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F. M. OWEN

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ROCK BIT CONE WRENCH

Filed April 27, 1931

Fig. 1.

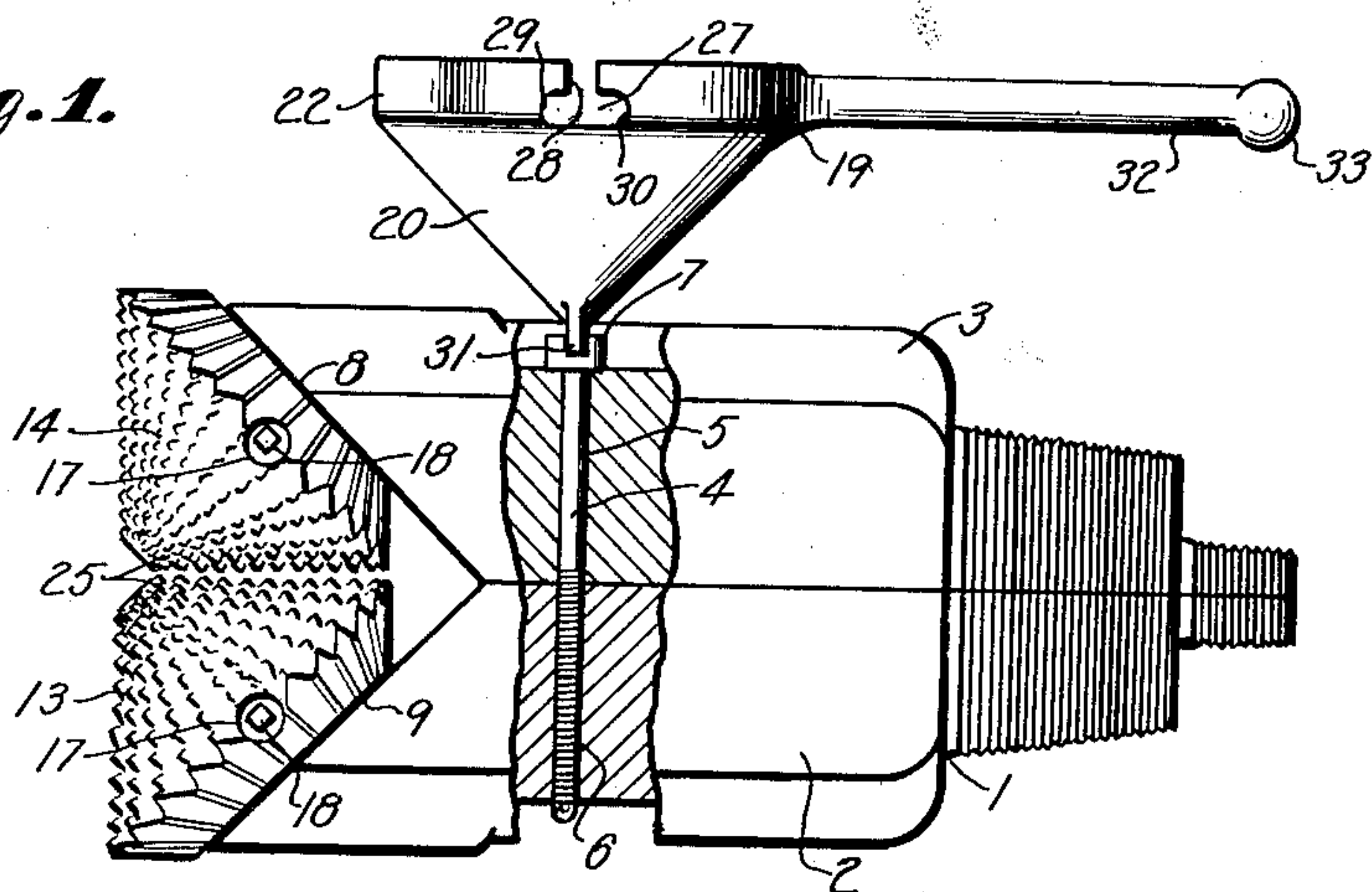


Fig. 2.

