

No. 751,532.

PATENTED FEB. 9, 1904.

W. A. MERRALLS.
ROCK BREAKER.

APPLICATION FILED JULY 1, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

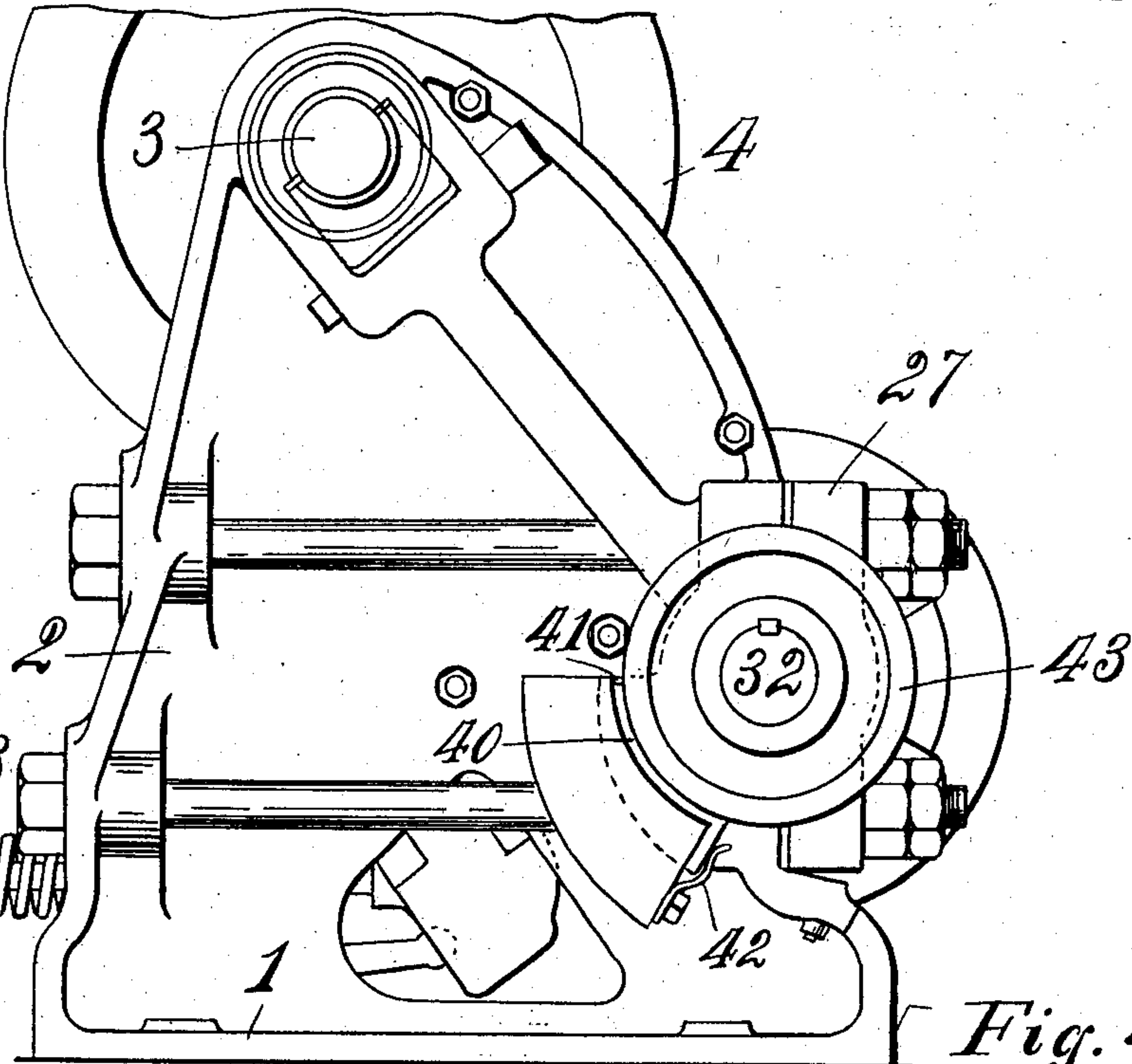


Fig. 3.

