Sheet 2-2 Sheets.

# G. H. Hulskamp,

## Piano,

No. 29,081. Patented July 10, 1860.

Fig. 3.

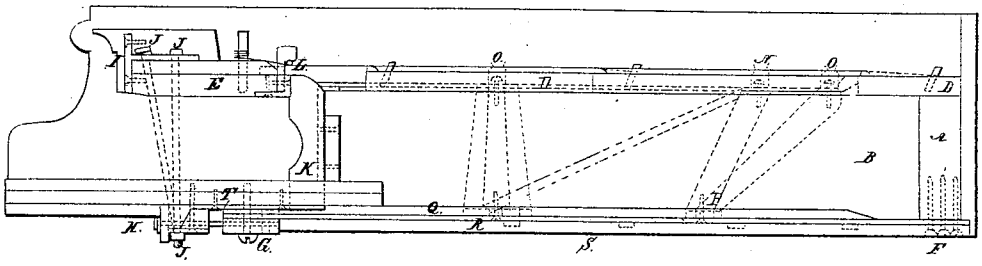
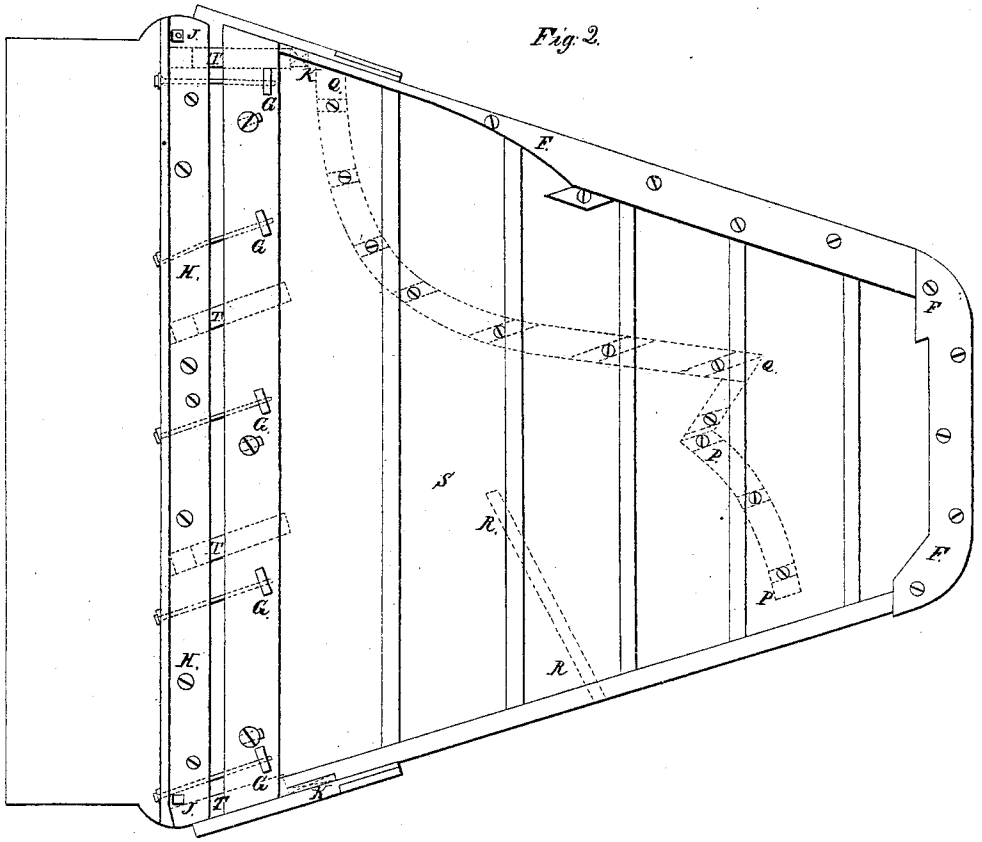


Fig. 2.



Witnesses:

Philip Zc Baermann

A. F. Lee

Inventor.

G. Henry Hulskamp

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

# UNITED STATES PATENT OFFICE.

G. HENRY HULSKAMP, OF TROY, NEW YORK.

## PIANOFORTE.

Specification of Letters Patent No. 29,081, dated July 10, 1860.

