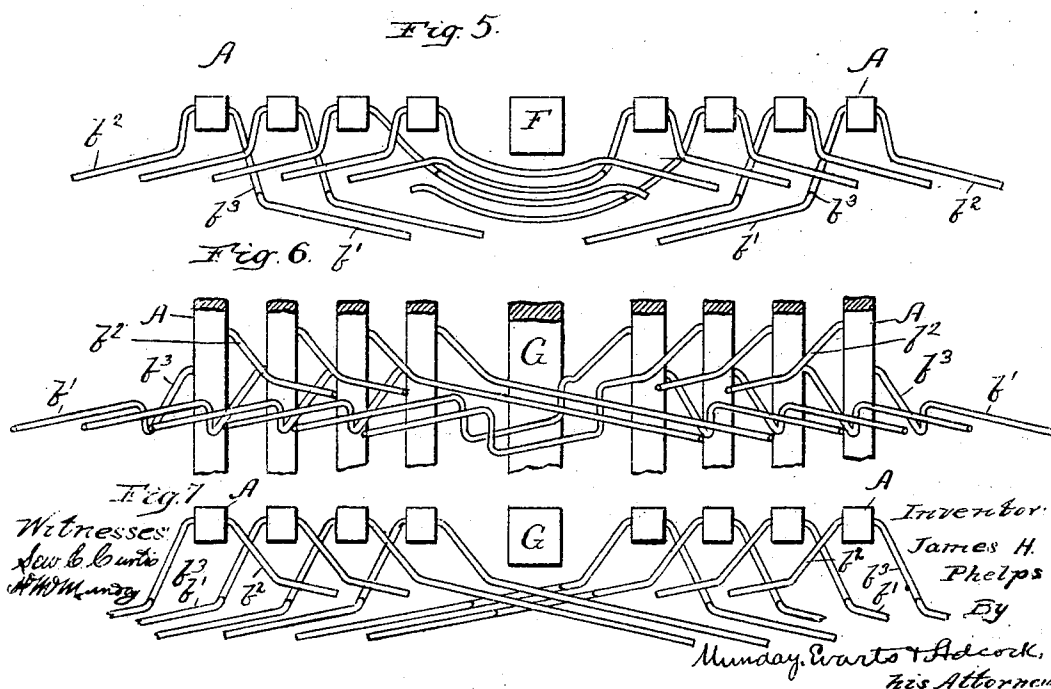
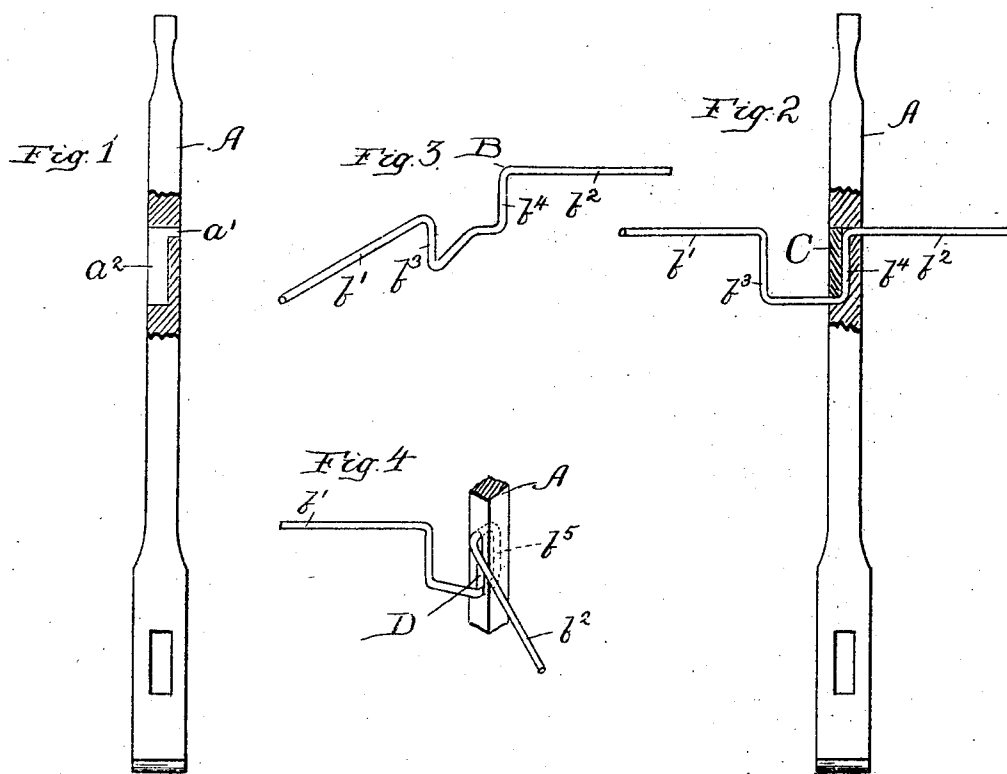


J. H. PHELPS.  
PIANOFORTE ACTION.

No. 549,685.

