



# UNITED STATES PATENT OFFICE,

STEPHEN P. BROOKS, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN PIANO-FORTES.

Specification forming part of Letters Patent No. 18,673, dated November 24, 1857.

*To all whom it may concern:*

Be it known that I, STEPHEN P. BROOKS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Piano-Fortes; and I do hereby declare that the nature of the same and the manner in which they are to be performed or are constructed and operated are described and represented in the following statement or specification and the accompanying drawings, of which—

Figure 1 denotes a front elevation of such parts of a piano-forte as exhibit my invention. Fig. 2 is a vertical and transverse section of the same, showing the action or mechanism used for sounding a string.

The nature of my invention consists, first, in combining and arranging the damper and hammer of each key of the action in one bent lever operated by a fly or lifter, as will be hereinafter described, and, second, in a peculiar arrangement of the fly-lifter and escapement or mechanism extending between the jack and hammer.

In the drawings, A denotes the iron or metallic frame; B, the sounding-board; C, the case or wooden frame; D D, the strings; E, the hammer, and F the damper, these latter two being shown as operating on two strings or two branches of one string in the usual manner. The hammer-head and damper are arranged so that one projects from the other, and both work or turn on one common fulcrum *a*, they forming together a bent lever having a hammer-head *b* fixed to one arm and a damper-cushion *c* attached to the other arm. A lifter K, attached to and projecting from a fly L, is hinged or jointed at one end to the damper-arm, while at its other end it works with the escapement *d* of a jack G, projecting upward from the key H. In the drawings this lifter is represented as forming one piece with the fly, and as bent or extended over the jack and down upon the escapement, the back catch being shown at *e* as placed just in rear of the escapement, so that immediately after the fly-lifter has fallen off the escapement it may be received and rest on the back catch, which operates to arrest the rearward motion of the hammer until the fin-

ger of the player is raised so as to permit the key to rise upward.

From the above it will be seen that the fly and lifter are attached firmly together, or are in one piece or bar, and the escapement is arranged on the jack, a regulating-screw and stop or button being applied to the fly and made to work against the jack, as shown at *f*. One or more spiral springs *s' s'* extend from the fly-lifter to the jack and serve to bring the lifter or fly back on the escapement when the key is being elevated. Such enables me to construct a very simple and efficient action.

The iron or metallic frame A is fastened to the case C, the sounding-board B (having the bridge *l* glued to it) being separate from the case and not directly attached to it, but secured or fastened immediately to the back of the metallic frame. Therefore it is not controlled or strained by the case under the changes of temperature to which the latter may be subjected. Being fastened directly and wholly to the metallic frame, the sonorous quality of the sounding-board is more uniform, or not so likely to be injuriously affected by atmospheric changes as when the sounding-board is directly connected with the case.

The iron frame is for an upright piano, and it is made square or arched at its top and extends down to the bottom of the case and rests thereon. It is constructed with a curved hitch-pin plate or bar *a*<sup>2</sup>, running from its top down to one of its sides and connected with the bottom plate *b*<sup>2</sup> by two bars *c*<sup>2</sup> *d*<sup>2</sup>, cast in one piece with the hitch-pin plate and the rest of the frame, and arranged as shown in Fig. 1, such bars not only extending from the bottom plate *b*<sup>2</sup> to the hitch-pin plate *a*<sup>2</sup>, but along on their outer surfaces and above the same sufficiently to prevent such plates from being warped or twisted under the strain of the strings. This construction of the frame renders it very strong and enables the sounding-board to be extended beyond the plate *a*<sup>2</sup>, as shown in the drawings. It also enables the bridge to be disposed in the middle of the sounding-board, whereby the vibration of the said board is most effectually attained.

Having thus explained my invention, what I claim is as follows:

1. Combining or arranging the hammer and damper of each string in or on one bent lever, substantially as specified.

2. Jointing or hinging the fly or fly-lifter to the hammer-lever and arranging the escapement on the jack, substantially as described, the same dispensing with hinging the fly to the jack and enabling the fly and lifter to be made or united in one rigid bar or piece.

3. The above-described arrangement of the back catch—viz., on the jack and in rear of the escapement.

In testimony whereof I have hereunto set my signature.

S. P. BROOKS.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.