

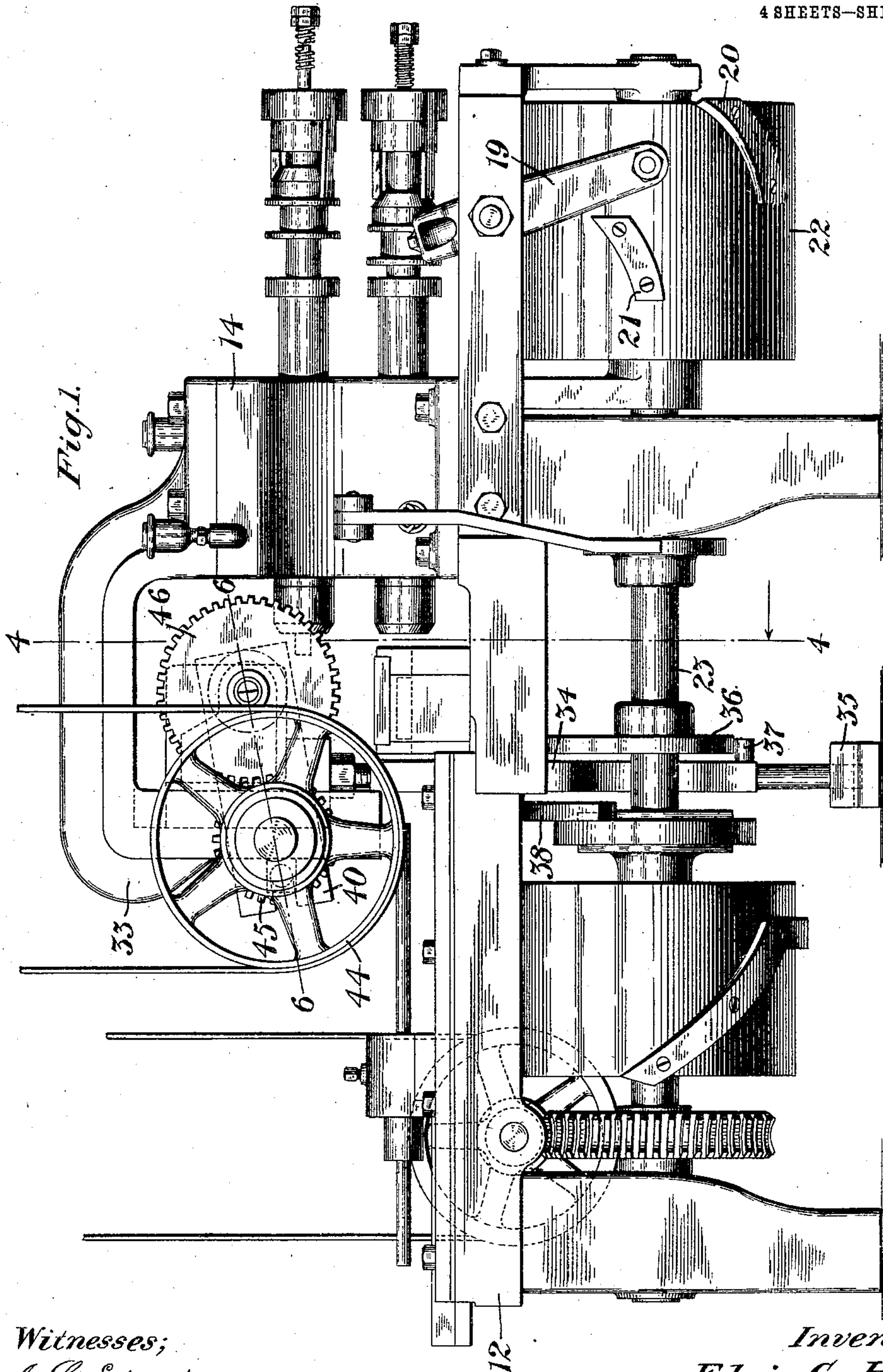
E. C. HENN.
BOLT MACHINE.

APPLICATION FILED AUG. 10, 1907.

965,184.

Patented July 26, 1910.

4 SHEETS—SHEET 1.



Witnesses;
J. L. Edwards.
H. D. Penney

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4 SHEETS—SHEET 2.

