(No Model.) 2 Sheets—Sheet 1.

W. KLOSE.

METHOD OF FINISHING SHEET METAL HAND RAILS.

No. 536,533. Patented Mar. 26, 1895.

FIG. 1.

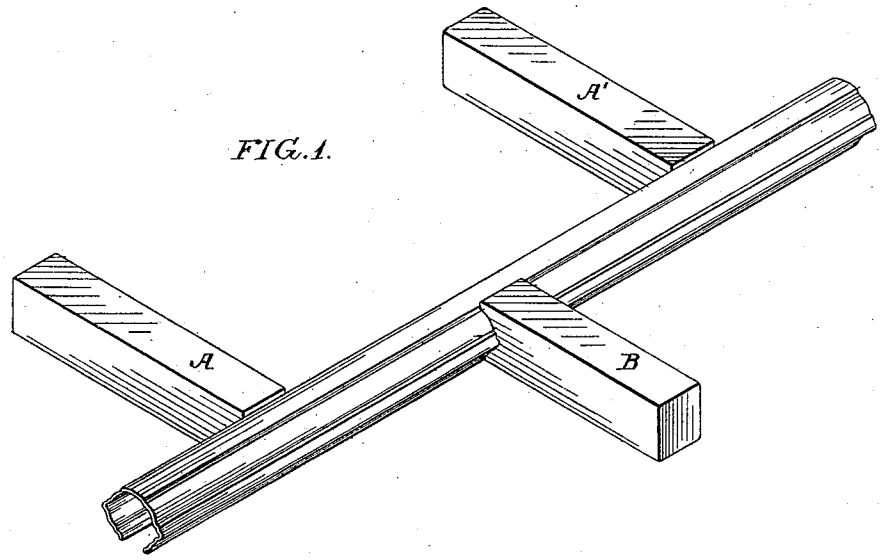


FIG. 2.

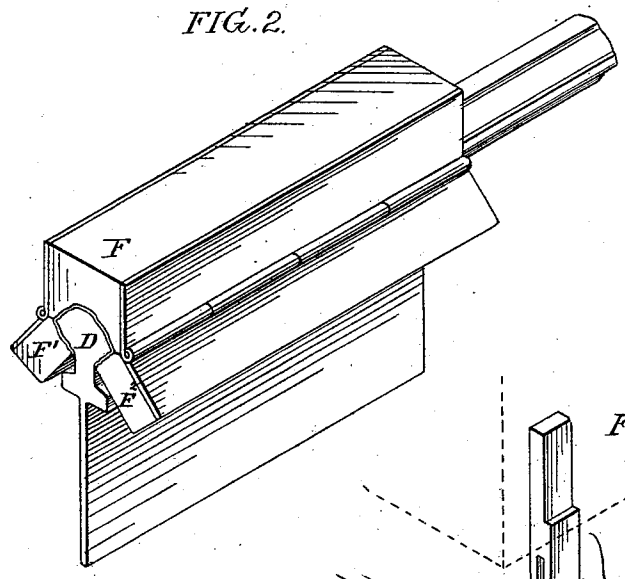


FIG. 3.

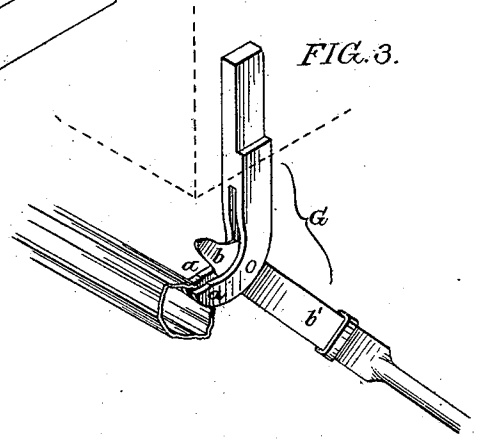
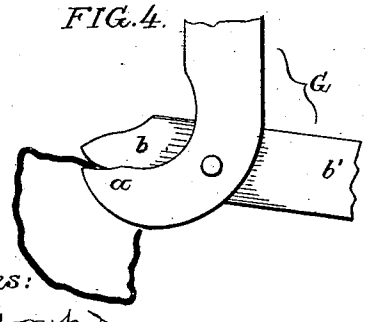


FIG. 4.



Witnesses:
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by his Attorneys
Howson & Howson

(No Model.) 2 Sheets—Sheet 2.

W. KLOSE.

METHOD OF FINISHING SHEET METAL HAND RAILS.

No. 536,533. Patented Mar. 26, 1895.

