A. HICKS.

PIANO ACTION.

APPLICATION FILED JULY 31, 1907.

1,016,408.

Patented Feb. 6, 1912.

Fig. 1.

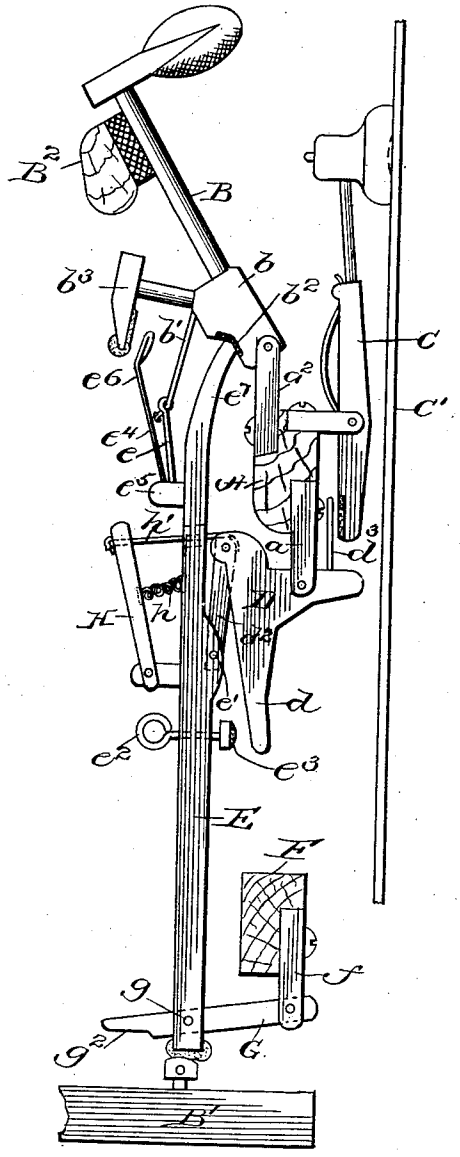
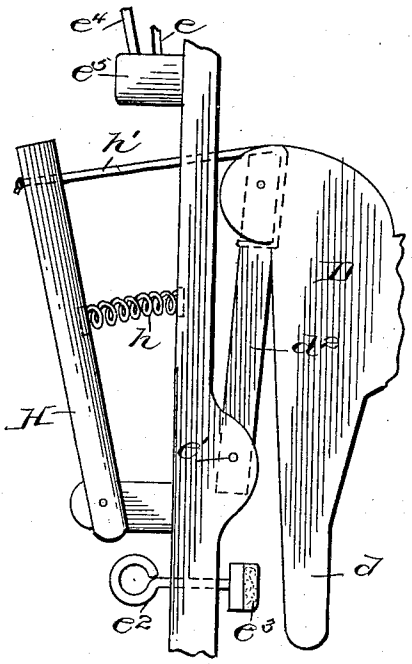


Fig. 2.



Witnesses

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ALFRED HICKS, OF ST. JOHN'S WOOD, ENGLAND.

PIANO-ACTION.

1,016,408. Specification of Letters Patent. Patented Feb. 6, 1912.

Application filed July 31, 1907. Serial No. 386,469.

To all whom it may concern:

Be it known that I, ALFRED HICKS, a citizen of the United States of America, residing at 14 Queens Terrace, St. John's Wood, in the county of Middlesex, England, have invented a new and useful Improvement in Piano-Actions, of which the following is a specification.

The object of my invention is to produce an action for upright pianos, which shall be especially adapted for use in pianos with "inside-players", both mechanically and because of economy of space; an action that shall be more simple and less liable to get out of order than those hitherto employed, and which shall have the best possible responsive and repetition qualities.

In order more clearly to describe my invention I have illustrated it as forming part of a pianoforte action in the accompanying drawings which show in Figure 1 an entire pianoforte action in elevation with cross rails in section. Fig. 2 is an enlarged elevation of a portion of the mechanism.

