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McCormick

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[54] **CANOPY ASSEMBLY FOR A DUAL BOOM DRILL**

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[52] **U.S. Cl.** **173/34;** 173/37; 173/43; 175/219

[51] **Int. Cl.** **E21c 11/02**

[58] **Field of Search** ..... 173/34, 37, 43, 44, 38, 173/23; 299/11; 175/219; 61/45 D

[56] **References Cited**

UNITED STATES PATENTS

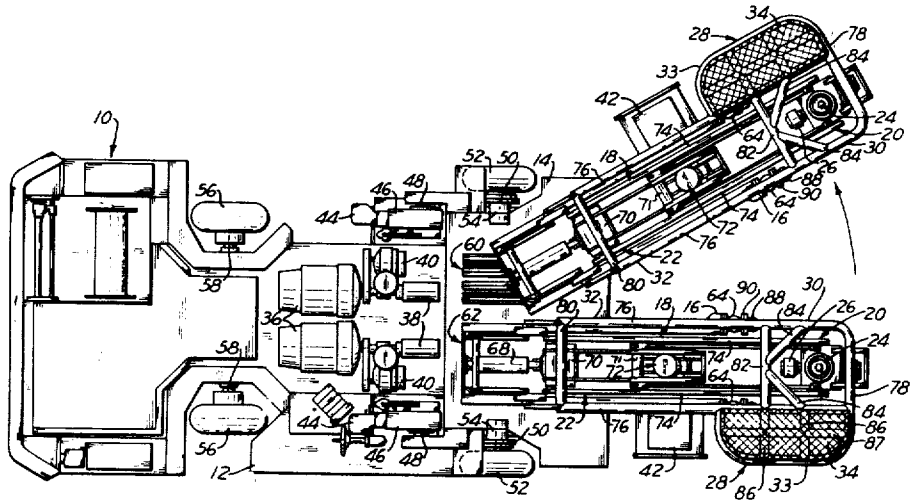
2,750,155	6/1956	Nixon	175/219 X
2,754,087	7/1956	Johnson	175/219 X
3,283,831	11/1966	Bronder	175/219 X
3,375,880	4/1968	Pyles et al.	173/37
3,471,888	10/1969	Grant et al.	173/34 X
3,768,574	10/1973	Long	173/38 X
3,784,159	1/1974	Skattman et al.	175/219 X

Primary Examiner—David H. Brown
Attorney, Agent, or Firm—Stanley J. Price, Jr.

[57] **ABSTRACT**

A portable drilling machine has a forwardly extending horizontal platform upon which is pivotally mounted a pair of spaced forwardly extending frames. The frames are arranged on the horizontal platform to pivot toward and away from each other in a horizontal plane. Each frame carries a boom assembly having front end and rear end portions. The boom assembly front end portion supports a drill unit. The boom assembly is operable to raise the drill unit in a linear vertical path while the frame is arranged to move the boom assembly and the drill unit in a horizontal plane. A canopy assembly having front end and rear end portions is positioned in overlying relationship with the frame and boom assembly and includes a portion covered with an expanded metal screen positioned adjacent the drill unit. The front end portion is pivotally connected to an extensible rod that is concentrically positioned within a lift cylinder rigidly mounted to the frame. Actuation of the lift cylinder extends the rod vertically upwardly to move the front end portion in a vertical plane. The rear end portion is rotatably mounted to the frame and is operable upon actuation of the lift cylinder to move longitudinally in a linear horizontal path on the frame to permit linear vertical movement of the front end portion. With this arrangement, the canopy assembly is moved in a linear vertical path to a preselected height above the portable drilling machine and protects the drill operator during the drilling operation.