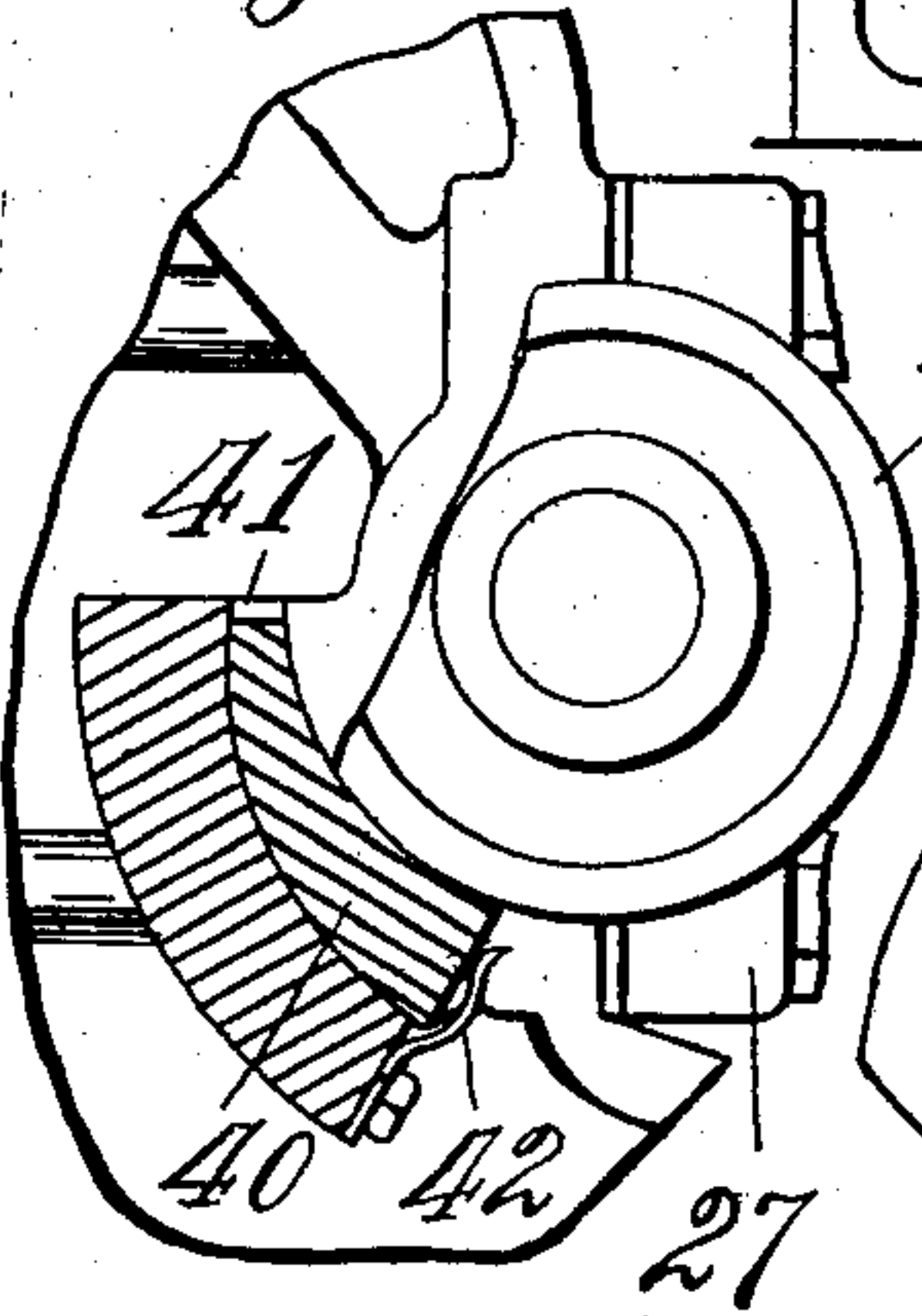


Fig. 4.

