

(No Model.)

2 Sheets—Sheet 1.

R. H. ELLIOTT & J. B. CARRINGTON.

REAMER FOR USE IN MINING.

No. 549,771

Patented Nov. 12, 1895.

Fig. 1.

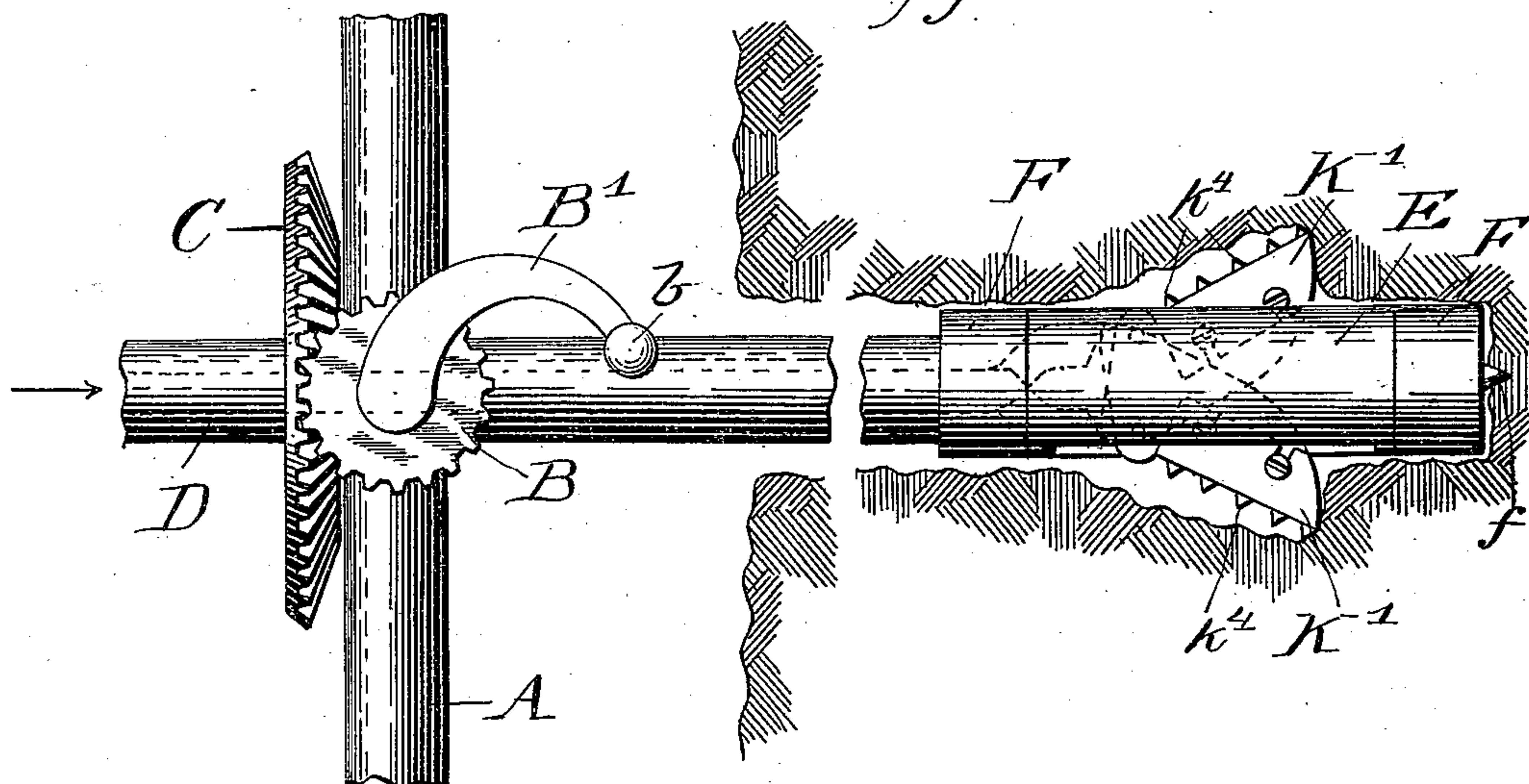


Fig. 2.

