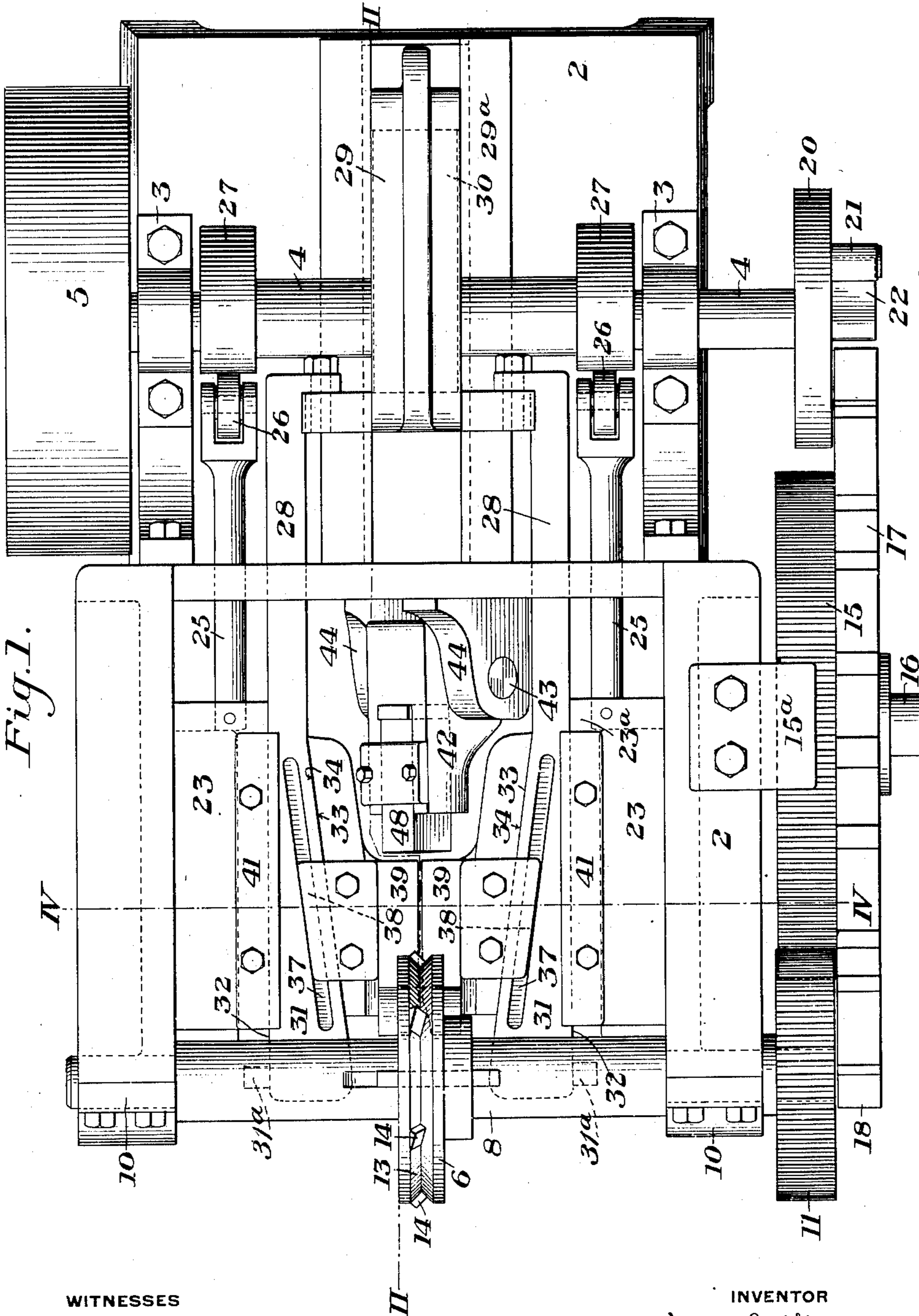


928,409.

Patented July 20, 1909.