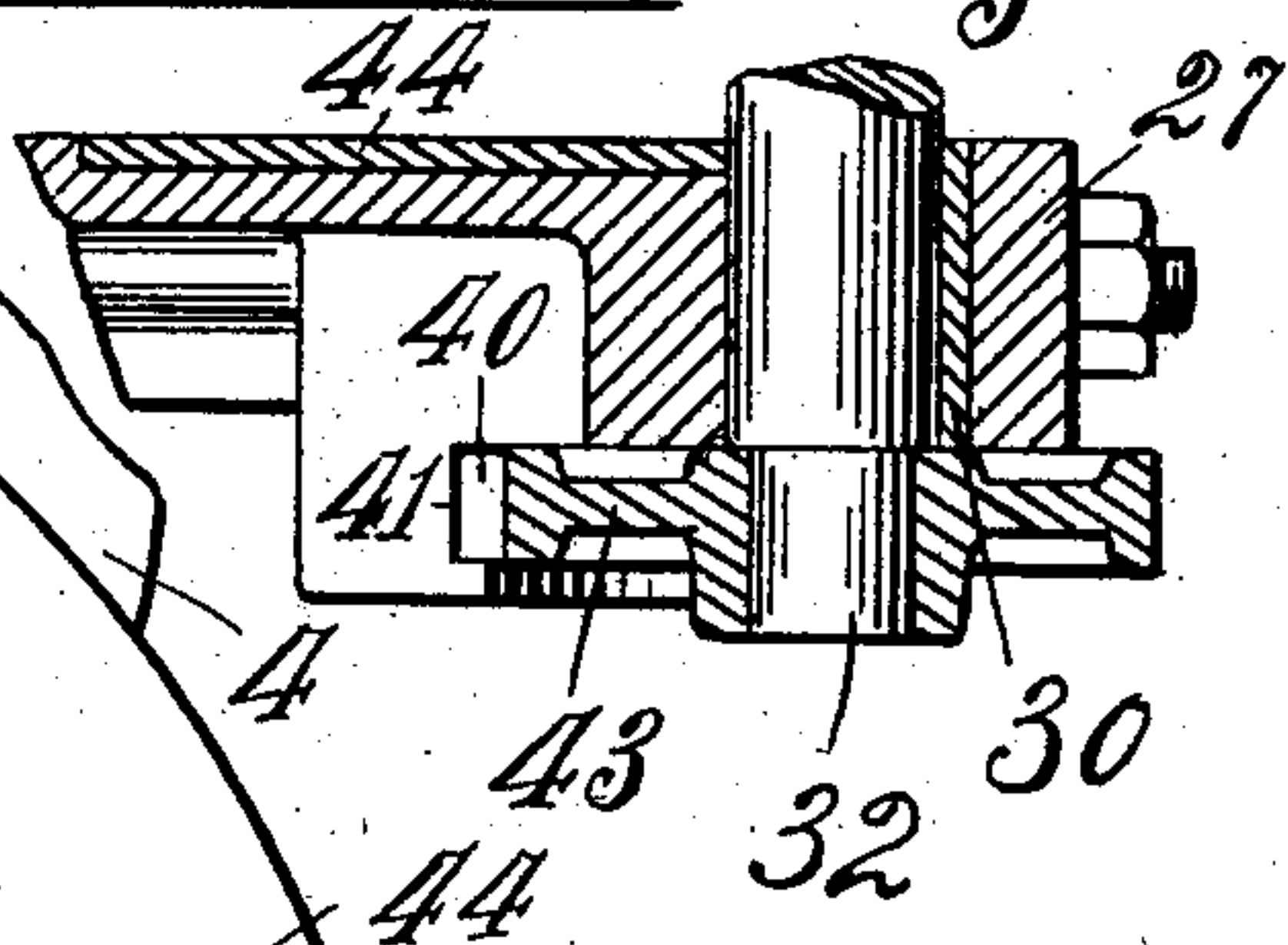
