

(No Model.)

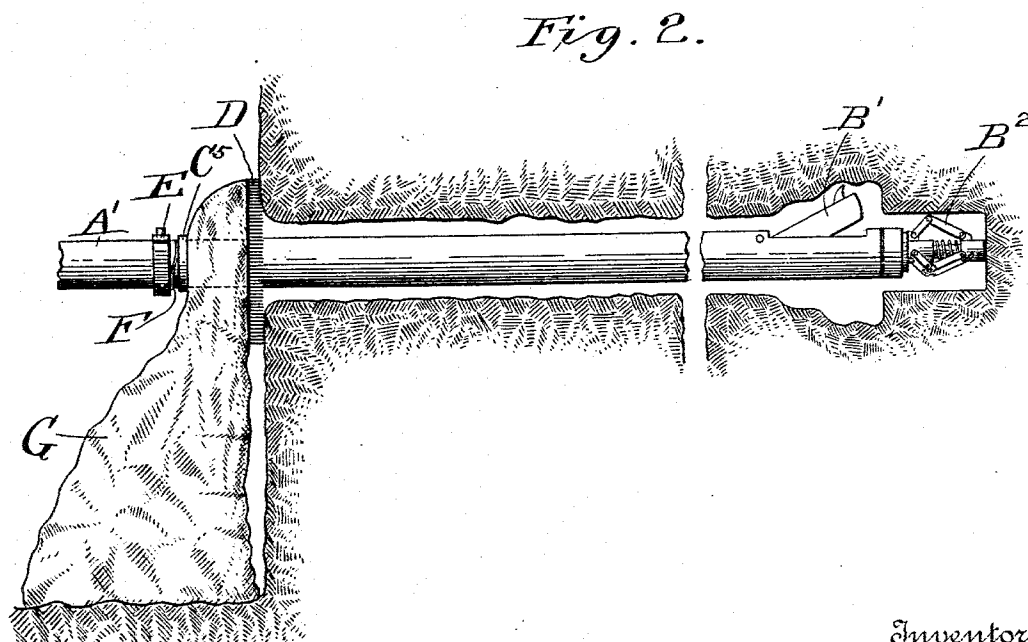
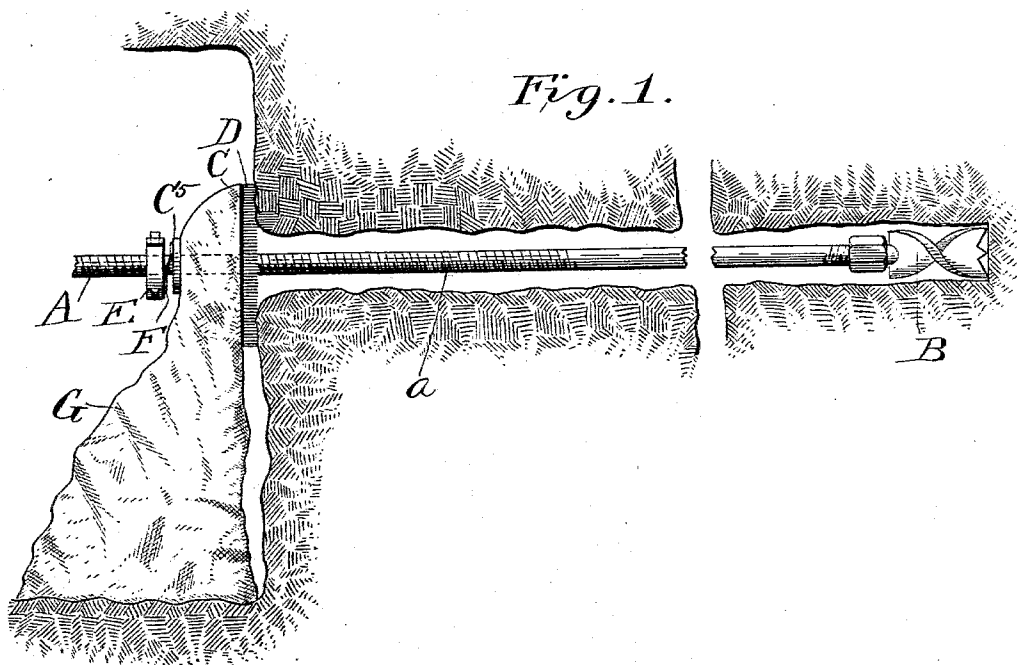
2 Sheets—Sheet 1.

R. H. ELLIOTT.

DUST ARRESTER FOR MINING DRILLS AND REAMERS.

No. 551,464.

Patented Dec. 17, 1895.



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2 Sheets—Sheet 2.

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Fig. 4.

Fig. 5.

