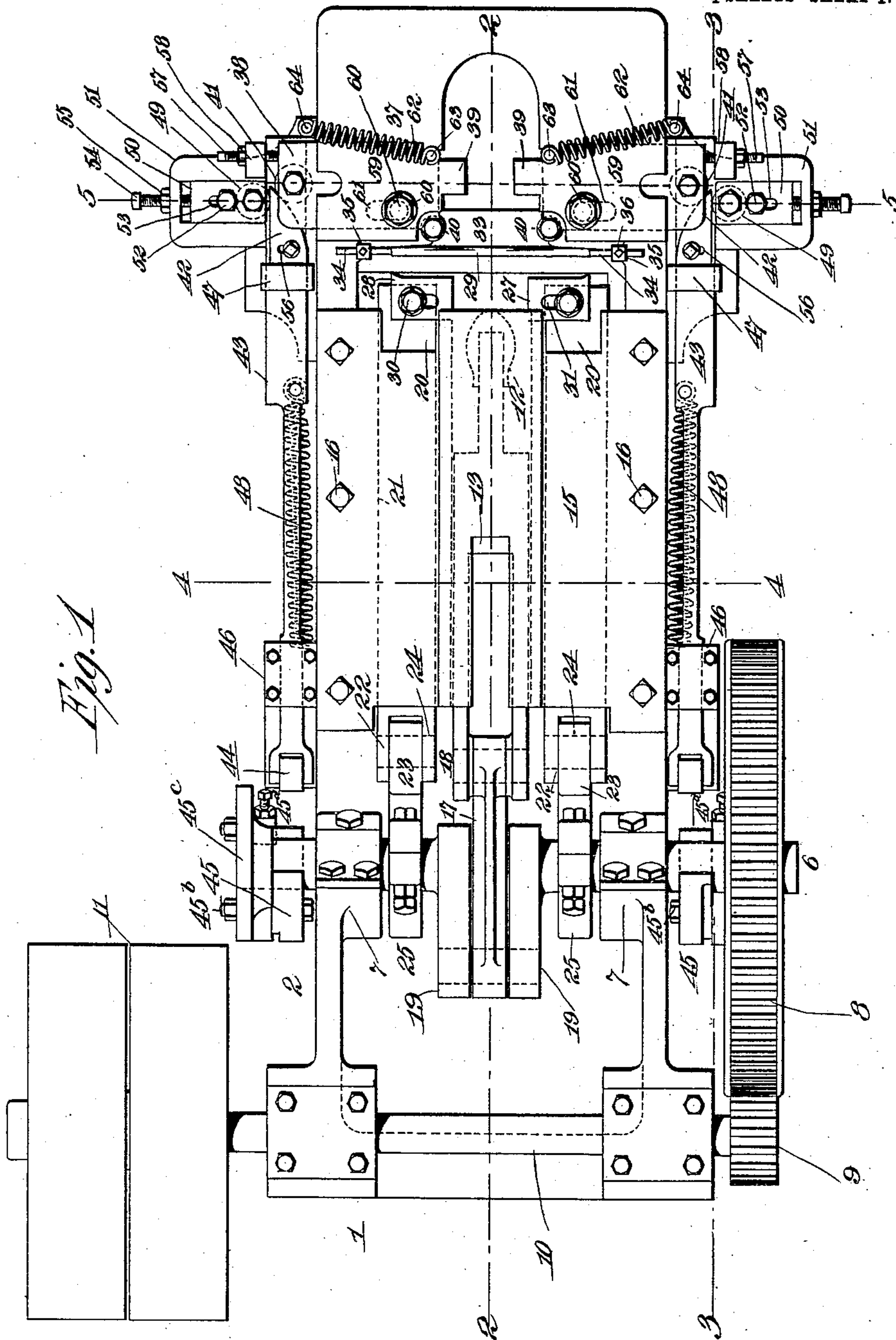


No. 873,802.

PATENTED DEC. 17, 1907.