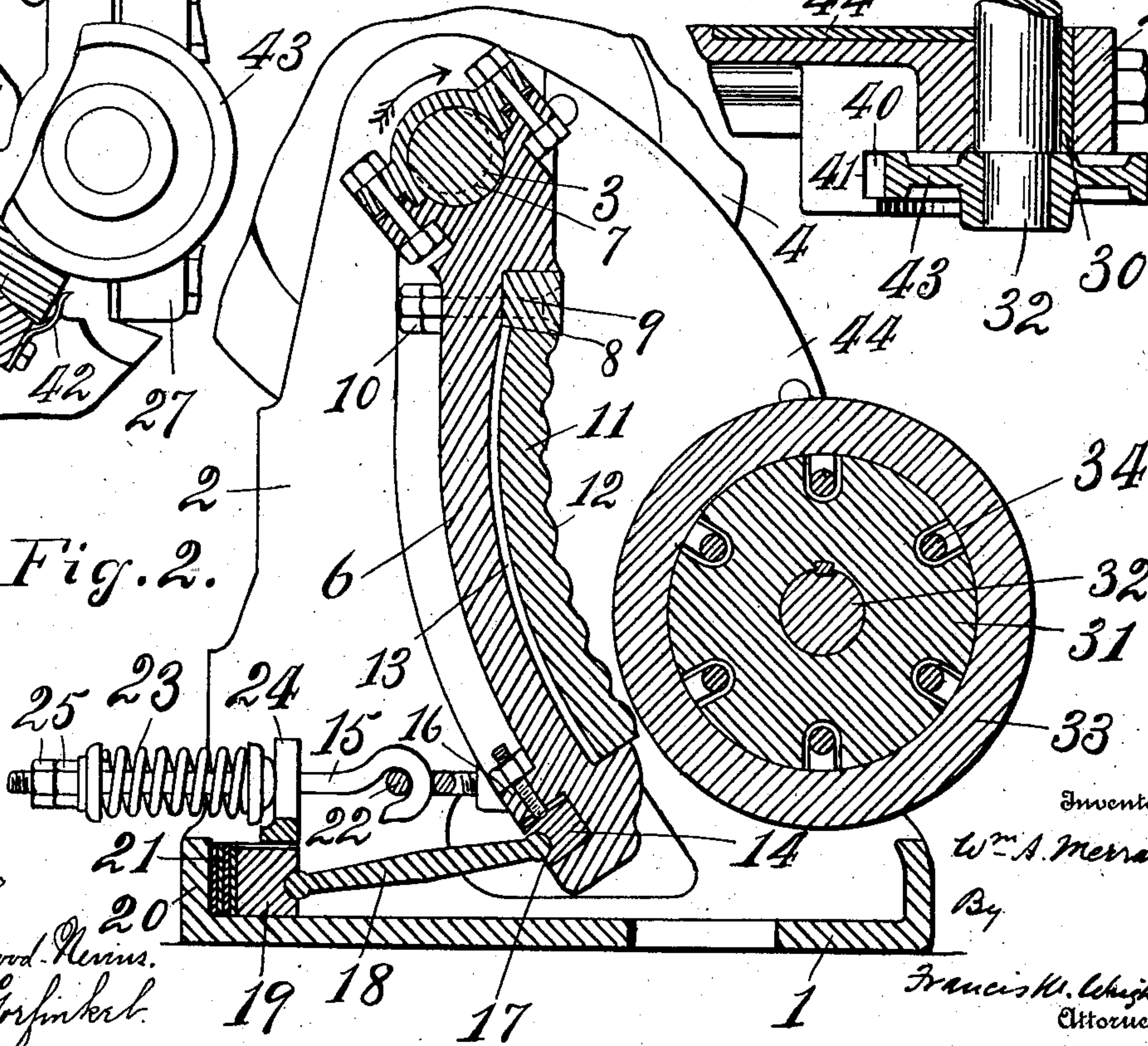