Patented Nov. 12, 1895.



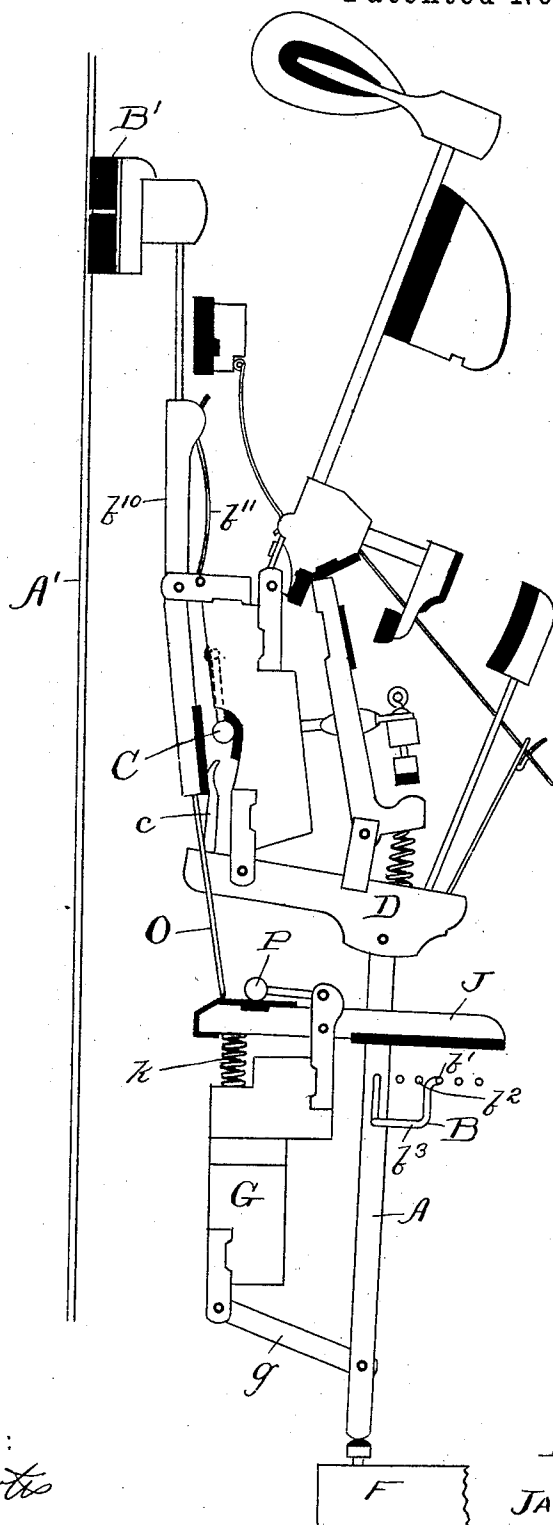
(No Model.)

2 Sheets—Sheet 2.

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WITNESSES:

Sew. C. Curtis  
A. W. Munday,

*INVENTOR:*

JAMES H. PHELPS

BY Munday, Ewart & Adcock,  
HIS ATTORNEYS.

# UNITED STATES PATENT OFFICE.

JAMES H. PHELPS, OF SHARON, WISCONSIN.

## PIANOFORTE-ACTION.

SPECIFICATION forming part of Letters Patent No. 549,685, dated November 12, 1895.

Application filed January 4, 1894. Serial No. 495,598. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. PHELPS, a citizen of the United States, residing in Sharon, in the county of Walworth and State of Wisconsin, have invented a new and useful Improvement in Pianoforte-Actions, of which the following is a specification.

This invention relates to an improved construction of that portion of pianoforte-actions which forms the subject of Letters Patent granted to me December 22, 1891, No. 465,494. In said patent the stickers are shown as being provided with laterally-extended arms adapted to operate levers which close the dampers of adjacent keys not harmonizing with the keys to which the stickers belong. In my said patent these arms are shown as being cut from sheet metal and secured to the outside of the stickers by means of rivets or screws. In my present invention I prefer to form them of wire and to let them into the body of the stickers in such manner as to render the use of screws or rivets unnecessary.

The nature of the invention is fully set forth in the description, which I give below, and also illustrated in the accompanying drawings, wherein—

Figure 1 shows an elevation of a sticker as prepared for the insertion of the wire forming the laterally-extending arms; and Fig. 2 is a similar view showing the wire in place therein, both this figure and Fig. 1 being partly broken away. Fig. 3 shows the wire detached. Fig. 4 shows a modified construction. Fig. 5 is a plan of a series of the stickers and their lateral arms. Figs. 6 and 7 are respectively a perspective and a view similar to Fig. 5, showing the construction employed in a portion of the action. Fig. 8 is an elevation of the action of one of the keys provided with my improvement.

