

(No Model.)

2 Sheets—Sheet 1.

J. RUSSELL.

MACHINE FOR ROLLING HORSESHOE BARS.

No. 368,621.

Patented Aug. 23, 1887.

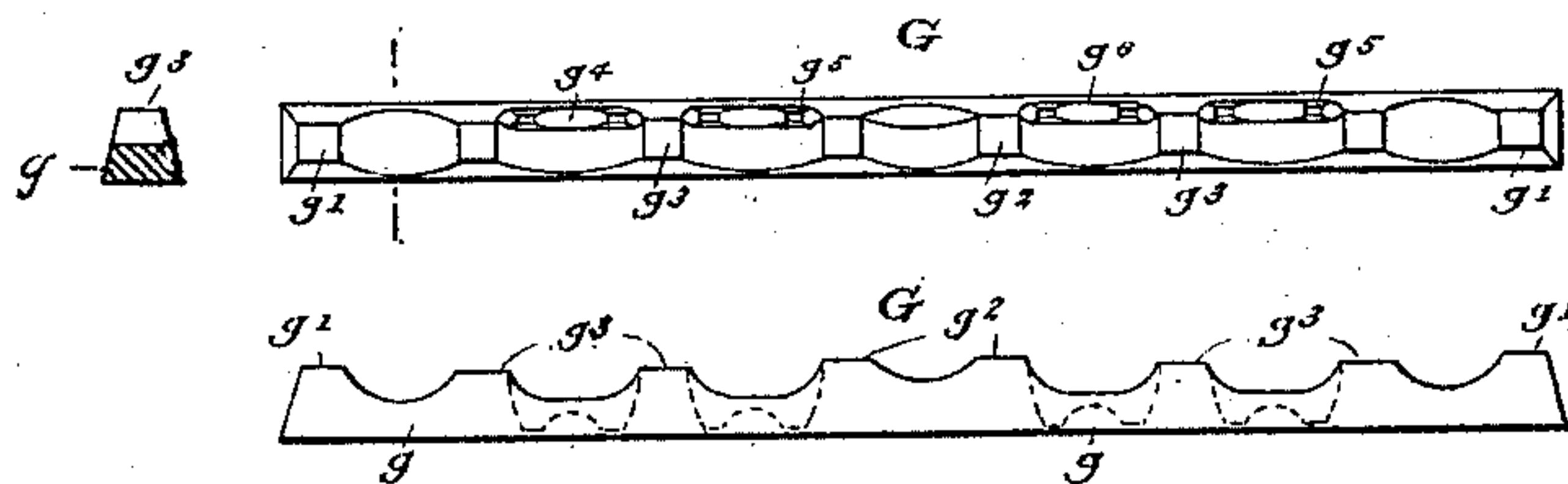
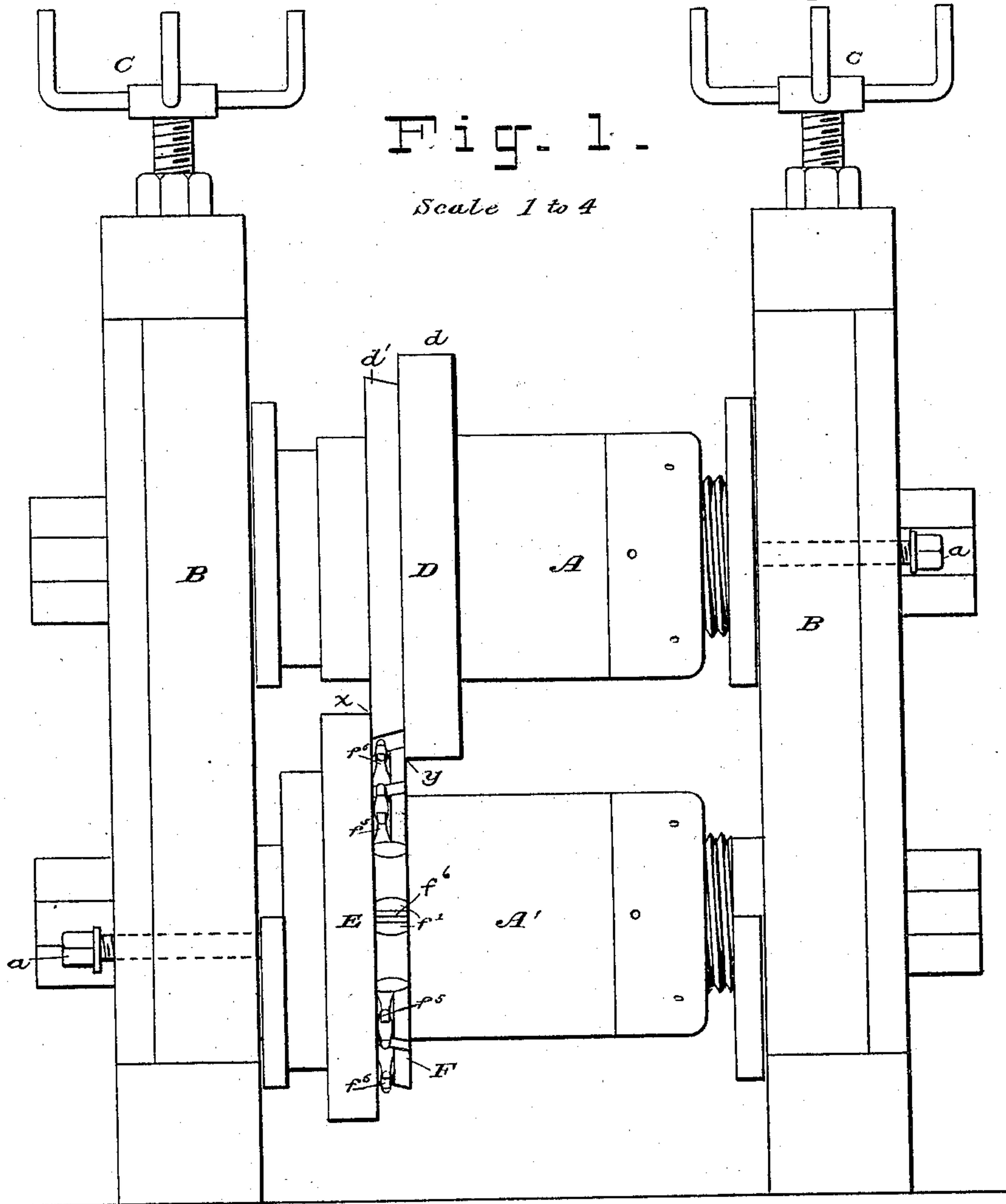