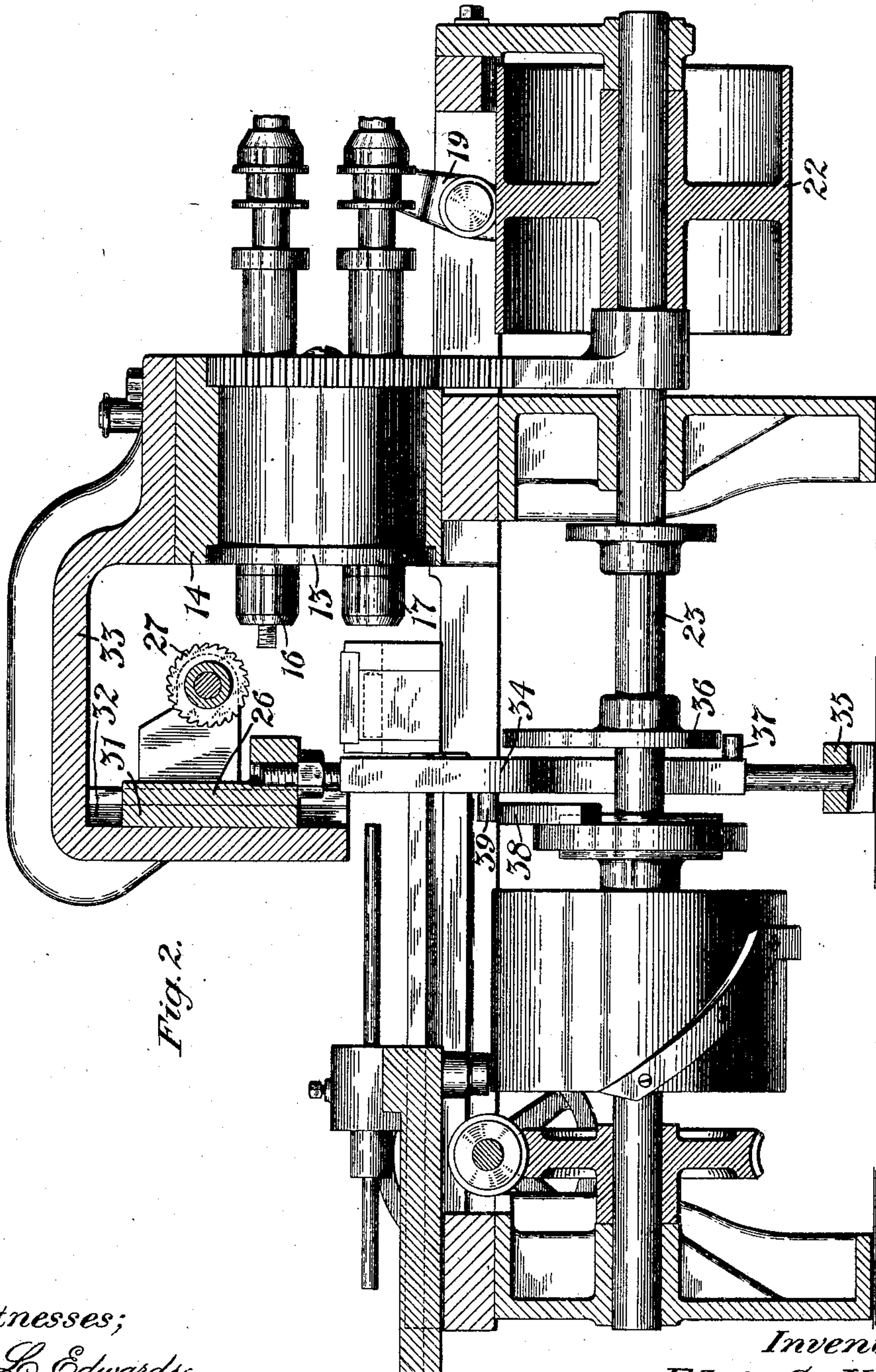


Fig. 2.

