July 12, 1932. C. N. HICKMAN 1,866,707

PIANO KEY ACTION

Filed May 1, 1929 2 Sheets-Sheet 1

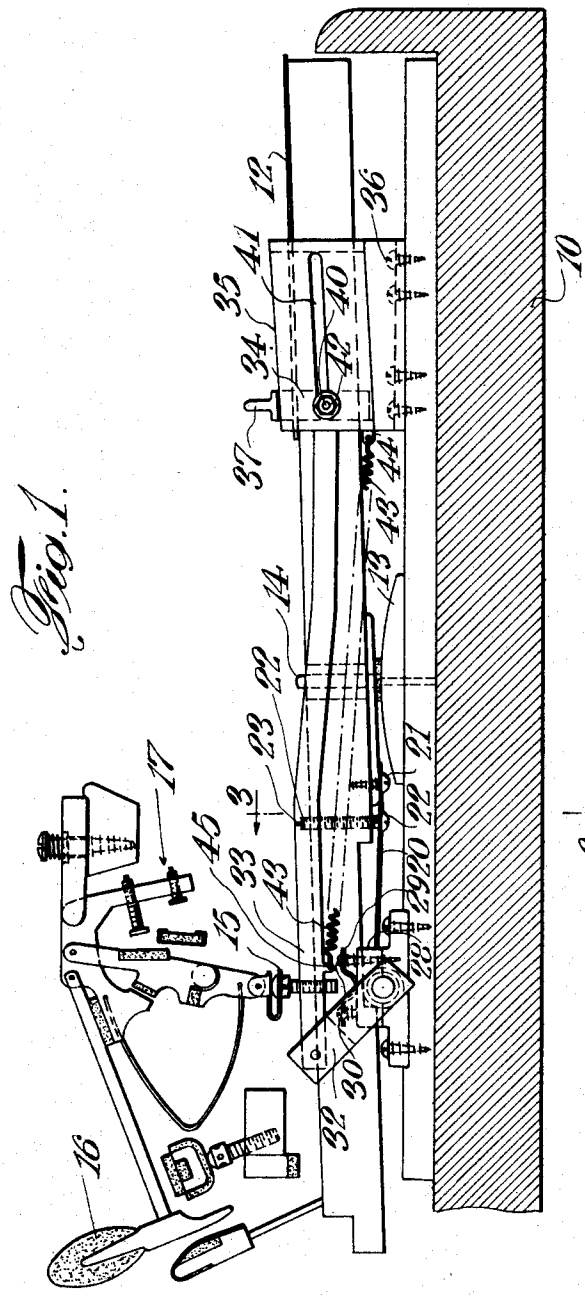


Fig. 1.

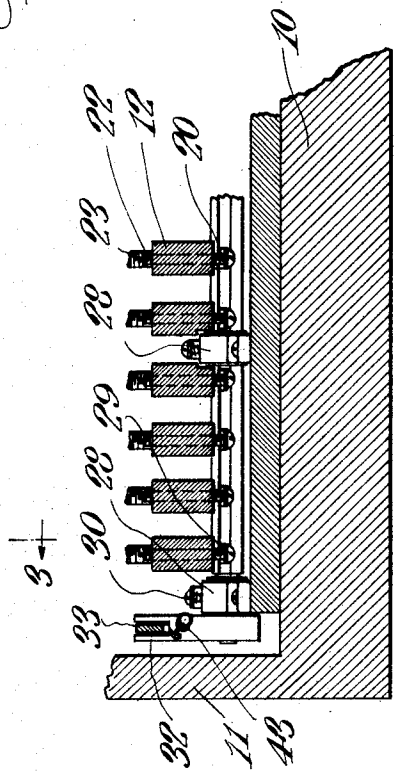


Fig. 3.