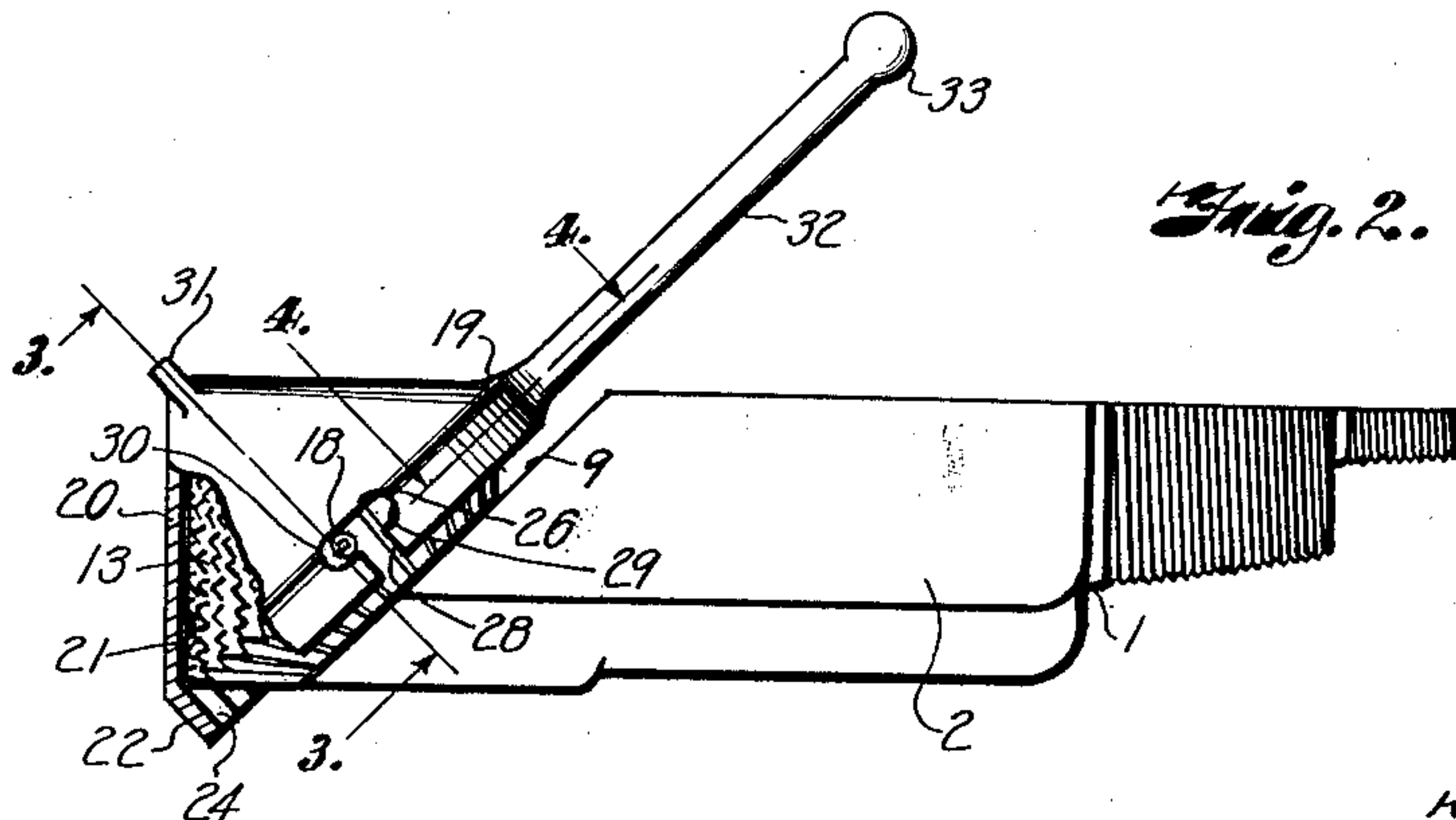


Fig. 3.