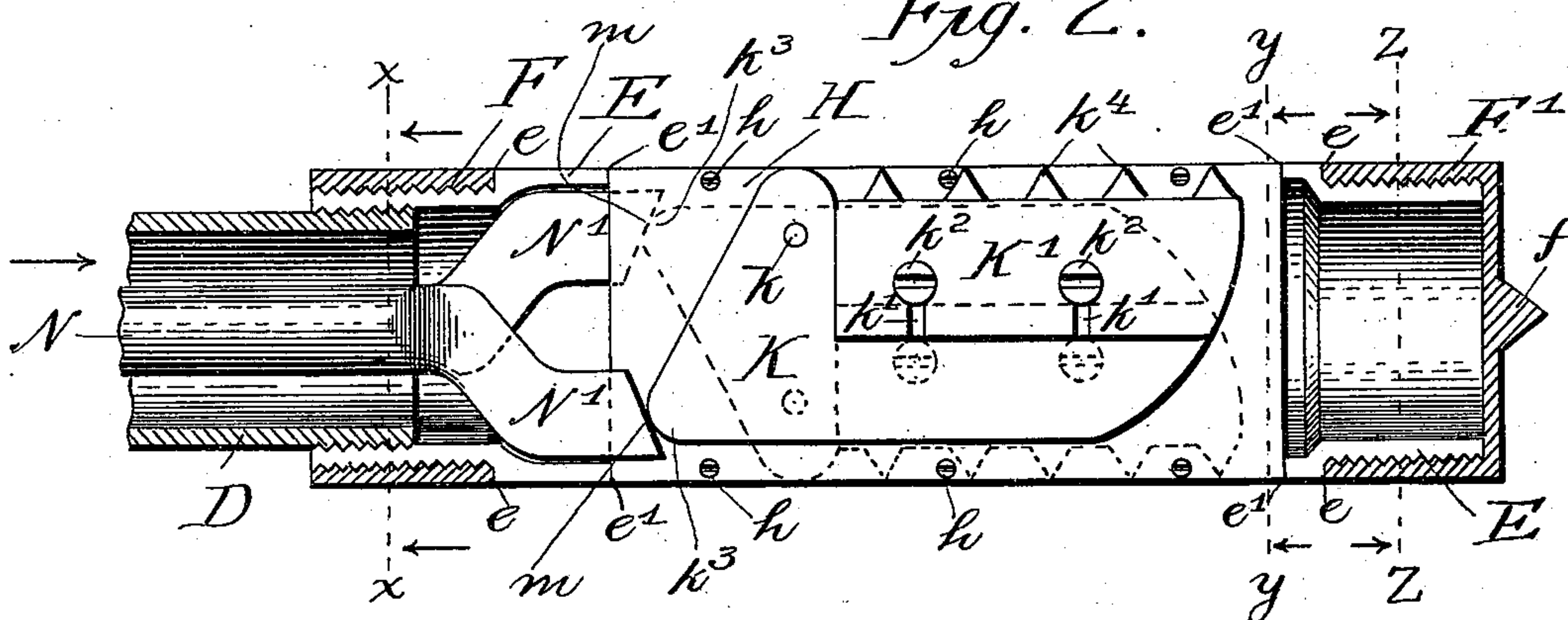


Fig. 3.

