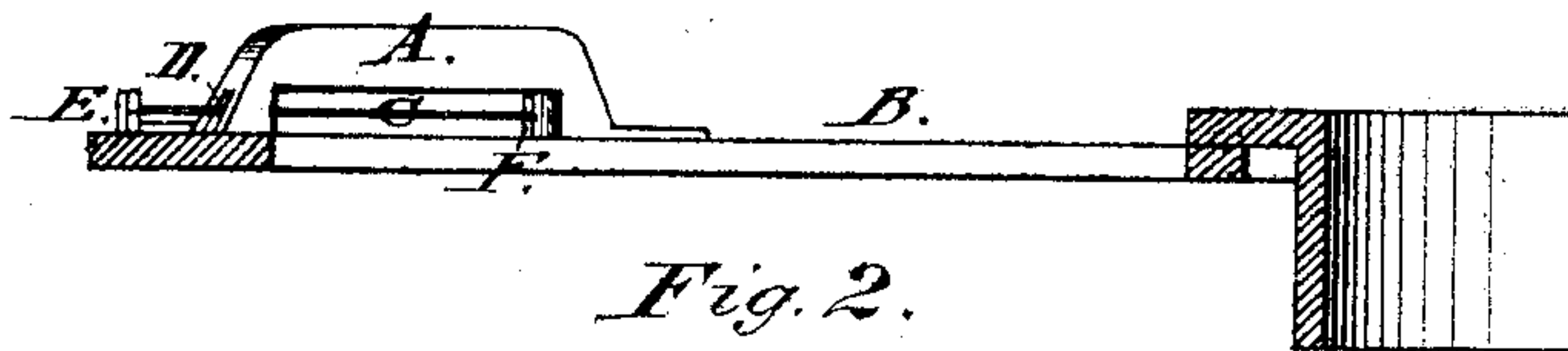
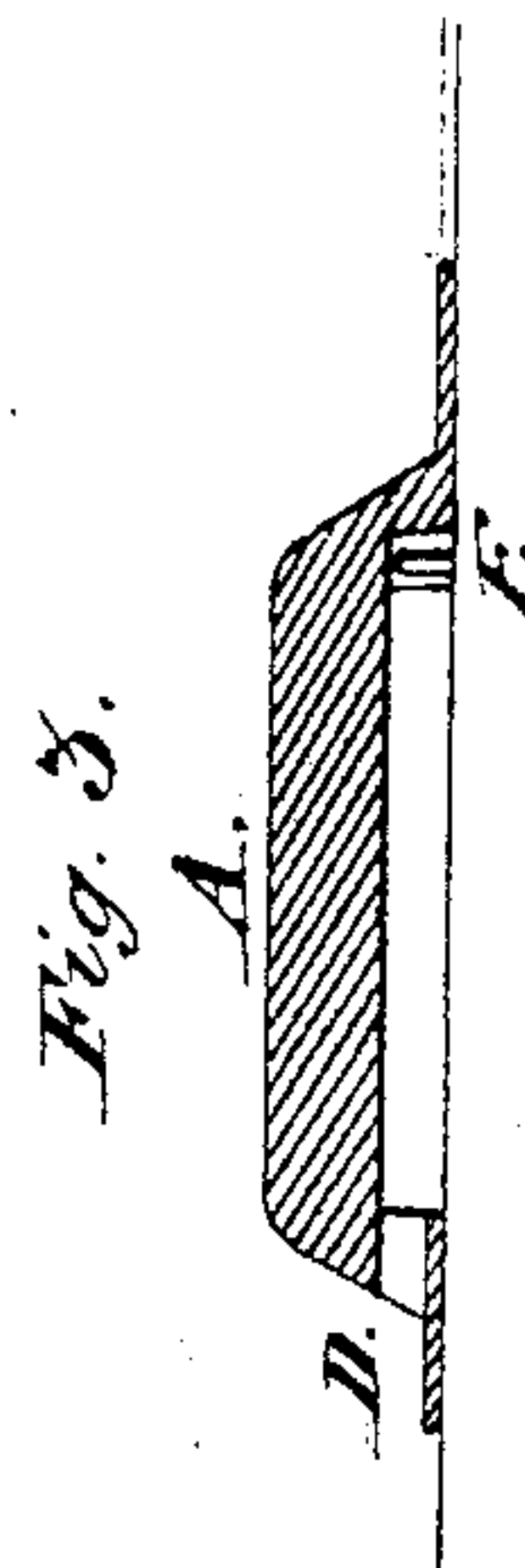