Fig. 5.

Scale 1 to 4

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

Scale 1 to 1

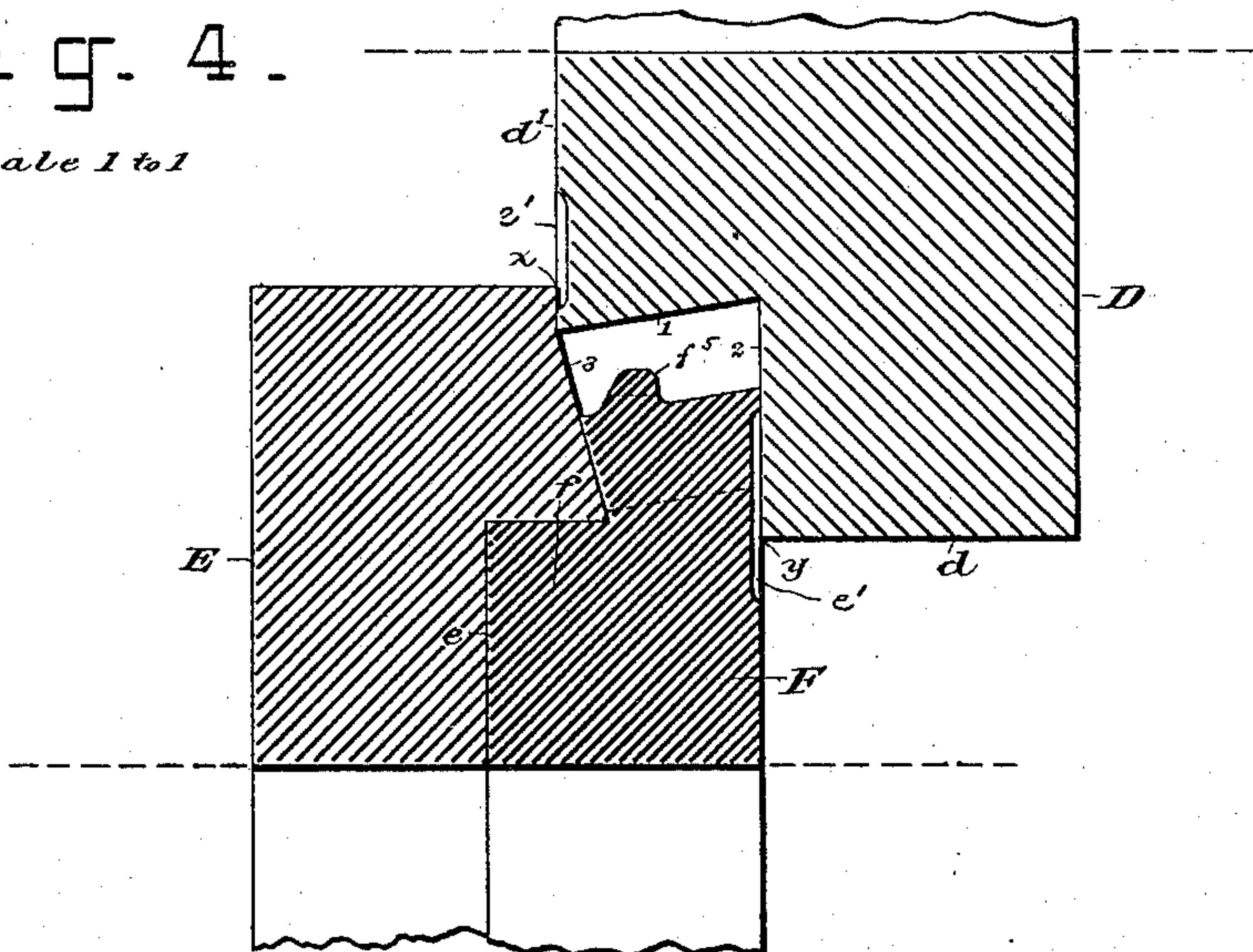


