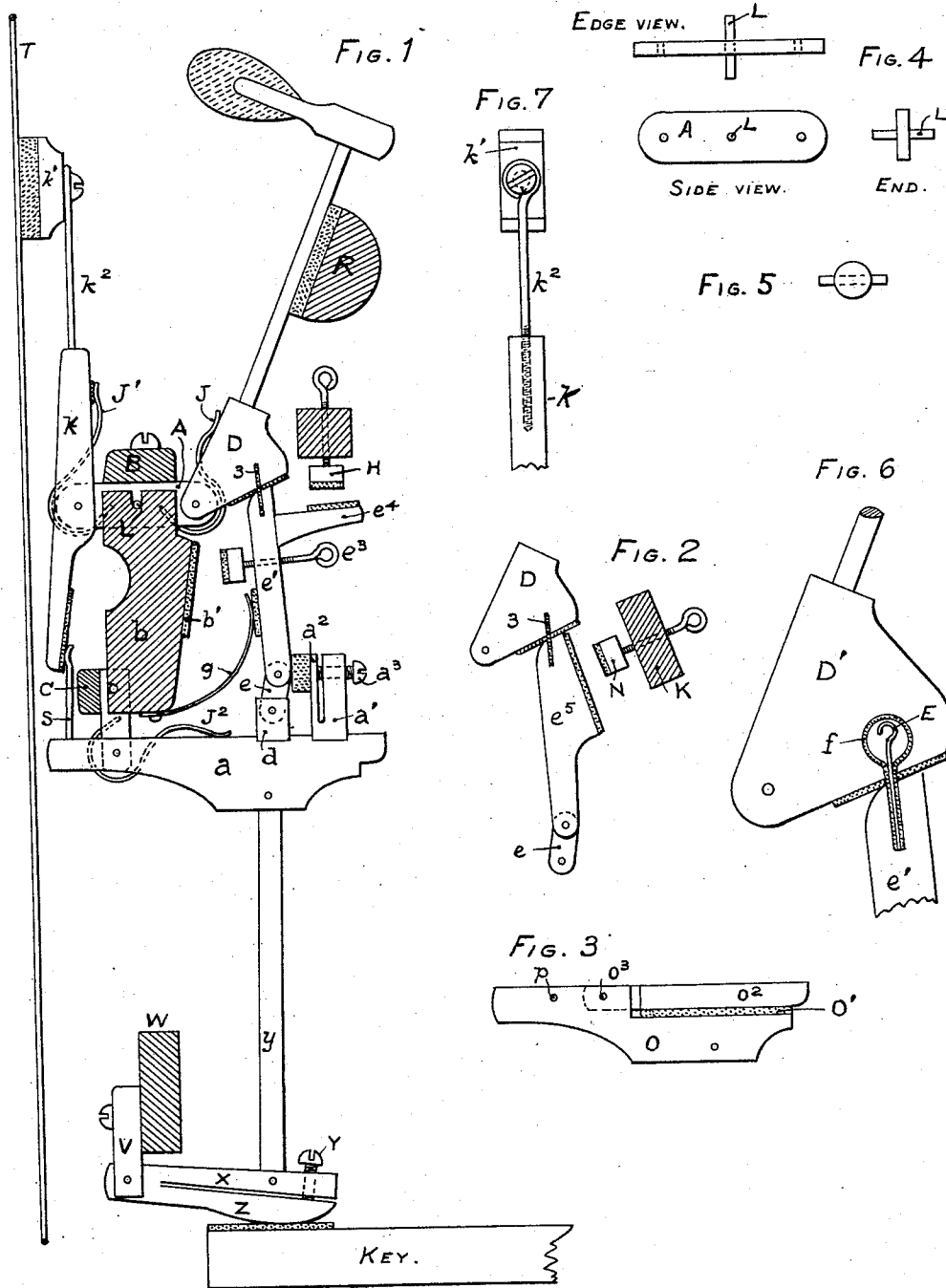


(No Model.)

S. R. PERRY.
PIANO ACTION.

No. 468,918.

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WITNESSES,
Calvin W. Parsons,
E. G. Stevens

INVENTOR.
Samuel R. Perry.

UNITED STATES PATENT OFFICE.

SAMUEL R. PERRY, OF SCRANTON, PENNSYLVANIA.

PIANO-ACTION.

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To all whom it may concern:

Be it known that I, SAMUEL R. PERRY, a resident of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented new and useful Improvements in Piano-Actions, the following being a full, clear, and exact description of the same.

This invention relates to upright-piano actions; and it consists of certain novel constructions and combinations of parts so arranged and adapted to produce a more rapid stroke against the strings and the speedy return of the hammer to rest when the stroke is made.

It consists, also, in the novel construction of the flanges supporting the various levers, and the construction of springs so arranged as to bear against the parts with the least possible friction when operated.

