

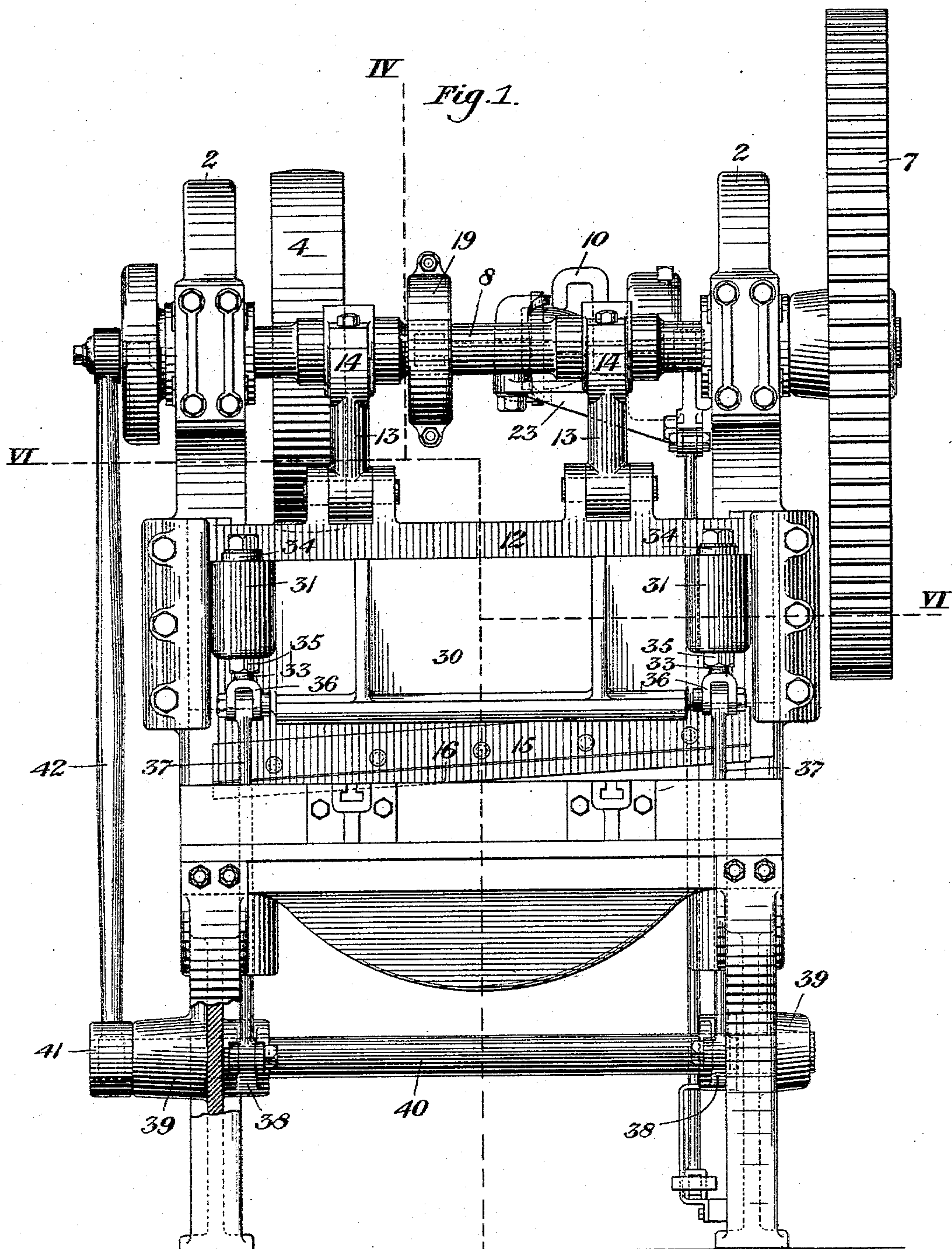
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5 Sheets—Sheet 1.

G. MESTA.
DOUBLING AND SHEARING MACHINE.

No. 494,819.

Patented Apr. 4, 1893.