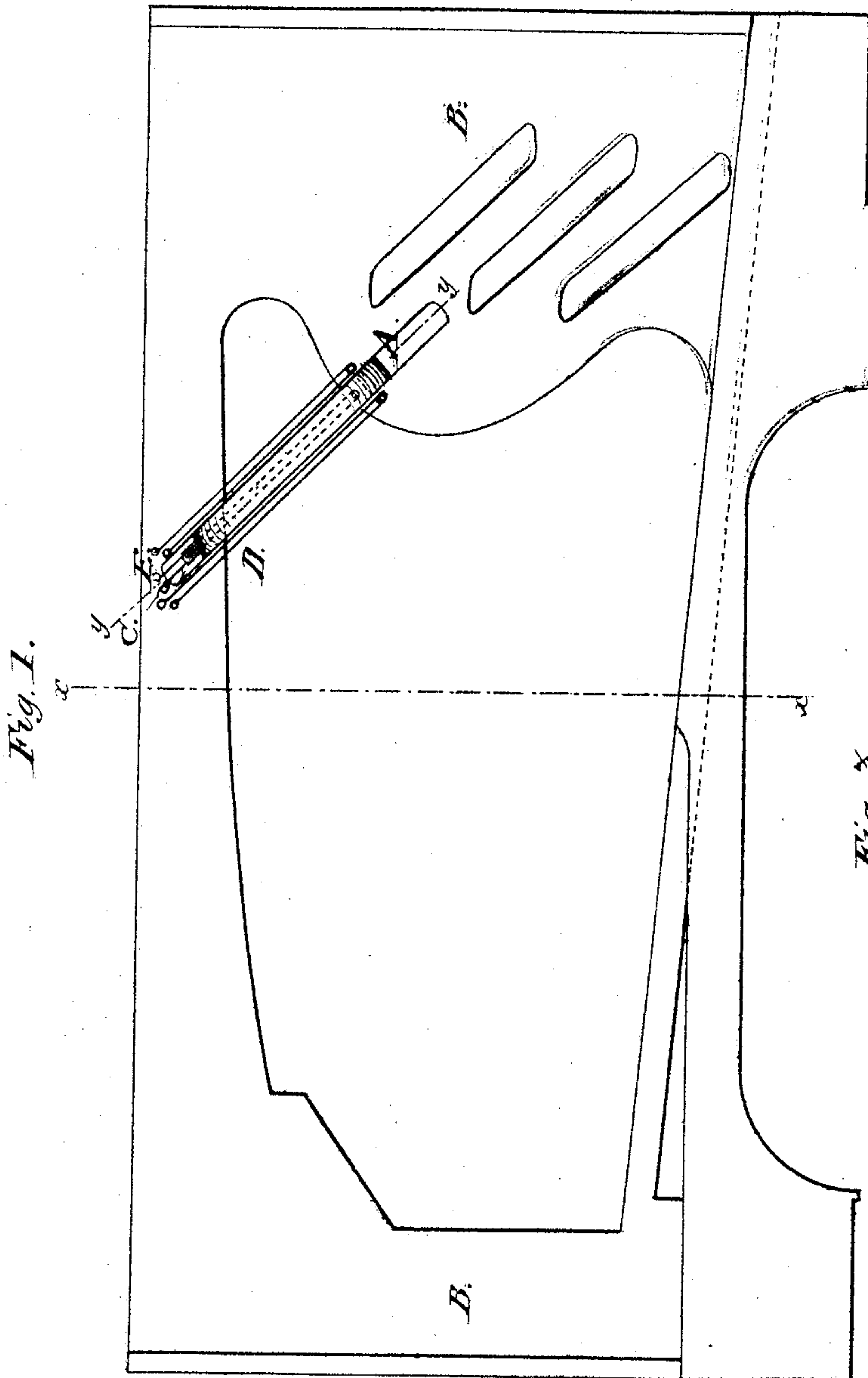


