

No. 815,845.

PATENTED MAR. 20, 1906.

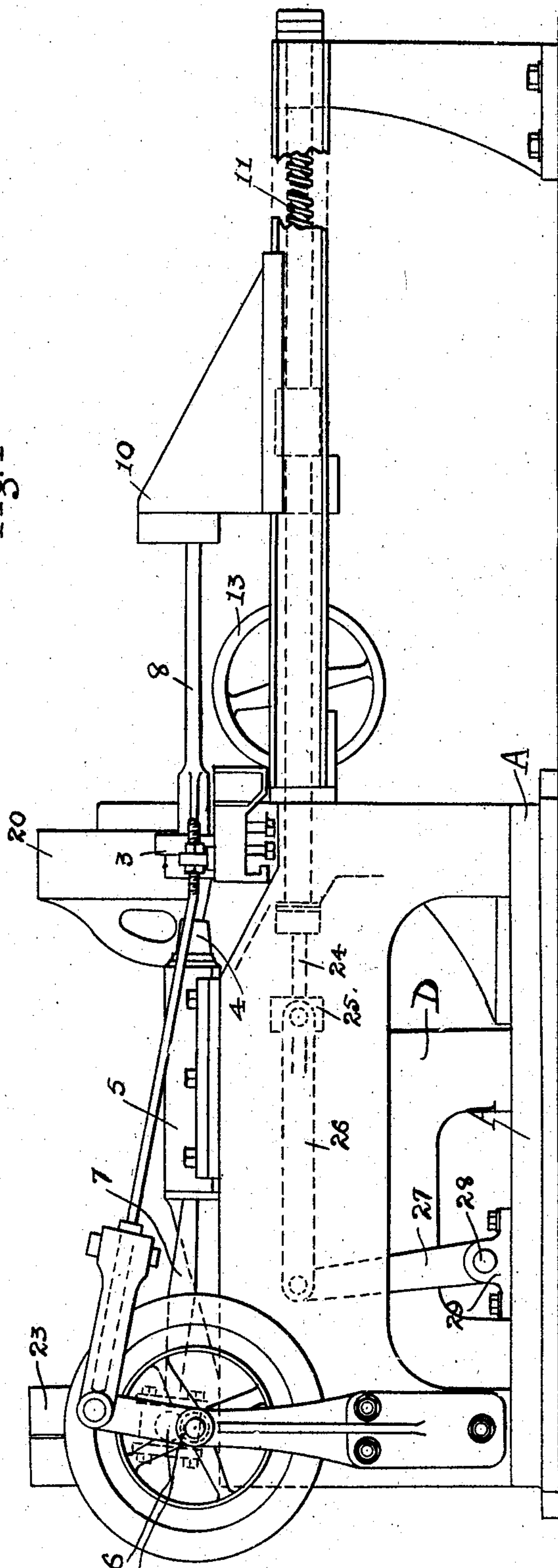
W. P. LIGHTBODY.

MECHANISM FOR SHAPING AND SWAGING ROCK DRILLS.

APPLICATION FILED JULY 2, 1904.