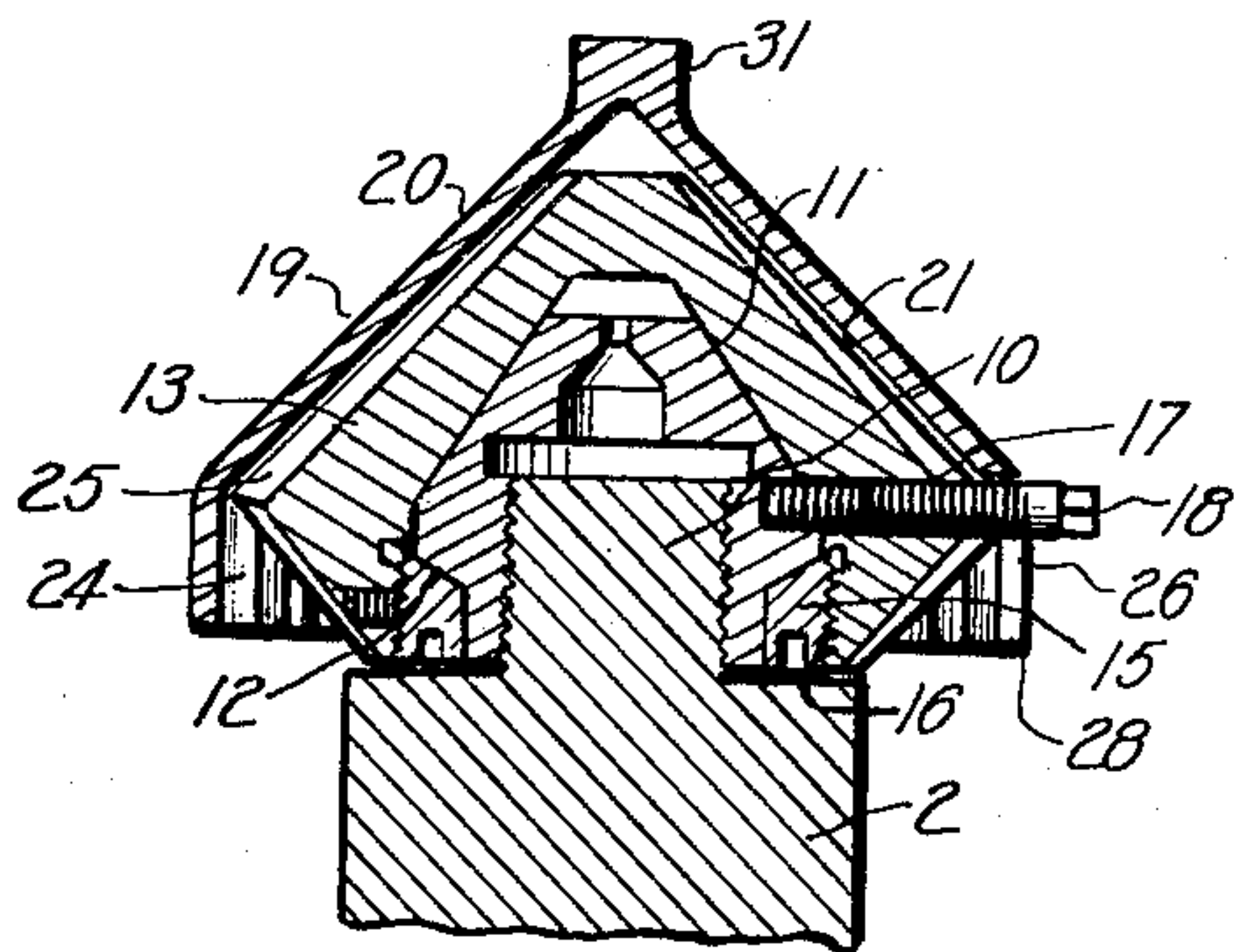


Fig. 4.