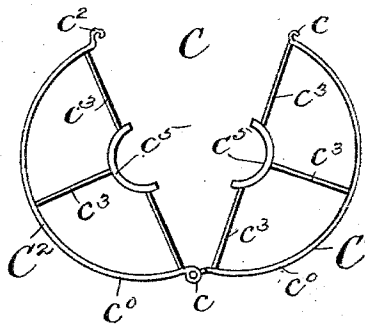
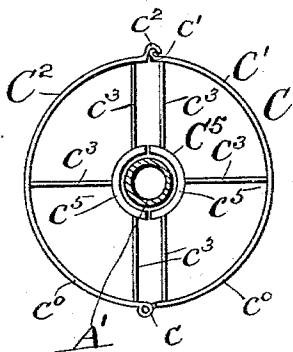
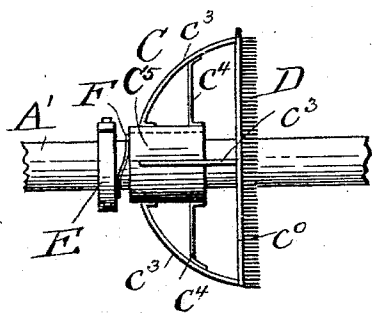


Fig. 6.

Fig. 7.

Fig. 8.

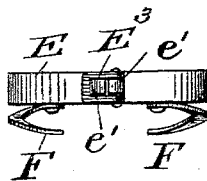
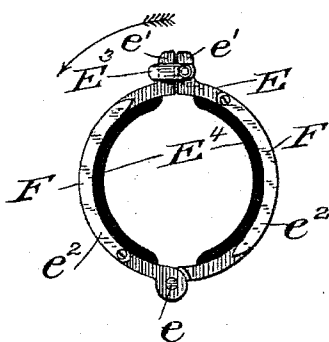
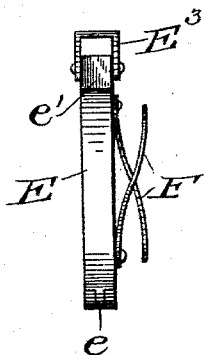
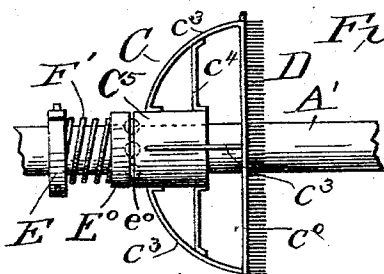


Fig. 9.



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UNITED STATES PATENT OFFICE.

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DUST-ARRESTER FOR MINING DRILLS AND REAMERS.

SPECIFICATION forming part of Letters Patent No. 551,464, dated December 17, 1895.

Application filed April 22, 1895. Serial No. 546,714. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. ELLIOTT, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Dust-Arresters for Mining Drills and Reamers; and I 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.

My invention relates to dust accumulators or arresters for use in drilling and reaming bore-holes in mining coal or other like soft or dust-yielding minerals.

In coal-mining especially the boring-tool makes a great deal of dust, and where this dust is removed from the bore-hole by means of an air-blast passing through the hollow stem of the drill or reamer, which returns dust-laden through the bore-hole, as described in the patents granted R. H. Elliott and J. B. Carrington, Nos. 530,510 and 530,511, dated December 11, 1894, this dust becomes especially objectionable to the operatives in the mine. It is to avoid this objection that the hereinafter described device was provided.

This device consists essentially of a sack or pouch which may be either opened or closed at the bottom, and has its mouth opening over the mouth of the bore-hole, against which it is held by suitable means, while the drill or reamer spindle continues to revolve.

The said invention also consists in certain novel details of construction and arrangements of parts which will be hereinafter more fully described and claimed.

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

Figure 1 represents a vertical section through the bore-hole, showing a mining-drill in operation and the dust-arrester mounted thereon. Fig. 2 represents a similar view showing a reamer in operation with the dust-arrester mounted thereon. Fig. 3 represents a side elevation of the frame for keeping the mouth of the dust-sack extended

and for supporting the same on the reamer-spindle or drill-spindle. Fig. 4 represents an end view of the device shown in Fig. 3, as seen from the right of the said figure, but with the fringe detached from the frame. Fig. 5 is a similar view to that shown in Fig. 4, except that the frame is unhooked and detached from the spindle. Fig. 6 represents a side elevation of the collar used to press the frame shown in Figs. 3, 4, and 5 toward the mouth of the bore-hole. Fig. 7 represents an end view of the device shown in Fig. 6, and as seen from the right of the said figure, except that the holding-loop is turned down in the holding position. Fig. 8 represents a plan view of the device shown in Fig. 7, and Fig. 9 represents another method of connecting the collar to the frame for the head of the dust-sack, whereby the said frame may be kept pressed over the mouth of the bore-hole.