12 Claims, 4 Drawing Figures



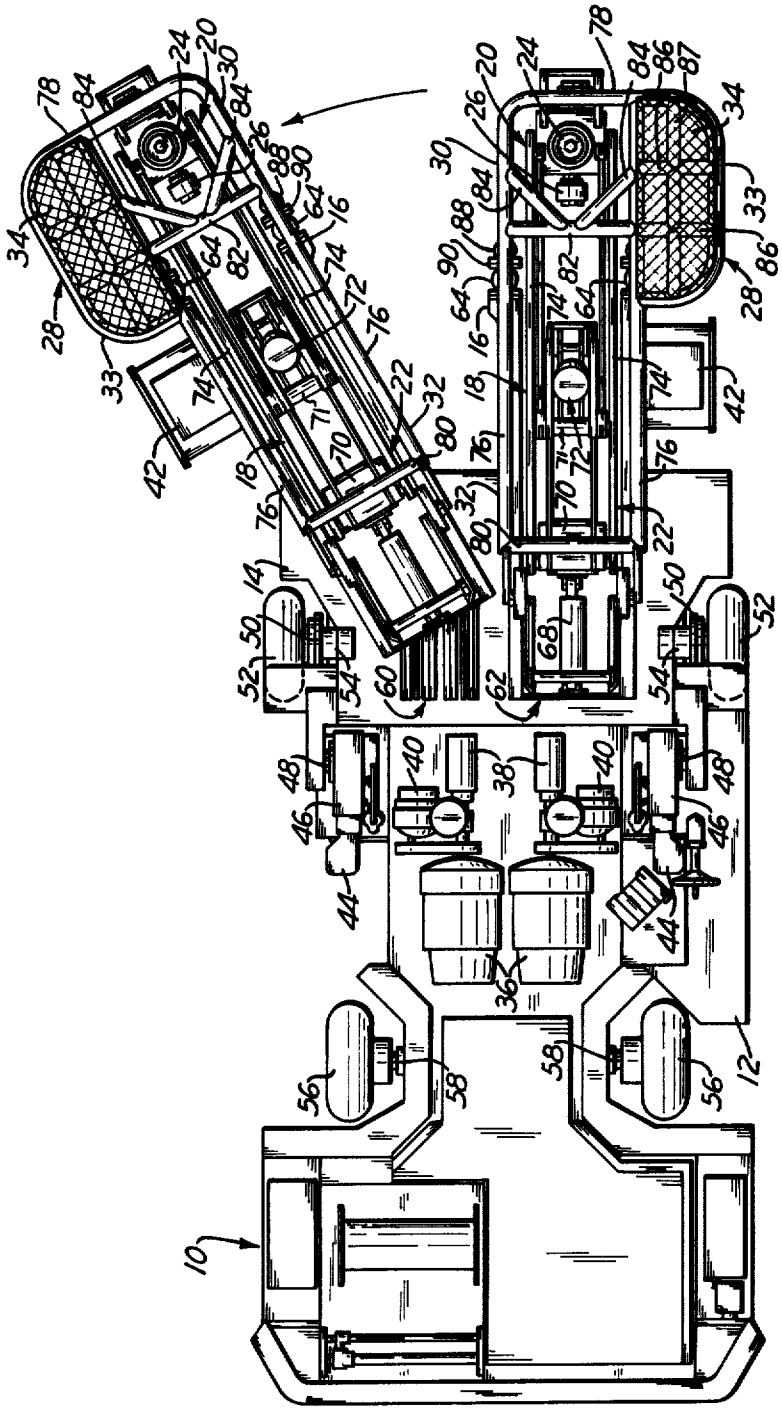


Fig. 1

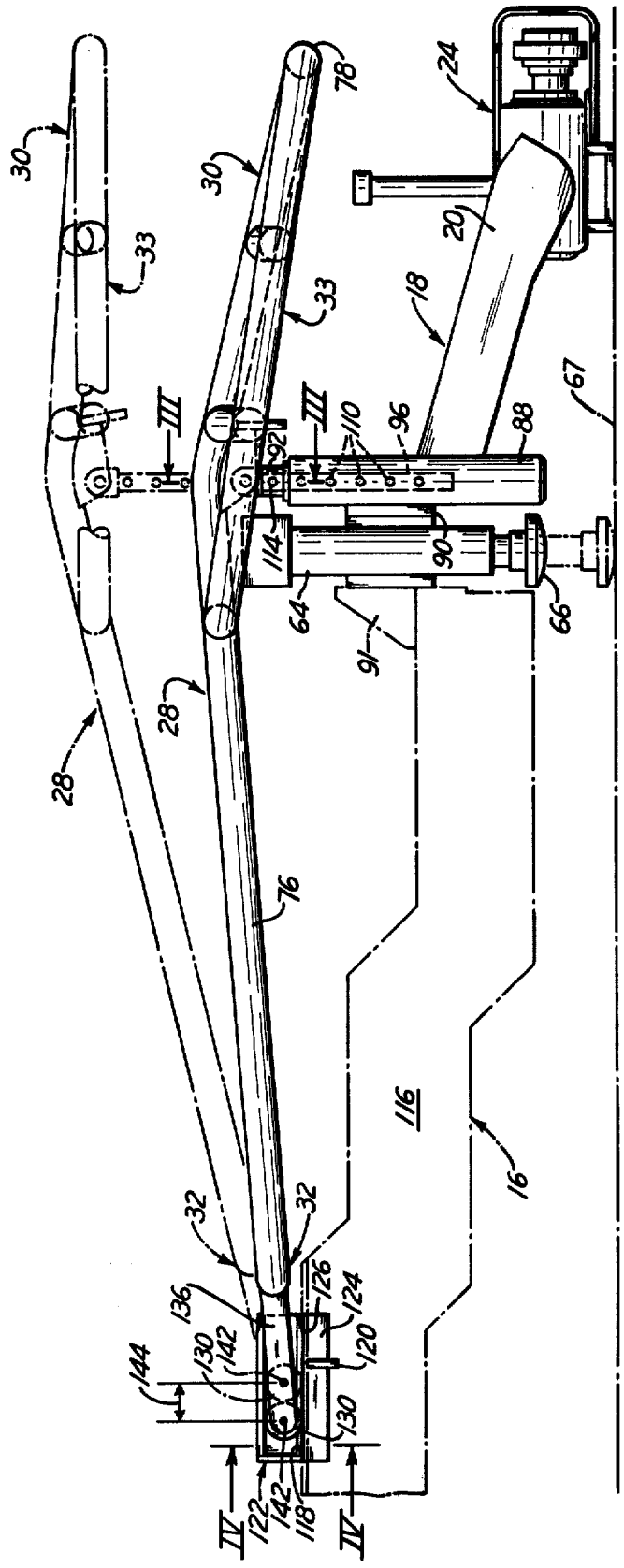


Fig. 2

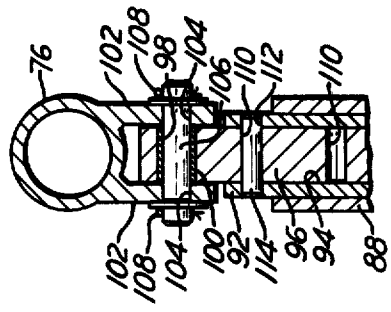


Fig. 3

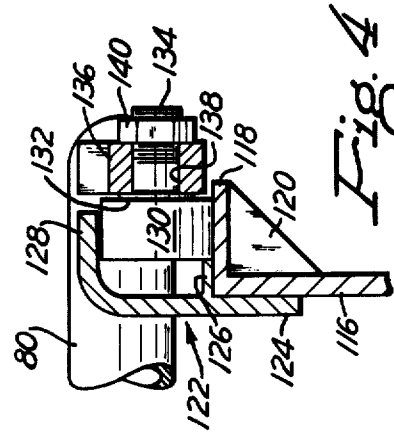


Fig. 4

CANOPY ASSEMBLY FOR A DUAL BOOM DRILL

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a canopy assembly for a mobile dual boom drill, and more particularly to a canopy assembly arranged to move in a linear vertical path to a preselected height above a mobile drilling machine to support a section of the mine roof during the drilling operation.

2. Description of the Prior Art

In underground mining, conventional roof bolts are employed to support the roof of the mined area. In addition, transverse timbers are retained in abutting relation with the roof surface to provide support therefor and are held in place by roof bolts extending through the timbers and engaged engaged the rock strata. The roof bolts extend through predrilled holes in the mine roof and function to prevent sliding movement of the different rock strata relative to each other. The roof bolts stabilize the mine roof condition and reduce the possibility of collapse of a portion of the mine roof resulting in injury to operating personnel and damage to the mining equipment.

Prior to engaging the bolts to the mine roof surface vertical holes must be drilled to a predetermined depth into the roof. U.S. Pat. Nos. 3,319,727 and 3,375,880 disclose portable drilling machines which include a drill unit carried by a boom member that extends forwardly from a mobile car. The boom member is supported by a frame which is pivotally mounted to the horizontal platform of the mobile car. Suitable linkage mechanisms are provided to move the drill unit in a linear vertical path and an angular vertical path. The frame pivotally mounted to the mobile car is provided with a linkage mechanism which permits the frame and the boom to pivot in a horizontal plane while the drill unit traverses a linear path perpendicular to the longitudinal axis of the drilling machine. Further linkage mechanisms are provided to move the drive unit along a linear path in a horizontal plane parallel to the longitudinal axis of the boom. With this arrangement, the drill units are operable to drill bolt holes along lines transverse and parallel to the longitudinal axis of the mobile car.

