



(No Model.)

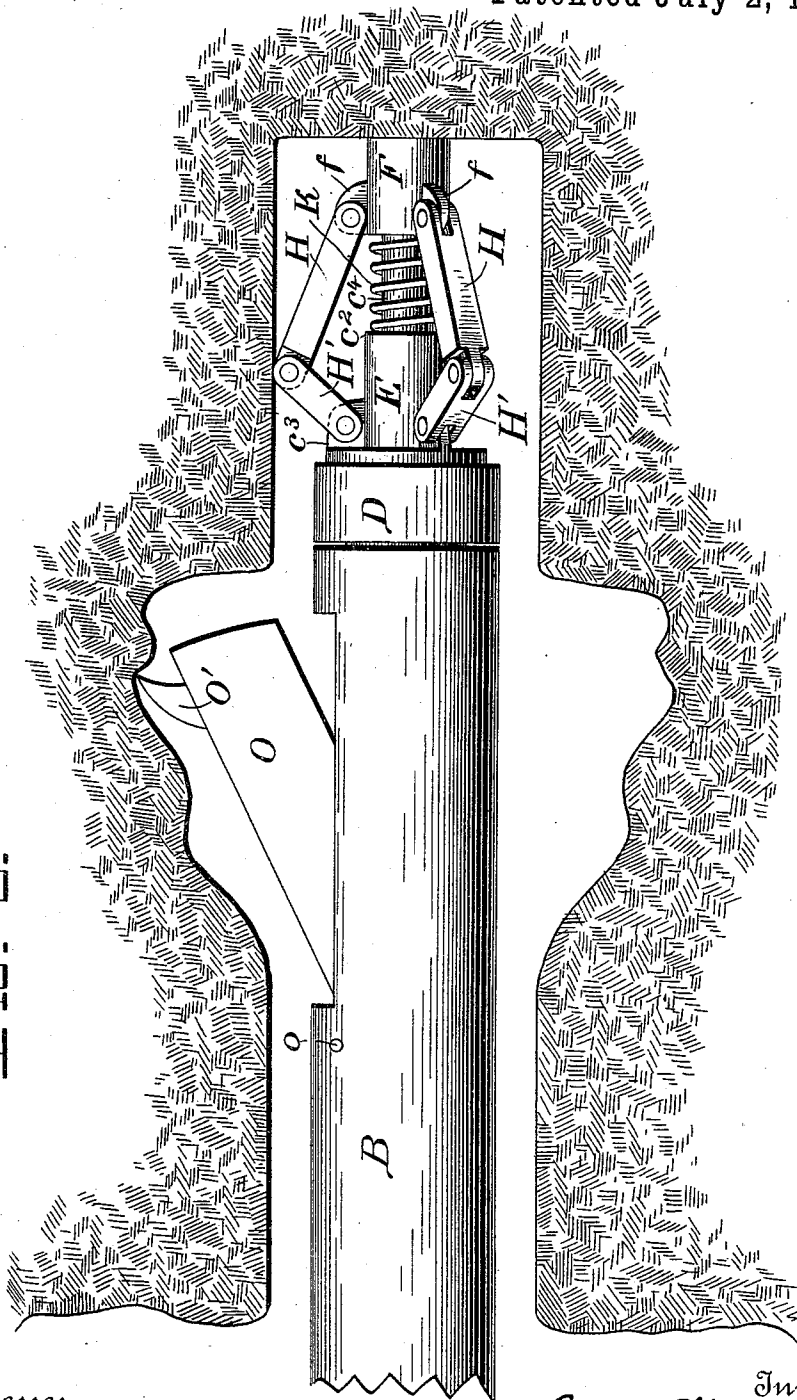
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REAMER FOR USE IN MINING.

No. 542,152.

Patented July 2, 1895.

FIG. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## REAMER FOR USE IN MINING.

SPECIFICATION forming part of Letters Patent No. 542,152, dated July 2, 1895.

Application filed November 1, 1894. Serial No. 527,682. (No model.)

*To all whom it may concern:*

Be it known that we, ROBERT H. ELLIOTT and JOHN B. CARRINGTON, citizens of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Means of Centering Reamers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in reamers for use in mining, and it especially relates to improved means of centering the reamer in the bore-hole, whereby a more uniform action of the reamer on the various sides of the bore-hole is secured.

Reference is had to the accompanying drawings, wherein the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation of a reamer-spindle fitted with our improved centering device, the reamer-cutters, which may be of any well-known form—such, for instance, as those shown in our applications, Serial No. 499,814, filed February 10, 1894, Serial No. 500,910, filed February 20, 1894, and Serial No. 509,096, filed April 26, 1894—are omitted from the drawings. Fig. 2 represents an end view of the device shown in Fig. 1, as seen from the right of the said figure. Fig. 3 represents a central longitudinal section of the device shown in Figs. 1 and 2 and illustrates its use in a drill-hole, and Fig. 4 represents a side elevation of a modification of the device shown in the other figures. Fig. 5 represents a side elevation of the front end of a reamer with the centering device shown in Figs. 1 to 3 in use in a bore-hole.

A represents the bore-hole, which has been previously drilled in the ordinary way.

