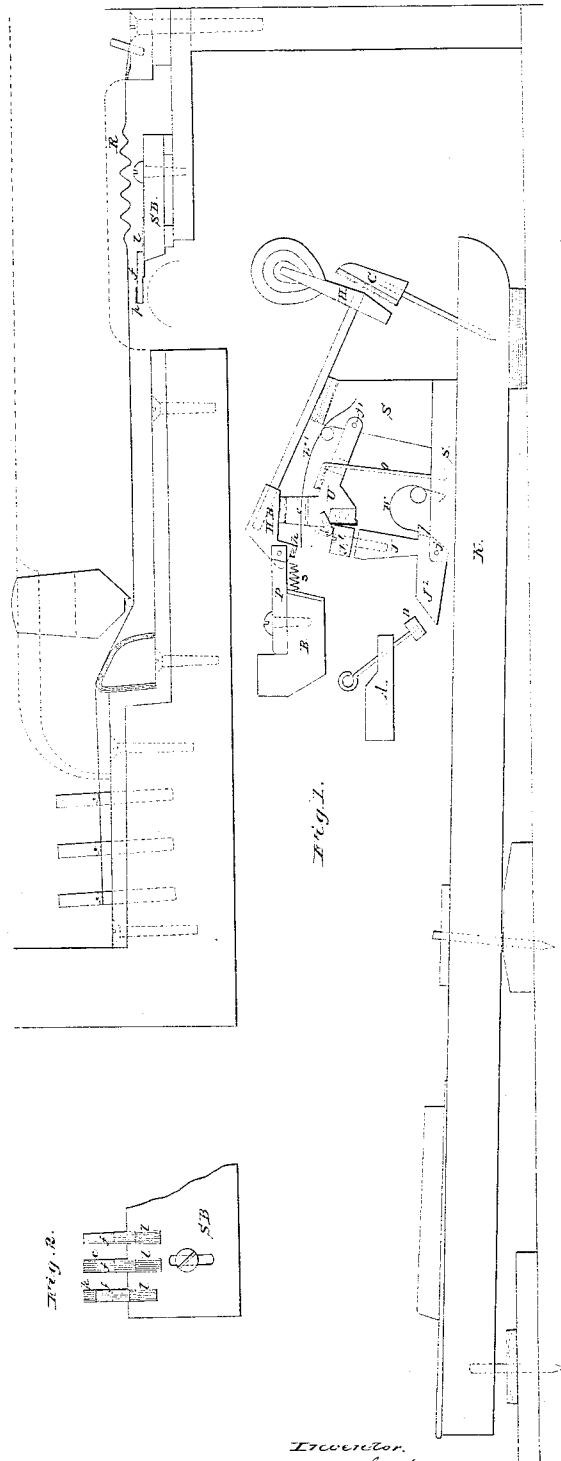


G. H. Hulskamp,
Stringing Pianos,

No 17,789,

Patented July 14, 1857.



Attest:
Eliza Foster
Charles L. Foster

Inventor.
G. Henry Hulskamp.

UNITED STATES PATENT OFFICE.

G. HENRY HULSKAMP, OF TROY, NEW YORK.

PIANOFORTE.

Specification of Letters Patent No. 17,789, dated July 14, 1857.

To all whom it may concern:

Be it known that I, G. HENRY HULSKAMP, of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Pianofortes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings and to the letters of reference marked thereon.

The first part of my improvement relates to the action of pianofortes. It is represented at Figure I, which is a vertical section through the middle of one of the keys K, K, and with the exception that the string and frame to which it is attached are much shortened it represents the several parts in their full size and proper proportions. The shaded parts are those covered with felt or buckskin to prevent noise. To the key K, K, is glued the standard S, S, and to it are attached by joints at *j* and *j'* the jack J and the lever or underhammer U. Two wire springs *w* and *w'* are attached to the same standard—*w* to press the jack against the under hammer and *w'* to bear up the latter against its stop O. An orifice is made through the under hammer at *o* with a slot leading to it from the side for the easy insertion of the spring *w'*. This passes through the orifice and extends so as to bear against the point *h* of the hammer for the objects hereinafter stated. Two bars A and B extending lengthwise across the piano are firmly attached to the frame in the usual manner. A serves to support the detaching stop D. To B is screwed the hinge butt P to which is attached by joints the hammers H. A spiral spring *s* attached to the hammer butt H B and pressing against the bar B serves to counteract in part and regulate the weight of the hammer.

C is the check to prevent the rebound of the hammer in the usual form. The head J' of the jack is attached to the body J by a screw so that its height can be accurately adjusted. The same object can be attained by making the head of the underhammer adjustable in the same way but the method shown in the drawing will be found most convenient. Screws upon the stems of D and O also serve to adjust their position.

