E. F. GALLIGAN.

DUST COLLECTOR FOR ROCK DRILLS.

APPLICATION FILED MAY 14, 1914.

1,131,052.

Patented Mar. 9, 1915.

2 SHEETS—SHEET 1.

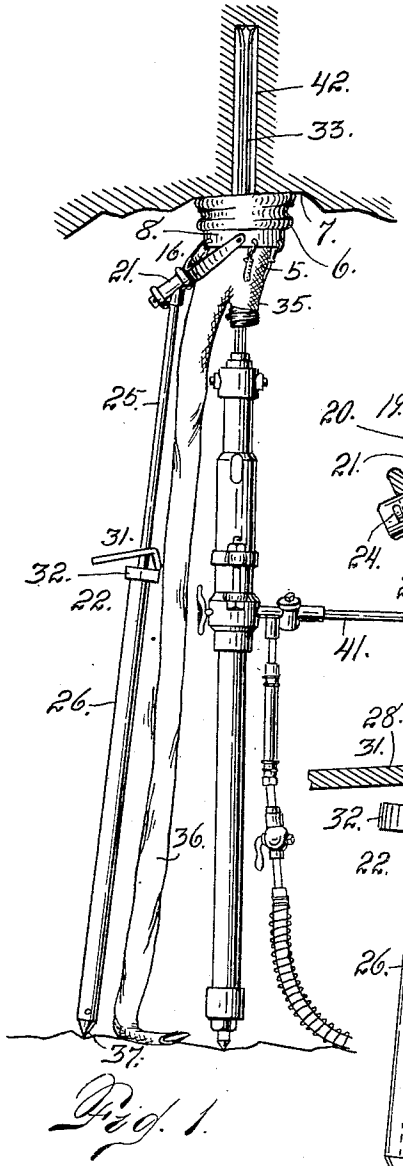


Fig. 1.

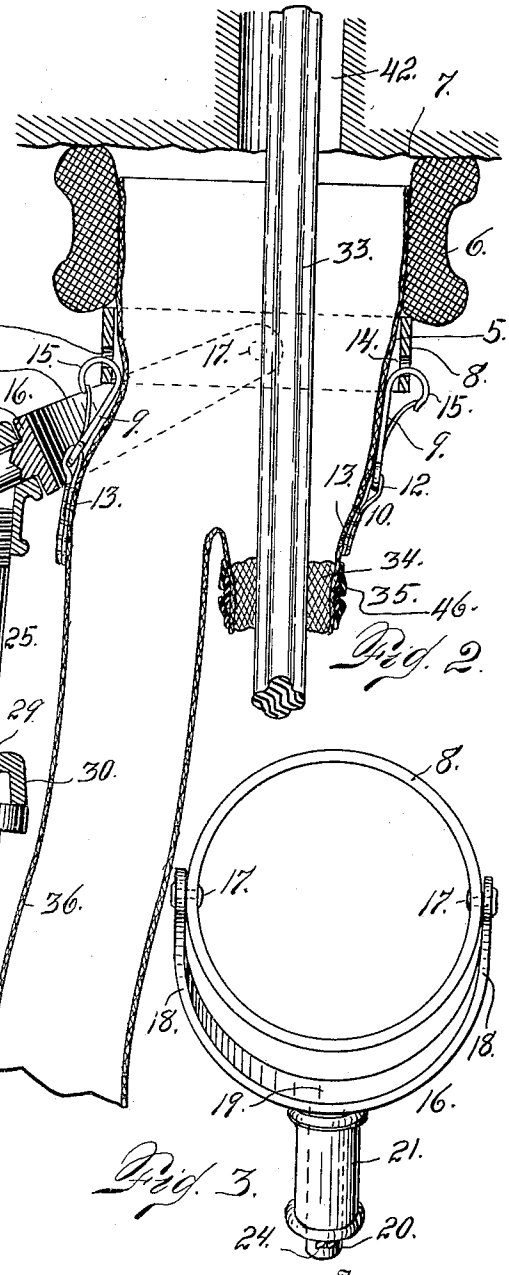


Fig. 2.