In Fig. 1, A indicates the hammer rail to which are pivotally attached the hammer B and damper C. The piano string is represented by C'. B' represents a key lever and directly above it I place the vertical sticker E connected at its base to the lever rail F by the sticker lever G. This sticker lever projects through the sticker and is available for the purpose hereinafter set forth. The upper end of the sticker engages against the hammer-butt b and is moreover attached to the said hammer butt by means of the spring e which hooks into a loop b' of mohair or other suitable material fastened to the hammer butt. The spring e is so placed that it tends to draw the upper end of the sticker under the hammer butt, so as to engage the cushioned shoulder b^2. The hammer butt is of the usual construction.

The sticker E is provided with a throw-off device constructed as follows: The three-armed throw-off lever D has its horizontal arm pivoted to the flange a fixed upon the rail A. Its upper arm is curved in the manner shown in the drawing, and is pivoted to the vertical link d^2, the lower end of which link is pivoted at e' to the sticker. The third arm of the lever D, indicated by the letter d, is prolonged downward far enough to provide sufficient outward motion for the throw-off action as shown, and the usual adjusting device consisting of the screw e^2 provided with a pad e^3 is fixed in the sticker so as to control the extent to which the motion of the sticker actuates the throw-off lever D. Finally the damper spoon d^3 is placed, as shown in the drawing, upon the horizontal arm of the throw-off lever and adapted to actuate the damper lever C in the well known manner.

In order to lock the hammer after it has been struck and to hold it in proximity to the string as long as the finger is on the key and thus facilitate repetition, I secure the upwardly extending check wire or rod e^4 to the sticker by means of the projecting shoulder e^5. This check wire is flattened at its upper end and provided with a pad e^6 adapted to encounter the inner surface of the back stop b^3 attached in any suitable manner to the hammer butt b. This inner surface of the back stop is suitably cushioned with felt or the like so as to afford a sufficient grip to the cushion e^6 of the check wire, when the latter is raised to lock the hammer.

The construction and arrangement of parts employed by me produces a very compact action and results in an economy of space so that a mechanical player may be fitted within the piano case without interfering with the successful operation of the action. The engaging or key-operating element of the player is intended to act upon the projecting end g^2 of the sticker lever G. The upper end of the sticker is curved toward the hammer butt, as shown at e^7, instead of being straight or having an upper projecting part as in previously known actions. The position and the manner in which the link d^2 is centered in the sticker at e' are important. By pivoting the link d^2 at a point above the regulating screw e^2, I am enabled to use a short link which co-operating with the relatively longer depending arm d of the throw-off lever furnishes a highly efficient escapement.

The operation of this action will be obvious from the drawing and the foregoing explanation of the parts. When the key B' is struck, the end shown in the drawing rises and pushes the sticker E upward to move the hammer and throw it against the string C'. The sticker E in rising rocks the throw-off lever D by means of the link d^2 and causes its arm d to strike the pad e^3. The special form of the throw-off lever is designed to operate the sticker efficiently

and with economy of space. The action of the throw-off lever shifts the sticker laterally and causes its end to slip from under the hammer butt *b*, giving the escapement. At the same time the damper spoon d^3 being thrown forward by the rocking of the lever D oscillates the damper lever C and lifts the damper from the string. The check wire e^4 at the same time is projected directly under the inner surface of the back stop b^3 thus preventing the hammer from dropping back upon the hammer rest B^2 so long as the finger of the player depresses the key, thus facilitating the rapid repetition of the same note. As soon as the key has been released, the spring *e* pushes the sticker back into its original position and the parts return to the position illustrated in the drawing. In place of the long spring and loop used heretofore in actions of this type for the return of the point of the sticker to its place under notch of hammer-butt (*b*), I secure the same result while gaining increased resilience (thereby improving the repetition qualities and the elasticity of the touch) by using the device illustrated in Fig. 2. To a convenient place in front of the sticker E is pivoted one end of a fly (H). A spiral or other suitable spring *h* is placed between the fly and the front of the sticker. The loose end of the fly is connected with an opposing part of the action in the rear of the sticker by means of a cord or other suitable connection *h'* passing through or past one side of the sticker. I have illustrated this connection as attached to the link d^2 and the lever D, but it may be secured to the rail A or some other part. In the preferred form as shown in the drawings, it is evident that when a key is struck and the sticker is pushed back by the action of the point of lever (*d*), the spiral spring will be compressed between the sticker and the loose fly; the upper end of the fly being held in opposition to the spring by means of a cord which passes through the hole specially prepared for it in the sticker and is attached to the upper end of the link (d^2). When the key is released, the reaction of the spring will thrust the point of sticker back into place. The hammer butt is kept in control by means of a bridle tape of ordinary construction worked on to a bridle wire affixed to the sticker.