T. KATER.
Pianos.

No. 146,459.

Patented Jan. 13, 1874.



Witnesses.

A. H. Norris
W. J. Peyton.

Fig. 2.

Inventor.

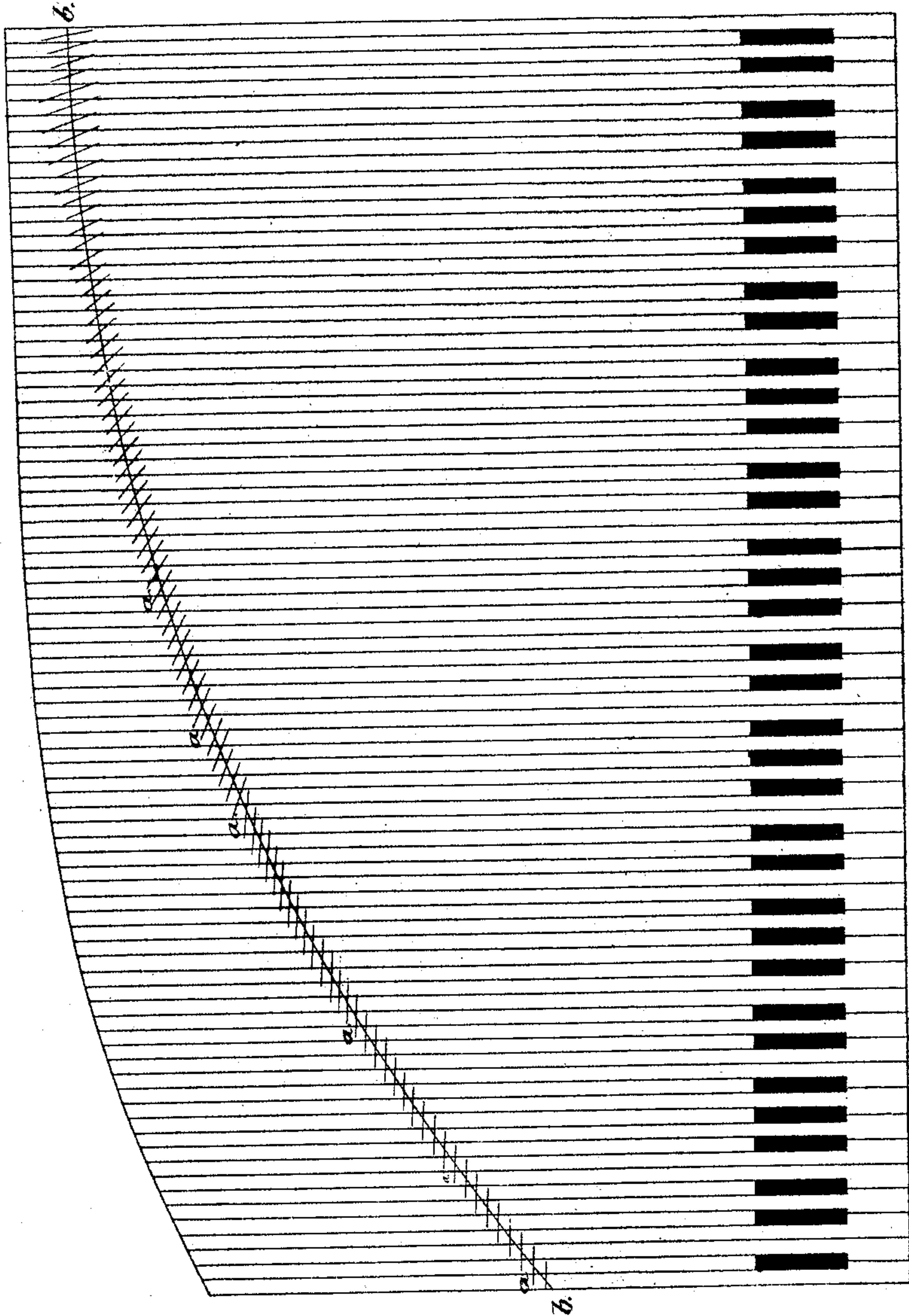
Thomas Kater.
By James L. Norris
Atty.

T. KATER.
Pianos.

No. 146,459.

Patented Jan. 13, 1874.

Fig. A.



Witnesses:

A. H. Norris.
Wm. J. Peyton.

Inventor.

Thomas Kater.
By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

THOMAS KATER, OF HAMILTON, CANADA.

IMPROVEMENT IN PIANOS.

Specification forming part of Letters Patent No. **146,459**, dated January 13, 1874; application filed December 29, 1873.

To all whom it may concern:

Be it known that I, THOMAS KATER, of Hamilton, Wentworth county, of the Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Scale for Constructing and Stringing Pianos, of which the following is a specification:

This invention relates to a novel mode of constructing and stringing a piano, whereby the blank spaces usually left in ordinary pianos are utilized or dispensed with, and a more equal or regular distribution of the strings effected.

This invention consists in recessing the treble bar of the iron frame, so as to enable the space under the same to be occupied by a note, or two or more of the treble strings, the recess being formed in the said bar in a plane above and parallel with the iron frame, which will enable the strings throughout the entire scale to be placed at a farther distance apart, by reason of the space thus gained, and each string, passing under the treble bar, will be free from, or out of direct contact with, the base of the treble bar and the upper surface of the iron frame, the blank spaces which are left at other points of the scale in ordinary pianos being also occupied, which will be conducive of securing more space for the keys and hammers, thus obviating the crowding of the hammers and the cutting away of the same, and securing a better and increased tone, as the strings and hammers are equally distributed in proper relation to each other, and the vibration of the strings from the tuning-pins to the hitching-pins secured and utilized.

