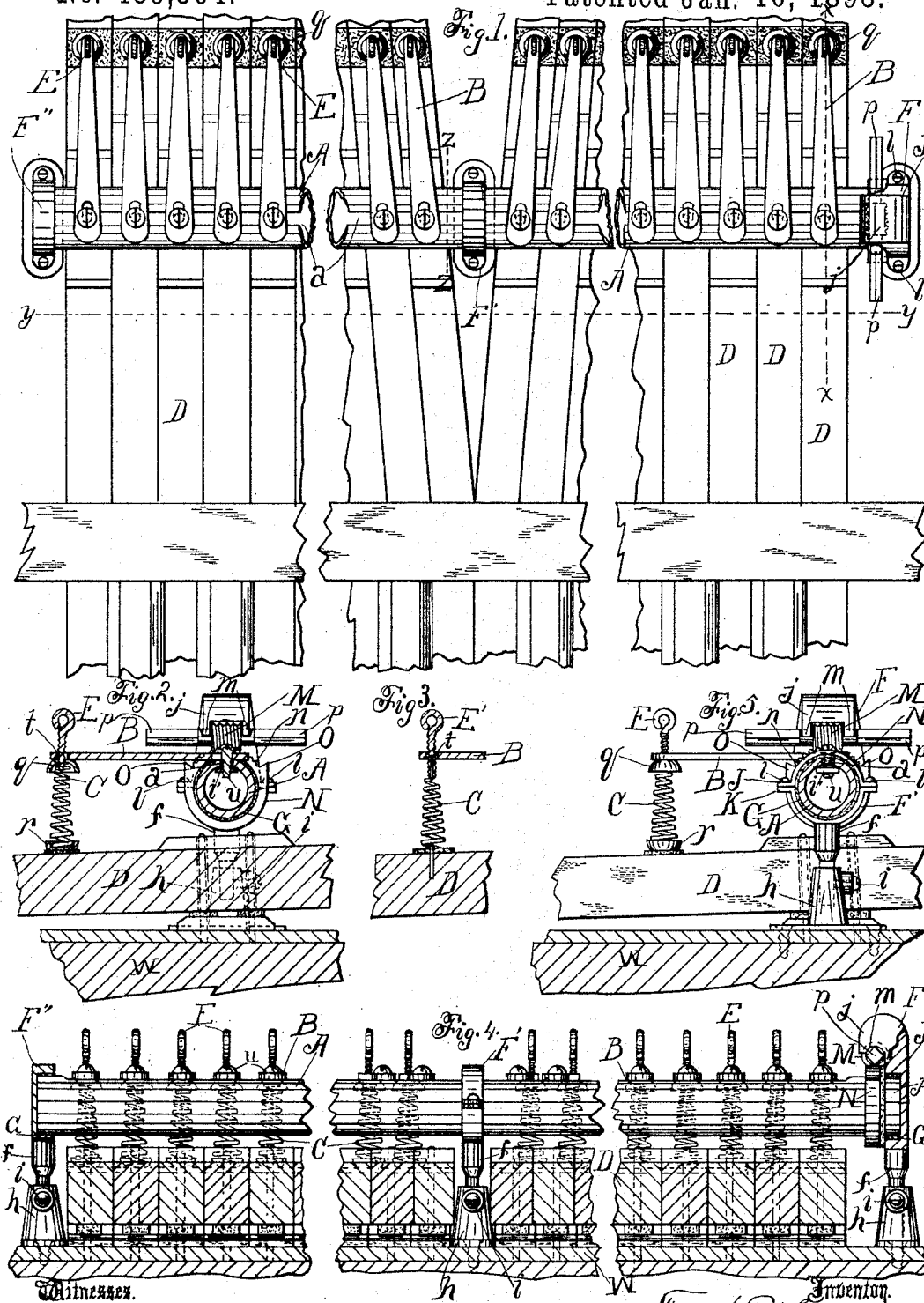


F. B. LONG.

## KEY TOUCH ADJUSTER FOR PIANOFORTES.

No. 489,564.

Patented Jan. 10, 1893.