Fig. 3.

Witnesses

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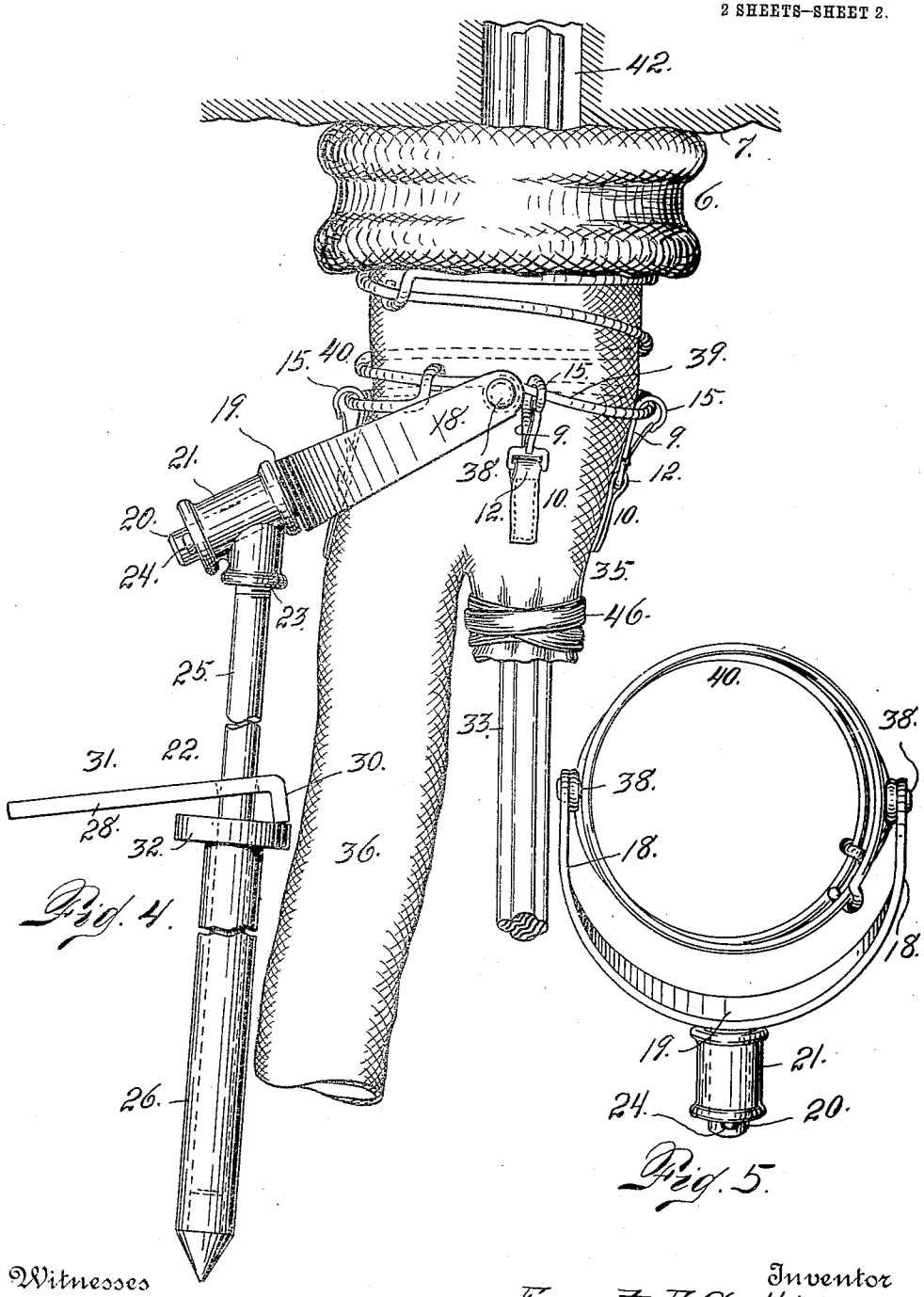


Fig. 4.

Fig. 5.