WITNESSES

W. T. Corwin
H. M. Corwin

INVENTOR

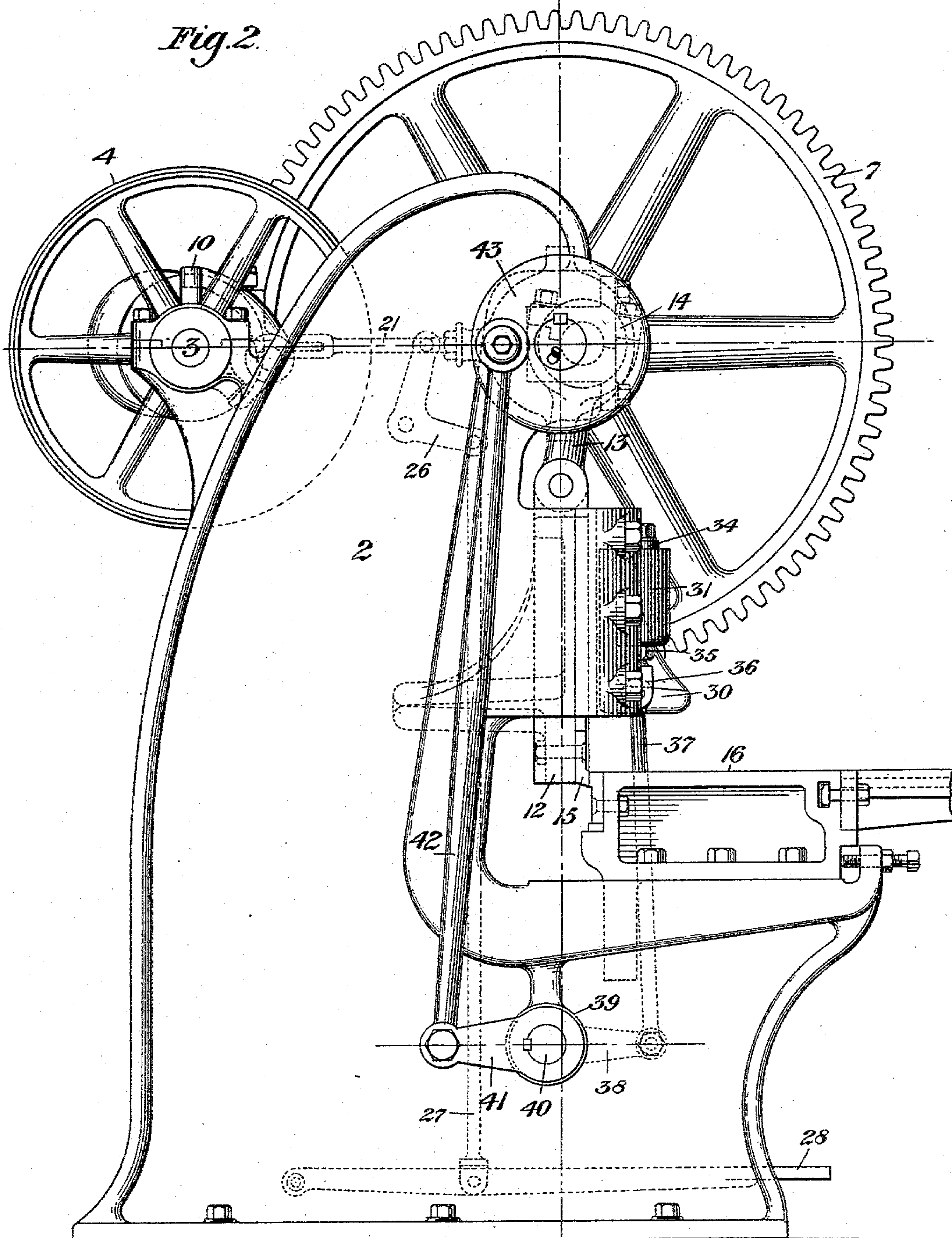
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Fig. 2.