A. SMITH.
HORSESHOE MACHINE.
APPLICATION FILED DEC. 3, 1904.

4 SHEETS—SHEET 1.



Witnesses:

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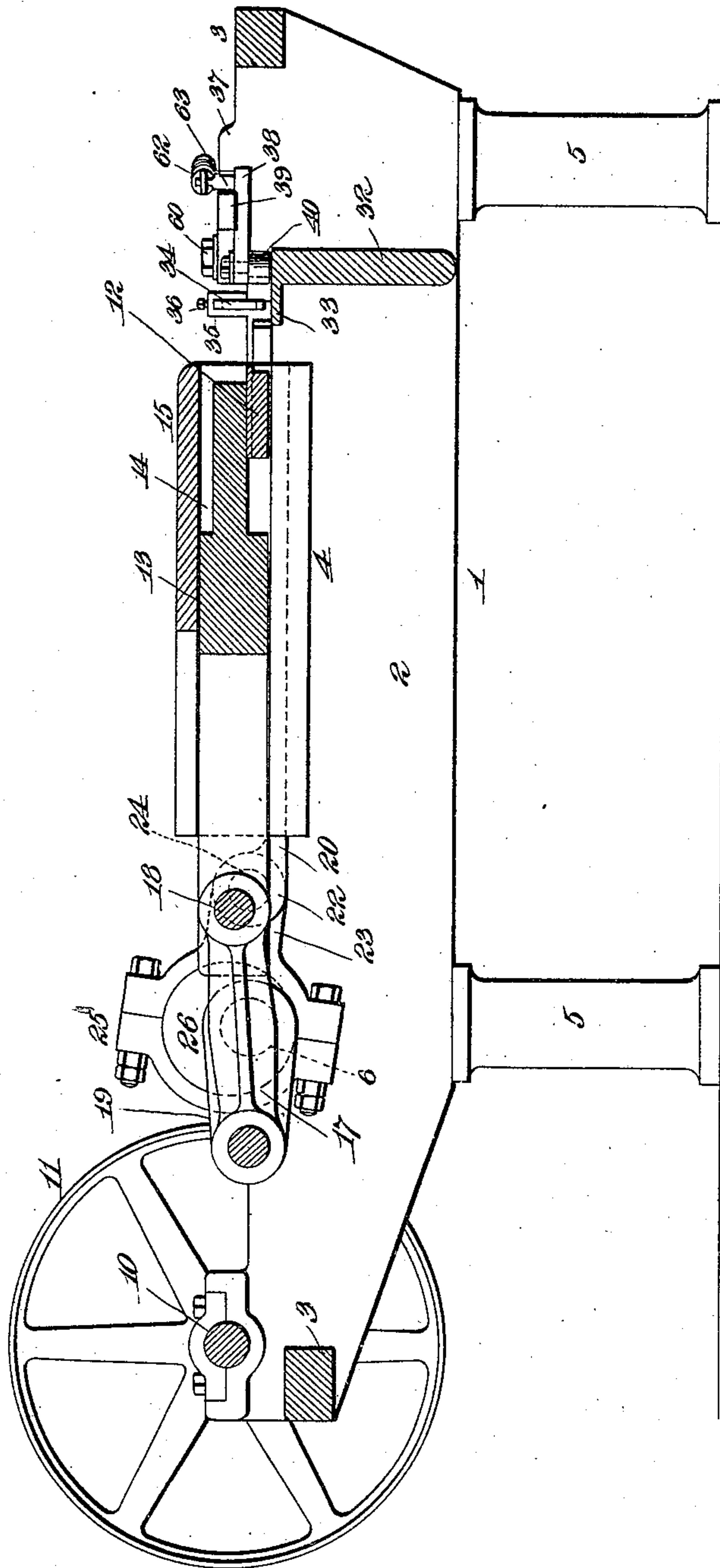
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4 SHEETS—SHEET 2.

