# S. W. Draper,

## Piano Attachment,

No. 4,082. Patented June 20, 1845.

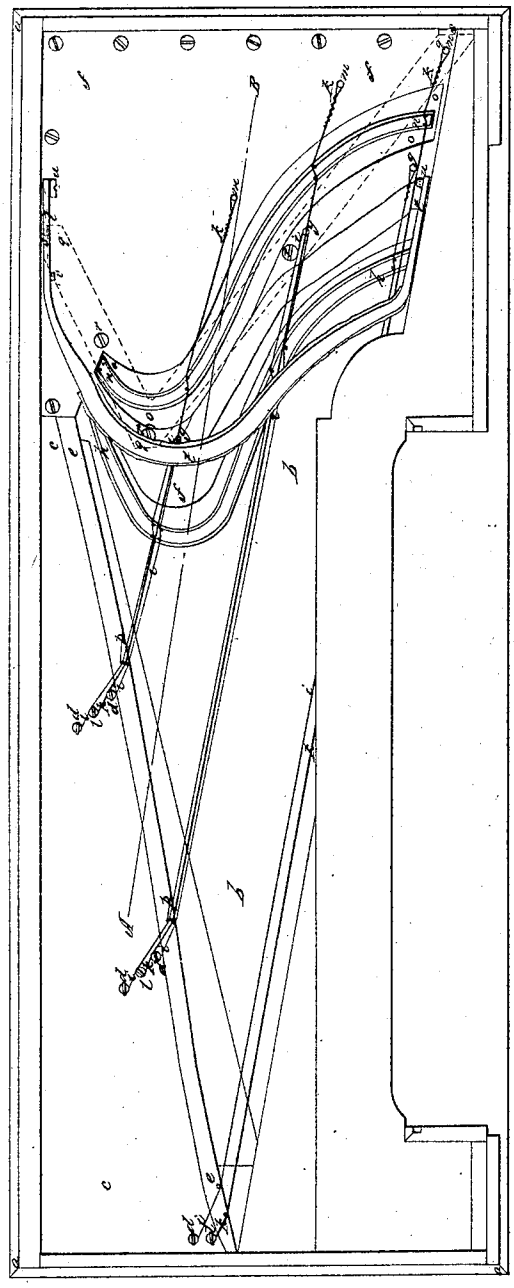


Fig. 1.

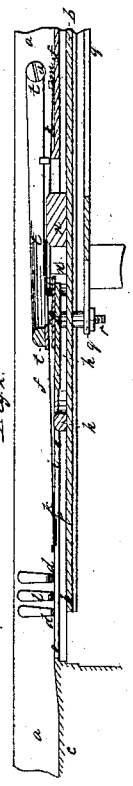


Fig. 2.

AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS.)

# UNITED STATES PATENT OFFICE.

SIMON W. DRAPER, OF BOSTON, MASSACHUSETTS.

## PIANOFORTE.

Specification of Letters Patent No. 4,082, dated June 20, 1845.

*To all whom it may concern:*

Be it known that I, SIMON W. DRAPER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Pianofortes, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvement by which my invention may be distinguished from others of the same class, together with such parts or combinations as I claim and desire to have secured to me by Letters Patent.

The object of my improvement is to increase the volume of tone, and to augment the harmony, when a chord is struck upon the instrument, by producing with the stroke of each hammer, the usual simple tone, and in addition thereto a consonant tone an octavo below. The object is effected by means of an additional string for each note in the instrument, which is made sufficiently longer than those by which the tone is commonly produced, to produce the octave tone above specified; a secondary "crooked bridge," in rear of the ordinary one, being provided for the said additional strings, and some necessary alterations in the construction of the "iron frame" and "back bridge," being made, as will be explained in the sequel.

The figures of the accompanying plate of drawings represent my improvement.

Figure 1, is a plan or top view of a piano forte with the cover removed, showing the main parts of the instrument, without the "action," and Fig. 2, is a detail sectional view, taken in the plane of the line A B, Fig. 1.

*a a a a*, &c., is the exterior casing of the instrument.

*b b* is the sounding board, formed in the usual manner.

*c c* is the "back block" in which the rest or tuning pins *d d*, are confined, and *e*, *e*, is the "back bridge" (so called), on the front edge of said block over which the strings pass to the said rest pins.

