

No. 675,319.

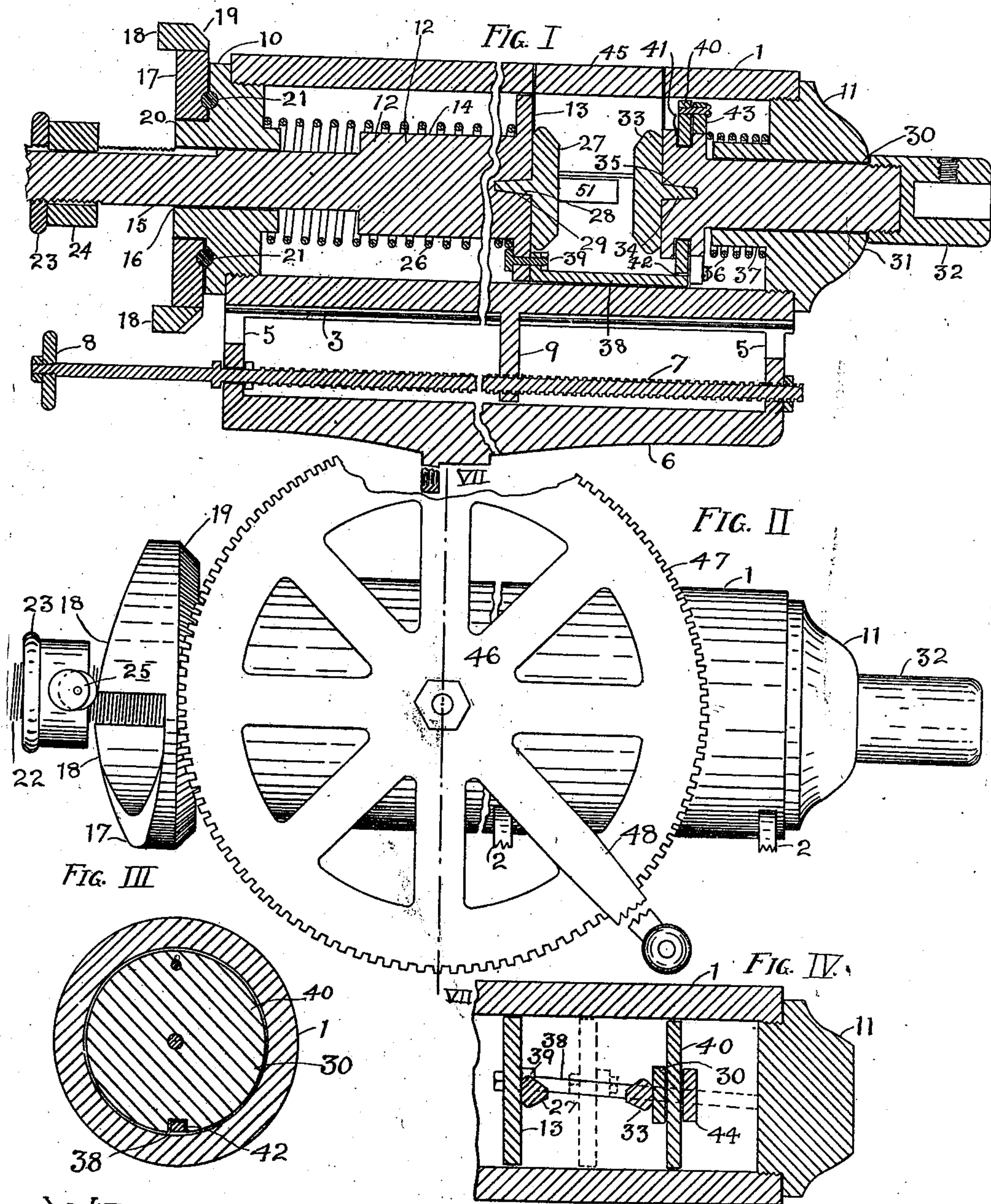
W. S. BOYD, 3rd.
ROCK DRILL.

Patented May 28, 1901.