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Clarence N. Hickman
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Emery, Booth, Varney & Whittemore

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PIANO KEY ACTION

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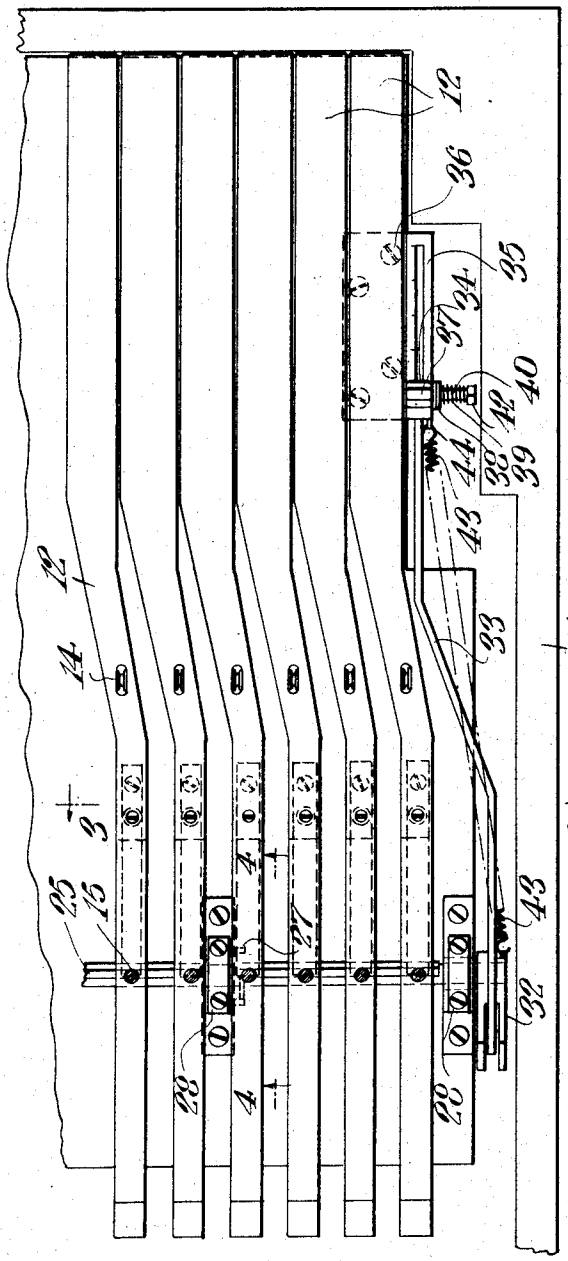


Fig. 2.

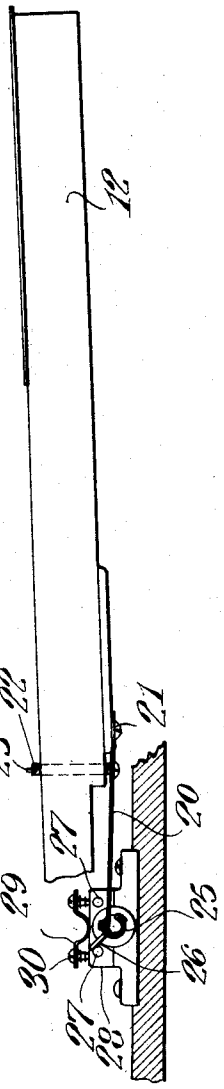


Fig. 4.

Inventor
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Patented July 12, 1932 1,866,707

UNITED STATES PATENT OFFICE

CLARENCE N. HICKMAN, OF JACKSON HEIGHTS, NEW YORK, ASSIGNOR TO AMERICAN PIANO CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY

PIANO KEY ACTION

Application filed May 1, 1929. Serial No. 359,466.

This invention relates to keys of pianos and kindred instruments and has for an object the provision of improved means for adjusting the touch of such keys.

It is common practice to adjust the touch of keys by applying permanent weights to them but this usually does not provide for subsequent variation of the touch except by changing the weights. Various persons using the instrument stroke the keys in different ways and accordingly it is desirable to vary the touch characteristics of the keys collectively to suit individual preference and to be able to effect this variation or adjust quickly and conveniently.