Fig. 2



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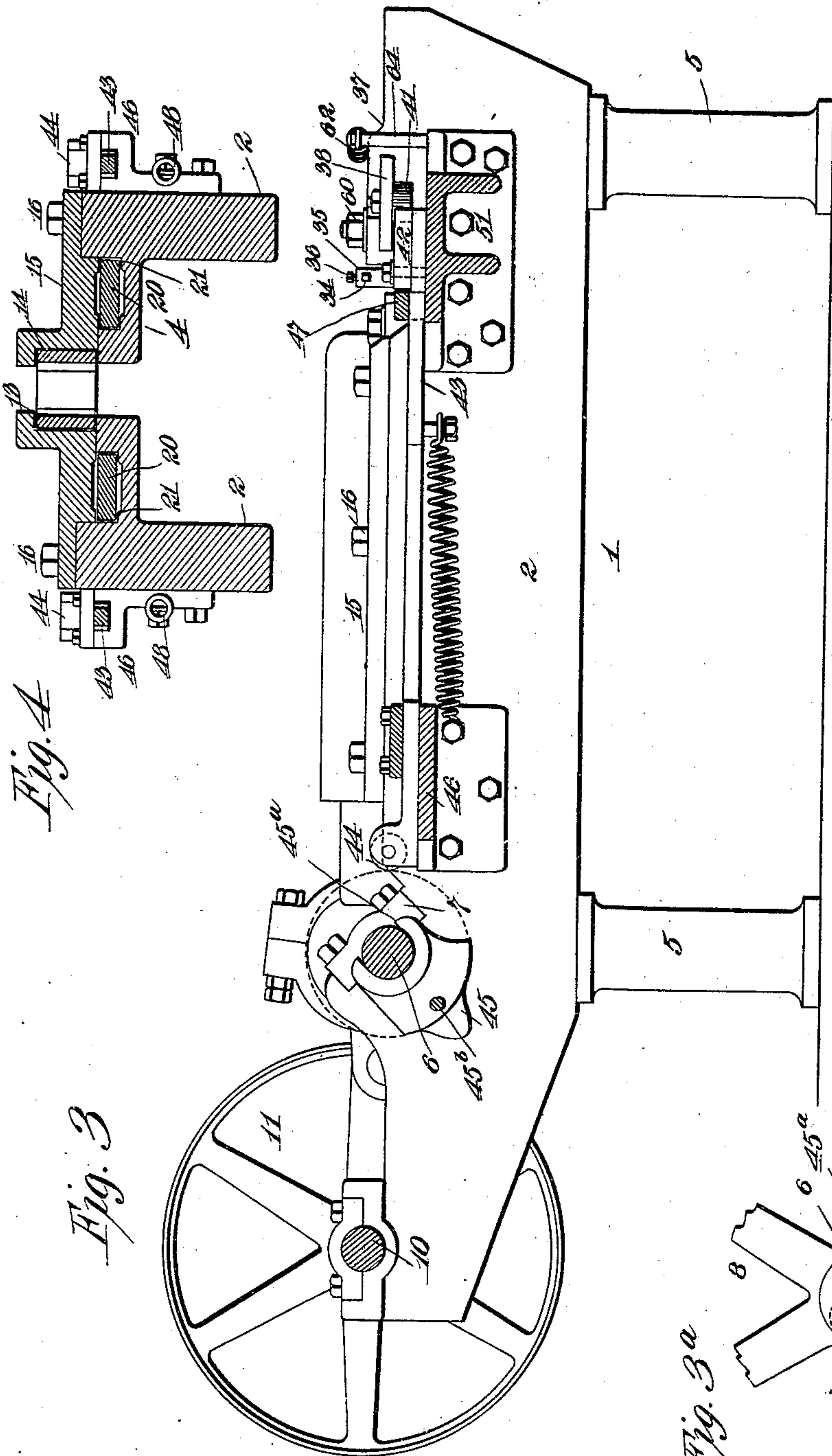
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4 SHEETS—SHEET 4.