(Application filed June 22, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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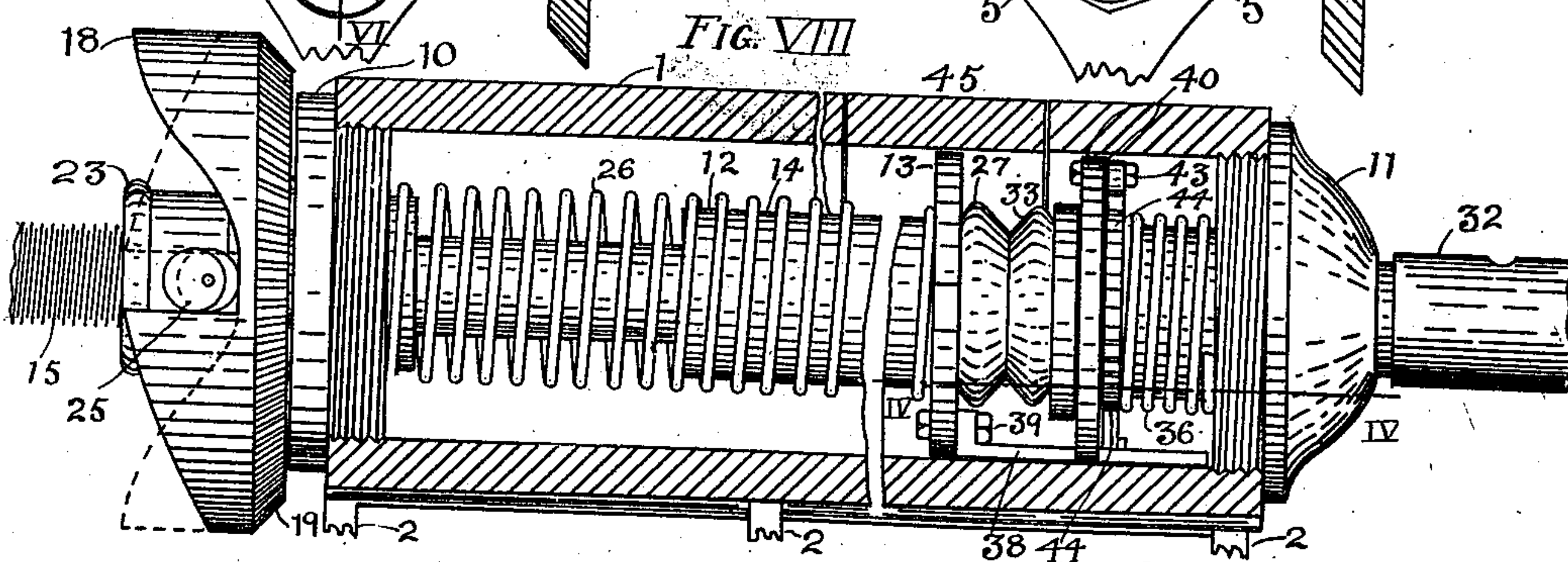
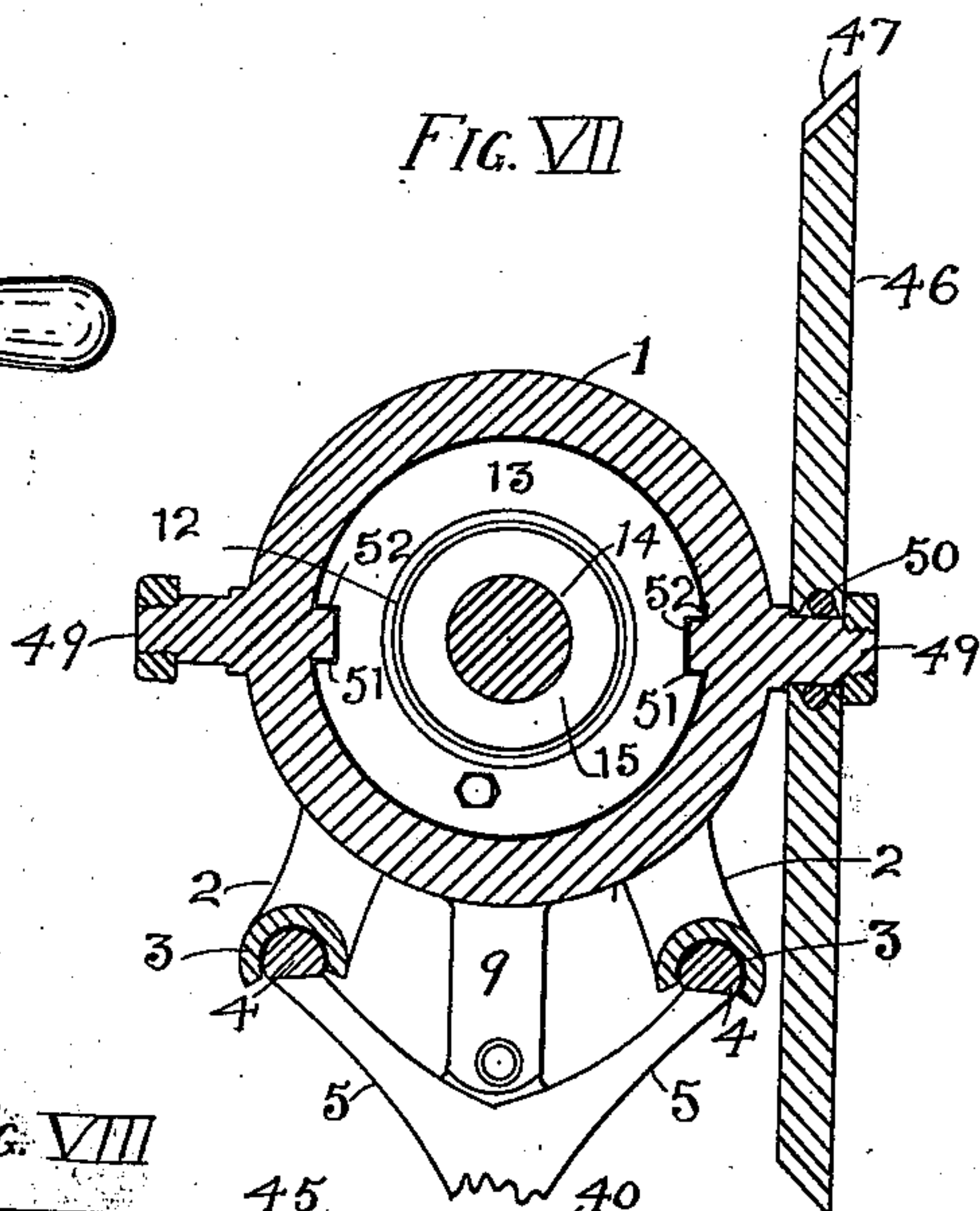
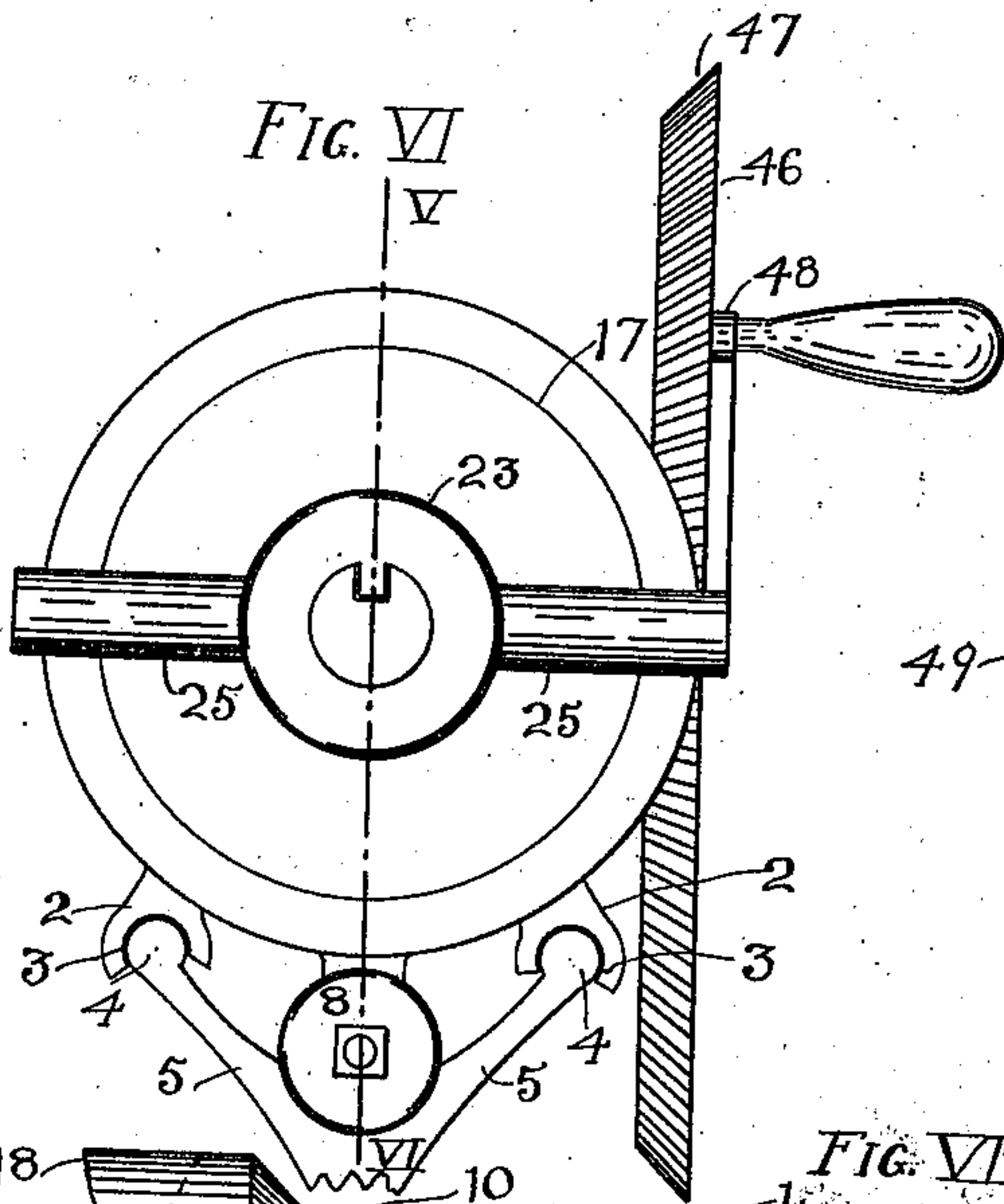