WITNESSES

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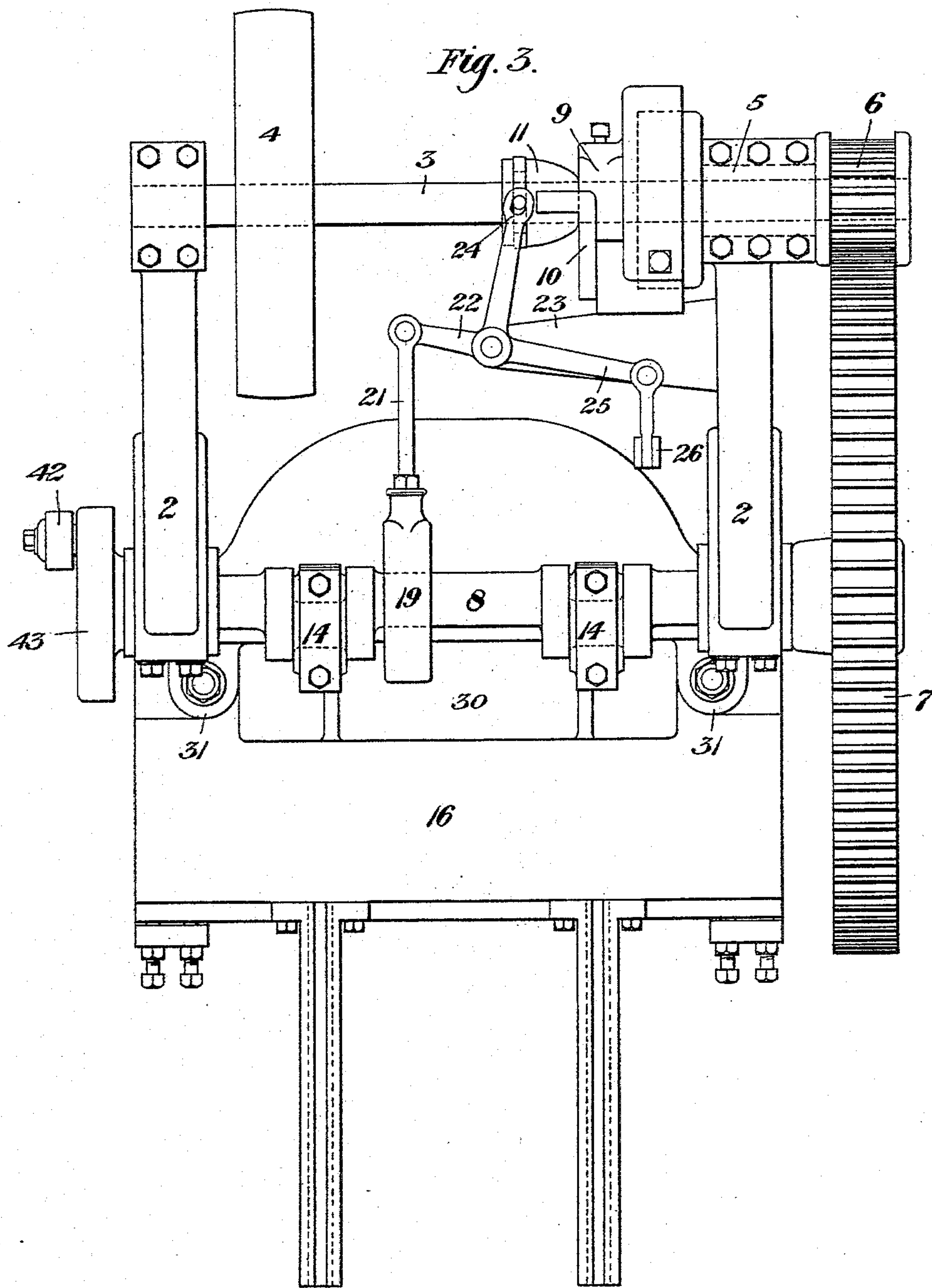