4 SHEETS—SHEET 1.

Fig. 1



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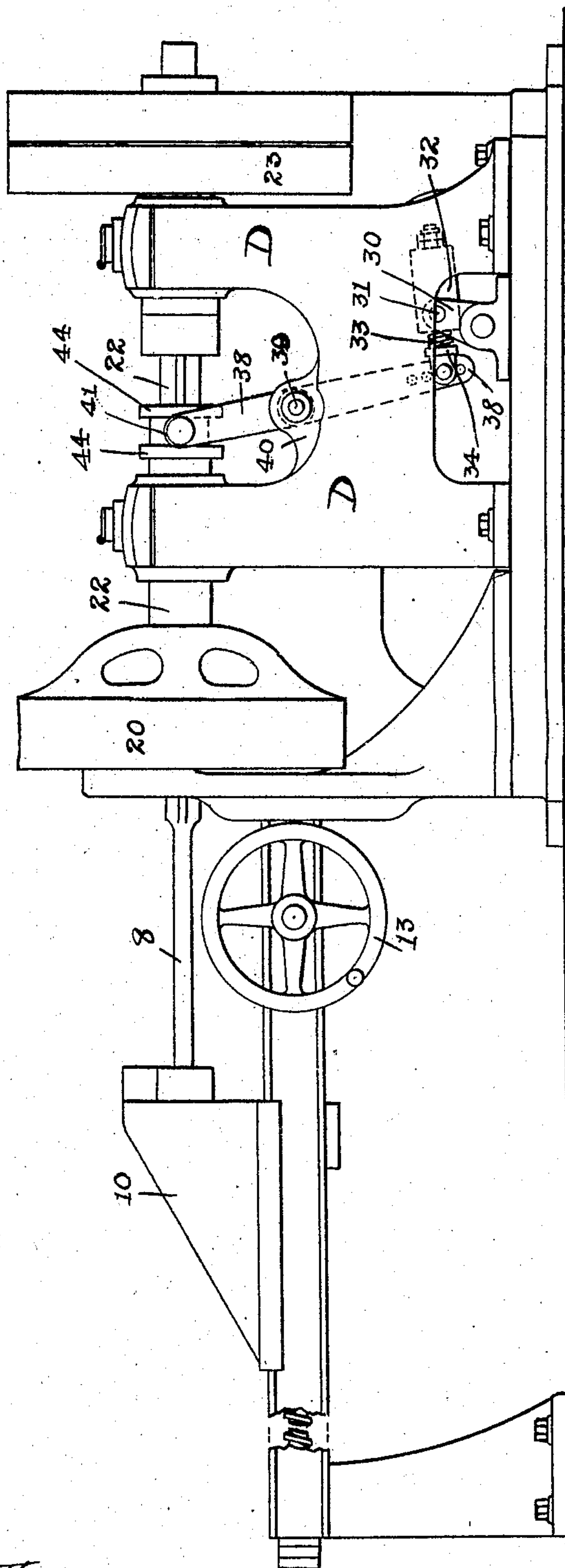
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4 SHEETS--SHEET 2.

Fig. 2



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4 SHEETS—SHEET 3.