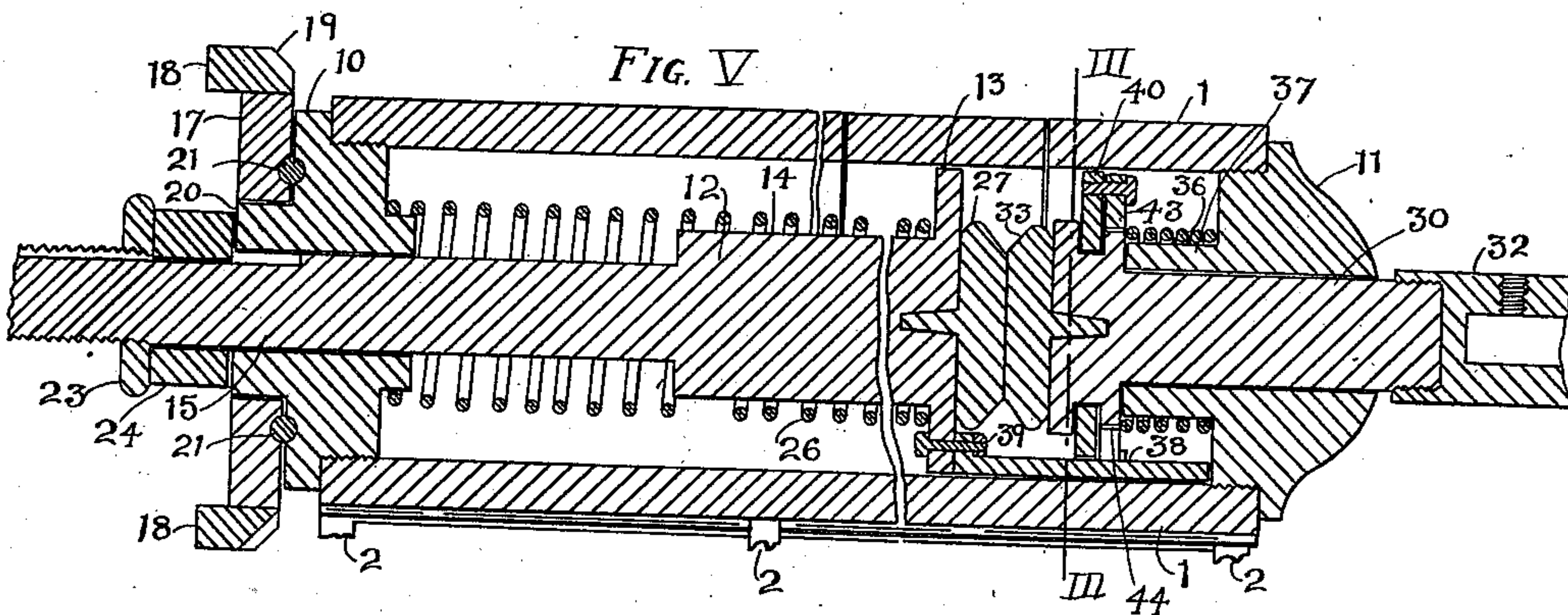
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UNITED STATES PATENT OFFICE.

