

No. 750,035.

PATENTED JAN. 19, 1904.

F. McNAMARA.  
PIANOFORTE.

APPLIOATION FILED OCT. 14, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig: 1.

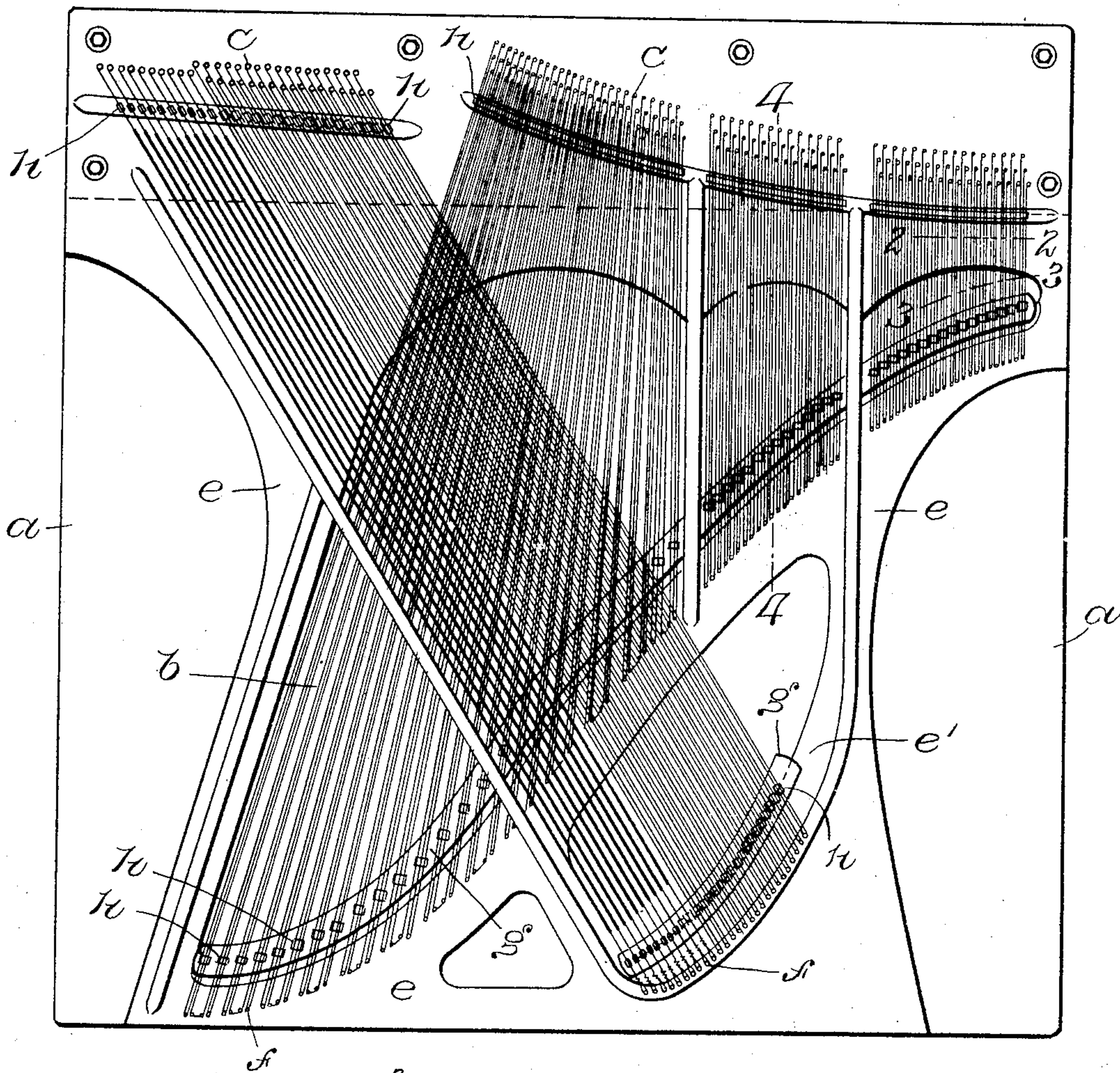


Fig. 2.

