

No. 629,072.

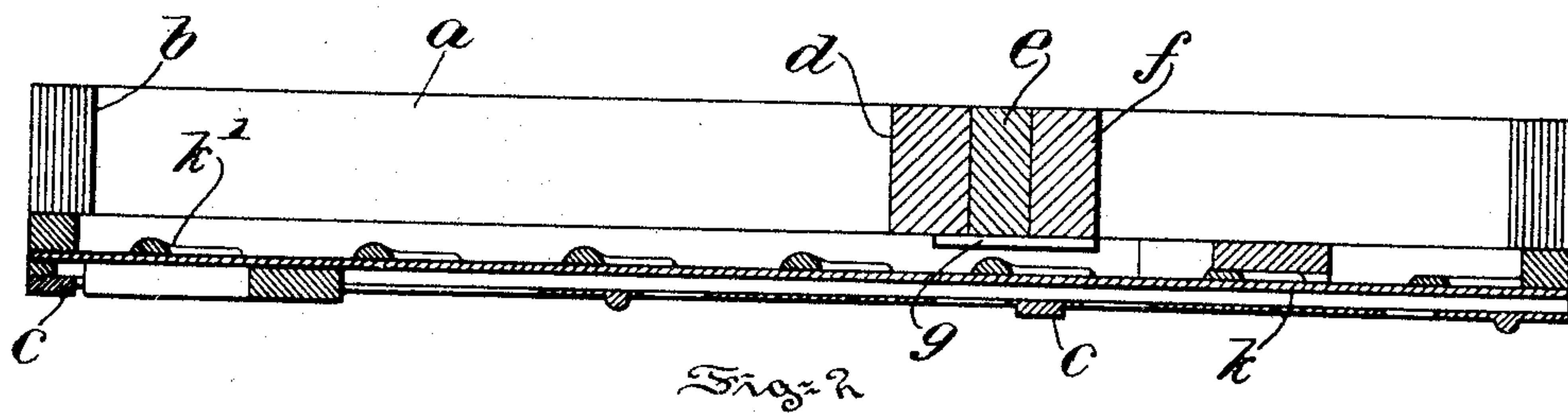
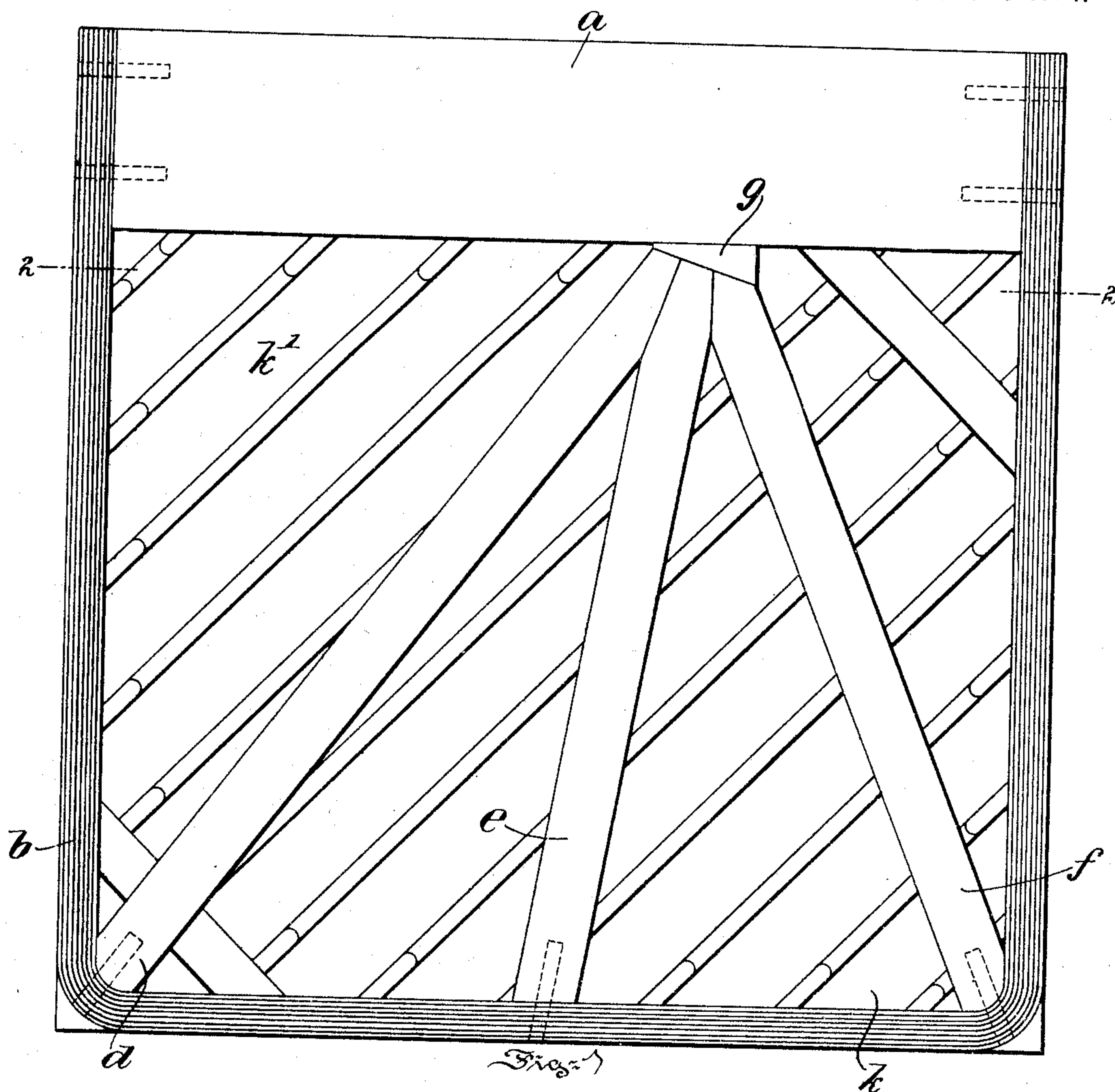
Patented July 18, 1899.

