

(No Model.)

W. TRURAN.
DIE FOR MAKING STAPLES.

No. 327,974.

Patented Oct. 6, 1885

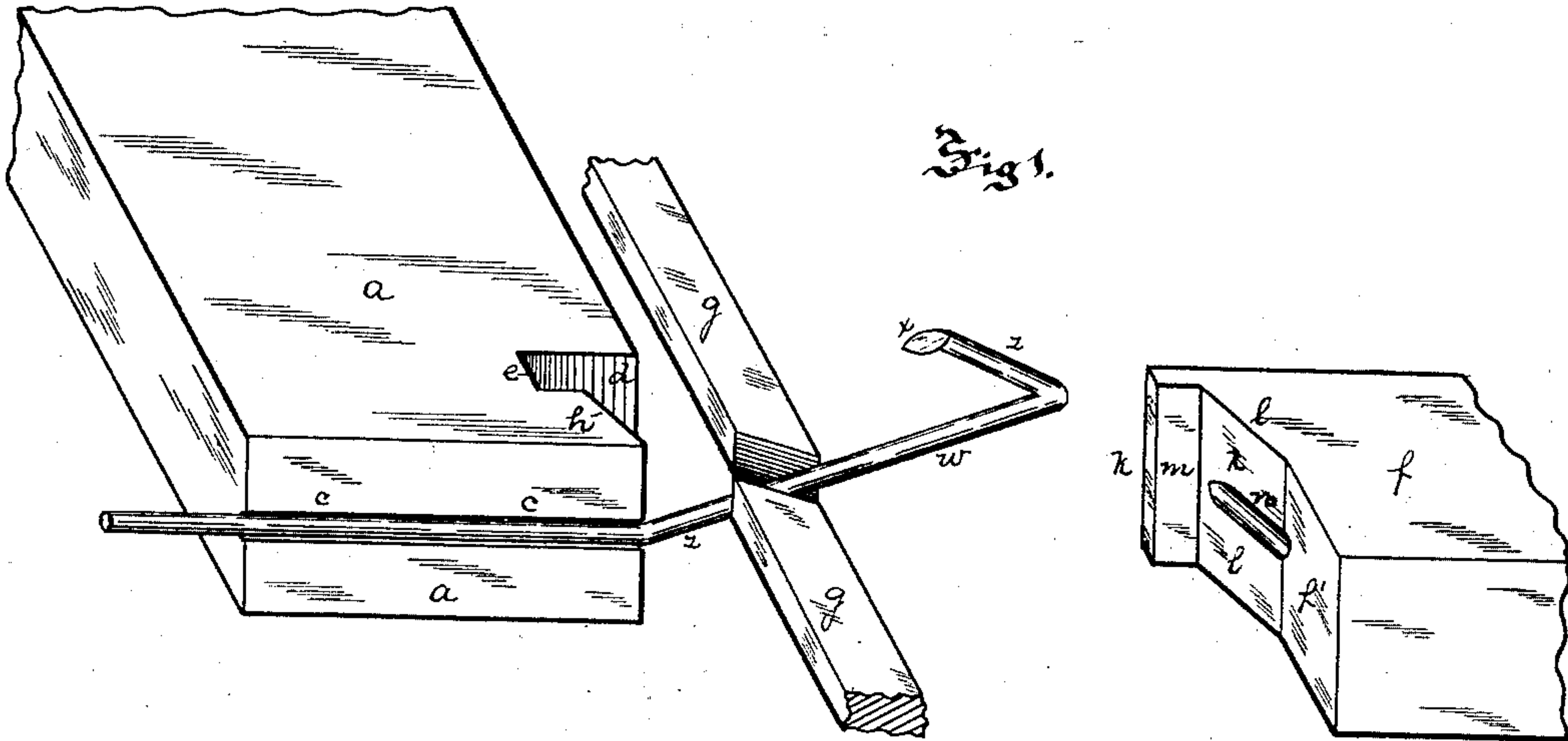


Fig. 1.