Moreover, various individual keys of the action may vary in touch due to variations in weight or frictional resistance and it is desirable to be able to vary the touch characteristics of the individual keys so that uniformity of touch throughout the action or non-uniformity, if that be desired, may be easily and conveniently secured.

Considered from a mechanical viewpoint the adjustment mechanism must be strong and durable; must act with minimum friction to prevent wear; must be silent; and desirably must be simple and inexpensive to manufacture and install.

An exemplary embodiment of mechanism for fulfilling the above requirements will now be described in connection with the accompanying drawings thereof in which:

Figure 1 is a sectional elevation taken immediately within the encasing panel;

Figure 2 is a plan view;

Figure 3 is a partial vertical section taken on the line 3—3 of Figures 1 and 2; and

Figure 4 is a partial vertical section taken on the line 4—4 of Figure 2.

In the drawings which show the front portion of a piano embodying the present invention, the keybed is designated by the numeral 10 and the side panel of the encasing frame by the numeral 11. The keys 12 are fulcrumed upon a transverse plate 13 as by pins 14 extending through suitable slots in the keys.

The rear ends of the keys, shown at the left of Figure 1, are provided with capstan screws 15 for actuating the hammers 16 through hammer operating mechanism generally designated by the numeral 17. Since the hammer operating mechanism may be of any desired type, of which many are well known in the art, that disclosed in the drawings will not be specifically described herein.

The touch adjusting means, with which the present invention is particularly concerned, is required to produce a touch effect in the keys which is auxiliary to that primarily imposed by the hammer mechanisms and the keys themselves. The in-built touch effect, it will be realized, will vary somewhat for the various keys due to variations in weight, friction and balance. Therefore, the touch adjusting means should be of such a nature that it can be separately adjusted for each key. The desired effect may be secured by the use of resilient members attached to each of the keys, these members being shown herein (Figure 1) as leaf springs 20 rigidly secured to the bottoms of and behind the fulcrums of the keys 12 by screws 21.

Separate adjustment of the touch of each key is provided by an adjustment screw 22 threaded into the key and having its head engaged beneath the free portion of the spring 20. The upper end of the screw 22 is provided with a tool accommodating portion 23 for adjustment from above the keys—a readily accessible location.

Means for the collective adjustment of all the keys together is provided by a cross member 25 formed as a slitted tube embracing the ends of all of the key springs 20 between the edges of the slits. The cross member is mounted in spaced friction bearings 28, the caps of which are pressed down upon the journals by resilient clips 29 adjustably secured by screws 30. The width of the slits and the disposition of the springs therein are such that the springs are not gripped in any position of the member. Further, the relation is such that if the springs are forced out of the slits by excess turning of the cross member in clockwise direction they will be reengaged by reverse turning of the member. As shown in Figure 4, however, this disengagement may be prevented by limiting the

turning of the cross member as by a pin 26 on the member and cooperating fixed stop pins 27.

In making collective adjustment for all the keys the cross member 25 is rotated about its axis which varies the tension on the springs 20. The cross-member is preferably of metal and has a narrow surface of contact with the springs so that friction and wear will be small. If desired, the member may be lined with felt or similar material to silence the action with the springs.

The cross member 25 may be rotated to regulate the tension on the springs 20 through an arm 32 rigidly secured to one end of the member and a rod 33 pivoted at its rear end to the arm 32 and operated at its front end by a slide 34. The slide is mounted in a guide 35 secured by screws 36 to the key bed of the piano. The guide is located near the front end and at one side of the row of keys where it is easily accessible for adjustment. The slide is moved by a finger grip 37 and is frictionally held in adjusted position by a collar 38 pressed against the side of the guide 35 by a spring 39. The spring and collar are carried on a stud 40 rigid with the slide 34 and extending through a slot 41 of the guide. A nut 42 threaded on the stud adjusts the tension on the spring.

