

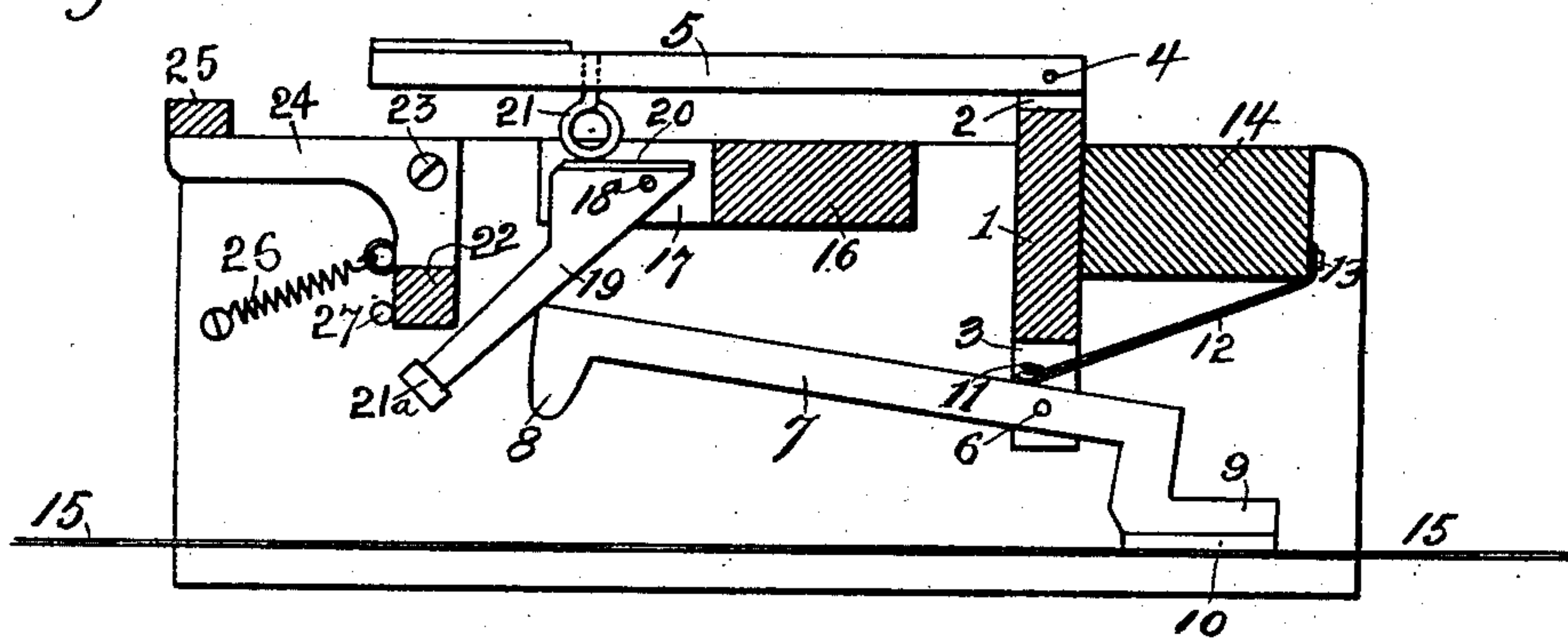
D. P. & L. F. BOYD.