Fig. 8

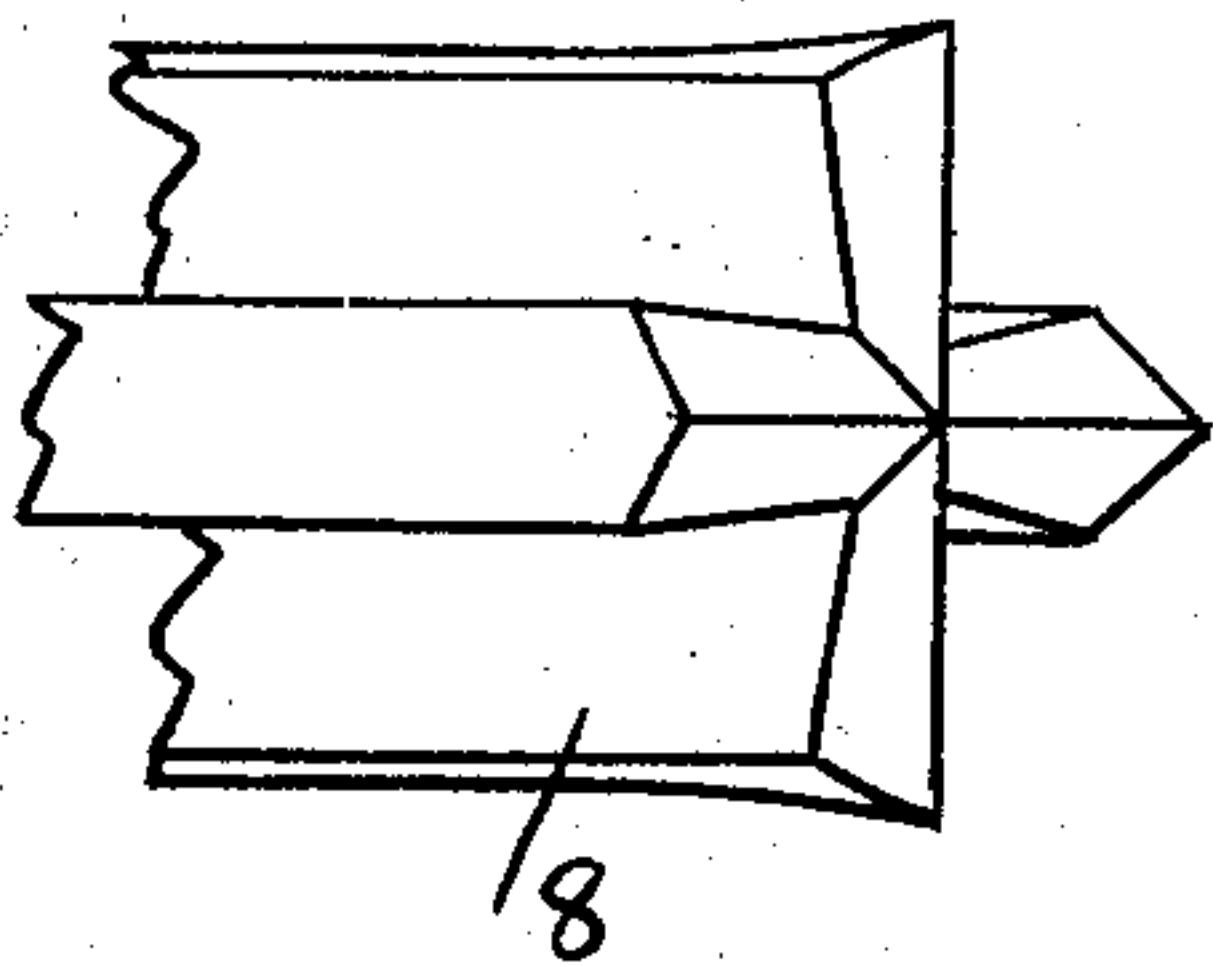