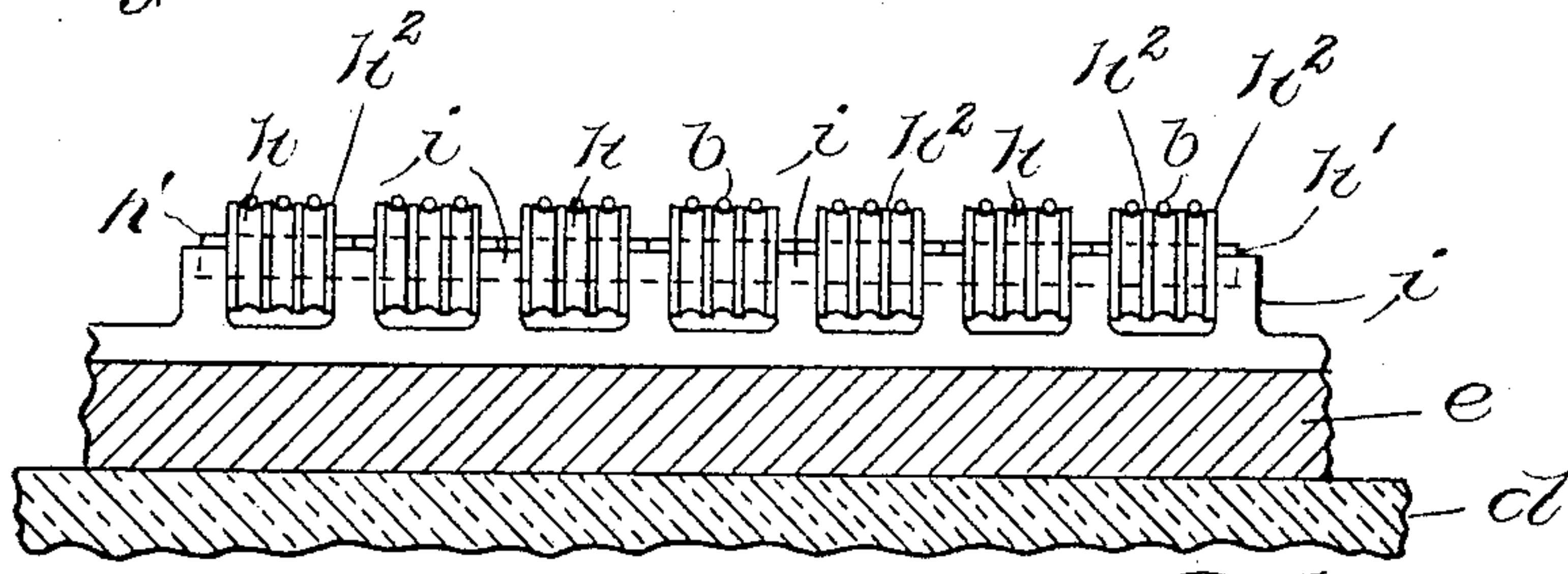
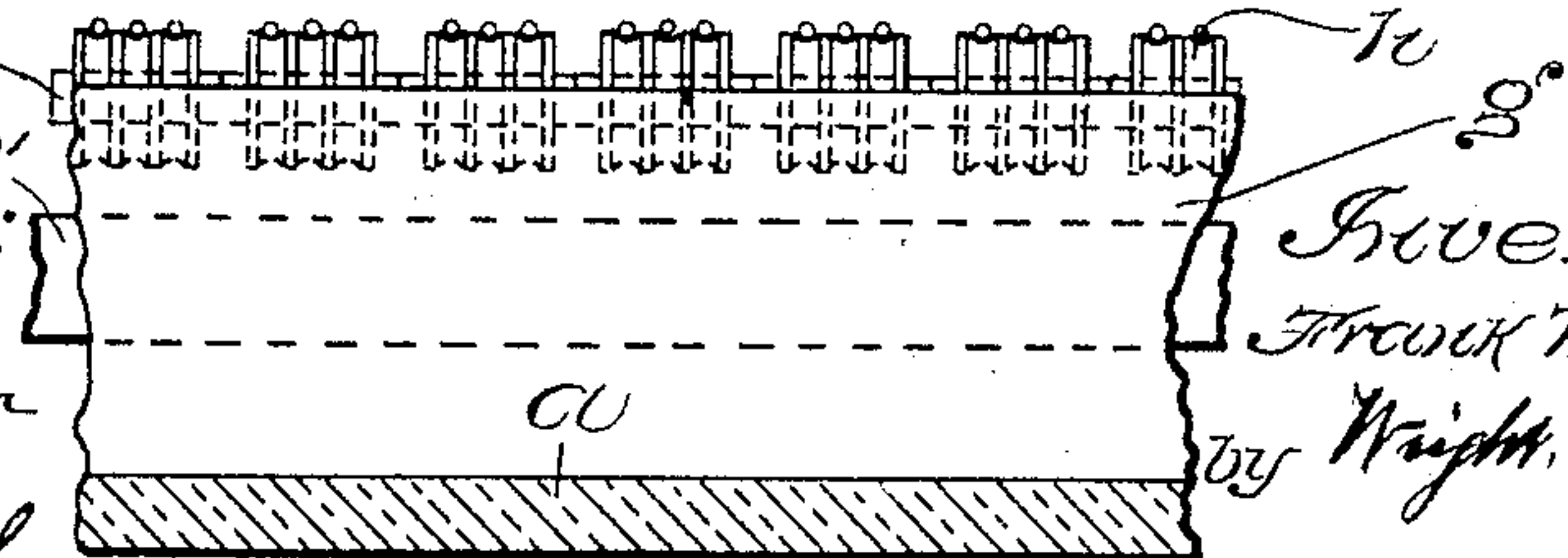


Fig. 3.