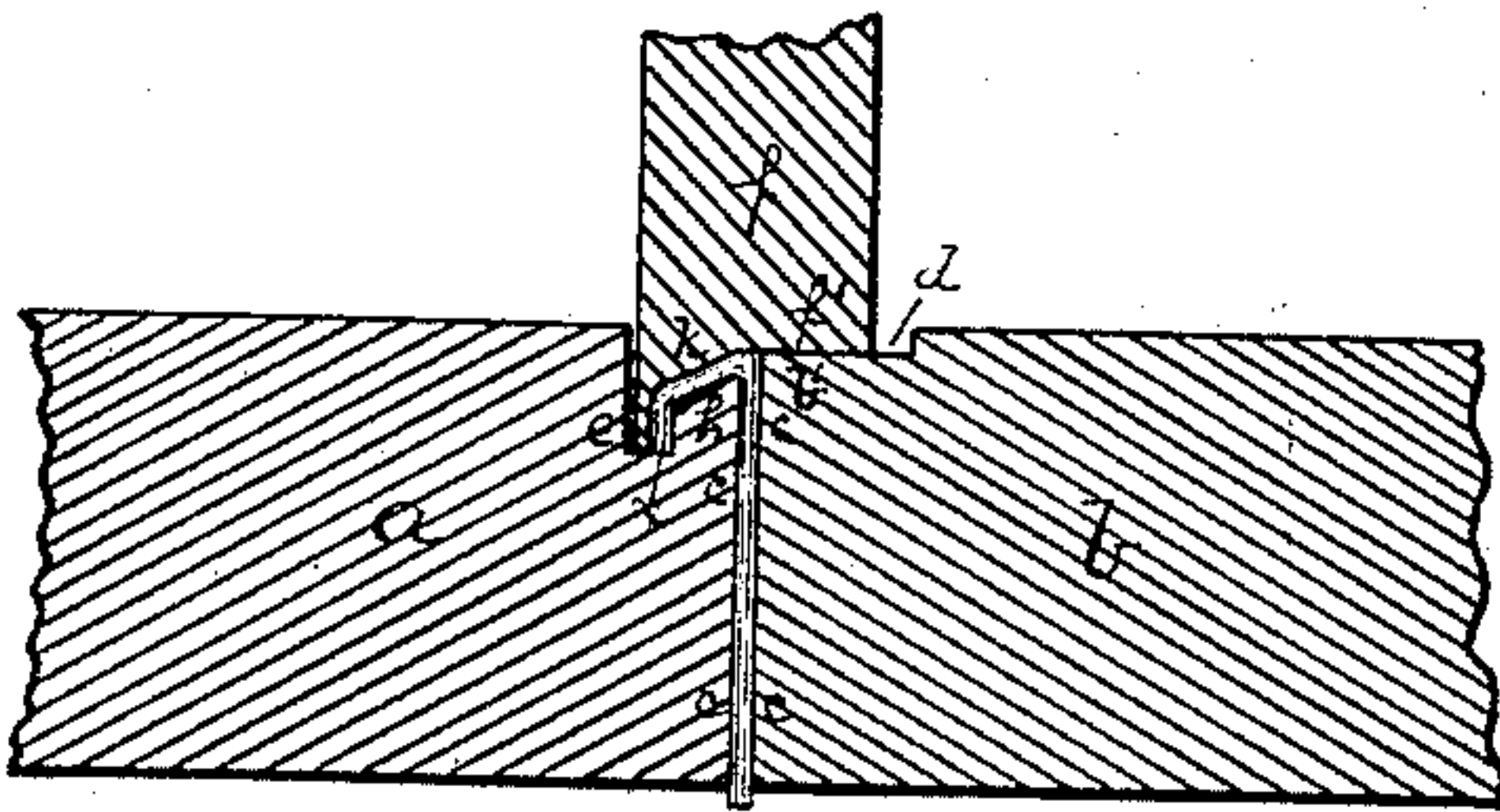


Fig. 2.