H. W. GRAY.
UPRIGHT GRAND PIANO.

(Application filed June 10, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

W. H. Jackson

K. H. Gilligan

Inventor:
Henry H. Gray

By
Augustus B. Stoughton
Attorneys.

UNITED STATES PATENT OFFICE.

HENRY W. GRAY, OF PHILADELPHIA, PENNSYLVANIA.

UPRIGHT GRAND PIANO.

SPECIFICATION forming part of Letters Patent No. 629,072, dated July 18, 1899.

Application filed June 10, 1898. Serial No. 683,053. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. GRAY, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Upright Grand Piano, of which the following is a specification.

Objects of the invention are, first, to produce in an upright piano a greater volume and superior quality of tone than is produced not only in ordinary upright pianos, but even in that type of pianos known as "grand" pianos; second, to provide an upright grand piano that will hold better in tune than do upright pianos as heretofore constructed; third, to attain all the musical advantages of a grand piano in an instrument of the upright form, among which may be mentioned the fact that the latter occupies a much smaller space and presents a more sightly appearance than the former, and, fourth, to attain in an upright piano these musical advantages at a less cost than is required for the production of ordinary upright pianos.

The invention is hereinafter more fully described, and particularly pointed out in the claims.

The nature, characteristic features, and scope of the invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is an elevational view illustrating the inside frame of a piano as viewed from the back of the instrument, showing that the sounding-board, more especially that portion of it which underlies the strings of the highest treble notes and is located at the upper left-hand portion, is unobstructed by wooden struts, braces, and the like. Fig. 2 is a section taken on the line 2 2 of Fig. 1. Fig. 3 is an elevational view showing the main frame, the metal frame, and the sounding-board and certain of their accessories taken from the front of the piano after the strings, keyboard, and accessories have been removed therefrom; and Fig. 4 is a detail view.