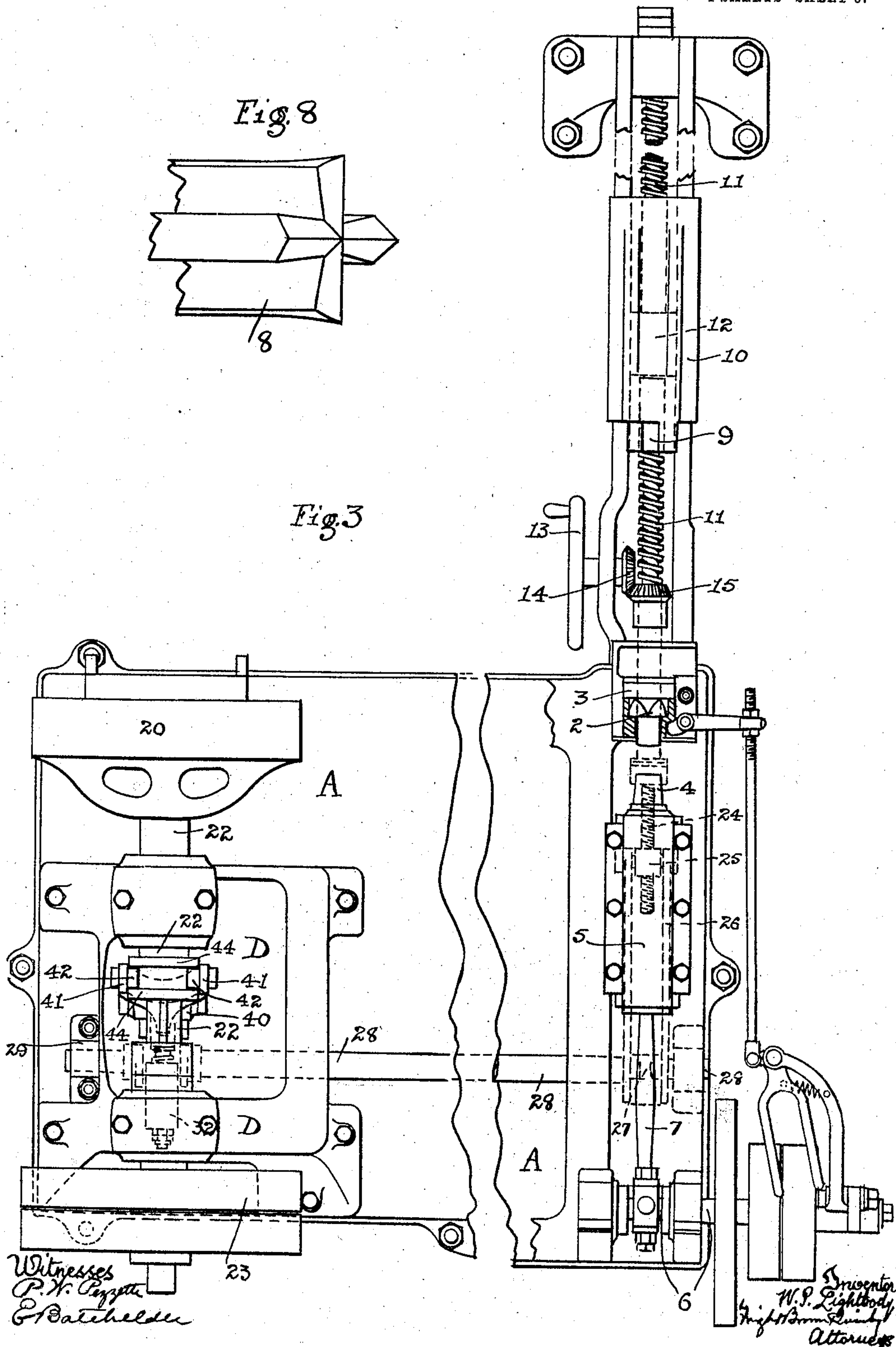