Fig. 3.

Scale 1 to 4

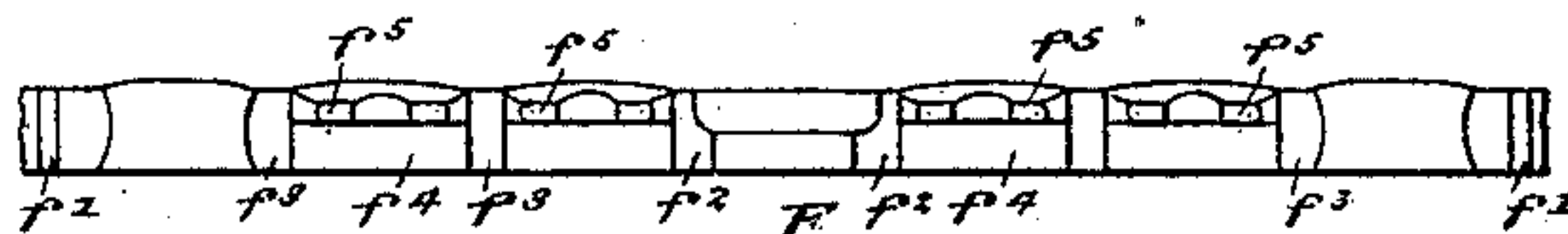
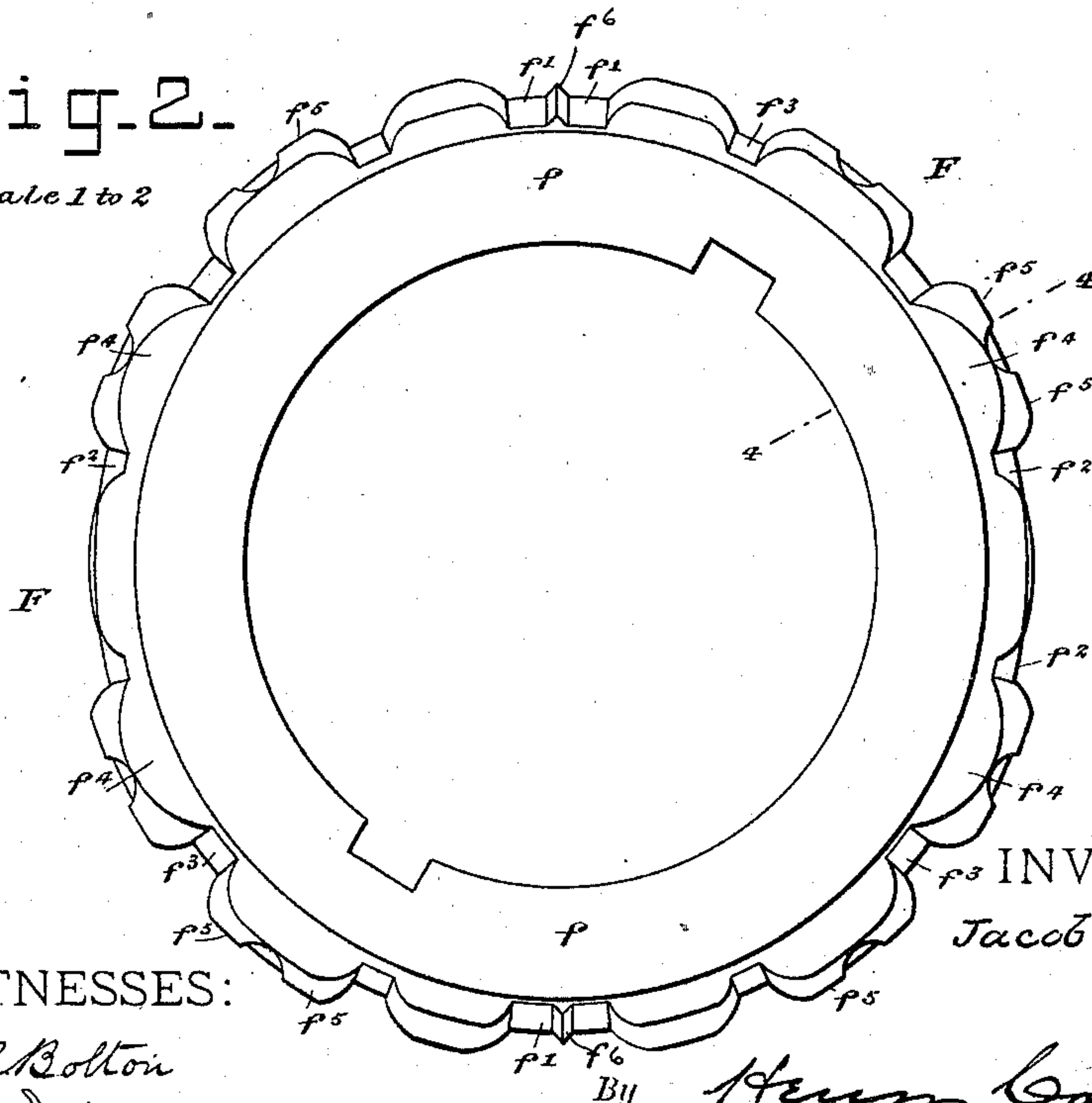


