

A. Hall. Street 1. 2. Sheets.

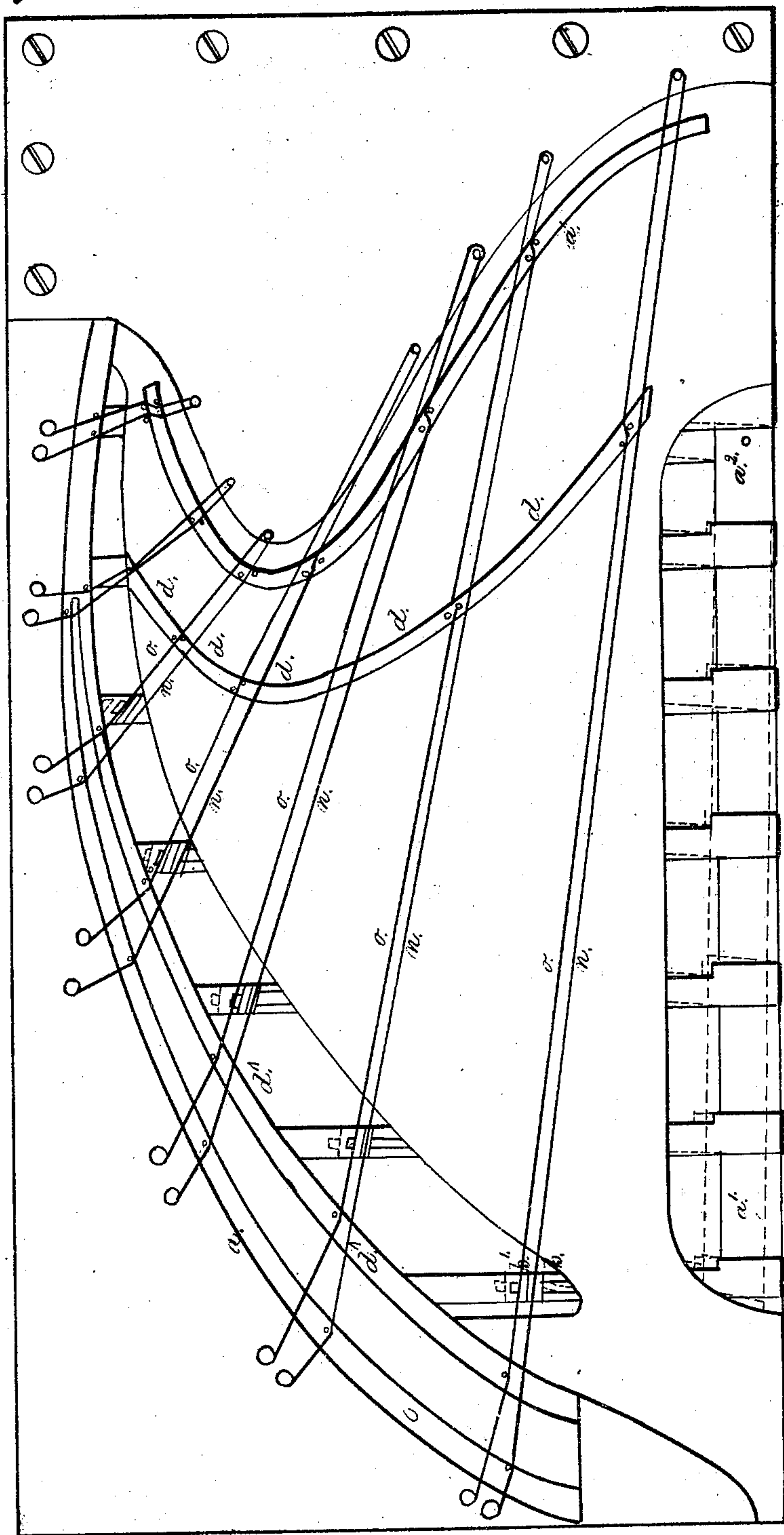
*Piano.*

Street 1.2, Streets.

No. 10776.

*Patented. April 11. 1854*

Fig: 1.



