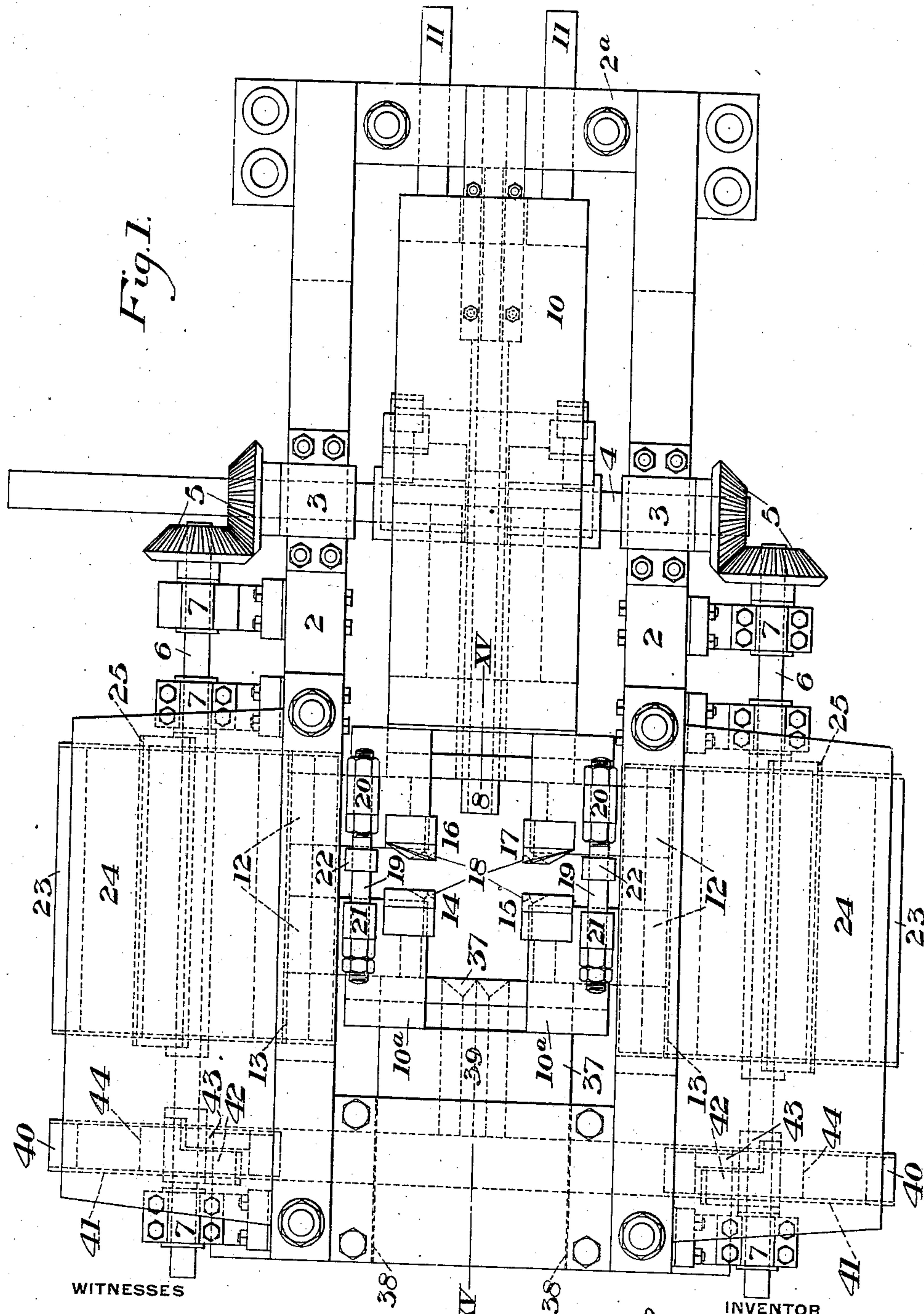


899,317.

J. M. MURPHY.
 BARB FORMING MACHINE.
 APPLICATION FILED NOV. 29, 1907.

Patented Sept. 22, 1908.
 4 SHEETS—SHEET 1.