Fig-2.

Scale 1 to 2



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UNITED STATES PATENT OFFICE.

JACOB RUSSELL, OF BROOKLYN, NEW YORK.

MACHINE FOR ROLLING HORSESHOE-BARS.

SPECIFICATION forming part of Letters Patent No. 368,621, dated August 23, 1887.

Application filed November 29, 1886. Serial No. 220,144. (No model.)

To all whom it may concern:

Be it known that I, JACOB RUSSELL, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented certain Improvements in Machines for Rolling and Creasing Horseshoe-Blanks, of which the following is a specification.

My invention relates to rolls for rolling and creasing a blank for horseshoes of peculiar form; and the invention consists in the peculiar construction and arrangement of the collars and creases of the rolls, whereby I produce the peculiar form of blank desired.

The object is to produce a horseshoe-blank—or rather a bar containing two or more of such blanks—which shall have a series of calks and creases for the nails, and shall also be broadest on the upper or plain face (next the horse's foot) and taper evenly at its lateral sides or edges, as will be hereinafter more fully described. To roll such a bar requires a peculiar construction and arrangement of the rolls, and in this my improvements consist.

In rolling a bar that is designed for a horseshoe with calks and creases for the nails, attempts have been made to employ what are known as "collar and groove" rolls, and other attempts have been made, also, to use rolls with the creaser arranged on the upper roll to produce blanks of this general character; but from my own knowledge, and for reasons that will be hereinafter explained, these have not been successful.

The main novel features of my invention consist in arranging one of the collars on the upper roll and one on the lower roll, and in arranging the creaser on the lower roll.

I will first describe the construction of my rolls with reference to the accompanying drawings, and then point out the advantages I attain by such construction.

Figure 1 is a front elevation of a pair of my improved rolls. Fig. 2 is a side view of the creaser-ring detached. Fig. 3 is the "stretch-out" of one-half of the edge of the creaser-ring. Fig. 4 is a cross-section of the collars and ring in the plane of the axes of the rolls. Fig. 5 represents, in plan, elevation, and cross-section, a horseshoe-blank produced by these rolls.