5 SHEETS—SHEET 1.



WITNESSES

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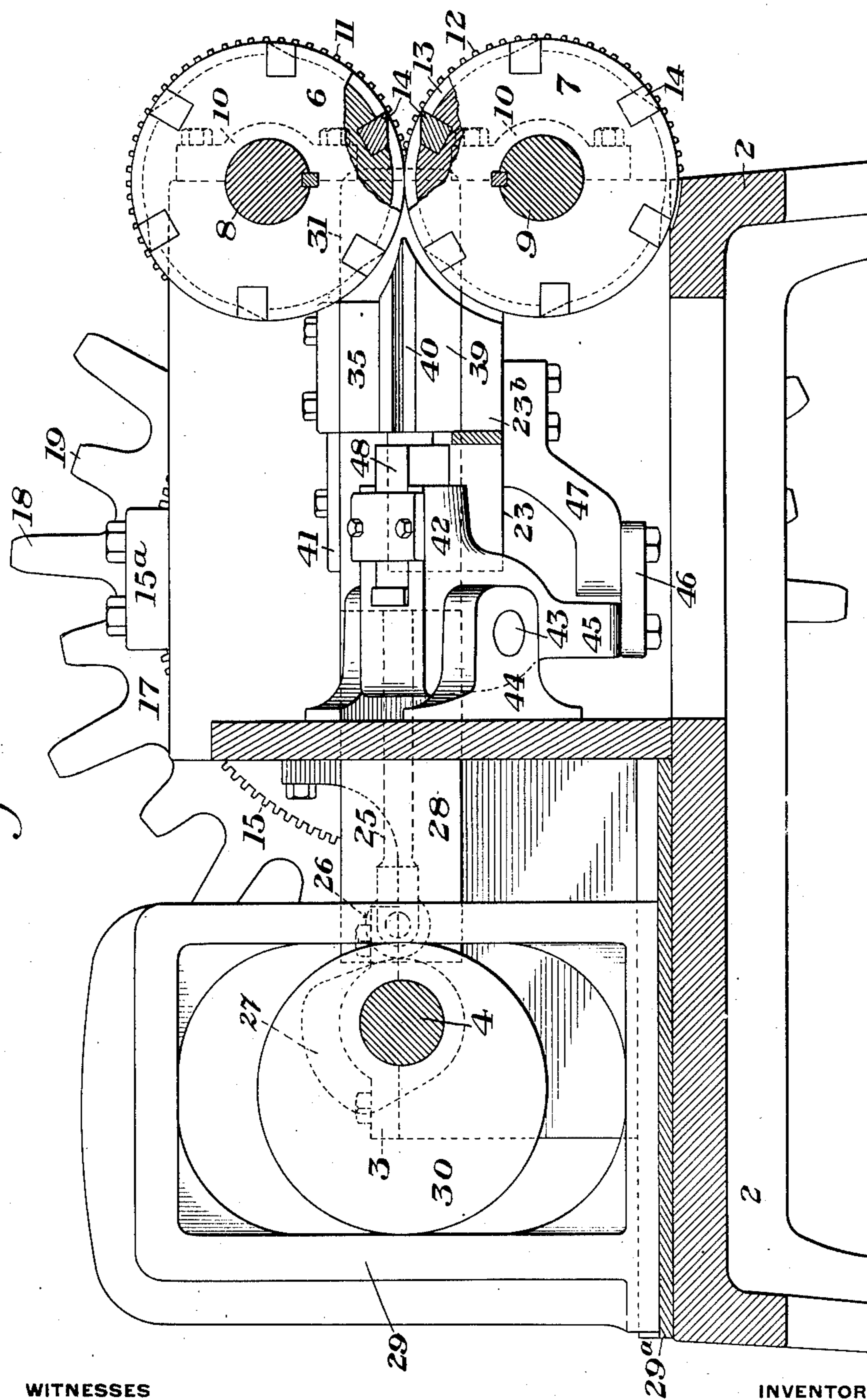
Wm. D. Thomas,
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5 SHEETS—SHEET 2.

Fig. 2.