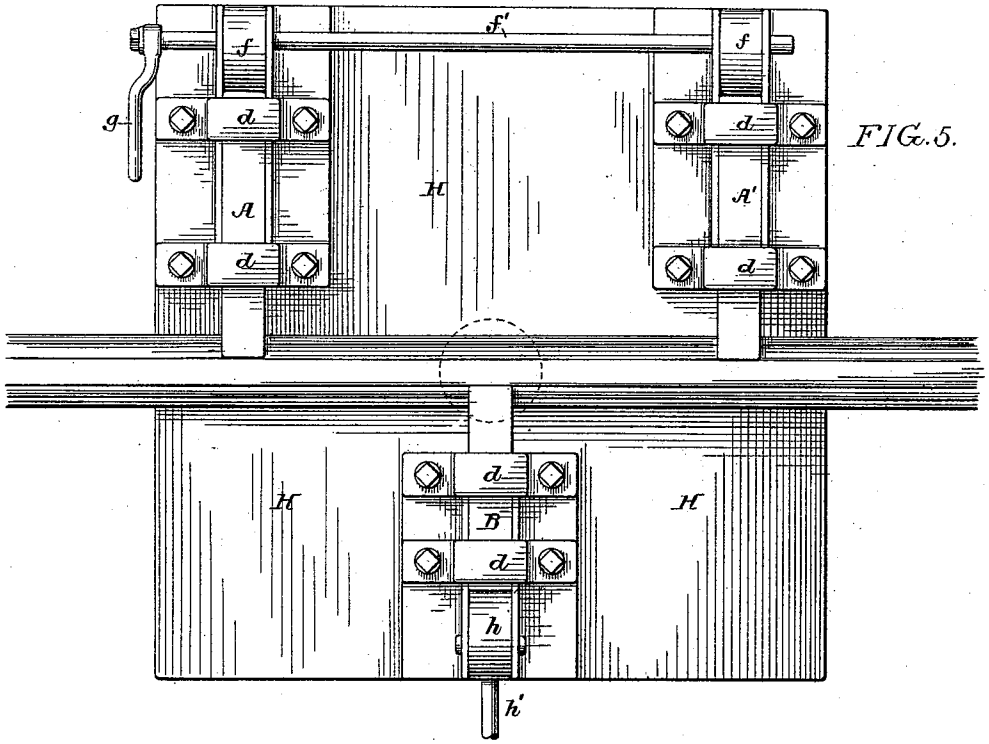

FIG. 5.

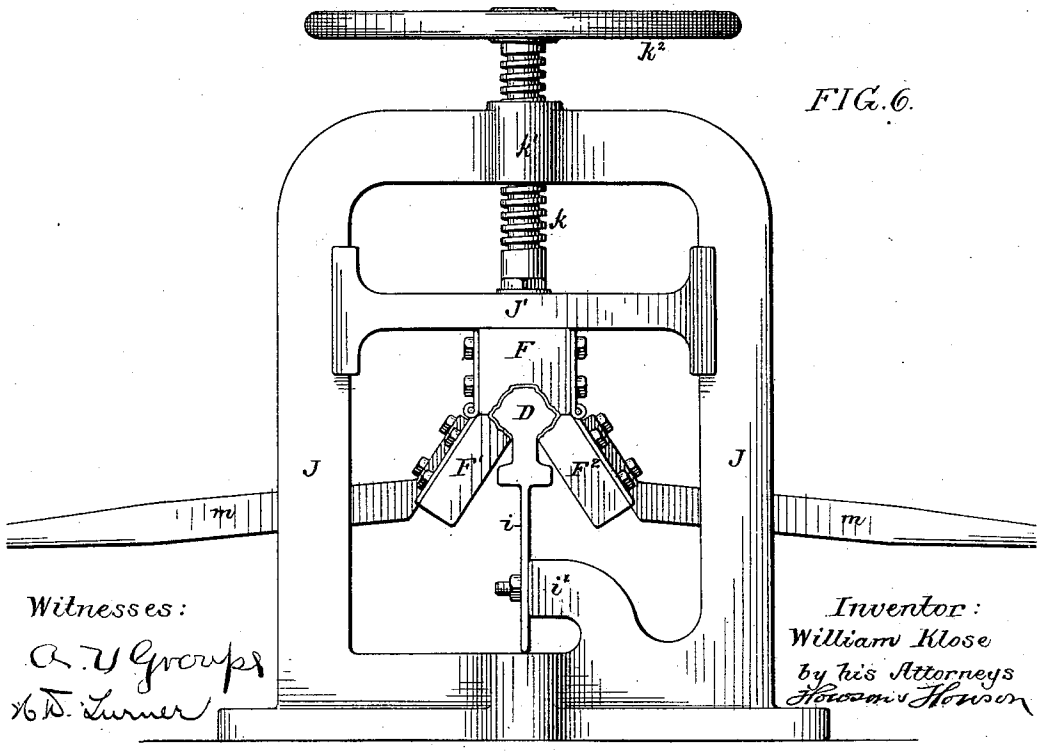

FIG. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM KLOSE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE BELMONT IRON WORKS, LIMITED, OF SAME PLACE.

METHOD OF FINISHING SHEET-METAL HAND-RAILS.

