United States Patent [19]

Long

[11] 3,737,006

[45] June 5, 1973

[54] **APPARATUS HAVING AN OPERATOR CARRYING AND PROTECTIVE DEVICE**

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[73] Assignee: **The Marmon Group, Inc.,** Chicago, Ill.

[22] Filed: **Mar. 30, 1971**

[21] Appl. No.: **129,337**

[52] **U.S. Cl.** **182/112,** 182/129, 182/141

[51] **Int. Cl.**.....**E04g 1/26**

[58] **Field of Search**.....182/112, 129, 2, 182/63, 141, 148; 175/219; 299/33; 296/137, 98

[56] **References Cited**

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Primary Examiner—Reinaldo P. Machado

Attorney—Royal R. Rommel and John M. Rommel

[57] **ABSTRACT**

An operator protective device for operator controlled apparatus, the protective device including a platform upon which an operator may be situated and a canopy extending over at least a portion of the platform and having at least an overhanging portion thereof spaced from the platform to provide a protective cover over an operator situated on the platform. Means is provided to selectively increase and decrease the relative spaced apart distance between the platform and the portion of the canopy which extends thereover, which means may also include means for movement of both the platform and the canopy as a unit with respect to the apparatus while maintaining a fixed relative spaced apart distance between the platform and the portion of the canopy which extends thereover.

14 Claims, 17 Drawing Figures

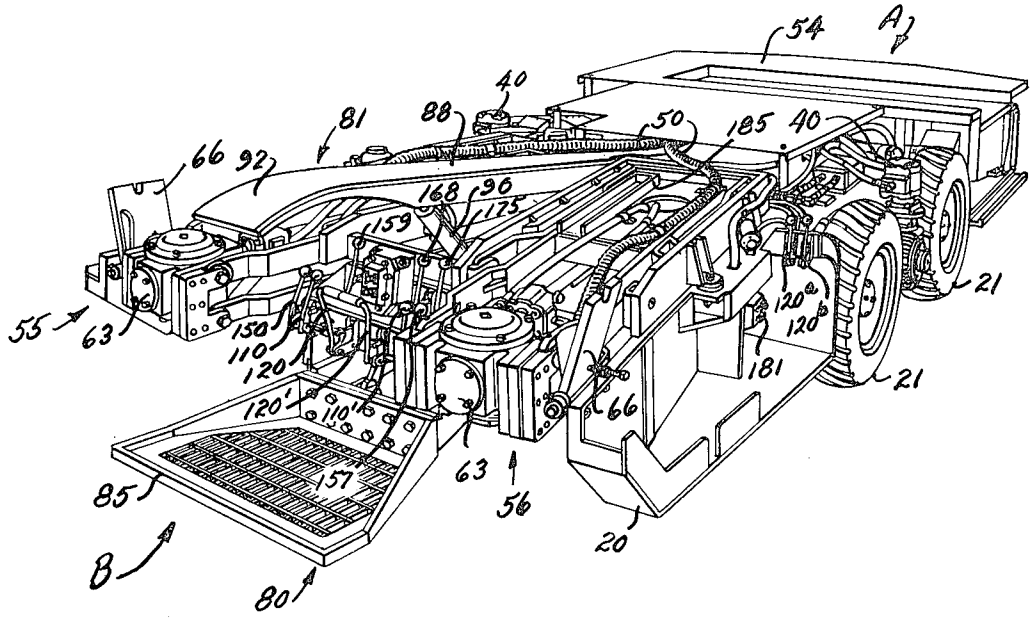


FIG. 1

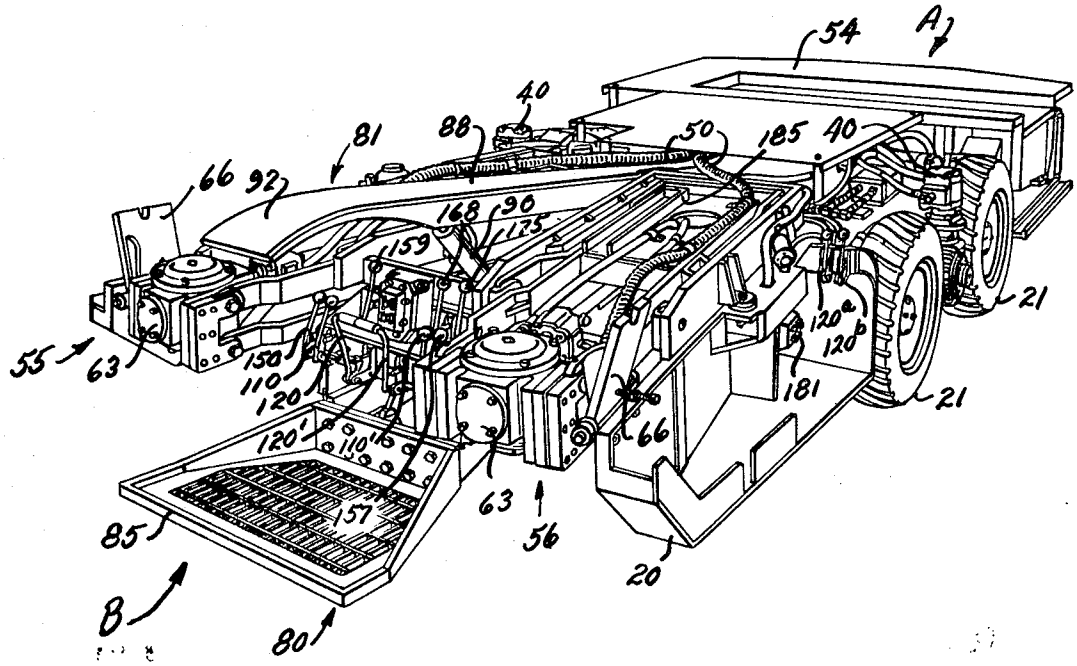
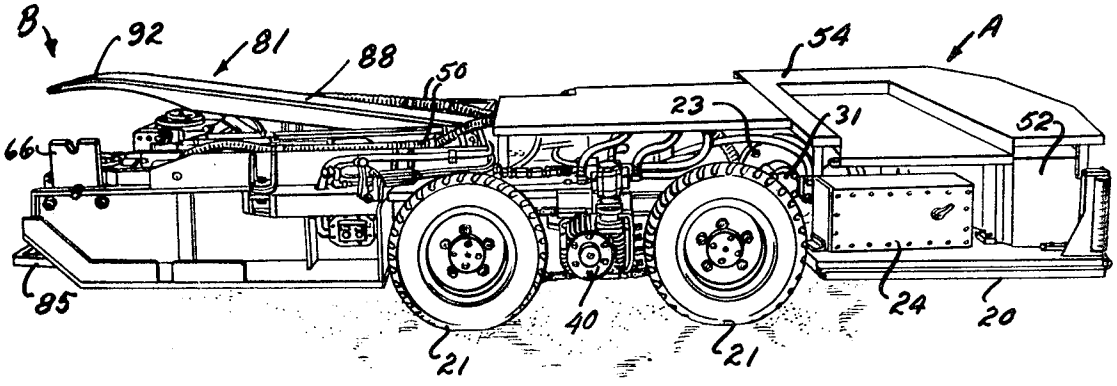