## ACTION FOR STRINGED MUSICAL INSTRUMENTS.

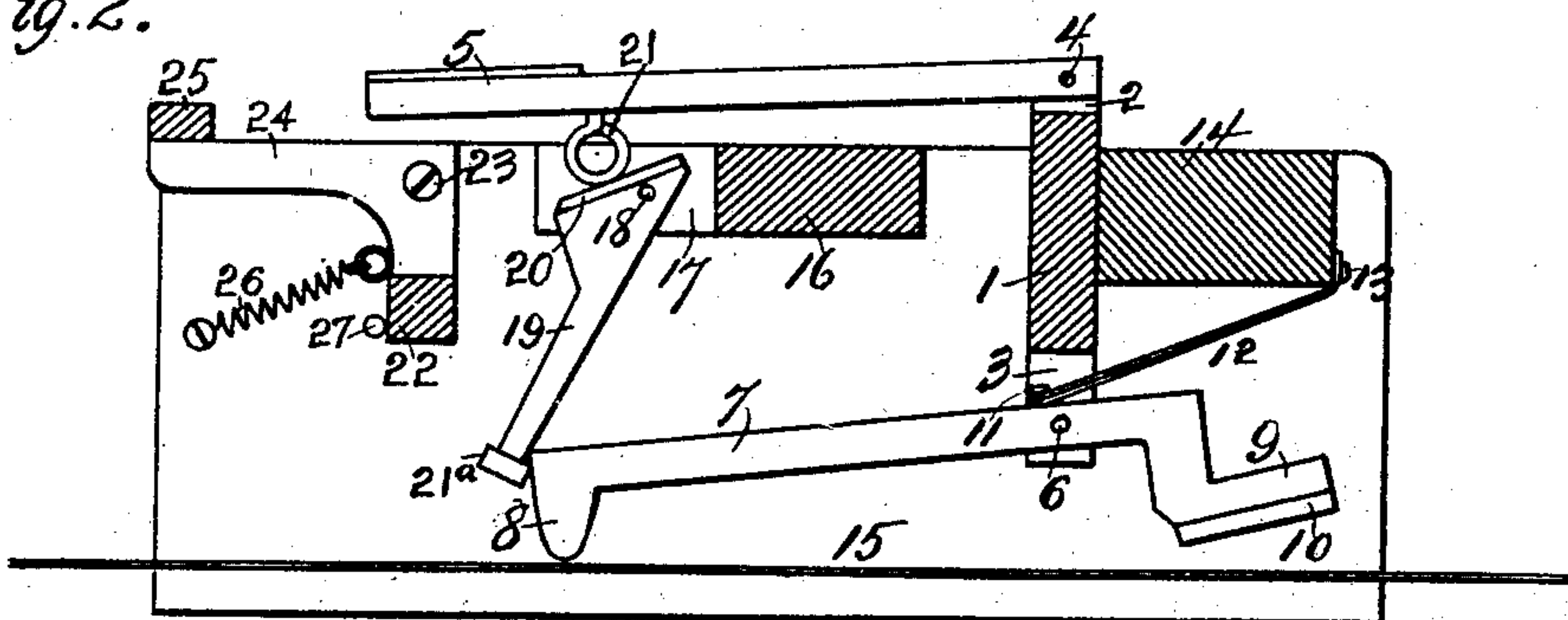
APPLICATION FILED MAY 6, 1902.

NO MODEL.

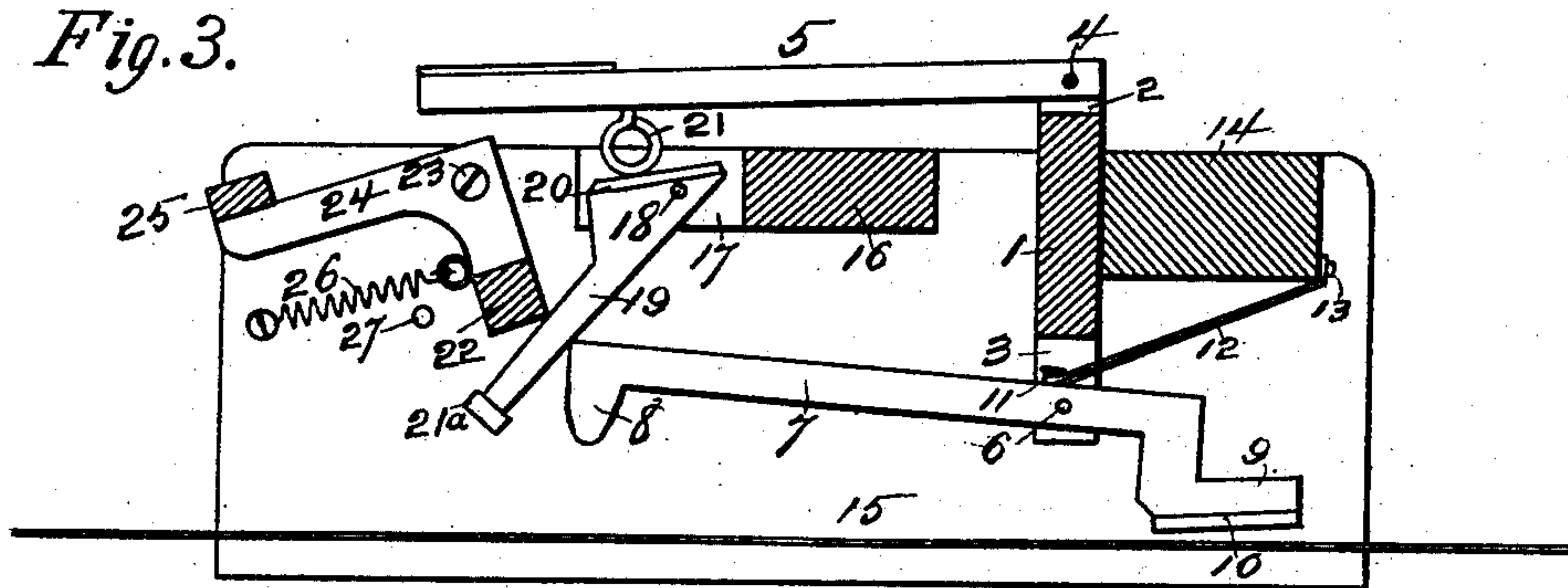
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