Fig. 3





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4 SHEETS—SHEET 4.

Fig 5

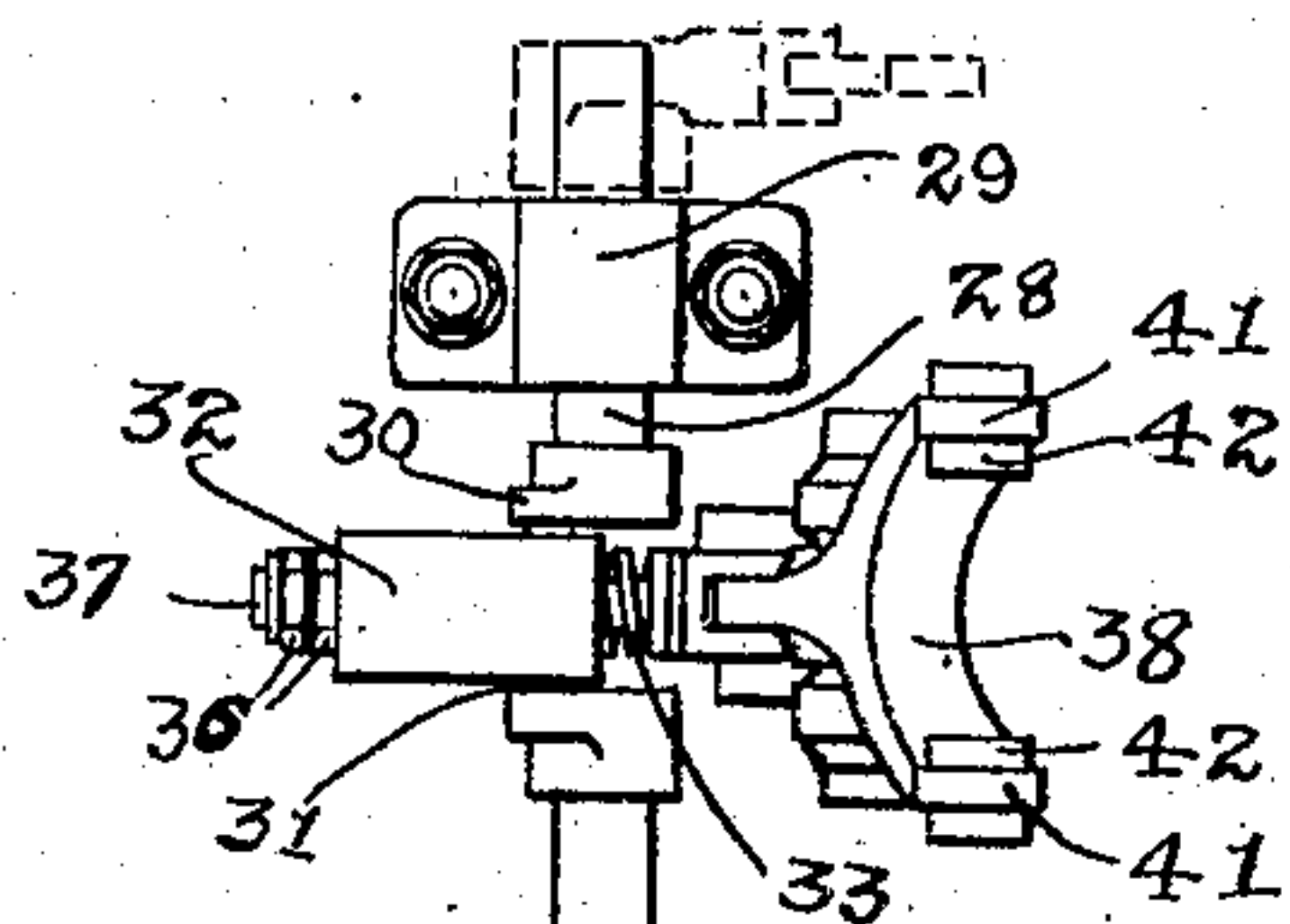
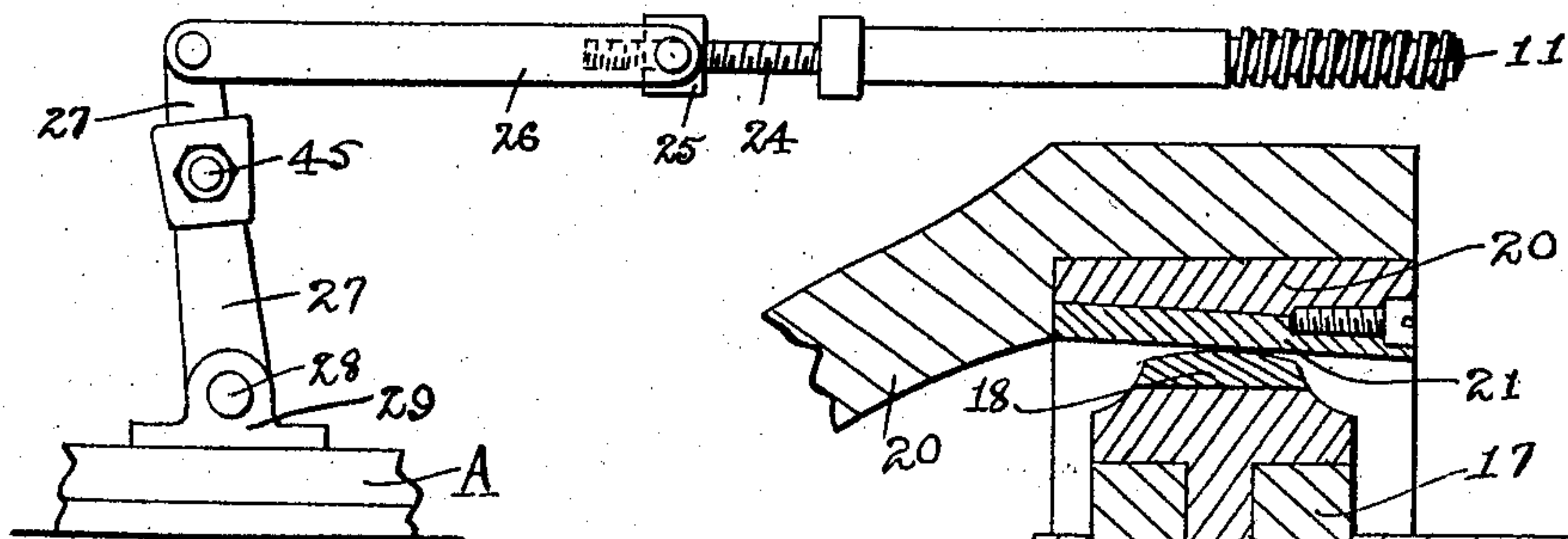