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DUST-COLLECTOR FOR ROCK-DRILLS.

1,131,052. Specification of Letters Patent. Patented Mar. 9, 1915.

Application filed May 14, 1914. Serial No. 838,495.

To all whom it may concern:

Be it known that I, EMMET F. GALLIGAN, a citizen of the United States, residing at Idaho Springs, county of Clear Creek, and State of Colorado, have invented certain new and useful Improvements in Dust-Collectors for Rock-Drills; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in dust collectors for rock drills, my object being to provide a construction adapted for use in collecting the dust or rock cuttings which escape from the drill hole during the drilling operation.

The object of this invention is to collect the dust and prevent it from permeating the atmosphere and rendering the same injurious to the workmen in the vicinity who are compelled to breathe the dust-laden air. Thus dust renders the atmosphere dangerous to life by reason of the fact that workmen who breathe such air for a considerable time are liable to be permanently injured, as the most serious results often follow from such experience, which frequently produces tuberculosis.

In my improvement, I employ a hood which is applied to the breast of the rock around the drill hole. The drill steel passes through this hood, the lower portion of the latter having an opening through which the steel passes. This portion of the hood is tightly secured to the drill steel to prevent the escape of any dust therethrough. Leading downwardly from the hood, is a flexible conduit preferably composed of canvas of sufficient length to reach the bottom of the drift or tunnel where the apparatus is in use. The rock cuttings pass downwardly through this conduit and are quietly deposited at the bottom of the drift, thus preventing the formation of dust and practically entirely doing away with the difficulties heretofore mentioned.

My present improvement relates more particularly to the manner of supporting the hood in contact with the breast of the rock around the drill hole, and this support consists of a forked bracket adapted to straddle the hood on the outside, its arms being pivotally connected with a rigid band or with a spring surrounding the hood and bearing against a relatively heavy band of some soft material as felt, which engages the breast of the rock, this band being sufficiently firm to endure the necessary pressure to support the hood in position to perform the dust collecting function. This forked bracket is pivotally connected at its upper extremity with a sleeve which is mounted on the top of a standard which is lengthwise adjustable for the purpose of properly regulating its length to conform to conditions in different mines, or places where it may be necessary to employ my improvement. By virtue of the pivotal connection of the forked bracket with the upper extremity of the supporting standard, and also the pivotal connection of the arms of the bracket with the spring or band surrounding the hood, a universal joint construction is obtained, making it possible to support the hood against the breast of the rock when the latter stands at practically any angle to the direction of the standard. This is an important feature in an instrument of this class, as there is no uniformity in the planes of the breast of the rock as compared with the normal upright position of the standard, and by virtue of the improvement just explained, the apparatus is readily adjustable to all conditions and compensates for variations or changed conditions along the lines above indicated, which will be met with in different mines or localities.

Having briefly outlined by improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing.—Figure 1 is an elevation illustrating my improvement shown in connection with a rock drilling machine, the latter being in position for use. Fig. 2 is a section taken through the hood, the forked bracket and the upper portion of the conduit, through which the rock cuttings pass downwardly from the hood, the parts being shown on a larger scale than in Fig. 1. Fig. 3 is a top plan view of the bifurcated bracket, shown in connection with a metal

ring adapted to surround the hood and bear against the band at the outer extremity of the latter, the scale being approximately the same as in Fig. 2. Fig. 4 is an elevation of my improved construction, partly broken away, on the same scale as Fig. 2, showing a slightly modified form of construction. Fig. 5 is a top plan view of the forked bracket, shown in connection with a spring adapted to surround the hood.

The same reference characters indicate the same parts in all the views.