In the drawings, Figure 1 is a plan or top view of an iron frame for pianos, showing the arrangement of the strings composing a note in respect to the treble bar. Fig. 2 is a transverse section on the line *xx* of Fig. 1. Fig. 3 is a section of the treble bar, taken on the line *yy* of Fig. 1. Fig. 4 is a plan view illustrating the arrangement of the strings in respect to the keys according to my invention.

In the ordinary mode of stringing pianos, considerable space is lost or not occupied between the groups of strings and at the treble end of the scale, which is conducive of bringing about a crowded state of the hammers and keys at different points, necessitating, in certain instances, the cutting away or paring off

of the hammers, in order to make room for their proper action on the strings. In order to avoid these defects, and other disadvantages incidental to a crowded state or unequal distribution of the strings and hammers, I propose to arrange the strings of a piano throughout the entire scale in such respect or juxtaposition to each other that all the blank spaces heretofore left are occupied or utilized, which will cause the strings to be more equally distributed, additional space being also left between the strings, as will be obvious. In order to carry out this result, I contemplate, in the first instance, to utilize the space which is usually left beneath the treble bar A of the iron frame B by arranging under and longitudinally through said bar a note, consisting of two, three, or more, of the treble strings C, which will permit the strings throughout the entire scale to be arranged at farther distances apart, by reason of the additional space thus secured or gained. The recess is formed in a plane parallel with and above the iron plate, so that the strings will be out of contact with the base of the treble bar, and the upper surface of the iron frame at all points between the hitching-pins and tuning-pins, whereby a free and full vibration of the strings is effected between the hitching and tuning pins; and, further, a down bearing is secured, neither of which results could be as well obtained when the recess or channel in the bar was inclined with respect to the iron frame, as has been heretofore done, and the strings made to bear upon a depending projection formed beneath the bar below and in front of the opening. The blank spaces generally left at the point where two groups of strings separate or radiate in opposite directions is also obviated by arranging the bridges in such relation to each other, and with the sounding-board and tuning-block bridge, that the strings *a* are disposed as shown in Fig. 4. The strings, as represented, are so arranged in respect to the striking line *b*, which is located between the sounding-board and frame, that they are equidistant apart throughout said line, so as to cause the hammers to strike the same with equal effect. The treble bar A, which extends diagonally across the iron frame, is recessed or channeled at its rear end, as shown at D, so as to enable a note com-

posed of the treble strings to be passed through the opening thus formed, their ends being then attached to the tuning-pins E. The opposite ends of the strings are fastened to a hitching-pin, F, which is located under the treble bar, by causing the edge iron frame to extend or project forward under the treble bar, in order to form a recess or point of attachment for the hitching-pin. The number of hitching-pins and strings which are located under the treble bar may be increased or diminished, according to the size of the bar; as, for example, if two strings are employed to form a note, one hitching-pin and two tuning-pins are employed; and if three strings are resorted to, two hitching-pins and three tuning-pins are used. In certain instances it is also proposed to groove or channel the sides of the treble bar, for the passage of the strings; but this mode is generally objectionable, as it will tend to weaken the treble bar.

By my mode of stringing pianos, I obtain several important advantages, for, by dispensing with the blank spaces, a larger hammer can be employed, as the strings are more regularly and proportionately distributed, which will obviate the cutting away or paring off of the hammers, in order to prevent the same from interfering with each other; and, furthermore, it is easier to produce by my arrangement of strings a regular striking line; and the hammers are arranged in position with more ease and facility, as the same are not crowded, in consequence of which a true position is secured, and the tone of the instrument improved and augmented.

It will, of course, be apparent that due provision by proportion must be made for the variation in the size of the hammers; and, therefore, the strings must be arranged at such regular distances apart and the blank spaces so utilized as will not interfere with the free operation of the hammers upon the strings. The string recess, channel, or opening in the treble bar may be formed in the process of manufacture, or may be made subsequently by drilling; or the treble may be formed separately of wrought or cast iron, and afterward secured upon the iron frame.

It is, of course, understood that it is within the province of my invention to employ, at various other locations on the iron frame, a bar, A, recessed or channeled as the treble bar, to receive the strings composing various notes.

I claim as my invention—

The treble bar of an iron frame for pianos, provided with a channel, D, formed in the bar parallel with and above the iron frame, for the passage of the strings composing a treble note, so that the strings will be out of contact with the iron frame and base of the treble bar, as herein shown, for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 29th day of December, 1873.

THOMAS KATER.

Witnesses:

JAMES L. NORRIS,
WM. J. PEYTON.