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Patented Dec. 10, 1901.

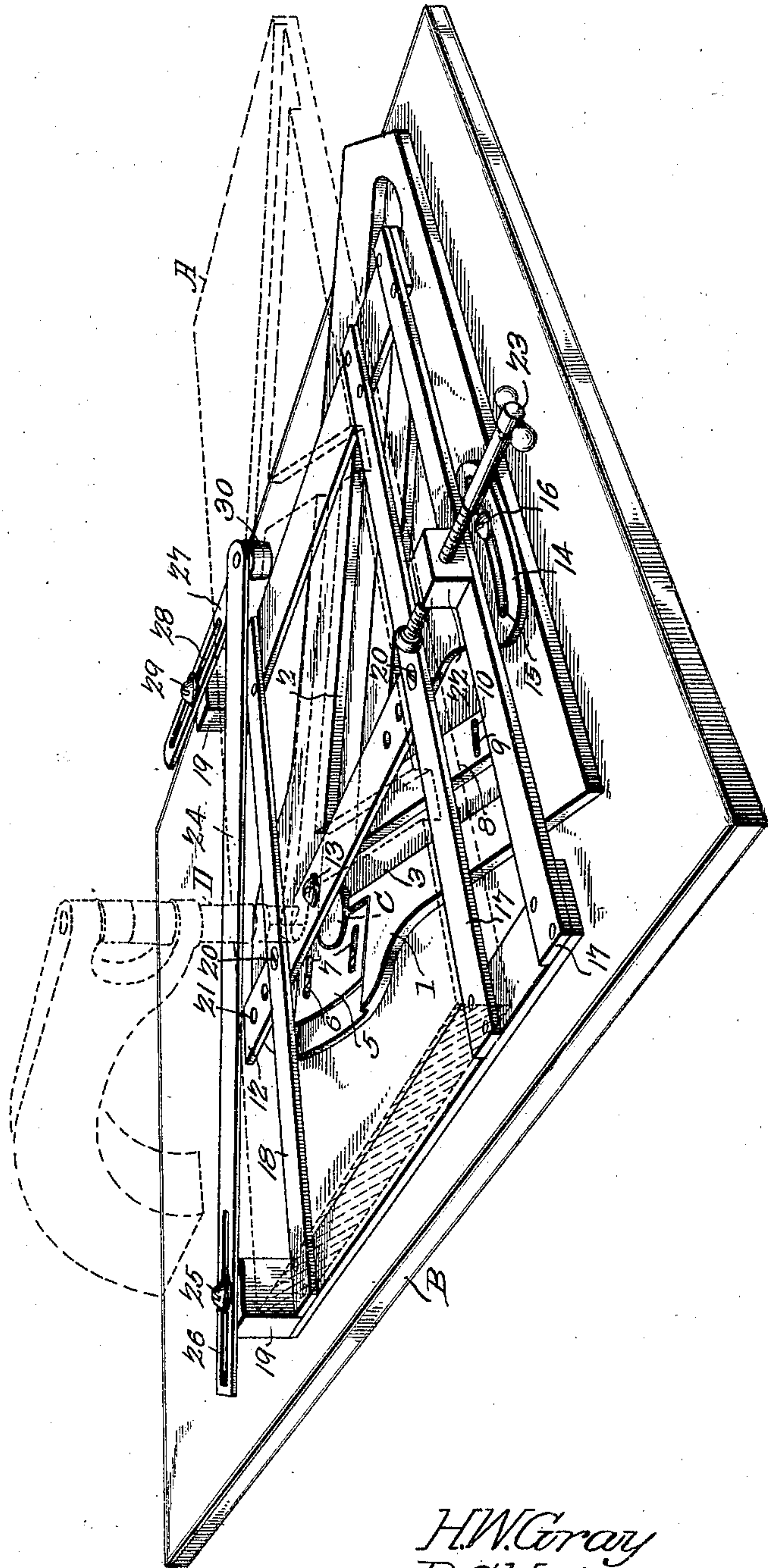
H. W. GRAY & R. C. HORTON.
HOUSING APPARATUS.