WITNESSES

W. W. Swartz
 R. A. Balderson

INVENTOR

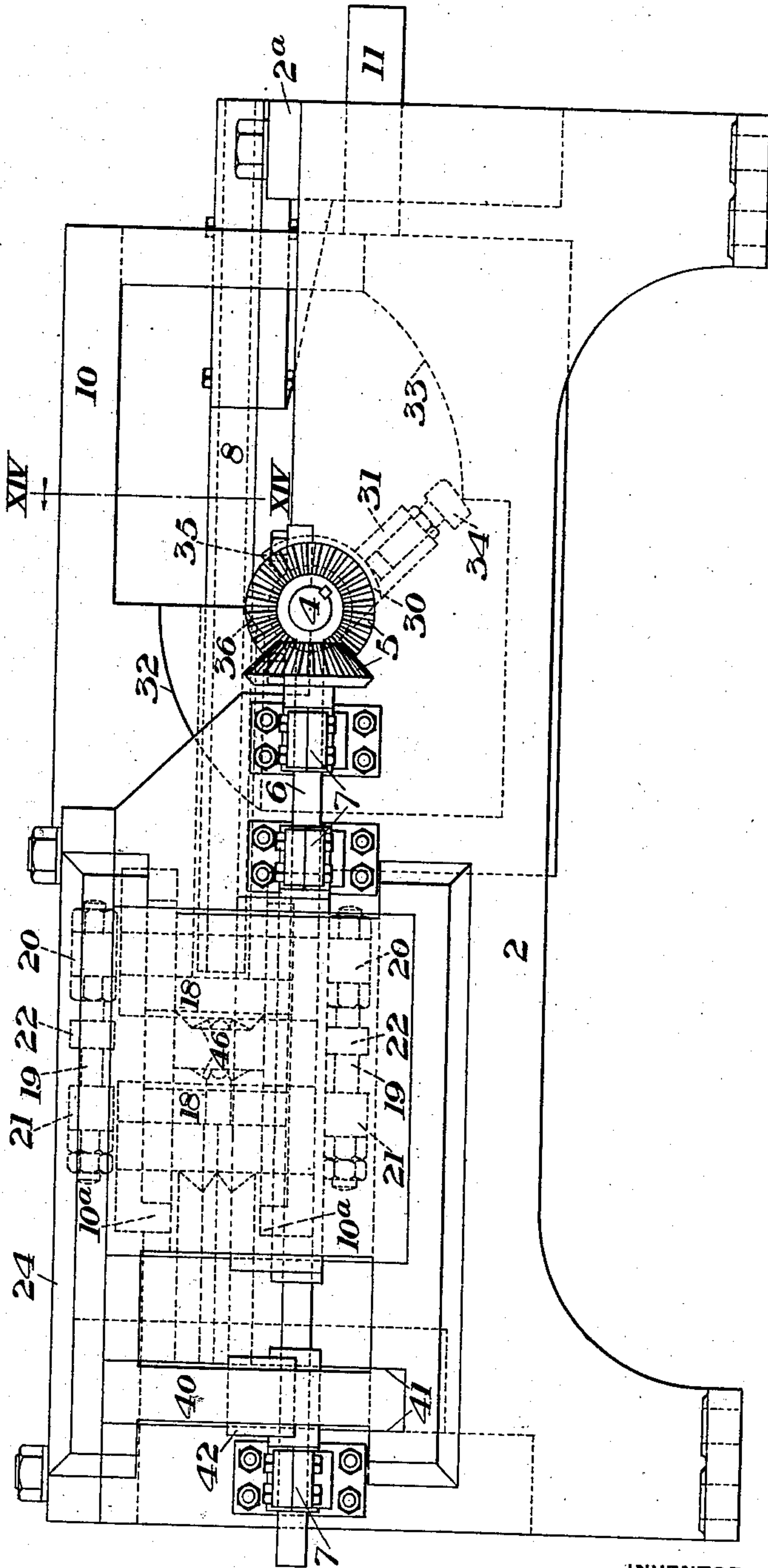
Jas. M. Murphy,
 by Babcock, Byrnes & Parmelee,
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Fig. 2.



WITNESSES

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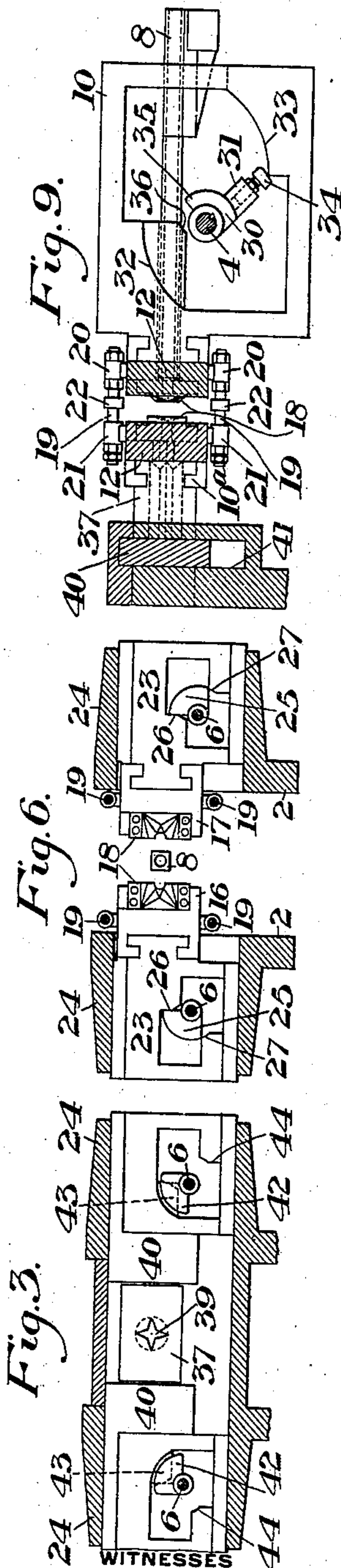
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 14.