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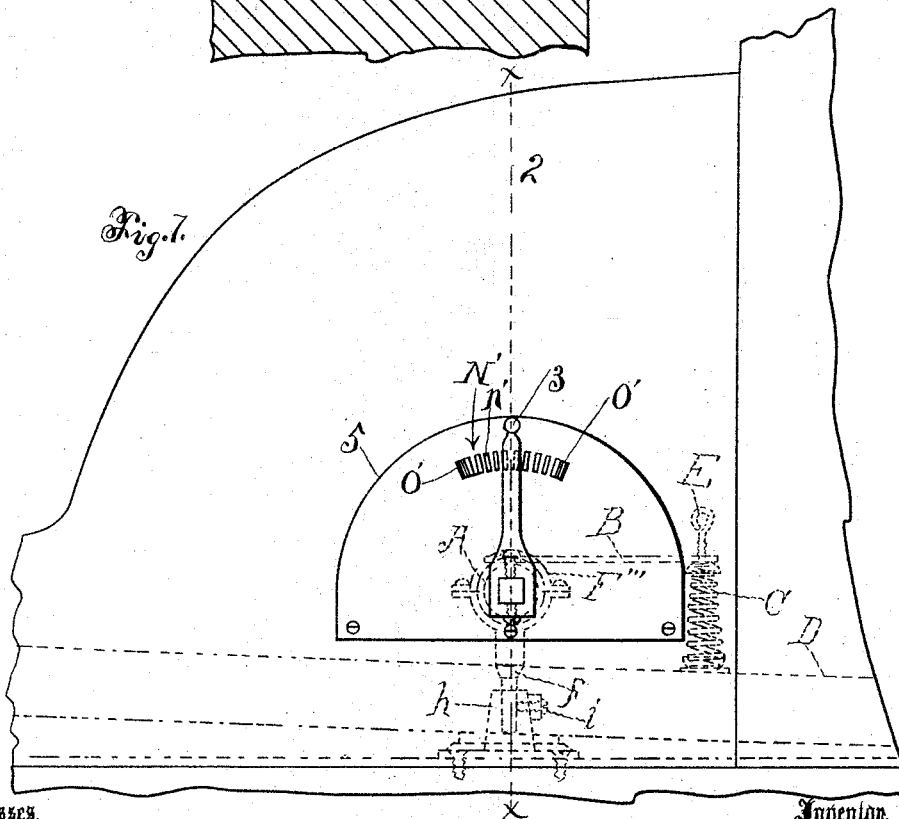
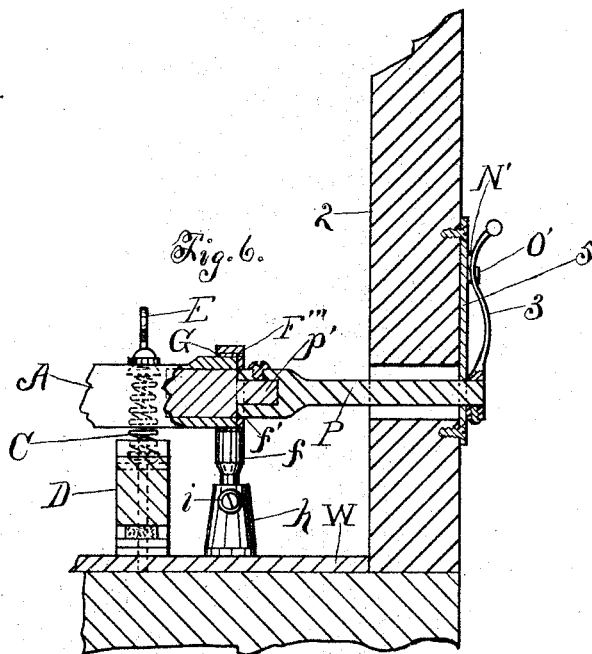
Frank B. Long  
~~Alfred Townsend~~  
 his attys.

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## KEY TOUCH ADJUSTER FOR PIANOFORTES.

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Witnesses.

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# UNITED STATES PATENT OFFICE.

FRANK B. LONG, OF LOS ANGELES, CALIFORNIA.