(Application filed Apr. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses
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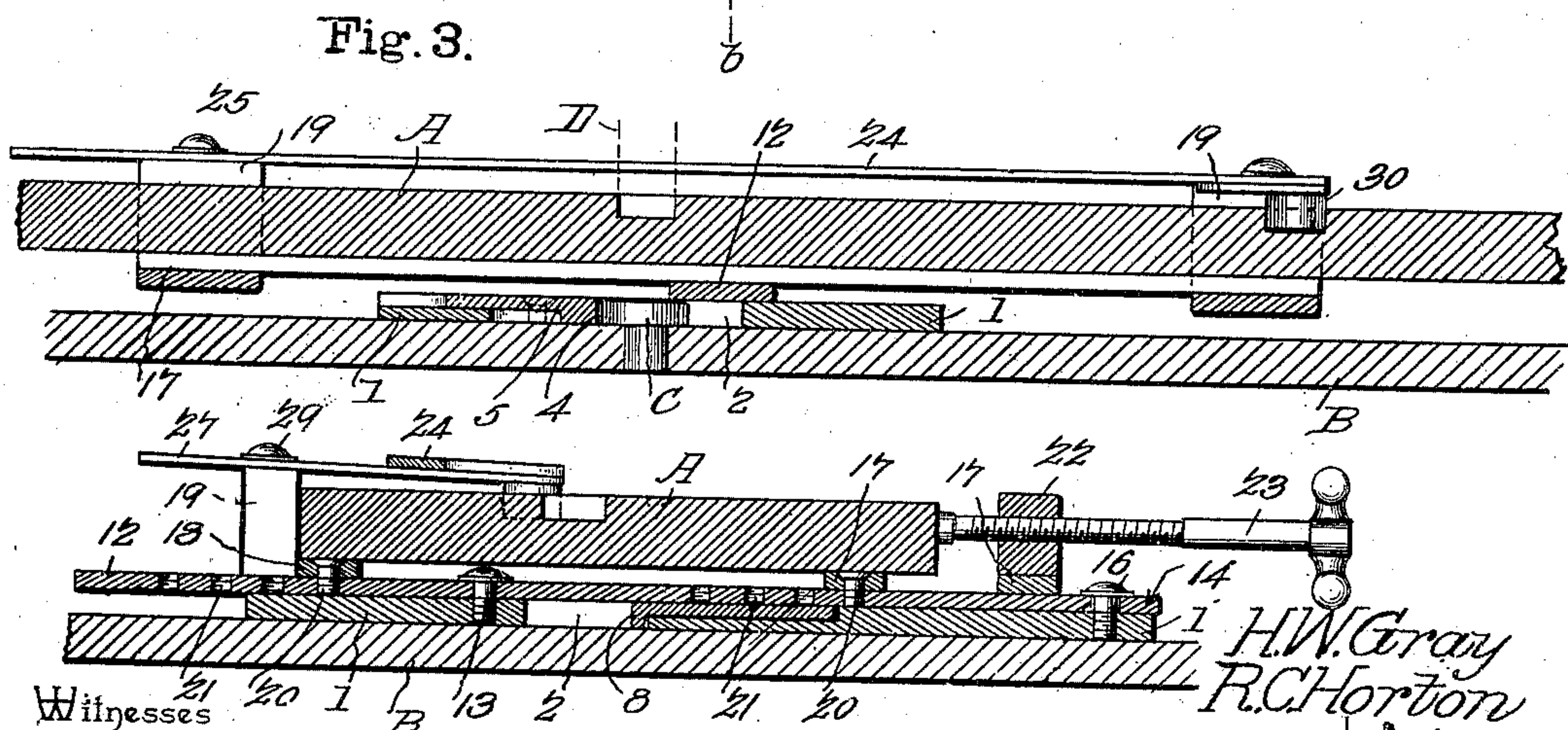
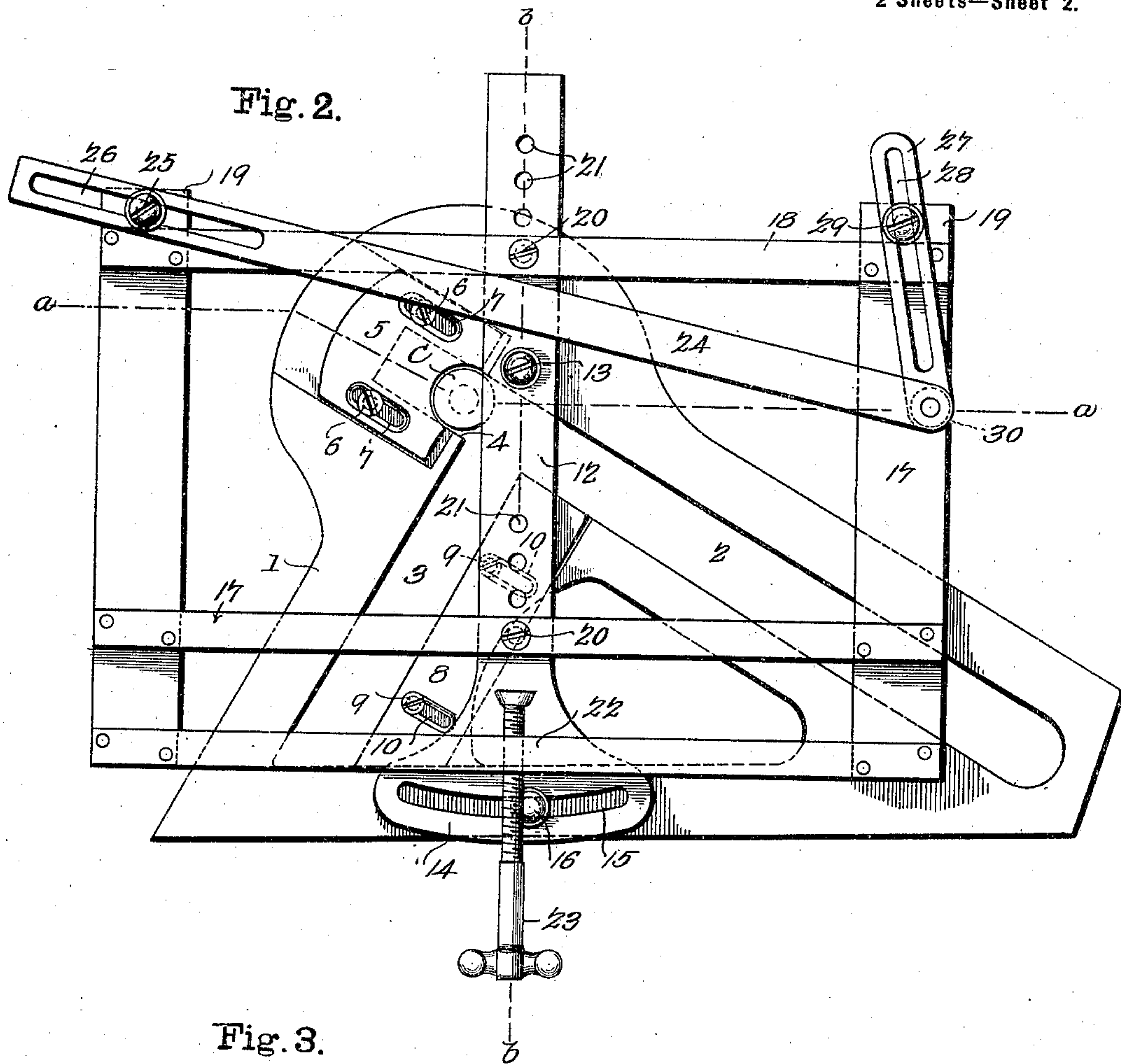
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2 Sheets—Sheet 2.