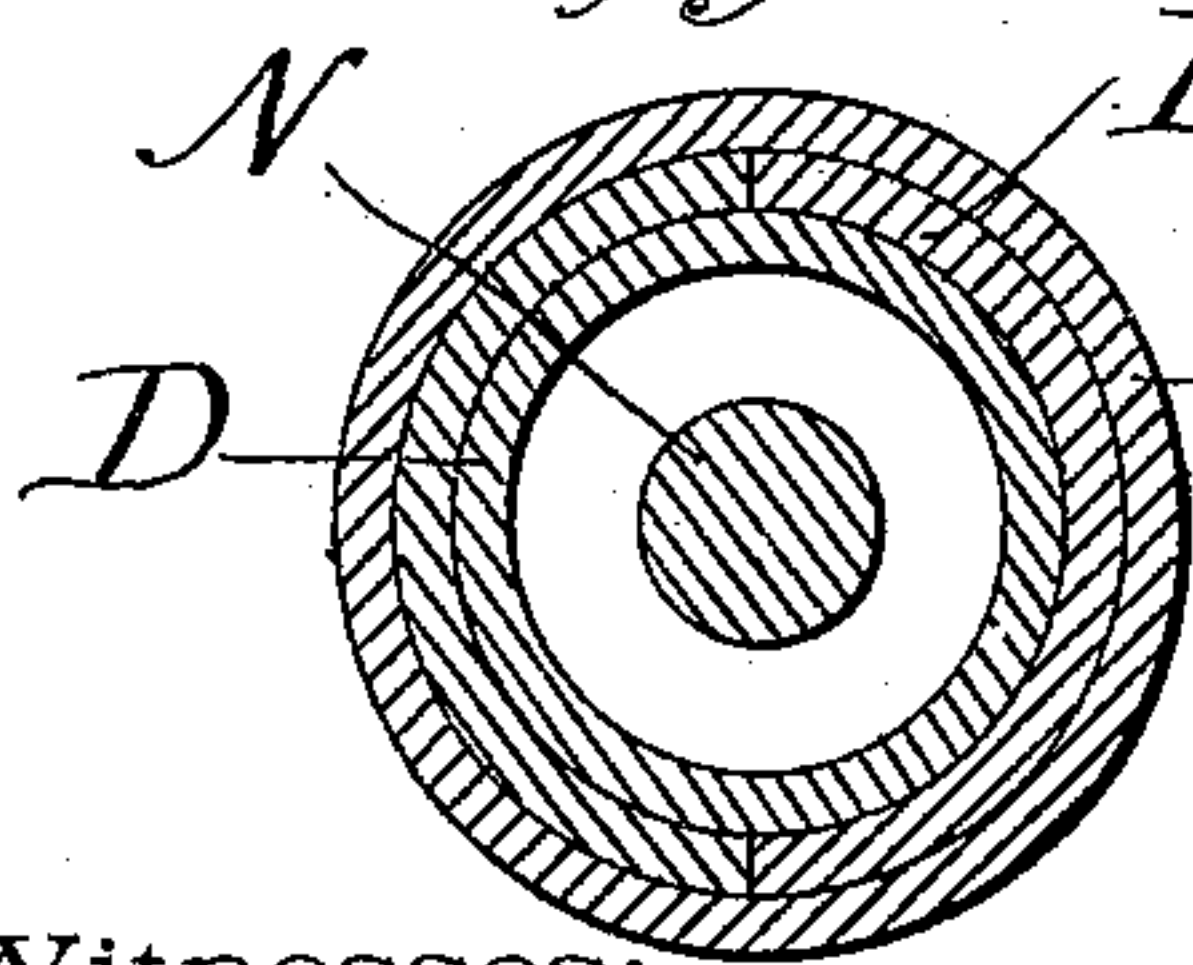


Fig. 4.

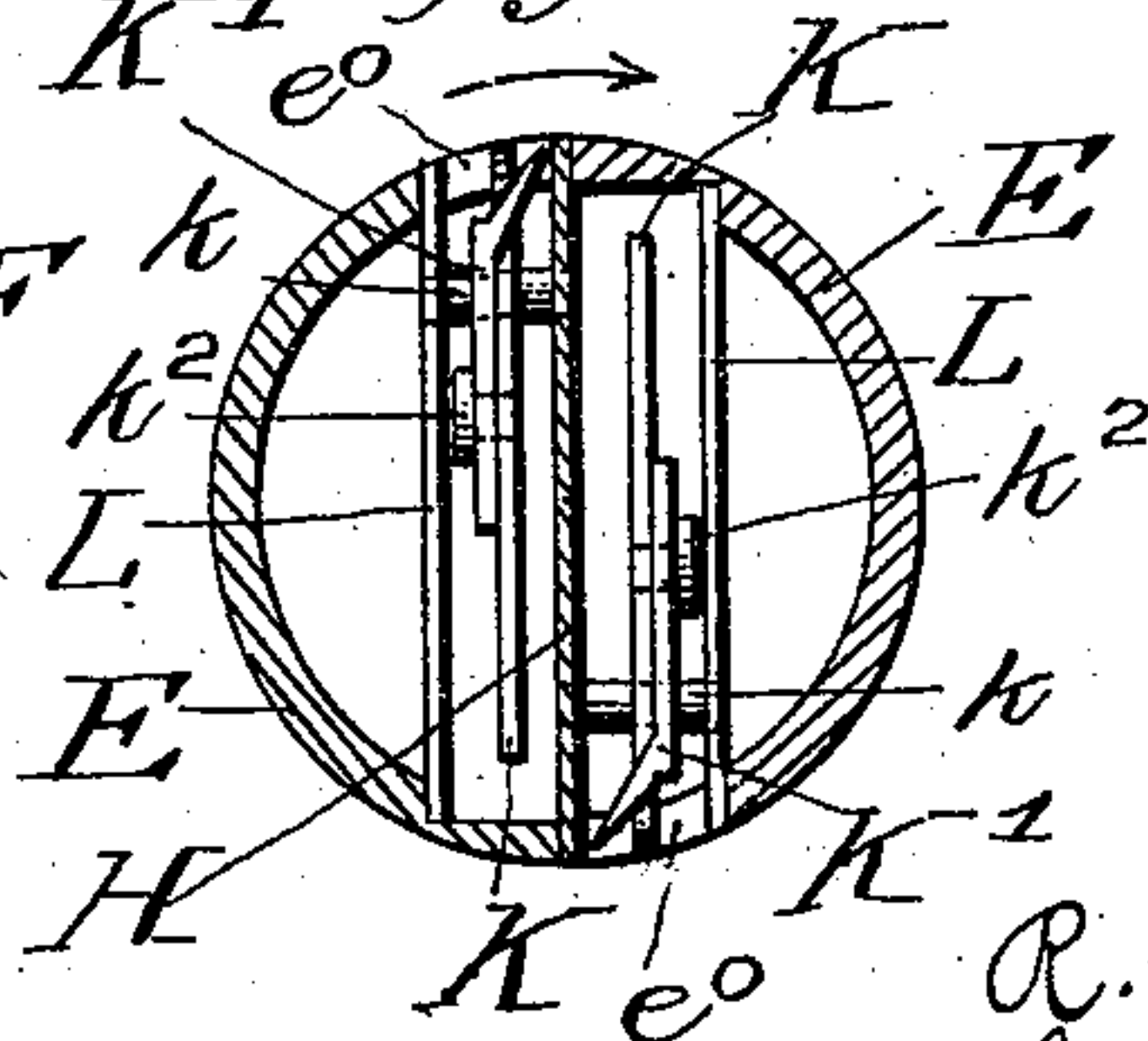
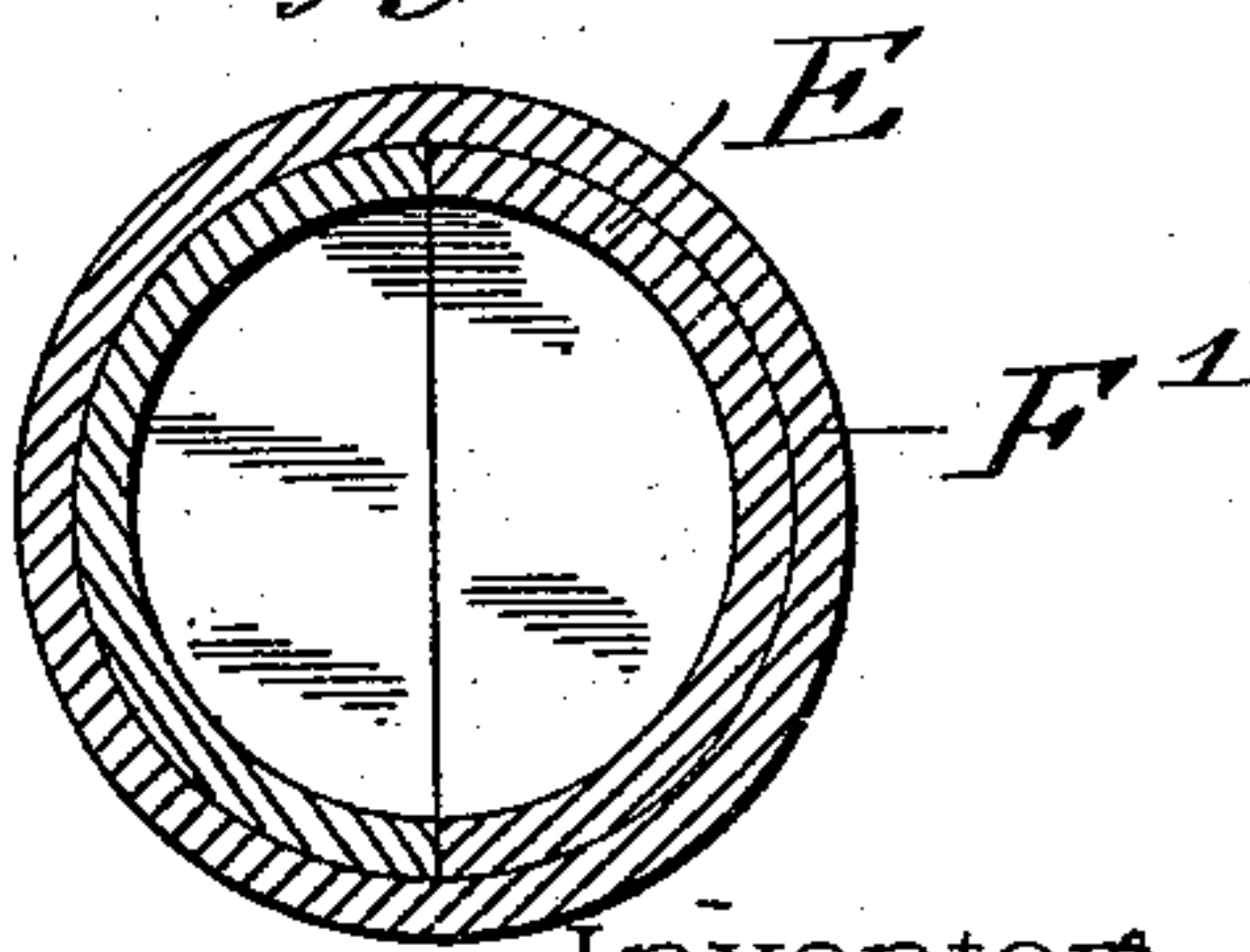