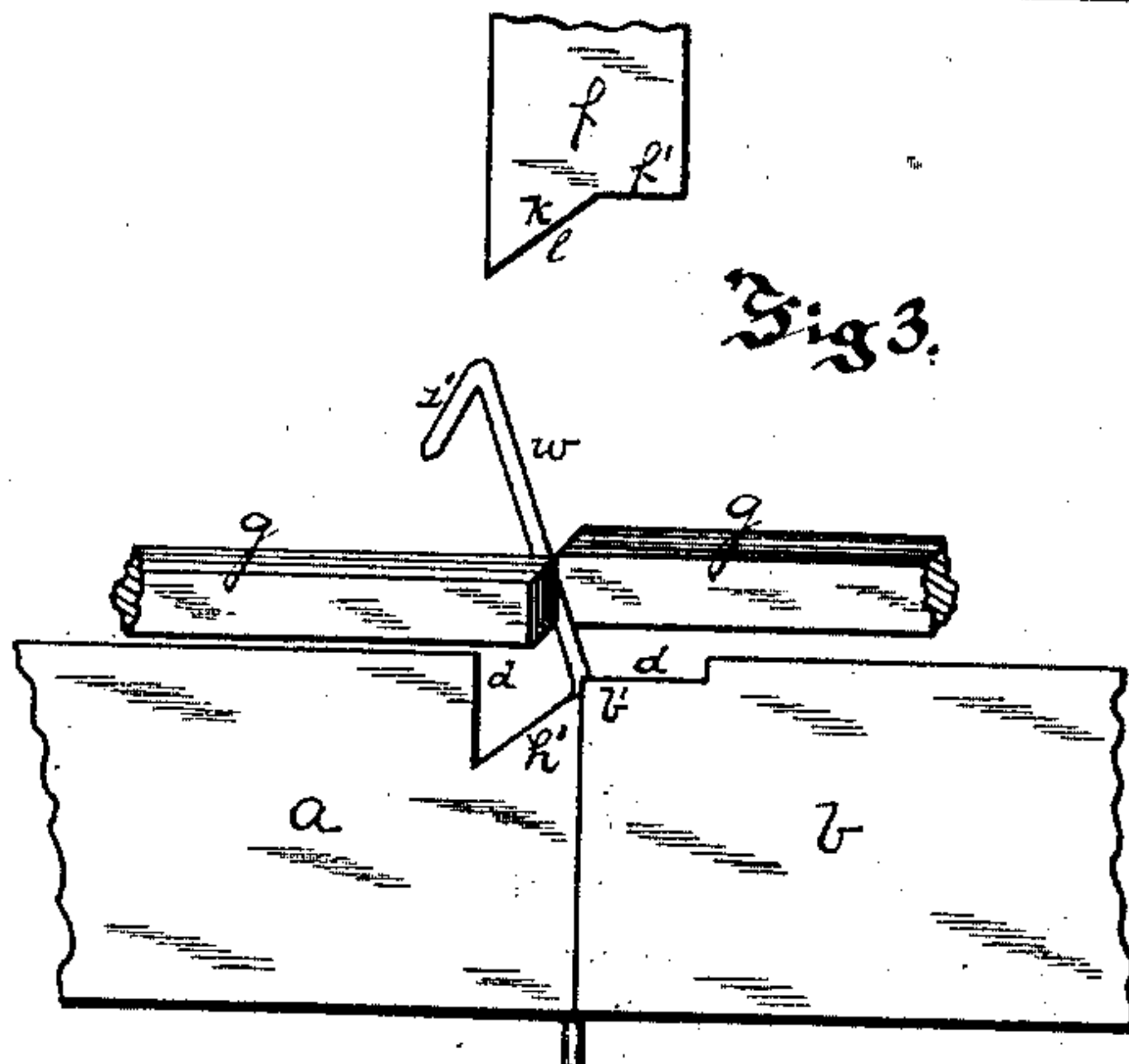


Fig. 3.