Witnesses 21 20 1 B 13 2 8 21 20

Fig. 4.

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UNITED STATES PATENT OFFICE.

HENRY W. GRAY AND RILEY C. HORTON, OF KEOKUK, IOWA.

HOUSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 688,634, dated December 10, 1901.

Application filed April 20, 1901. Serial No. 56,761. (No model.)

To all whom it may concern:

Be it known that we, HENRY W. GRAY and RILEY C. HORTON, citizens of the United States, residing at Keokuk, in the county of Lee and State of Iowa, have invented a new and useful Housing Apparatus, of which the following is a specification.

Our invention is an improved apparatus for housing stringers of stairs of any desired pitch without the necessity of laying off the treads and risers by a square or otherwise; and it consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a housing apparatus constructed in accordance with our invention, showing the same disposed in operative position on the table of a boring or routing machine having a vertically-disposed cutting-bit adapted for routing out the grooves of the stringer of a staircase for the treads and risers. Fig. 2 is a top plan view of the same. Fig. 3 is a sectional view taken on a plane indicated by the line *a a* of Fig. 2. Fig. 4 is a similar view taken on a plane indicated by the line *b b* of Fig. 2.

In the embodiment of our invention we provide a base-frame 1, in which are right-angled slots 2 3, each of suitable length and breadth, the former corresponding to the tread of a stair-stringer and the latter corresponding to a riser thereof. The slot 2 projects beyond the slot 3 to form the nose 4, and a nose-piece 5 is secured on the said base-frame by means of set-screws 6, which operate in slots 7, with which said nose-piece is provided, and thereby the latter is adjustable, so that the nosings of the stairs may project beyond the risers to any extent desired. On one side of the riser-slot 3 is an adjustable straight-edged piece 8, which is secured on the base-frame by set-screws 9, that operate in adjusting-slots 10, with which said piece 8 is provided. Thereby the slot 3 may be narrowed or widened to any desired extent. An adjusting-bar 12 is pivoted on the base-frame by a pivot-screw or other suitable device 13. At the outer end of said adjusting-bar is a head 14, which is provided with a slot 15, the latter being concentric with the pivot 13. A set-screw 16, which operates in said slot 15, is adapted to secure the said

adjusting-bar on the base-frame at any desired angle with relation to the slots 2 3. On the said adjusting-bar is placed a pitch-frame 17, which may be either of the construction here shown or any other suitable construction and has a straight edge 18 on its inner side, which is at right angles to the adjusting-bar 12, the latter being centrally located with relation to the pitch-frame. Projections 19, which form a flange on the straight edge 18, rise from the upper side of the said pitch-frame. The latter is adjustable on the adjusting-bar 12 and, as here shown, is secured thereto by set-screws 20. The said adjusting-bar is provided with series of adjusting-openings 21, adapted to be engaged by the said adjusting-screws. The pitch-frame must be set on the adjusting-bar in such manner that the distance between the nose of slot 2 and the straight edge 18 will be equal to the distance desired between the nose and the upper edge of the stringer. The pitch-frame being secured to the adjusting-bar 12 at right angles thereto and said adjusting-bar 12 being pivotally attached to and adjustable on the said base-frame, it follows that the straight edge 18 of said pitch-frame may be set at any desired angle with relation to the tread and riser slots of the base-frame, according to the pitch of the stairs. At the edge of the pitch-frame opposite the straight edge 18 is a lug or ear 22, in which is a clamping-screw 23, by means of which the stair-stringer, which is indicated at A in Figs. 1, 3, and 4, may be clamped in position on the pitch-frame with its upper edge in line with the straight edge 18 of said pitch-frame.

A space-bar 24, which is preferably made of suitable spring metal, is adjustably secured at one end on one of the projections 19 by a set-screw 25, which operates in an adjusting-slot 26, with which said space-bar is provided. The opposite end of said space-bar is pivotally connected, as at 26, to the inner end of a link 27, which is also preferably made of spring metal. Said link is provided with an adjusting-slot 28. A set-screw 29 in said slot adjustably secures said link on the projection 19 which is opposite the adjusting-screw 25. Thereby the space-bar may be set at any desired angle with relation to the straight edge 18, according to the pitch of the stairs.