During the bolt drilling operations and prior to the placement of the roof bolts and transverse timbers to support the roof, the roof is unsupported presenting an unstable condition and a safety hazard to workmen. Consequently, stress present in the overhead strata may result in movement of portions of the roof and a roof fall. There is need for a canopy that is maintained in overlying relationship with the frame and boom of a portable mining machine and may be moved therewith to protect the drill operator during the drilling operations. The canopy assembly must be connected on the frame in such a manner that the canopy is able to move horizontally in a plane parallel to the longitudinal axis of the mobile car. Furthermore, the canopy assembly must be adapted to be movable in a linear vertical path for use in mines having roof portions of different vertical height.

SUMMARY OF THE INVENTION

In accordance with the present invention there is provided a canopy for a dual boom drill which includes a mobile car having a horizontal platform. A forwardly extending frame is pivotally mounted to the horizontal platform. A boom assembly having front and rear end portions is pivotally secured to the forwardly extending frame to permit movement of drill means supported by the boom assembly front end portion in a vertical plane. A canopy assembly having front and rear end portions is maintained in overlying relationship with the boom assembly. Extensible means are provided for moving the canopy connecting front end portion in a linear vertical plane to a preselected height above the frame. Articulated means are provided for the the canopy assembly rear end portion to the forwardly extending frame. The canopy assembly front end portion is arranged to pivot about the extensible means and move in a linear vertical plane.

The articulating means include a roller rotatably mounted to the upper edge portion of each of the vertical sidewalls of the frame. Channel means retain the roller on the upper edge portion and permit the roller to tranverse a linear horizontal path thereon. The roller is connected to a side arm which projects rearwardly from the rear end portion of the canopy assembly. As the roller traverses the surface of the upper edge portion of the vertical sidewalls, the arm member moves in a path horizontal path parallel to the horizontal plane of the frame.

With the above arrangement actuation of the extensible means to vertically raise the canopy assembly front end portion moves the roller in a linear horizontal path on the upper edge portion. The rectilinear movement of the roller moves the canopy assembly rear end portion connected to the arm member in a horizontal path parallel to the horizontal plane of the frame. The horizontal movement of the rear end portion urges the canopy assembly front end portion to pivot about its connection to the extensible means. Thus, the canopy assembly front end portion is moved in a linear vertical path to engage in abutting relation the mine roof surface or to a position adjacent thereof.

Accordingly, the principal object of this invention is to provide a canopy assembly for a dual boom drill arranged to move in a linear vertical path to a preselected height above the mobile drilling machine to protect the drill operator during drilling operations.

Another object of this invention is to provide a mobile drilling machine with an overhead canopy assembly having a front end portion capable of being raised in a linear vertical path to a preselected height above the mobile drilling machine.

These and other objects and advantages of this invention will be more completely disclosed and described in the following specification, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a mobile drilling machine, illustrating a pair of canopy and drill boom assemblies mounted on the mobile drilling machine.

FIG. 2 is a fragmentary view in side elevation of the canopy assembly illustrating in phantom the linear vertical movement thereof relative to the boom assembly.

FIG. 3 is a sectional view taken along the line III—III of FIG. 2, illustrating the pivotal connection between the front end portion of the canopy assembly and the extensible rod of the canopy cylinder.

FIG. 4 is a sectional view taken along the line IV—IV of FIG. 2, illustrating the articulated connection be-

tween the forwardly extending frame and the rear end portion of the canopy assembly.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, and particularly FIGS. **1** and **2**, there is illustrated a mobile drilling machine generally designated by the numeral **10** that includes a body portion **12** having a horizontal platform **14** positioned at the front portion thereof. A pair of frames **16** are pivotally mounted to the horizontal platform **14** and extend forwardly therefrom. A boom assembly, generally designated by the numeral **18**, includes a front end portion **20** and a rear end portion **22** pivotally secured to the forwardly extending frame **16**. The front end portion **20** carries a drill unit **24** having a drill steel mounted therein. A drill bit is secured to the end of the drill steel and a hydraulic motor **26** rotates the drill steel and drill bit.