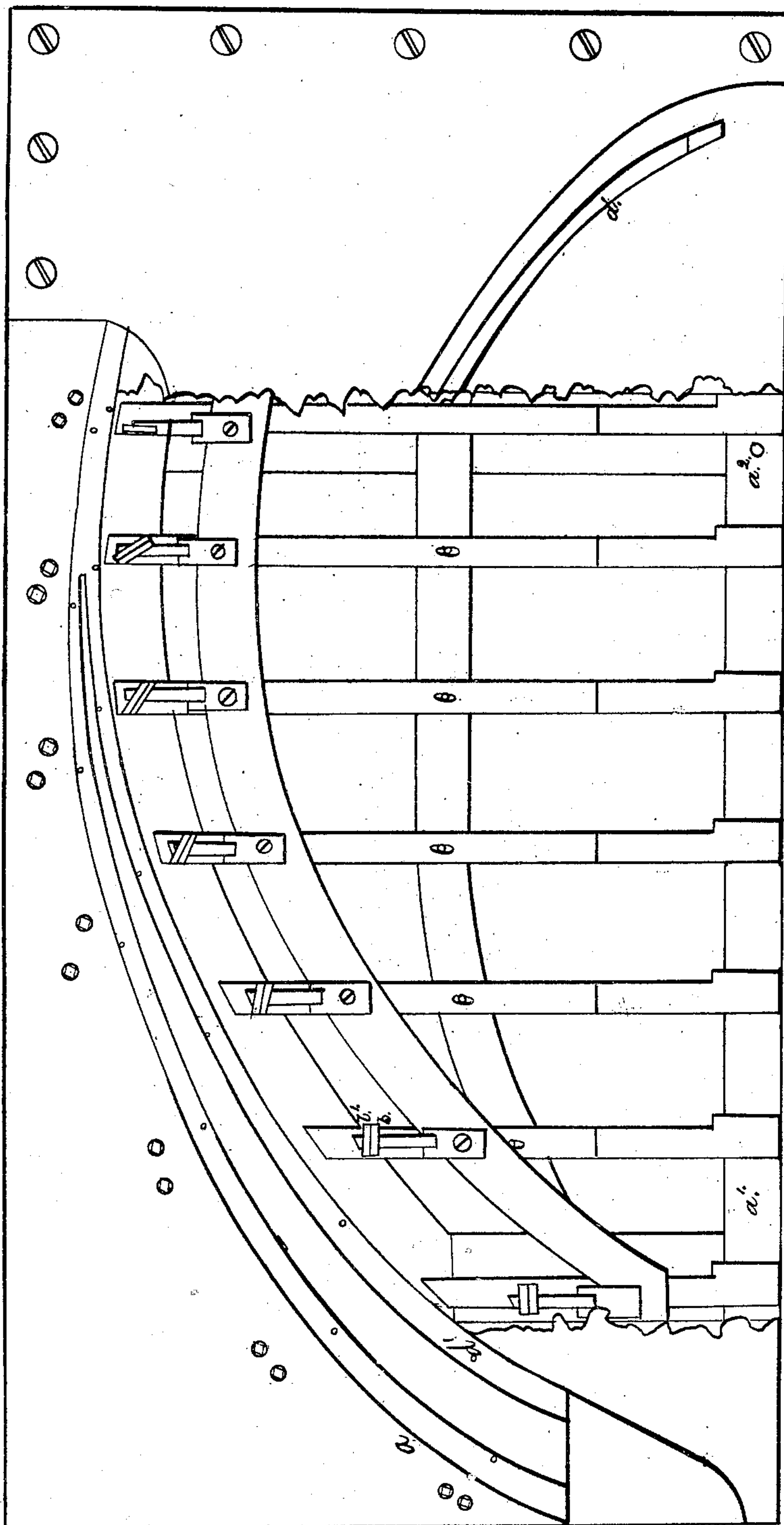
*Piatto.*

2, Sheets, Sheet 2.

*No 10.776*

*Patented Apr 21, 1854*

Fig. 2.





# UNITED STATES PATENT OFFICE.

ALEXANDER HALL, OF LLOYDSVILLE, OHIO.

## PIANOFORTE-ACTION.

Specification of Letters Patent No. 10,776, dated April 11, 1854.

*To all whom it may concern:*

Be it known that I, ALEXANDER HALL, of  
Lloydsville, in the county of Belmont and  
State of Ohio, have invented certain Im-  
5 improvements in Octave-Pianos, and that the  
following is a full, clear, and exact descrip-  
tion of the principle or character which dis-  
tinguishes them from all other things before  
known and of the usual manner of making,  
10 modifying, and using the same.

In the performances upon the pianoforte  
playing in octaves above the normal notes is  
not very often introduced on account of the  
difficulty of execution though the effect is  
15 always brilliant and delightful. In most  
pieces the bass so well balances the tenor  
and treble on one side that the ear has no  
desire for octaves below the normal notes  
composing the air but the ear always craves  
20 the octave above to fill up the full measure  
and power of each note. Attempts have  
been made to introduce octaves below the  
normal notes by the introduction of a few  
extra strings and an extra bridge exterior  
25 to the usual bridge. Besides the fact that  
there exists little or no necessity for the in-  
troduction of such notes, it is not possible  
to introduce them successfully without elon-  
gating, the whole instrument to a consider-  
30 able extent for the following reason. It  
would not answer to make all the strings in  
a piano or any other instrument of the same  
size and length and regulate the notes  
merely by the tension of the strings. A  
35 certain relation between the size, length and  
tension of each string must be observed in  
order to get full and clear tones, hence the  
impracticability of carrying out the intro-  
duction of the octave below notes even if it  
40 were very desirable, for the great increase  
in the size of the instrument would be a  
serious objection the piano forte being al-  
ready very cumbersome. By my plan how-  
ever of introducing octaves above no extra  
45 room is taken up, the bridges for the octave  
strings being placed within the usual  
bridges of the piano on or over the resound-  
ing board. There is no complication of the  
action, a fatal objection to some of the at-  
50 tempts that have been made to introduce  
the upper octaves, and by a device of great  
simplicity I am enabled to play the octaves  
or not at pleasure.

