S. B. Driggs,

Piano,

No. 41,977, Patented Mar. 22, 1864.

Fig. 1.

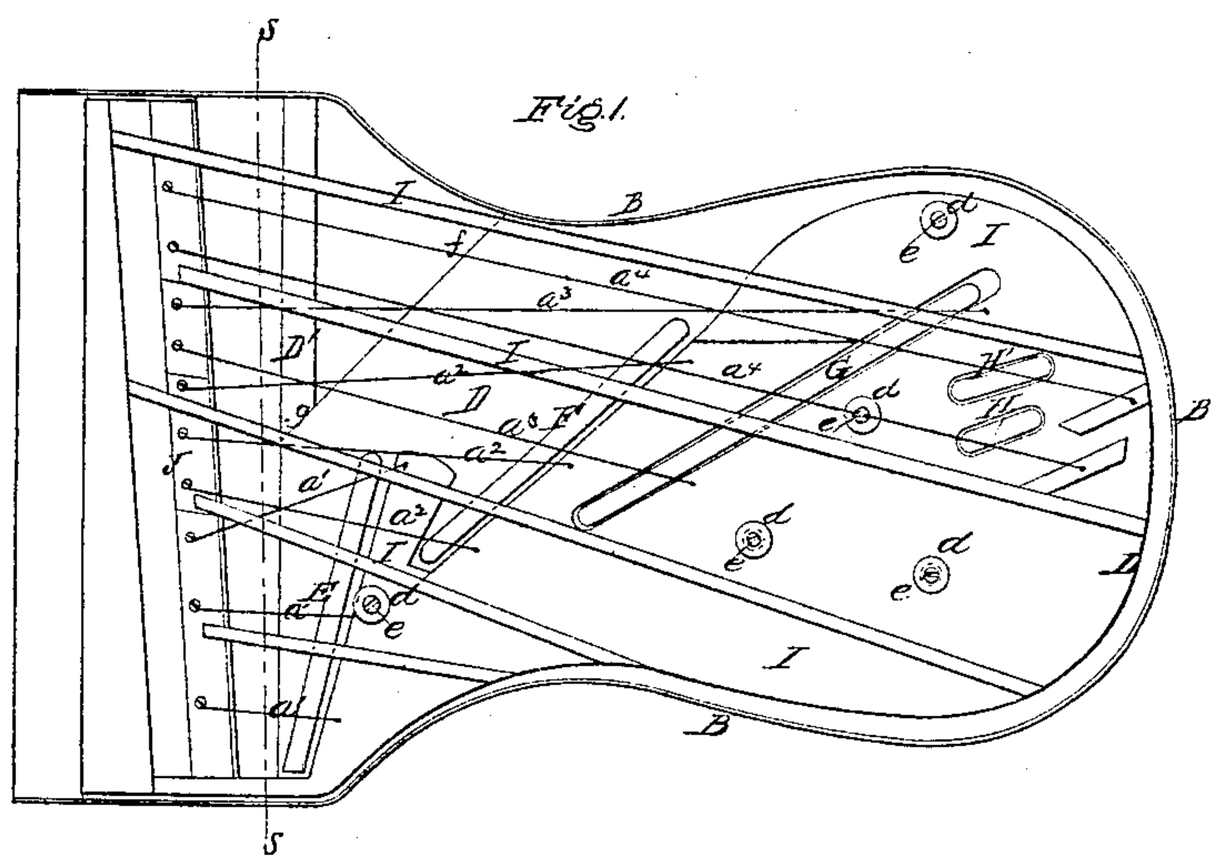


Fig. 2.