The friction of the cross member 25 in its bearings and the friction of the slide 34 in its guide tend to hold the cross member in any adjusted position but this action may be assisted by a coiled spring 43 secured to a fixed lug 44 and a depending lug 45 on the rod 33. The spring 43 tends to turn the cross member clockwise against the counter-clockwise action of the key springs 20.

It will be apparent that the invention is not limited to the particular embodiment described but may find other embodiments within the scope of the subjoined claims.

What I claim is:

1. A key mounting for pianos and related instruments comprising in combination, a plurality of fulcrumed keys, leaf springs secured at one end to each of said keys, means for separately adjusting the touch of each of said keys, including a headed screw provided with a turning-tool-receiving portion at its upper end accessible from above the key, and means for collectively adjusting the touch of all of said keys, including a member extending transversely of said keys and engaging said springs, friction bearings provided with adjustment springs embracing said member, and means accessible from the outside of said instrument casing for turning said member.

2. A key mounting for pianos and related instruments comprising in combination, a plurality of fulcrumed keys, leaf springs secured at one end to each of said keys, means for separately adjusting the touch of each of said keys, including an adjustment screw threaded to the key, and means for collectively adjusting all of said keys including a cross member contacting with said springs, said member being provided with adjusting means accessible from the outside of the instrument casing.

3. A key mounting for pianos and related instruments comprising in combination, leaf springs secured to the bottom of each of said keys, and a transverse member for collectively adjusting the touch of all of said keys, said member having a narrow surface of contact with said springs.

4. A key mounting for pianos and related instruments comprising in combination, a resilient member for each of the keys of the instrument, a transverse member for collectively adjusting the tension on said resilient members and friction bearings for said member adapted to hold it in adjusted positions.

5. A key mounting for pianos and related instruments comprising in combination, a resilient member for each of the keys of the instrument, a transverse member for collectively adjusting the tension on a plurality of the resilient members and a friction slide operatively connected with said transverse member for turning it.

6. Apparatus of the character described comprising a piano key, a leaf spring rigidly secured at one end to said key, and means for adjusting the free end of said spring for varying the touch of the single key alone.

7. In pianos, in combination, keys arranged to operate hammer mechanism and means for adjusting the touch of said keys, said means including means for separately adjusting the touch of each of the keys and means for collectively adjusting the touch of all of the keys.

8. In pianos, in combination, keys arranged to operate hammer mechanism, means for separately adjusting the touch of each of said keys including a member associated with each key, and means for collectively adjusting all of said keys including mechanism adapted to act on said members.

9. In pianos, in combination, keys arranged to operate hammer mechanism and means for adjusting the touch of said keys including a resilient member cooperating with each of said keys and means on said key accessible for operation from above the key for adjusting said resilient member.

10. Apparatus for adjusting the touch of pianos and related instruments including resilient members cooperable with the keys, a turnable member for regulating the tension on said members and resilient means cooperating with said turnable means tending to balance the effect of said resilient members on said turnable member, and a friction held adjusting member connected to said turnable member.

11. Apparatus for adjusting the touch of pianos and related instruments including resilient members cooperable with said keys, a turnable member for regulating the tension on said resilient members, said turnable member being provided with a slit receiving the end of a resilient member.

12. Apparatus of the character described, comprising in combination, a plurality of keys, and means for adjusting the touch of said keys, said means including a hand adjusted member positioned near the keyboard where it is easily accessible to the operator while playing and frictional means holding said member in position along a guide.

In testimony whereof, I have signed my name to this specification this 27th day of April 1929.

CLARENCE N. HICKMAN.

CERTIFICATE OF CORRECTION.

Patent No. 1,866,707. July 12, 1932.

CLARENCE N. HICKMAN.

It is hereby certified that the state of incorporation of the assignee in the above numbered patent was erroneously described as "New Jersey", whereas said state of incorporation should have been described as Delaware, as shown by the records of assignments in this office; page 1, line 14, for the word "adjust" read adjustment; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of November, A. D. 1932.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

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Patent No. 1,866,707. July 12, 1932.

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