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

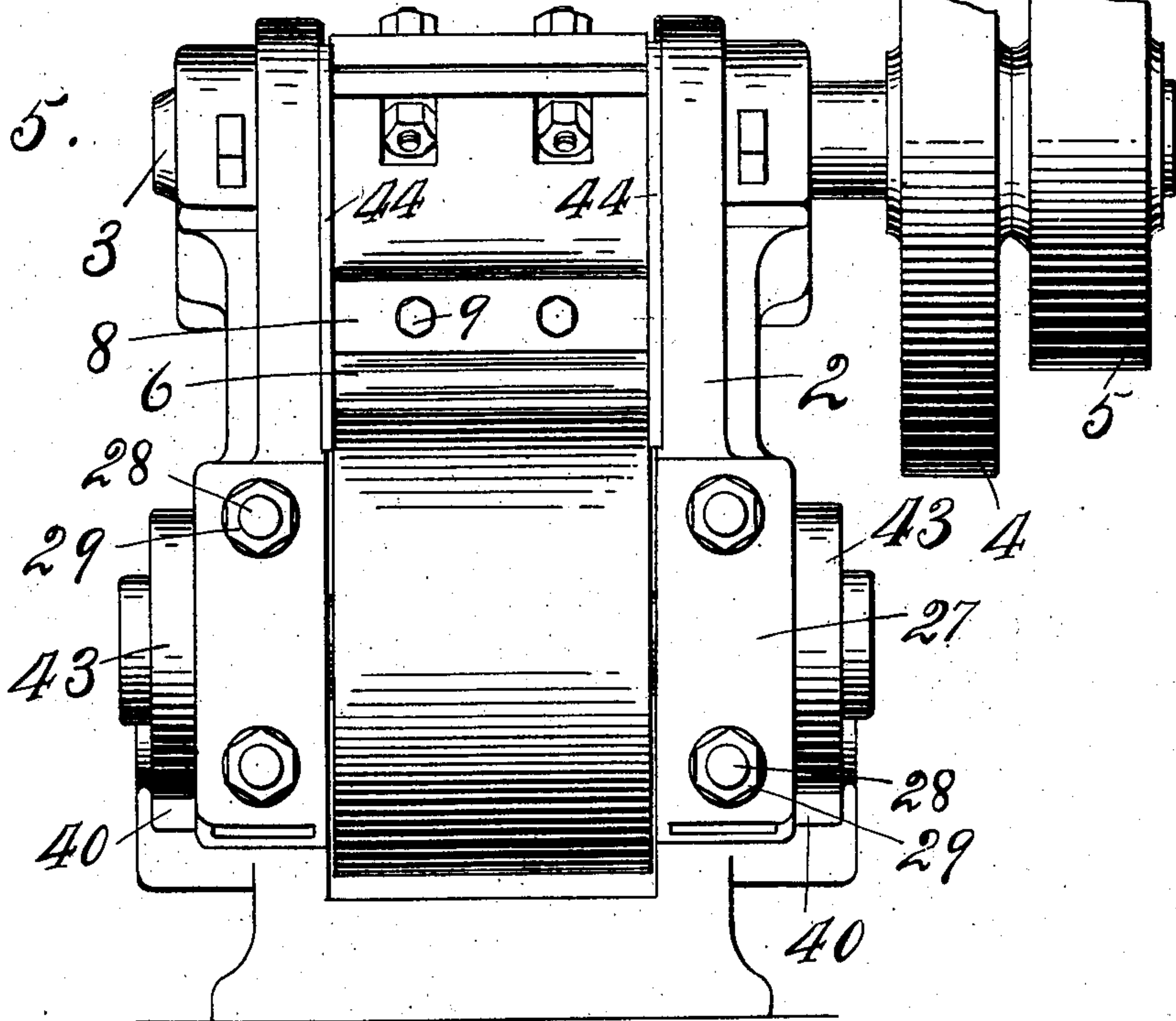
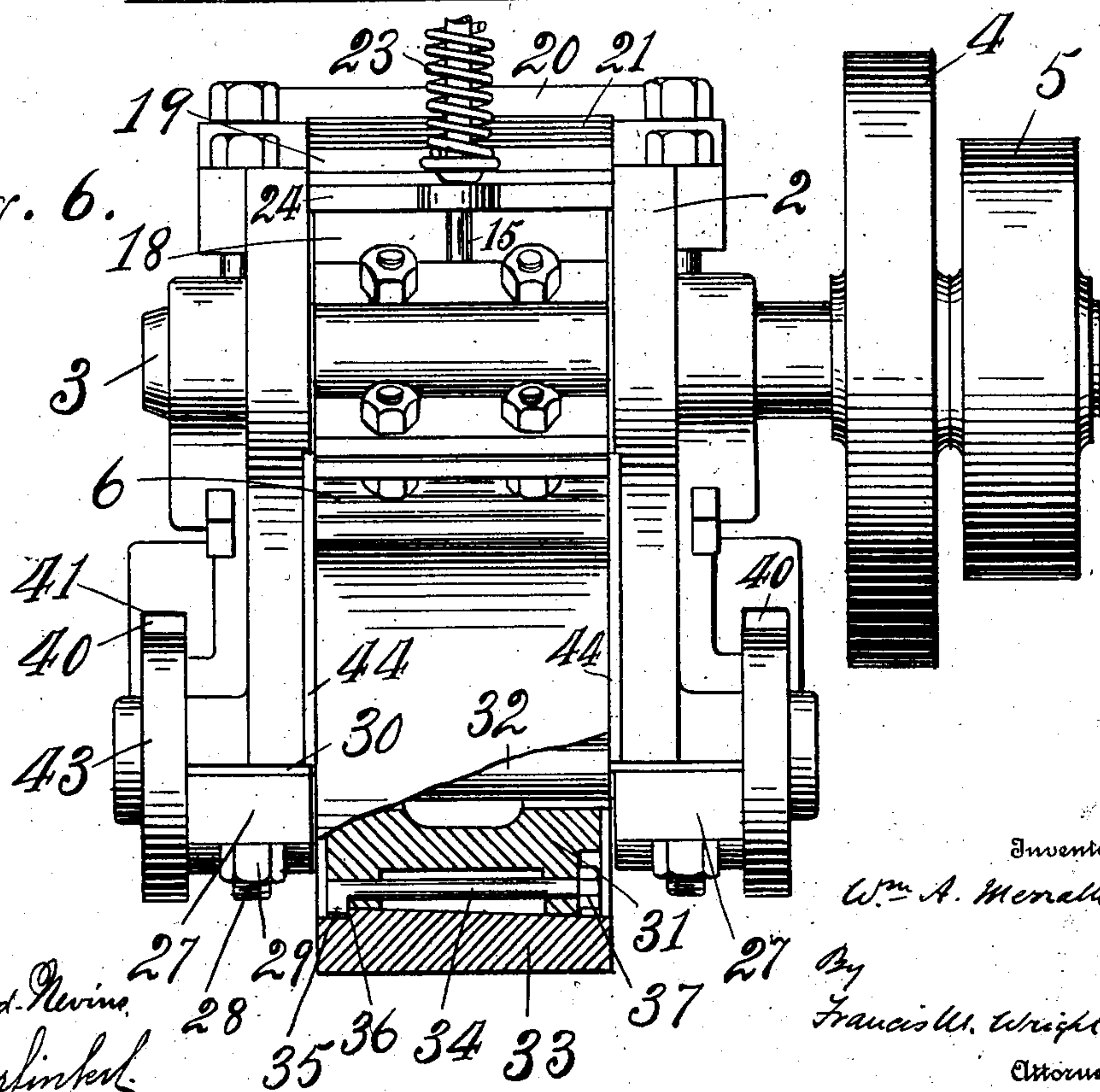