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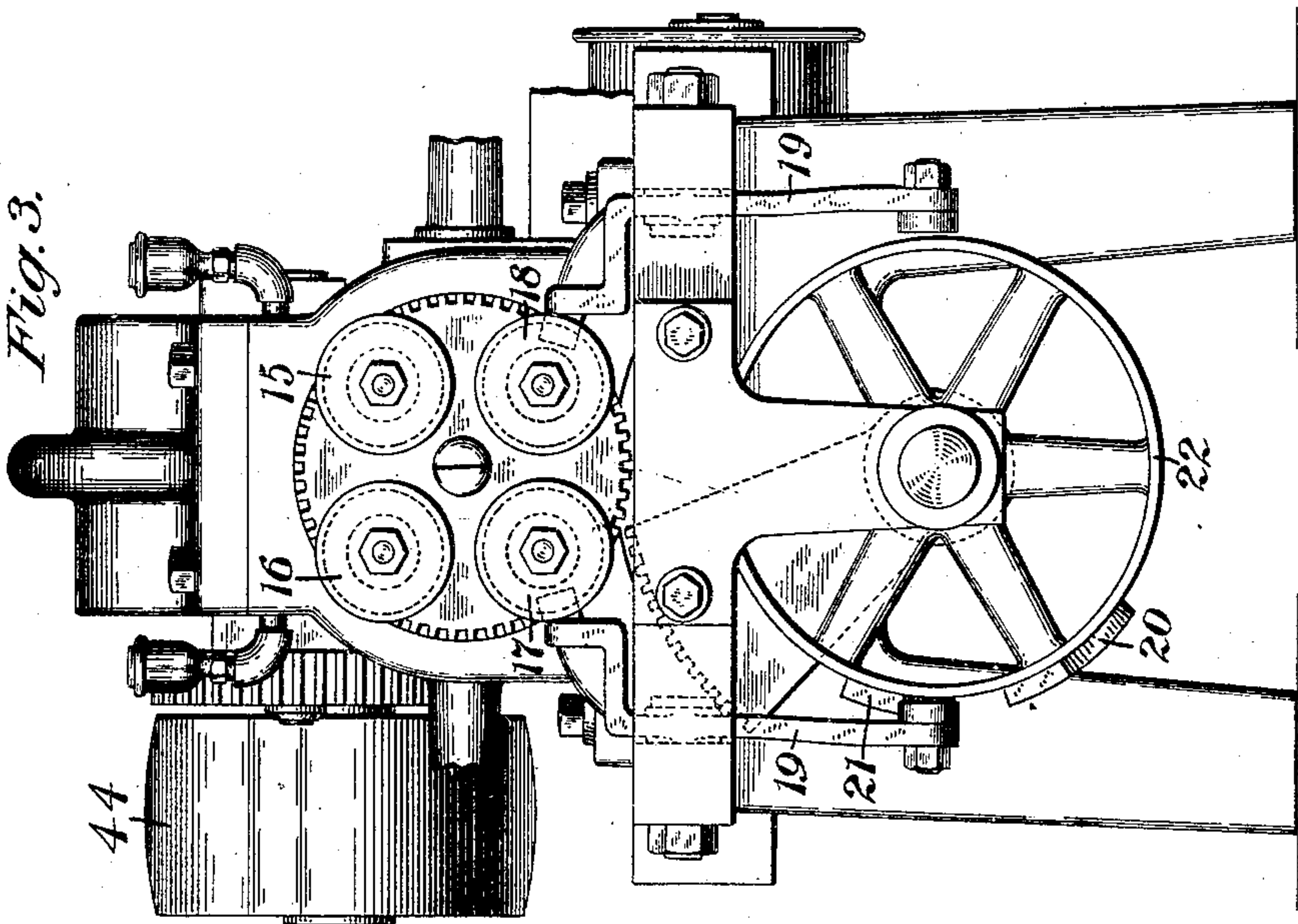