B represents the front end of the reamer shaft or spindle, the cutters of which are not shown. This spindle is provided with screw-threads *b* to engage the screw-thread *c* on the rear end of the reamer-head C, which reamer-head is provided with an annular flange *c'* and a cylindrical lug *c<sup>2</sup>* projecting in front of said

flange. The sleeve D has a lip *d* projecting behind said annular flange and free to revolve on said reamer-head. The forward portion of said sleeve is interiorly screw-threaded, as at *d'*, to engage the screw-threads *e* on the rear portion of the cap E, which cap is hollowed out, as at *e'*, to receive the lug *c<sup>2</sup>* and to revolve freely about said lug. The said cap E is provided with perforated lugs *e<sup>3</sup>*, a shoulder *e<sup>2</sup>*, and a cylindrical forward portion *e<sup>4</sup>*. Mounted over the forward end of this cylindrical portion *e<sup>4</sup>* is a sliding cap F provided with perforated lugs *f*. The links H and H', preferably three of each, although a greater number may be employed, connect the lugs *f* and *e<sup>3</sup>*, and thus secure the sliding cap F on the fixed cap E. These pairs of links H and H' form a plurality of toggle-joints, which are normally kept nearly straight by the coil-spring K interposed between the shoulder *e<sup>2</sup>* and the sliding cap F.

It will be evident that if pressure be brought on the reamer-spindle from the rear while the sliding cap F is held rigid the cylindrical portion *e<sup>4</sup>* will slide into the cap F, compressing the spring K and causing the various toggle-joints to press outward uniformly, thus centering the reamer-spindle in the bore-hole. As soon as the pressure is relieved, the spring K will straighten the toggle-joints and the reamer may be readily withdrawn from the bore-hole.

It will be seen that the reamer-spindle will revolve freely, the head C being journaled in the sleeve D and the cap E.

The reamer shown in Fig. 5 is provided with a cutting-blade O, pivoted at *o*, and an auxiliary cutting-blade O', as described in detail in our Patent No. 530,512, granted December 11, 1894.

In the modification shown in Fig. 4 the sleeve D' is faced with a ring P, which ring is provided with a plurality of radial dove-tailed grooves, in which slide freely the dove-tailed lugs *m'* at the base of the blocks M. The backs of the blocks are provided with lugs *m*, to which the links H<sup>2</sup> are pivotally connected, which links are also pivotally connected to the lugs *f* on the sliding cap F. This cap is normally pressed forward by the

spring K and tends to drag the block M inward toward the axis of the reamer. When the reamer is pressed forward against the action of the spring K, the sliding collar F being held rigidly, the blocks M will be forced out radially and will hold the reamer centered in the bore-hole. As soon as the pressure is removed, the spring K will force the sliding cap F forward again, drawing in the block M and allowing the reamer to be readily withdrawn from the bore-hole.

It will be obvious that various modifications of the herein-described device might be made which could be used without departing from the spirit of my invention.

It will be evident that the herein-described centering device will allow the reamer to be readily inserted in and withdrawn from the bore-hole. Also, it will, by properly centering the reamer, secure the uniform cutting of the reamer-blades and materially lessen the time and labor required in reaming out a chamber for the explosive charge.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a reamer spindle of a centering device forming a journal bearing for the forward end thereof, the said centering device being provided with three or more extensible arms adapted to press outward when said centering device is subjected to longitudinal pressure, substantially as described.

2. The combination with a reamer spindle, of a cap forming a journal bearing therefor, a sliding cap mounted on said first cap and extensible arms connected to said first cap and operated by said sliding cap, substantially as described.

3. The combination, with a reamer spindle, of a centering device forming a journal bearing for the forward end thereof, the said centering device being provided with three or more extensible arms adapted to press outward when said centering device is subjected to longitudinal pressure; with a spring normally drawing said extensible arms inward toward the axis of the reamer spindle, substantially as described.

4. The combination, with a reamer spindle, of a cap forming a journal bearing therefor; a sliding cap mounted on said first cap, and

extensible arms connected to said first cap and operated by said sliding cap; and a spring interposed between said caps and normally tending to draw said arms inward toward the axis of the reamer spindle, substantially as described.

5. In a reamer spindle centering device, the combination with the reamer spindle, of a cap forming a journal bearing therefor and terminating in a forwardly projecting lug, a sliding cap normally projecting beyond the end of said lug, and extensible arms connected to said first cap and operated by pressure on said sliding cap, substantially as and for the purposes described.

6. In a reamer spindle centering device, the combination with the reamer spindle, of a cap forming a journal bearing therefor and terminating in a forwardly projecting lug, a sliding cap normally projecting beyond the end of said lug, and extensible arms connected to said first cap and operated by pressure on said sliding cap, and a spring interposed between said caps and normally tending to press forward said sliding cap, substantially as and for the purposes described.

7. In a reamer spindle centering device, the combination with the reamer spindle, of a cap forming a journal bearing therefor and terminating in a forwardly projecting lug, a sliding cap normally projecting beyond the end of said lug, and toggle joints connected to each of said caps and operated by pressure on said sliding cap, substantially as and for the purposes described.

8. In a reamer spindle centering device, the combination with the reamer spindle, of a cap forming a journal bearing therefor and terminating in a forwardly projecting lug, a sliding cap normally projecting beyond the end of said lug, and toggle joints connected to each of said caps and operated by pressure on said sliding cap, and a spring interposed between said caps and normally tending to press forward said sliding cap, substantially as and for the purposes described.

In testimony whereof we affix our signatures in presence of two witnesses.

ROBERT H. ELLIOTT.  
JOHN B. CARRINGTON.

Witnesses:

W. G. ROBINSON,  
H. C. KENNARD.