On the under side of the inner end of link 27 is a depending pin or roller 30.

In operation our improved housing apparatus is placed on the bed or table B of a suitable boring or routing machine and initially the nose of tread slot 2 is engaged by a pin C, which rises from the said bed or table B directly in line vertically with the routing or cutting bit D, which is indicated in dotted lines in Figs. 1 and 3. The pin C is of suitable diameter, and in practice we provide a number of these pins of various diameters, which may be interchangeably used on the bed or table B, being readily removable therefrom. Having set the adjusting-bar 12, and hence the pitch-frame 17, to the desired angle with relation to the tread and riser slots of the base-frame by the means and in the manner hereinbefore described and having adjusted the pitch-frame on the adjusting-bar 12 according to the desired height of the stringer above the nosing, the stringer is placed on the pitch-frame with one end of the stringer bearing thereon, the stringer is clamped in position on the pitch-frame by the clamping-screw 23, which coacts with the projections 19 for this purpose, the cutting or routing bit D is then lowered to operative position on the stringer and set in motion, and the stringer by means of our housing apparatus is then cut by the bit or cutter D, the latter following the slots 2 3 by reason of the pin C, which is adapted to traverse the slots, the apparatus being appropriately moved by the operator. The space-bar 24 is adjusted according to the width of the treads and the pitch of the stairs. Having cut the riser and tread grooves in the stringer for one step, the stringer is then readjusted on the pitch-frame and set thereon with the pin 30 of said space-bar in engagement with the nose of the completed tread-groove and the operation before described is then repeated to cut the tread and riser grooves in the stringer for another step, and so on.

In practice the pin C should be of less diameter than the slots 2 3, and in cutting the grooves in the stringer the housing apparatus is so operated manually as to cause said pin to bear against opposite sides of the slots in the base-frame alternately, and thereby the routing or cutting bit is caused to cut first one side and then the other of each groove in the stringer. By having a series of pins C of different diameters the grooves in the stringer may be cut any desired width. The sides of the slot 2 of the base-frame may be paralld or they may slightly diverge from the nose if it be desirable to correspondingly cut the tread-groove in order to facilitate the insertion of the ends of the treads therein in the erection of the staircase.

By reversing the position of the base-frame our improved apparatus may be employed both for right and left hand stairs.

Having thus described our invention, we claim—

1. In an apparatus of the class described, the combination of a base-frame having tread and riser slots, a pitch-frame adjustable on said base-frame, a space-bar having a slot at one end, a set-screw in said slot, and securing said space-bar to said pitch-frame, a link pivotally connected to the opposite end of said space-bar, said link having a slot, and a set-screw in said slot, connecting said space-bar to said pitch-frame, substantially as described.

2. In an apparatus of the class described, the combination of a base-frame having tread and riser slots, a bar pivoted on said base-frame, means to secure said bar to said base-frame, at any desired adjustment, a pitch-frame secured and adjustable on said bar, a space-bar secured to one side of the pitch-frame, said space-bar being adjustable, and means to secure a stair-stringer on said pitch-frame, substantially as described.

3. In an apparatus of the class described, the combination of a base-frame having right-angled slots for the purpose set forth, a bar pivoted on said base-frame, means to secure said bar to said base-frame at any desired adjustment, and a pitch-frame secured and adjustable on said bar, substantially as described.

4. In an apparatus of the class described, the combination of a base-frame having tread and riser slots, a pitch-frame adjustable on said base-frame and a space-bar adjustable on said pitch-frame, for the purpose set forth, substantially as described.

5. In an apparatus of the class described, the combination of a base-frame having tread and riser slots, and an adjustable nosepiece at the nose end of said tread-slot, with a pitch-frame adjustable on said base-frame, substantially as described.

6. In an apparatus of the class described, the combination of a base-frame having right-angled slots representing the tread and riser of a stair, and means to vary the width of said riser-slot, with a pitch-frame connected to and adjustable on said base-frame, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

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Witnesses:

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