

C. PETERS.

Improvement in Harmonicon Attachments to Piano-Fortes.

No. 128,976.

Patented July 16, 1872.

Fig. 1

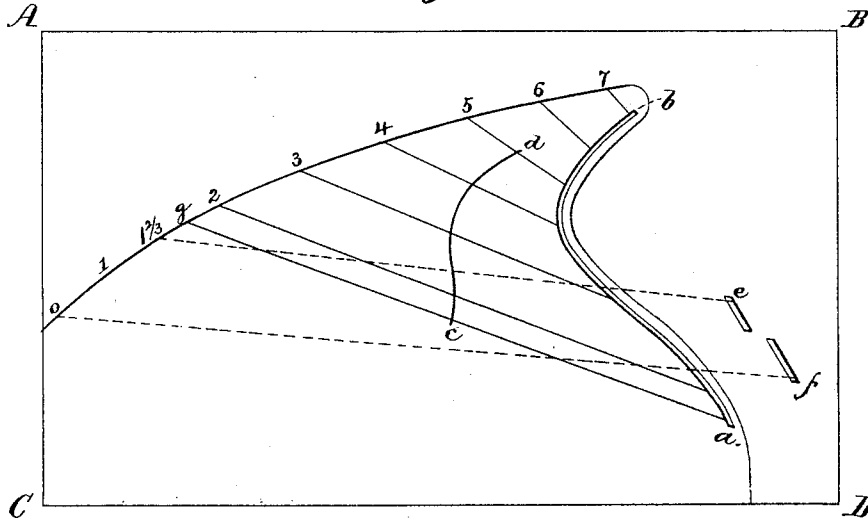


Fig. 2.

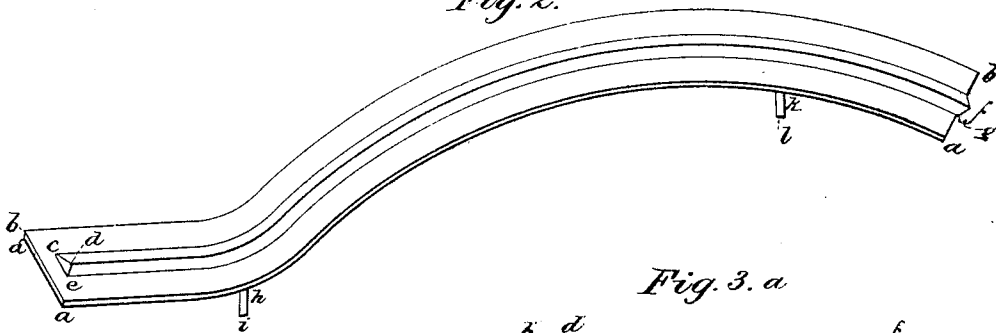


Fig. 3. a

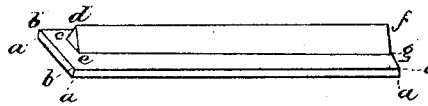
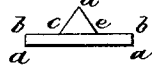


Fig. 3. b.



Witnesses:

Felix Fetting
Rob. Coit, Jr.

Inventor:

Charles Peters.

UNITED STATES PATENT OFFICE.

CHARLES PETERS, OF NEW LONDON, CONNECTICUT.

IMPROVEMENT IN HARMONICON ATTACHMENTS TO PIANO-FORTES.

Specification forming part of Letters Patent No. 128,976, dated July 16, 1872.

Specification of the "Harmonicon," invented by CHARLES PETERS, of New London, State of Connecticut.