A represents a drill-spindle which is provided with a feed-screw *a*, operated in the ordinary way, and terminates in the drill steel B.

A' represents a reamer-spindle, provided with cutting-blades B' and centering device B², and operated as described in my application for improvements in reamers, filed November 1, 1894, Serial No. 527,682.

The devices for rotating the drill or reamer spindle and for blowing air therethrough are not a part of the present invention, and are not shown in the drawings.

G represents a sack or pouch, which may be either closed at the bottom and made of perforate material or of imperforate material, open at the bottom, or of any suitable material.

The upper portion of the sack G is secured to a frame C, which is preferably faced with a fringe D, of bristles, wire, cloth, or the like, which fringe is pressed close against the edges of the bore-hole, and serves to in a large measure prevent the escape of dust laterally. This frame C and its fringe D are pressed toward the mouth of the bore-hole in any convenient way, such as by the mechanism shown in Figs. 3, 6, and 9. Thus the frame C is made of two semicircular ribs *c*⁰

pivoted together as at *c*, and hooked together at the opposite end as by means of the hooks *c'* and *c''*. (Shown most clearly in Figs. 4 and 5.) These ribs *c'* are connected to the two parts *c³* of the sleeve *C⁵* which incloses the drill or reamer spindle by means of the curved ribs *c³* and the braces *c⁴*. (Shown most clearly in Figs. 3 and 9.) The two parts *c³* form a sleeve *C⁵* which fits loosely around the drill or reamer spindle, and which sleeve is pressed forward by the springs *F*. (Shown in Figs. 1, 2, 3, 6, 7, and 8, or by the spring *F'*, shown in Fig. 9.) The springs *F* are attached to the front face of a collar or ring *E*, which is made of two parts hinged together, as at *e*, and provided with opposite lugs *e'*, to one of which the loop *E³* is pivoted, which loop slips over the opposite lug and thus holds the two parts of the ring together. The ring *E* is lined throughout most of its inner surface with the pads *E⁴* of rubber or leather, which enable the ring to hold firmly on the reamer-spindle, or to engage in the screw-threads on the drill-spindle.

In the form of device shown in Fig. 9, *F'* represents a coil-spring, which incloses the spindle *A'* and bears at one end on the ring *E*, and at the other end on a second ring *E'*, which is connected by balls or antifriction-rollers *e'* with the back of the sleeve *C⁵*.

Where the dust-arrester is used with reamer-spindles as shown in Figs. 2, 3, and 9, the ring or collar *E* is clamped in a fixed position on the reamer-spindle, and the springs *F* or *F'* press the frame *C* toward the mouth of the bore-hole and keep the fringe *D* close against the edges thereof.

Where the device is used on a drill-spindle, the same motion of the drill-spindle which causes the same to feed forward will also tend to carry the ring *E* forward; but this will be resisted by the frame *C* and the drill-spindle will turn in the collar *E*, and thus the mouth of the dust-sack will be kept pressed against the mouth of the bore-hole.

The operation of the device will be understood by an inspection of the drawings. The dust blown backward out of the bore-hole is arrested either by the fringe *D* or by the sack *G*, and the air escapes either through the fringe or through the interstices in the side of the sack or through the open bottom of the sack, leaving the great mass of dust behind in the sack.

It will be obvious that various modifications of the herein-described apparatus might be

made, which could be used without departing from the spirit of my invention.

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

1. In a device of the character described, the combination with a drill or reamer spindle, and a frame loosely inclosing the same and of greater diameter than the mouth of the bore hole, and a fringe on the face of said frame inclosing the mouth of the bore hole, of a sack secured to said frame and opening downward therefrom, and means for pressing said frame toward the mouth of the bore hole, substantially as and for the purposes described.

2. In a device of the character described, the combination with a drill or reamer spindle, and a frame loosely inclosing the same and of greater diameter than the mouth of the bore hole, of a sack secured to said frame and opening downward therefrom, a collar clamped on said spindle, and a spring bearing against said collar and pressing said frame toward the mouth of the bore hole, substantially as and for the purposes described.

3. In a device of the character described, the combination with a drill or reamer spindle, and a frame loosely inclosing the same and of greater diameter than the mouth of the bore hole, with a sleeve in the rear center of said frame, of a sack secured to said frame and opening downward therefrom, a collar mounted on said spindle, and a spring interposed between said collar and said sleeve for pressing said frame toward the mouth of the bore hole, substantially as and for the purposes described.

4. In a device of the character described, the combination with a drill or reamer spindle, a frame loosely inclosing the same and of greater diameter than the mouth of the bore hole, and a fringe on the front edge of said frame, of a sack secured to said frame and opening downward therefrom, a collar clamped on said spindle, and a spring bearing against said collar and pressing said frame toward the mouth of the bore hole, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT H. ELLIOTT.

Witnesses:

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