

E. C. SAGER.

DEVICE FOR USE IN OBTAINING BRIDGE BEARINGS IN CONSTRUCTING PIANOS.

APPLICATION FILED OCT. 10, 1902.

Patented Oct. 13, 1908.

901,262.

2 SHEETS—SHEET 1.

Fig. 1.

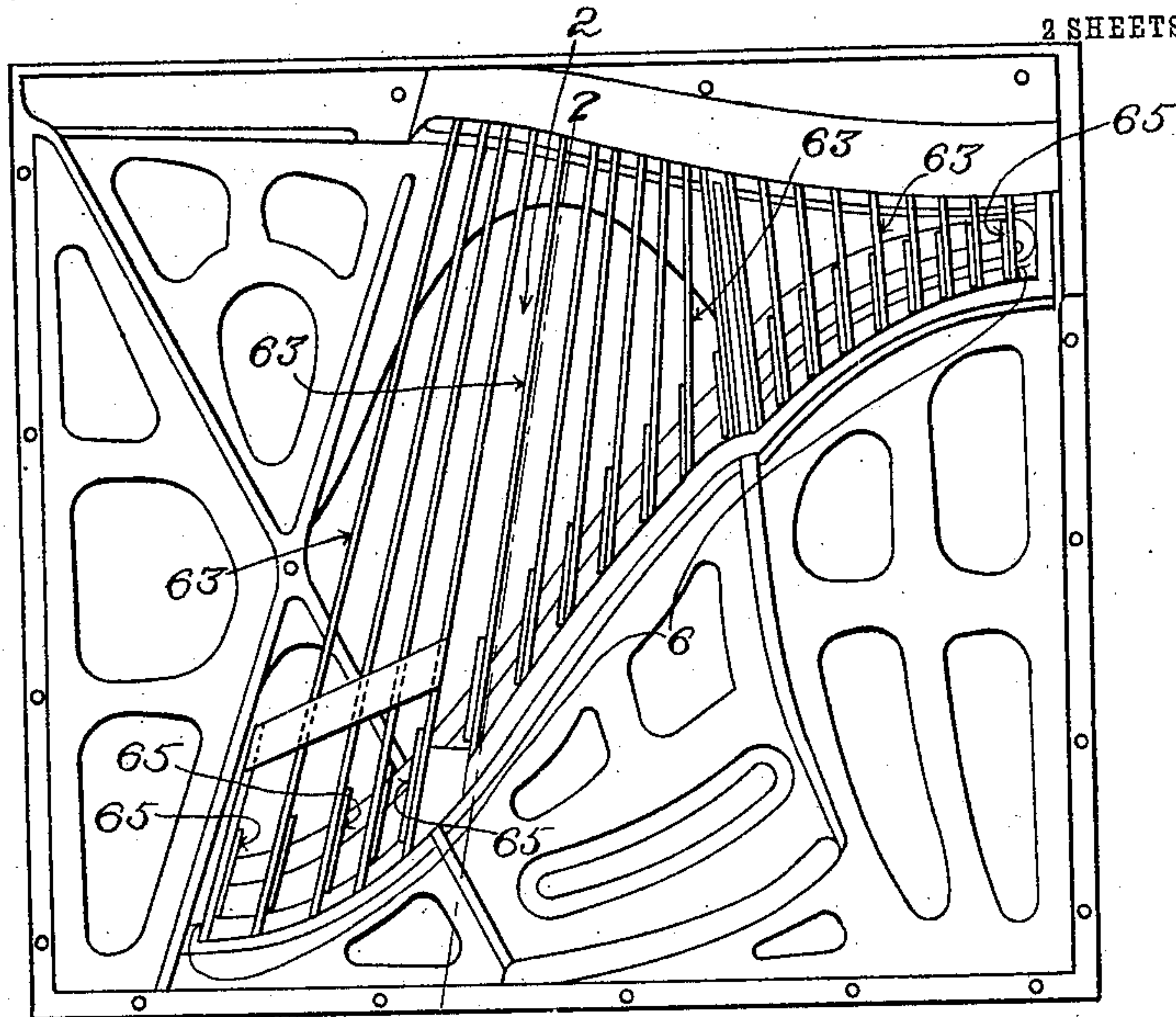


Fig. 2.

