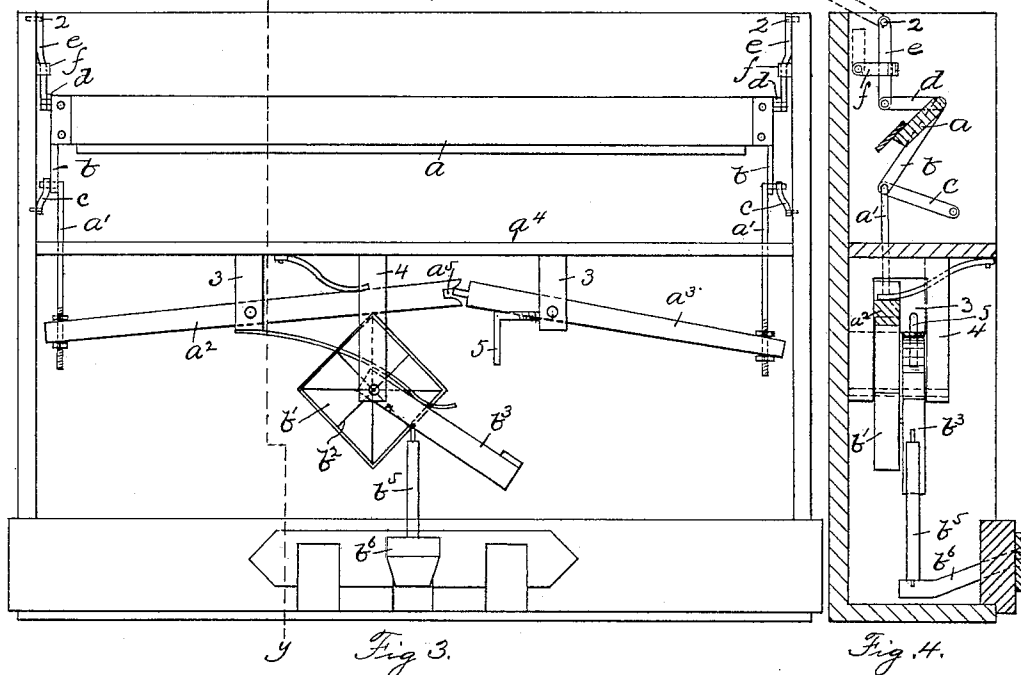
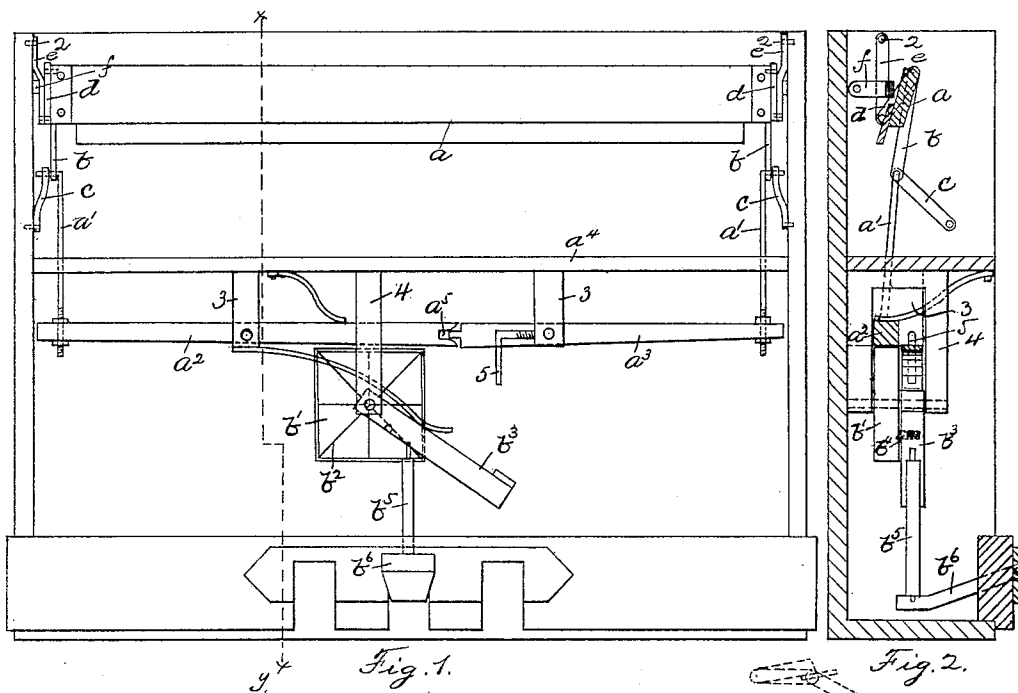


(No Model.)