In said drawings, A' may represent one of the strings of the piano; B', the damper;  $b^{10}$ , the damper-bar, and  $b^{11}$  its spring; C, the loud-pedal bar for throwing all the dampers out, and c the usual arm for operating the damper when the key is struck.

D is the pivoted lever supporting the jack, A the sticker, and F the key.

G is a stationary bar having in some constructions a connecting-link g for holding the sticker.

J is the pivoted or rocking lever, through whose action the damper is allowed to be closed, and P is the rod suspended upon cranks and operated usually by the foot-pedal, whereby the levers J of all the keys are held stationary against action.

k is an upwardly-acting spring tending to lift the rear end of lever J.

B is a wire forming laterally-extending arms  $b'$  and  $b^2$ . It is secured in the sticker, as hereinafter set forth, and the arm  $b'$  extends in one direction therefrom and the arm  $b^2$  in the opposite direction. The arm  $b'$  is depressed, as at  $b^3$ , to avoid interference with the arms  $b^2$  of the stickers of adjacent keys, and also to avoid interference with the lever J, corresponding to its own sticker. Through these lateral arms the sticker of the key, when the latter is struck, closes the dampers of the discordant adjacent keys at either side substantially in the manner set forth in my said patent. In my improved method of securing these wires in the stickers I bore through the sticker from one side, as shown at  $a'$ , Fig. 1, and also slot the sticker partially through from one side, as seen at  $a^2$ . The wire B, which before insertion is brought substantially to the form shown at Fig. 3, or the reverse thereof—that is to say, with one arm, and usually the shorter one, unbent or straight—is then inserted in the sticker from the slotted side, said arm being pushed through the hole  $a'$  until the vertical portion  $b^4$  of the wire lies snugly against the inner wall of the slot  $a^2$ . The wire is now in the position shown at Fig. 2, and is secured permanently in the sticker by means of a filling-block C, which is adapted to fill that portion of the slot not occupied by the wire and to be glued in place therein. After the wire has been thus inserted the unbent arm thereof is bent to the form desired for use, and which form will be understood from Figs. 5, 6, and 7.

In Fig. 4 I show a modified construction which permits the wire to be completely formed before it is secured in the sticker. In this form the sticker is slotted from its front toward its back, so that it may receive the vertical U-shaped bend  $b^5$  of the wire, this bend serving to connect the two arms  $b' b^2$ , as does the part  $b^4$  of the other construction. A filling-piece D is also employed with this form

of the invention, and it is adapted to fill the unoccupied portion of the slot and to be glued therein in the same manner as the piece C.

In Fig. 5 the wires are shown with the proper bends to enable them to pass the bracket F between the base and middle sections of the action, and Fig. 7 shows how they are made to pass the bracket G between the middle and treble sections. Fig. 6 is intended to show more clearly the vertical bends, which are necessary in case of some of the wires to avoid interference.

The operation of the invention is substantially as follows: Supposing the series of keys to be equipped with the wire laterally-extending arms, when the performer desires to obtain the singing effect of the concordant tones only he raises the rod P from the levers J. If the key F be now struck, its sticker is forced upward and the lever D and its damper-operating wire are made to force the lower end of the damper-bar backward, thus freeing the damper from the string. This movement of the damper-bar carries the extension O over against the end of the lever J and allows the spring *k* to lift the rear end of the lever. This results in detaining the damper from returning to the string after the key is released, and it will remain in this position until some one of the neighboring keys is struck or the rod P is again lowered. In the upward movement of the sticker at the time the key is struck the forward end of the lever J enters within the recess *b*<sup>3</sup> and is unaffected by the upward movement of the arm *b*<sup>1</sup>, but in the case of each of the two keys at the right and left of the key F the arms *b*<sup>1</sup> and *b*<sup>2</sup> engage with the levers J of those keys, if they happen to be down, and lift them to the hori-

zontal position, thus allowing the extension O to move over lever J, so that the damper may return to the string in obedience to its spring *b*<sup>11</sup>. The performer can at any time by lowering the rod P return all the levers J to their normal position, and while the rod P remains thus lowered can use the instrument in the same manner as without my improvements, using either the soft or loud pedal where desired.

I claim—

1. The combination with the stickers of a piano forte action of wires B forming laterally extending arms adapted to close the dampers of the adjacent keys, a bent portion of said wires being let into the bodies of the stickers from the side thereof and made rigid against turning therein, substantially as specified.

2. The combination with the stickers of a piano forte action, of wires B forming laterally extending arms adapted to close the dampers of the adjacent keys, a bent portion of said wires being let into slots formed in the sides of the sticker bodies and confined therein by filling pieces, substantially as specified.

3. The combination with the stickers of a piano forte action, of wires B forming laterally extending arms adapted to close the dampers or the adjacent keys, said wires being provided with bends, such as *b*<sup>4</sup>, and being let into the bodies of the stickers with such bent portion confined in the stickers, substantially as specified.

JAMES H. PHELPS.

Witnesses:

GEO. C. MANSFIELD,  
CHARLES W. SEARL.