Fig. 5.



Witnesses:

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Fig. 7.

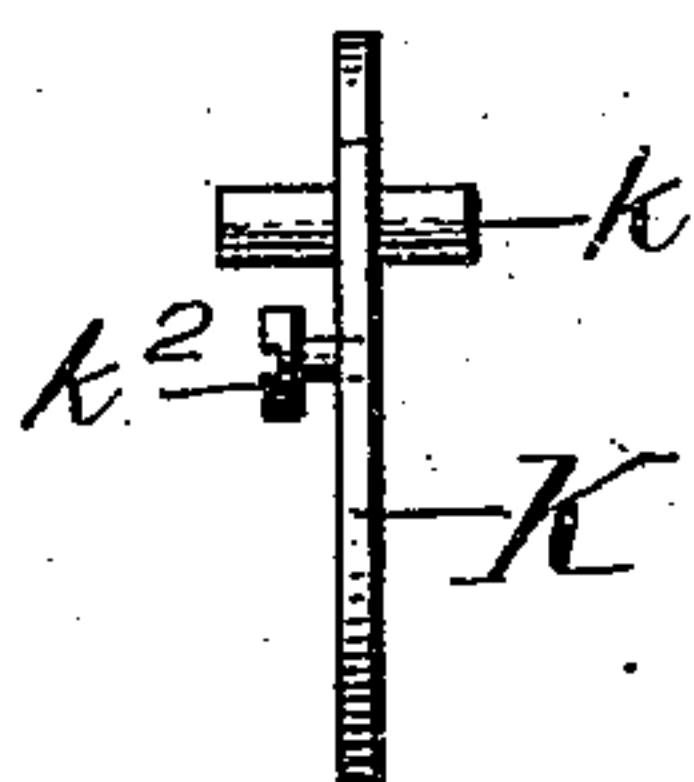


Fig. 6.

