toothed member 23 will thus be driven, and if said member be moved toward the sounding board 2 by either of the devices which are adapted to rock the yoke 26, said
130 toothed member 23 will be in the position where it will engage each and every block 49 which may be elevated by the depression of the proper key 8. So long as any key 8 remains depressed and its block 49 thus retained in elevated position, a vibrating
135 movement is communicated to the appro-

appropriate hammer 15, which is thus caused to strike upon its spring 14 each and every time a tooth of the member 23 rides over the block 49. It is obvious, therefore, that the devices shown on the left side of Fig. 3 are adapted to produce a quick series of strokes or vibrations of the respective hammers 15 and thus to cause said hammers to strike repeatedly upon the strings 14. Each hammer 15 can thus be made to vibrate almost with the rapidity of an electric bell and at each movement to strike the strings 14.

Upon the extreme inner ends of the key 8 is a damper 55 (Fig. 3). When said key is depressed, the damper 55 is carried out of engagement with the string 14 and is held out of engagement so long as the key is depressed and the hammer 15 kept in operation, but when the finger of the operator is removed from the key and the parts are allowed to return to normal position, the damper 55 will touch the strings 14 and stop their vibration. Each key 8, it will be observed, is connected to one of the hammers 7 and to one of the hammers 15, and each depression of any particular key 8, therefore, is adapted to cause the hammer 7 which that key controls to strike once against the strings 4 and also to cause the hammer 15 which the same key controls to strike a great number of times against the strings 14, said number depending both upon the speed of revolution of the part 23 and the length of time during which the key 8 is held down.

The various hammers 7 are adapted to drop against the rest 56. The rods 57 project outwardly from said rest 56 to the front of the piano, being controlled by the stops 58 (Figs. 1 and 2). If said stops are pulled toward the player, the rest 56 is advanced from the full line position, Fig. 3, to the dotted line position in said figure, and the respective hammers 7 thereby advanced to the point where they will not be affected by the depression of the key 8. The members 56, 57, and 58, therefore, are adapted to serve the same function as the soft pedal in an ordinary piano, and in addition to move the hammers 7 to a point where they will remain unaffected by the operation of the keys 8. As previously noted, each key 8 is connected to and adapted to control one hammer 7 and one hammer 15, and preferably the wires 14, which are struck by any particular hammer 15, are pitched one octave higher than the wires 4 which are struck by that hammer 7 operated by the same key 8. The object of this arrangement is to prevent the hammers 15 from making such a loud noise as to drown out the music produced by the hammers 7.

If the player desires to play upon the strings 4 alone, and not play upon the strings

14, the hammers 15 can be permitted to remain inoperative and will so remain until such time as the player operates either the knee-piece 34 or the stops 41, or by simply omitting to operate the treadle the hammers 15 will remain idle. If, on the other hand, the operator desires to play only upon the strings 14, the hammers 7 can be forced to remain idle by moving the stops 58 so that the rest 56 is advanced to the dotted line position, Fig. 3. In this manner the operator can at will play upon both sets of strings and with both sets of hammers simultaneously, or he can operate either set which he chooses without affecting or operating the other set.

In the drawings the invention is depicted as being arranged with the vibrating hammers 15 upon that side of the instrument nearer the keyboard and the ordinary hammer 7 on that side farther removed from the keyboard. This arrangement, however, is a mere matter of convenience and it is by no means essential that said arrangement be preserved. Any arrangement by which the rotating member 23 may be caused to come into engagement with those parts controlling the vibrating hammers and to be removed from such engagement will suffice. It should also be understood that the action which is herein shown is not the only action which may be employed and that many changes in details of construction and arrangement of parts may be made without departing from the scope of the invention or of the various claims.

The member 23 must be of substantially the same length as the bank of hammers, and said member 23 is substantially a cylinder provided with a series of serrations upon its outer circumference or periphery. When said cylinder 23 is caused to revolve, the face 54 of each block 49 which has been raised to the dotted line position, Fig. 15, will be forced away from the cylinder 23 and into dotted line position, Fig. 4, each time that the crest of one of the serrations rides over said face 54. The block 49, however, will return to full line position, Fig. 4, as soon as the edge of the serration has passed beyond the block, said return to full line position, Fig. 4, being secured by the springs 22 and 51.

I claim as my invention:

1. A piano comprising a plurality of hammers, a rotatable serrated member, means for rotating the same, a rocking lever upon which each of said hammers is mounted, means intermediate said serrated member and said lever over which means the teeth of said rotatable member are adapted to ride, key-controlled means to carry said intermediate means into or out of engagement with said rotatable member, a pivoted yoke in which said rotatable member is mounted,

said rotatable member being normally out of reach of said intermediate members, and means engaging with said yoke and adapted to force said rotatable member into engagement with said intermediate member.

2. A piano comprising a plurality of hammers, a rotatable serrated member, means for rotating the same, a rocking lever upon which each of said hammers is mounted, means intermediate said serrated member and said lever over which means the teeth of said rotatable member are adapted to ride, key-controlled means to carry said intermediate means into or out of engagement with said rotatable member, a pivoted yoke in which said rotatable member is mounted, said rotatable member being normally out of reach of said intermediate members, a bell-crank pivotally mounted upon the piano and adapted to co-act with said yoke thereby to force said serrated member toward said intermediate members, and means for operating the bell-crank.

3. A piano comprising a plurality of hammers, a rotatable serrated member, means for rotating the same, a rocking lever upon which each of said hammers is mounted, means intermediate said serrated member and said lever over which means the teeth of said rotatable member are adapted to ride, key-controlled means to carry said intermediate means into or out of engagement with said rotatable member, a pivoted yoke in which said rotatable member is mounted, said rotatable member being normally out of reach of said intermediate members, a

spring against the resistance of which said yoke is adapted to move, a bell-crank adapted to engage with said yoke thereby to force said serrated member toward said intermediate members, and means for operating the bell-crank.

4. A piano comprising a plurality of hammers and two sets of strings, a rotatable serrated member, means for rotating the same, a rocking lever upon which each of said hammers is mounted, means intermediate said serrated member and said lever over which means the teeth of said rotatable member are adapted to ride, key-controlled means to carry said intermediate means into or out of engagement with said rotatable member, a pivoted yoke in which said rotatable member is mounted, said rotatable member being normally out of reach of said intermediate members, means co-acting with said yoke and adapted to force said rotatable member into engagement with said intermediate member, a pair of hammers, one adapted to move in one direction and the other adapted to move in the opposite direction, and means for operating said second-mentioned hammer by means of the same key which operates the hereinbefore mentioned key-controlled means.

In testimony whereof I have hereunto affixed my name in the presence of two witnesses.

ALFRED J. OSSWALD.

Witnesses:

ANGELINE OSSWALD,
ROBT. KLOTZ.