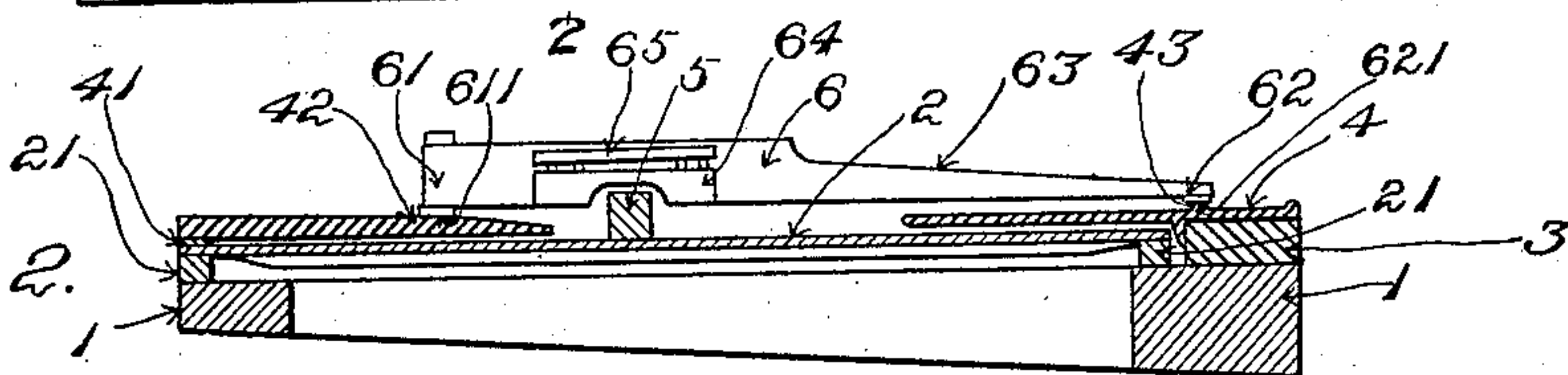
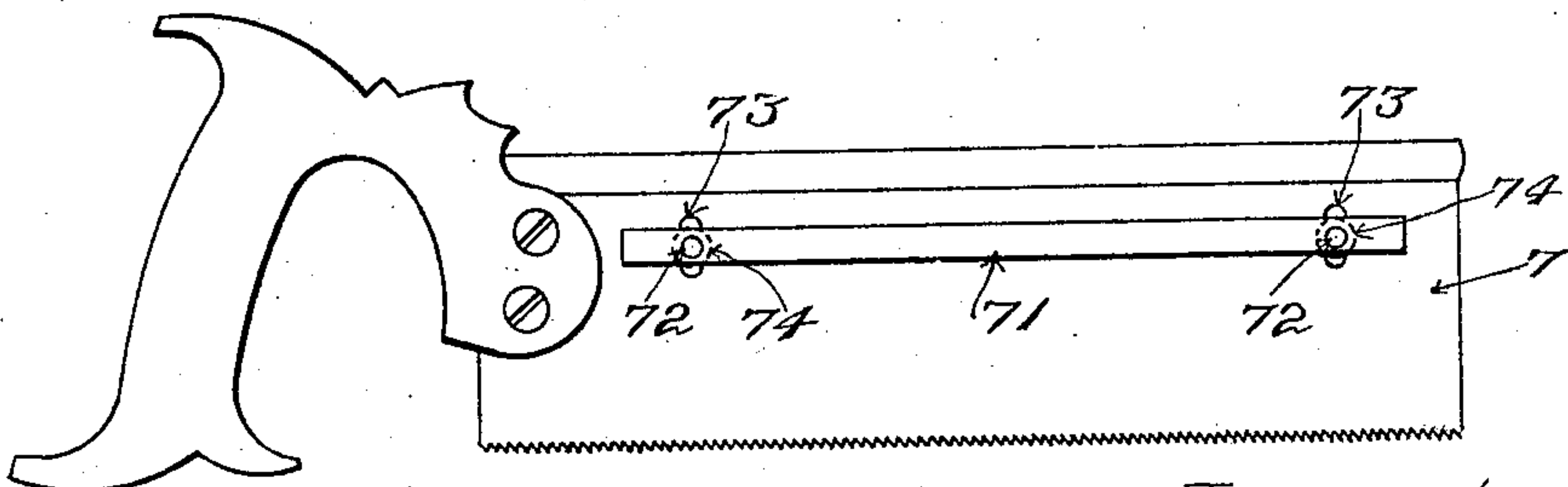