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ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 675,319, dated May 28, 1901.

Application filed June 22, 1900. Serial No. 21,177. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BOYD, 3rd, a citizen of the United States, residing at Los Angeles, (with post-office address at 534 South Broadway, Los Angeles,) in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Rock-Drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain new and useful improvements in rock-drills; and my invention consists in certain features of novelty hereinafter described and claimed.

Figure I is a vertical longitudinal section of my improved device, showing the carriage-support. Fig. II is a side elevation. Fig. III is a transverse section taken on line III III, Fig. V. Fig. IV is a section taken on line IV IV, Fig. VIII. Fig. V is a vertical longitudinal section of the body of the drill, taken on line V V, Fig. VI. Fig. VI is a rear elevation. Fig. VII is a transverse section taken on line VII VII, Fig. II. Fig. VIII is in part an elevation and in part a section showing the interior and principal working parts of the drill.

Referring to the drawings, 1 represents a cylinder or casing inclosing the striking mechanism of the drill, said casing being provided with legs 2, having grooves 3 at their lower ends, which rest upon rails 4, supported on the upper ends of arms 5 of a bed-plate 6, whereby the drill may be reciprocated lengthwise while in operation.

7 represents a feed-screw connected with the bed-plate 6 and having a hand-wheel 8 for operating the same, the feed-screw 7 passing through a bracket 9 on the lower side of the casing, whereby the turning of the screw moves the casing and drill either forward or backward.

10 represents a screw-plug at the rear end of the casing 1, and 11 represents a screw-plug at the front end of the casing.

12 represents a striker-shaft extending into the cylinder 1 and having a flange 13 on its inner end, said striker-shaft having an enlarged section 14 and a reduced section 15,

the reduced section of the shaft extending through a central aperture 16 in the screw-plug 10 at the rear end of the casing.

17 represents a cam-wheel having a series of cams 18 on its outer periphery and having a beveled gear-wheel 19 on its inner periphery. The cam-wheel 17 is loosely mounted on a hub 20 of the plug 10 and is provided with ball-bearings 21, interposed between the back of the cam-wheel and the rear face of the plug. The striker-shaft 12 is screw-threaded at its rear end, as shown at 22, and is provided with an adjusting-nut 23.

24 represents a collar on the shaft 12, said collar having radial arms 25. The cams 18 when the machine is in operation, riding against the arms 25, cause the striker-shaft 12 to travel toward the rear end of the casing 1. As the apex of the cam passes the arm the striker-shaft is freed and permitted to travel in the opposite direction, it being forced in said direction by means of an actuating-spring 26, which has been contracted by the cam pressing against the arm and forcing the striker-shaft in the opposite direction.

27 represents a hammer-head with a pin 28 on its inner face, which fits into a recess 29 on the inner end of the striker-shaft.

30 represents a drill-shaft located in the central aperture 31 in the plug 11 at the front end of the casing, said drill-shaft having a chuck 32 secured to its outer end, to which a drill may be attached.

33 represents a hammer-head secured to the rear end of the drill-shaft by means of a pin 34, fitting into a recess 35 in the same manner that the hammer-head 27 is secured to the striker-shaft. Thus said hammer-heads when battered up or if for any other purpose they may need repairing can be removed and replaced without having to remove the shafts. The drill-shaft is thrown forward with the drill by the impact of the striker-shaft, the hammer-head 27 striking the hammer-head 33, and is reciprocated in the opposite direction by means of a coil-spring 36, resting on a hub 37 on the inner face of the plug 11, the drill-shaft being thus returned to its normal position. In order to produce the most effective results, it is desirable that as the drill is

thrown forward it should also travel in a rotary direction. To accomplish this, I provide a bar 38, having its rear end secured at 39 to the flange 13 of the striker-shaft, said bar
5 extending forwardly and at an angle to the length of the casing, whereby when the striker-shaft is reciprocated said bar will also be reciprocated.