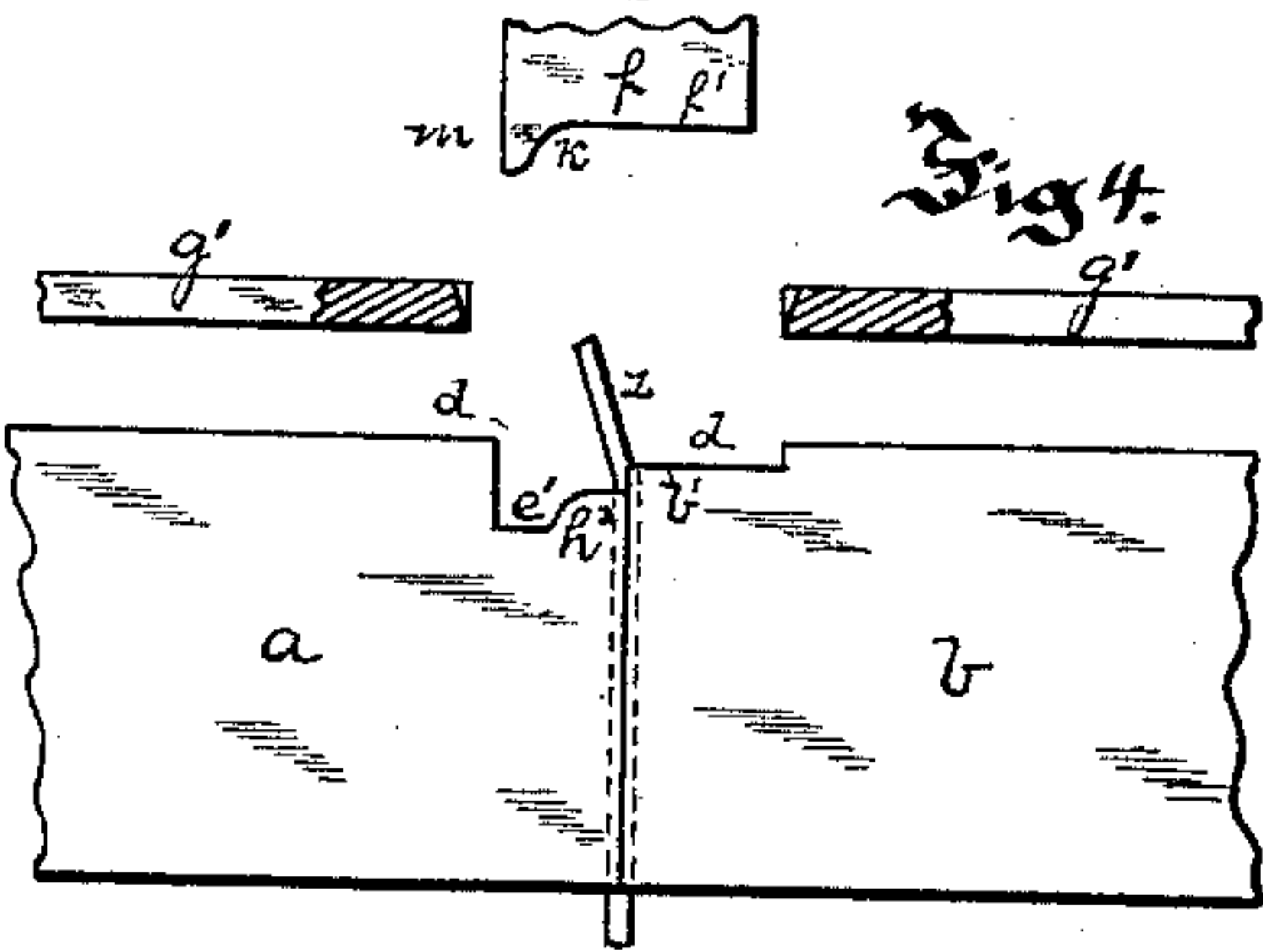


Fig. 4.