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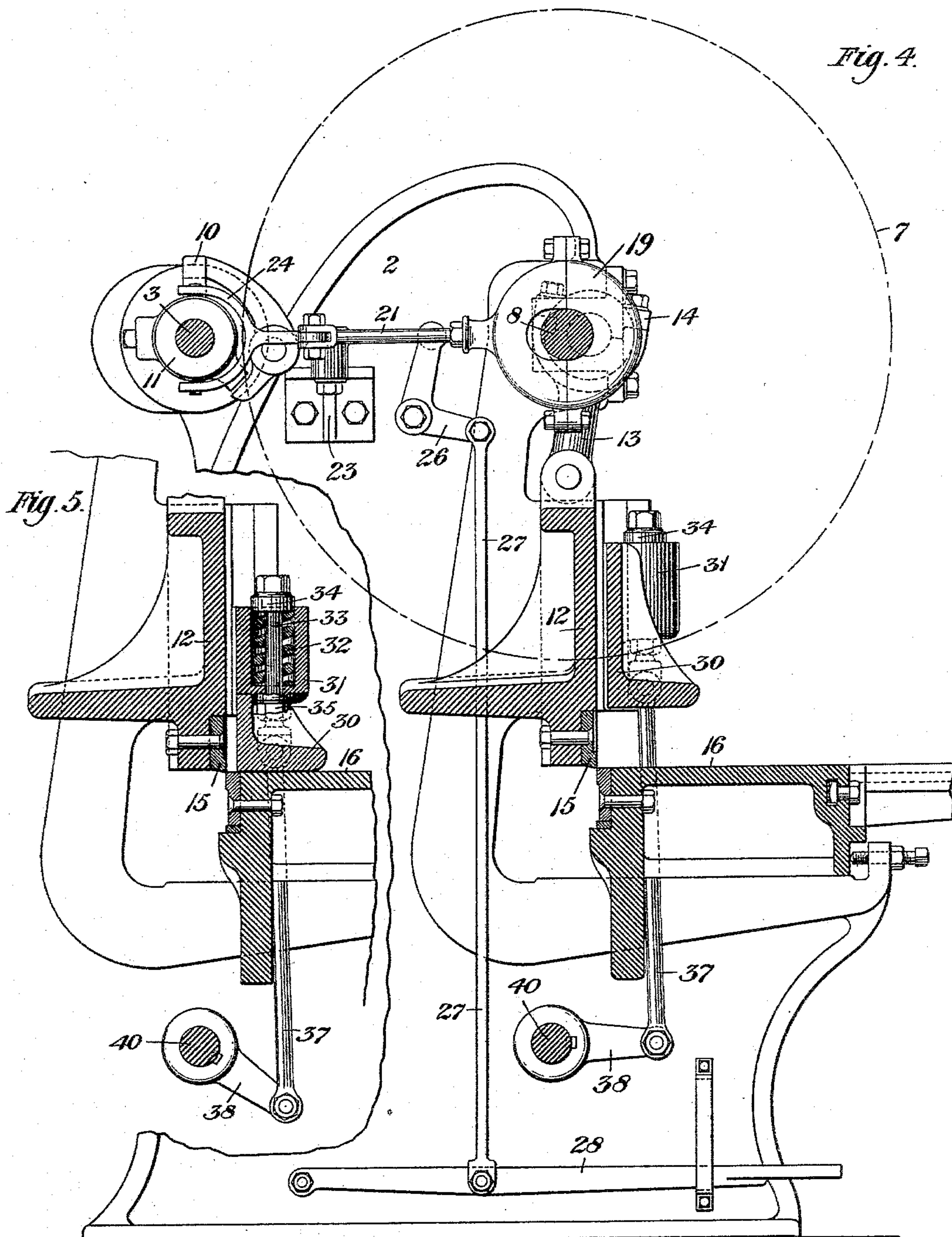
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