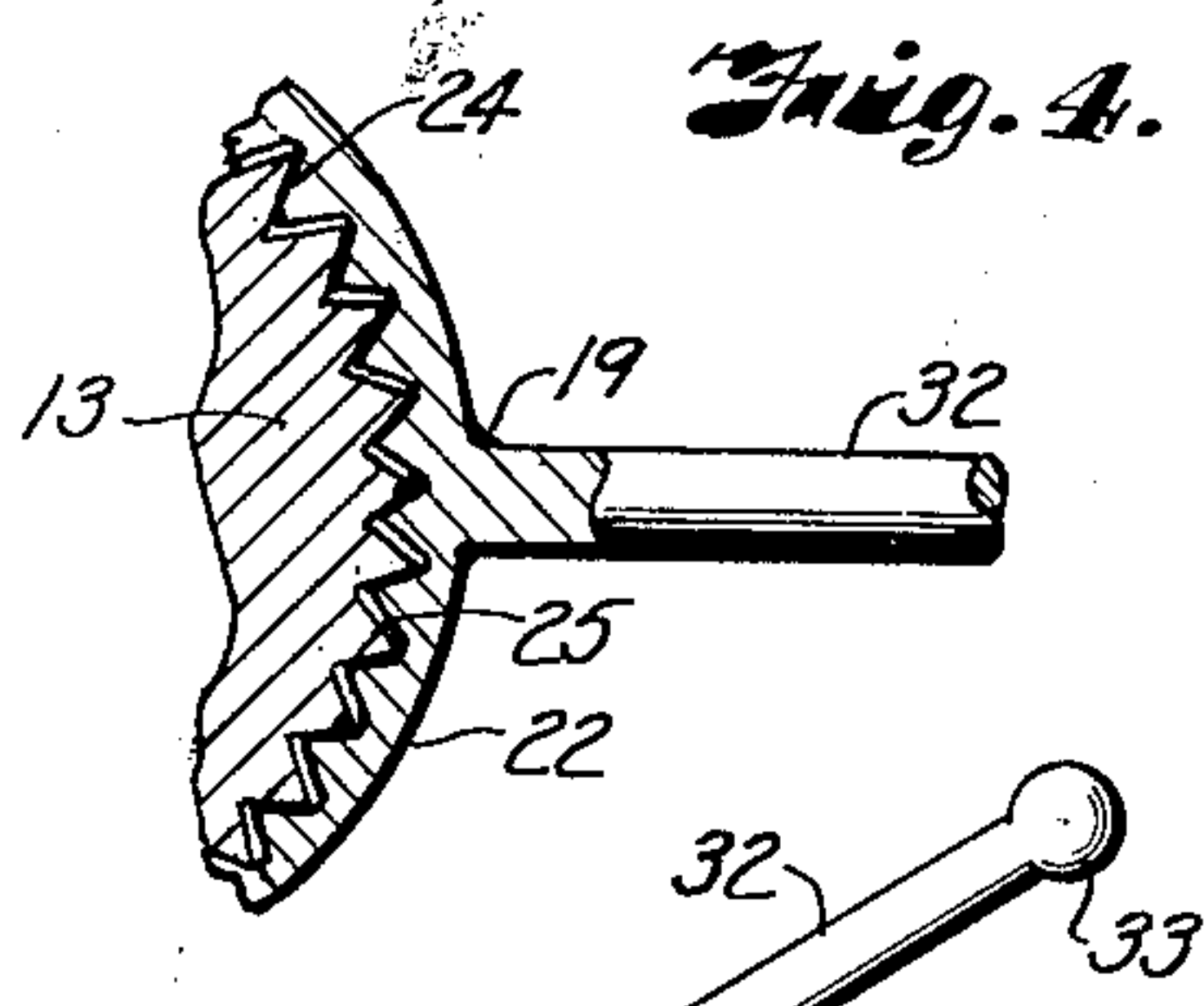
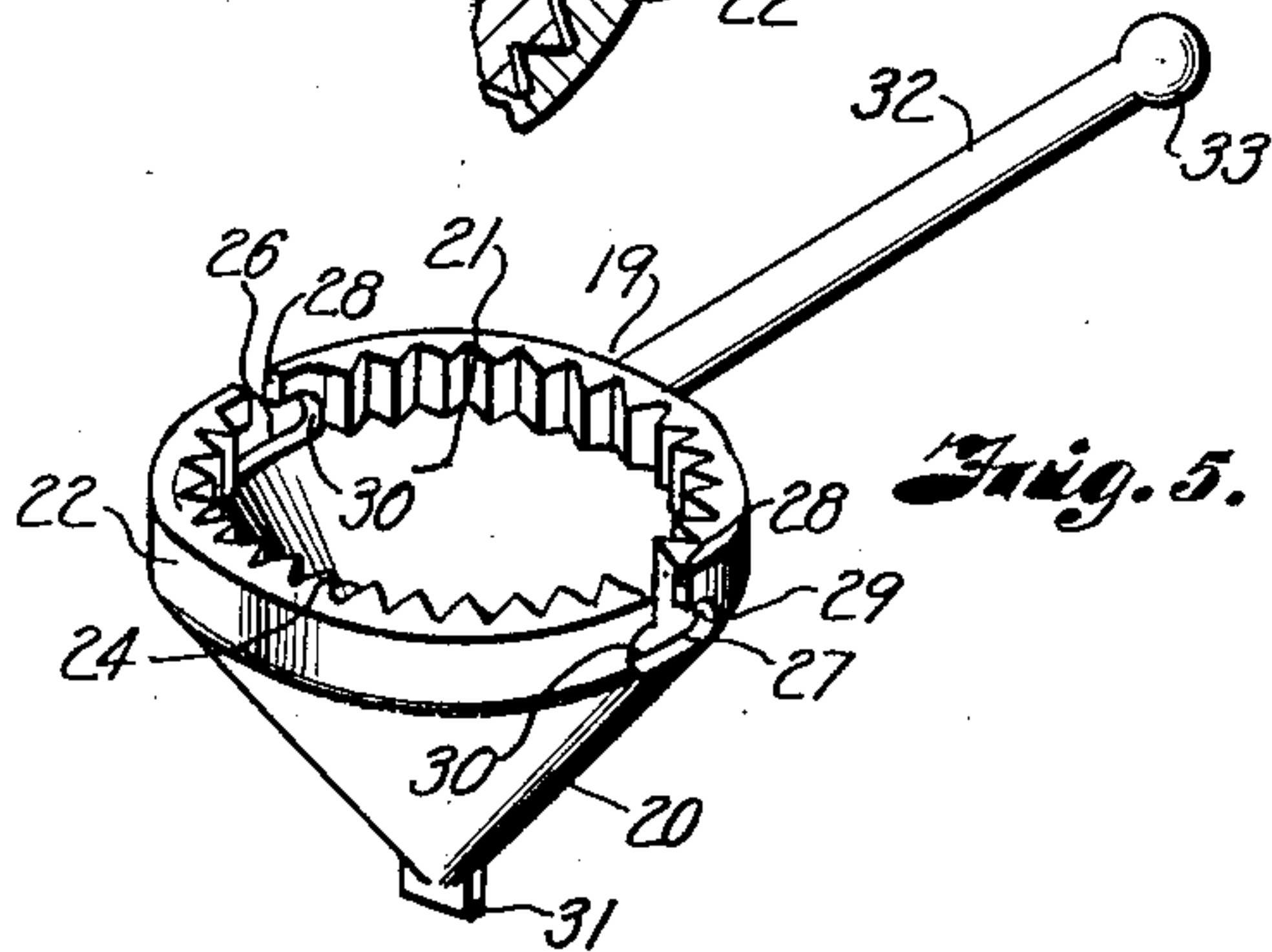