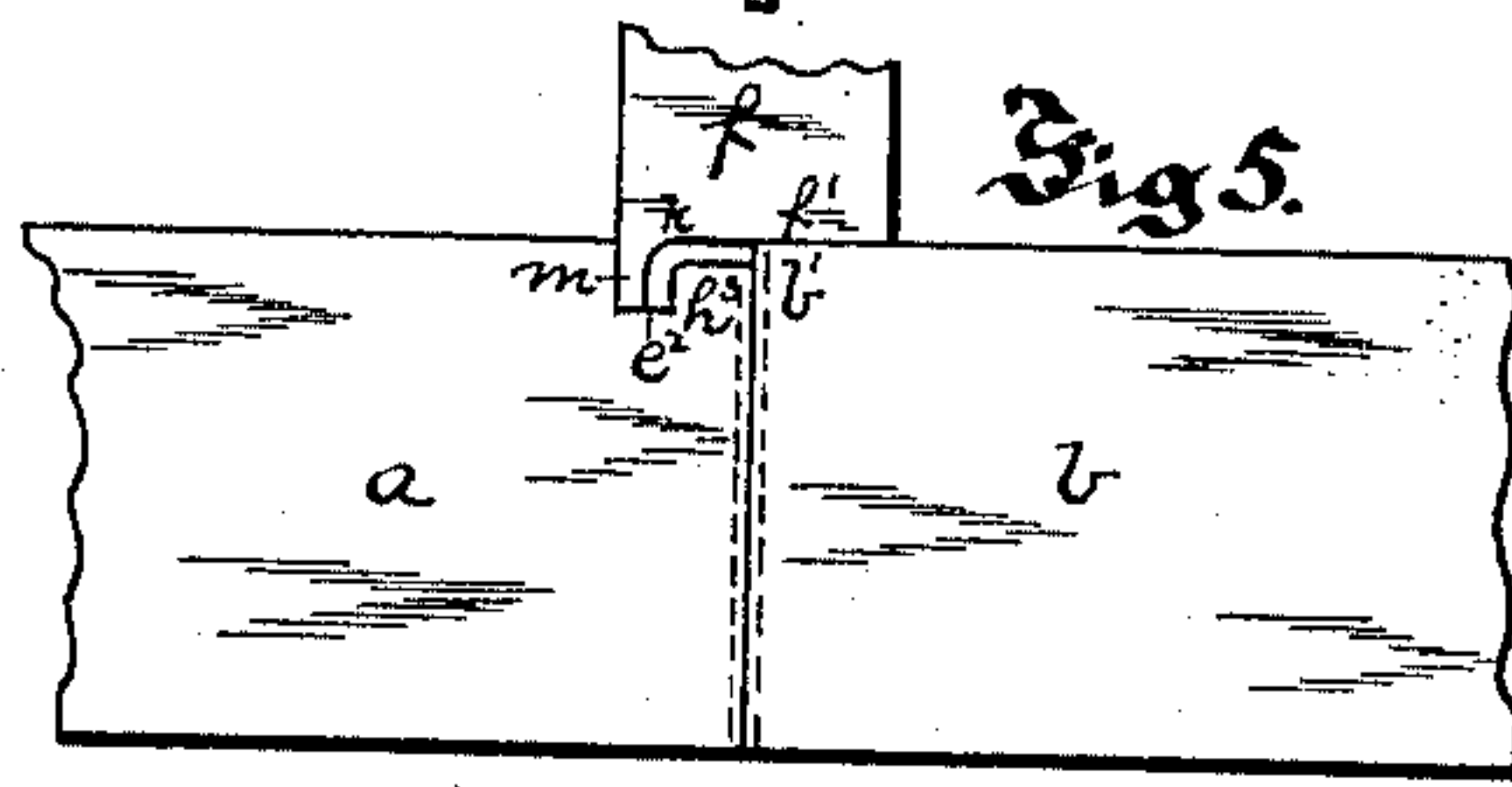