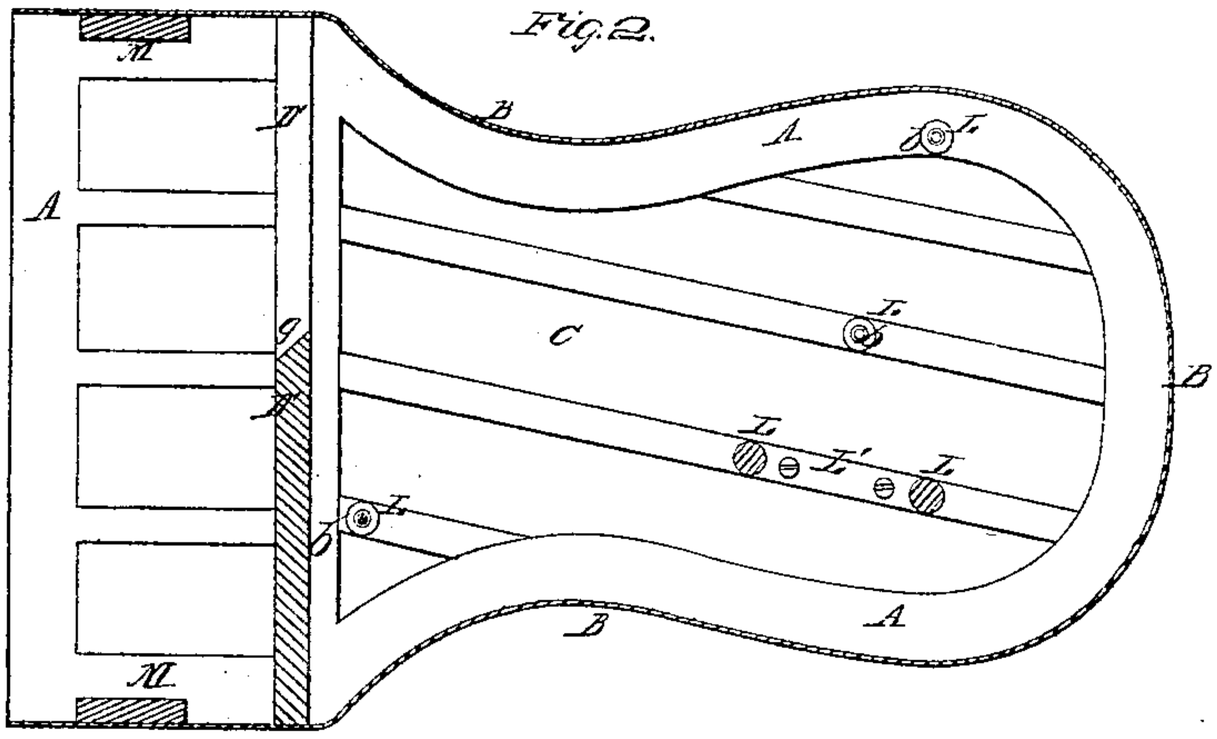
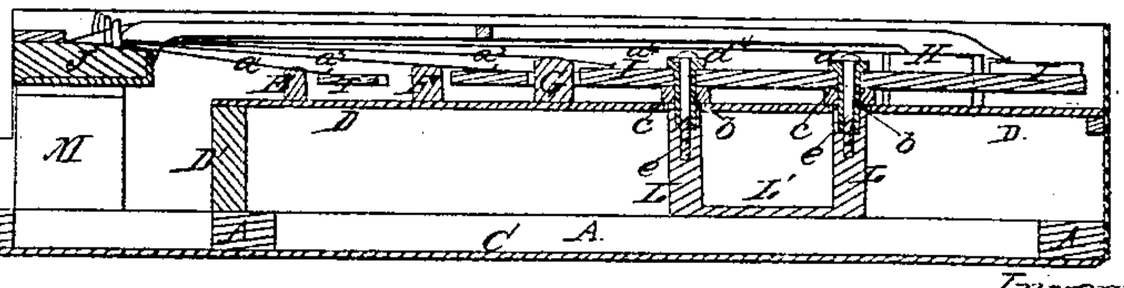


Fig 3.



Witnesses:
Thos. H. Douglas
Geo. W. Reed

Inventor:
S. B. Driggs.
By Munn & Co
Attys

UNITED STATES PATENT OFFICE.

SPENCER B. DRIGGS, OF NEW YORK, N. Y.

IMPROVEMENT IN PIANO-FORTES.

Specification forming part of Letters Patent No. **41,977**, dated March 22, 1864.

To all whom it may concern:

Be it known that I, SPENCER B. DRIGGS, of the city, county, and State of New York, have invented certain new and useful Improvements in Piano-Fortes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan of the interior of a grand piano-forte constructed according to my invention. Fig. 2 is a horizontal section of the same below the sound-board. Fig. 3 is a longitudinal vertical section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in the employment of straight bridges throughout the whole scale of a piano-forte, whereby, besides allowing much more freedom of vibration to the board, the strings are enabled to be arranged in overstrung tiers or sections through the middle of the board, and I am enabled to obtain a more perfect scale as to the proportionate length of strings, and to obtain a progressively-increasing distance between the notes on the bridges toward the bass, which latter result is of great importance, for as the strings of the lower notes require longer vibrations, so they require greater distance or space of bridge uninterfered with by other notes.

It also consists in electrically isolating the case, sound-board, and all that produces and adds to the tone of the instrument, from the iron frame or plate or mere sustaining portion, whereby whatever electricity may be generated or attracted by the vibration of the strings is all forced into and prevented from escaping in any way but through the sound-board.

It also consists in making the case of the grand piano-forte narrower across the middle than at the r ar end and wider than usual at the rear end, the object being to make the case, which I construct of a mere shell of wood and with a bottom sound-board, of a form approximating to that of the violin or guitar, which is the form best adapted for sound, and to obtain a greater width of sound-board in the lower or bass part of the instrument, where greater vibration is necessary.

It further consists in providing an opening at the left-hand front corner of the sound-board of a grand piano-forte, for the purpose of giving a better opportunity for the sound to come out from the instrument when a bottom sound-board is used.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In carrying out my improvements I construct the piano-forte with a strong, open base-frame, A, of wood, the outside of which gives form to the rim B of the case, which consists of a mere shell, and I cover the bottom of the said frame with a thin sound-board, C, according to my Letters Patent No. 19,081. The sound-board proper, D, or, as I prefer to term it, the "tone-magnifier," is glued to the rim B of the case at its sides and back, and its front end is glued to a timber, D′, which rests on the base-frame A.