A canopy assembly, generally designated by the numeral **28**, is positioned in overlying relationship with the frame **16** and the boom assembly **18**. The canopy assembly **28** includes a front end portion **30** and the rear end portion **32** which is secured to the frame **16** by means described hereinbelow. The front end portion **30** includes a laterally extending side portion **33** positioned adjacent the drill unit **24**. An expanded metal screen **34** is secured to the top surface of the side portion **33**.

A pair of motors **36** are mounted on the mobile body **12** and activate a pair of hydraulic pumps **38** and a pair of vacuum pumps **40** mounted on the mobile body **12**. The drill unit **24** is connected to the vacuum pump **40** by a hose (not shown). A dust collector **42** is secured to each of the frames **16** and is connected by a hose (not shown) to the vacuum pump **40** so that dust generated during the drilling operations is drawn from the bit of the drill unit **24** through a hose to the dust collector **42** by the vacuum pump **40**.

Fluid under pressure is supplied by the hydraulic pumps **38** and is fed through lines (not shown) to the hydraulic motors **44** mounted on each side of the mobile body **12**. The hydraulic motor **44** is connected by gearing in a speed reducer housing **46** to the sprocket **48**. The sprockets **48** carry chains that drive sprockets **50** on the front wheels **52**. The front wheels **52** are mounted on shafts **54** suitably secured to the front portion of the mobile body **12** adjacent the horizontal platform **14**. The rear wheels **56** are axially supported by the shafts **58** mounted to the rear portion of the mobile body **12**. With the above described arrangement, the mobile body **12** carrying the frames **16** and the boom assemblies **18** is propelled along the floor of an underground mine to an area where bolt holes are to be drilled in the mine roof.

As illustrated in FIG. **1**, a plurality of parallel spaced channel members **60** are rigidly secured to the platform **14**. Each of the channel members **60** extends from the rear end of the platform **14** toward the front end thereof. Rollers of a universl connecting mechanism (not shown) secured to the bottom portion of the frame **16** adjacent the rear end portion **62** thereof are arranged to traverse the channel members **60**. Swing means (not shown) mounted on the platform **14** are pivotally connected to the bottom portion of the frame **16**. The swing means permit limited lateral swinging motion of the frame **16** relative to the platform **14** while providing continuous support for the frame **16**. With this arrangement, the drill unit **24** moves in a horizontal plane perpendicular to the longitudinal axis of the mobile car **12**.

A pair of stabilizing jacks **64** are oppositely mounted to the front of the frame **16**. The stabilizing jack **64** is actuated either mechanically or hydraulically and includes a base portion **66** arranged to forcibly engage the mine floor **67** and thereby stabilize the frame **16**, as illustrated in FIG. **2**. The effective length of the jack **64** may be remotely controlled to maintain the frame **16** at an angle to the longitudinal axis of the mobile car **12**. A horizontally positioned hydraulic cylinder **68** connects the rear end portion **62** of the frame **16** to a boom carriage **70** which supports the rear end portion **22** of the boom assembly **18** as illustrated in FIG. **1**. The boom carriage **70** is suitably supported by the frame **16** and is rotatably mounted thereon. Actuation of the hydraulic cylinder **68** moves the boom carriage **70** longitudinally along the frame **16**. The longitudinal movement of the boom carriage **70** relative to the frame **16** moves the drill unit **24** through the boom assembly **18**. Thus, the longitudinal range of the drill unit **24** to drill the holes in the mine roof is increased.

An elevating link **71** is supported by the boom carriage **70** and is pinned to a pair of parallel spaced boom arms **74**. An elevating mechanism **72** functions to raise and lower the elevating link **72** which, in turn, raises and lowers the boom assembly **18** in an arcuate forward path to thereby move the boom arms **74** longitudinally and provide a resultant rectilinear motion of the drill unit **24** in a linear vertical path. U.S. Pat. No. 3,375,880 completely describes the arrangement for moving the drill unit **24** in a linear vertical path, as summarized hereinabove.

The canopy assembly **28** has a pair of spaced parallel tubular side members **76** connected by a tubular front member **78** and a tubular back member **80**. To provide the canopy assembly **28** with additional structural strength, a transverse member **82** entends between the tubular side members **76**. A pair of diagonal members **84** are secured at one end to the tubular side members **76** adjacent the front member **78** and at the other end to the intermediate section of the transverse member **82**. The side portion **33** projects outwardly from the canopy assembly front end portion **20** with the frame front member **78** forming a portion of the side portion. The side portion **33** includes a plurality of transverse members **86** and a longitudinal support member **87** that provide strength and rigidity for the canopy side portion **33**. The expanded metal screen **34** is secured to the upper surface of the side portion **33** to protect the drill operator from the hazards of rocks dislodging from the mine roof as holes are drilled in the roof.