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM A. MERRALLS, OF SAN FRANCISCO, CALIFORNIA.

ROCK-BREAKER.

SPECIFICATION forming part of Letters Patent No. 751,532, dated February 9, 1904.

Application filed July 1, 1903. Serial No. 163,913. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MERRALLS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Rock-Breakers, of which the following is a specification.

My invention relates to improvements in rock breakers and pulverizers, the object of my invention being to provide an apparatus of this character which shall be simple in construction, effective and economical in operation, and which will wear well and do its work as well and effectively after long use as at first, one, moreover, in which the parts can readily be adjusted for wear.

My invention is an improvement upon the style of rock-breaker known as the "Nicholl" rock-breaker, for which a patent was granted June 22, 1886, No. 344,004. This rock-breaker has some very meritorious features and is an excellent rock-breaker when new. It has never, however, come into extensive use on account of the trouble it has given when it has been used a sufficiently long time for some of the parts to wear. Particularly has this been the case with the balls which lock the crushing-cylinder against reverse movement. Said balls tend to become flattened, and when flattened they cease to roll and bind between the ends of the cylinder and the sides of the frame, impeding the movement of the cylinder and rendering the device practically useless.

My invention therefore resides in the novel construction, combination, and arrangement of parts hereinafter fully specified, and particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is a side view of the rock-breaker. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a detail vertical section through the locking-wedge. Fig. 4 is a horizontal section through the friction-wheel. Fig. 5 is a front view of the apparatus. Fig. 6 is a top plan view thereof, partly in section.

Referring to the drawings, the frame of the rock-breaker comprises the bed 1 and the sides 2 in a single casting.