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No. 750,035.

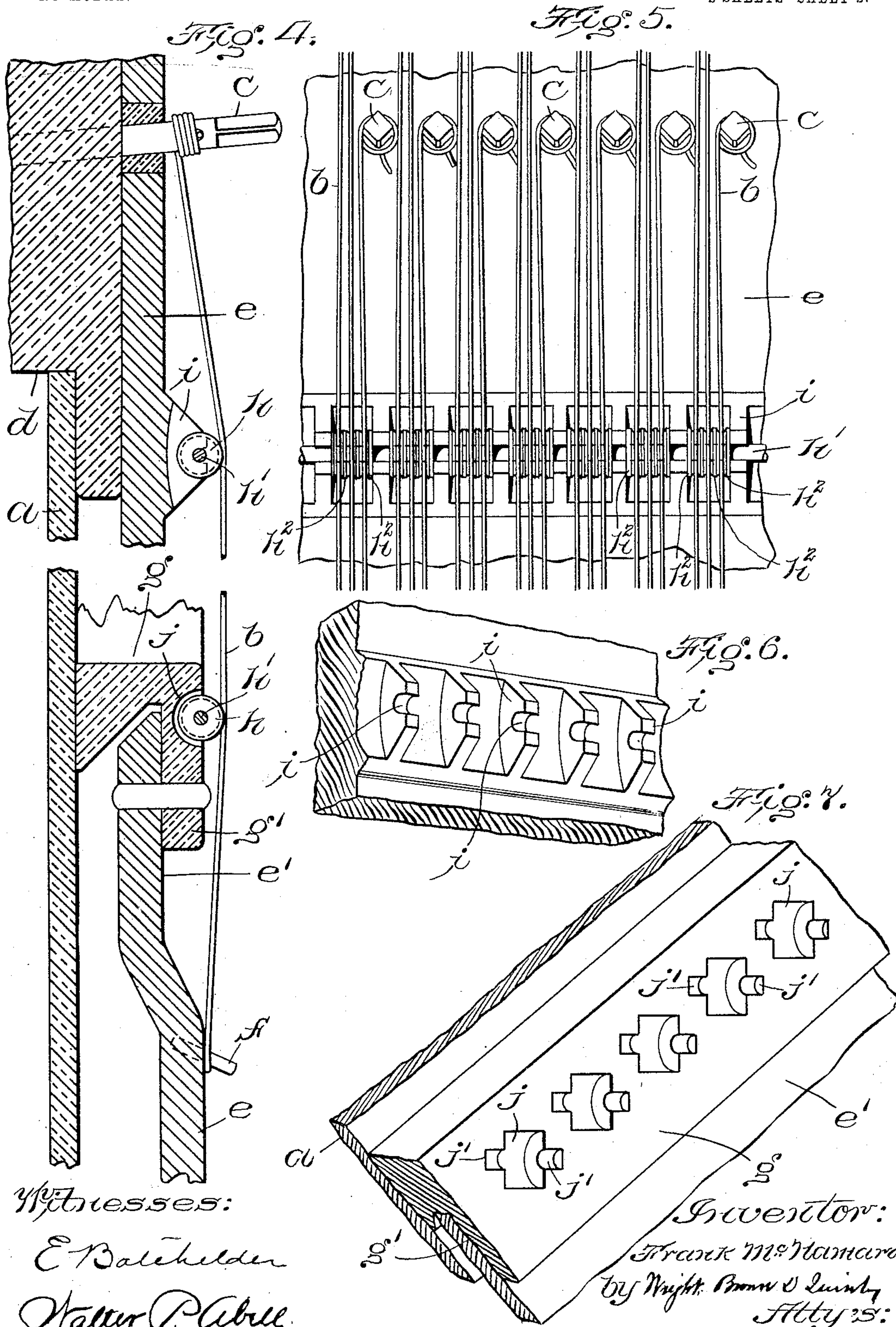
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2 SHEETS—SHEET 2.





# UNITED STATES PATENT OFFICE.

FRANK McNAMARA, OF CLINTON, MASSACHUSETTS.

## PIANOFORTE.

SPECIFICATION forming part of Letters Patent No. 750,035, dated January 19, 1904.

Application filed October 14, 1903. Serial No. 176,945. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK McNAMARA, of Clinton, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Pianofortes, of which the following is a specification.