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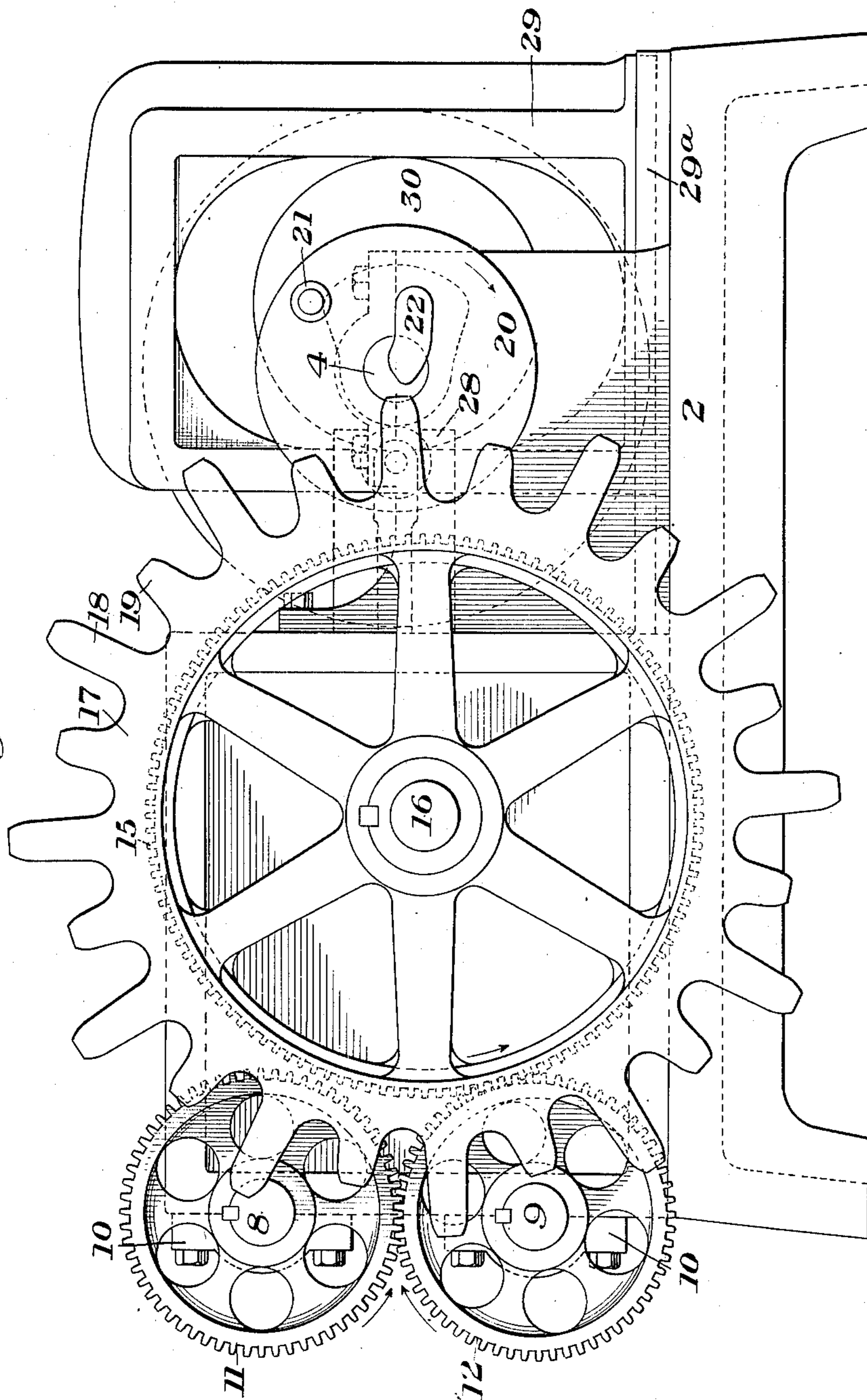
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5 SHEETS--SHEET 3.

Fig. 3.



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HEADING MACHINE.
APPLICATION FILED FEB. 29, 1908.

Patented July 20, 1909.