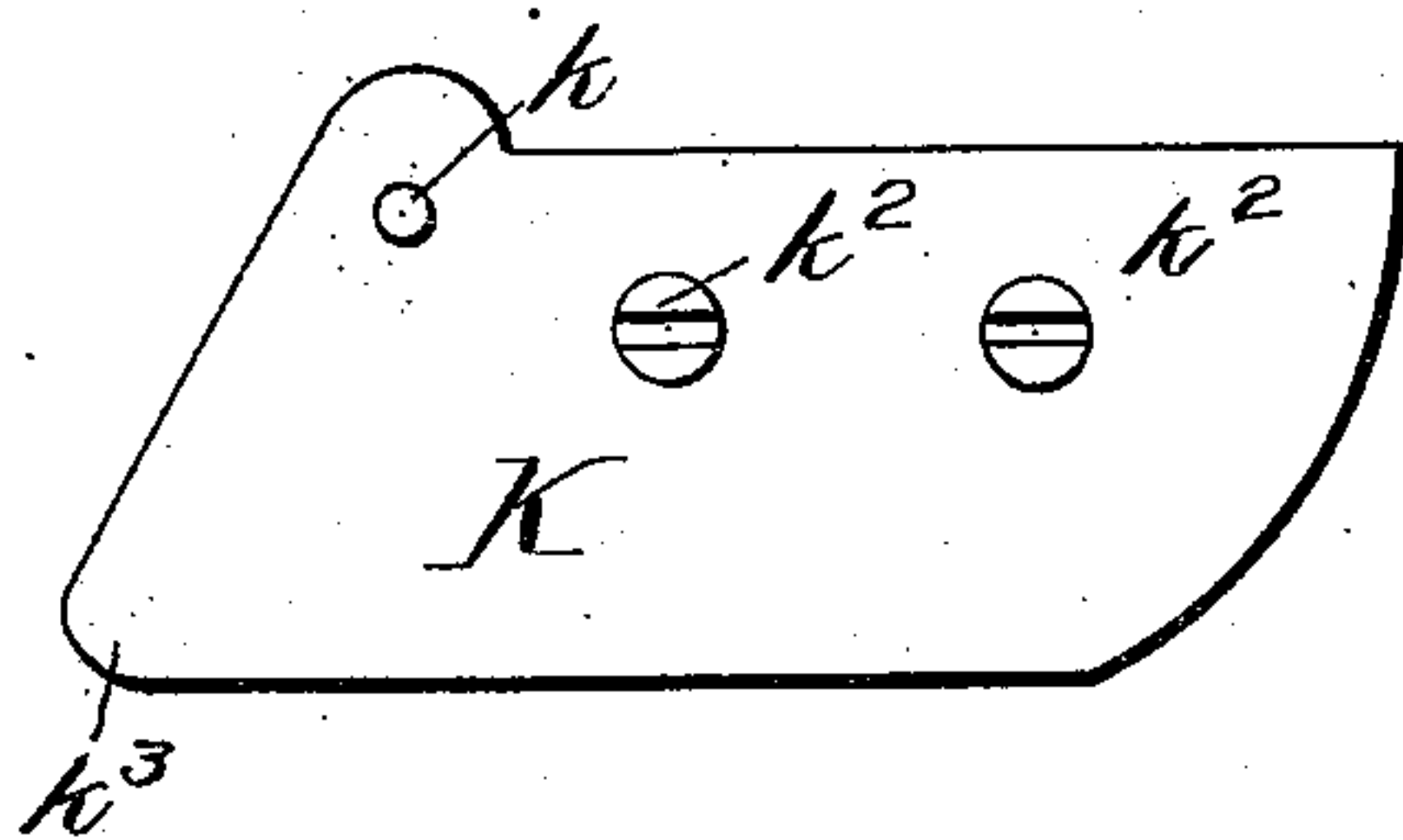


Fig. 9.