Fig 4

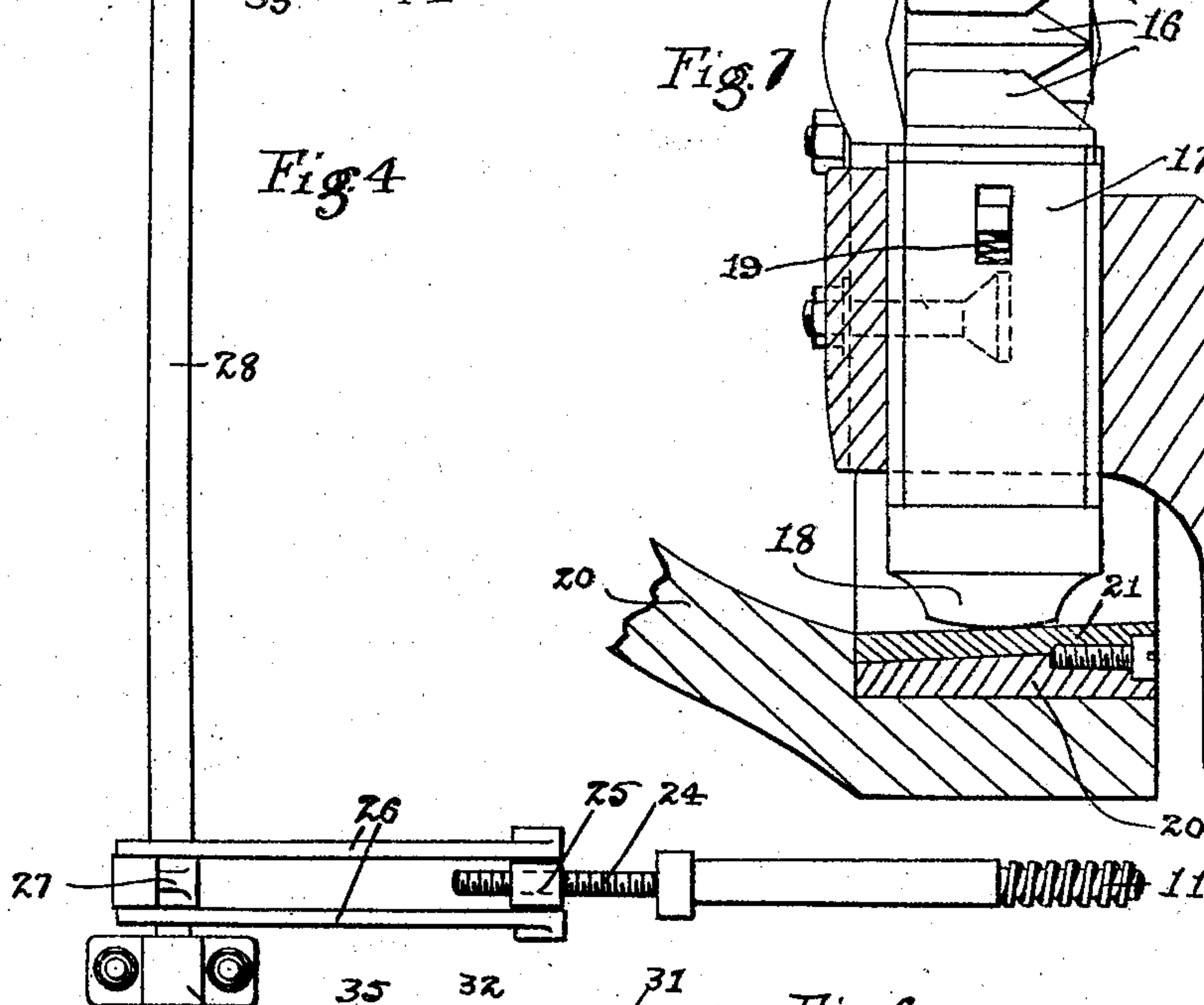


Fig. 6

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# UNITED STATES PATENT OFFICE.

WILLIAM PARR LIGHTBODY, OF JOHANNESBURG, TRANSVAAL.

## MECHANISM FOR SHAPING AND SWAGING ROCK-DRILLS.

No. 815,845.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed July 2, 1904. Serial No. 215,142.

*To all whom it may concern:*

Be it known that I, WILLIAM PARR LIGHTBODY, a subject of the King of Great Britain, and a resident of Langlaagte Deep, (Box 1056,) Johannesburg, Transvaal, but at present of Beehive Works, Bolton, in the county of Lancaster, England, have invented certain new and useful Improvements in Mechanism for Swaging and Shaping Rock-Drills, of which the following description, together with the accompanying sheets of drawings, is a specification.

My invention relates to improvements in mechanism for use in the process of sharpening rock-drills of the class wherein the cutting edges converge so that they form a kind of cross or star, the bar of metal out of which they are formed having three or four wings or ribs. In rock-drills of this description the radial dimensions thereof should always be in proportion to their lengths. Thus a short drill is of greater width than a long one, and it is in the production of devices for connecting together the "dollying" mechanism (whereby the cutting edges are properly shaped by a die and wherein the drill is held or supported at its two ends by parts which are adjustable, so as to accommodate drills of different lengths) and swaging mechanism for acting upon the sides of the wings or ribs, so that on the drills being presented to said swaging mechanism they may be brought thereby to the proper dimensions relatively with their lengths.