In conclusion I wish to state that I am aware that pianoforte actions are already known in which a straight sticker is connected below the throw-off to a vertical link attached to one end of a horizontal lever having its other end linked to the hammer rail; also that the sticker has been mechanically operated by means of mechanism engaging with a prolongation through the sticker of the sticker lever, and I make no claim to these devices in general.

What I claim is:

1. In a piano, the combination with a key and a hammer, of a sticker resting on the key and engaging the hammer, a three-armed throw-off lever pivotally hung in rear of the sticker and having upwardly, downwardly, and rearwardly extending arms, a link having its upper end pivoted to the extremity of the upwardly extending arm of the throw-off lever and its lower end pivoted directly on the rear side of the sticker, a regulating screw mounted in the sticker below the said link and arranged to bear against the depending arm of the throw-off lever, and a damper-spoon erected on the rearwardly extending arm of the throw-off lever.

2. In a piano, the combination with a key and a hammer, of a sticker resting on the key and engaging the hammer, a throw-off lever pivoted to a fixed part of the piano and hung on the sticker and provided with an arm adapted to release the sticker from the hammer, a fly pivotally mounted on the sticker and connected to the throw-off lever and means arranged between the fly and sticker and adapted to yieldingly separate the said fly and sticker.

3. In a piano, the combination with a key and a hammer, of a sticker resting on the key and engaging the hammer, a throw-off lever pivotally hung in rear of the sticker, a link connecting said lever with the sticker, a fly pivotally mounted on the front of the sticker, a flexible connection between the fly and said link, and means for holding the fly normally from the sticker.

4. In a piano, the combination with a key and a hammer, of a sticker resting on the key and engaging the hammer, a throw-off lever pivotally hung in rear of the sticker, a link connecting the throw-off lever and the sticker, a fly pivotally mounted on the sticker, a spring arranged between the fly and the sticker, and a flexible cord connecting the upper end of the fly and the link.

5. In a piano, the combination with a key and a hammer, of a sticker resting on the key and engaging the hammer, means for disengaging the sticker from the hammer, a fly pivotally mounted on the sticker and connected to a fixed part of the piano and thereby retained in operative relation to the sticker, and means arranged between the fly and sticker and bearing on the said sticker to hold the same normally in engagement with the hammer.

6. In a piano, the combination, with a key and a hammer, of a sticker arranged to bear on the key and to engage the hammer on its front side, a fly mounted on the sticker and connected to a fixed part of the piano on the same side of the sticker as the hammer to limit the distance of the fly from the sticker, resilient means bearing upon the fly and the

sticker tending to separate the said fly and sticker and thereby to press the latter into engagement with the hammer, and means to disengage the sticker from the hammer.

7. In a piano, the combination, with a key, a hammer, and a fly, of a sticker mounted between the fly and the hammer and arranged to bear on the latter, the fly being mounted on the sticker and also connected to a fixed part of the piano on the same side of the sticker as the hammer to limit the distance between the fly and sticker, means to disengage the sticker from the hammer, and a resilient compression member interposed between and bearing against the fly and sticker and tending to separate the two and thereby to hold the sticker yieldingly against the hammer.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED HICKS.

Witnesses:
LEONARD E. HAYNES,
JOHN R. JORDAN.