5 SHEETS—SHEET 4.

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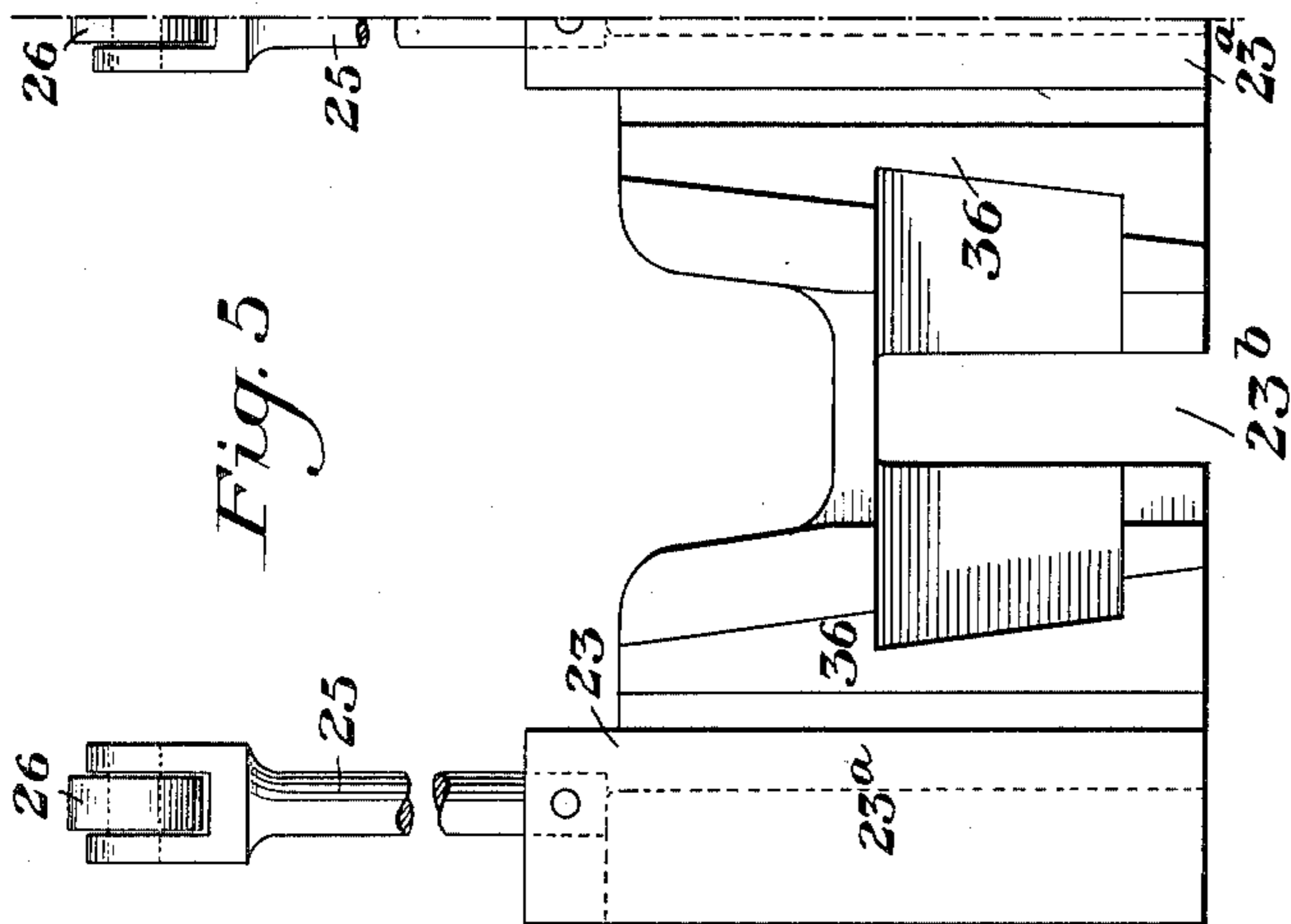
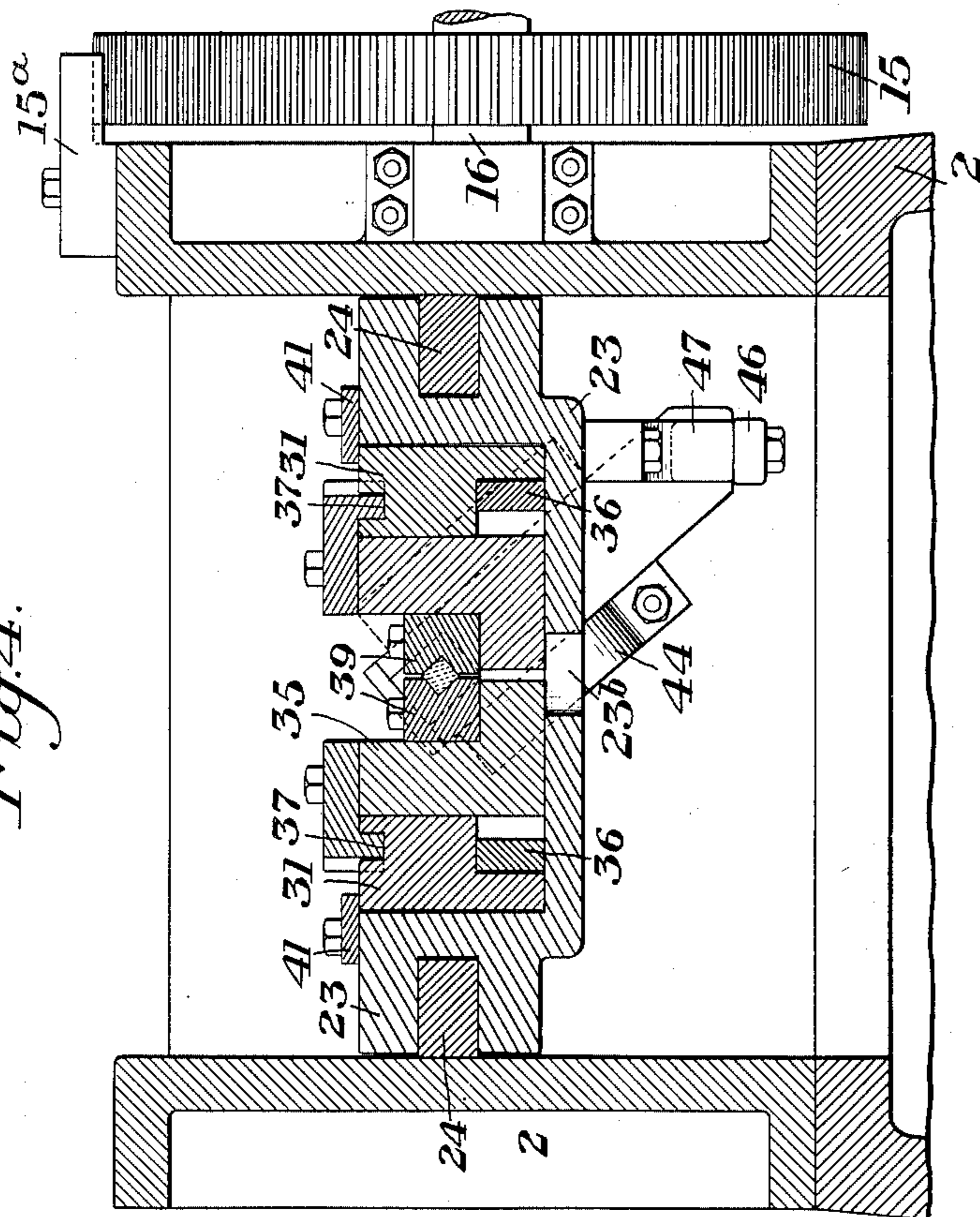