N. MARSTON.
PIANO.

No. 477,669.

Patented June 28, 1892.



WITNESSES
Lucy F. Graves.
William C. Jennings

INVENTORY.
Norman Marston
by B. J. Hayes,
att'y.

UNITED STATES PATENT OFFICE.

NORMAN MARSTON, OF HAMPTON, NEW HAMPSHIRE.

PIANO.

SPECIFICATION forming part of Letters Patent No. 477,669, dated June 28, 1892.

Application filed March 30, 1892. Serial No. 427,074. (No model.)

To all whom it may concern:

Be it known that I, NORMAN MARSTON, of Hampton, county of Rockingham, State of New Hampshire, have invented an Improvement in Pianos, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to improve the construction of the harp-pedal mechanism of pianos whereby the harp-bar may be applied by depressing the pedal and thereafter removed by again depressing the pedal.

15 In accordance with this invention the harp-bar is pivotally connected at or near its upper edge to the upper ends of two levers, the lower ends of which are pivoted to fixed points on or connected to the frame, and arms extend downward from each end of the harp-bar, the lower ends of which are loosely connected to the upper ends of vertical rods or bars, which latter extend down to the lower part of the frame and are connected to the outer ends of two horizontally-arranged levers, the adjacent ends of which are so connected together that as one is moved to raise or lower the vertical rod connected to it the other will be correspondingly moved. Suitable levers are provided for directing the throw or movement of said harp-bar. Suitable means are provided which when moved by the pedal moves the levers carrying the vertical rods, so as to throw the harp-bar into engagement with the strings and which when again moved by the pedal removes the harp-bar from its engagement with the strings. The means herein shown for accomplishing this result consists of a cam-block made quadrangular or of other suitable shape and having on its face a series of teeth or shoulders and a loosely-pivoted arm carrying a pawl, which engages the teeth of said quadrangular cam-block for advancing it step by step, said pawl-carrying arm being connected with the pedal. A suitable stop-pin is provided for limiting the upward movement of said pawl-carrying arm so that it will be checked when the cam-block has been moved a suitable distance to in turn move the levers so far as to throw the harp-bar into engagement with the strings or to remove it from its engagement with the

strings. The connections by means of which the harp-bar is supported are such that said bar may be disconnected and thrown up out of its normal position, so that the entire surface of the strings may be exposed to thereby facilitate the work of the tuner.

Figure 1 shows in front elevation a portion of a piano-frame and harp-bar and means embodying this invention for moving it; Fig. 2, a vertical section of the parts shown in Fig. 1, taken on the dotted line *xx*; Fig. 3, a view similar to Fig. 1, showing the harp-bar as moved into engagement with the strings; and Fig. 4, a vertical section of the parts shown in Fig. 3, taken on the dotted line *yy*.

The harp-bar *a*, herein represented as having secured to its lower edge a strip of felt, may be of any usual or suitable construction, and has depending from it at each end a short arm *b*, the lower ends of which are loosely connected to the upper ends of short levers *c*, pivoted to the frame-work or otherwise supported. To each end of the harp-bar *a* and at or near the upper edge thereof levers *d* are also loosely connected, the opposite or lower ends of which levers are loosely connected to the lower ends of arms *e*, which in this instance are loosely pivoted to the frame-work at 2, or they may be otherwise supported. Latches *f* are connected to the frame-work, by means of which the arms *e* are normally held in fixed position, so that fixed points may be provided to which the levers *d* are pivoted. To the lower ends of the depending arms *b*, or it may be to the short arms *c*, vertical rods or bars *a'* are connected, which extend down and are connected at the lower ends to the outer ends of levers *a² a³*, pivoted to hangers 3 on the under side of the support *a⁴*, or they may be otherwise supported. That end of the lever *a²* opposite to which the rod *a'* is connected is recessed, as at *a⁵*, to receive the adjacent end of the lever *a³*, so that when one of said levers is moved the other will be correspondingly moved.

