Oct. 25, 1955 V. B. BIGGS ET AL 2,721,725

DUST ELIMINATOR FOR ROCK DRILLS

Filed Jan. 28, 1952 2 Sheets-Sheet 1

Fig. 1

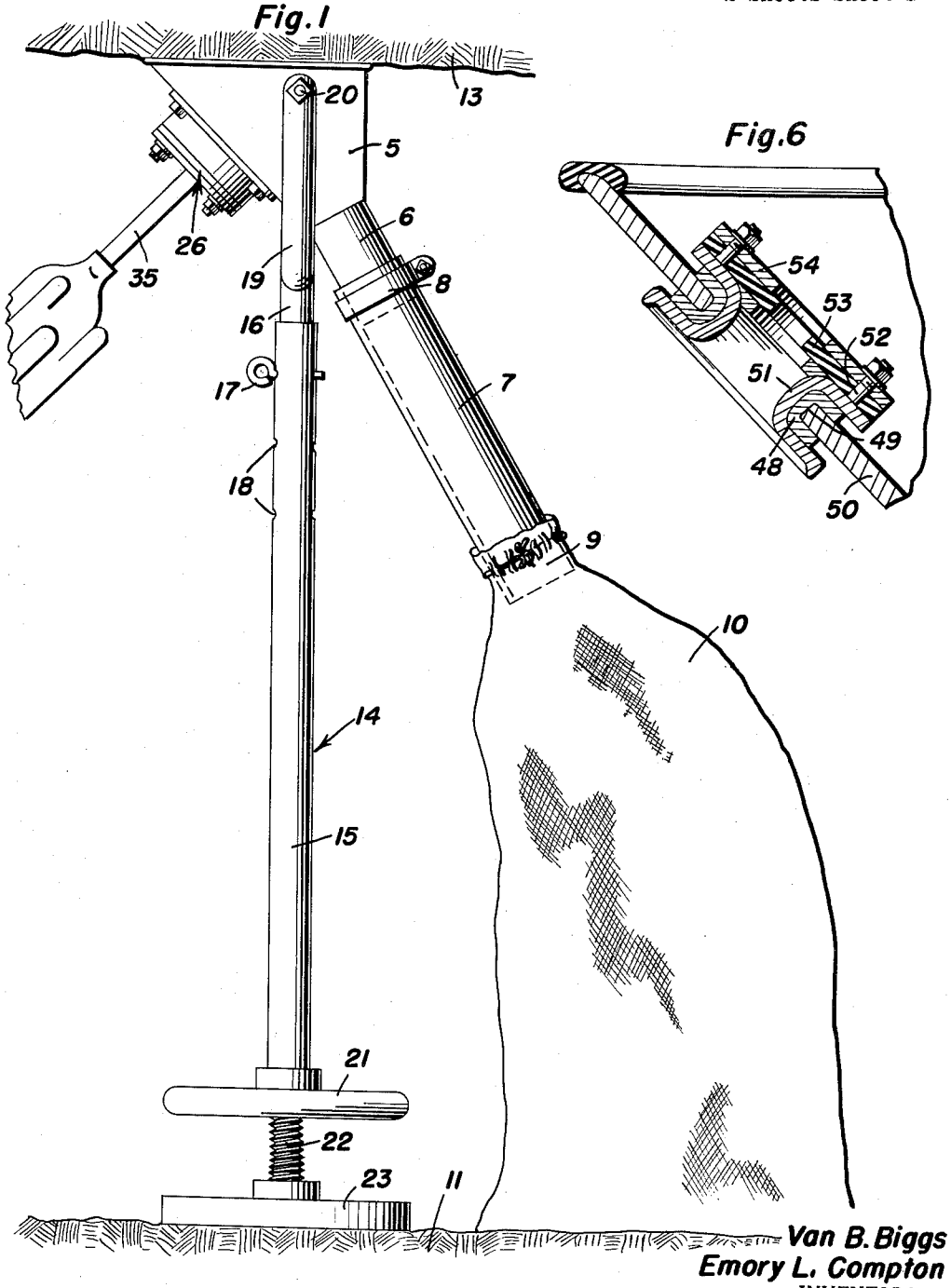


Fig. 6

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Filed Jan. 28, 1952 2 Sheets-Sheet 2