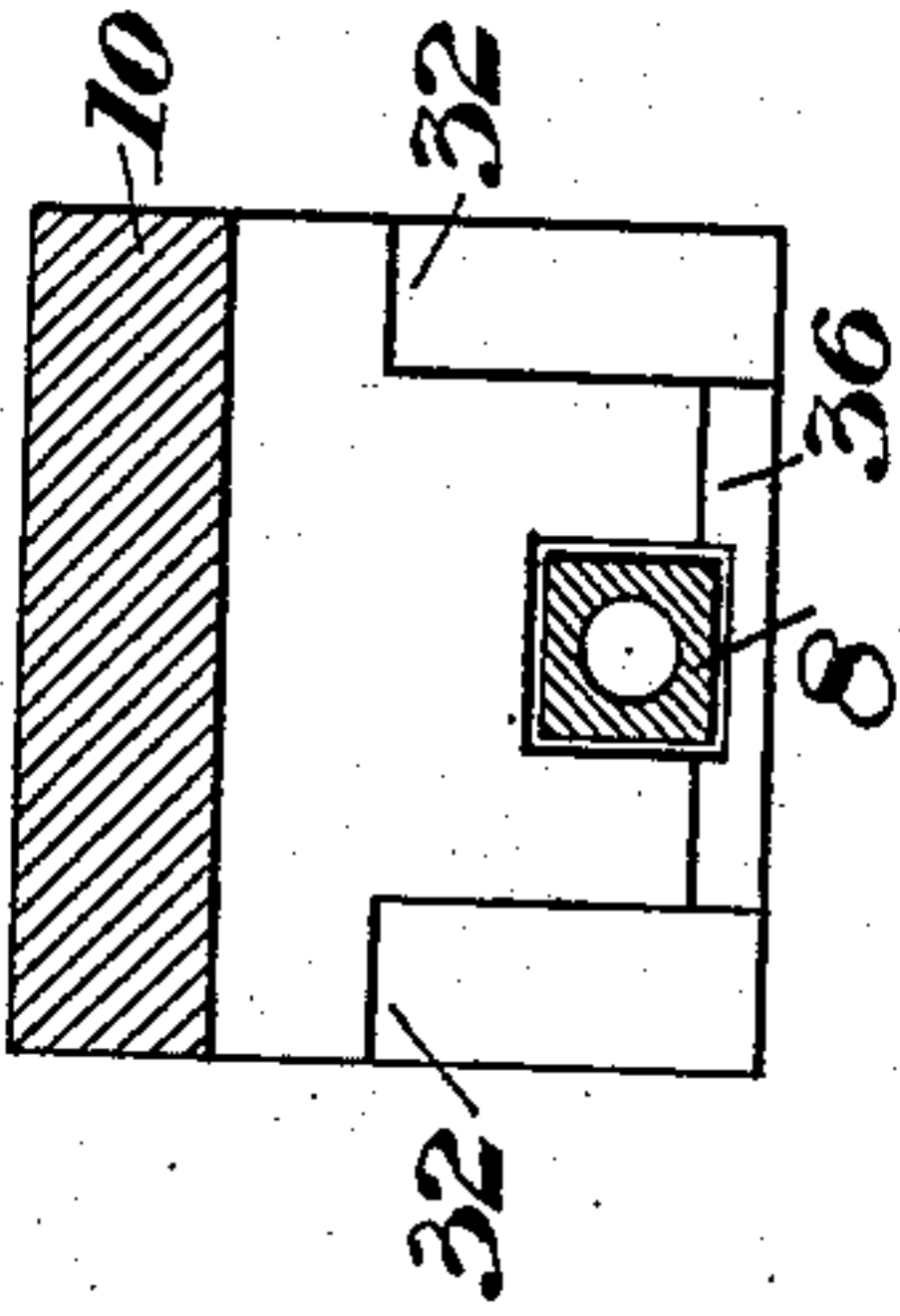


Fig. 18.

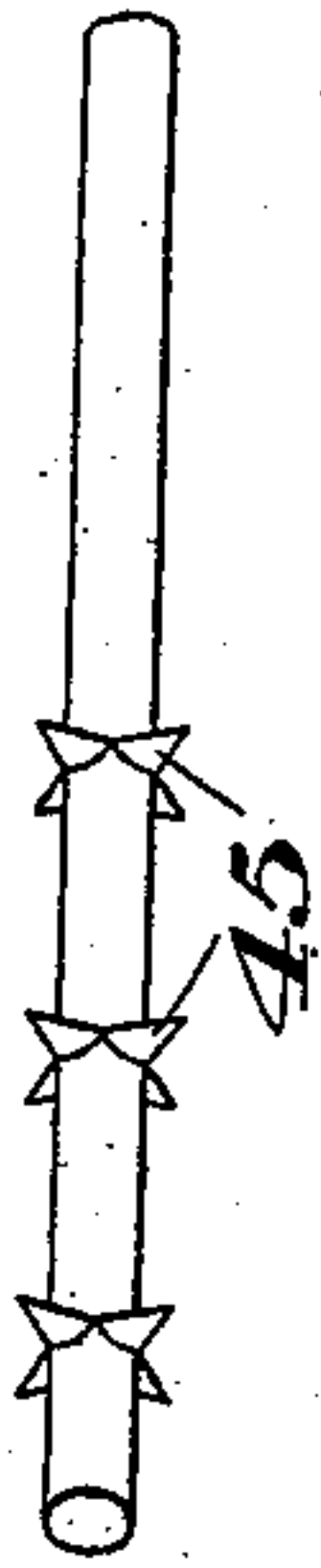


Fig. 17.