## KEY-TOUCH ADJUSTER FOR PIANOFORTES.

SPECIFICATION forming part of Letters Patent No. 489,564, dated January 10, 1893.

Application filed May 26, 1892. Serial No. 434,483. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK B. LONG, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Individual-Key-Touch-Adjuster for Pianofortes, of which the following is a specification.

The object of my invention is to provide a cheap and simple touch adjuster for pianofortes which is adapted to be accurately adjusted for each individual key and which can be applied to any piano.

The accompanying drawings illustrate my invention.

Figure 1 is a fragmentary top view of my invention applied to the key-board of a pianoforte. Fig. 2 is a fragmentary section on line  $x-x$  Fig. 1. Fig. 3 is a fragmentary view illustrating means of connection between spring, key and screw, different from that shown in Fig. 2. Fig. 4 is a fragmentary front elevation, the keys being shown in section at line  $y-y$  Fig. 1 while the end posts are shown in partial vertical mid-section. Fig. 5 is a section on line  $z-z$ , Fig. 1 looking toward the right. Fig. 6 is a fragmentary sectional view showing an attachment for operating the regulator from the outside of the piano. Fig. 7 is a view of the outside of the piano provided with the attachment shown in Fig. 6. Line  $x-x$  shows the line of section of Fig. 6.

My invention comprises essentially the combination of a journaled key-spring carrying rod A; a series of key-spring carrying arms B secured thereto by suitable means and arranged to project therefrom over their respective keys; a series of spiral springs C arranged to communicate between the arms and their respective keys D, and spring carrying screws E arranged to screw through the arms respectively and connected with the springs immediately or by suitable intermediate means to move the springs toward or from the keys to increase or decrease the pressure of the springs upon their respective keys, and means for partially rotating the rod.

It also consists in the specific construction of the rod and the combination therewith of the spring-carrying arms and the means

shown for securing the rod and arms together.

It also consists in the construction and arrangement of the brackets or supporting posts which are secured to the key bottom or other suitable portion of the frame of the piano, in which posts or brackets the rod is journaled, whereby the height of the rod above the keys can be adjusted.

It also consists in the combination of the rod, the end bracket and the specific means hereinafter described for partially rotating the rod.

The rod A consists of a tube provided on one side with a slot  $a$  arranged longitudinal of the tube, the upper edges of the walls of which slot form a suitable seat for the arms B which are seated thereon and are secured thereto. The tube is journaled in the brackets  $F$   $F'$  and  $F''$  (or  $F'''$ ) with its slot  $a$  uppermost so that the edges of the slot will not cut the bearings. The bearings in which the rod is journaled are bushed with bushing felt G in which the rod rotates and which prevents rattling.

The boxes of the end posts  $F$  and  $F''$  ( $F'''$ ) are capped over on the outside so that when the parts are in position the rod will be held against axial movement. The posts comprise a journal portion, a stem  $f$  and a socketed bracket base  $h$  in which the stem is seated, and a set screw  $i$  which is adapted to clamp the post in the socket and hold it at the required height. The journal portion of the end post  $F$  is formed of an upper and lower journal box member J and K which are secured together by screws  $l$ .

In the form shown in Figs. 1 to 5 the upper journal box member J is provided with a worm-retaining bracket or arm  $j$  which is arranged to project inward over the rod and is provided with a suitable bearing  $m$  in which is journaled a worm M. The bearing  $m$  is open underneath to admit the worm. The end of the rod is provided with a rack arm N fixed to such rod and adapted to be partially rotated by the worm M which is arranged to mesh in it. The rack arm N is provided with teeth  $n$  in a limited arc and stops  $o$  are provided at the ends of the arc to engage the worm and limit the rotation of the rod. The

worm is provided at its ends with angular stems  $p$  to receive a socket key by which the screw can be rotated. The springs may be seated in papier maché cups  $q, r$ ; if desired, or they may be connected direct with their screws and keys as shown in Fig. 3. In the form illustrated in Fig. 2 the lower cup or socket  $r$  is seated on the end of the key and the upper cup or socket  $q$  is fixed to the screw  $E$  which screws through the arm B.