The several scales on the figures are rela-

tive rather than actual, as the blanks will vary in cross-section and length.

The rolls are mounted in substantially the ordinary way, A A' representing, in general, the two rolls; B, the frame in which they are rotatively mounted, and C C the usual screws bearing on the boxes of the upper roll, A. On the upper roll is the collar D, of which d is the flange portion, and d' the coned portion. On the lower roll is a collar, E, which overlaps the cone d' at x , and the creaser F, which is overlapped by the flange d of collar D at y . Set-screws $a a$ (seen in Fig. 1) screw through the frame B and bear against the flanged boxes of the rolls. These serve to keep the flanges on the collars pressed up tightly against the respective parts at x and y . The cone d' is exactly the same width as the creaser F and enables the joints at x and y to both be made tight.

The collars and creaser may be mounted on the rolls in the usual manner, or in any good way, and the details of this construction need not be described.

Referring to Fig. 4, it will be seen that the collar E has a recess in its face at e , to receive a reduced part, f , of the creaser-ring F. The coned face 1 of the cone d' forms the upper or plain face of the blank. The perpendicular face 2 of the flange d forms one of the inclined lateral faces or edges of the blank. An inclined face, 3, on the collar E forms the opposite inclined lateral face or edge of the blank, and the creaser F forms the lower narrower face of the blank, in which are formed the creases for the nails, and on which are formed the raised calks. The transverse section of creaser F in Fig. 4 is taken through the highest elevation on the creaser, which elevation forms the indentation to mark the position of the nail-hole. The rolls, as herein shown, are designed to produce a blank, G, like that illustrated in Fig. 5, wherein g is the web or body of the blank; $g' g'$, the heel-calks; g^2 , the double toe-calk; g^3 , intermediate calks; g^4 , the creases in the web for the nails, and g^5 the indentations in said creases where the nail-holes are to be punched.

Referring to Fig. 2, which shows a creaser having a peripheral length or scope sufficient to form two blanks, G, $f' f'$ represent recesses for

producing the heel-calks; f^2 , the recess for producing the toe-calk; f^3 , the recesses for producing the intermediate calks; f^4 , the elevations for producing the nail-creases in the web; f^5 , the projections (on elevations f^4) for producing the indentations g^5 in the blank, and f^6 cutters for indicating the points where the blanks are to be separated. These latter produce transverse indentations or creases in the bar at the severing-points. I have particularly described the blank that the creaser as herein formed will produce; but my rolls are equally well adapted for rolling or forming any horseshoe-blank having calks and creases. As before stated, the lateral faces or edges of the blank taper down from the flat upper face of the blank to the tips of the calks; and in rolling the blank the perpendicular face 2 of the flange d forms one of these edges and the face 3 forms the other. To effect this taper properly I construct the face 3 to extend down to a point a little below the lowest recess in the face of the creaser-ring F—that is to say, those recesses that produce the calks. This enables the face 3 to produce a smooth unbroken incline or taper on that edge of the bar. In forming the creaser-ring to fit up to the inclined face 3 the elevations on same are undercut, as seen in Fig. 4.

In rolling horseshoe-blanks of this general character several difficulties have been encountered, and these I will describe in order that my mode of obviating them may be the better understood.

First. The blank when in the rolls is very hot, and consequently so soft as to bend very easily, and in the ordinary collar and groove rolls it is found impracticable to properly deliver it, the lateral friction of the collars thereon causing the blank to "stick" and wrap itself around the creaser or rolls. This difficulty I obviate by arranging one flange on each roll, the perpendicular flange d on the upper roll acting by frictional contact with the blank to lift the latter from the creaser F. This flange, for the reason that its face moves in a plane perpendicular to the axis of the roll, adheres more firmly to the blank than the inclined face 3 on collar E, and thus exerts a lifting force on the blank as it emerges from the rolls, which is in excess of or is sufficient to counterbalance the force tending to cause the blank to adhere to the creaser and wrap itself around the same. This is a very important feature of the rolls, as it enables them to deliver the blank or bar of blanks perfectly and at all times.

Second. At the margin of the blank, between the nail-crease and edge of the blank, the metal is drawn out quite thin. This is seen at g^6 in Figs. 4 and 5; and owing to the elongation of the bar in the rolls this thin web is apt, if the metal is very hot, to draw down or fail to "fill," and if the metal is cooler or "short" said web is apt to break or crack across in the rolling. I find this to be the case where the creaser is on the upper roll, and

particularly where the collars are both on one roll. In my rolls this difficulty is entirely obviated, and I believe this is due, in the main, to the arrangement of the creaser on the lower roll, the bar being thus pressed down upon the creaser, instead of the creaser being forced down into the bar.