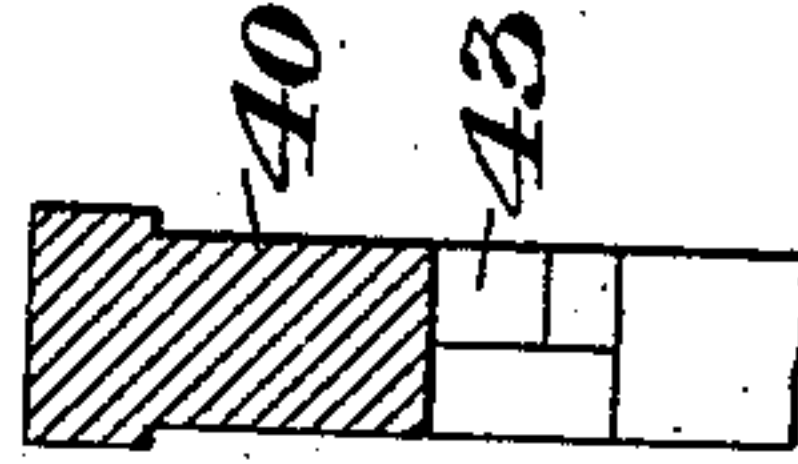


Fig. 16.

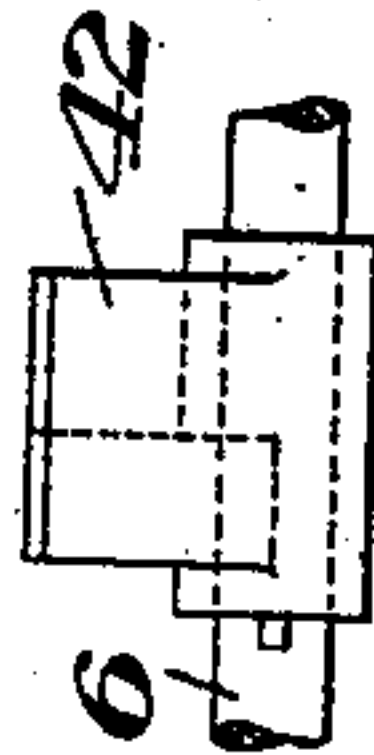


Fig. 13.

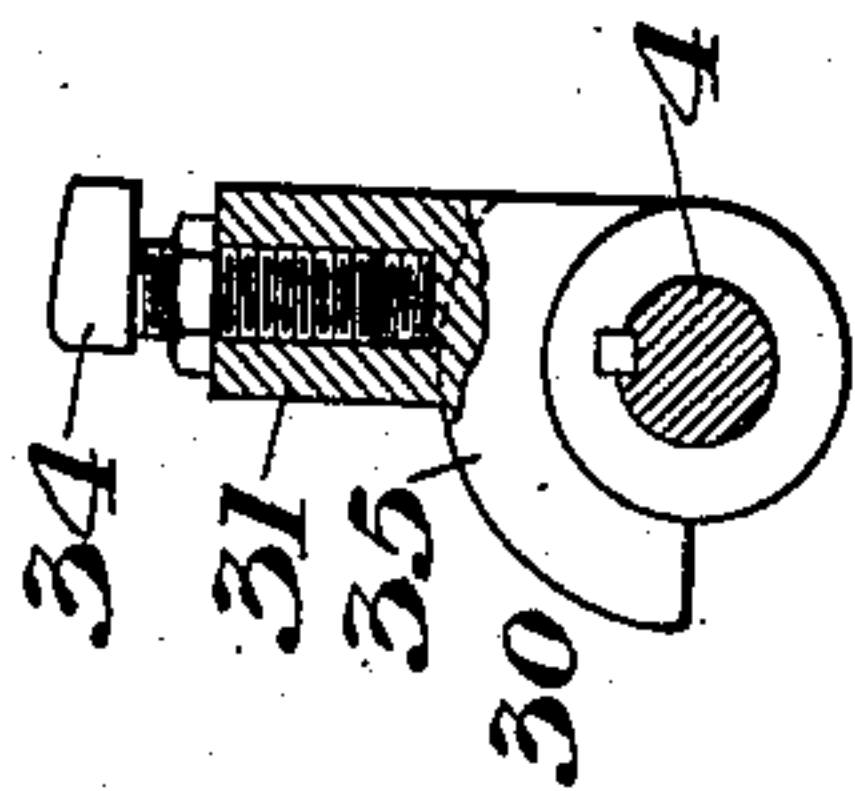


Fig. 12.