In the form shown in Fig. 3 one end of the spring is inserted in the key and the other end is attached to the screw. As shown, the screw  $E'$  is perforated axially and the end of the spring is inserted therein and thus holds the spring in place. The sockets in the arms B through which the screws screw are provided with the felt bushings  $t$ . The arms are held in place on the tubular rod by screws  $u$  inserted through the slot  $a$  therein and screwed into nuts  $v'$  arranged on the inside of the tube for that purpose.

In practice the bases of the posts or brackets  $F F' F'' (F''')$  are fixed to the key bottom  $W$  and the rod is placed in position in the journal bearings of the brackets, and the stems of the posts are set in their respective sockets in the bases and are secured in place in the proper position by the set screws; care being had to make the rod parallel with the plane of the keys. Before inserting the toothed arm-carrying end of the rod in its bearing post or bracket  $F$ , the worm is set in place and when the rod is in place the toothed arm prevents the worm from dropping down out of its bearings. The springs are then adjusted with relation to their respective arms by turning the screws  $E$  until it is found upon trial that the pressure of the several springs upon the keys is uniform. When thus adjusted, the device is ready for ordinary use. To increase or diminish the weight of the touch the rod  $A$  is partially rotated. In the forms shown in Figs. 1 to 5 this is done by rotating the worm.

The stem  $p$  of the worm is angular to receive a key which may be applied to turn the worm to rotate the rod.

In the form shown in Figs. 6 and 7 the bracket  $F'''$  which is substituted for bracket  $F$  in the other views is provided with an opening  $f'$  arranged to allow an angular key stem  $p'$  to project therethrough from the end of the rod  $A$  to form an attachment for the rod-operating key  $P$  which is fitted thereupon and arranged to project through the cheek 2 of the piano to be operated from the outside of the piano.

3 is a spring-handle fixed upon the end of key  $P$  outside of the cheek and arranged to spring toward the cheek and into engagement with a suitable rack  $N'$  fixed to a plate 5 secured to the cheek of the piano.

$O, O'$ , are stops arranged at the ends of the rack to stop the spring-arm from moving too free. These correspond to the stops  $o$  shown

in Figs. 2 and 5 and the teeth  $n'$  of the rack correspond with the teeth  $n$  shown in such figures.

No key is shown in the drawings to be applied to turn the stems  $p$  but keys suitable for the purpose are well known and no illustration thereof is necessary.

By the means for rotating the rod shown in Figs. 6 and 7 the rod can be partially rotated from the outside of the piano by springing the spring handle  $S$  clear of the rack and moving it the distance required to produce the pressure desired upon the keys.

Now having described my invention, what I claim as new and desire to secure by Letters Patent is;—

1. A touch adjuster for piano fortes comprising the combination set forth of a journaled key-spring-carrying rod; a series of key-spring-carrying arms secured thereto by suitable means and arranged to project therefrom over their respective keys; a series of springs arranged respectively to communicate between the arms and their respective keys; and the spring-carrying screws arranged to screw through the arms respectively and connected with the springs immediately or by suitable intermediate means to move the springs toward or from the keys to increase or decrease the pressure of the springs upon their respective keys, and means for partially rotating the rod.

2. In a touch adjuster for piano fortes the combination set forth of the journaled rod consisting of the tube provided on one side with the slot arranged longitudinal of the tube; the spring-carrying arms seated on the walls of the slot; the nuts arranged inside the tube, and the screws respectively passed through the arms and slot and screwed into the nuts.

3. The combination set forth of the piano frame; the keys; the socketed bracket boxes secured to the frame; the journal portions and the stems  $f$  of the brackets arranged with the stems in the sockets of the bases; the set screws arranged to clamp the stems respectively in their bases, the rod journaled in the brackets; the spring-carrying arms secured to the rod and arranged to project therefrom over their respective keys and the springs communicating between the arms and their keys.

4. In a touch adjuster for piano fortes the combination set forth of the journaled spring-arm-carrying rod provided with the toothed arm; the end bracket  $F$  comprising the upper journal box member  $J$  and the lower journal box member  $K$  secured thereto and provided with the worm retaining bracket  $j$ ; the worm journaled therein and arranged to mesh in the toothed arm.

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Witnesses:

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