No. 756,590. PATENTED APR. 5, 1904.

E. CORNELIUS.

EXPANSIVE REAMER.

APPLICATION FILED DEC. 18, 1903.

NO MODEL.

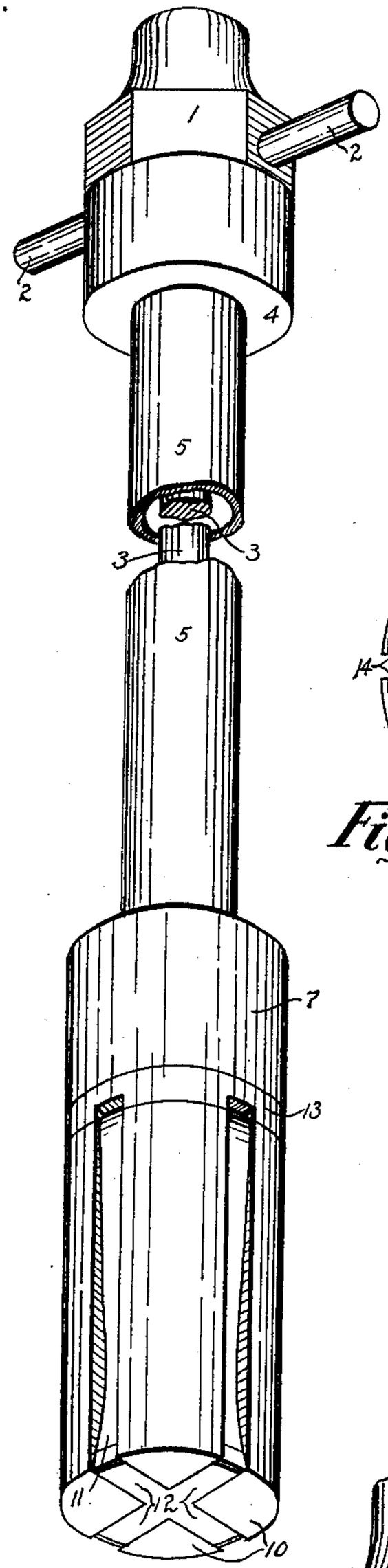

Fig 1.

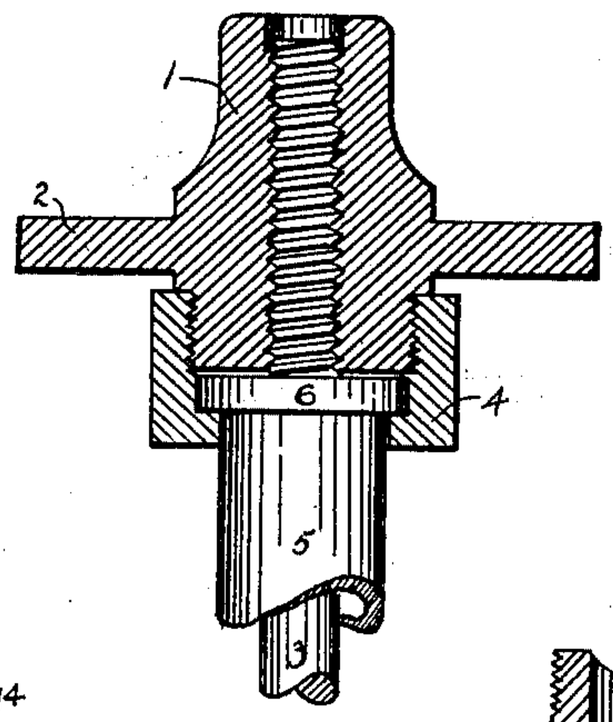

Fig 7.

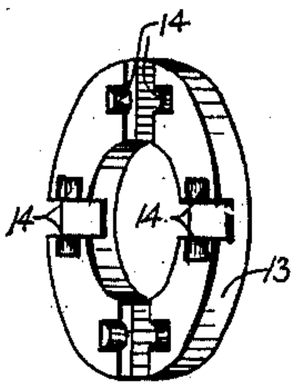

Fig 6.