SPECIFICATION forming part of Letters Patent No. 536,533, dated March 26, 1895.

Application filed November 28, 1892. Serial No. 453,408. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KLOSE, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Finishing Sheet-Metal Hand-Rails, of which the following is a specification.

The object of my invention is to readily and thoroughly accomplish the operation of preparing hand rails of bent sheet metal for being fitted accurately together, and this object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figures 1, 2, 3 and 4, are diagrams illustrating successive steps in the carrying out of my invention. Fig. 5. is a plan view of apparatus devised for carrying out the first step of the process; and Fig. 6, is a front elevation of apparatus for carrying out the second step of the process.

In preparing adjoining lengths of bent sheet metal hand rails for being fitted together, it is necessary, in order to insure close and accurate joints, that the length of rail shall be straight, that the patterns of the two lengths of rail shall exactly coincide at the meeting point, and that each end of the length of rail shall be at right angles to the longitudinal line of the rail so that adjoining lengths will snugly abut against each other.

In carrying out my invention with the object of reducing each length of hand rail to this condition, I first take the length of hand rail as it comes from the bending rolls, and is consequently more or less buckled or warped, and subject it to the action of opposing dies A A′ and B at such points in its length as may be necessary to remove any buckle or warp in the rail and render the same perfectly straight and true longitudinally, the inner ends of the dies of course being shaped to conform to the shape of the inner and outer sides of the hand rail. This operation being completed, first one and then the other end of the rail are slipped endwise onto a die D which conforms accurately to the true internal shape of the rail and each end portion of the rail is pressed firmly against this die by means of a series of dies F F′ and F^2, the die F acting upon the top of the rail, and the dies F′, F^2 upon the under portions of the rail at each side of the same as shown in Fig. 2. The opposite ends of the rails being rendered true in contour by this operation, it only remains to trim them off square or at right angles to the longitudinal line of the rail, and while this might be done by a shear blade or saw working across the ends of and close to the dies D, F, F′ and F^2, I prefer to use for the purpose a pair of shears G, one jaw *a* of said shears being forked and adapted to enter the opening in the bottom of the hand rail, and the other jaw *b* of the shears forming a part of the movable arm or lever *b′* of said shears. The nose of the forked jaw *a* being introduced into the opening in the under side of the hand rail, the jaw *b* is operated so as to form a succession of short cuts through the hand rail on one side of said opening, the rail being turned so as to permit the jaw to act upon successive portions of the same until the rail has been trimmed entirely round from one edge of the lower opening to the other. This operation is effected without distorting the shape of the rail owing to the fact of the short cuts, and to the further fact that the strip of metal forming the rail is supported upon one side by one jaw of the shears while the other jaw is acting to cut said strip.

In some cases the trimming of the rail ends may precede instead of following the truing action of the dies D, F, F′ and F^2 but the plan before described is to be preferred.

In the organized machine for carrying out the first step of my improved process I preferably mount the dies A A′ and B in guides *d* upon a table H which is pivoted to a suitable bed plate or standard at a central point as indicated by the dotted circle in Fig. 5. The dies A A′ are projected by cams or eccentrics *f* mounted upon a rock shaft *f′* having an operating lever or handle *g* and the die B is likewise projected by a cam or eccentric *h* with operating handle *h′*.

The object of pivoting the table H in the center is to provide for the reversal of the dies so that the dies A A′ may act first upon one side and then upon the opposite side of the

rail as the condition of the rail may suggest as the most advantageous, the reversal of the table being effected by first withdrawing the dies and then simply lifting the rail so as to permit the table to be swung around beneath it, the rail being then lowered into position to be acted upon by the dies in their new relation. By this means the turning of a long length of rail end for end, whenever a change in the action of the dies is required, is rendered unnecessary, and the operation is materially facilitated. In the organized machine shown in Fig. 6 for carrying out the second step of the process the die D has a shank *i* secured to an arm *i'* at the base of a frame J to which is adapted a slide J' actuated by a screw *k* adapted to a nut *k'* at the top of the frame J and provided with a hand wheel k^2. The slide J' carries the upper die F and to each side of the latter are hung the side dies F' F^2 which are provided with suitable levers *m* whereby they may be manipulated so as to cause them to press inward and upward against the under sides of the rail as shown in Fig. 6.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The mode herein described of preparing lengths of bent sheet metal hand rails, said mode consisting in straightening the rail longitudinally, subjecting the end portions of the rail to pressure between inner and outer dies, to properly shape the rail at the ends, and shearing off the ends of the rails, without distorting the same, substantially as specified.

2. The mode herein described of preparing bent sheet metal hand rails, said mode consisting in straightening the rail longitudinally, subjecting the end portions of the rail to pressure between inner and outer dies to properly shape the rail at the ends, and trimming off the ends of the rail by shearing around the same, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM KLOSE.

Witnesses:
F. M. WHITELEY,
F. L. WHITELEY.