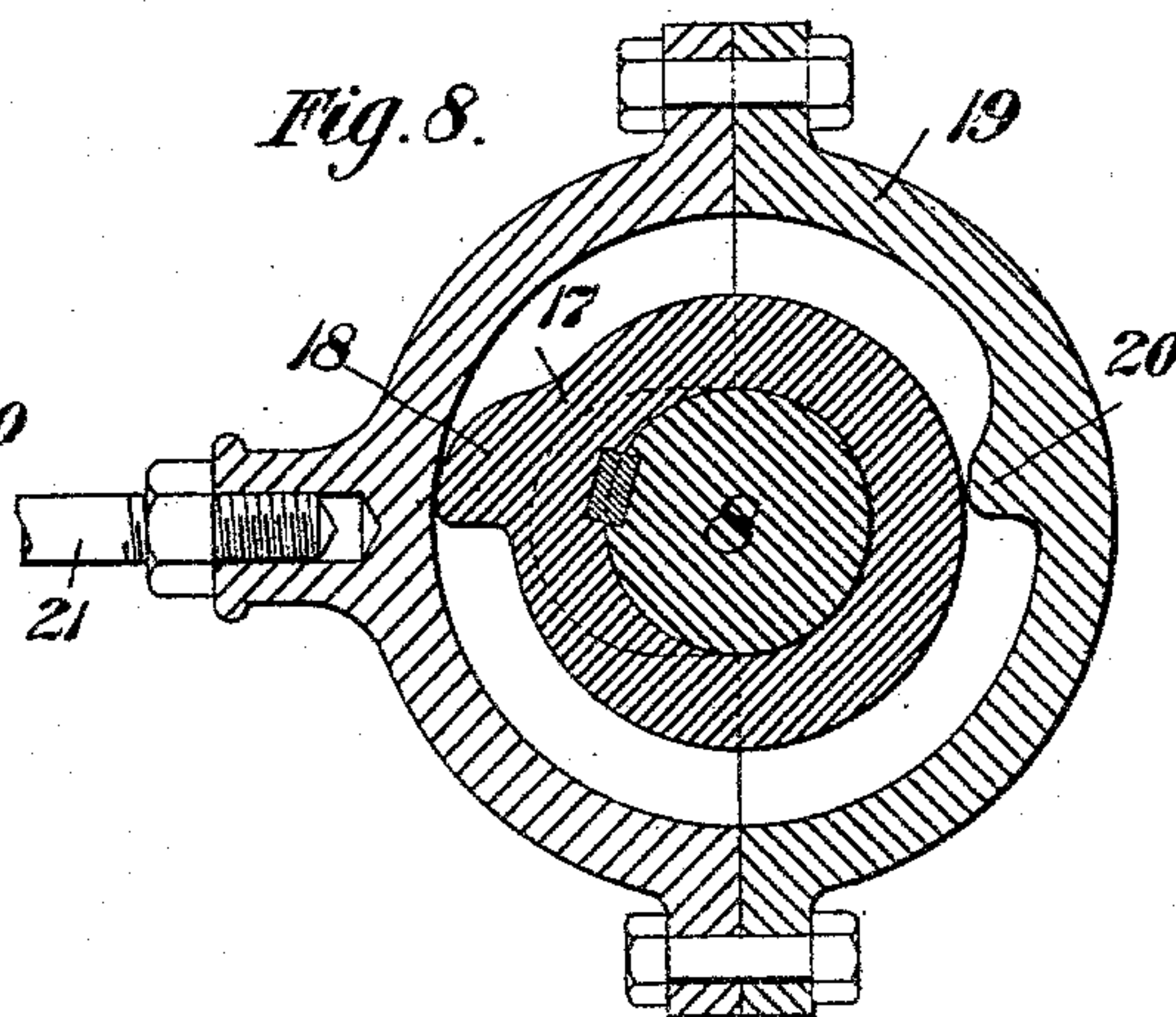
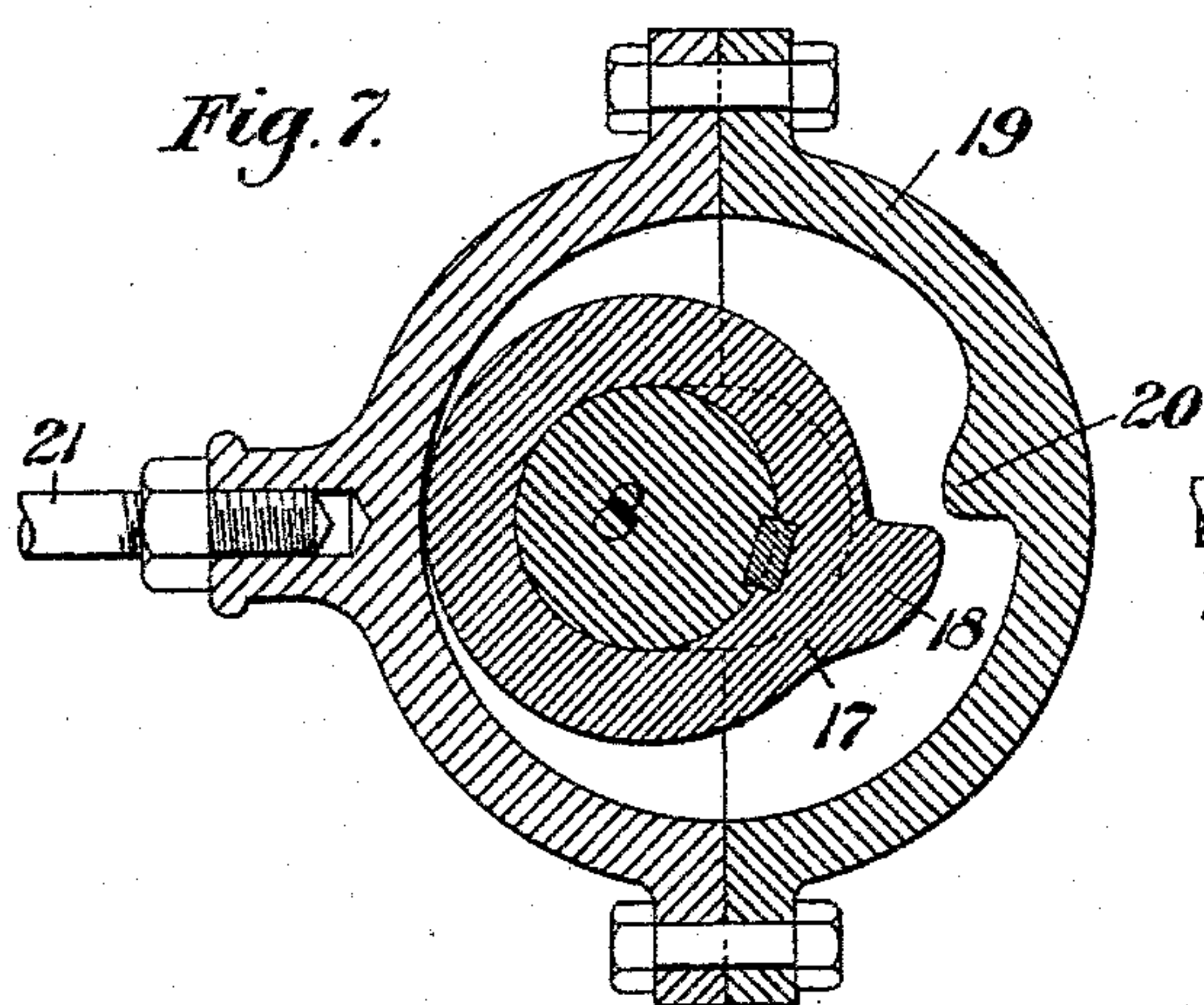