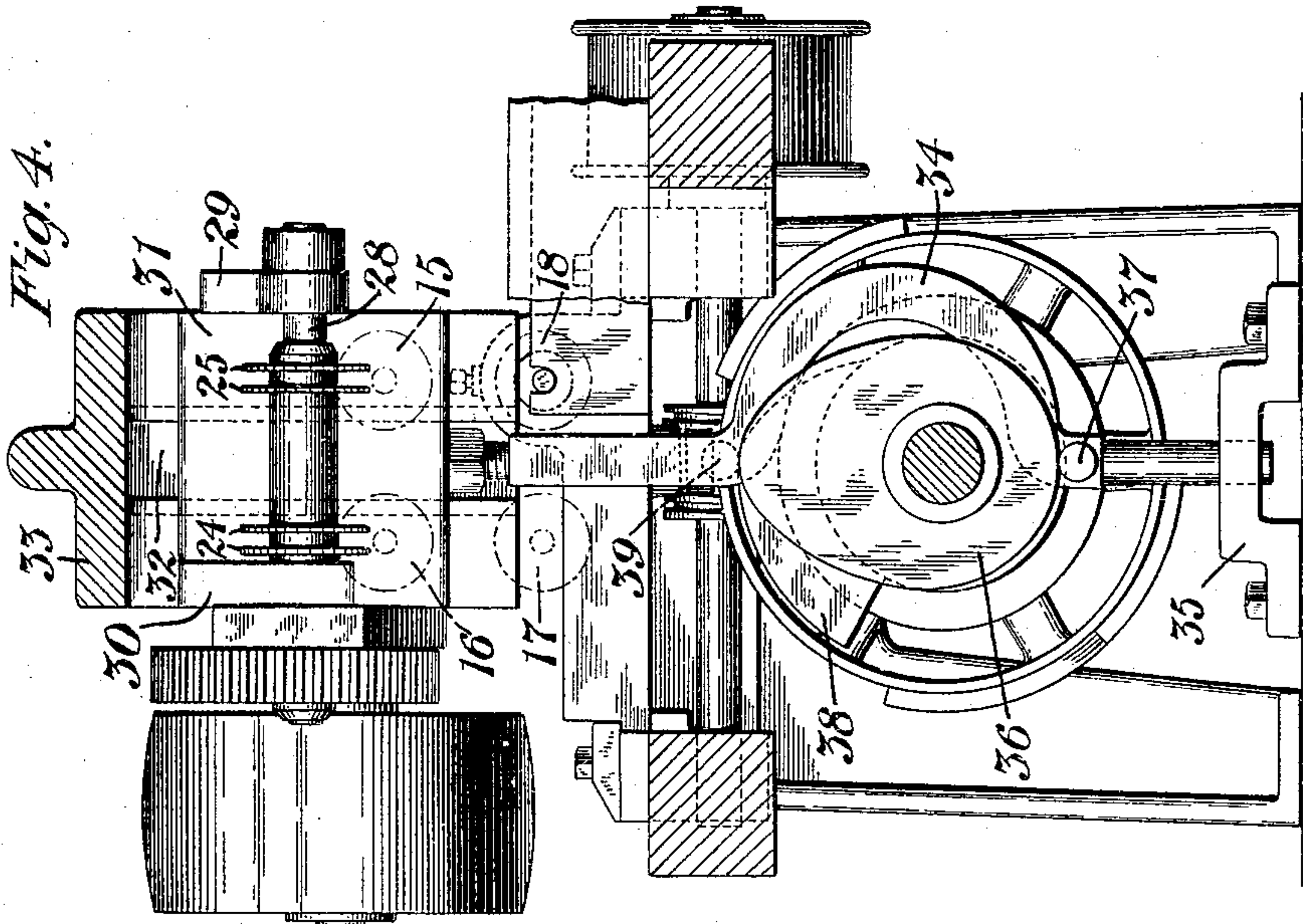
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