Fig. 5

Fig. 4.



WITNESSES

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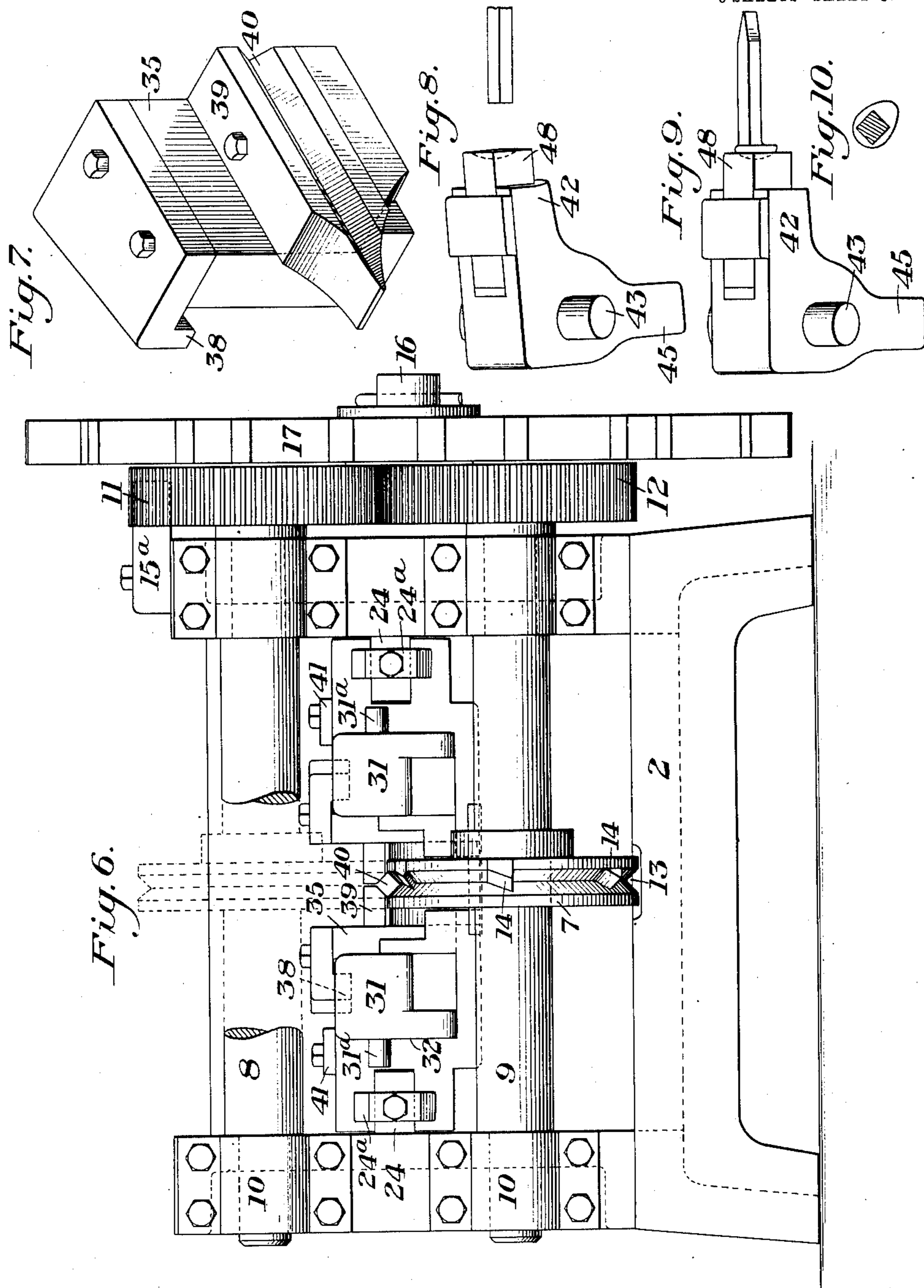
Wm D. Thomas
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5 SHEETS—SHEET 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM D. THOMAS, OF PITTSBURG, PENNSYLVANIA.