A canopy lift cylinder **88**, illustrated in FIGS. **2** and **3**, is mounted by a brace **90** to each of the stabilizing jacks **64** which is, in turn, mounted by a brace **91** to the front of the frame **16**. The lift cylinder is positioned in underlying relationship to the tubular side member **76** of the canopy assembly **28**. The lift cylinder **88** includes an inner cylinder **92** concentrically positioned therein. The inner cylinder **92** has a vertical chamber **94**, and a rod member **96** is slidably positioned in the vertical chamber **94** for extension outwardly therefrom. The canopy lift cylinder **88** can be actuated either manually or hydraulically to extend and retract the rod member **96**.

the extension rod **96**, as illustrated in FIG. **3**, has a transverse bore **98** passing through the upper end portion thereof. A sleeve **100** is concentrically retained in the bore **98**. The tubular side member **76** includes a pair of downwardly depending ears **102**, each having a transverse bore **104** passing therethrough. The upper end portion of the rod member **96** is pivotally connected to the tubular side member **76** by pin **106** positioned within the bores **104** aligned with the bore **98**. A pair of cotter pins **108** retain the pin **106** within the aligned bores **98** and **104** so that the upper end portion of the rod member **96** remains pivotally connected to the tubular side member **76** of the canopy assembly **28**.

The rod member **96** includes a plurality of vertically spaced bores **110** that pass transversely therethrough. The inner cylinder **92** is provided with a single bore **112** passing transversely through the upper end portion thereof adjacent the ears **102** of the tubular side member **76**. A pin member **114** is arranged to pass through the bore **112** aligned with a selected bore **110** of the rod member **96**. The pin **114** connects the rod member **96** to the inner cylinder **92** and thereby maintains the rod member **96** immovable within the vertical chamber **94** of the inner cylinder **92**. As illustrated in FIGS. **2** and **3**, the rod member **96** is maintained at its lowermost position within the inner cylinder **92**. By manually or hydraulically extending the rod member **96** out of the inner cylinder **92** and aligning the bore **112** with a selected bore **110** and passing the pin member **114** therethrough, the rod member **96** can be maintained at a preselected height above the frame **16**. As illustrated by the phantom lines in FIG. **2**, the adjustable feature of selectively positioning the rod member **96** in the inner cylinder **92** permits raising of the canopy assembly **28** to a desired elevation depending on the height of the mine roof.

The frame **16** includes a pair of oppositely positioned vertical sidewalls **116**, one of which is shown in FIG. **2**. The sidewall **116** is provided with an upper edge portion **118** as illustrated in FIGS. **2** and **4**. The edge portion **118** extends horizontally outwardly from the sidewall **116**, and gusset **120** maintains the edge portion **118** in a substantially horizontal plane relative to the sidewall **116**. A channel member, generally designated by the numeral **122**, is positioned on the frame **16** adjacent the canopy assembly tubular member **80**.

The channel member **122** includes a lower end portion **124** rigidly secured in abutting relation to the inboard side of the sidewall **116**. A horizontally extending lower abutment member **126** of the channel member **122** is secured in abutting relation to the top of the edge portion **118**. A horizontally extending upper abutment member **128** of the channel member **122** is arranged parallel to the lower abutment member **126** and extends beyond the end of the lower abutment member **126**. With this arrangement, the upper and lower abutment members **126** and **128** form an open end portion of the channel member **122** for receiving a roller **130**.

The roller **130** is mounted for horizontal, longitudinal movement on the edge portion **118**. The upper abutment member **128** projects over a portion of the roller **130** and thereby aids to maintain the roller **130** within the open end portion of the channel member **122** as the canopy assembly **28** is raised and lowered by operation of the lift cylinder **88**.

The roller **130** includes a bushing **132** and a threaded shaft member **134** coaxially aligned with the roller **130** projects outwardly from the bushing **132**. A pair of parallel spaced arm members **136** suitably secured to the tubular member **80** of the canopy assembly rear end portion **32** project rearwardly therefrom. Each of the arm members **136** includes a bore **138** that passes transversely through the end of the arm member. The shaft member **134** of the roller **130** is arranged to extend through the bore **138** of the arm member **136**. A suitable fastening device **140** is threadedly engaged to retain the arm member **136** on the shaft member **134**.