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**INVENTORS**

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# UNITED STATES PATENT OFFICE.

DAVID P. BOYD AND LEANDER F. BOYD, OF TOLEDO, OHIO.

## ACTION FOR STRINGED MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 719,641, dated February 3, 1903.

Application filed May 6, 1902. Serial No. 106,165. (No model.)

*To all whom it may concern:*

Be it known that we, DAVID P. BOYD and LEANDER F. BOYD, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Actions for Stringed Musical Instruments; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to a piano-action, and is designed to provide a cheap, simple, durable, and effective keyboard and action to be applied to and used in connection with instruments of the type known as the "auto-harp."

Our invention consists more particularly in the details of construction hereinafter described, and shown and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical transverse sectional elevation of our action, showing the parts in their normal position ready for use; Fig. 2, the same, showing the key depressed, the hammer caught on its rebound and held from contact with the string by the back-stop, and the damper elevated; and Fig. 3 is the same, showing the sustaining-rail, hereinafter referred to, in operative position.

Like numerals of reference indicate like parts throughout the drawings.

In the drawings, 1 is a hammer and key-rail notched at top at suitable intervals, as at 2, and at bottom, as at 3. In the notches 2 are pivoted, as at 4, the keys 5. In the notches 3 are pivoted, as at 6, a bar 7, one end of which forms a hammer 8 and the other end of which forms a damper 9, faced with felt 10. In the top of the bar 7, just forward of the pivot 6, is a pin 11, which is engaged by one end of an elastic rubber band 12, the opposite end of the band being in engagement with a pin 13, projecting from a bar 14, which forms part of the frame of the action. The pull of the elastic rubber band 12 holds

the hammer 8 normally elevated and the damper 9 10 normally depressed onto the string 15, as shown in Fig. 1.

16 is a jack-rail notched at proper intervals, as at 17. In the notches of the jack-rail are pivoted, as at 18, the jacks 19. The jack consists of a flat bar 19, having at its upper pivoted end a shoulder 20, which is faced with felt. Secured to the under side of the key 5 is a screw-eye 21, the loop of which projects down into the slot or notch 17 and rests upon the shoulder of the jack. The screw-eye may be screwed into and out of the key, and the screw-eye may also be turned side-wise, so that it is in contact with both sides of the notch or slot 17. Thus the proper adjustment of the eye may be obtained and lateral motion of the key prevented. Over the free end of the jack 19 is stretched a small stout elastic rubber band, which by its resiliency retains its place at any point at which it may be placed, thus providing for simple quick accurate adjustment. The band 21<sup>a</sup> serves as a back-stop and when properly adjusted will invariably catch the end of the hammer on its rebound from the string, as illustrated in Fig. 2, and will prevent the hammer from touching the string or interfering with its vibration until a new blow is delivered upon the key.