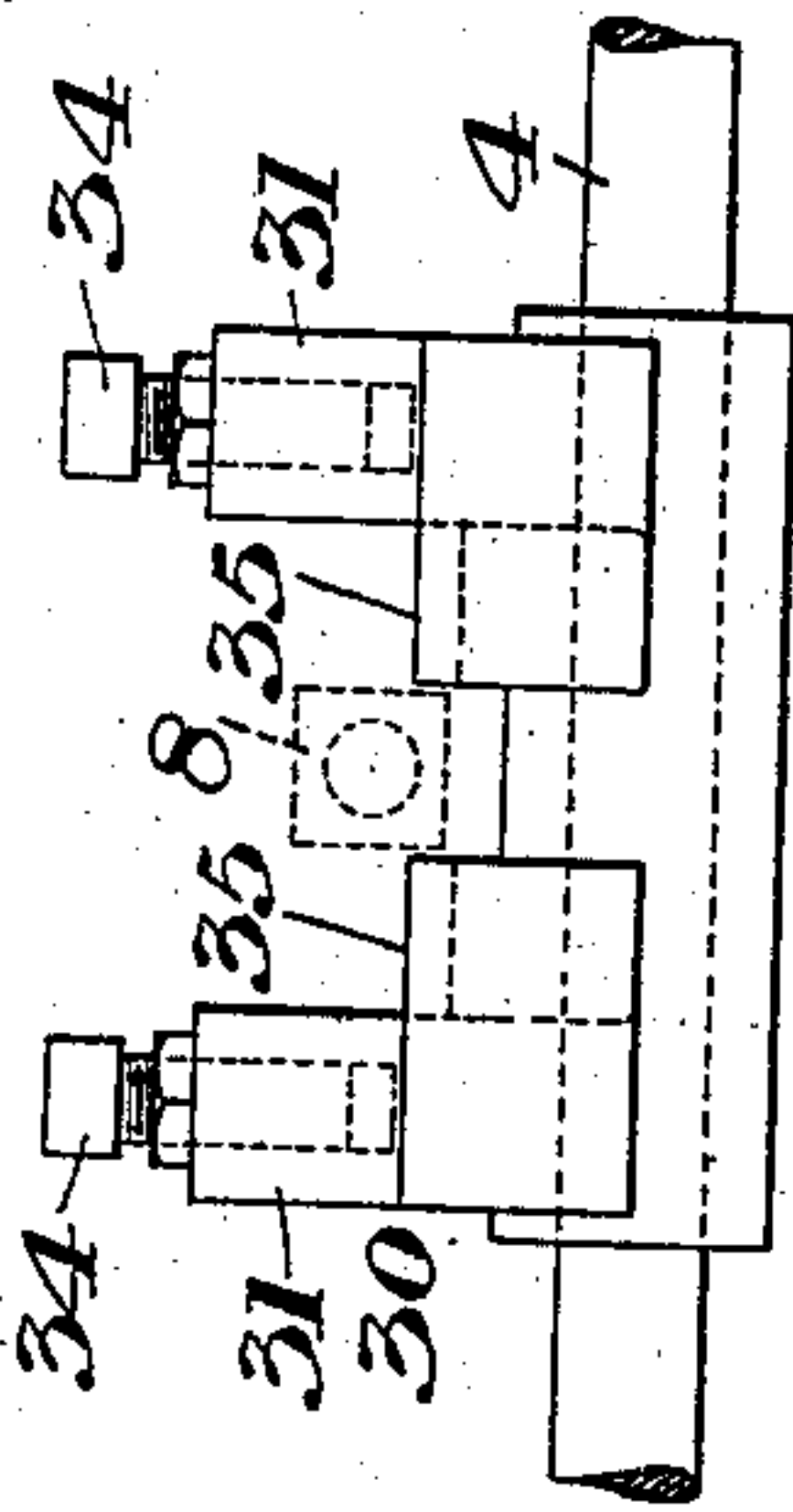
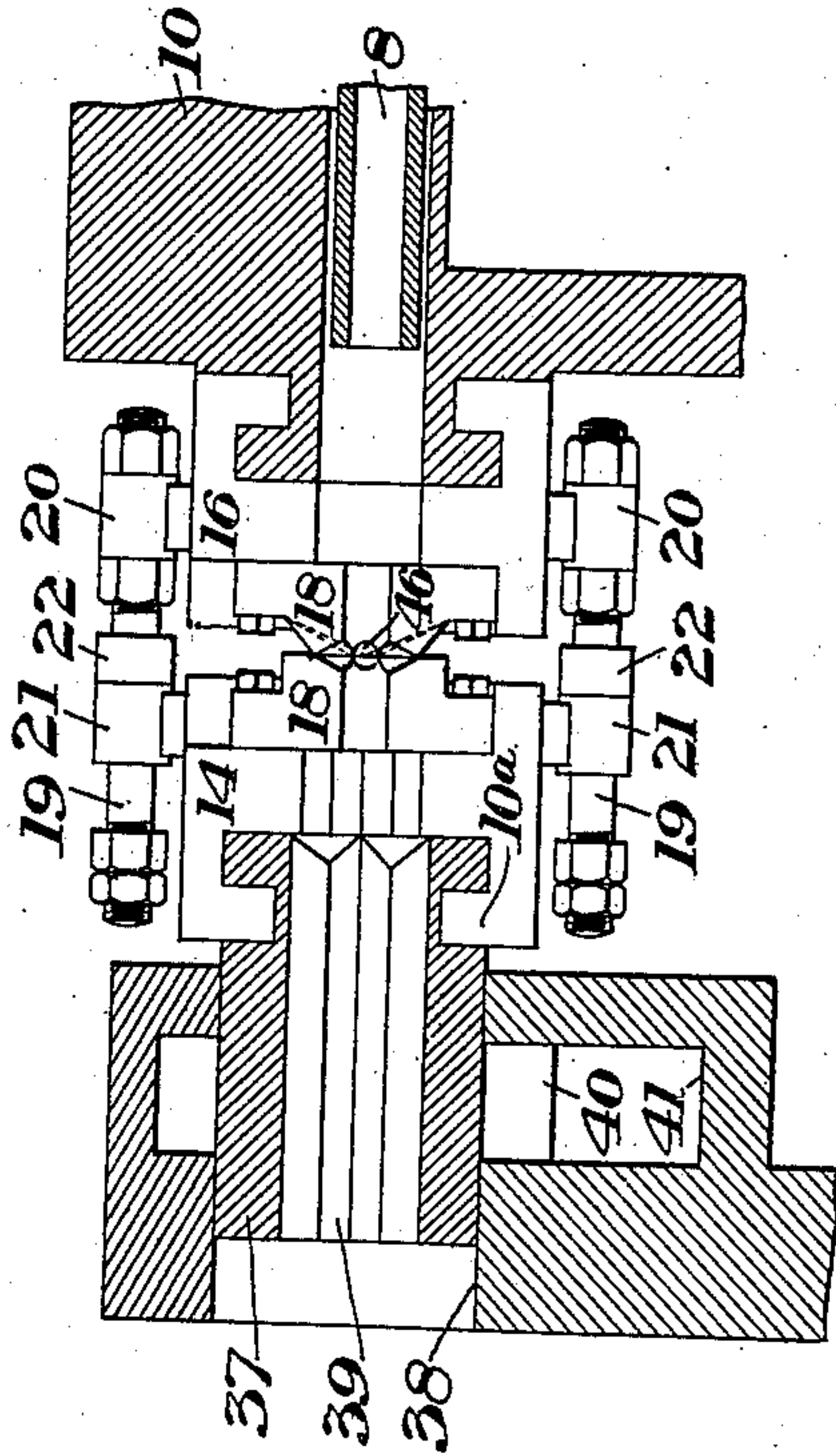