The nature of my invention consists in a  
55 peculiar arrangement of the strings, bridges,  
and action of the piano forte by which I am

enabled to introduce the upper octaves in  
addition to the normal notes, while playing  
upon the instrument. I have also invented  
a new hammer head by which I am enabled  
60 to strike with the proper effect, two strings  
of different degrees of tension. I am aware  
that various efforts have been made to in-  
troduce the upper octaves while playing and  
that every attempt to do this by mecha-  
65 nism has failed while the introduction of the  
upper octaves by the touch of the performer  
though brilliant in effect is always at the  
expense of melody and execution. In order  
to retain the free use of all the fingers, some  
70 distinguished artists have resorted to what  
have been called artistic fingers, they being  
artificial fingers attached to the wrist or  
the hand for the purpose of touching the  
octaves. 75

Figure 1, is a top view of the open in-  
strument and Fig. 2 is a top view with the  
strings and sounding board removed.

My mode of introducing the upper oc-  
taves is as follows: In addition to the usual  
80 bridges  $a$   $a'$  for the normal strings of the  
piano I employ the extra bridges  $d$ ,  $d'$ , so  
as to give to the octave strings their ap-  
propriate length. The octave strings are de-  
noted by letter ( $o$ ) and the normal strings  
85 by letter ( $n$ ). The bridges ( $d$ ,  $d'$ ) may be  
separate or all united so as to form one  
bridge, and are attached to the sounding  
board. They may however be detached  
90 from and a little distance above the sound-  
ing board. The bridge ( $d'$ ) having a  
curvature nearly like the common bridge  
( $a$ ) is employed for a special reason, to wit.  
The bridge ( $a$ ) would not answer as the  
95 bridge for the octave strings for it has been  
found that the best tones are attained by  
causing the hammers in piano fortes to  
strike some harmonic node of the string  
and the distance of one eighth from the  
bridge is that adopted. Now as I am to em-  
100 ploy but one hammer head for each string  
and its accompanying octave, the nodes of  
the normal and octave strings must both  
come together directly over the hammer  
head. The drawing is not exact to the  
105 scale of proportion but their approximation  
together with this statement and descrip-  
tion will suffice.

In order to suit the character of the ham-  
mer heads to the double function of play-  
110 ing high and low tones with the same head,  
I make that part of the head ( $b'$ ) which



strikes the octave, of a harder texture than the part (b) which strikes the normal strings, by which I am enabled to bring out full tones on each string. Where dampers  
 5 are used in piano fortes to stop the action upon one set of strings as for instance by the common harp pedal, the muffling of one string diminishes the volume of sound from the other, whereas if the action could be  
 10 shifted so as to strike only one string the other being left free to vibrate, would contribute to the volume of sound by resonance or sympathy. As in my octave piano I prefer to use but one normal string I preserve  
 15 to the octave string full freedom to vibrate by a peculiar mode of shifting the action, when I wish to play upon the normal strings without the octaves.

It is necessary in piano fortes that the  
 20 hammers should so strike the strings that the longest diameter of the face of the hammer should be parallel with the line of the strings. This has hitherto presented an obstacle to the introduction of shifting ac-  
 25 tion in square pianos, where the hammer heads are twisted round for the upper notes, so as to be in seven octave pianos entirely at right angles to the hammer heads for the low notes. But from the relative posi-  
 30 tions of the bridges and strings for the normal and upper octave notes my shifting action becomes perfectly adapted to the purpose and the hammer heads though mov-  
 35 ing in an arc yet fall in the shifting operation, under the nodal points of both strings. This result it will be seen would be imprac-

ticable in the case of two normal unison strings as in the common piano forte.

This device is as before mentioned one of great simplicity and consists in pivoting the  
 40 key board ( $a'$ ) at the point ( $a^a$ ) or some point near this end so that when the free end is pushed inward the proper distance all the hammer heads move round in an arc  
 45 as shown by the dotted red lines and fall under the nodal points of both strings. Before the key board is pushed inward the hammer heads strike only the normal strings as shown in the drawings.

My piano I denominate the "Celestial  
 50 piano."

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

1. The arrangement of the bridges of the upper octave strings in combination with  
 55 the shifting action so that the nodal points of these strings may coincide with those of the normal strings, in the manner set forth.

2. I claim the mode of shifting the action by pivoting the key board in combination  
 60 with the employment of upper octave strings in the manner set forth.

3. I claim making the hammer heads of hard and soft material for the purpose of  
 65 playing with effect upon the upper octave and normal string with the same hammer head.

ALEX. HALL.

Witnesses:

CHAS. G. PAGE,  
 TOLMIE CAMPBELL.