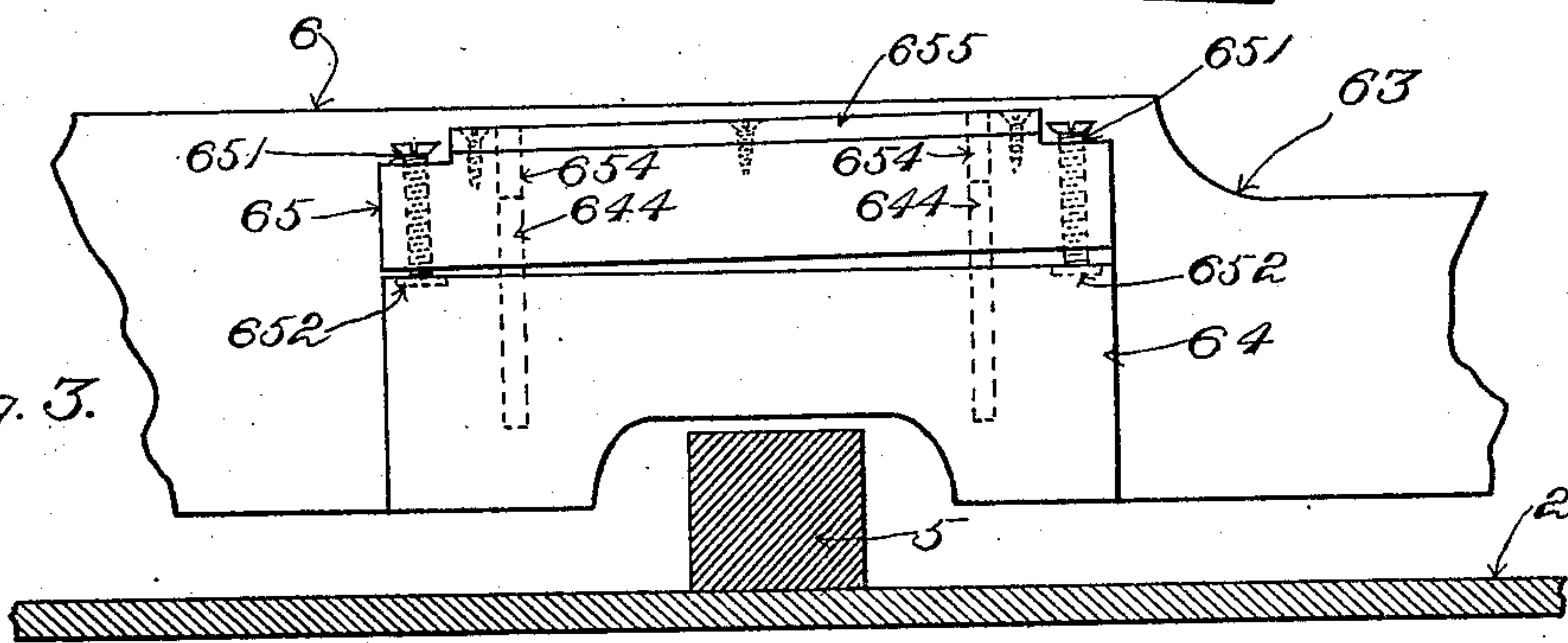