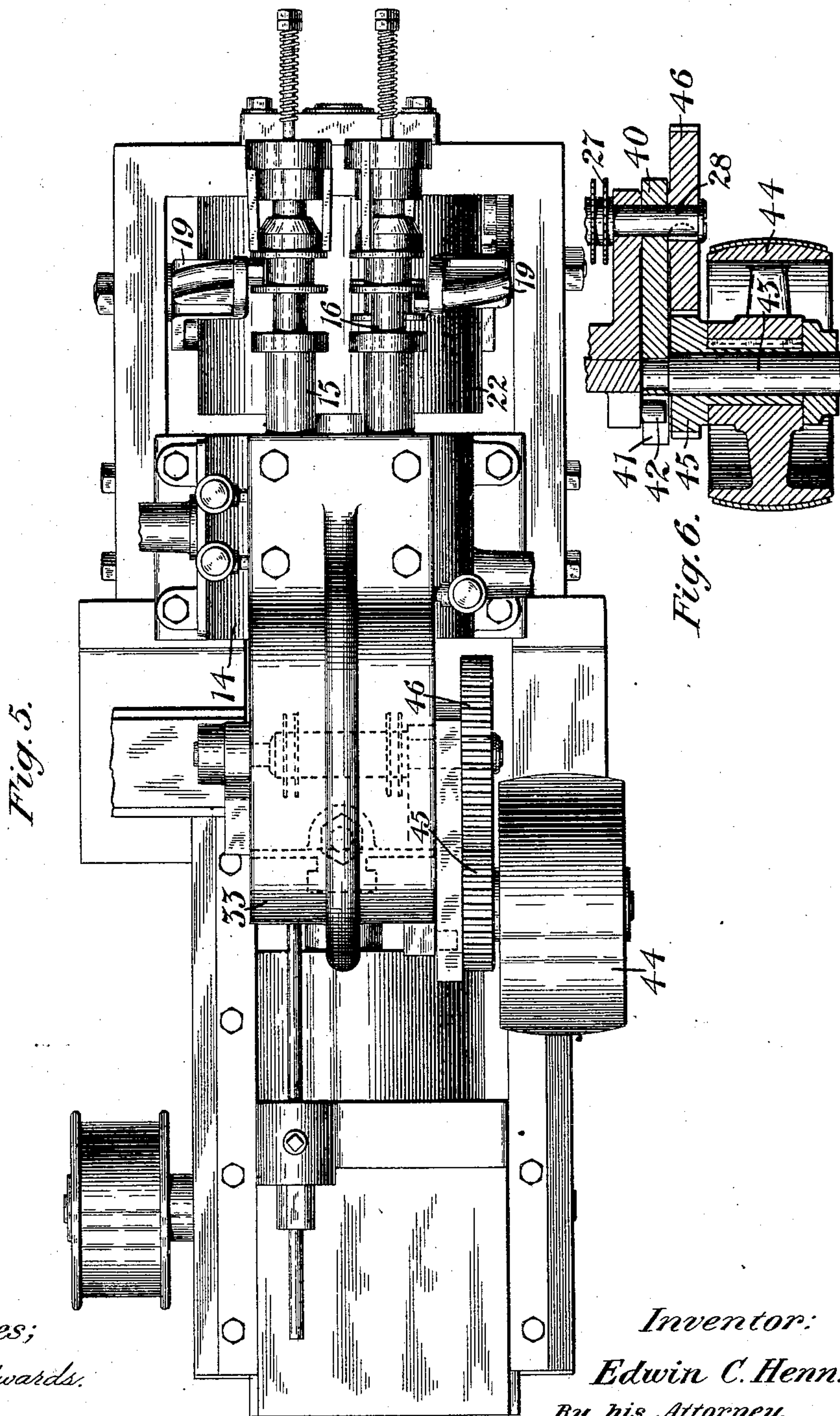


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

EDWIN C. HENN, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL-ACME MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

BOLT-MACHINE.

965,184.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWIN C. HENN, a citizen of the United States, residing in Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Bolt-Machines, of which the following is a specification.

This invention relates to machines for finishing the heads or ends of bolts, machine screws or the like.

The object of the invention is to provide an improved multi-spindle machine that will simplify and expedite such operation by a single reciprocating member operating on a plurality of bolts or articles at the same time and between the indexings of a head carrying a plurality of the articles.

A further object of the invention is to provide an improved means for supporting and operating a plurality of cutter members for the purposes indicated.

In the accompanying drawings, illustrating one embodiment of my invention, Figure 1 represents the machine in front elevation; Fig. 2 is a longitudinal vertical section through the machine; Fig. 3 is an end elevation; Fig. 4 is a section on the line 4-4 indicated in Fig. 1; Fig. 5 is a plan view; and Fig. 6 is a horizontal section on the line 6-6 indicated in Fig. 1.