Fig.2

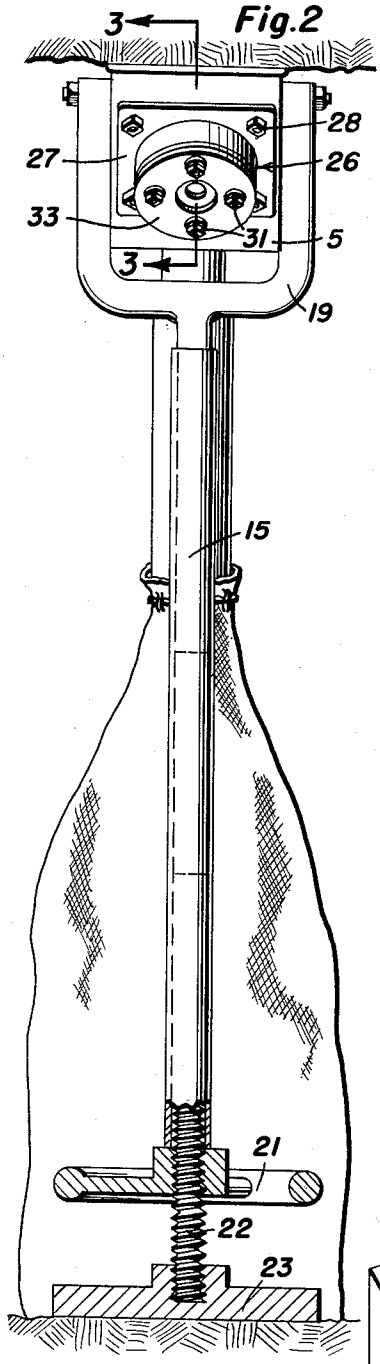


Fig.3

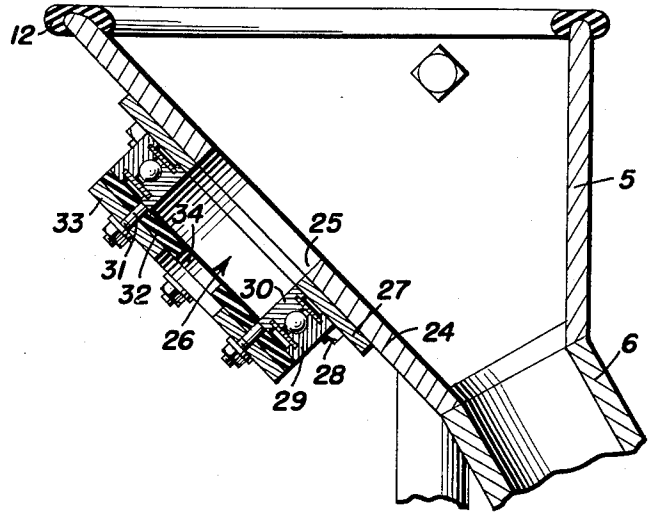
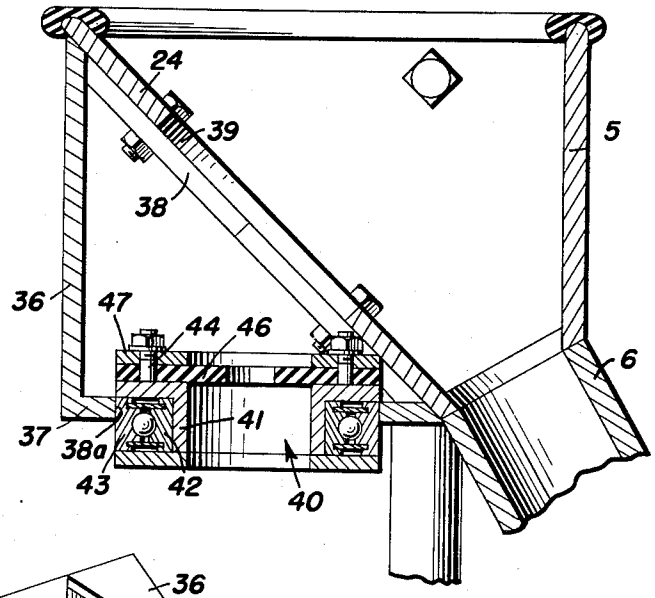


Fig.4



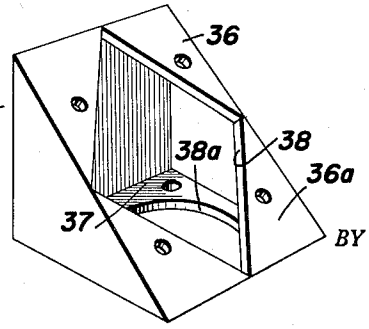


Fig.5

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DUST ELIMINATOR FOR ROCK DRILLS

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Application January 28, 1952, Serial No. 268,634

3 Claims. (Cl. 255—50)

The present invention relates to new and useful improvements in dust eliminators and collectors for use with air stoper or other type of drills while drilling in the roof of a coal mine or other underground passages.

An important object of the invention is to provide a dust collecting bag adapted for supporting at the roof of the mine independently of the drill and including a dust collecting throat in which the drill works.

Another object of the invention is to provide an opening in the throat to receive the drill and a bearing for the drill rotatably carried by the throat and which seals the opening therein.

Another object is to provide an adjustable support for the throat to hold the same against the roof of the mine.

A still further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view;

Figure 2 is a front elevational view;

Figure 3 is an enlarged vertical sectional view taken on a line 3—3 of Figure 2;

Figure 4 is an enlarged vertical sectional view showing an adapter for attaching to the throat for use when the drill is held perpendicularly and illustrating a modified bearing construction;

Figure 5 is a perspective view of the adapter; and

Figure 6 is an enlarged sectional view of a further modified bearing construction.

Referring now to the drawings in detail, wherein for the purpose of illustration we have disclosed a preferred embodiment of the invention the numeral **5** designates a substantially funnel-shaped throat having a spout **6** at its lower end to which a tube **7** is attached by a conventional type hose clamp **8** and with the neck **9** of a dust collecting bag **10** attached to the lower end of tube **7**. The bottom of bag **10** is open to rest on the floor of a mine **11** to deposit dust collected in the bag on the floor.