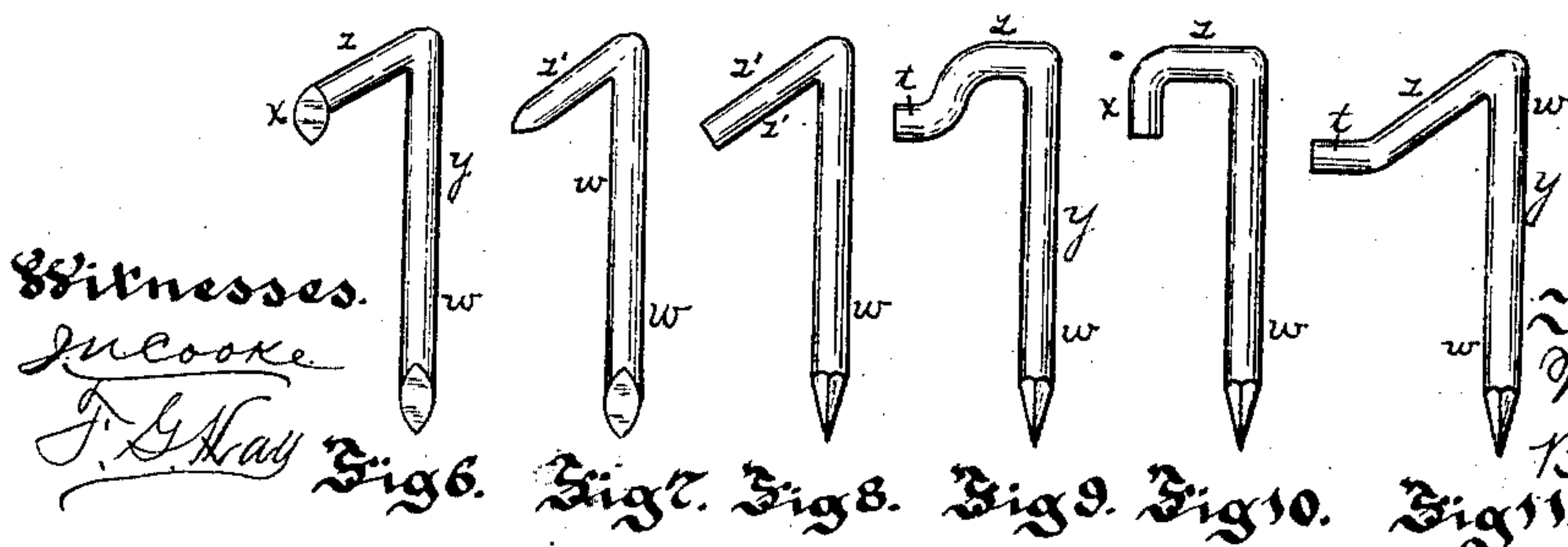