*f f* is the iron plate in which the hitch pins *g g*, are confined, and *h h* is the "crooked bridge" as ordinarily arranged in the instruments now in common use.

The common strings *i i i i* of the instrument pass from the hitch pins *g*, *g*, &c., in front of bridge *n*, over the bridge *h h* to the tuning pins *d d*. In my improvement as herein above mentioned additional strings for the consonant octave tones are arranged nearly parallel to the common strings of each note or between the same as shown at *k k*, *k k*, &c., Fig. 1. These strings *k k*, &c., pass from proper rest or tuning pins *l*, *l*, as shown by blue lines in Fig. 1 bearing on the top of the back bridge, *e e*, and are hitched to the plate pins *m m m*, in rear of the secondary crooked bridge *n n*, on the top of which bridge they bear in the ordinary way and are raised above the bridge *h*.

This bridge *n n*, is curved almost symmetrically with the front crooked bridge *h h*, as shown in Fig. 1, and is fitted to the sounding board like it in a space *o o o o* cut out of the iron plate *f* as shown in the figure by which the difficulty is avoided of resting two sets of strings on one bridge. This bridge *n n* is a little higher than the bridge *h h* in order that the octave strings *k k*, &c., may not touch said bridge *h h* in their vibrations; but in order to bring those parts of said strings which are over the points where the hammers act on the same on a level with the other strings *i i i*, &c., the back bridge *e e* is cut away in the places shown at *p*, *p*, Figs. 1 and 2, so that the "octave" strings *k k*, &c., and ordinary strings *i i*, &c., are struck and vibrated by one and the same hammer, and without any alteration in the action of the instrument.

The cutting away of the iron plate *f' f* as hereinbefore specified for the insertion or application of the secondary crooked bridge *n n*, will have a tendency to weaken said plate, but this tendency is counteracted by the introduction of the angular iron brace *q q q*, shown by red lines in Fig. 1, which is firmly connected to the two parts of the iron plate by means of screws and nuts shown at *r*, *r r*, Figs. 1, and 2, the end of the long arm of said angular brace resting on the head block of the instrument at, *s*, and that of the short arm resting on the back block at *s'*.

A heavy curved damper bar *t t t*, supported at each end on a pivot *u u* Fig. 1, rests on the octave strings and damps them by its own weight, wholly checking their vibrations; and when it is desired to get the full volume of tone from the instrument, this damper bar is raised by means of the vertical step pin *v*, which is operated by

means of a lever and pedal in a manner well understood by piano forte manufacturers. When this bar is raised as specified the volume of tone is greatly enhanced while the harmony is as full and perfect as could be desired.

I am aware that a damper bar has before been used in a piano forte, but in a very different connection from that I have described, and for a different purpose, while it also operates on a different part of the strings, its object and purpose being to raise the tone of the strings, as ordinarily arranged, an octave, which can only be done by pressure upon them, at points some distance in front of the common crooked bridge. In my arrangement the bar operates only by its weight, and is applied merely to stop the vibrations of the strings as hereinabove described, the line where it presses or operates being much nearer the iron plate than in the case just above specified. As my improvement is arranged it will be requisite in the construction of the instrument to use the "over action dampers," to stop the vibrations of the strings when the fingers are removed from the keys, in preference to the other kinds now in use.

Having thus described my improvement and its application to a piano forte, I shall state my claim as follows:

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

1. Combining an additional octave string to each note of the piano forte in the manner described; that is to say, by causing said strings to be raised at the head, or right hand end, a little above the strings *i*, that form the note, while at the opposite end they are depressed sufficiently to bring all the strings to a level at the point where the hammer strikes them.

2. I also claim placing the secondary bridge, or that nearest the right hand end of the instrument, in an opening made for that purpose in the plate, through which the bridge projects, a little higher than the one immediately in front of it; the hitch pins of the common strings being in that part of the plate that is between the two bridges, and those for the octave strings being beyond the secondary bridge.

3. I also claim the combination of the brace *q* with the plate for the purpose of supporting that part of said plate between the bridges; it being attached thereto by screws or otherwise as herein fully set forth.

4. Lastly I claim in combination with the elevated strings the crooked damper in the manner and for the purpose described.

In testimony that the foregoing is a true description of my said invention and improvement, I have hereto set my signature this 13th day of June in the year eighteen hundred and forty-five.

SIMON W. DRAPER.

Witnesses:
J. J. GREENOUGH,
L. CALDWELL.