Fig. 5

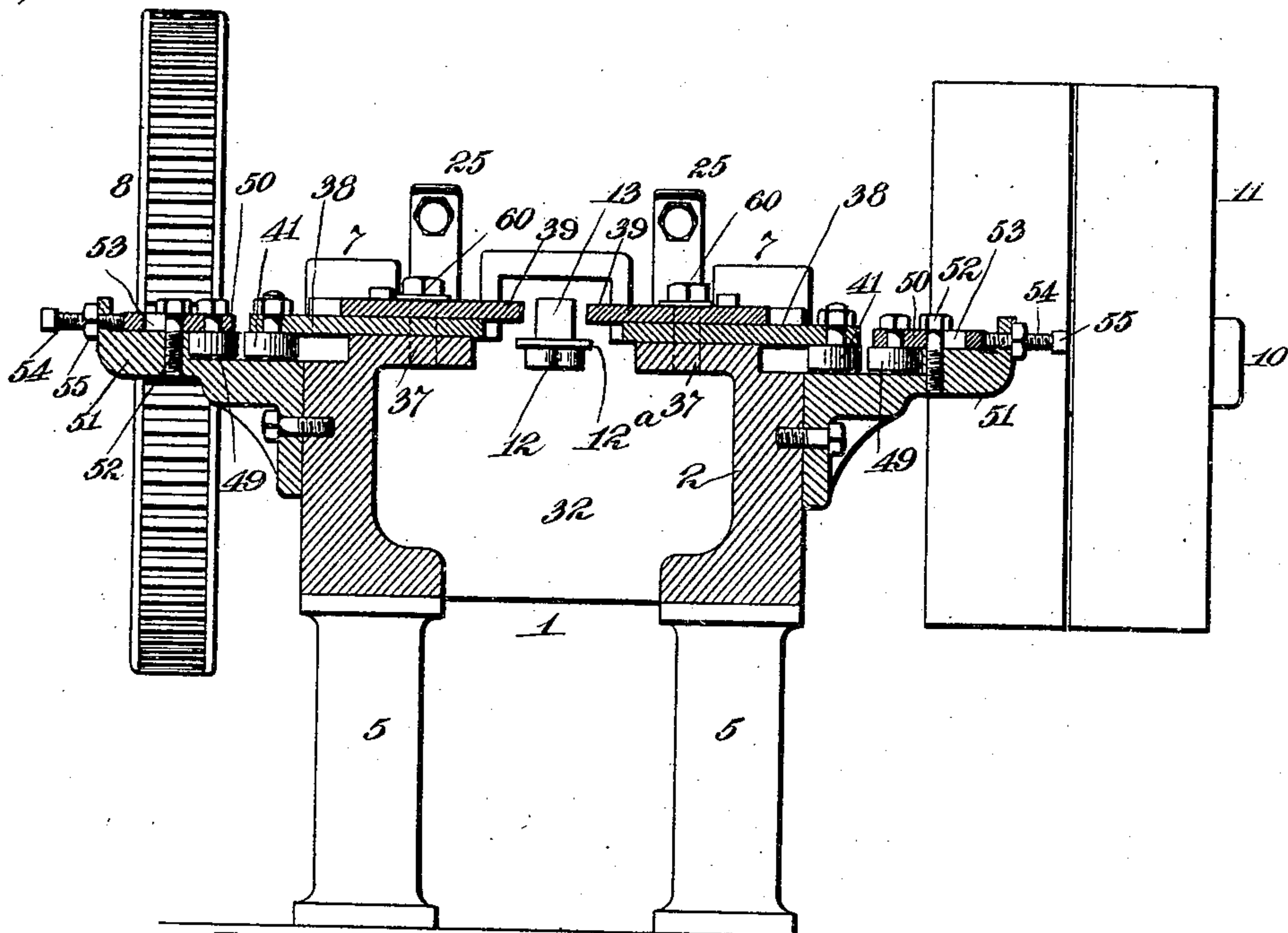