HEADING-MACHINE.

No. 928,409.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed February 29, 1908. Serial No. 418,455.

To all whom it may concern:

Be it known that I, WILLIAM D. THOMAS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Heading-Machines, 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 longitudinal section on the irregular line II—II of Fig. 1; Fig. 3 is a side elevation; Fig. 4 is a cross section on the line IV—IV of Fig. 1; Fig. 5 is a detail view of the slide; Fig. 6 is an end view partly broken away; Fig. 7 is a detail view of one of the gripping members or jaws; Figs. 8 and 9 are detail views illustrating the heading operation; and Fig. 10 is a sectional end view of one of the spikes formed by the machine.

My invention has relation to machines for making spikes, bolts or other headed metal articles and is designed to provide a machine of this character which shall be simple in its construction and operation and by means of which spikes or other headed articles can be rapidly and cheaply made.

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

In the drawings, the numeral 2 designates the frame of the machine, which is provided near one end portion with suitable bearings 3, in which is journaled a main actuating shaft 4. This shaft is driven by means of a pulley 5, or in any other suitable manner.

6 and 7 designate a pair of feed-in and cut-off wheels, which are rigidly secured to the respective shafts 8 and 9, which are journaled in bearings 10, at the opposite end portion of the machine from the shaft 4, said shafts being journaled one above the other, and intergeared at one end by means of the toothed pinions 11 and 12. Each of these wheels is formed with a V-shaped groove 13, in its periphery and with a series

of spaced cutters 14, which project into the grooves. The two grooves 13 fit together and form a feed opening for the stock, which, in the present instance, is of rectangular form, the particular machine shown being adapted to the manufacture of spikes. As will be seen, the feed opening formed by the two grooves is arranged to feed the stock diamond-wise. The wheels 6 and 7 are rotated by a step-by-step movement by means of a spur wheel 15, which is journaled on a stub shaft 16, projecting from one side of the frame. Secured to this spur wheel 15 is a larger toothed wheel 17, having a series of long teeth 18, and a series of alternating shorter teeth 19. On the end of the main shaft 4 is a crank disk 20, having a crank pin 21, and also a cam projection 22, on its outer face. The shaft 4 is constantly rotated, the cam projection 22 first coming in contact with one of the long teeth 18, to start the rotation of the toothed wheel 17, and spur wheel 15, after which the crank pin 21 engages one of the shorter teeth 19. The advantages of this arrangement is that by first bringing the cam projection 22 into engagement with one of the longer teeth of the wheel 17, sudden starting of the gears is prevented, since the projection 22 being nearer the center of the crank disk 20, works on a shorter leverage with respect to the shaft 4 and on a longer leverage with respect to the shaft 16, thereby causing a very gradual and easy starting of the feed-in operating gearing, the crank pin 21 commencing its work after the gearing has been started.

15^a is a brake-block for the wheel 15.

23 designates a slide mounted upon the ways or guides 24 at the lateral portions of the frame 2, and having the forwardly projecting bars or arms 25, whose forward ends are provided with antifriction rollers 26, which bear against cams 27, on the main shaft 4.

28 designates a bifurcated yoke, the arms of which are connected at their forward ends to form a strap portion 29, which embraces the cam or eccentric 30 on the shaft 4, and this strap portion is guided in a groove bearing 29^a on the base or frame 2. The rear portion of the yoke carries the two wedge members 31, having each a straight side 32, which is in sliding contact with the inner face of the side portions 23^a

of the slide 23, and whose wedge faces 33 engage the outer vertical faces 34 of the gripping jaws or members 35. These wedge members are further guided in their movements by the portions 36 of the slide 23. In the upper face of each of these wedge members is an oblique recess or groove 37, which is parallel to the inner wedge faces 33, and which is engaged by a depending lip 38, on the adjacent gripping member or jaw.