Fig. 3.



Witnesses:
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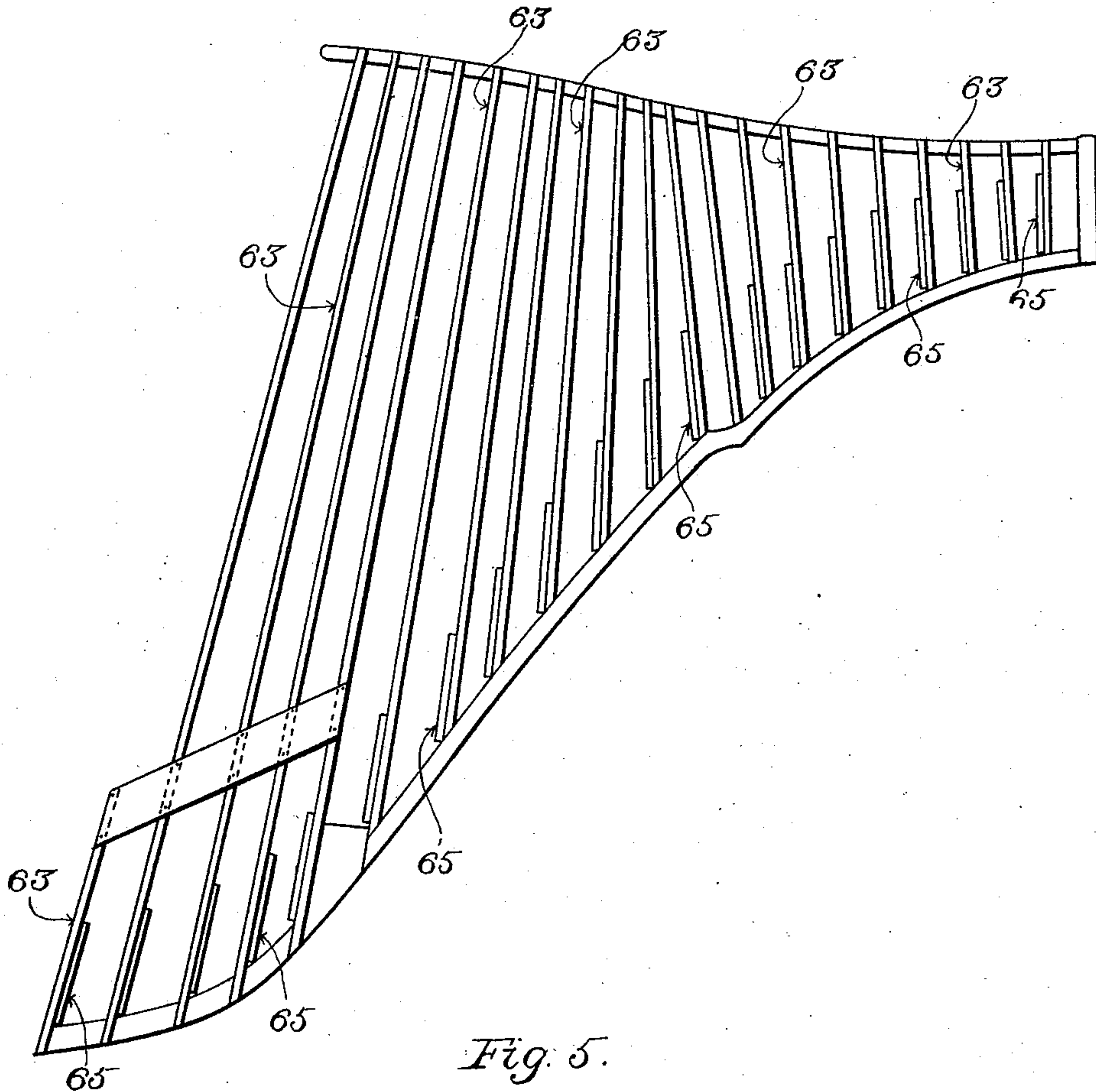


Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD C. SAGER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO CHICKERING & SONS, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

DEVICE FOR USE IN OBTAINING BRIDGE-BEARINGS IN CONSTRUCTING PIANOS.

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Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed October 10, 1902. Serial No. 126,672.

To all whom it may concern:

Be it known that I, EDWARD C. SAGER, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Devices for Use in Obtaining Bridge-Bearings in Constructing Pianos, of which the following is a specification, reference being had therein to the accompanying drawings.

Heretofore, in practice, in constructing pianos, the operation of reducing and trimming the bridge of a piano to the required height and shape in producing the bearing upon said bridge for the strings has been a tedious and difficult one, calling for a highly skilful and experienced workman, the outlay of considerable time and labor, and the exercise of correct judgment and great care. Accuracy and uniformity of results have been difficult of attainment. The results secured have depended upon the manual skill and accuracy of the individual workman, and have varied with the personal equation of different workmen.

The main object of the invention is to provide means whereby to facilitate the operation aforesaid, lessen the outlay of labor and time, render less necessary the employment of highly-skilled labor, and enable the required bridge-bearing to be produced with accuracy and uniformity.