In the accompanying sheets of drawings, which are illustrative of my said invention, Figure 1 is a side elevation of dollying and "swaging" apparatus for treating rock-drills and my improved devices for connecting these parts together. Fig. 2 is a side elevation thereof as seen in the opposite direction to Fig. 1. Fig. 3 is a plan of said parts. Fig. 4 is a plan of the levers and other parts for connecting the dollying and swaging mechanisms together. Fig. 5 is a side elevation of certain of the parts illustrated by Fig. 4. Fig. 6 is a sectional plan, enlarged scale, of a certain portion of the devices shown by Fig. 4. Fig. 7 is a sectional side elevation, drawn to an enlarged scale, of a portion of the swaging mechanism, hereinafter described. Fig. 8 is a drawing in detail showing the form of rock-drill for the treatment of which my invention is especially applicable.

The dollying mechanism illustrated by the accompanying drawings consists of a "dolly"

or die 2, which is mounted in bearings 3 and is acted upon by the hammer 4, fixed in the sliding bearings 5, operated by the crank-shaft 6 through the connecting-rod 7. The drill 8 as it is being acted upon by this device has one end supported in the dolly-bearing, the opposite end of said drill taking within the opening 9 and against the face of the anchorage or holder 10, and in order that varied sizes of drills may be acted upon this anchorage or holder 10 is moved nearer to or farther from the dolly 2, the bearing of the latter serving as a stop when the end of the drill abuts thereagainst, the adjustment of anchorage or holder 10 being effected by the rotation of the screw 11, which meshes with the nut 12. (Shown in broken lines, Fig. 3.) The screw 11 is rotated by the hand-wheel 13 and bevel-gears 14 and 15.