Fig. 6

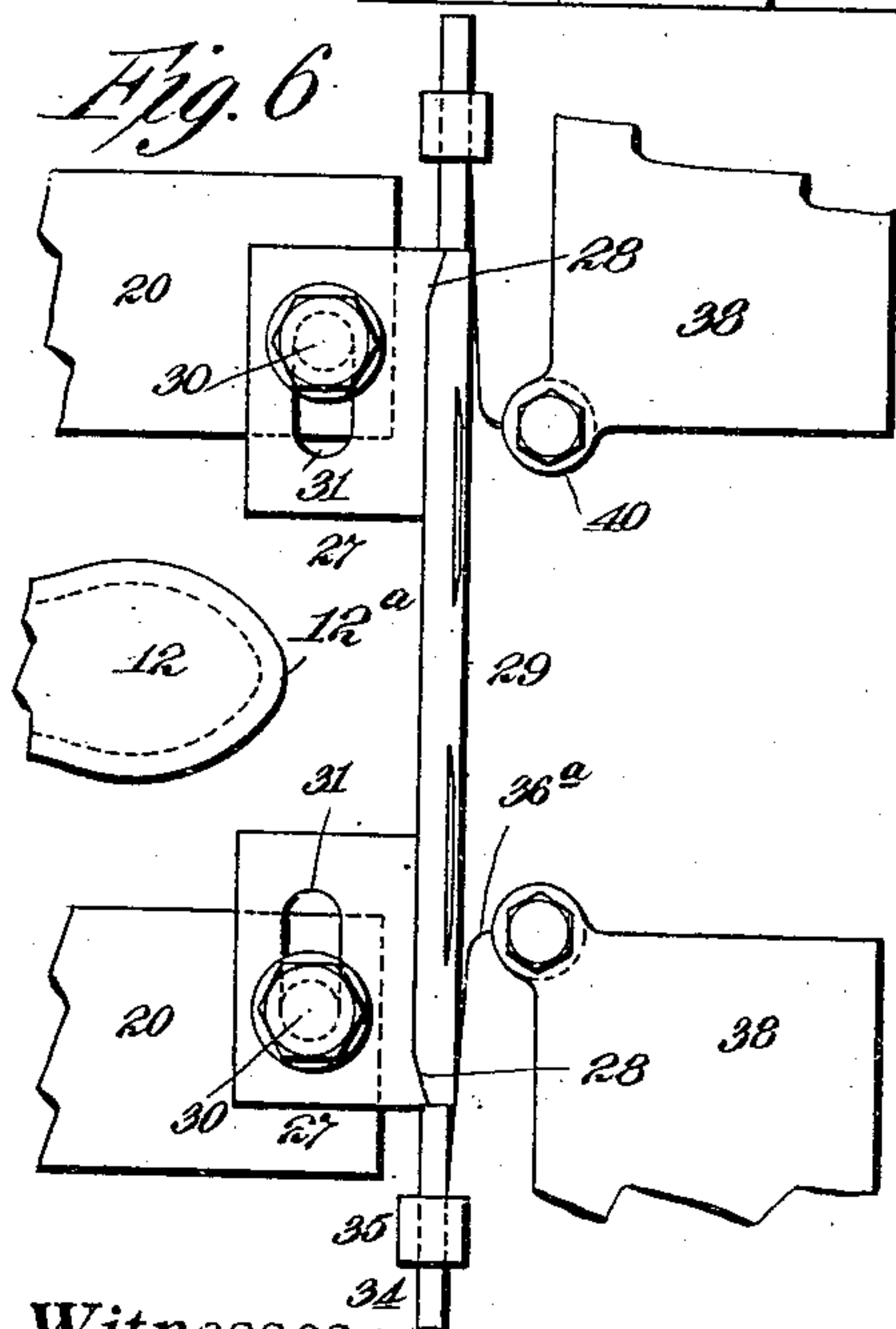