In the drawings, *a* is the pin-block, which carries the pins to which one end of each of the strings is connected. The inside frame *b* is attached to the pin-block. The metal

frame *c* supports the other ends of the strings and is mounted on the front of the frame, comprised of the members *a* and *b* and of the parts to be hereinafter described. Incidentally it may be remarked that the aggregate strain exerted by the strings of an ordinary piano when in tune is approximately forty tons, so that features of construction about to be described are of great importance.

d, *e*, and *f* are braces that radiate from a suitable point on the pin-block *a* and at their ends serve to brace the inside frame *b*. As shown, the brace *d* runs to one corner of the inside frame, the brace *f* to the other corner of the inside frame, and the brace *e* to a point intermediate of these corners, and all of the braces radiate from a clamp *g*. The described construction enables these braces to be so relatively arranged as to resist the combined tension of all the strings. The bass-strings may be said to extend from *h* to *h'* and the other strings to extend approximately between *i i'* and *j j'*. The strings in the neighborhood of *j j'* produce the highest treble notes, and in ordinary upright pianos these notes are so poor in tone and quality that skilled musicians object to upright pianos and for this reason do not use them. The defects in volume and quality of tone, while most marked in the high treble notes, characterize the instruments as a whole. I believe that such defects were due to the presence of the multiplicity of struts, braces, and heavy outside frames which obstructed the sounding-board. At any rate, by the present invention such defects are obviated and an instrument of remarkable qualities of tone and volume of sound is produced. This is believed to be due to the fact that the whole sounding-board *k*, including that portion *k'* of it which underlies the high-treble strings, is substantially unobstructed at the back by a lot of heavy wooden framing, which has a disastrous effect upon the volume, quality, and tone of the instrument. As shown, the inside frame *b* is constructed of one piece of generally U-shaped form and comprised of a great number of pieces of wood united together after the fashion of veneering. This frame is very strong in proportion to its cross-section, and it, as well as the pin-block *a*, is firmly held to place by the braces, while at

the same time the sounding-board is comparatively unobstructed, so that a great volume and superior quality of tone are produced.

5 The described main frame of the piano, which includes the inside frame, the pin-block, and the braces, is very rigid and resists the great strain of the strings so perfectly that the instrument holds its tune for
10 a comparatively long time. In ordinary upright pianos the main frame comprises, as is well known, a number of pieces of wood joined end to end, arranged something like a gridiron and surrounded by a very heavy
15 wooden frame. Such a main frame not only gives rise to imperfections in the volume and quality of tone, but also is not well adapted to resist the great strain due to the tension on the strings, so that the instrument does
20 not hold its tune well. The clamp *g* is constructed and operates between the pin-block and the braces after the manner of a wedge, and it may be secured to place by means of fastening devices, such as screws. (Shown
25 in Fig. 4.)

A piano constructed in accordance with the present invention produces a greater volume and superior quality of tone than is produced by even a grand piano, which, as is well
30 known, is a far better instrument from a musical point of view than an ordinary upright piano. Moreover, it holds its tune better than ordinary upright pianos, and it is cheaper to construct and is more durable.

35 It will be obvious to those skilled in the art to which the invention appertains that modifications may be made in detail without de-

parting from the spirit thereof. Hence the invention is not limited to the precise construction and arrangement of parts hereinabove 40 set forth and illustrated in the accompanying drawings; but

Having thus described the nature and objects of the invention, what is claimed as new, and desired to be secured by Letters Patent, 45 is—

1. A main frame for an upright piano which comprises an inside frame of wood veneer having a horizontal base part and two parallel arms extending upward vertically from the 50 base, a pin-block located at the top of the instrument and attached between and at the ends of said arms, and braces radiating from near the treble portion of the pin-block and engaging the corners and horizontal part of 55 the inside frame, substantially as described.

2. A main frame for an upright piano which comprises a generally U-shaped inside frame of wood veneer having a horizontal base part and upwardly-extending parallel arms, a pin- 60 block supported at the ends of said arms, and radiating braces, substantially as described.

3. A wood veneer inside frame for an upright grand piano which comprises a straight horizontal base part and straight arms extend- 65 ing vertically upward from the ends of and arranged at right angles to the base part, substantially as described.

In testimony whereof I have hereunto signed my name.

HENRY W. GRAY.

In presence of—

H. C. SCHANACKER,
HORACE E. WALTON.