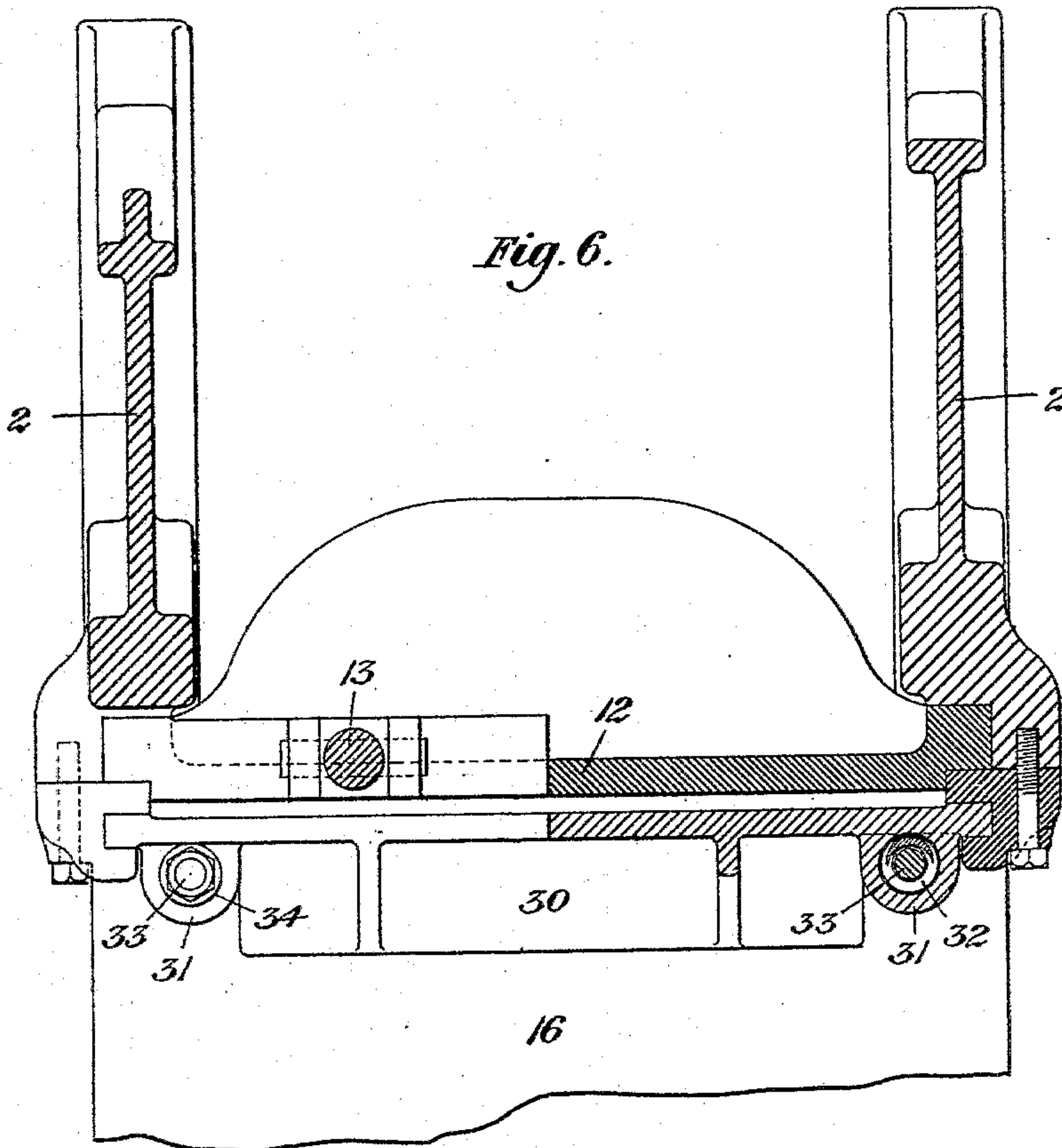
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Patented Apr. 4, 1893.