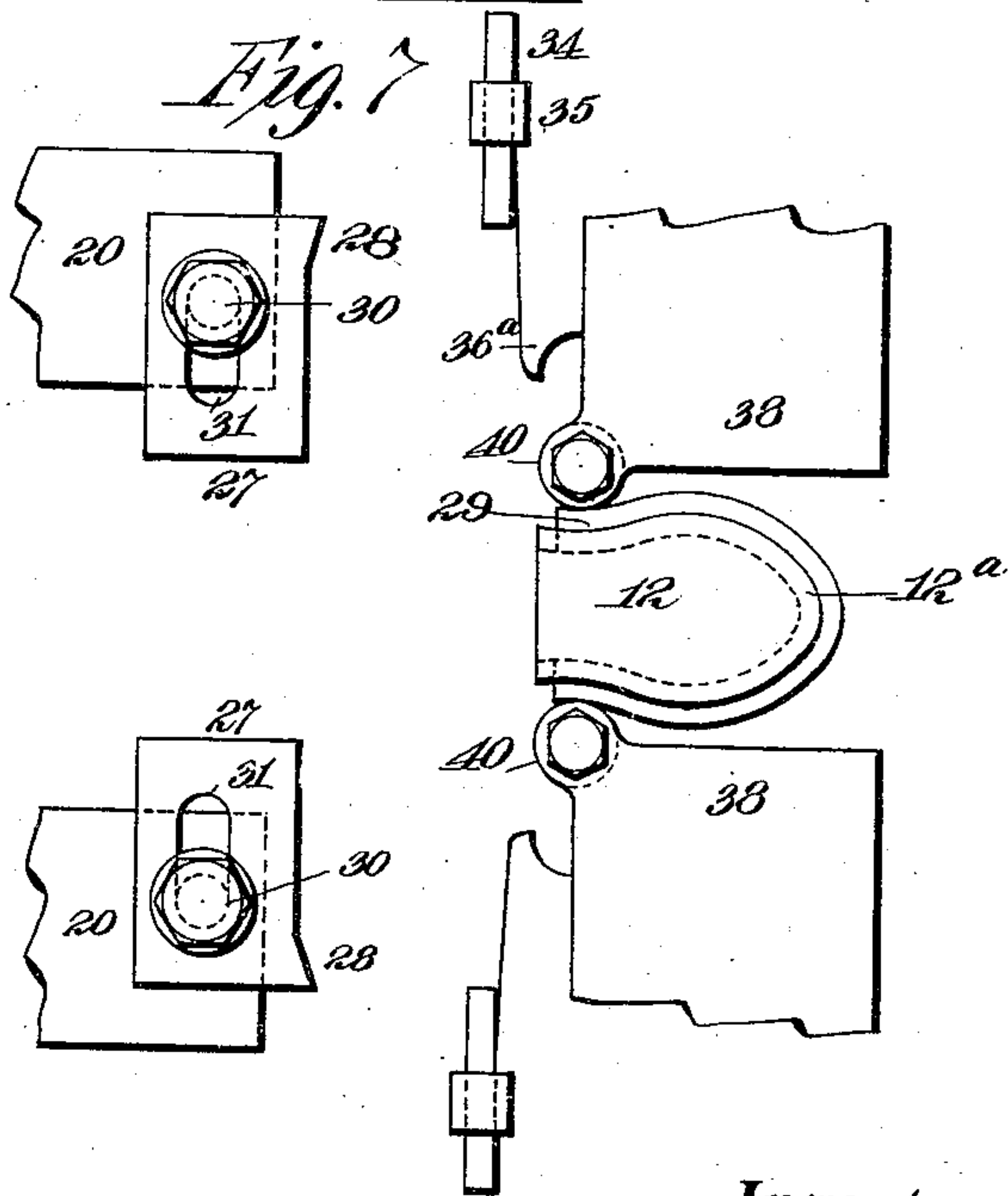