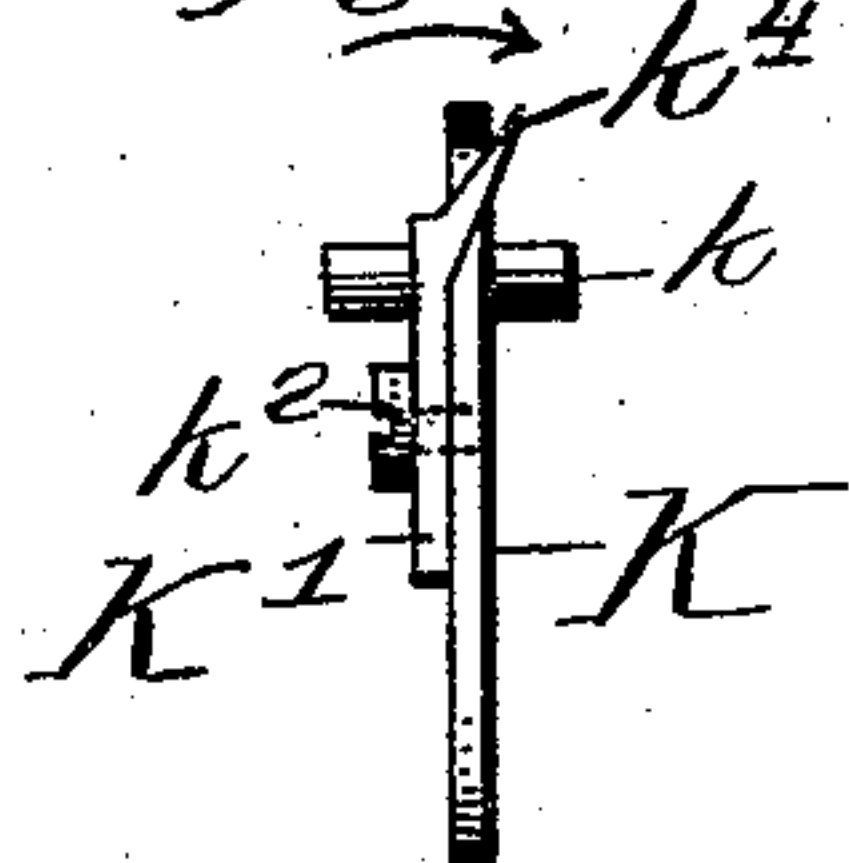


Fig. 8.

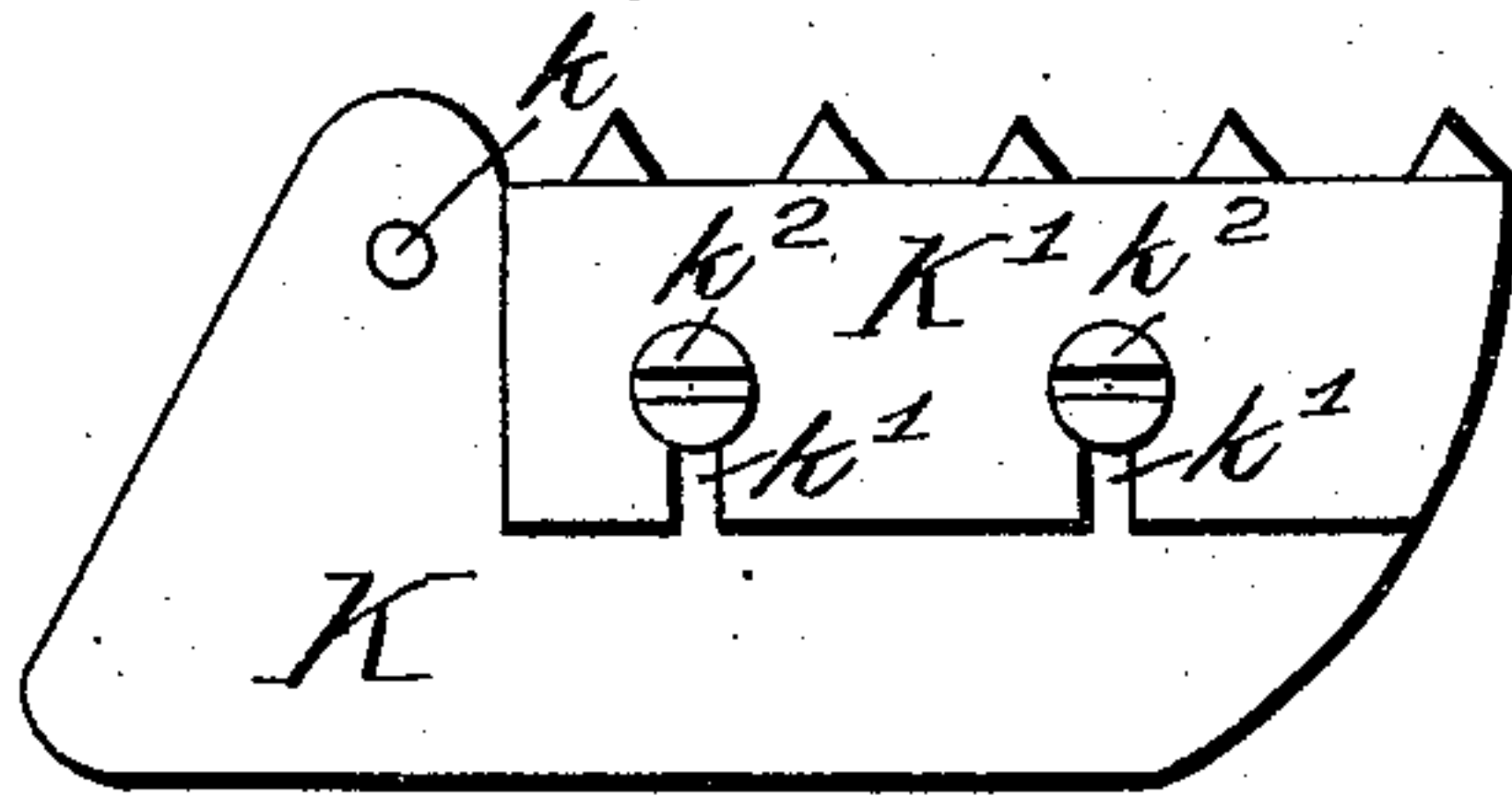


Fig. 11.