The upper edge of the throat **5** is provided with a rubber gasket **12** which is held against the roof **13** of a mine by means of an adjustable standard designated generally at **14**. Standard **14** comprises a lower tube **15** in the upper end of which a rod **16** is telescopically received and secured in vertically adjusted position by means of a transverse pin **17** selectively positioned in a vertical row of openings **18** in the tube and post. The upper end of post **16** is formed with a yoke **19** to which the throat **15** is pivoted by means of bolt and nuts **20**.

The lower end of tube **15** rests on an adjusting wheel **21** which is threaded on an upstanding screw **22** entering the lower end of the tube and with the lower end of the screw secured to a base **23**.

Throat **5** includes an inclined wall **24** having an opening **25** therein, and to which a combined bearing and sealing unit, designated generally at **26**, is secured.

The bearing and sealing unit comprises an apertured attaching plate **27** secured to the throat by bolts and nuts **28** and having the outer annular bearing race member **29** of a ball bearing assembly welded to the underside of the plate. The inner annual race member **30** of the ball bearing assembly has nut equipped studs **31** welded thereto for rotatably attaching an apertured rubber sealing ring **32** and an apertured metal plate **33** to the inner race member of the bearing assembly with said ring **32** clamped between said plate **33** and the inner race member **30**.

The central opening **34** of the sealing ring **32** is of reduced diameter to closely fit with a drill **35** inserted upwardly through the unit **26** into the throat for drilling the roof of the mine whereby the sealing ring rotates with the drill to prevent wear to the ring while sealing the opening in the throat. Dust and fragments from the drilling operation drop through the spout **6** into the bag **10** where it is deposited in a pile on the floor of the mine.

In the modified construction shown in Figures 4 and 5 a box-like adaptor **36** having an inclined top wall **36*a*** is attached to the inclined wall **24** of the throat and a horizontal bottom **37**, said top and bottom having openings **38** and **38*a*** alined with the opening **39** of the throat for drilling perpendicularly.

The combined bearing and sealing unit **40** includes a channel-shaped ring **41** mounted in the opening **38** of the adaptor and enclosing the inner and outer races **42** and **43** of the bearing assembly. Inner race **42** is welded to the ring **41** for rotation therewith, while outer race **43** is welded to the bottom **37** of the adaptor.

Studs **44** rise from the top flange **45** of ring **41** for attaching the apertured rubber sealing ring **46** and metal plate **47** thereto for rotation by the drill when inserted upwardly through the throat.

Figure 6 illustrates a further modification of the bearing and sealing unit and comprises an outer annular channel member or ring **48** crimped in a fixed position in the opening **49** of the throat **50**, and **51** represents an inner annular channel member or ring which is rotatable in outer ring **48**. Studs **52** are welded to one of the flanges of inner ring **51** for securing a rubber sealing ring **53** and a metal ring **54** thereto for rotation therewith.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described our invention, what is claimed as new is:

1. A dust collector for an elongated rotary mine drill comprising a funnel-shaped throat having a lower end attachable to a bag, an upper edge engageable with a mine roof, and a flat side oblique to said edge to slant from said roof when said edge is engaged and provided with an opening for insertion of a drill therethrough into said throat, an annular flat bearing and sealing member of elastic and flexible material adapted to frictionally grip and support said drill for lateral oscillation and longitudinal movement in said throat in drilling operations, means attached to said side of the throat and rotatably mounting said member at one side of said opening for rotation with said drill and flexing under oscillation of said drill comprising flat rings upon opposite sides of said

member, and nut equipped studs on one ring securing said rings together in clamping relation to said member with said studs extending through said member to prevent rotation of said member relative to said rings, and supporting means for said throat adapted to support the throat with said edge engaged with said roof.

2. The combination of claim 1, said first named means including an outer channeled ring straddling the edge of said opening and fixed therein, an inner channeled ring straddling said outer ring and rotatable thereon, said member being secured to said outer ring.

3. A dust collector for an elongated rotary mine drill comprising a funnnel-shaped throat having a lower end attachable to a bag, an upper edge engageable with a mine roof, and a flat side oblique to said edge to slant from said roof when said edges are engaged and provided with an opening for insertion of a drill therethrough into said throat, an annular flat bearing and sealing member of elastic and flexible material adapted to frictionally grip and support said drill for lateral oscillation and longitudinal movement in said throat in drilling operations, means attached to said side of the throat and rotatably mounting said member at one side of said opening for rotation with said drill and flexing under oscillation of said drill comprising flat rings upon opposite sides of

said member, nut equipped studs on one ring securing said rings together in clamping relation to said member with said studs extending through said member to prevent rotation of said member relative to said rings, an adapter having an inclined top attached to the flat side of the throat and also having a horizontal flat bottom and openings in its top and bottom vertically aligned with said first named opening, one of said rings being fixed in the opening in said bottom, and supporting means for said throat adapted to support the throat with said edge engaged with said roof.

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