Fig. 5.



Witnesses.
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Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM TRURAN, OF ALLEGHENY CITY, PENNSYLVANIA, ASSIGNOR TO
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DIE FOR MAKING STAPLES.

SPECIFICATION forming part of Letters Patent No. 327,974, dated October 6, 1885.

Application filed July 26, 1884. Serial No. 138,838. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM TRURAN, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Dies for Making Staples; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to dies for making wire staples, having special reference to dies for making staples having a single driving-bar, and an arm bent back therefrom at an acute angle, to fit over and hold a wire or bar resting in the seat thereof, as described in application for patent made by me on the 9th day of July, 1884, Serial No. 137,187, and staples of similar form, these staples being principally employed with wire fences.

It consists, essentially, in a pair of gripping-dies adapted to hold the wire so that a portion thereof extends beyond the dies, one gripper having an anvil corresponding to the form to which the arm is to be bent, in combination with a reciprocating bending-die moving in the line of feed of the wire, having a face corresponding to the form of the arm, and adapted to bend to one side the portion of the wire extending beyond the gripping-dies and press it against the anvil, and thus form it to shape.

It also consists in combining with the gripping-dies shears adapted to sever the wire at a point to the side of the center line of feed of the wire, and thus impart to the portion forming the arm its initial bend, bending it into such position that the reciprocating bending-die can operate more easily thereon.

It also consists in certain details of construction of the dies employed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a perspective view illustrating my improved dies, one of the grippers being removed. Fig. 2 is a horizontal section thereof. Figs. 3, 4, and 5 are top views showing different positions of the dies, and different forms of dies. Figs. 6, 7, 8, 9, 10, and 11 are views of the staples formed.

Like letters of reference indicate like parts in each.

My improved dies may be employed in the machine described in application for Letters Patent filed by me July 8, 1884, Serial No. 137,148, the motions necessary for the manufacture of these shapes being imparted to the dies, shears, &c., by the apparatus described and illustrated therein.

The gripping-dies *a b* are secured in a suitable die-box, and in their working-faces are the grooves *c c*, in which the wire to be formed into shapes fits. One die, *b*, has a reciprocating motion against the other die, thus intermittently gripping the wire and opening to allow it to be fed forward between the grippers, suitable feeding mechanism being shown in said application. The faces of the grippers are preferably recessed, as at *d*, to receive the reciprocating die *f*, though this recessing is not necessary, recesses of different depth being employed in order to vary the distance between the working-faces of the grippers and the shears *g*, and thus vary the length of wire extending beyond the grippers, to be bent over and form the arm *z* of the staple *y*.

In one gripping-die, *a*, is the anvil *h*, against which the arm *z* of the staple is bent by the bending-die *f*, this anvil corresponding in shape to the shape of the arm *z* of the staple. In Figs. 1 and 2 are illustrated the dies for forming the staple preferred by me, (shown in Fig. 6,) the anvil *h* extending back from the working-face at an acute angle, and having the recess *e*, in which the end *x* of the arm *z* is bent parallel with the driving-bar *w* of the staple. The exact shape of this anvil may of course be varied according to the form of the arm *z* of the staple, different forms of these staples and some dies for forming them being shown in the several figures, as will be referred to hereinafter.

The end of the gripping-die *b* extends beyond the anvil *h* of the die *a* about the thickness of the wire, and so forms a stop, *b'*, to the bending-die, and prevents it striking the wire with sufficient force to flatten it.

The bending-die *f* is mounted in bearings, and actuated by suitable cam, or cam and spring, apparatus, the die reciprocating in the line of feed of the wire. It has the flat stop-face *f'* and the working-face *k* corresponding to the shape of the arm *z* of the staple and adapted

to press the wire against, or against and into, the anvil-face *h* of the die *a*, the face *k* of the dies shown in Figs. 1 and 2, having the inclined portion *l* and the lug *m*, adapted to press the end of the wire into the recess *e* to bend the portion *x* of the arm.

In order to hold the wire in true horizontal line during bending and prevent the pressure of the bending-die from bending it up or down, the groove *n* is formed in the inclined portion *l* of the bending-die on the same horizontal plane as the wire is fed, and the end of the wire fits in this groove and is held in true horizontal line thereby, the end of the wire sliding down the groove as the arm is bent to shape.

The shears *g g*, for cutting off the finished staple, work in suitable guides just in front of the grippers *a b* and point the end of the driving-bar as it is sheared from the wire. Suitable apparatus for operating these shears is shown in the application for Letters Patent, Serial No. 137,148, above referred to. Where it is desired to have the end of the arm *z* pointed, the cutting-edges of the shears are arranged to shear diagonally across the wire, as shown in Fig. 1, thus pointing the finished staple and forming a point for the arm *z* of the next staple formed. In forming a staple with the arm *z* blunt the shears shown at *g' g'* in Fig. 4 are employed.

To impart the initial bend to the arm of the staple and insure its being bent properly by the bending-die *f*, the shears operate on the wire at a point at the side of the line of feed in front of the anvil-die *a*, as shown in Figs. 1 and 3, one shear first pushing over the wire and so bending it, as is shown in Fig. 3, and the shears then severing the finished staple from the wire and leaving the portion forming the arm of the next staple bent to one side, as shown in Fig. 4, in position for the bending-die to press it back against the anvil.