Third. It is well known to those skilled in working metals in this manner that a "fin" is apt to be formed on the blank or bar at its corner by the forcing of the hot metal into the crevice between the rolls; also, that this fin will be formed by preference at the lower or under side of the bar, and at that point where the bar is most subjected to pressure in drawing or elongating it. Therefore the fin on this blank would be formed at the joint between the rolls adjacent to that edge of the blank in which the creases are formed. I obviate this difficulty by the arrangement of the creaser on the lower roll and the creasing elevations f^4 and f^5 next to collar E, thus throwing the joint (x in Fig. 4) at which such fin would otherwise be formed on the upper side. There is much less tendency toward the formation of a fin at the other lower joint, (y in Fig. 4.) By arranging one collar-flange on the upper roll and the other on the lower roll I am enabled to keep these flanges pressed up closely to the respective parts of the other roll, so as to avoid an open joint and to take up looseness caused by wear; and in order to lessen the amount of metal in contact and cause the rolls to fit the more closely together in their lateral contact at x and y , I prefer to slightly recess the faces of cone d' and creaser F, as seen at $e' e'$ in Fig. 4, so as to leave only a narrow raised portion of the faces of same to contact and bear on the respective collar-flanges.

It will be seen, then, that the characteristic features of my improved rolls are, the arrangement of one collar and flange on each roll, the axes of the rolls being parallel, and the flanges overlapping the adjacent parts on the other roll; the arrangement, in rolls of this kind, of the creaser on the lower roll; the arrangement of the perpendicular flange on the upper roll, which latter forms the upper plain face of the blank, and the arrangement of the elevations $f^4 f^5$, which form the nail-creases, next the flange on the lower roll. There are some novel features of construction as well as arrangement. The reasons for these arrangements of the several parts have already been given, and I consider them essential in a roll for producing this general form of creased horseshoe-blank.

I am aware that collar and groove rolls and cresers variously arranged and constructed have been before employed for rolling horseshoe-blanks, examples of which may be found in the patents of Justus and Young, No. 211,024, and Claude, No. 219,621, and I do not claim these; but I am also aware that many of these forms of rolls have not proved successful in practice for the reasons I have given.

In the patent of Justus and Young the axes of the rolls are not parallel, the creasers are on the upper roll, and the flange on the upper roll does not pass the collar on the lower roll, but rests thereon. In all of these respects the rolls described in this patent differ materially from mine.

Having thus described my invention, I claim—

10 1. A pair of rolls for rolling horseshoe-blanks, having the creaser on the lower roll, and one collar-flange on the upper roll and the other collar-flange on the lower roll, as set forth.

15 2. A pair of rolls for rolling horseshoe-blanks, having the creaser on the lower roll, and one collar-flange on the upper roll and the other collar-flange on the lower roll, the axes of the rolls being parallel, as set forth.

20 3. A pair of rolls for rolling horseshoe-blanks, having the creaser on the lower roll, and one collar-flange on the upper roll and the other collar-flange on the lower roll, the axes of the rolls being parallel, and the faces of the overlapping flanges being planes at right angles to the said axes of the rolls, as set forth.

25 4. A pair of rolls for rolling horseshoe-blanks, having the creaser and one collar on the lower roll, the elevations on the creaser for producing the nail-crease being arranged

next to said collar, and having the other collar-flange on the upper roll, as set forth.

5. In a pair of rolls for rolling horseshoe-blanks, the combination of the collar on the upper roll, provided with a flange, d , with its face arranged perpendicular to the axis of the roll, and a cone, d' , the collar-flange E on the lower roll provided with an inclined face, 3, and a creaser, F, on the lower roll, provided with the necessary elevations to form the nail-creases, arranged adjacent to said face 3, as set forth. 35

6. The combination, with the collar-flanges on the rolls, of the cone d' and the creaser F, both provided with recesses $e' e'$, as and for the purposes set forth. 40

7. The combination, with the collar E, provided with an inclined face, 3, and a recess, e , to receive a reduced part, f , of the creaser-ring, of the said creaser-ring provided with recesses in its edge to form the calks, said face 3 extending down to a point as low as the bottom of the deepest recess in the edge of said creaser, for the purpose set forth. 50

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses. 55

JACOB RUSSELL.

Witnesses:

HENRY CONNETT,
T. D. COPLINGER.