E F G H H′ are the straight sound-board bridges, five in number, the last two, H H′, being of the same height, but the others being of gradually-diminished heights, to permit the arrangement of the strings in four overstrung tiers, the lowest tier, a' a', embracing the strings at the treble end of the scale, resting on the lowest bridge, E, the next tier, a^2 a^2, embracing a number of strings lower in the scale, resting on the next bridge, F, the next tier embracing a number of strings, a^3 a^3, still lower in the scale, resting on the bridge G, and the next tier embracing the lowest or bass strings, a^4 a^4, resting upon the highest bridges, H H′. The reason for using two bridges, H H′, for the uppermost tier of strings, a^4 a^4, is to enable the said strings to be brought wide enough apart without making the bridge of too great length. The bridges F G H H′ are severally arranged over the middle of the width of the sound-board, where there is the greatest amount of vibration; but the bridge, E, for the treble strings a' a', is arranged with its left hand end, where the shortest strings are supported, close to the side of the instrument, those strings requiring a very firm bearing. The bridge E forms a very acute angle with the hammer-line, which is indicated in dotted outline and marked *s s* in Fig. 1, the bridge F a less acute angle, the bridge G a still less acute angle, and the bridges H H′, which

are parallel, the least acute angles. The above increase in the angles formed by the straight bridges with the hammer-line enables the necessary progression of increase of width between the bridge-bearings and between the strings from the highest to the lowest notes—that is to say, enables the distance of each string from the next one lower in the scale to be made greater than its distance from the next one higher in the scale. By this arrangement of bridges the vibration of the board is rendered more free than by any system heretofore used, as they are all, with the exception of E, over the middle of the board; and the straight form interferes less than the curved form of bridge.

The strings are sustained independently of the case by means of an iron plate or frame, I, corresponding with the form of the case, the wrest-plank J being bolted to the said plate, and the said plate is supported upon the frame A by means of several iron standards, L L, from which it is electrically isolated by means of glass or other suitable material which is a non-conductor of electricity. The isolation represented for each standard (see Fig. 3) is composed of a cylindrical tube or thimble, *b*, of glass, which is fitted into a cavity in the top of the standard, and to a hole in two flat rings, *c* and *d*, of which *c* is fitted to the exterior of the thimble below the plate I, and *d* is placed above the thimble *b* and plate I. A screw, *e*, passing through the ring *d* and tube or thimble *b* and screwing into the standard, secures the plate I to the standard, and at the same time secures the glass in place. Washers of india-rubber or other soft material may be interposed between the glass and the plate I and standard L. For convenience of securing the standard L to the frame I, I cast two standards on one base, L, as shown in Figs. 2 and 3. At the front of the instrument I have represented on each side an additional support, M, for the plate I, and these supports are also faced with glass to isolate the plate.

The violin-like shape of the case and the increased width at the rear end of the case of the grand piano-forte is well illustrated in Figs. 1 and 2. Both sides are made of corresponding curved form, instead of one side being straight, as in the common form of grand piano. This form and increased width at the back of the case, in connection with the thin sides and thin vibrating bottom or additional sound-board C, gives the instrument more of the character of the violin.

The opening at the left-hand front corner of the sound-board or tone-magnifier D is shown at *f f g* in Fig. 1. To form this opening, the sound-board is cut off at the above-mentioned corner from a point four or five inches from the first or treble bridge, E, and parallel with the second bridge, F. The timber D′, which supports the front of the board, is also cut away up to the point *g*, where the board commences to be glued onto it. By this means more room is provided for the sound to come out than has heretofore been provided when the whole of the bottom of the instrument has been closed up by a bottom sound-board, C.

I am aware that F. C. Lighte obtained Letters Patent for what he termed "insulators;" but these insulators are applied between the wrest-plank and the iron plate and otherwise in a different manner from the means of electrical isolation, and for an entirely different purpose, and I hereby disclaim such isolation.

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

1. The employment throughout the scale of a piano-forte of a system of straight bridges, of different heights, whereby the strings are brought in overstrung tiers or sections over or as near as possible to the middle portion of the sound-board, substantially as herein described, and other results, hereinabove mentioned, are obtained.

2. Electrically isolating the case, the sound-board, and all that is instrumental in producing or developing the sound from the iron frame or mere sustaining portion of the piano-forte, substantially as and for the purpose herein specified.

3. Constructing the case of the grand piano-forte of violin form—that is to say, with both sides curved, and with the rear portion wider than the middle portion, substantially as and for the purpose herein described.

4. In combination with a bottom sound-board, C, in a grand piano-forte, the opening *f f g* at the front left hand corner of the upper sound-board, D, substantially as and for the purpose herein specified.

SPENCER B. DRIGGS.

Witnesses:

THOS. L. J. DOUGLAS,

M. M. LIVINGSTON.