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UNITED STATES PATENT OFFICE.

GEORGE MESTA, OF PITTSBURG, PENNSYLVANIA.

DOUBLING AND SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,819, dated April 4, 1893.

Application filed January 19, 1893. Serial No. 458,966. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MESTA, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Doubling and Shearing 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 front elevation of my improved machine. Fig. 2 is an end elevation of the same. Fig. 3 is a plan view. Fig. 4 is a vertical sectional view on the line IV—IV of Fig. 1. Fig. 5 is a detail view of the same. Fig. 6 is a horizontal sectional view on the line VI—VI of Fig. 1; and Figs. 7 and 8 are sectional views of the cams which operate the clutch head.

Like symbols of reference indicate like parts in each of the figures.

Heretofore, as generally constructed, machines for doubling and shearing sheet metal, known as crocodile shears, have had the doubling-arm connected with the rear end of the knife-jaw, so that the doubling of the metal was done by the reverse movement of the jaw. This construction is objectionable in that the feed to the doubling-arm is at right angles to the feed to the shearing-knife, and also because a special form of table is required, and the cutting and shearing mechanisms have been inseparable from each other.

The object of my invention is to provide a combined doubling and shearing machine in which the line of feed to the doubling-head is the same as the line of feed to the shearing-knife, and in which the doubling-head and shearing-knife have operating mechanism independent of each other, and in which the doubling mechanism is separable from the shearing mechanism so that the machine may be employed as a combined doubling and shearing machine, or merely as a shearing machine when the doubling mechanisms is detached.

I will now describe my invention so that others skilled in the art may manufacture and use the same.

In the drawings, 2 is the frame of the machine, at the rear of which is journaled the power-shaft 3, having a belt-wheel 4, by means of which power from the engine is applied.

Keyed or secured to a sleeve 5, which fits loosely on the shaft 3, is a pinion 6, which gears with the toothed wheel 7 which is keyed to the shaft 8. Power is applied to the pinion 6 from the shaft 3 by a clutch, which may be of any suitable make, one part 9 of which is keyed to the shaft 3, and is adapted to engage with the sleeve 5. A loose head 11, on the shaft 3, serves to throw the lever 10 of the clutch and make and break connection with the sleeve 5. Fitting in slide-ways in the frame 2 is the vertically reciprocating knife-head 12, which is pivotally supported by the wrists 13, which wrists are at their other ends provided with cranks or eccentric collars 14 on the shaft 8. Bolted to the lower part of the head 12, is the guillotine-knife 15, arranged to shear the metal along the edge of the table 16. Keyed to the shaft 8 is a cam 17 (see Figs. 7 and 8) having a nose or projection 18. Surrounding this cam is the collar 19, having on its inner face a projection 20. Connected with the collar 19 is the arm 21, which at its outer end is pivoted to the end of a bell-crank-lever 22, which lever is pivoted to the bracket 23, and the outer end of the other arm of which is provided with a yoke 24, which is loosely connected with the head 11, which throws the clutch in and out of gear. By this arrangement, as soon as the shaft 8 has made one revolution which causes the knife 15 to descend and ascend, the cam projection 18, engaging and passing the projection 20, pushes the head 19 and arm 21 forward, which operates the crank-lever 22 and disengages the clutch from the sleeve 5, thereby cutting off power from and stopping the movement of the shaft 8. Pivoted to a third arm 25 of the bell-crank-lever 22, is the vertical bell-crank-lever 26, the other arm of which bell-crank-lever is pivoted to the rod 27, the lower end of which is pivoted to the treadle 28. By these devices, when the workman places his foot on the treadle, he draws the arm 25 forward and pushes the clutch into gear with the sleeve 5, which causes the shaft 8 to make another revolution until the cam projection 20 in the collar 19 is again brought against the projection 18 of the cam 17, when the power is again automatically cut off from the shaft 8, the knife having completed its stroke.