Fig. 7



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UNITED STATES PATENT OFFICE.

ARTHUR SMITH, OF EASTON, PENNSYLVANIA, ASSIGNOR TO AMERICAN HORSE SHOE COMPANY, OF PHILLIPSBURG, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HORSESHOE-MACHINE.

No. 873,802.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed December 3, 1904. Serial No. 235,337.

To all whom it may concern:

Be it known that I, ARTHUR SMITH, a citizen of the United States, residing at Easton, in the county of Northampton, State of Pennsylvania, have invented certain new and useful Improvements in Horseshoe-Machines, of which the following is a specification.

The object I have in view is to construct a machine for squeezing the ends of billets, and bending and forming them, in the manufacture of horseshoes, which machine will be composed of few moving parts, will be expeditious in operation, not liable to get out of order and can be operated at a minimum of expense, and can be readily adjusted to accommodate different sizes and styles of shoes. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which,

Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a section taken on the lines 2,—2, of Fig. 1. Fig. 3 is a section taken on the lines 3—3 of Fig. 1. Fig. 3^a is a detail view of the adjustable cam. Fig. 4 is a section taken on the lines 4—4 of Fig. 1. Fig. 5 is a section taken on the lines 5—5 of Fig. 1. Figs. 6 and 7 are enlarged views of parts of the mechanism showing the operation of upsetting the ends of the billet and bending it to shape.

In all of the several views like parts are designated by the same reference characters.

The machine comprises 1, means for squeezing the ends of the billet to provide for the desirable extra thickness of the heels; 2, means for bending the billet to a U-shape, and 3, means for forming the billet to the finished shoe. With these principal portions the machine also comprises other desirable features, such as means for alining the billet when it is presented for action to the squeezing and bending mechanism, and means for adjusting the various mechanism for wear and to accommodate different sizes and styles of shoes. When the occasion demands the squeezing means may be disconnected, or omitted altogether, or the bending and forming mechanism, one or both, may be omitted or disconnected.

In carrying out my invention I provide a support 1, which comprises side members 2, 2, cross members 3, 3, and a horizontal member or table 4. These members may be formed of a single casting. The support 1 is

mounted upon standards or legs 5, so that it may be raised to an elevation which will be convenient. A main shaft 6 is carried in bearings 7 in the side members 2, and is provided at one end with a gear wheel 8. This gear wheel is rotated by suitable mechanism, that shown consisting of an intermeshing pinion 9 carried by a shaft 10 and provided with fast and loose pulleys 11. These pulleys connect with a belt and countershaft and a suitable belt shifter (not shown). By this means the shaft 6 may be rotated at will.

The bending die 12, shown in broken lines in Fig. 1, is carried upon a slide 13, mounted in ways 14, on a plate 15 (see Fig. 4). The die is of the configuration of the finished shoe, and has a flange 12^a around the upper edge to prevent the shoe from rising during the bending and forming operations. The plate 15 is secured by bolts 16 to the side members 2 and rests upon the table 4. The opposite end of the slide 13 from the die is bifurcated, as shown, for the admission of a pitman 17 connected thereto by a pin 18. This pitman 17 is secured to a crank 19 on the shaft 6 so that the slide 13 and die 12 may be reciprocated by the rotation of the shaft 6.

On each side of the slide 13 is a slide 20, mounted in ways 21, formed in the table 4. These slides 20 are retained in place by the plate 15, and are provided with bifurcated ends 22 within each of which is arranged a pitman 23 secured by a pin 24 and provided with an eccentric strap 25. Each of these straps surrounds an eccentric 26 carried by the shaft 6. The two eccentrics are of the same throw and secured to the shaft 6 at the same angle so that the slides 20 may be simultaneously moved an equal distance. The slides 20 are arranged however, so as to be moved at a different period of time from the slide 13. Each of the slides 20 carries a die 27, provided with a projecting portion 28 for squeezing the extremities of the billet 29. The dies 27 are secured to the slides 20 by means of bolts and nuts 30, and adjustment is provided by means of a slot 31 to accommodate different lengths of billets.

A cross member 32 having a flat upper surface 33 connects the sides 2, 2, of the support 1 and serves as a table for supporting the billet. Alining rods 34 serve as a means to retain the billet while it is being squeezed and bent with its center coincident with the center of the machine. These rods are car-

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ried by brackets 35 having securing screws 36 so that the rods may be adjusted to accommodate different lengths of billets.

A means for forming the billets to shape is provided. This means is as follows: Slides 38 are mounted in ways, cut in projecting portions 37 of the side members 2. That portion of each projecting portion 37 toward the dies, is inclined, forming a bending surface or cam 36^a, and constituting a fixed abutment. Above each slide is provided an extension 39, (see Fig. 5), for holding down the slide while the horseshoe is being bent. At one corner of each of the slides 38 is arranged a roller 40 which is caused to engage with the billet, and in conjunction with the die 12 and cam 36^a, bend the billet to the desired shape.