Referring first more particularly to Figs. 1 to 3, inclusive, of the drawing, let the numeral 5 designate a flexible hood, to whose outer extremity is secured a relatively heavy band, 6, of some soft material as felt, the said band being adapted to bear against the breast of the rock, which is designated by the numeral 7. Surrounding the hood below the band, and bearing against the latter when the apparatus is in use, is a metal ring 8, which is connected by means of snap hooks 9, the latter being secured to the hood by means of canvas loops 10, which are connected with the snap hooks, as shown at 12 and sewed to the hood as shown at 13. The ring 8 is perforated as shown at 14, to receive the snap hooks, whose eye extremities 15 are passed therethrough. A forked bracket 16 is pivotally connected with the ring 8 on opposite sides, as shown at 17. The arms 18 of the bracket straddle the hood and their free extremities are connected with the ring, as stated. The space between the two arms is sufficient to permit the desired range of movement of the hood when turning on the axes of the pivots 17. The bracket 16, at the junction 19 of the arms 18, is provided with a stem 20, which is journaled in a bearing sleeve 21, which is threaded as shown at 23, upon the upper extremity of a standard 22, the bracket being held in place by a key, as a cotter pin 24, passed through the extremity of the stem, which extends beyond the bearing. By virtue of this construction, the bracket is adapted to turn on an axis extending at right angles to the axes of the pivots 17. The axis of the bearing 21 preferably forms oblique angles with the axis of the standard 22. The latter, as illustrated in the drawing, is composed of two members 25 and 26, the member 25 telescoping with the member 26 which is tubular for the purpose. The two members of the standard are locked at the desired position of vertical adjustment by means of a locking device 28 which is provided with a perforation 29 through which the member 25 passes loosely. Beyond the perforation in one direction, the locking device is provided with a part 30, which preferably extends at right angles to the body 31 of the device, in which the perforation is formed. The part 30 of the locking device rests upon the upper surface of a relatively large collar 32, with which the upper extremity of the tubular member 26 of the standard is equipped. When the locking device is allowed to assume its normal position, the weight of the standard member 25 and the parts above connected therewith, will cause the locking device to assume a position slightly inclined to a plane, cutting the axis of the standard at right angles, whereby the locking device is caused to engage the member 25 at the upper extremity of the perforation 29 on one side, and at the lower extremity of the same perforation on the opposite side. This results in a gripping action by the locking device, which maintains the parts in the adjusted position. The drill steel 33 passes through a bushing 34 of soft material, as felt, with which a relatively short leg 35 of the hood is lined. This short leg is exteriorly wound by a flexible band 46 which is fastened, whereby the dust is prevented from escaping around the drill steel where the bushing is located. A flexible conduit 36 leads downwardly from the body of the hood, being arranged at one side of the bushing 34. This conduit is relatively large and affords ample capacity for the passage of the rock cuttings and dust which pass through the hood, being removed from the drill hole during the drilling operation. As illustrated in the drawing, this conduit should be of sufficient length to extend to the bottom 37 of the drift or tunnel in which the apparatus is located.

While, as illustrated in the drawing, this invention is especially adapted for drilling up-holes or holes sufficiently downwardly inclined from their inner extremities to cause the rock cuttings to pass by gravity into and through the canvas conduit 36, it must be understood that the invention is equally well adapted for use where the holes are horizontal, or even downwardly inclined from their outer extremities, since in the last named case, air may be employed for removing the rock cuttings and forcing them into the canvas conduit, which is then made relatively larger and adapted to catch and retain the cuttings which are deposited in a mass within the said conduit or receptacle.

Drills are already constructed for introducing air through a central opening in the drill steel, through which air is passed for expelling the cuttings in horizontal or down holes. Without the use of a dust collector, however, this feature of expelling the rock cuttings by the use of air largely increases the injurious effects resulting from the dust produced during the drilling operation and further emphasizes the necessity for a dust collector of the character herein disclosed.

The form of construction shown in Figs. 4 and 5 is substantially the same as shown

in Figs. 1 to 3, inclusive, except that in Figs. 1 to 3, the forked bracket 16 is pivotally connected as shown at 38, with the lower convolution 39 of a relatively stiff spiral spring 40, which surrounds the hood, its outer extremity bearing against the band 6 which engages the breast of the rock in the same manner as heretofore described.