*To all whom it may concern:*

Be it known that I, G. HENRY HULSKAMP, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Pianofortes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings.

The same letters refer to like parts in each.

Figure 1 is a horizontal plan of the instrument, as seen by a person above looking down upon the parts represented. Fig. 2 is a similar view of the under side of the instrument. It is supposed to be turned bottom side upward to show the sounding board on the under side. Fig. 3 is a vertical plan as seen from the right hand side of the instrument. Fig. 4 is an upright view of one of the agrafes in full size.

My principal improvement is designed to affect the vibrations and tone of the sounding board. In the ordinary construction of pianofortes of different kinds the tension of the strings, amounting to about 13,000 pounds, tends to produce a slight curvature of the frame, to which they are attached, and causes great compression of the sounding board and injury of its tone. To remedy this defect strong iron bars are usually placed immediately above the strings in grand pianofortes and to some extent in square ones, and connected with the frame, so as to prevent as far as practicable its flexure and produce solidity. It is well known that some degree of tension of a sonorous body materially affects its vibrations. The head of a drum or the strings of an instrument would produce little or no sound without some strain upon them. So, too, in pianofortes I have found that some degree of tension in the sounding board produces a striking effect upon the quality and volume of its tone, and the best effects are produced when some relation exists between the tension of the strings and the strain upon the board. My improvement consists in applying this principle to pianofortes of different kinds, and I flatter myself that I have made an important advance in the construction of that instrument. I dispense entirely with the cross bars before referred to. The strain of the strings on one side of the frame is counteracted by an equal strain of the sounding board on the other. An equilibrium is maintained between the two. Any excess or variation of the tension on one side is in a measure communicated to the other and a proper relation between the two sustained.

Fig. 1 shows the application of the principle to a grand pianoforte. It is a view from above looking down upon the parts of the instrument represented. A, A, A, A, A, A, A is the ordinary wooden frame with its cross beams B, B, and C. On the frame is secured the hitch plate D, D, D, D, D, to which the strings are attached in the usual manner. The red lines represent three strings extending from the hitch plate to the wrest plank E, E, E.

In Fig. 2 the pianoforte is supposed to be turned bottom side upward to exhibit the sounding board S on its under side and its attachments. The back end of it and a part of one of the sides are glued to the frame and fastened by the pieces F, F, F, and screws as represented. These fastenings are directly opposite to the fastenings of the hitch plate on the upper side of the frame. The front end of the sounding board is made thick by gluing on two wooden cross bars, one on each side, and into these are placed and fixed the iron screw nuts G, G, G, G, G, to receive the iron bolts, which passing through the fixed iron plate H, H, with screws on their ends serve to tighten and strain the sounding board. These bolts lie and act in a direction parallel to the strings on the opposite side of the frame and should be tightened sufficiently to counteract the tension of the strings. These bolts and screws are not perhaps indispensable, for if the end of the sounding board, on which they act, were drawn tight and permanently fixed before the strings were strained, the tuning of the instrument would of itself give a considerable degree of tension to the sounding board and partially effect the objects of my improvement. But the bolts and screws will be found to be highly advantageous, to regulate and adjust the tension to the degree found best on trial and use. These parts are also represented in the vertical plan Fig. 3. One of the long strings is shown extending from the wrest plank at E and attached to the hitch plate at D. Directly opposite to it, on the under side, the sounding board is attached at F and extends to G and is strained by the screw bolt at H, equally with the tension of the strings at E. The parts, that are shaded blue, represent

or the continuous curved sounding bridge or board, whereby the vibrations of the strings are transmitted to near the middle part of the soundingboard substantially as described.

4. The extension of a wooden hitch board made thick with different pieces of wood as described, nearly to the soundingboard bridge in combination either with a sounding board above the frame extending no farther than the sounding board bridge, or a sounding board below the frame or both; for the uses and purposes set forth.

5. The mode set forth of strengthening the piano forte by making the iron brackets K, K, K, K, bear not only against the iron plate on the upper side but also against an iron plate through intermediate bars on the under side and connecting that iron plate with the top plate by the iron bolts J, J, substantially as described.

6. The construction of the bridge L and the agrafes (Fig. 4) substantially as described, or making the bridge L of soft metal in the manner as the agrafes.