The fastening device **140** exerts an inwardly directed force upon the arm member **136** which is transmitted through the arm member to the roller **130**. Thus, the roller **130** is urged into abutting contact with the lower abutment member **126**. The above described articulated connection between the canopy assembly rear end portion **32** and the frame **16** permits the roller **130** to rotatably traverse the surface of the horizontal edge portion **118** and thereby provide longitudinal movement of the arm member **136** in a horizontal path parallel to the horizontal plane of the frame **16**.

The canopy assembly **28** is shown in phantom lines in FIG. **2** at its uppermost elevation. As described hereinabove, the canopy assembly **28** is extended from its lowermost position to a preselected position, within the range of vertical movement of the rod member **96** in the chamber **94**, by removing the pin **114** from the aligned bores **110** and **112** of the rod member **96** and the inner cylinder **92**. The rod member **96** is then freely movable in the chamber **94** for extension outwardly from the inner cylinder **92**. As the rod member **96** moves upwardly in a vertical plane, the roller **130** advances forwardly on the edge portion **118**. For an extension of the rod member **96** from its lowermost position to its uppermost position, the axis **142** of the roller **130** traverses the distance **144** on the edge portion **118**. Thus, the vertical movement of the rod member **96** in the chamber **94** provides horizontal movement of the roller **130** on the edge portion **118**. For a selected position of the rod member **96** intermediate of its upper and lower positions, the axis **142** of the roller **130** will move longitudinally on the edge portion **118** within the distance **144**.

The articulation between the roller **130** and the arm member **136** permits the arm member **136** to move in a linear horizontal path parallel to the horizontal plane of the frame **16** as the roller **130** traverses the surface of the edge portion **118**. The canopy assembly rear portion **32** connected to the arm member **136** through the back member **80** follows the path traversed by the arm member **136** which is determined by the travel of the rollers **130** on the edge portions **118**. The horizontal movement of the arm members **136** and the rear end portion **32** urges the canopy assembly front end portion **30** to pivot about the connection of the ears **106** to the rod members **96**. Thus, the combined horizontal movement of the canopy assembly rear end portion **32** and the pivotal movement of the canopy assembly front end portion **30** about the rod member **96** provides a resultant linear vertical movement of the front end portion **30**.

The front end section **30**, in its lowermost position relative to the frame **16** as illustrated in FIG. **2**, is inclined downwardly at an angle from a horizontal plane passing through the pivotal connection of the front end portion **30** to the rod member **96**. Extension of the rod member **96** vertically outwardly from the chamber **94**,

pivots the front end portion **30** about the pin **106** to approach a substantially horizontal position, as indicated in phantom. With this arrangement, the pivotal movement of the front end portion **30** upwardly in a horizontal plane and the articulation of the rear end portion **32** about the frame **16** in a linear horizontal path moves the front end portion **30** in a linear vertical path as the rod member **96** moves vertically upwardly.

In operation, the mobile drilling machine **10** with the combined boom assemblies **18** and frames **16** extending forwardly from the horizontal platform **14** is moved into position for drilling at a desired area in the mine. The frames **16** are then selectively pivoted toward or away from each other on the horizontal platform **14** to move the respective drill units **24** secured to the ends of boom assemblies **18** into the desired horizontal position. The stabilizing jacks **64** are actuated to urge the base portions **66** into abutting contact with the mine floor **67** to thereby fixedly secure the frames **16.** The hydraulic cylinder **68** is actuated to move the boom carriage **70** and the boom assembly **18** longitudinally on the frame **16** while the drill unit **24** is spaced from the roof. The linkage mechanism for the boom assembly **18** is then actuated to move the drill unit **24** vertically upwardly into drilling position. Simultaneously with the vertical movement of the drill unit **24,** the canopy assembly front end portion **30** is raised in a linear vertical path by extension of the rod member **96** from the inner cylinder **92** to provide working space from the drill operator beneath the canopy side portion **33.**

The canopy front end portion **30** may also be moved into abutting contact with the mine roof surface to thereby support the mine roof during the drilling operation. The drilling operation is then commenced by actuation of the motor **26** to rotate the drill bit. Should rock dislodge from an unsupported section of the mine roof during the drilling operation, the machine operator controlling the drill unit **24** is protected from personal injury by the expanded metal screen **34** covering the side portion **33** of the canopy assembly **28** positioned above him. The covered side portion **33** is conveniently located adjacent the drill unit **24** to permit the operator to position himself below the covered side portion as he controls the drill unit **24.**