39 designates the jaw or grip proper which is secured to the inner side of the gripping member and which is formed with a V-shaped recess 40, in its inner face to receive and grip the stock. One of these grips is shown in detail in Fig. 7, and the cooperating arrangement of the two grips is clearly shown in Figs. 1 and 4.

41 designates removable cap plates which extend over the outer edge portions of the wedge members 31, and hold them down to their guiding seats.

31^a are pins or projections on the wedge members 31, which are arranged to engage the rear end portion of the slide 23.

24^a are back-stops on the guides 24 for limiting the backward movement of said slide.

42 designates a hammer-head which is pivoted at 43 between lugs 44 of the main frame, and which has a shank portion 45, depending below the pivot and connected by a link 46, with an arm 47, secured to the under side of the slide 23. This hammer is shown in detail in Figs. 8 and 9, and may also be clearly seen in its related position in Figs. 1 and 2. Secured in this head is the heading die or tool 48. As will be seen by reference to Figs. 1, 2, 8 and 9, just referred to, the center 43, upon which the hammer moves and which is preferably formed by stops or trunnions projecting from the sides of the hammer-head and engaging the bearings in the lugs 44, lies in an inclined plane, so that the hammer is arranged to strike a downward and oblique blow at an angle to the line of feed of the stock.

The operation of the machine is as follows: The stock is fed into the machine between and by the feed-in and cut-off wheels 6 and 7, its forward end being fed by the wheels between the jaws or grips 39, of the gripping members, the cutters 14 acting to cut off the stock and point it at the proper length, depending upon their spacings. The rotation of the main shaft 4 causes the eccentric 30 to act on the strap 29, of the yoke 28, and thereby pull the wedge members 31 forwardly. The forward movement of these wedge members draws the clamping members together and causes the grips or jaws 39 to tightly seize and hold the stock. During the time that the stock is thus being

gripped, the slide 23 is held against the forward movement by the fact that the high portions of the cams 27 are in engagement with the antifriction wheels 26, at the forward ends of the arms 25. Consequently, the slide 23 will be held in stationary position until the gripping members have been actuated to securely close upon and hold the stock, after which the pins or projections 31^a on the wedge members will engage the support. The cams 27 now release the slide and the continued action of the eccentric 30 draws the yoke 28 forwardly, together with the slide 23, and moves the inner end of the spike blank toward the hammer-head. At the same time, the hammer-head is given a downward swiping blow by means of the link connection 46 with the slide 23, and forms the head. This head will be formed at an angle of about forty-five degrees to a vertical plane passing through the line of feed of the stock, as shown in Fig. 10. The continued revolution of the shaft 4 after the heading operation has been completed, returns the yoke 28 to its rear position, thereby relieving the wedging action of the members 31 upon the gripping jaws, and permitting said jaws to open and drop the completed article which falls to the base of the machine through an opening 23^b in the slide 23.

To adapt the machine for the formation of other articles, it is simply necessary to remove the feed wheels 6 and 7, and substitute other wheels having peripheral grooves of the proper form to accommodate the cross section of the stock to be used, and also having cutters of the proper kind and spacing to sever the blanks into proper lengths. A proper change is also made in the driving gear for these wheels. The grips or jaws 39 are also removed and others substituted, adapted to the changed form of stock. In making bolts or other headed articles having a symmetrical head, the link 46, which connects the hammer-head to the slides 23, is removed and a suitable wedge or plugging is inserted between the hammer-head and the adjacent portion of the frame, so that the hammer is held stationary. The heading is then effected wholly by moving the blank forwardly against the hammer tool or die 48, by the action of the gripping jaws.

The manner of feeding the stock in diamond-wise position, as here shown and described, is of special advantage in the formation of spikes, since the cutters act upon the stock in such a manner as to prevent it from being forced laterally, and thereby making a point of greater width than the dimension of the shank of the spike. Heretofore, considerable difficulty has been experienced in preventing this lateral forcing out of the metal and widening of the point

of the spike in the cutting operation. By feeding the stock diamond-wise in the manner described, and arranging the hammer-head to strike an oblique blow, this objection is obviated and the head of the spike is formed in proper relation to the shank, as shown in Fig. 10.

The entire machine is simple in its construction, being composed of but few parts, all of which are actuated from one shaft. The operations of the parts are of positive character, and the several operations of forming the headed articles are rapidly performed.

It will be obvious that various changes may be made in the details of construction and arrangement. Thus, other forms of gearing may be employed for imparting the step-by-step movement to the feed-in and cut-out wheels, and the manner of closing and releasing the gripping members may be changed.