The invention consists in the device or instrument which I will now proceed to describe with reference to the accompanying drawings, in which latter is represented a convenient embodiment of the principles of the invention. The said device is intended for use in producing a series of indicating cuts or kerfs in the outer edge or face of the bridge of a piano to guide the workman in the subsequent reduction and planing or trimming of the said surface to the required form, it having a number of saw-guides comprised in an assembled series, arranged adjacent to one another in positions corresponding with predetermined portions of the bridge, the said series conforming to the contour of the bridge, and the said guides being constructed to control the positions of the bottoms of said cuts or kerfs, they having means of adjustment to enable the depths and inclination of the cuts or kerfs to be varied.

In the drawings,—Figure 1 shows in plan

certain portions of a piano, with my device or instrument applied thereto. Fig. 2 is a view in vertical section on the plane indicated by the dotted line 2, 2, Fig. 1, looking in the direction indicated by the arrows at the ends of such line. Fig. 3 is a detail view, on an enlarged scale, partly in section, illustrating one of the saw-guides and its relation to the bridge which is to be operated upon. Fig. 4 shows in side elevation a saw such as I contemplate employing in connection with the device or instrument of the preceding figures. Fig. 5 shows in plan the device or instrument apart from the portions, aforesaid, of a piano.

In the drawings,—for the purpose of clearly indicating the purpose of the invention, as well as the manner of employing the same, I have shown certain portions of a piano of well-known construction with the invention applied thereto.

At 1 is represented the wooden frame or skeleton, in general.

2 is the sounding-board, and 21 the board-lining intervening between the said sounding-board and the said skeleton.

3 is the pin-block or wrest-plank, and 4 is the plate. In making ready to employ the new device or instrument, the plate is applied to the skeleton or frame 1, and temporarily bolted or otherwise secured in its usual place thereupon. When the parts in question are thus assembled, one edge of the plate rests, as usual, upon the pin-block, and between the remaining edges thereof and the sounding-board the plate-lining 41 is interposed.

The hitch-pin bearing upon the plate is indicated at 42.

At 43 is indicated the wrest-plank bridge.

The sounding-board bridge is indicated at 5. Hereinafter this last part is referred to simply as the bridge.

As is well understood, the face or edge of bridge 5 which is opposite (*i. e.* farthest away from) the sounding-board 2 constitutes in practice the bridge-bearing, *i. e.*, the support over which the strings are deflected intermediate the hitch-pin bearing and the wrest-plank bridge 43. This face or edge of the bridge 5 requires to be very accurately formed and positioned in order that the best results may be secured in the piano, and in the operation of producing the required bridge-bearing the said face or edge is re-

duced in height, trimmed, and shaped with great care and exactness.

The device or instrument embodying my invention is shown at 6. It comprises, essentially, an assembled series of guides hereinafter described, to direct a saw in forming a number of saw-cuts or kerfs in the outer face or edge of the bridge, the said series being arranged to correspond with the contour of the bridge, and the guides being arranged adjacent one another in positions corresponding with predetermined portions of the bridge. The respective saw-guides are provided with means to determine the depth of said saw-cuts or kerfs and the angles or inclinations of their bottoms relative to the height of the bridge.

The device is employed by being applied to the plate in proper working relations with respect to the bridge. It enables the workman to apply a saw to the respective guides in succession, and by means of said saw produce in predetermined portions of the outer face or edge of the bridge a series of saw-cuts or kerfs which, respectively, have the predetermined depths and have their bottoms formed at the predetermined angles or inclinations to the height of the bridge. After the workman has produced the required series of the saw-cuts or kerfs in the outer face or edge of the bridge, he removes the device 6 from the plate and separates the plate from the skeleton or frame, so as to afford facility in working upon the bridge. He then works or trims the said edge or face of the bridge down carefully to the extent which is indicated by the depths and inclinations of the bottoms of the saw-cuts or kerfs. The said saw-cuts or kerfs serve as guides to indicate clearly and definitely to the workman the amount of material requiring to be planed or otherwise taken off in order to secure the desired bridge-bearing. They enable exact and uniform results to be secured in forming the bridge-bearing, and greatly expedite, simplify, and facilitate the operations.