Fig. 15.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES M. MURPHY, OF PITTSBURG, PENNSYLVANIA.

BARB-FORMING MACHINE.

No. 899,317.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed November 29, 1907. Serial No. 404,220.

To all whom it may concern:

Be it known that I, JAMES M. MURPHY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machines for Forming Barbs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of a machine embodying my invention; Fig. 2 is a side elevation of the same; Figs. 3 and 4 are detail transverse sectional views; Fig. 5 is an end view, these three views showing the thrust blocks in their different positions; Figs. 6, 7 and 8 are transverse sectional views, showing one pair of the barb-forming dies in their different positions, corresponding respectively to the positions of the parts shown in Figs. 3, 4 and 5; Figs. 9, 10 and 11 are longitudinal sectional views, showing one pair of the barb-forming dies in three different positions corresponding respectively to the positions shown in Figs. 3 and 6, 4 and 7, and 5 and 8; Figs. 12 and 13 are detail views showing the end cams; Fig. 14 is a detail sectional view on the line XIV—XIV of Fig. 2; Fig. 15 is a longitudinal section on the line XV—XV of Fig. 1; Fig. 16 is a detail view of one of the side cams; Fig. 17 is a detail sectional view of one of the abutments against which the side cams operate; and Fig. 18 is a perspective view showing the work done by the machine.

My invention has relation to a machine for forming barbed rods or wires, and is designed to provide a simple and practical machine for this purpose by means of which said rods or wires may be rapidly formed by the action of dies.

The precise nature of my invention will be best understood by reference to the accompanying drawings in which I have shown one embodiment thereof and which will now be described, it being premised, however, that various changes may be made by those skilled in the art in the details of construction and arrangement without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the main frame of the machine. Journalled transversely in this frame in suitable bearings 3 is a main operating shaft 4, which may be driven by any suitable power. Geared to the shaft 4 by the beveled gearing

5 are the two side shafts 6, which are suitably journalled in bearings 7, on the main frame.

8 designates a stationary feed tube or guide which extends longitudinally of the machine for a portion of its length, and through which the stock to be barbed is fed by any suitable means.

10 is a longitudinally-movable die-carrying slide, which is supported and guided at its rear end by the tail rods 11, which have sliding bearings in the rear transverse portion 2^a of the main frame and which is supported and guided at its forward end by the laterally extending portions 12, which move in guides 13, in the side portions of the main frame.

Mounted at the forward end portion of the slide 10 are two die-blocks 14, 15, 16 and 17, which are provided each with a removable die-plate 18. The dies 14 and 15 are carried in extensions 10^a of the slide 10, which is connected to the slide proper by means of the bolts 19. These bolts are rigidly secured in lugs 20, on the slide 10, and have a sliding engagement with lugs 21, on the extension 10^a, and each bolt carries at its intermediate portion a stop block or projection 22, the construction and arrangement being such that the slide 10 can move forwardly a certain distance before the extension 10^a commences to move, after which the stop collars 22 will engage the lugs 21 and move the extension 10^a with the slide 10. The die-blocks 14 and 15 are secured to slides 23, which extend laterally through the guides 24, of the main frame into position to be operated by cams 25, on the side shafts 6, as most clearly shown in Figs. 6, 7 and 8. These cams, one of which is shown in detail in Fig. 16, are rigidly secured to the shaft 6 and are formed with one portion 25, which is adapted to engage in a bearing surface 26 on the carrier 23, to move the same in a direction to close the die against the opposite die; and with another portion 25^a, which is arranged to engage a bearing surface 27 on the carrier 23 to move said carrier in the opposite direction. The two shafts being geared to the main shaft 4 to operate in unison, these two cams 25 operate together to open and close the two dies 16 and 17. These dies are fixed on the slide extension 10^a, in so far as any longitudinal movement is concerned. The two dies 14 and 15 are mounted in the slides 10^a operated to be reciprocated thereby towards and

away from the dies 16 and 17, and also to have a lateral movement towards and away from each other corresponding to the movement of the dies 16 and 17 just described.