The apparatus is shown as equipped for forming squared ends on bolts and as comprising a bed member 12, having a work carrier comprising a head or turret 13 suitably rotatable in a portion 14 of the frame. The head has a series of work holders or chuck members arranged in a circle, and which may comprise any suitable members for gripping the bolts or other articles to be operated upon. In the present instance four of such holders are provided, designated 15, 16, 17 and 18, arranged a quadrant distance apart. Suitable means, not shown, are provided for gripping and releasing the bolts at the proper time. These means may be operated by levers 19 pivoted on the frame and operated by straps 20 and 21 on a cam drum 22; the latter being fast on the main driving shaft 23.

A plurality of cutter members are provided and supported to reciprocate to engage a plurality of the articles in the holders. In the construction illustrated two pairs of cutters 24 and 25 are shown supported from a cutter carrier 26 arranged to

reciprocate transversely of the axis of rotation of the center of the cutter to bring the cutter members to engage respectively with the bolts in two holder members, preferably with the two upper or horizontal ones, in the positions of 15 and 16 shown in Fig. 3. The cutter carrier will reciprocate transversely of the axis of rotation of the turret. The carrier member is automatically reciprocated between the successive advancements or indexings of the turret, which will be for a quarter turn where four holders are employed.

In the construction illustrated each cutter member comprises a pair of cutters 27, that are spaced the distance apart of the opposite faces to be formed on the bolts; whereby when the carrier is reciprocated the cutters will operate on the bolts on opposite longitudinal sides to form two parallel faces. After such reciprocation, as indicated in Fig. 4, upon the quarter indexing of the head, the bolt in holder 15 will be advanced from the cutter 25 to the cutter 24, while the bolt in holder 18 will be advanced to the position to be operated upon by the cutter 25 at the next operation. The next reciprocation of the carrier will cause the bolt in the holder 16 to be faced on opposite sides by the cutter 24. Now, when the bolt was in the position of holder 15 and had two opposite faces formed thereon and thereupon the holder advanced a quarter turn, those faces that were vertical when formed are turned through ninety degrees, and when brought to the position of holder 16 will lie horizontally. Therefore the operation of the cutter 24 upon the bolt is to form two new opposite parallel faces that extend at right angles to the faces previously formed. In other words, the bolt is now squared, or has a square head or end portion formed thereon. Each succeeding indexing of the head and reciprocation of the cutters will bring a fresh bolt to be operated upon by the first cutter 25, while the bolt acted upon by this cutter will be turned through ninety degrees and then operated upon by the second cutter and have its head finished. When the holder arrives at the position of 17, the bolt or article is removed or ejected by any suitable means. And in the position of the holder 18 a fresh bolt may be inserted in the holder. Of course, various forms of heads, such as hexagonal, octagonal, or polygonal,

may be formed instead of slabbing the surface at right angles.

Suitable means are provided for automatically reciprocating the carrier for the cutters, timed relative to the indexing of the head, to operate on each bolt between successive indexings. Means are also provided for preferably causing a constant rotation of the cutter members throughout their reciprocation. In the construction illustrated the cutter members 24 and 25 are secured on a short shaft 28 rotatable in two bearing blocks 29 and 30, fast to a carrier slide 31 that is guided in ways 32 in an overhanging bracket 33 secured to the frame portion 14. The axis of the shaft 28 is disposed transversely of the axis of rotation of the turret and transversely of the line of the path of reciprocation of the cutter carrier. An operating bar 34 is secured to the slide 31 and has its lower extremity guided in an aperture in a block 35 on the base or floor. The main shaft 23 carries a cam 36 that engages a pin 37 on the bar 34 that serves to move the bar and carrier downward; while a second cam 38 on the driving shaft engages a second pin 39 on the bar 34 and thereby elevates the bar and carrier, the cams being arranged to cause the reciprocation of the carrier at the proper time.