According to the provisions of the patent statutes, I have explained the principle, preferred construction and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiments. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A canopy for a dual boom drill comprising,
a mobile body having a horizontal platform,
drill means,
a forwardly extending frame pivotally mounted to said horizontal platform,
a boom assembly having front end and rear end portions, said boom assembly rear end portion pivotally secured to said forwardly extending frame to permit movement of said drill means supported by said boom assembly front end portion in a vertical plane,
a canopy assembly having front end and rear end portions maintained in overlying relationship with said forwardly extending frame,
extensible means for moving said canopy assembly front end portion in a linear vertical path to a preselected height above said frame, and
articulating means for connecting said canopy assembly rear end portion to said forwardly extending frame.

2. A canopy for a dual boom drill as set forth in claim **1** which includes,
said articulating means operable to move said canopy assembly rear end portion longitudinally in a horizontal path parallel to the horizontal plane of said forwardly extending frame.

3. A canopy for a dual boom drill as set forth in claim **1** which includes,
said canopy assembly rear end portion movably supported on said forwardly extending frame for longitudinal movement in a horizontal path upon extension of said extensible means.

4. A canopy for a dual boom drill as set forth in claim **1** which includes,
said articulating means operable to move said canopy assembly rear end portion longitudinally in a linear horizontal path parallel to the horizontal plane of said frame and thereby permit said extensible means to move said canopy assembly front end portion in a linear vertical path.

5. A canopy for a dual boom drill as set forth in claim **1** in which,
said canopy assembly front end portion is pivotally connected to said extensible means.

6. A canopy for a dual boom drill as set forth in claim **1** which includes,
said canopy assembly front end portion having an integral laterally extending side portion adjacent said front end portion with an expanded metal screen secured in overlying relation with said side portion adjacent to said drill means.

7. A canopy for a dual boom drill as set forth in claim **1** which includes,
ground stabilizing means for forcibly maintaining said frame immovable relative to said mobile car, said stabilizing means suitably mounted to said frame.

8. A canopy for a dual boom drill as set forth in claim **1** in which,
said frame includes a pair of vertical sidewalls, each of said vertical sidewalls having an upper edge portion,
said articulating means includes a roller positioned for rectilinear rotational movement in a plane parallel to the longitudinal axis of said frame on said upper edge portion,
channel means for maintaining said roller rotatably engaged to said upper edge portion,
a pair of parallel spaced arm members connected to said canopy assembly rear end portion and extending rearwardly therefrom,
a bore extending transversely through each of said arm members,
a shaft member coaxially secured to said roller and projecting outwardly therefrom, said shaft member arranged to extend through said bore, and
fastening means for securing said arm member to said shaft member of said roller.

9. A canopy for a dual boom drill as set forth in claim **1** which includes,

a pair of forwardly extending frames pivotally mounted in spaced relation to and extending forwardly from said horizontal platform,

said frames pivotally arranged on said horizontal platform to move toward and away from each other, and

said canopy assembly suitably connected to each of said frames so that said canopy assembly pivots in a horizontal plane with said frame.

10. A canopy for a dual boom drill as set forth in claim **1** in which,

said extensible means includes adjustable means for maintaining said canopy assembly front end portion at a preselected vertical height above said frame.

11. A canopy for a dual boom drill as set forth in claim **10** in which said adjustable means includes,

a pair of outer cylinders mounted in spaced vertical relation to said frame, each of said outer cylinders having a chamber therein,

an inner cylinder concentrically arranged in each of said outer cylinder chambers, said inner cylinder having a chamber therein,

a rod member movably positioned in said inner cylinder chamber and having an upper end portion extending outwardly therefrom, and

connecting means for pivotally securing said rod member upper end portion to said canopy assembly front end portion to thereby permit said rod member to move said canopy assembly front end portion in a linear vertical path.

12. A canopy for a dual boom drill as set forth in claim **11** which includes,

a plurality of vertically spaced bores passing transversely through said rod member,

said inner cylinder having a transverse bore passing therethrough, and

a pin member extending through said inner cylinder bore aligned with said rod bore to thereby retain said canopy assembly front end portion at a preselected vertical height above said frame.

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