Assuming that the construction is installed substantially as illustrated in the drawing, the drill steel is acted upon by a reciprocating hammer with which the drilling mechanism is equipped, the said hammer driving the steel through the bushing 34 of the hood. The hood is sufficiently flexible to allow the partial rotary movements imparted to the drill steel and also to the body of the drill, through the instrumentality of a lever arm 41 connected with the drilling machine, (see Fig. 1). As the drilling operation proceeds, the rock cuttings from the drill hole 42 enter the hood and pass downwardly through the conduit 36, as heretofore explained, or into a canvas bag or other receptacle where it is retained, when the arrangement of the hole is such as to necessitate the employment of air for removing the rock cuttings, as in the case of horizontal or down holes, previously explained more in detail.

Having thus described my invention, what I claim is,—

1. A dust collector for rock drills, comprising a hood, a supporting standard and a universal joint connection between the standard and hood for supporting the latter in place against the breast of the rock, the universal joint connection comprising two pivotal joints having their axes at right angles to each other, the parts of each joint being freely movable at all times during the operation of the device.

2. A dust collector for rock drills, comprising a hood, a supporting standard and a bracket pivotally connected with the hood at one extremity and with the standard at the other extremity, the axes of the pivots at the opposite ends of the bracket extending at right angles to each other, the bracket being free to move on said pivots at all times during the operation of the device.

3. A dust collector for rock drills, comprising a hood adapted to engage the breast of the rock around the drill hole, a supporting standard, a reinforcing member surrounding the hood and whose axis is substantially coincident with the axis of the hood, and a universal joint connection between the standard and said member, the parts of said joint being freely movable at all times.

4. A dust collector for rock drills, comprising a hood, a supporting standard, a reinforcing member surrounding the hood, the axis of said member being substantially coincident with the axis of the hood, and a bracket having one extremity pivotally connected with the said reinforcing member, while the other extremity is pivotally connected with the standard, the axes of the two pivots extending at right angles to each other, the parts connected by both pivots being freely movable at all times.

5. A dust collector for rock drills, comprising a hood, a supporting standard and a forked bracket whose arms embrace the hood on opposite sides and are pivotally connected therewith, the base of the bracket having a stem journaled on the standard, the axes of the pivots and journal extending at right angles to each other.

6. A dust collector for rock drills, comprising a hood, a supporting standard, a reinforcing member surrounding the hood, a forked bracket, arms embracing the hood and pivotally connected with the reinforcing member on opposite sides of the hood, the base of the bracket having a stem journaled at the upper extremity of the standard, the axis of the journal being perpendicular to the axes of the fork arm pivots.

7. A dust collector for rock drills comprising a hood, a supporting standard, a reinforcing member surrounding the hood, a forked bracket whose arms embrace the hood and are pivotally connected with the reinforcing member on opposite sides of the hood, the base of the bracket having a stem journaled at the upper extremity of the standard, the axis of the journal forming oblique angles with the axis of the standard and being perpendicular to the axes of the fork arm pivots.

8. A dust collector for rock drills, comprising a hood, a lengthwise adjustable supporting standard, a reinforcing member surrounding the hood, a forked bracket having a stem journaled at the top of the standard which is provided with a sleeve for the purpose, the axis of the journal forming oblique angles with the axis of the standard, the arms of the bracket projecting on opposite sides of the hood and pivotally connected with the reinforcing member, the axis of the stem and the axis of the fork arm pivots being perpendicular to each other.

9. A dust collector for rock drills, comprising a hood, adapted to engage the breast of the rock around the drill hole, a supporting standard composed of two members arranged in telescopic relation, adjustable means for securing the two members in the adjusted relation, comprising an angle plate having one arm perforated to receive the upper member, while the other arm engages the top of the lower member, the perforated arm when the device is in the locking position forming oblique angles with the member passing through its perforation, a forked bracket having a stem journaled on

the upper extremity of the standard, the arms of the bracket extending on opposite sides of the hood, a reinforcing member surrounding the hood with which the said arms are pivotally connected, the axes of the said pivots being perpendicular to the axis of the bracket's journal.

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

EMMET F. GALLIGAN.

Witnesses:
JOHN C. MEYER,
E. J. SLATER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."