A sustaining-bar 22 extends the length of the keyboard and at each end is pivotally supported, as at 23, upon bent levers 24. These levers carry a bar 25, which extends the length of the keyboard and is within convenient reach of either hand of the player. The bar 22 is provided with a spring 26, which holds the bar normally retracted against the stop 27 and out of contact with the jacks 19.

The operation of our device is as follows: The key and hammer-rail, the jack-rail, and the sustaining-bar being suitably supported at their ends upon the stringed instrument in such a manner that the several keys, hammers, and dampers lie directly above their appropriate strings, if now a key be struck the screw-eye pressing down upon the shoulder of the jack 19 will throw the jack into the position shown in Fig. 2. The end of the hammer-bar resting against and sliding upon the



inclined lower edge of the jack is caused by the movement of the key and jack to deliver a downward blow to the string. At the rebound of the hammer it is caught by the back-stop 21 and held against touching the string. When the finger is removed from the key, the rubber band 12, pulling upwardly upon the bar 7, lifts the hammer, the jack, and the key into normal position and at the same time forces the damper 9 10 down upon the string, stopping its vibration. Should the performer desire to sustain or prolong the notes, the bar 25 is pressed downwardly, which may be readily and conveniently accomplished with a finger, thumb, or ball of either hand, thus throwing the bar 22 against the upper inclined edges of the jacks and pressing the jacks downwardly into the position indicated in Fig. 3. All the dampers and hammers will now be held off the strings until the bar 25 is released, when the spring 26 will restore the bar 22 to its normal position, and the several dampers, hammers, jacks, and keys will by their respective springs 12 be restored to their normal position.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a piano-action, a bar having at one end a hammer and at its other end a damper, pivotal supports for the bar between its ends, means for holding the damper normally in engagement with its string and the hammer away from the string, a key, and connections intermediate the key and the hammer-bar.

2. In a piano-action, a bar which carries at one end a hammer and at its other end a damper, a pivotal support for the bar, means for actuating the bar, and means for holding the damper normally against and the hammer normally away from the string, which means comprise an elastic member, such as an india-rubber band, secured at one end to the bar and at its other end to a fixed member of the instrument.

3. In a piano-action, a jack-bar pivotally supported at one end, a hammer-bar which abuts against and slides upon the jack-bar, a back-stop upon the end of the jack-bar oppo-

site the pivoted end, and means for actuating said jack-bar.

4. In a piano-action, a jack comprising a bar pivotally supported at one end, a back-stop at the opposite end of the bar consisting of an india-rubber band, and a shoulder upon the bar at its pivoted end, the face of which shoulder is disposed at an acute angle to the longitudinal line of the jack-bar.

5. In a piano-action, a notched jack-rail, jacks pivoted in the notches of the jack-rail, hammers engaged and actuated by the jacks, keys, screw-eyes engaged with the keys and having their eyes disposed in the notches of the jack-bar and in contact with the jacks.

6. In a piano-action, a series of bars pivotally supported between their ends and having at one end a hammer and at the opposite end a damper, means for holding the hammers normally elevated and the dampers normally depressed, jacks and keys which actuate said hammer and damper-bars, and a pivotally-supported normally-retracted sustaining-bar adapted and arranged to be moved into the path of the jacks, whereby said hammers and dampers may be held out of contact with the strings of the instrument.

7. A piano-action comprising a frame, a series of bars pivotally supported in the frame and having at one end a hammer and at the other end a damper, springs which hold the hammers normally elevated and the dampers normally depressed, jacks pivoted at one end in the frame and carrying at their opposite ends back-stops, shoulders on the jacks, keys pivotally mounted in the frame, screw-eyes engaged with the keys and in contact with the shoulders of the jacks, and a sustaining-bar adapted and arranged to engage the jacks and to hold both hammers and dampers off the strings.

In testimony whereof we affix our signatures in presence of two witnesses.

DAVID P. BOYD.  
LEANDER F. BOYD.

Witnesses:

CHAS. E. CHITTENDEN,  
ALMON HALL.