Fig. 5.



INVENTOR.
Frank M. Owen

BY

Arthur C. Brown

ATTORNEY.

UNITED STATES PATENT OFFICE

FRANK M. OWEN, OF OKLAHOMA CITY, OKLAHOMA, ASSIGNOR OF ONE-HALF TO
AMERICAN IRON AND MACHINE WORKS COMPANY, OF OKLAHOMA CITY, OKLA-
HOMA, A CORPORATION OF OKLAHOMA

ROCK BIT CONE WRENCH

Application filed April 27, 1931. Serial No. 533,053.

This invention relates to wrenches and more particularly to a wrench for assembling and disassembling rock bits employed in well drilling operations, the principal objects of the invention being to provide a wrench for readily manipulating the through bolts which retain the sections of a bit together and for removing the cones from the sections without danger of injury to the operator due to flying pieces chipped from the cone.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a side elevational view of a wrench constructed in accordance with my invention, illustrating its application to the through bolts of a rock bit.

Fig. 2 is a similar view of the wrench illustrating its application to one of the cones of the bit, a part of the wrench head being broken away to better illustrate its engagement with the cone.

Fig. 3 is a sectional view on the line 3—3, of Fig. 2, particularly illustrating engagement of the cone lock pin with the wrench head.

Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 2, illustrating the relation of the teeth on the wrench head with the teeth of the cone.

Fig. 5 is a detail perspective view of the wrench particularly illustrating the teeth for engaging teeth of the bit and the T shaped slots for receiving the lock pins of the cone bit.

Referring in detail to the drawing:

1 designates a cone type rock bit comprising mated sections 2 and 3 secured together by through bolts 4 projecting through openings 5 in the section 3 and into threaded openings 6 in the section 2, the bolts being provided with the usual slotted heads 7. The lower ends of the sections are beveled as at 8 and 9 and projecting therefrom are threaded bosses 10 for receiving cone-shaped bearing heads 11 having a peripheral shoulder 12.