The aim of my invention is to add to the other good qualities peculiar to the piano-forte the great advantage that until now was the prerogative of instruments of the violin tribe. The effect of this improvement on the piano-forte is the production of harmonics by a simple contrivance representing the light touch of the finger-point on the strings, as it is performed by violin or guitar players, eliciting from the instrument those powerful and agreeable sounds which are known in musical art as the harmonics, thus making the piano-forte a musical instrument in the fullest sense of its requisites. It is a well known law of sounds that half the length of the string produces the octave, which is of the same character as the tonic, but less in volume because the other half of the vibration is intercepted. By placing the finger-point lightly on the middle of a string we obtain also an octave, but of a different character and of a greater volume, since the whole length of the string continues its vibration, and thereby produces twice the intensity of sound, because the whole string vibrates as fast as a string of half that length would do, or the string makes twice as many vibrations as it would make untouched, thus yielding that intensity of sound, which, by its rich and mellow roundness, is so agreeable to the ear.

It is on the above principle that my improvement acts, and the contrivance by which to obtain said effect is as simple as the principle itself, as will be shown by the following explanation.

Let A B C D, Figure I, represent the upper inside of a piano-forte, where the curves *o—7*, *b—a*, signify the two bridges, *o—7* the one on the rest-plank, and *b—a* the other, near the plate. The figures from *o* to *7* indicate the termini of the seven octaves of strings on the bridge, over the rest-plank, running over the other bridge near the plate. The dotted lines *o f* $1\frac{2}{3}$ *e* show one octave and two-thirds of overstrung spun-wires; *g* to *7* and *a* to *b* exhibit the three octaves and a third of plain steel wire. The curve *c d*, extending from *g* to fifth octave, divides the strings, which it crosses, into two halves exactly, and indicates the place

where the "harmonics" of the octave are obtained.

Fig. II represents a side view of the "harmonic rim;" Fig. III, the cross-section or vertical transverse section and side view; Fig. III, *a*, side view; Fig. III, *b*, transverse section.

The letters *a a a b b*, Fig. II, represent a rim, of hard wood, iron, or brass, about a quarter of an inch in thickness, one inch in width, and of the necessary length to extend from the first steel wire to the fifth octave. This rim is cast or wrought into the shape required by the configuration of the two bridges, so as to describe a curve, exactly dividing the strings of those octaves where the harmonics are to be brought out into two equal halves. On said rim I place, securely fastened, a triangular strip of India rubber, or other suitable material, about a quarter of an inch high, the edge of which must be soft enough to resemble the skin of the finger-point, and, when brought in contact with the middle of the strings, produces the harmonic octave. This triangular strip is marked by the letters *c d e f g*.

Fig. III, *b*, shows the vertical transverse section of rim and triangular strip; *a a b b*, rim; *c d e*, triangular strip.

The above harmonic rim, whether placed over or under the strings, is put into action by a simple lever arrangement connected with a pedal in a similar way like the other (loud and soft) pedals of a piano. There generally is in the lyra, or pedal-frame, of all modern pianos, besides the rods working the two pedals, a third one, not employed, but merely put on for appearance, and the very same I make perform the operation necessary to put my contrivance into the motion desired. This performance of the additional pedal does not in any way interfere with the operation of the other two usual ones.

The two short rods *h i*, *k l*, Fig. II, may either be used in the motive power of the pedal or merely as the means of keeping the harmonic rim in its proper place.

The space required for the application of my harmonicon is so insignificant and so far out of the way of the rest of the action usually applied to piano-fortes that it can be attached to any one of them without involving any essential change of arrangement in their present

construction or a perceptible difference in outside appearance, as will be obvious, not only to practical piano-makers, but also to every piano-player.

This harmonicon is intended for that part of the piano-forte only which carries the melody—*i. e.*, comprising about three octaves and a third, or a half, as the case may be, of the middle of the "scale,"—although it could be applied all over it.

Although the striking effect of my invention is likely to bring about a great revolution in the musical world at large, as well as in the manufacture of piano-fortes henceforward, I

claim as its main merit the insignificance of additional workmanship, and, consequently, the inconsiderable cost of its application to a piano-forte, being far from increasing its price beyond a reasonable allowance for the improvement.

I claim—

The harmonic rim of vulcanized rubber, fastened to a metallic or other substantial body to secure strength and stability of the rim.

New London, Connecticut, October 23, 1871.

Witnesses:

CHARLES PETERS.

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