The swaging mechanism illustrated by the drawings consists of a series of swages 16, which are mounted in radially-movable blocks 17, provided with caps 18, which are held, by means of springs 19, in contact with the inner surface of the ring 20, the parts 21 of which are cam-shaped, and (as the ring 20 is rotated by its driving-shaft 22 and pulley 23) impart the reciprocatory movements to the blocks 17. The inner surface of the cam-ring 20 is also inclined in an axial or longitudinal direction, so that as it is moved longitudinally or axially it transmits varied movements to the swages 16. These longitudinal and rotary movements of the shaft 22 and ring 20 are allowed by said shaft being connected to its driving-pulley 23 by feathers and keyways.

The essential feature of my invention is to provide means which as the anchorage or holder 10 is adjusted by means of the screw 11 to accommodate varied lengths of drills the cam-ring 20 is or may be simultaneously moved, thereby adjusting it to such a position that when the drill is presented to the swages 16 after the dollying operations have been performed said swages may swage or bring the wings of the drill to their proper dimensions required in proportion to the length of said drill. To the end of the screw 11 I connect another screw 24, which as it rotates with the screw 11 moves the nut 25 along it. This nut is connected, by means of links 26, to the lever 27, fixed upon the shaft 28, which is mounted in bearings 29 on the base-plate A and carries at its other end the levers 30, in which swivels (by the pins or trunnions 31) the casing 32. Within said



casing is mounted the spring 33, its outer end taking against the flange 34 of the sleeve 35, which passes through said spring and casing and is provided with nuts 36. Inside the sleeve 35 is a pin or shaft 37, which is connected to the lever 38, fulcrumed at 39 in bearings 40 on the framework D, its outer ends 41 carrying bowls 42, which take between flanges 44 on the shaft 22. By these means the rotary motions of the screw 24 transmit a longitudinal movement in a backward or forward direction to the shaft 22 and cam-ring 20, these movements being always in proper relation to those of the anchorage 10. As this longitudinal movement is transmitted through the spring device 33 34, &c., should the swages 16 not be able to swage or bring the drill down to its proper dimensions quickly (in which case the rotary motions of the ring 20 might be arrested) this spring device may yield and allow the swaging operations to be performed gradually.

The lever 27 is formed in two parts held in position by a bolt 45, (see Fig. 5,) so that when desired these may be separated and the adjusting mechanism thrown out of action.

Having thus described the nature and object of my said invention, what I claim is—

1. A machine of the character described comprising radially-arranged swaging devices, a rotatable cam-ring for operating the same, means for reciprocating said ring, an adjustable drill-support, and connections between said drill-support and said reciprocating means, whereby the latter is controlled by the adjustment of the former.

2. A machine of the character described comprising radially-arranged swaging devices, a rotatable cam-ring for operating the same, a yielding device for reciprocating said ring, an adjustable drill-support, and connections

between said drill-support and said yielding device, whereby the latter is controlled by the former.

3. A machine of the character described comprising radially-arranged swaging devices, a rotatable cam-ring surrounding the same, a lever adapted to reciprocate said ring, a cushion for said lever, an adjustable drill-support, and connections between said drill-support and said lever, whereby the latter is controlled by the former.

4. A machine of the character described comprising radially-arranged swaging devices, a rotatable cam-ring for operating the same, a rock-shaft having an arm, a casing mounted on said arm, a lever adapted to reciprocate said ring, a spring in said casing bearing against said lever, an adjustable drill-support, and connections between said drill-support and said rock-shaft.

5. A machine of the character described comprising radially-arranged swaging devices, a rotatable cam-ring surrounding the same, a rock-shaft, a lever operated thereby and adapted to reciprocate said cam-ring, an adjustable drill-support, and connections between the drill-support and said rock-shaft.

6. A machine of the character described comprising radially-arranged swaging devices, a rotatable cam-ring surrounding the same, a rock-shaft, a lever operated thereby and adapted to reciprocate said ring, a drill-support, an adjusting-shaft therefor, and connections between said shaft and said rock-shaft.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM PARR LIGHTBODY.

Witnesses:

SAMUEL HEY,

JAMES HENRY ELLISON.