13 and 14 designate cones rotatably mounted on the heads 11 and are retained thereon

by rings 15 threaded into the sockets 16 of the cones to engage the shoulders 12 on the heads 11 to retain the cones in rotative position.

The cones 13 and 14 are also provided with threaded openings 17 in their peripheries to receive threaded lock pins 18, later described.

The structure thus far described is of standard rock bit construction and specifically forms no part of the present invention but is illustrated to better describe the application of my improved wrench which is generally designated 19.

The wrench 19 preferably comprises a cone-shaped body member 20 having an interior cone-shaped recess 21 adapted to snugly receive one of the cones, as best illustrated in Fig. 2. Extending circumferentially at the base of the body member is a flange or rim 22 having inwardly extending teeth 24 of suitable shape and spacing to snugly receive the teeth 25 at the base portion of the cones as best illustrated in Fig. 4, attention being directed to the clearance reserved between the cone teeth and teeth of the wrench to permit limited rotational movement of the wrench independently of the cone for a purpose presently described.

Formed in the flange 22 at diametrically opposite points are T-shaped slots 26 and 27. The vertical portions 28 of the slots extend through the base of the rim and are of sufficient width to permit reception of the lock pins 18 when applying the wrench so that upon initial rotation of the wrench the pin may enter in either of the socket portions 29 or 30 to lock the wrench with a cone, as best illustrated in Fig. 2.

Formed at the apex of the cone is a rectangular shaped lug 31 adapted to engage in the slotted head of the through bolts as later described.

The wrench is provided with a radially extending handle 32 preferably integral with the rim 22 and provided on its outer end with a ball-like enlargement 33, as shown in Figs. 1 and 2.

In disassembling a bit with a wrench constructed as described, the wrench is applied as shown in Fig. 1 so that the lug 31 engages

in the slotted head of the through bolts and by rotating the handle the bolts may be loosened to permit separation of the bit sections. After the sections have been separated the
 5 cone-shaped body portion of the wrench is applied over the cone bits as shown in Fig. 2 so that the teeth of the cone intermesh with the teeth formed on the rim of the wrench and the lock pin 18 enters one of the slots
 10 26 or 27. The wrench is then slightly rotated to move the lock pin into either of the socket portions 29 or 30 to lock the wrench to the cone and thereafter the cone may be unscrewed from the boss 10 by rotating the
 15 wrench in the proper direction.

Sharpened cones may be applied to the body portions of the bit by reversing the operation and the through bolts tightened to retain the sections by applying the lug 31
 20 of the wrench in the slotted heads of the bolts and rotating the wrench in the proper direction to tighten the threads.

It is apparent that the cone-shaped body portion of the wrench provides a shield to
 25 prevent portions of the teeth, fractured incidental to removal of the cones, from flying off and injuring the operator of the wrench.

It is also apparent that the teeth on the rim provide a positive grip for the wrench
 30 entirely around its periphery and that the T-shaped slots engaging with the lock pins, lock the wrench on the cone during manipulation of the device.

What I claim and desire to secure by Letters Patent:

1. A wrench for cone bits comprising a head having a cone-shaped shield portion to receive a cone of a bit, a circumferential flange on the head having a T-shaped slot
 40 for receiving a lock-pin of the cone to anchor the wrench to the cone, teeth on the flange for freely engaging the teeth of the bit to permit limited rotational movement of the wrench independently of the cone to en-
 45 gage a lateral portion of said T-shaped slot with the lock-pin, and a lateral handle secured to said flange.

2. A wrench for cone bits comprising a head having a cone-shaped shield portion to
 50 receive a cone of a bit, a circumferential flange on the head having a slot for receiving a lock-pin on the cone to anchor the wrench to the cone, teeth on the flange for freely engaging the teeth of the bit to permit
 55 limited rotational movement of the wrench independently of the cone to effect locking engagement of the lock-pin in said slot, and means on the head for effecting rotation of the head.

3. A wrench for cone bits comprising a
 60 head having a cone-shaped shield portion to receive a cone of a bit, a circumferential flange on the head having a bayonet slot for receiving a lock-pin on the cone to anchor the
 65 wrench to the cone, teeth on the flange for

freely engaging the teeth of the bit to permit limited rotational movement of the wrench independently of the cone to effect locking engagement of the lock-pin in said slot, and means on the head for effecting rotation of the head.

In testimony whereof I affix my signature.

FRANK M. OWEN.

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