40 represents an annular ring resting in a
10 groove 41 at the rear end of the drill-shaft, said ring being provided with a recess 42, through which the bar 38 extends, the effect being that as the striker-shaft is thrown forward the bar 38, moving forward and at the
15 same time toward the side of the casing, will cause the annular ring and drill-shaft to partly rotate in one direction, while the annular ring is returned to the initial point by the bar traveling in the opposite direction as
20 the striker-shaft reciprocates. The ring 40 is loosely mounted on the drill-shaft and is connected with the same by means of pawls 43, engaging a ratchet-wheel 44 on the drill-shaft.

25 45 represents a door by which access may be had to the interior of the casing.

46 represents an operating-wheel having gear-teeth 47, which mesh with the cam gear-wheel.

30 48 represents a crank for operating the wheel 46.

49 represents studs on each side of the casing, to which the wheel 46 may be attached, thus operating the device from either side.

35 50 represents a ball-bearing for the wheel 46.

The flange 13 of the striker-shaft 12 is provided on its outer periphery with grooves 51, in which ribs 52 on the inner sides of the casing extend in order to form a guide for said
40 striker-shaft as it reciprocates.

I claim as my invention—

1. A rock-drill comprising a cylinder formed with grooved legs, and a pendent bracket, a
45 bed-plate formed with arms, rails supported on the arms and providing tracks for the grooved legs of the cylinder, a feed-screw working in the pendent bracket, turning in the arms of the bed-plate, and having an operating hand-wheel, a plug secured to the
50 front end of the cylinder, a plug secured to the rear end of the cylinder, a drill-shaft, mounted in the front plug, having a removable head, a spring for throwing the drill-shaft rearward, a striker-shaft mounted in
55 the rear plug, having a removable head, a spring for throwing the striker-shaft forward, a collar mounted on the striker-shaft, having radial arms, a driven bevel gear-wheel mounted
60 on the rear plug having cams adapted to impinge against the radial arms for retracting the striker-shaft, and a driving bevel

gear-wheel journaled to the cylinder and meshing with the driven bevel gear-wheel.

2. A rock-drill comprising a cylinder, a plug 65 secured to the front end of the cylinder, a plug secured to the rear end of the cylinder, a drill-shaft mounted in the front plug having a removable head, a spring for throwing the drill-shaft rearward, a striker-shaft having a screw-threaded rear end, mounted in
70 the rear plug, and having a removable head, a spring for throwing the striker-shaft forward, an adjustable collar mounted on the rear end of the striker-shaft and having radial arms, a nut adjustable on the rear end
75 of the striker-shaft, a driven bevel gear-wheel mounted on the rear plug having cams adapted to impinge against the radial arms for retracting the striker-shaft, and a driving bevel
80 gear-wheel journaled to the cylinder and meshing with the driven bevel gear-wheel.

3. A rock-drill comprising a cylinder, a plug secured to the front end of the cylinder, a plug secured to the rear end of the cylinder, 85 a drill-shaft formed with an annular recess at its inner end, and mounted in the front plug, a spring for throwing the drill-shaft rearward, a striker-shaft formed with a flange at its inner end, and mounted in the rear plug, 90 a spring for throwing the striker-shaft forward, an annular ring having a peripheral recess and located in the annular recess of the drill-shaft, a pawl secured to the annular ring, a ratchet-wheel mounted on the drill- 95 shaft with which the pawl engages, a bar located at an angle to the cylinder, secured, at its rear end to the flange on the striker-shaft and having its forward end engaging in the recess of the annular ring, a collar mounted 100 on the rear end of the striker-shaft and having radial arms, a driven bevel gear-wheel, mounted on the rear plug, having cams adapted to impinge against the radial arms for retracting the striker-shaft, and a driving bevel 105 gear-wheel journaled to the cylinder and meshing with the driven bevel gear-wheel.

4. In a rock-drill, the combination of a casing, independent striker and drill shafts mounted in said casing, removable hammer- 110 heads secured to the ends of the meeting ends of the shafts, a spring for actuating the striker-shaft, an annular ring on the drill-shaft having pawl-and-ratchet connection with said shaft, said annular ring having a 115 recess near its periphery and a bar engaging said recess adapted to travel at an angle with the casing and having one of its ends fixed to the striking-shaft, substantially as set forth.

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Witnesses:

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