

United States Patent Office.

SAMUEL W. PARKER, OF SOMERVILLE, MASSACHUSETTS.

Letters Patent No. 106,612, dated August 23, 1870.

IMPROVEMENT IN PIANOS.

The Schedule referred to in these Letters Patent and making part of the same

I, SAMUEL W. PARKER, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in the Construction and Arrangement of Piano-Fortes, of which the following is a specification.

The first part of my invention relates to an arrangement by which the strokes of the hammer on certain "nodes" or points where the clang of the string, or the overtones which appear when the strings are struck by the hammer, will all harmonize with the fundamental note.

The second part of my invention relates to the construction and arrangement of the bridges, as described below.

The third part of my invention relates to a bass sounding-board, or lower sounding-board, located under and at the right of the keys, constructed as described below.

The fourth part of my invention relates to the construction of the upper or treble sounding-board.

By means of these points I obtain an immense power and great purity of tone.

In the accompanying drawing—

Figure 1 is a plan of my piano, showing the position of the strings, upper sounding-board, bridges, frame, &c.

Figure 2 is a plan of the lower or bass sounding-board, showing its position in the piano, &c.

Figure 3 is a section of my piano.

Figure 4 is a section of the bridge d^1 .

Figure 5 is an elevation of the brass plate u .

Figure 6 is a section of one of the bridges on the sounding-board.

In figure 1—

a is the frame of the piano.

b is a flange, which is a part of the frame a .

c^1 and c^2 are the bass-pin block-bridges.

d^1 , d^2 , and d^3 are the treble-pin block-bridges.

e^1 , e^2 , e^3 , e^4 , and c^4 are the bridges, which are placed on the treble or upper sounding-board.

e^3 is a bridge, connected by posts (fig. 3 S) with the lower or bass sounding-board.

K is the treble sounding-board.

n^1 and n^2 are barrings across the treble sounding-board.

In the first part of my invention, the arrangement and plan of this scale brings the stroke of the hammers o uniformly throughout the scale, upon that point or node of each string, where the clang of the string, called overtones or harmonics, all harmonize with the fundamental note, a point never before attained in the construction of the piano-forte.

The discordant overtones which appear in all piano-fortes heretofore manufactured, making it necessary to

divide up those discords and spread them through the instrument, detract from the purity of tone and harmony, so desirable in a musical instrument. In this scale those discords are all avoided, and this instrument can be tuned with perfect chords throughout. This is attained by causing the hammers to strike one-seventh or one-ninth the length of each string, from the end resting on the pin-block bridge. The one-seventh or one-ninth is always reckoned from the stop-pin, that being the point where the vibration commences. The pin-block bridges are represented by c^1 c^2 d^1 d^2 d^3 .

My method of attaining this most accurately is by making each section of the piano, bridges; and hammer perfectly straight. c^1 , for example, is perfectly straight. The same is true of c^2 d^1 d^2 d^3 ; also e^1 , e^2 , e^3 , e^4 , and c^4 .

In my instrument, I usually place the hammers so that they will strike the strings one-seventh of the distance from the stop-pins on the pin-block bridges c^1 and c^2 , and one-ninth the distance from the stop-pins on the pin-block bridges d^1 , d^2 , and d^3 , the former being connected with the bass-strings and the latter with the treble-strings.

Piano-forte makers now do not have any fixed point for the hammers to strike, and it is an acknowledged fact that a piano has never been built which can be tuned with perfect chords.

I claim that my piano has and will accomplish this result.

It will be understood that, in my first claim, which I consider a very important one, there is a vast distinction between striking a piano-forte string from one-seventh to one-ninth of the length, and striking it at exactly one-seventh or exactly one-ninth of its length. The former is done every day in every piano; the latter, I believe, has never been attempted. Prof. John Tyndall, in his work on sound, speaks of the former, but not of the latter.

With regard to the second part of my invention, in the arrangement and construction of the bridges, one thing is of great importance to secure power, brilliancy, and purity of tone, viz: firmness at the point where the vibration of the strings is made to stop.

In order to secure this firmness at the treble, a solid brass plate (see fig. 5) is used, extending nearly one-half the way down the scale, secured firmly to the pin-block bridges d^2 and d^3 , and blocks underneath, the strings passing through small holes in this plate (see fig. 5.) On leaving this plate the strings pass over raised bridges e^2 e^3 and e^4 , receiving the pressure of two other pins, thus producing a brilliancy and power of tone never before equalled in this part of the piano-forte. All the pin-block bridges that do not rest on

the sounding-board are made highest at the stop-pin, and concave at the center, and sloping at the back part of the bridge, (see fig. 4.)

With regard to the third part of my invention, which is well represented in fig. 2—

g is the bass or lower sounding-board, located under and at the side of the keys; $h^1 h^2 h^3 h^4$ are their barrings, stretching across the sounding-board, thus keeping the board straight and uniform in its position, and giving the greatest possible vibrating power.

There are barrings on the under side of the sounding-board g , exactly opposite those on the upper side.

I usually make the outside barrings h^4 and h^1 about twice as thick as the inside ones. The usual custom now is to make very thick barrings only on one side of the board.

$f^1, f^2,$ and f^3 are the foundations for the key-frame.

The bass sounding-board g is glued to the front and back, p , of the piano, and by one point, y , only to the end. It does not reach to the other ends, B.

The bass strings and bridge c^3 rest on the bass sounding-board g , thus relieving the treble sounding-board k of the weight of the bass strings.

The treble sounding-board k has also thin barrings $n^1 n^2$ on the upper and under sides, similar to the barrings $h^1 h^2 h^3 h^4$ on the bass sounding-board.

The two sounding-boards g and k are connected by

sounding-posts m and l , (figs. 2 and 3,) placed in different positions, as the case may be, between the boards, thus imparting a rich and uniform tone throughout the instrument.

Both sounding-boards are sized with coatings of glue, which greatly increases their elasticity and power to aid the strings in their vibrations, as proved by actual experiment.

I claim as my invention—

1. The bridges and hammers $c^1 c^2 c^3 c^4 d^1 d^2 d^3 d^4 e^1 e^2 e^3 e^4$, arranged in sections of straight lines, substantially as and for the purpose described.

2. The bridge, of the shape shown in fig. 4, concave and sloping at the back, in combination with the brass plate u , shaped as described, and for the purpose set forth.

3. A sounding-board, with the thin barrings $n^1 n^2$ and $h^1 h^2 h^3 h^4 h^5$, on both sides of the sounding-boards, said sounding-boards being sized with coatings of glue, for the purpose above described.

4. I claim the bass sounding-board g , with the thin barrings, and glue sized, constructed and arranged substantially in the manner above described.

SAML. W. PARKER.

Witnesses:

H. M. HARTSHORN,
H. W. WILLIAMS.