The operation is as follows: When the back part of the key is raised by pressing down the front of it the hammer will be carried rigidly upward by the jack and underhammer, pressing against the hammerbutt, until it has attained about $\frac{3}{4}$ of its greatest height. Then

the projection J² of the jack strikes against the detaching stop D and it will become fully detached when the hammer has been brought to within about $\frac{1}{8}$ of an inch from the string as in some other actions heretofore in use. The spring *w'* has a force sufficient to raise the hammer when acting upon it through the underhammer, but enough to sustain only about $\frac{2}{3}$ of it when acting against the point *h*. This point it reaches a little before the jack has fully escaped and adds to the force of the blow during the remaining upward motion of the key, but permits the hammer to drop a little below the string after the blow has been given. The under-hammer will slide down the inclined face of the hammer-butt after the jack has become detached, being then sustained and pressed against it by the force of its spring. As the key descends the underhammer will rise up the inclined face and connect again with the jack. So that the blow may be repeated with a small part only of the motion of the key. It is thus seen that the connection between the key and the hammer varies at different points in its ascent. At first it is rigid and inflexible during the action of the jack. Then it is through an elastic spring which gives great lightness and elasticity to its action. It will also be observed that by this construction the motion of the under-hammer is in nearly the same direction as that of the point of the hammer-butt against which it acts and thus adds much to the ease and power of the action.

The second part of my improvement is in the soft pedal. This has heretofore been made to interpose a soft substance between the hammer and all the strings of a note, producing thereby the effect of deadening merely or muffling the sound. I have enabled it to produce a new, very soft and delightful tone, unlike any that we have been accustomed to hear. It is known by the name of the dolce harmonic attachment. This effect has been attained first, by making the soft material so narrow that it shall touch one only of the strings of a note. In the lightest blows of the hammer that string only will be effected and a very slight yet clear sound will be produced. With harder blows the soft material yielding to them permits an impulse upon the other string or strings of the note and the blending of the two sounds in perfect harmony produces a most pleasing effect. At the same time the performer is enabled to express a variety of

musical sentiment from the scarcely audible notes upon the single string to the full loud sound of hard blows upon all.

Secondly, by making the substance interposed of different degrees of hardness increasing from the lowest to the highest note of the instrument—supposing them to all be divided into three equal portions—for the first or lowest division I use felt. It is made soft by picking up the nap upon its surface for the lowest note and as they rise in the scale it is made gradually harder by picking it less and by cutting away the nap previously formed. For the second division buckskin is substituted and varied in hardness as before described. Parchment is used for the last division—in its natural state for the highest note and made gradually softer as before described for lower notes. The drawing represents a piece of parchment interposed.

The sliding bar S B Figs. I and II is made in the usual form. It is connected with the pedal and actuated by it in the manner heretofore in common use.

l is a piece of leather glued to the sliding bar; *f* a strip of felt glued to the leather, and *p* a piece of parchment glued to the felt. In Fig. II the three different materials are represented side by side—*p* parchment, *c* buckskin, and *f* felt—attached as before described.

The third part of my improvement affects the size and shape of the instrument. The long strings are made corrugated from near the sounding board bridge to the hammer, as represented at R in the drawing. They are made of hard steel wire and partly covered with soft iron and pressed, by any suitable machine adapted to the purpose, into the desired form of larger or smaller corrugations proportioned to the length of the

string. The force of the elastic spring thus given to the wire in the direction of its length is such that when drawn to its proper tension in the process of tuning it will be partially straightened, about one-third, where it will remain, keep in tune as well or better than a straight string, be improved in tone, and admit the instrument to be made about two feet shorter in its length.

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

1. The arrangement and construction of the action of piano fortes substantially as above set forth, having the jack, under-hammer, and springs attached to the key and moving in the same general direction with the hammer-butt.

2. I claim the use and application of the spring *w'* extending through the head of the under-hammer to bear against the hammer butt for the purposes described.

3. I claim the regulating screw in the head of the jack, or its equivalent in the head of the under-hammer, to regulate the height of that part of the action.

4. I claim the shape of the hammer butt with its spiral spring substantially as above set forth.

5. I claim the dolce harmonic attachment constructed as above specified or its equivalent, and I claim its parts to wit, the interposing of a substance to touch one string only of a note, and the making of such substance to vary in hardness with the different notes of the instrument.

6. I claim the corrugated spring for the purposes specified.

G. HENRY HULSKAMP.

Witnesses:

ELISHA FOOTE,
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