5 This lateral movement of the dies 16 and 17 is imparted by the cams 25, which are made long enough to operate these dies as well as the dies 14 and 15. Figs. 6, 7 and 8 may also be considered to show these dies 14 and 15

10 and their operating mechanism.

The slide 10 is actuated by the cams 30 (shown in detail in Figs. 12 and 13 and also in Figs. 9, 10 and 11). These cams are rigidly secured to the main shaft 4 and are each

15 provided with a higher portion 31, which is designed to engage a bearing surface 32 on the slide 10, for the purpose of moving the slide forwardly and also the bearing surface 33 on said slide, for the purpose of moving it

20 in a reverse direction, or backwardly. To permit an adjustment in the throw of these cams and the consequent extent of movement of the slide, their bearing ends or noses are preferably constituted by adjustable

25 screw members 34. Each of these cams 30 also has a lower portion 35, which is arranged to bear against the surface 36 on the slide for the purpose of giving it an initial forward movement before the higher portion 31 com-

30 mences to operate.

37 is a block which is connected to the slide extension 10^a to reciprocate therewith in guides 38 of the main frame, and through which is formed an opening 39, which corre-

35 sponds in cross section to the cross section of the finished barbed rod. (See Figs. 3, 4 and 5). This block with its opening forms a guide through which the finished article is delivered by the machine, as hereinafter de-

40 scribed.

40 designates laterally movable thrust blocks or anvils which are mounted in guides 41, in the lateral extensions 24 of the main frame, to reciprocate towards and from the

45 center of the machine in front of the block 38, as most clearly shown in Figs. 3, 4 and 5. These thrust blocks or anvils are actuated by the cams 42, which are secured to the side shafts 6. Each of these clamps has a low

50 portion which engages the abutment 43 on the block to move it forwardly and a high portion which engages the abutment 44 on the block to move said block backwardly.

The operation of the machine is as follows:

55 The stock to be barbed, which is in the form of a plain cylindrical rod, is fed into the machine through the stationary longitudinal feed tube or guide 8, until its forward end portion enters the opening in the block 37,

60 the successive dies being in the open positions shown in Fig. 1. The machine is then started and its first action is to cause the cams 25 to move the dies 14, 15, 16 and 17, towards the longitudinal center of the ma-

65 chine to firmly clamp the stock between

them, this movement being from the position shown in Fig. 6 to the position shown in Fig. 7. When these dies have thus firmly closed upon the stock, the portions 35 of the

70 cams 30 come into action and move the slide 10 forwardly, bringing the dies 16 and 17 against the dies 14 and 15 in the manner shown in Fig. 10. As these dies 16 and 17 move forwardly, they grip the middle of the

75 rod and force it outwardly, so that when the dies come together, there is formed upon the rod a set of barbs, such as shown at 45, in Fig. 18. The meeting faces of the two dies 16 and 17 have therein the die-forming cavities 46, which shape the barbs, and whose

80 cutting edges trim out the fin or web between the individual points or spurs, so that the finished barb is substantially as shown in Fig. 18. That is to say, the finished barb is made to consist of a number of points, in-

85 stead of a continuous fin surrounding the body of the stock. After these barbs have been thus formed, the high portions 31 of the cams 30 come into engagement with the cam surfaces 32 on the slide 10, as shown in

90 Fig. 11, and impart a further forward movement to said slide. During the previous forward movement, the stop collars 22 on the bolts 19, which connect the slide exten-

95 sion 10^a with the slide 10, have been brought into engagement with the lugs 21. When, therefore, the high portions of the cams 30 come into action in the manner shown in Fig. 10, the extension 10^a will be moved for-

100 wardly, together with the slide 10, thus carrying the stock forwardly a distance equal to the distance between the adjacent sets of barbs and bringing the stock in position for the formation of the next succeeding set of barbs. The parts are now in the positions

105 shown by Figs. 5, 8 and 11. During the first forward movement of the slide 10, under the action of the lower portions of the cams 30, the cams 42 act to advance the thrust blocks 40 from the position shown in Fig. 3 to the

110 position shown in Fig. 4, where they form an abutment for the slides and receive the thrust of the barb-forming action of the dies. Before the high portions of the cams 30 commence to act, the cams 42 come to the posi-

115 tions shown in Fig. 4, and retract these thrust blocks or anvils to the position shown in Fig. 5, so that they are out of the path of forward movement of the slide 10^a, whereby the latter is free to move forwardly under the ac-

120 tion of the high portions of the cams 30. As soon as the stock has in this manner been carried forwardly the proper distance, regulated by the adjustment of the members 34 of the cams 30, the cams 25 act to open the

125 two sets of dies 14 and 15 and 16 and 17. At this time, the high portions of the cams 30 come in contact with the cam bearings or abutments 33 on the slide 10 and the latter, together with the slide extension 10^a, is re-

130

tracted. The cycle of operations is then repeated to form the next succeeding set of barbs.

