



# UNITED STATES PATENT OFFICE.

STEPHEN P. BROOKS, OF SOMERVILLE, MASSACHUSETTS.

## IMPROVEMENT IN PIANO ACTIONS.

Specification forming part of Letters Patent No. 132,709, dated November 5, 1872.

*To all whom it may concern:*

Be it known that I, STEPHEN P. BROOKS, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Piano-Fortes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a side elevation of a piano-forte action having my improvements applied thereto, the parts being in the position which they occupy before the key is depressed. Fig. 2 is a side elevation of the same, representing the position of the parts immediately after the hammer has struck the string.

The ordinary piano-forte hammer in general use consists of a solid piece of wood provided at one end with a thick covering of felt to cause it to give an elastic blow. This method of construction is, however, expensive, while it does not render the hammer sufficiently elastic.

My invention has for its object to increase the elasticity of the hammer and at the same time reduce its cost; and consists in a hammer having that portion which gives the blow open or hollow, whereby greater elasticity is secured than where a solid hammer with a thick covering of felt is employed, while the tone of the instrument is also greatly improved. My invention also consists in a peculiar construction and arrangement of parts whereby the rail is made to act as a back catch, the hammer, after striking the blow, being held by this device in such close proximity to the string that it will repeat with a very slight motion of the key-lever.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawing, A represents the key-frame, to which the key-lever B is attached in the usual manner. Near the inner end of the lever B is secured a block, C, between ears *a*, at the end of which is pivoted the butt D, to which latter is secured at an angle the arm or stem *b* of the hammer E. When the parts are in the position seen in Fig. 1 the front of the butt D rests on a cushion, *c*, placed within a notch in the block C. G is the rail,

to the top of which is secured a block, H, to the inner end of which is pivoted the fly-lifter I, which extends down and bears against the notched portion or escapement *e* of the butt D, and thus as the key-lever B is depressed the hammer is brought up against the string *f*, as required. *g* is a stop or button attached to a regulating-screw, *h*, which passes through the butt D. This stop, when the hammer is raised, bears against the fly-lifter and vibrates it against the resistance of a light spiral spring, *i*, when, by means of the escapement, the hammer is relieved from contact with the string after the blow is struck. At the same instant the upper part of the butt D, which is provided with a cushion, *k*, is brought up firmly against the under side of the rail G, which thus serves as a back catch to hold the hammer firmly at a slight distance from the string and prevent it from rebounding. By means of this device the hammer is held in such close proximity to the string *f* that the rapid repetition of a note can be easily effected with a very slight motion of the key-lever B, which is not the case where an ordinary back catch is employed. The hammer-head E is formed of veneers or thin pieces of wood bent around a pattern or "former" into the required shape, so as to leave that portion of the hammer which strikes the string open or hollow, as seen at *l*. The exterior of the shell or hollow portion of the hammer is provided with a thin covering, *m*, of felt.

By thus dispensing with the thick felt covering heretofore used, and making a portion of the hammer open or hollow, its cost is reduced, and it is also rendered much lighter than those heretofore used, rendering the action of the instrument easier, while it gives a more elastic blow than a solid hammer and consequently produces a much better tone.

*n n* are the rest-pins, which are driven into the pin-block K at an acute angle. Each of these pins is provided with a spiral groove, *3*, for the reception of the string *f*, which is thus maintained in its proper position and prevented from slipping down, while the tension upon the wire, instead of starting or loosening the rest-pin, as has heretofore been the case when driven in straight, tends to force it down more firmly into the pin-block, by which means the strings are kept properly strained, and the

liability of the instrument getting out of tune is thus greatly diminished.

*Claims.*

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A piano-forte hammer-head made open or hollow, substantially as and for the purpose set forth.

2. I also claim a piano-forte hammer-head formed of veneers or thin pieces of wood bent into the required shape, substantially as set forth.

3. I also claim the butt D with the hammer-stem *b*, pivoted to the block C, combined with

the rail G as a back catch to hold the hammer after the blow is struck, substantially as described.

4. I also claim the key-lever B with its block C, in combination with the butt D, its escapement *e*, and stop *g*, the fly-lifter I, rail G, and the hammer E with its stem *b*, operating substantially in the manner and for the purpose set forth.

Witness my hand this 19th day of July, A. D. 1872.

STEPHEN P. BROOKS.

In presence of—

P. E. TESCHEMACHER,  
W. J. CAMBRIDGE.