It consists, also, of a divided actuating-lever so arranged that its parts may move together as one lever or may separate and move independently of each other to a desired extent.

It also consists of a novel means of regulating the action and keys and the construction and application of dampers; also, the construction of hammer-butts and reacting springs for the same.

These various improvements, with slight modifications, will also apply to grand or square pianos.

In the accompanying drawings, making a part of this specification, Figure 1 is a side elevation of an upright action, showing certain novel features. Fig. 2 is a form of Fig. 1, changing the position of the rail and buffer which unlocks the links. Fig. 3 is a side view of a divided actuating-lever; Fig. 4, a side, edge, and end view of a tongue or flange. Fig. 5 shows a round flange. Fig. 6 shows a side view of hammer-butt and the method of attaching the long link, also a novel method of inserting a reacting-spring for the hammer. Fig. 7 is a novel method of securing the damper-blocks to the damper-levers.

In constructing my invention I employ the actuating-lever *a*, also, by preference, the divided lever, as shown by Fig. 3, (which will be fully described farther on,) which lever *a* is connected to the action-rail *b* by means of the flange *c*. On the upper side of lever *a* is

rigidly secured a flange *d*, to which the short link *e* is attached, which in turn is joined to the long link *e'*. This long link in turn is hinged to the hammer-butt *D* by means of cloth or other flexible material placed into slots cut into the link and hammer-butt. The hammer-butt *D* and damper-lever *K* are hinged to the flange *A*, said flange resting in a groove formed across the rail and provided with a pin *L*, (see Fig. 4), passing through it at or near its center. The pin, resting in a longitudinal slot formed in the rail, secures the flange in place, and the longitudinal cap *B*, resting on the flanges in rotation, firmly secures them to the rail by means of screws. The pin *L* may be inserted into single flanges, as shown at *c*, in the same manner and for the same purpose. The cap may extend the whole length of the action-rail, or it may for convenience be placed thereon in sections. The spring *J* is fastened to the under side of the flange and, passing around the end of said flange and through the hammer-butt, is allowed to rest against the inner side of the hammer-butt. When the hammer is thrown against the string, the spring *J* tends to prevent the hammer from resting on the string after the stroke is made. The damper-lever *K* is held against the string by a spring *J'*, fastened to the under side of the flange, passing around the end of the flange and through the damper-lever, and resting against the upper side of the damper-lever. By this method of securing the hammer and damper-springs it will be seen that a sufficient length of wire need be had to make the springs as flexible as need be without coiling.

To the actuating-lever *a* is rigidly attached a post *a'*, which is slotted on its inner surface, thereby forming a tongue *a²*, upon which a cushion is placed and against which the long link *e'* is required to rest. By means of the screw *a³* the tongue is made adjustable, so that any required angle of the long and short links may be secured. The same result may be effected by means of a screw and buffer passing through the post and regulating the links.

To the lower edge of the action-rail I attach a spring *g*, which acts against the long link *e'*, pressing said link against the tongue

on post a' . Passing through the long link e' is a screw and buffer e^3 , which are intended to regulate the position of the long link and hold it when forced against the action-rail cushion b' at the termination of each stroke, thus forming the back-check to hold the hammer from reacting against the string. The long link e' is provided with an arm or projection e^4 , said arm being cushioned on its upper surface to come in contact with the regulating-screw and buffer H. When this arm strikes the buffer H, it will throw the long and short link connection over and beyond the alignment of its pivots and thus unlock the hammer at or near the end of the stroke and immediately hold the buffer e^3 against the action-rail cushion b' .

In Fig. 2 the buffer N and rail K are placed in such a position and the long link e^5 so formed as to allow it to slide against the buffer. The spring J², Fig. 1, is placed to press upon the actuating-lever, so as to weight the same and secure rapid movement.

Fig. 3 represents my improved actuating-lever, in which O is the bottom part and O² a separate lever attached by a pivot O³, the pivot P being used to secure the lever to the other parts of the action. O' is a cushion allowing the two levers to strike when in motion without noise.

The object of constructing the actuating-lever O of two parts is as follows: When the hammer-rail R (shown in Fig. 1) is thrown forward and held in any position to shorten the hammer's stroke and thereby soften the tone, it will carry up the lever O², Fig. 3, and hold it in any desired position without materially changing the relation of the keys or the lower part of the actuating-lever O. Hence, as the lower part of the actuating-lever does not move unless pressed by the key, the dampers K, as shown in Fig. 1, will not be drawn away from the string T, thus allowing the hammer to be close to the strings in playing the instrument, at the same time allowing the dampers to perform their functions.

On the bottom of the pitman-rod y , Fig. 1, is a regulating device of a novel construction, which consists of a slotted lever Z, which is attached to a rail W by means of the flange V. Through the upper portion of the lever Z and arm X passes a regulating-screw Y, by means of which a nice adjustment of the action is made upon the keys and may be used for changing the dip of the keys with ease and precision.