The proper working relations of the device 6 with respect to the bridge 5 are secured in applying the device to the plate, by causing one side, 61, of the device to register with the hitch-pin bearing 42, and the opposite side, 62, to register with the wrest-plank bridge 43. These two sides, respectively, have prepared surfaces 611 and 621 which make contact with the said hitch-pin bearing and wrest-plank bridge. By causing the device to register with the said hitch-pin bearing and wrest-plank bridge, the correct relations of the saw-guiding and gaging devices relative to the bridge 5 are insured. Hence, when the saw-cuts or kerfs are produced in the bridge, they constitute invariable guides for the reducing and trimming of the bridge in producing the bridge-bearing.

The construction, etc., of the saw-guides

and gages may vary in practice without involving departure beyond the limits of the invention.

In the illustrated embodiment of the invention, 63, 63, etc., are a number of connecting-bars or strips, extending from one edge of the device 6 to the opposite edge, along lines which correspond with those of certain of the strings, the series of the said bars or strips 63, 63, etc., being spaced apart at suitable intervals throughout the length of the bridge. The bars or strips 63, 63, etc., are recessed or notched in their inner or under edges, to fit over the bridge 5, as shown in Fig. 3. To the sides of these bars or strips are applied blocks 64, 64, etc. The inner edges or bottoms of the blocks are notched correspondingly with the bars or strips 63, 63, to fit over the bridge. The said blocks 64, 64, serve as guides in forming the saw-cuts or kerfs in the bridge. In making the saw-cuts or kerfs, the saw is caused to bear against the exposed vertical side-face of each block 64 in turn. Each block 64 determines the direction in which the corresponding saw-cut or kerf crosses the bridge, and the number and arrangement of the guides determines the number, spacing, etc., of the saw-cuts or kerfs that may be made in the bridge by the workman.

For the purpose of determining the depth of each cut or kerf, and the position of the bottom thereof, gages 65, 65, etc., are provided. Each thereof consists of a block mounted upon the corresponding block 64, and faced upon its top side with a wear-plate 655. The saw, 7, is provided with a gage consisting of a strip or shoulder, 71, extending lengthwise of its blade, upon one side of the latter. This gage may be immovably fixed in its connection with the saw-blade, but usually is constituted of a strip, as shown, secured to the saw-blade by means of screws 72, 72, passing through transverse slots 73, 73, in the saw-blade, the said screws being provided with thumb-nuts 74, 74, by means of which the strip may be clamped to the saw-blade in the desired position of adjustment transversely of the latter. As the saw cuts into the bridge, the depth of its cut or kerf is limited by contact of the shoulder or strip 71 with the gage-block 64. The depth of the said cut or kerf may be varied, and wear may be compensated for, by making adjustment of the strip 71 upon the saw-blade, but I usually provide for varying the said depth or compensating for wear by making block 65 adjustable. To this end, set-screws 651, 651, are fitted to holes that are tapped in the opposite ends of the gage-block 65, the inner ends of the said set-screws engaging with wear-plates 652, 652, that are applied to the corresponding guide-block 64. By rotation of the said set-screws, the gage-block may be adjusted vertically with rela-

tion to the guide-block, as required in providing for variation in the depth of the saw-cut or kerf.

The gage-block 65 is herein shown as 5 guided in its adjustment vertically with relation to the bridge by means of pins or dowels 644, 644, projecting from guide-block 64 and received in holes 654, 654, in gage-block 65. The gage-block 65 may be mounted upon the 10 block 64 with its top surface with which the saw makes contact disposed at a fixed angle or inclination with relation to the height of the bridge corresponding with the angle 15 which the bottom of the saw-cut or kerf is desired to have relative to the height of the bridge. This angle or inclination may be as desired. Usually, however, I make suitable provision for effecting variation in the said angle. In the present instance, by making 20 suitable adjustment of the set-screws 651, 651, the gage-block 64 may be canted or tilted lengthwise sufficient to vary the angle or inclination throughout the required extent or range of adjustment.

25 It will be obvious that certain of the principles which I have herein set forth are capable of being applied in other connections than that disclosed, and consequently I do not in all cases limit myself strictly to the employ- 30 ment of such principles for obtaining bridge-bearings for pianos.

I claim as my invention:—

1. The compound gage to enable a series of 35 indicating cuts or kerfs to be produced in the surface of a body to guide in removing the material at said surface to reduce or trim the latter to the required contour, comprising an organized series of saw-guides corresponding in plan with the area to be shaped 40 and in arrangement with the respective features of such contour, the said saw-guides controlling the positions of the respective saw-cuts or kerfs and being provided with gages to control the depth thereof the said 45 gages having adjusting means to vary the inclination of the bottoms of the respective cuts or kerfs.