This invention relates to the means for supporting the strings of a pianoforte; and it has for its object, first, to equalize the tension of the strings uniformly throughout their entire length, so that when the tension is increased by the turning of the tuning-posts the increase will be uniformly distributed throughout the entire length of each string.

The invention also has for its object to provide means whereby a considerable part of the pressure of the strings on the bridge, which is interposed between the strings and the sounding-board and is in contact with the latter, will be supported mainly by the rigid string-plate of the instrument instead of by the resonant sounding-board, thereby reducing to the minimum the interference with the vibrations of the sounding-board due to the pressure of the sound-conducting bridge upon it.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of the string-plate and sounding-board of a piano embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 1. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents an enlargement of a portion of Fig. 1. Figs. 6 and 7 are perspective fragmentary views showing in perspective parts which are shown in section in Fig. 4.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents the sounding-board of a piano.

*b b* represent the usual strings.

*c c* represent the tuning-posts, which are frictionally engaged, as usual, with a beam or bar *d*, affixed to the frame of the piano, and *e* represents the rigid string-plate, which is

usually made of cast-iron and is located beside the sounding-board.

The general construction and arrangement of the above-mentioned parts is or may be the ordinary construction and arrangement, excepting as hereinafter specified.

Each string is attached at one end to a pin *f*, rigidly affixed to the string-plate *e*, as usual, the ends of the strings attached to the pins *f* being hereinafter referred as the "fixed" ends, these being opposite the ends which are adjustably connected with the tuning-posts *c* in the usual manner.

*g* represents the bridge, which supports the strings at points adjacent to their fixed ends and is in contact with the sounding-board *a*, said bridge being usually made of resonant material, such as wood, and serving to conduct vibrations from the strings to the sounding-board.

In carrying out my invention I provide the string-plate *e* with an extension *e'*, which is formed and arranged to support a flange *g'*, formed on the bridge *g*, said flange being bolted or otherwise secured to the extension *e'*, so that the bridge, while in contact with the sounding-board, is supported mainly by the string-plate *e*. Hence the pressure exerted by the strings upon the bridge *g* does not interfere with the resonance of the sounding-board to such an extent as it would if the bridge were not supported, as described, by the string-plate.

The string-plate is provided with suitable means for supporting the strings at points adjacent to the tuning-posts *c*. In this embodiment of my invention the said means comprise a series of antifriction-rollers *h*, having shafts or trunnions *h'*, which are preferably cast upon the string-plate. The bridge *g* is also preferably provided with a series of antifriction-rollers *h*, which are partially received in cavities *j*, formed in the bridge *g*, said cavities having sockets *j'* at their ends, (see Fig. 7,) which sockets support the trunnions *h'* of the rollers *h*. For convenience the rollers *h* are preferably arranged in groups of three, the three rollers of each group mounted upon a single shaft *h'*. To prevent the

rattling of the rollers  $h$  against each other and against their supports, washers  $h^2$ , of felt or other material, are interposed on the shafts  $h'$ .

It will be seen that each string is supported  
5 between its fixed and adjustable ends on two freely-rotatable antifrictional rollers. Hence when the tension of a string is varied by the adjustment of a tuning-post the variation will extend uniformly throughout the entire length  
10 of the string. This uniform distribution of the tension of the strings is a very important factor in keeping the strings in tune, as I have found by practical experience.

I am aware that it has been proposed to sup-  
15 port the strings at points adjacent to the tuning-posts by antifriction-rollers; but I am not aware that piano-strings have ever been supported at two points by antifriction-rollers, one point being adjacent to the tuning-post  
20 and the other adjacent to the fixed end of the string, so that the tension is made uniform throughout the entire length of the string.

I claim—

1. In a piano, the combination of the sound-  
25 ing-board, the strings, the tuning-posts, the string-plate having means for supporting the strings at points near the tuning-posts, and the

string-supporting bridge affixed to the portion of the string-plate which supports the fixed ends of the strings, said bridge being in con- 30 tact with the sounding-board but supported by the string-plate.

2. In a piano, the combination of the sound- ing-board, the strings, the tuning-posts, the string-plate having a series of string-support- 35 ing antifriction-rollers located near the tuning-posts, and another series of antifriction-rollers supporting the strings near the fixed ends of the latter.

3. In a piano, the combination of the sound- 40 ing-board, the strings, the tuning-posts, the string-plate having a series of string-supporting antifriction-rollers located near the tuning-posts, and a bridge affixed to the frame near the fixed ends of the strings and in con- 45 tact with the sounding-board, said bridge having another series of string-supporting antifriction-rollers.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANK McNAMARA.

Witnesses:

WALTER P. ABELL,  
E. BATCHELDER.