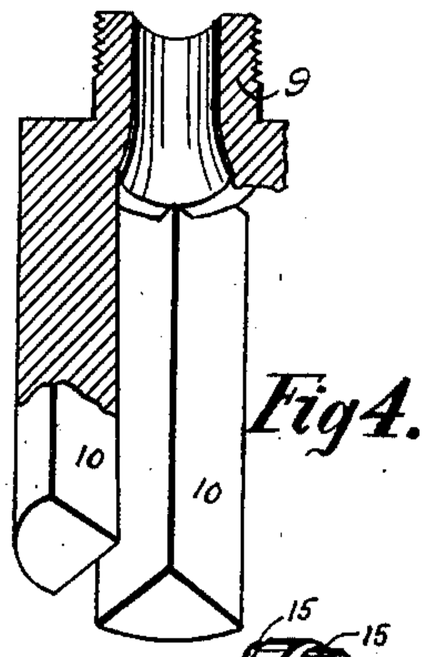

Fig 4.

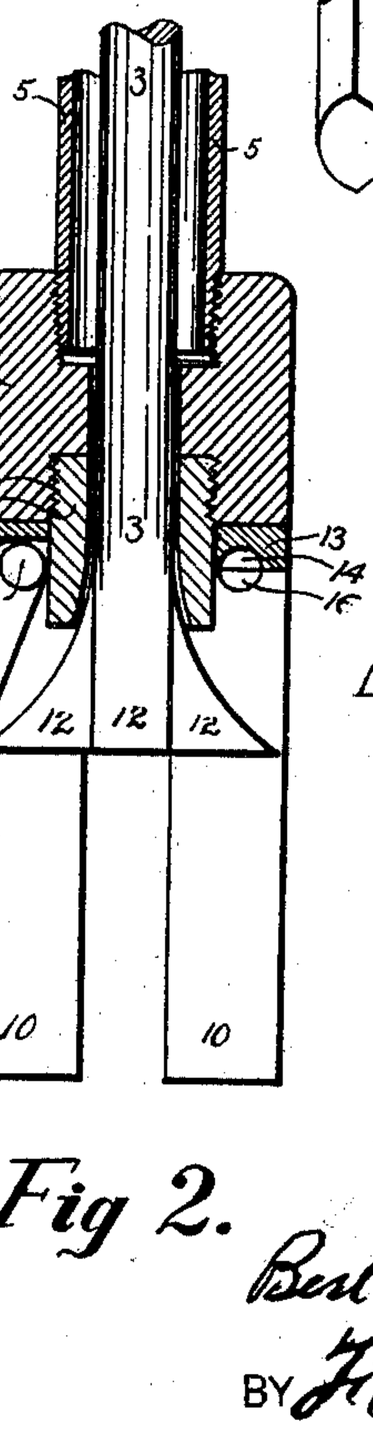

Fig 2.

Fig 5.

Fig 3.

WITNESSES:

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No. 756,590. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

EGBERT CORNELIUS, OF ORRVILLE, OHIO, ASSIGNOR OF ONE-HALF TO BERT COPE, OF ORRVILLE, OHIO.

EXPANSIVE REAMER.

SPECIFICATION forming part of Letters Patent No. 756,590, dated April 5, 1904.

Application filed December 18, 1903. Serial No. 185,678. (No model.)

To all whom it may concern:

Be it known that I, EGBERT CORNELIUS, a citizen of the United States, residing at Orrville, in the county of Wayne and State of Ohio, have invented certain new and useful Improvements in Expansive Reamers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the figures of reference marked thereon, in which—

Figure 1 is a side perspective view showing the different parts properly assembled and illustrating the cutters closed. Fig. 2 is a sectional view of the pipe-connecting head and also showing the cutter-head spreader in proper relative position and one of the cutters expanded, also showing the cutter-guides. Fig. 3 is a detached view of one of the cutters. Fig. 4 is a view showing two of the cutter-guides and the connecting-thimble, showing a portion of the cutter-guides in section. Fig. 5 is a detached view of the cutter spreader-head. Fig. 6 is a detached view of the cutter-abutting thimble. Fig. 7 is a sectional view of the driving-head, showing the coupling-collar located thereon and the tube connected thereto.

The present invention has relation to expansive reamers; and it consists in the novel arrangement hereinafter described, and particularly pointed out in the claims.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The object of the present invention is to provide a means for cutting or producing an opening of greater size at the bottom or inner portion of a hole drilled in rock or other material for the purpose of inserting blasting material.