2. The compound gage to enable a series of 50 indicating cuts or kerfs to be produced in the surface of a body to guide in removing the material at said surface to reduce or trim the latter to the required contour, comprising an organized series of saw-guides corresponding in plan with the area to be shaped and in arrangement with the respective features of 55 such contour, the said saw-guides controlling the positions of the respective saw-cuts or kerfs and being provided with gages to control the depth thereof the said gages having 60 adjusting means to vary the depths of the respective cuts or kerfs.

3. The compound gage to enable a series of 65 indicating cuts or kerfs to be produced in the surface of a body to guide in removing the material at said surface to reduce or trim the

latter to the required contour, comprising an organized series of saw-guides corresponding in plan with the area to be shaped and in arrangement with the respective features of such contour, the said saw-guides controlling 70 the positions of the respective saw-cuts or kerfs and being provided with gages to control the depth thereof the said gages having adjusting means to vary the depths of the respective cuts or kerfs and the inclinations 75 of the bottoms thereof.

4. The device for use in obtaining the bridge-bearing of a piano, comprising, essentially, a series of saw-guides conforming to the contour of the bridge of a piano, arranged 80 adjacent one another in positions corresponding with predetermined portions of the bridge, having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide 85 in the subsequent reduction and trimming of the same, and also having adjusting means to enable the depths of the cuts or kerfs to be varied.

5. The device for use in obtaining the 90 bridge-bearing of a piano, comprising, essentially, a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the 95 bridge, having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same, and also having adjusting 100 means to enable the inclination of the bottoms of the cuts or kerfs to be varied.

6. The device for use in obtaining the bridge-bearing of a piano, comprising, essentially, a series of saw-guides conforming to 105 the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, having means to control the positions of the bottoms of the indicating saw- 110 cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same, and also having adjusting means to enable the depths of the cuts or kerfs and the inclination of the bottoms 115 thereof to be varied.

7. The device for use in obtaining the bridge-bearing of a piano, provided with means to register with a predetermined portion of the plate of a piano, and having a series of saw-guides conforming to the contour 120 of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, the said saw-guides having means to control the 125 positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same.

8. The device for use in obtaining the 130

- bridge-bearing of a piano, provided with means to register with a predetermined portion of the plate of a piano, and having a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, the said saw-guides having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same, and also having adjusting means to enable the depths of the cuts or kerfs to be varied.
9. The device for use in obtaining the bridge-bearing of a piano, provided with means to register with a predetermined portion of the plate of a piano, and having a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, the said saw-guides having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same and also having adjusting means to enable the inclination of the bottoms of the cuts or kerfs to be varied.
10. The device for use in obtaining the bridge-bearing of a piano, provided with means to register with a predetermined portion of the plate of a piano, and having a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, the said saw-guides having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same, and also having adjusting means to enable the depths of the cuts or kerfs and the inclination of the bottoms thereof to be varied.
11. The device for use in obtaining the bridge-bearing of a piano, provided with means to register with the hitch-pin bearing

and the wrest-plank bridge, and having a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, the said saw-guides having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same.

12. The device for use in obtaining the bridge-bearing of a piano, provided with means to register with the hitch-pin bearing and the string-bearing of the wrest-plank, and having a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in position corresponding with predetermined portions of the bridge, the said saw-guides having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same, and provided with adjusting means to enable the depths of the cuts or kerfs to be varied.

13. The device for use in obtaining the bridge-bearing of a piano, provided with means to register with the hitch-pin bearing and the string-bearing of the wrest-plank, and having a series of saw-guides conforming to the contour of the bridge of a piano, arranged adjacent one another in positions corresponding with predetermined portions of the bridge, the said saw guides having means to control the positions of the bottoms of the indicating saw-cuts or kerfs which are made in the bridge to guide in the subsequent reduction and trimming of the same, and also having adjusting means to enable the depths of the cuts or kerfs and the inclinations of the bottoms thereof to be varied.

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

EDWARD C. SAGER.

Witnesses:

CHAS. F. RANDALL,
WILLIAM A. COPELAND.