In making the staples the wire is fed between the gripping-dies, which then close and hold it. The shears then act to impart to it the initial bend and shear it off, leaving the portion forming the arm *z* extending beyond the grippers and bent slightly toward the anvil *h*. The reciprocating bending-die *f* then comes against the portion *z*, and, holding the end thereof in the groove *n*, presses the wire back against the anvil *h* and causes it to conform thereto, at the same time bending the end of the wire into the recess or seat *e*, so forming the arm *z* and the portion *x* thereof parallel with the body *w* of the staple. The flat face *f'* of the bending-die strikes against the stop end *b'* of the gripping-die *b*, and so prevents the compression of the wire between the bending or gripping dies with sufficient force to flatten it. The bending-die is then retracted, the gripping-dies open, and the wire is fed forward the proper distance. The grippers then close and the shears cut off the finished staple, leaving the portion *z* extending beyond

the grippers, ready for bending by the die *f*. Where the shears shown in Fig. 4 are employed, a vertically-moving knocker-off bar is generally employed to insure the severing of the nail from the wire.

The several views of the dies illustrate the different forms of staples formed in dies embodying my invention, the dies shown in Fig. 3 forming the staple shown in Figs. 7 and 8, according to the form of shears employed, the anvil-face *h'* being employed to give the desired form to the arm *z*, those shown in Fig. 4 forming the staple shown in Fig. 9, the wire being first bent substantially at right angles on the anvil *h''* and then pressed by the lug *m* into the recess *e'*, and forming the bent end *t*, extending at right angles to the body *w* of the staple, and the dies shown in Fig. 5 forming the staple shown in Fig. 10, the bending-die pressing the wire against the anvil *h'''* and into the recess *e''*, so as to bend the arm *z* first at right angles and then parallel with the body *w* of the staple. The form of the dies may thus be changed according to the bend or curve of the arm *z*, forming the staples illustrated in Fig. 11, and other analogous forms.

The different staples shown may be rapidly and accurately bent to shape in the dies, the machine forming as high as two hundred per minute, so that they may be formed at as low a cost as any staples in the market.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In dies for forming wire staples, the combination of a pair of gripping-dies, one having an anvil-face, and a bending-die reciprocating in the line of feed and having a working-face conforming to the anvil-face and adapted to press the wire extending beyond the gripping-dies against the anvil-face.

2. In dies for forming wire staples, the combination of the gripping-dies, one having an anvil-face and a recess beyond the same, and the bending-die reciprocating in the line of feed and having a working-face conforming to the anvil-face, and a lug beyond the same, substantially as and for the purposes set forth.

3. In dies for forming wire staples, the combination of the gripping-dies, one having an anvil-face, and the bending-die reciprocating in the line of feed and provided with the swaging-face having the groove *n* therein, substantially as and for the purposes set forth.

4. In dies for forming wire staples, the combination of the gripping-die having an anvil-face, the gripping-die having a stop-shoulder extending beyond said anvil-face, and the bending-die reciprocating in the line of feed and adapted to bend the wire against said anvil-face and to strike said stop-shoulder, substantially as set forth.

5. In dies for forming wire staples, the combination of the gripping-dies *a b*, one having the backwardly-extending anvil-face *h*, and the reciprocating bending-die *f*, having the

inclined portion 7, corresponding to said anvil-face, substantially as and for the purposes set forth.

5 6. In apparatus for making wire staples, the combination of gripping-dies, one having an anvil-face, a reciprocating bending-die, and shears adapted to bend the wire toward said anvil-face and then sever it, thus impart-

ing to the wire its initial bend, substantially as set forth.

In testimony whereof I, the said WILLIAM TRURAN, have hereunto set my hand.

WILLIAM TRURAN.

Witnesses:

MATTHEW TRURAN,
A. GUTENDORF.

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