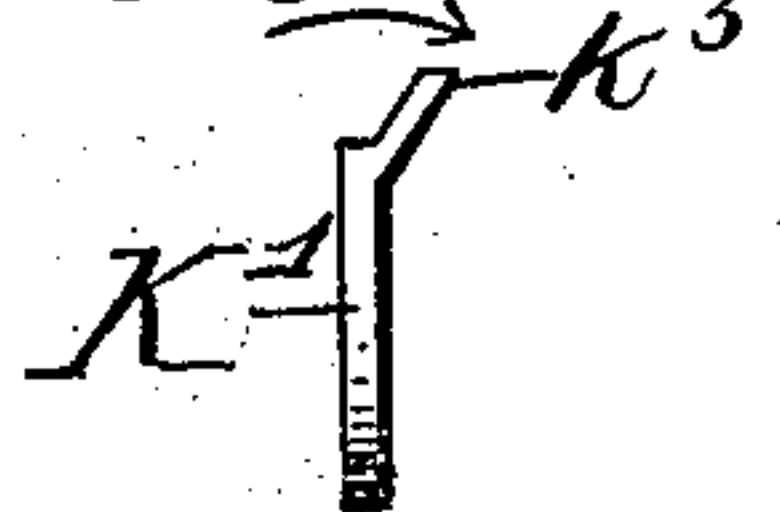
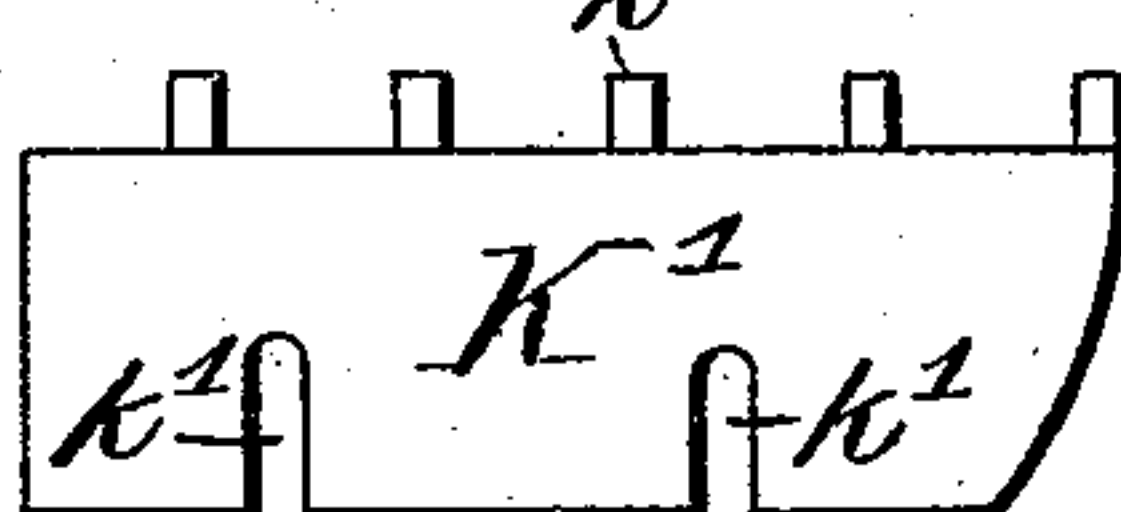


Fig. 10.



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# UNITED STATES PATENT OFFICE.

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## REAMER FOR USE IN MINING.

SPECIFICATION forming part of Letters Patent No. 549,771, dated November 12, 1895.

Application filed February 23, 1895. Serial No. 539,465. (No model.)

*To all whom it may concern:*

Be it known that we, ROBERT H. ELLIOTT, residing at Birmingham, in the county of Jefferson, and JOHN B. CARRINGTON, residing at Jasper, in the county of Walker, State of Alabama, citizens of the United States, have invented certain new and useful Improvements in Reamers for Use in Mining; 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 especially for use in the mining of coal or other mineral of like nature.

The said invention will be more fully understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation, partly in section, of the improved reamer in use in enlarging a pocket in a bore-hole. Fig. 2 represents an axial section through the said reamer before it has been inserted in the bore-hole. Fig. 3 represents a section along the line  $xx$  of Fig. 2 and looking in the direction of the arrows. Fig. 4 represents a section along the line  $yy$  of Fig. 2 and looking in the direction of the arrows. Fig. 5 represents a section along the line  $zz$  of Fig. 2 and looking in the direction of the arrows. Fig. 6 represents a detailed view of one of the reamer-blades as detached from the machine and before the detachable cutting-blade has been attached thereto. Fig. 7 represents an end view of the device shown in Fig. 6 as seen from the right of the said figure. Fig. 8 represents a view similar to that shown in Fig. 6 after one of the detachable cutting-blades has been secured thereto, and Fig. 9 represents an end view of the device shown in Fig. 8 as seen from the right of the said figure. Fig. 10 represents a side elevation of a modified form of detachable cutting-blade, and Fig. 11 represents an end view of the device shown in Fig. 10 as seen from the right of the said figure.

A represents the jack-post or other equivalent

device, on which the pinion B is revolvably mounted, which pinion is rotated by means of the hand-crank B' and handle  $b$  and revolves the gear-wheel C, which turns the reamer-spindle D.