By the use of the machine above described, the work of barbing metal rods can be rapidly effected. The die members are all of them positively actuated by their respective cams, there being no springs or other parts likely to become deranged or broken, the entire action of the machine being simple and effective in its nature. By changing the shape of the dies, square or other shaped stock may be barbed in the same manner as the round rods. The dies may be shaped to form any desired number of barbs in each set.

It will be obvious that various changes may be made in the details of construction and arrangement of the die carriers and dies and of the cams for actuating the same, without departing from the spirit and scope of my invention.

I claim:

1. In a barb-forming machine, a plurality of movable dies, means for actuating said dies to grip the stock, and means for subsequently actuating the dies, relatively to each other in the direction of the length of the stock to first form the barb and to then move forwardly with and feed the stock, substantially as described.

2. In a barb-forming machine, two pairs of dies, and means for moving said dies relatively to each other both longitudinally and transversely, and also means for moving all four of the dies in closed positions simultaneously in a longitudinal direction, substantially as described.

3. In a barb-forming machine, two pairs of dies, cam means for advancing and retracting said dies in a direction at right angles to the feed of the machine, and other cam mechanism for moving one pair of said dies longitudinally with reference to the other pair of dies, and for then moving all the dies as a whole in a longitudinal direction, substantially as described.

4. In a barb-forming machine, two pairs of dies, cam means for moving both pairs of dies towards and away from each other in a direction transverse to the line of feed of the machine, other cam mechanism for moving one pair of dies toward and away from the other pair in a direction parallel with the line of feed of the machine, and actuating mechanism for subsequently moving all four pairs longitudinally of the machine, substantially as described.

5. In a barb-forming machine, a longitudinally movable slide or main carrier, two sets of laterally movable die-carriers mounted on the main carrier to reciprocate therewith and also to reciprocate laterally thereon, one set of said dies also having a longitudinal movement relative to the other set, means for first actuating the laterally movable die-carriers

to cause them to grip the stock, and means for then actuating one set of die-carriers longitudinally towards the other set; substantially as described.

6. In a barb-forming machine, a pair of dies arranged to reciprocate towards and away from each other in a direction transversely to the line of feed of the machine, a second pair of dies also arranged to reciprocate towards and away from each other in a direction transversely to the line of feed of the machine, means for moving the two pairs of dies relatively to each other in a direction parallel to the line of feed of the machine, and means for moving the four dies in unison in the direction of the feed of the machine, substantially as described.

7. In a barb-forming machine, a longitudinally reciprocable die carrier, two sets of dies mounted thereon for movement in a direction at right angles to the direction of movement of the slide and independently thereof, means for actuating said slide to move one set of dies longitudinally in contact with the other set of dies, and for then moving the two sets of dies longitudinally in unison, substantially as described.

8. In a barb-forming machine, a longitudinally movable die carrier having an extension connected thereto by a lost motion connection, a pair of dies mounted on said carrier to move towards and away from each other in a direction at right angles to the movement of the carrier, a second pair of dies mounted on the extension and also having a movement towards and away from each other at right angles to the direction of movement of the carrier, cam means for actuating the two sets of dies to effect these movements, cam means for giving an initial movement to the carrier to close one pair of dies upon the other and for then moving both the carrier and its extension forwardly, substantially as described.

9. In a barb-forming machine, a longitudinally movable die carrier having an extension connected thereto by a lost motion connection, a pair of dies mounted on said carrier to move towards and away from each other in a direction at right angles to the movement of the carrier, a second pair of dies mounted on the extension and also having a movement towards and away from each other at right angles to the direction of movement of the carrier, cam means for actuating the two sets of dies to effect these movements, cam means for giving an initial movement to the carrier to close one pair of dies upon the other and for then moving both the carrier and its extension forwardly, the cam mechanism being also arranged to effect the retraction of the carrier and of the dies in both directions, substantially as described.

10. In a barb-forming machine, a longitudinally movable die carrier having an extension

sion connected thereto by a lost motion connection, a pair of dies mounted on said carrier to move towards and away from each other in a direction at right angles to the movement of the carrier, a second pair of dies mounted on the extension and also having a movement towards and away from each other at right angles to the direction of movement of the carrier, cam means for actuating the two sets of dies to effect these movements, cam means for giving an initial movement to the carrier to close one pair of dies upon the other and for then moving the carrier and its extension forwardly, together with movable thrust blocks or anvils arranged to be moved in front of the said extension, and means for advancing and retracting the same, substantially as described.

11. In a barb-forming machine, two pairs of die blocks, each of said blocks having a lateral stock-gripping face and a transverse die-forming face, said die-forming faces each

having a plurality of barb-shaped cavities or depressions therein and having cutting edges; substantially as described.

12. In a machine of the character described, the combination of two pairs of laterally movable dies, one die of each pair being also longitudinally movable towards and away from the other two dies, a support or slide upon which all four dies are mounted, thrust blocks or anvils arranged to be moved behind the front dies during their forming action, and means for operating said blocks or anvils arranged to withdraw them to permit the forward feeding movement of the slide or support and the four dies; substantially as described.

In testimony whereof, I have hereunto set my hand.

JAMES M. MURPHY.

Witnesses:

GEO. B. BLEMING,
GEO. H. PARMELEE.