The cam-block *b'* herein represented is made quadrangular in shape, and having on its edge a strip of felt is pivoted to a suitable hanger 4, depending from the under side of the support *a⁴*, or it may be otherwise supported, the felted edge or cam-face of said block bearing against or acting upon one of the pivoted le-

vers as a^2 . The face or front side of said cam-block b' is notched or provided with teeth or shoulders b^2 . An arm b^3 is loosely arranged on the shaft or arbor of the cam-block, which is provided with a suitable pawl b^4 , (see dotted lines, Fig. 2,) which is adapted to engage the teeth or shoulders b^2 on said block as the pawl-carrying arm is moved. The pawl-carrying arm is connected by a rod b^5 with the pivoted pedal b^6 . A stop-pin 5 is provided, which limits the upward movement of said pawl-carrying arm.

The operation is as follows: When the pedal b^6 is depressed, the pawl-carrying arm b^3 is lifted, rotating the cam-block b' one step, so that one of the projecting portions or corners of said cam-block will engage and lift the lever a^2 , and thereby correspondingly lift the lever a^3 , simultaneously depressing the rods $a' a'$ and moving the harp-bar a from the position shown in Figs. 1 and 2 into the position shown in Figs. 3 and 4, in which position it will engage the strings. As the harp-bar is supported by the arms $c d$, it will be seen that when the rods a' are depressed it will be moved slightly downward in the arc of a circle. The cam-block b' will hold the lever a^2 in this position while the pawl-carrying arm and pedal return to their normal position, and when said pedal is again depressed and the pawl-carrying arm again lifted the said cam-block will be advanced another step, permitting said lever a^2 and parts connected therewith to fall or resume their normal position. Thus it will be seen that at each successive movement of the pedal b^6 the harp-bar will be alternately thrown into engagement with the strings and removed therefrom. By disengaging the lower end of the arms $b b$ from the levers $c c$ and rods $a' a'$ by moving the latches f to thereby release the arms e it will be seen that said harp-bar may be turned up, as shown by dotted lines, Fig. 4, so as to leave the strings entirely exposed for the purpose of facilitating the work of the tuner.

By means of the construction of the support of the harp-bar it will be seen that it may be turned up out of the way easily and quickly without necessitating the removal of the frame to which it is supported, as is now the case.

I claim—

1. In a piano, a pivotally-supported harp-bar adapted to be moved into and out of engagement with the strings, combined with the vertical rods $a' a'$, pivoted levers connected

therewith for simultaneously moving them, a rotatable cam-block for moving said levers, a pedal, and interposed connections between said pedal and cam-block, whereby the latter is rotated by the operation of the former, substantially as described.

2. In a piano, a harp-bar adapted to be moved into and out of engagement with the strings, combined with the vertical rods $a' a'$, connected therewith, pivoted levers $a^2 a^3$, and cam-block for moving them, and means for moving said cam-block, controlled by the pedal, substantially as described.

3. In a piano, a harp-bar adapted to be moved into and out of engagement with the strings, the vertical rods $a' a'$, connected therewith, pivoted levers $a^2 a^3$, cam-block b' , quadrangular in shape and having a toothed face, and a pawl and pawl-carrying arm connected with the pedal, substantially as described.

4. In a piano, a harp-bar adapted to be moved into and out of engagement with the strings, the vertical rods $a' a'$, connected therewith, pivoted levers $a^2 a^3$, one of which is recessed at the end to receive the adjacent end of the other, the quadrangular block b' , having a toothed face, and a pawl and pawl-carrying arm connected with the pedal, substantially as described.

5. In a piano, a harp-bar adapted to be moved into and out of engagement with the strings, pivoted levers with which said harp-bar is connected, combined with a cam-block for moving said levers, and an operating device for moving said cam-block which is connected with the pedal, and a stop for said operating device, substantially as described.

6. In a piano, the harp-bar a , links d , to the upper ends of which said harp-bar is pivoted, pivoted arms e , to the lower ends of which said links d are pivoted, pivoted links c , to which said harp-bar is also pivotally and detachably connected, and means for moving said harp-bar, connected with and operated by the pedal, substantially as described.

7. In a piano, the harp-bar a , pivotal supports therefor, combined with the latches f , substantially as described.

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

NORMAN MARSTON.

Witnesses:

BERNICE J. NOYES,
LUCY F. GRAVES.