I claim:

1. In a metal heading machine, a longitudinally movable support, grippers mounted on the support and movable laterally thereon relative to each other to grip and hold the stock, a reciprocating wedge mechanism arranged to effect the relative lateral movement of the gripping members and also the longitudinal movement of the support and gripping members, means for holding the support while the wedge mechanism is acting to close the gripping members, and means for actuating the wedge mechanism, substantially as described.

2. In a metal-heading machine, a relatively fixed heading tool, means for feeding in and cutting off the stock, grippers which seize the cut blanks, and means for subsequently moving the grippers with the blank forwardly to the said tool, together with means for imparting a downward blow to said tool as the blanks are moved toward it, substantially as described.

3. In a metal heading machine, the combination with stock feeding and cutting devices, of a longitudinally movable support, gripping members mounted on said support to move laterally thereon relative to each other to grip and hold the stock, wedge members for effecting the lateral movement of the gripping members, and also to effect the longitudinal movement of the support and gripping members, means for actuating the wedge members, and stop means for holding the support against movement while the wedge members are acting to close the gripping members, substantially as described.

4. In a metal-heading machine, a pair of laterally movable gripping members, wedge members for closing the gripping members, bearing against the gripping members at the outer sides thereof, a movable support for

the wedge and gripping members, arranged to be engaged and moved by the wedge members after the gripping members have closed, means for holding said support stationary while the gripping members are closing, and means for subsequently releasing said support to permit it to move forwardly with the gripping members, together with means for actuating the wedge members, substantially as described.

5. In a metal working machine, a longitudinally movable support, gripping members mounted on the support and arranged to have lateral movement thereon relative to each other to grip and hold the stock, reciprocating wedge mechanism arranged to effect the relative lateral movement of the gripping members and also longitudinal movement of the support and gripping members, a driven shaft for actuating the wedge mechanism, and cam means on said shaft which hold the support against movement while the wedge mechanism is acting to close the gripping members, substantially as described.

6. In a metal working machine, a longitudinally movable support, gripping members mounted on the support and arranged to have lateral movement thereon relative to each other to grip and hold the stock, actuating mechanism arranged to effect the relative lateral movement of the gripping members and also longitudinal movement of the support and gripping members, a driven shaft, an actuating connection between the shaft and the gripper actuating mechanism, and stop means for holding the support against movement while the gripper actuating mechanism is acting to close the gripping members, substantially as described.

7. In a metal heading machine, a longitudinally movable support, means for alternately holding and releasing said support, a pair of gripping jaws mounted on said support for independent lateral movement, means for closing said jaws upon the blanks and for then causing them to move longitudinally with the support, a pivoted upsetting tool toward which the blanks are moved by the jaws, and an actuating connection between the upsetting tool and the support, substantially as described.

8. In a metal heading machine, a longitudinally movable support, means for alternately holding and releasing said support, a pair of gripping jaws mounted on said support for independent lateral movement, means for closing said jaws upon the blanks and for then causing them to move longitudinally with the support, a pivoted upsetting tool toward which the blanks are moved by the jaws, an actuating connection between the upsetting tool and the support, said pivoted upsetting tool being arranged to be held against movement, and the con-

nection between the tool and the support being a detachable one, substantially as described.

9. In a metal heading machine, means for
5 gripping a blank and moving it forwardly,
an upsetting tool mounted on a fixed pivot
toward which the severed blank is moved,
and positive actuating means for swinging
said tool on its pivot for imparting an
10 oblique striking blow to the blank as it is
moved thereto, substantially as described.

10. In a metal working machine, feeding
means comprising a pair of feed wheels hav-
ing complementary V-shaped grooves in
15 their peripheries forming a pass to receive
and feed a blank of substantially rectangular
cross-section in diamond-wise position in
respect to the axes of the feed wheels, each
wheel having oblique cutters projecting into
20 said grooves from one side thereof, with

cutting edges oblique to the axis of the feed
wheel, the cutters on the two wheels pro-
jecting from opposite sides of the grooves,
substantially as described.

11. In a metal heading machine, means 25
for gripping a blank and moving it for-
wardly, an upsetting tool mounted on a fixed
pivot toward which the severed blank is
moved, and a connection between the blank
gripping and moving means and the upset- 30
ting tool for swinging the tool on its pivot
to impart an oblique blow to the blank, as
it is moved thereto; substantially as de-
scribed.

In testimony whereof, I have hereunto set 35
my hand.

WILLIAM D. THOMAS.

Witnesses:

CHAS. F. BARR,
DAVID A. LYON.