In the present improvement, in view of the fact that the cutters reciprocate and also rotate simultaneously, it is essential that the reciprocatory movement of the cutters will not interfere with the means for transmitting rotary movement thereto. In other words, as the rotary movement of the cutters is in the present improvement imparted by means of a belt and pulley, which latter is carried on the cutter carrier, it is essential that the reciprocatory movement of such carrier shall not appreciably affect the position of the pulley, and for this purpose improved means is provided for imparting rotary movement to the cutters during the reciprocatory movement thereof, and this comprises, in the form shown, a block or member 40 which has a slot 41 at one end into which extends a pin 42 fast to the bracket 33. The block 40 has an aperture through which extends one end of the shaft 27 carrying the cutters, as shown in Fig. 6. When the carrier 26 is reciprocated, the shaft engaging the block will cause it to swing on the pivot 42 as an axis, and the slot will permit a slight endwise movement of the block therein, since its aperture, engaged by the shaft, moves in a straight line by the reciprocation of the carrier. The block 40 has a pin 43 on which rotates a pulley 44, to which is fastened a gear 45. A gear 46 is located on the end of the shaft 27 and meshes with the gear 45 by which the shaft 27 and the cutters are rotated from the pulley 43.

It will be seen that the axis of the pulley

43 is a very short distance from the pivotal axis of the block 40, so that the pulley can be driven by a belt from an overhead driving pulley. And the two gears being fast on the block 40 will always remain in mesh and serve to constantly drive the cutter members.

It will be observed that in the present improvement the cutter carrier is located to reciprocate in a vertical path in front of the work carrier and transversely of the axis of the work holders, and by means of this improved organization the cutters are brought into engagement with the work at the side thereof instead of at the end and therefore will cut the full depth of the head or work from start to finish, in other words, will slab off only that amount of metal which it is desired shall be removed to form the head, leaving an angular shoulder entirely across the slabbed portion.

I claim as my invention:

1. In a machine of the class described having a work holder, the combination of a cutter carrier supported to reciprocate toward and from the work holder, means for reciprocating the carrier, a shaft rotatably supported on the carrier and having a cutter thereon, a member pivoted at one end on a fixed support and having its other end engaging said shaft, a pulley rotatably supported on said member, and a pair of meshing gears one connected with said pulley and one with said cutter shaft, whereby the cutter is driven from said pulley during the reciprocation of the carrier.

2. The combination with a driving shaft, of a work carrier provided with a work holder, a cutter carrier supported in front of said work carrier for reciprocatory movement, a shaft mounted thereon, a cutter on said shaft, means for reciprocating said cutter carrier, and power transmitting means carried by the cutter carrier for rotating the cutter and including a driving pulley, said means being organized to permit the reciprocation of said cutter simultaneously with its rotation without appreciably affecting the position of said pulley and comprising a member pivoted at one end to a fixed part of the machine and having its other end in engagement with the cutter shaft and on which said pulley is rotatably supported, and intermeshing gears connected one with the pulley and the other with said cutter shaft.

3. An attachment for a machine of the class described, comprising a bracket, a sliding cutter carrier thereon having means for the attachment of reciprocating means therefor, a shaft rotatably supported on said sliding carrier, one or more cutters thereon, and power transmitting means carried by the cutter carrier for rotating the cutter or cutters and comprising a member pivoted at

one end on said bracket and having its other end engaging the cutter shaft, a pulley rotatably supported on said member, and meshing gears connected with said pulley and cutter shaft, whereby the cutter or cutters may be driven from said pulley during the reciprocation of the cutter carrier.

4. The combination with a frame, of a carrier supported to reciprocate on the frame, a shaft rotatably mounted on the carrier and having cutters thereon, a member pivoted on said shaft at one portion and having an opening at another portion, a fixed pivot projecting into said opening in the latter member whereby the member will be oscillated on the pivot by reciprocation of the carrier, and at the same time will have an endwise movement permitting relative approach and recession of the shaft and the pivot, a driving member pulley carried by the said member, and means for rotating said shaft from the driving pulley.

5. The combination with a frame, of a

carrier supported to reciprocate on the frame, a shaft rotatably mounted on the carrier and having cutters thereon, a member pivoted on said shaft at one portion and having an opening at another portion, a fixed pivot projecting into said opening in the latter member whereby the member will be oscillated on the pivot by reciprocation of the carrier, and at the same time will have an endwise movement permitting relative approach and recession of the shaft and the pivot, a driving pulley mounted on said member in proximity to said pivot and carrying a gear, and a gear on the said shaft meshing with said gear whereby the cutter shaft is continuously driven from the driving member during reciprocation of the carrier.

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Witnesses:

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