Situate in front of the knife-head 12, and

arranged to reciprocate in vertical slide-ways, is the doubling-head 30, the purpose of which is to double the sheet metal. On the front portion of this head are two boxes 31 containing the spiral springs 32, through which and through the boxes 31 extend the sliding bolts 33, having heads or collars 34, which bear on the springs 32 and heads or collars 35 below the boxes 31. At the lower ends of the bolts 33 are eyes 36 to which are pivoted the rods 37, the lower ends of which rods are pivoted to the lever-arms 38, which lever-arms are pivoted to the shaft 40 bearing in brackets 39 extending from the frame 2. At the outer end of the shaft 40 is keyed the crank-arm 41, to which is secured the lower end of the connecting rod 42, the upper end of which rod is pivoted eccentrically to the disk 43 which is keyed to the shaft 8. By these devices, power is transmitted from the shaft 8 to the head 30, causing it to make a complete downward and upward movement on each revolution of the shaft.

The operation is as follows:—The sheet metal to be doubled is placed on the table 16 under the doubling-head 30, which is then caused to descend on and double the metal by the workman pressing down the treadle 28, which throws the clutch-head 11 under the lever 10 of the clutch, and thereby connects the shaft 3 with the sleeve 5 and pinion 6 which impart power to the shaft 8 through the wheel 7. As the wheel or disk 43 makes its revolution with the shaft 8, the head 30 is caused to descend on and double the sheet metal and then ascend to its upper position, when, the cam 17 operating the clutch-head 11, power is cut off from the shaft 8. The metal thus doubled may then be pushed forward under the knife 15, and power is again imparted to the shaft 8, which causes the knife-head 12 and doubling-head 30 to again descend and shear the doubled metal. The purpose of the springs 32 is to prevent injury to the parts should the head 30 meet an obstruction in doubling the metal, in which case the head would remain stationary, the bolts 33 compressing the springs 32 in the boxes 31. Should it be desired to use the machine merely for

shearing, the doubling-head 30, and the rods 37 and 40 may be detached and removed.

The advantages of my improvement will be apparent to those skilled in the art. The line of feed to the doubling-head and knife being in the same line, the operation is rapid and the metal may be fed accurately without trouble, and owing to the automatic cut-off of power from the heads, the operation is much more certain. It is also a great convenience to be able to use the apparatus, when desired, for shearing only, the doubling-head being removed and out of the way.

It is evident that the automatic cut off may be applied to cutting and punching devices differing somewhat from that herein described.

Instead of the doubling-head described, the same mechanism may be used with a head for holding the metal plate while it is being cut.

I claim as my invention—

1. In a shearing and doubling machine, the combination of a doubling table a knife-head and a doubling-head situated parallel to each other, and at right angles to the line of feed on the table a shaft for operating the heads, and mechanism for connecting the doubling-head with the shaft; substantially as described.

2. In a shearing or doubling machine, the combination of the reciprocating head, a shaft for operating the head, a clutch for communicating power to the shaft, a cam and cam yoke situate on the shaft, and levers connecting the cam-yoke with the clutch; substantially as described.

3. In a shearing and doubling machine, the combination of a knife-head connected with a power shaft, a doubling-head connected with the shaft by separate detachable devices, and a spring or springs by which the doubling-head is connected with the operating mechanism; substantially as described.

In testimony whereof I have hereunto set my hand.

GEORGE MESTA.

Witnesses:

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H. M. CORWIN.