The herein-described mechanism for rotating the reamer-spindle is of the simplest form and is intended to be merely typical, as the means of transmitting motion to the reamer-spindle are not a part of our invention, and any preferred mechanism for accomplishing this result may be adopted.

Screwed on the forward end of the reamer-spindle D are two semicylinders E, which are held together by the rings F and F', the forward one of which is closed at its forward end and is provided with a nipple  $f$  for engaging in the end of the bore-hole, and thus forming a pivot about which the reamer revolves. Any suitable means for centering the reamer in the bore-hole may be adopted, if desired. These two semicylinders E are obversely slotted, as shown at  $e^o$  in Fig. 4, and are provided with longitudinal diaphragms L and with a central diaphragm H, secured to one of the said semicylinders by screws  $h$ , as shown most clearly in Fig. 2. This plate or diaphragm H is let into one of the said semicylinders flush against the shoulders  $e'$ , while the said semicylinders are provided with shoulders  $e$ , against which the rings F and F' fit snugly, as shown in Fig. 2.

Two blades K are obversely pivoted in the two semicylinders on pivots  $k$ , which are journaled in the diaphragms H and L, as shown in Fig. 4. These blades K are provided with detachable cutting-blades K', having teeth of any desired shape—such as  $k^4$  in Figs. 2, 8, and 9 or  $k^5$  in Figs. 10 and 11. These detachable blades K' are slotted, as at  $k'$ , and are clamped at the desired position on the pivoted blades K by means of the clamp-screws  $k^2$ .

The rear end of the blades K is rounded, as at  $k^3$ , and bears against the inclined face  $m$  of one of the fork-arms N', which are attached to the longitudinally-movable rod N, by means of which the blades K are forced apart or allowed to return to the closed position.

The slope  $m$  of the arms N' should be made



such that the blades K will not swing outward when they are in the position shown in Fig. 2, but may be readily forced outward by the longitudinal motion of the rod M.

5 The drill-spindle D and the semicylinders E are made hollow to permit the injection of air or other fluid therethrough in the direction indicated by the arrows in Figs. 1 and 2. The air or other fluid so entering will  
10 carry the chips back out of the bore-hole in the well-known way.

The teeth  $k^4$  or  $k^5$  should preferably be set at an angle laterally, as shown in Figs. 4, 9, and 11, so that they may cut into the bore-  
15 hole, the drill-spindle being revolved in the direction indicated by the arrows in the said figures. The advantages of this structure are to enable the teeth to bite into the material as the reamer revolves, while teeth ex-  
20 tending straight out from the blade would spring back and act more as a scraper than like a jack-plane or draw-knife.

By the herein-described construction the parts are very readily assembled and are  
25 readily taken apart for the insertion of new cutting-blades for repairs or for other purposes.

Moreover, by having detachable cutting-blades the same may be readily removed and  
30 sharp ones may be put into position. Furthermore, by having oppositely-disposed cutting-blades the said blades tend to center the reamer in the bore-hole, while the herein-described construction provides a means for  
35 causing the cutting-blades to be pushed out equally and to be withdrawn into the reamer-head when desired.

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

1. In a wing for use in mining reamers of the character described, the combination with a pivoted plate and means for swinging the same outward through the sides of the reamer  
45 head, of a detachable cutting blade secured to said plate and provided with teeth projecting from and inclined laterally to the surface of said blade, substantially as described.

2. In a mining reamer of the character de-

scribed, the combination with a slotted reamer 50 head, of a pivoted plate, a detachable cutting blade provided with cutting teeth projecting from the edge of and inclined laterally to the surface of said plate, the said plate being slot-  
55 ted along its rear edge, and screws adapted to pass through said slots and engage in said plate, and to adjustably connect said detachable blade to said plate, substantially as de-

scribed.  
3. A reamer head for use in reamers of the 60 character described, comprising two semicylindrical parts E, each longitudinally slotted along one element thereof, shouldered near the ends as at  $e$ , and externally screw-  
65 threaded beyond said shoulders, the union F screwed onto one end of the reamer head, and a cap screwed onto the other end, the said union and cap holding the two semi-  
70 cylinders together, a longitudinal plate passing through the center of the reamer head and secured to the semi-cylinders, slots ob-  
versely disposed at opposite sides of said plate, and wings pivoted to said plate and adapted to swing out through the said slots,  
75 substantially as described.

4. A reamer head for use in reamers of the character described, comprising two semi-  
cylindrical parts E each longitudinally slot-  
80 ted along one element thereof, shouldered near the ends as at  $e$ , and externally threaded beyond said shoulders, the union F' screwed on the end of the reamer head, the cap F' provided with the holding device  $f$  screwed  
85 onto the other end of said reamer head, and cutting wings pivoted in said reamer head and adapted to swing outward through said slots, substantially as described.

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

ROBERT H. ELLIOTT.  
JOHN B. CARRINGTON.

Witnesses for R. H. Elliott:

J. B. ROBINSON,  
H. C. KENNARD.

Witnesses for John B. Carrington:

PHILLIP RICHARDSON,  
J. H. HAYES.