The slides 38 are arranged to be simultaneously brought together, from the position shown in Fig. 6 to that shown in Fig. 7 to bend the shoe around the die by means of the following mechanism: Each slide 38 is provided with a roller 41. This roller is engaged by a cam 42 mounted upon a slide 43. The other extremity of the slide 43 is bifurcated and provided with a roller 44. The roller 44 is engaged by an adjustable cam 45 carried upon the shaft 6. The slide 43 is mounted in ways 46 and 47 and is engaged with the cam 45 by means of a spring 48. As a further support for the back of the cam 42 a roller 49 carried by a block 50 is provided. This block is supported upon a bracket 51 bolted upon the support 1, and is secured in place by means of a bolt 52 passing through a slot 53. Accurate adjustment is secured by means of a bolt 54 provided with a lock nut 55. In order to accommodate shoes of different sizes, the securing bolt for the cam 42 passes through a slot 56. Set screws 57 passing through ears 58 limit the outer movement of the slides 38.

The cams 45 are made adjustable so as to accommodate different sizes and shapes of shoes. The construction of the cam is shown at Fig. 3^a and is provided with fingers 45^c which grasp the shaft 6, and a bolt 45^b which connects it to the gear 8, or a disk 45^c. A bolt 45^d permits accurate adjustment.

The slides 38 are covered by a plate 59, secured in place by bolts 60 and supporting the extensions 39. The bolts 60 pass through slots 61 in the slides 38 so as to permit the latter to move. Springs 62 serve to retract the slides 38 and keep them in constant engagement with the cams 42. Each of the springs is connected to a standard 63 and 64 carried by the slide and main frame respectively.

The cams 45, 45 are each alike as to configuration and angle of throw. They are so

shaped (see Fig. 3) as to give a quick forward impulse, and in conjunction with the retracting springs, a quick return.

In operation, the shaft 6 being constantly rotated, the billets 29 are successively placed upon the table 33 and accurately aligned by means of the rods 64. The eccentrics, cranks and cams are so arranged that the slides 20 will first move, engaging the dies 28 with the ends of the billet and thereby squeezing them as shown in Fig. 6. This will form the desirable thickness at the ends of the billet to make the heel portions. The slides 20 will then be immediately withdrawn and the slide 13 advanced engaging the die 12 with the center of the billet, moving it into contact with the cams 36^a, 36^a, and will bend it. Further movement of the die 12 will continue to bend the billet and engage it with the rollers 49. At this time the cams 45 will have engaged with the rollers 44 and moved the slides 43 to engage the cams 42 between the rollers 41 and 49, which will move the two slides 38 toward each other and force the heels of the shoe between the rollers 40 as shown in Fig. 7, the die 12 being at the same time advancing. The forming operation will therefore be compounded of the movements of the slides 38 and die 12. The shoe will be prevented from being forced upward owing to the action of the die and slides on the beveled billet by means of the flange 12^a, and similarly the slides 38 will be held down by means of the extension 39. The slides 38 will be next withdrawn by means of the springs 48 and 62, and allowing the completed shoe to be removed. The die 12, and squeezing dies will be withdrawn, and the machine will be ready for squeezing and bending another billet.

Different sizes and shapes of shoes may be operated upon by substituting suitable bending dies and adjusting the position of the squeezing dies, alining rods and other portions of the machine to correspond.

Having now described my invention what I claim as new and desire to secure by Letters Patent, is:—

A machine for bending and forming billets into horse-shoes, which has the bending die moved by a crank, whereby a continuous movement will be secured, and a forming die moved by a cam whereby an irregular movement will be secured, there being means for adjusting the position of the cam in relation to the crank, so that the time of forming in relation to the time of bending can be varied.

This specification signed and witnessed this seventh day of November, 1904.

ARTHUR SMITH.

Witnesses:

JNO. ROBT. TAYLOR,
JOHN L. LOTSCH.