3 represents the eccentric-shaft, carrying

the fly-wheel 4 and the driving-pulley 5. The concave crushing-jaw 6 has its upper end eccentrically supported on said shaft, as shown at 7 in Fig. 2. In the face of said jaw, secured by means of the wedge 8, bolts 9, and nuts 10, is the crushing-plate 11, the crushing-face of which is corrugated horizontally, as shown at 12, while the rear face has vertical ribs 13, engaging the body of the crushing-jaw, preferably having similar ribs to prevent lateral movement therein. At the rear of the lower end of said crushing-jaw is a bearing-block 14, which is held down by means of screws working through rearwardly-extending lips 16 of the crushing-jaw. Said bearing-block 14 is socketed to receive the front rounded edge 17 of a supporting-plate 18, extending the width of the crushing-jaw, the rear edge of which plate is rounded and is received in a socket in a bearing-block 19, also extending the width of the crushing-jaw, as shown in Fig. 6. Said block 19 is supported against a lip 20, formed on the rear of the bed of the rock-breaker, by means of a number of plates 21, which can be added to in number, as required, to take up the wear and advance the lower end of the crushing-jaw up to the roller as the latter is worn. A hook 21 is attached to an eye 22, secured to the rear side of the crushing-jaw, and is drawn backward by means of a compressed spring 23 between a transverse bar 24 and nuts 25 on said hook. This spring therefore maintains the lower portion of the crushing-jaw in its proper position relative to the roller, permitting a slight vertical movement, due to the eccentric movement of the upper movement of the crushing-jaw.

The mounting of the crushing-cylinder is now different from that shown in the patent above referred to in that one half only of the bearing is formed by the frame of the rock-breaker, the other half being formed by means of a cap 27, which is held to its place by the bolts 28 and nuts 29, a semicircular bushing 30 being used around the cylinder-shaft within the cap against which the wear occurs. It will readily be seen that by this construction the bearing can be tightened up for wear by means of the bolts, and also the cylinder

can readily be removed for repairs and other purposes. The cylinder is also now made with a main body 31, keyed upon the shaft 32, and an external shell 33, which is slightly tapered, as shown in Fig. 6. Said shell is made of harder material than the main body and is held in place on said main body by means of the bolts 34, having one-sided heads 35, which overlie a circular shoulder 36, formed upon the shell, said bolts being secured by means of nuts 37. With this construction the shell is very easily removed and replaced by a new shell when worn too much for further operation, even with the adjustment of the crushing-jaw, by the insertion of the steel plates.

For the purpose of preventing reverse movement of the crushing-cylinder I provide on each side of the cylinder, on the outside of the bearing, a curved wedge 40, which rests in a socket 41, formed in the frame, and is normally pressed upward by means of a spring 42, engaging the lower end thereof. These wedges are self-adjusting as to wear, for as they wear the springs move them upward as far as permitted by the relative distance of the friction-rollers and faces of the sockets. When the eccentric revolves in the direction of the arrow in Fig. 2, the crushing-jaw moves forward and downward, and when there is rock or ore between the jaw and the cylinder the movement of the jaw causes the cylinder to move with it; but when the crushing-jaw moves backward and upward the cylinder is prevented moving reversely by means of said

wedges, which immediately engage said sockets and the lower edges of friction-wheels 43, secured upon the cylinder-shaft 32. Upon the forward movement of the cylinder again the wedges are disengaged from said sockets and friction-rings, so that the cylinder can move freely forward.

44 represents removable plates secured by means of bolts 45 and nuts to the sides of the frame to form with the crushing-jaw and the face of the cylinder a hopper to receive the rock to be crushed, said plates being readily removed when necessary on account of wear.

I claim—

In a rock-breaker, the combination of the frame, the driving-shaft, the crushing-jaw eccentrically mounted at its upper end on said shaft, the bearing-plate engaging the lower end of the crushing-jaw, the crushing-cylinder between which and said jaw the material is fed, the friction-wheel on the shaft of said cylinder, and the sliding wedge engaging said friction-wheel and received in a socket on the frame, said wedge being provided with spring means for normally pressing it in a direction opposite to the operative movement of the cylinder toward the lower end of the jaw, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM A. MERRALLS.

Witnesses:

K. L. NEVINS,
FRANCES M. WRIGHT.