Fig. 6 shows a novel and preferable method of attaching the long link e' to the hammer-butt D'. The long link e' being slotted at its upper end and the hammer-butt having an opening cut through it, (round or any other suitable shape,) a piece of cloth or other flexible material is then securely glued in such manner as to attach the long link and hammer-butt together. A thin strip E of brass or other material of sufficient flexibility is in-

serted between these clothed sides, allowing the loop-shaped upper end to act against the hammer-butt when its position is forced out of alignment with the clothed slot, which will take place as the hammer comes into close contact with the piano-string T, Fig. 1, and by which means this spring E will assist to force the hammer away from the string and prevent any rebound.

Fig. 7 shows a novel method of attaching the damper-wire k^2 to the block k' and to the damper-lever K, the wire k^2 having a thread at one end to screw into the wooden damper-lever K and an eye at the other end, through which a screw secures the wire to the block k' . By this means the block may be turned into any angle or position required in relation to the piano-strings and is capable of being adjusted to the required height.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a piano-forte action, the long link e' , attached to the hammer-butt D and having an arm e^4 , adapted to come in contact with the regulating-screw and buffer H, as and for the purpose described.

2. In a piano-forte action, the short link e , connected to the actuating-lever a by means of the flange d , said short link in turn connected to the hammer-butt D by means of the long link e' , said long link having a projecting arm e^4 and regulating-screw and buffer e^3 , in the manner and for the purpose specified.

3. In a piano-forte action, the long link e' , provided with an arm e^4 and carrying a regulating-screw and buffer e^3 , said buffer adapted to come in contact with the cushion b' on the rail b , as and for the purpose described.

4. In a piano-forte action, the actuating-lever a , carrying a post a' , said post provided with a regulating device for adjusting the angle formed by the link e' and the short link e and supporting said links in position, as shown and described.

5. In a piano-forte action, the flange A, having a pin L passing therethrough, said pin resting in a longitudinal slot formed in the action-rail b , in the manner and for the purpose specified.

6. In a piano-forte action, the action-rail b , having grooves cut across its surface at regular intervals, said grooves adapted to hold the flanges A, as shown and described.

7. In a piano-forte action, the flange A, having a pin passing therethrough, said pin resting in a longitudinal slot formed in the action-rail b , and the flange A held in place on the rail b by means of the cap B, as shown and described.

8. In a piano-forte action, the spring J, attached to the flange A, its loose end passing around the end of said flange and through the hammer-butt D and resting against the inner surface of the hammer-butt, as and for the purpose named.

9. In a piano-forte action, the spring J' , attached to the flange A, passing around the end of said flange, and resting against the damper-lever K in the manner shown, and for the purpose named.

10. In a piano-forte action, the spring J^2 , secured to the flange C, passing around said flange and through the actuating-lever a , and resting upon its upper surface, in the manner and for the purpose specified.

11. In a piano-forte action, the damper-wire k^3 , formed into an eye at its upper end and having its lower end threaded and screwed into the end of the damper-lever K, said wire secured to the damper-block with a screw in the manner and as shown.

12. In a piano-forte action, the regulating device hinged to the rail W and having a longitudinal slot forming the arms Z and X, the arm X provided with a regulating-screw Y and pivoted to the pitman or connecting rod y in the manner shown, and for the purpose named.

13. In a piano-forte action, the actuating-lever O, made of two parts hinged together, with a cushion O' interposed between said parts, in combination with the links, in the manner and for the purpose specified.

14. In a piano-forte action, the hammer-butt D, formed with an opening f , said opening clothed and the cloth extending out of the hammer-butt and containing a flexible

spring E, as shown, and for the purpose specified.

15. In a piano-forte action, the spring g , attached to the action-rail b and acting against the link e' in the manner and for the purpose specified.

16. In a piano-forte action, the link e' , provided with a slot and attached to the hammer-butt by means of a cloth hinge and spring E, as shown and specified.

17. In a piano-forte action, the links e and e' , connecting the hammer-butt and actuating-lever, the long link e' carrying a regulating-screw and buffer e^3 , said buffer adapted to come in contact with the cushion b' on the rail b , as shown, and for the purpose named.

18. In a piano-forte action, the links e and e' , connecting the hammer-butt and actuating-lever, the long link e' carrying a regulating-screw and buffer e^3 , said buffer adapted to come in contact with the cushion b' on the rail b , as shown, and for the purpose named.

19. In a piano-forte action, the links e and e' , connecting the hammer-butt and actuating-lever, the long link e' provided with an arm e^4 , adapted to come in contact with the regulating-screw and buffer H, as and for the purpose described.

SAMUEL R. PERRY.

Witnesses:

W. S. DIEHL,

W. W. WATSON.