G. HENRY HULSKAMP.

Witnesses:

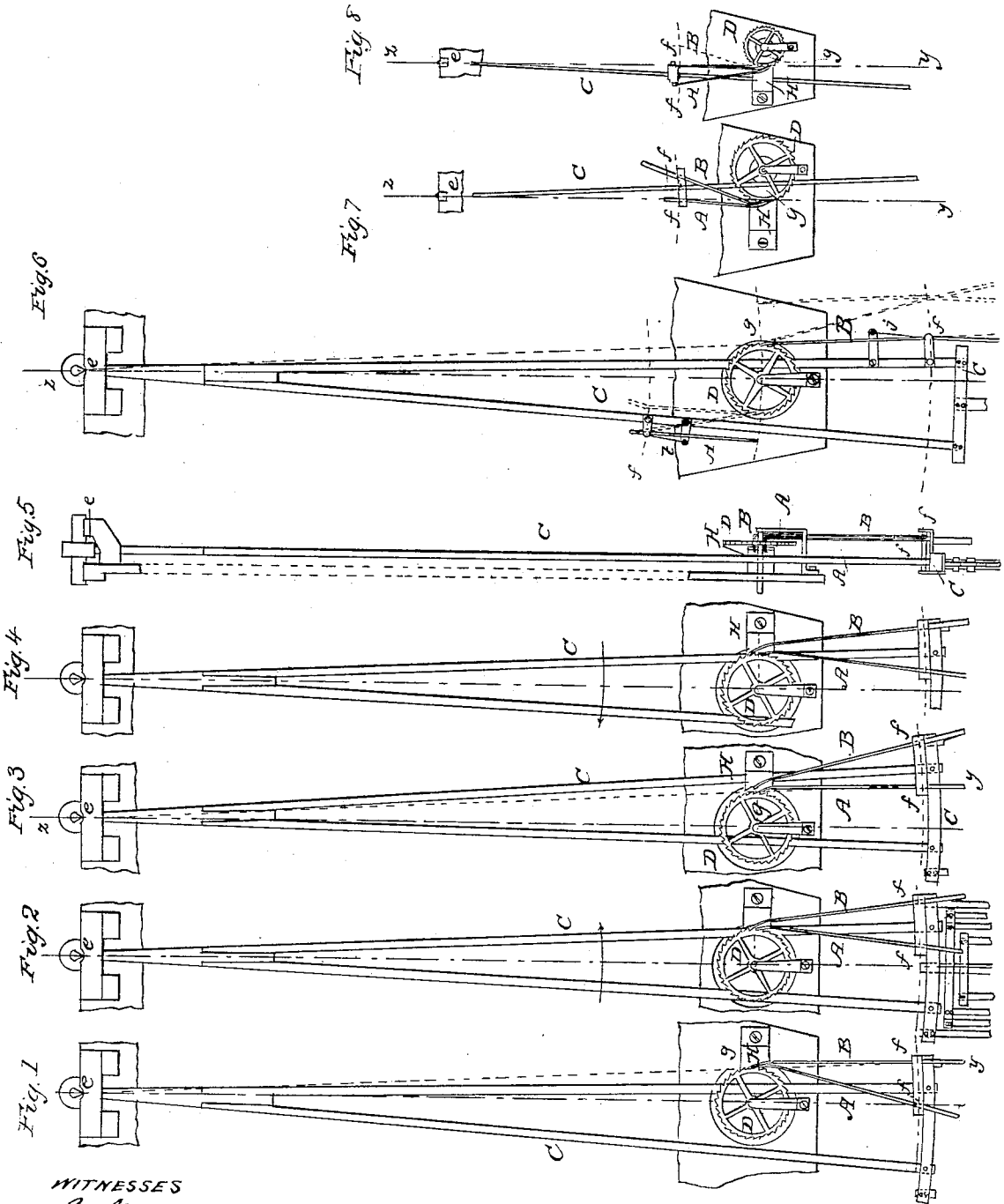
PHILIP H. BAERMANN,

A. A. LEE.

G. M. PHELPS.

Clock Escapement.

No. 29,097. Patented July 10, 1860.




WITNESSES

Geo Maxwell

Austin F. Parks

INVENTOR

Geo M Phelps

N. PETERS. Photo-Lithographer, Washington, D. C.