In use an ordinary or common drill is used and an ordinary hole drilled the desired depth before the device of the present invention is applied to use.

In the accompanying drawings, 1 represents the driving-head, which is provided with the handle 2. The driving-head 1 is provided with a screw-threaded aperture which receives the screw-threaded end of the rod 3. To the driving-head 1 is attached the coupling-collar 4 by means of screw-threads. For the purpose of connecting the driving-head to the tube or pipe 5 said tube or pipe is provided with the flanged end 6, which flanged end is received in the coupling-collar 4, as illustrated in Fig. 7. To the opposite end of the tube or pipe 5 is attached by screw-threads the head 7, which head is provided with a screw-threaded aperture 8, which screw-threaded aperture is for the purpose of receiving the cutter-guide thimble or connecting-collar 9, to which coupler head or collar 9 is securely attached or formed integral therewith the cutter-guides 10, which guides are located and arranged substantially as shown in Fig. 1, and, as shown, they are spaced from each other for the purpose of providing room for the cutters 11 and also for the flanges 12, which flanges are formed substantially as illustrated in Fig. 5 and are located upon the extreme end of the rod 3. Against the end of the head 7 is located the washer 13, which washer is non-screw-threaded and is located upon the non-screw-threaded portion of the connecting-collar 9, as illustrated in Figs 1 and 2. The washer 13 is provided with the open recesses 14, which open recesses are for the purpose of receiving bearing-lugs 15, formed upon the cutters 11.

The inner ends of the cutter-guides 10 are provided with the open recesses 16, and when the inner ends of the guide-arms are brought snugly against the washer 13 pivotal points will be provided for the cutters 11.

In use the parts are all properly assembled and the device inserted into the hole already drilled the distance equal to the distance where it is desired to increase the diameter of the blasting-hole. The handle 2 is then rotated in the direction to draw the rod 3 inward or away from the extreme ends of the cutter-guides 10, which movement turns the cutters upon their pivotal points and throws their cutting ends outward or away from a longitudinal center of the tool proper. After the rod 3 has been drawn so as to bring the cutters in close contact with the wall of the drilled

hole the driving-head 1 is hammered upon, thereby driving the ends of the cutters into the material designed to be cut, and as the cutters are forced forward they are drawn outward by the rotation of the head 1 until the cutters have been fully expanded or expanded the desired distance. After this operation is performed the driving-head 1 is rotated until the flanges 12, formed upon the rod 3, reach the ends of the guides 10, after which the tool proper is drawn backward and rotated sufficiently to cause the cutters to cut new channels, and the same operation performed and the operations continued until the blast-hole has been properly reamed. The tool is then removed and the blasting material placed in position.

It will be understood that by my peculiar arrangement I am enabled to place blasting material behind the inner end of the ordinary hole drilled by the ordinary tools, by which arrangement better results are produced by the explosion of the blasting material.

For the purpose of allowing the cutters 11 to be brought into position so that the reamer can be inserted their inner edges at the outer ends of said cutters are beveled, and the outer edges of the flanges 12 are beveled corresponding substantially with the bevel of the cutters.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an expansive reamer, the combination of a driving-head provided with a handle, and a screw-threaded aperture, a coupling-collar connected to said head, a pipe provided with a flange, said flange located in the coupling-collar, a rod located through the pipe and screw-threaded at one end, a coupling-head connected to the pipe, a coupling-thimble connected to the coupling-head, and guides connected to the coupling-thimble, said guides spaced from each other, a collar located between the coupling-head and the inner ends of the cutter-guides, cutters pivotally connected between the collar and the inner ends of the cutter-guides, and flanges formed upon the rod, said flanges located in the spaces between the guides all arranged, substantially as and for the purpose specified.

2. In a reamer of the class described, a tube and a driving-head connected to said tube, a rod located through the tube and movable longitudinally therein, a coupling-head secured to the opposite end of the tube from that to which the driving-head is attached, a thimble connected to the coupling-head, said thimble provided with cutter-guides, said cutter-guides spaced from each other, a collar located between the coupler-head and the inner ends of the cutter-guides, and cutters pivotally attached between the collar and the inner ends of the cutter-guides and flanges connected to the longitudinally-movable rod, said flanges located in the spaces between the cutter-guides and between the cutters, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

BERT CORNELIUS.

Witnesses:
T. W. ORR,
JOSEPH DYE.