FIG. 2



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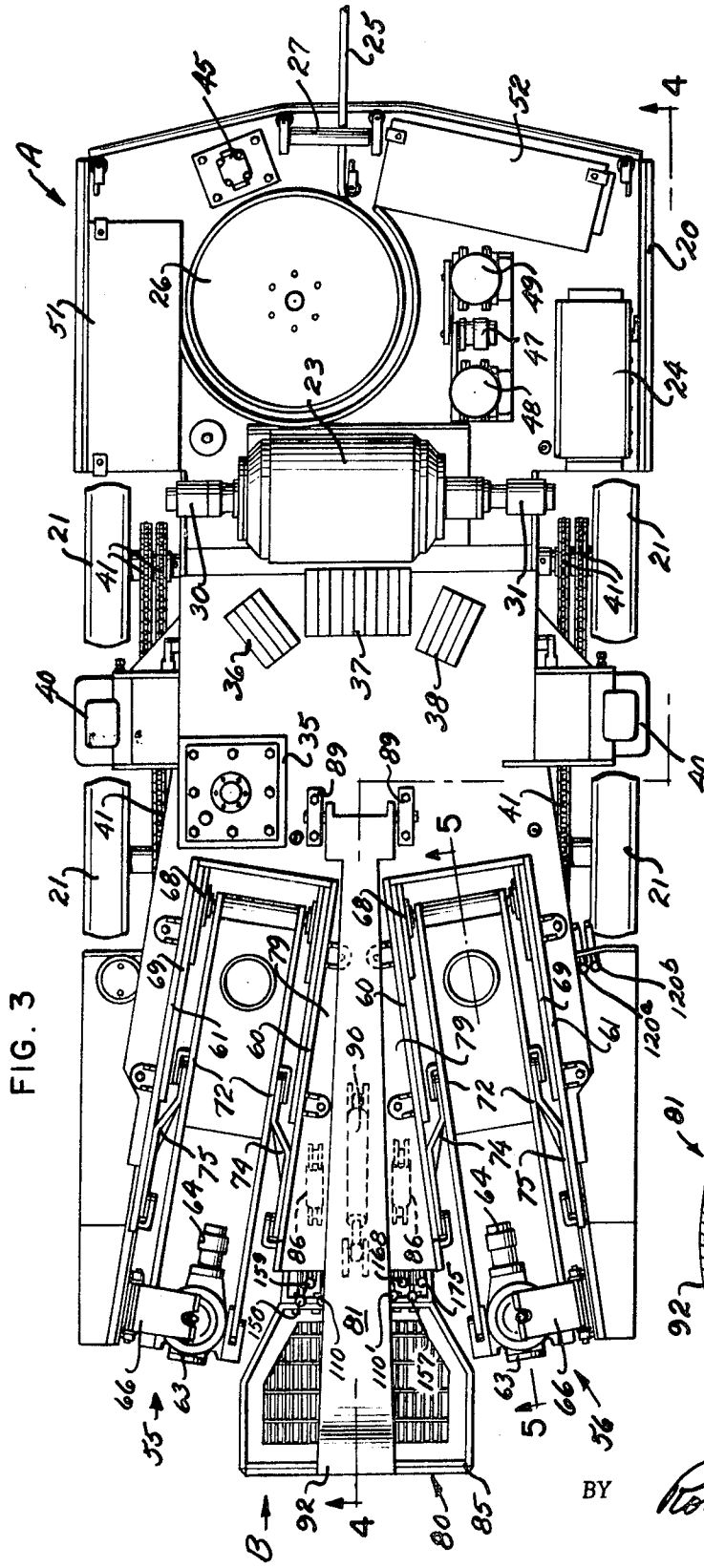


FIG. 3

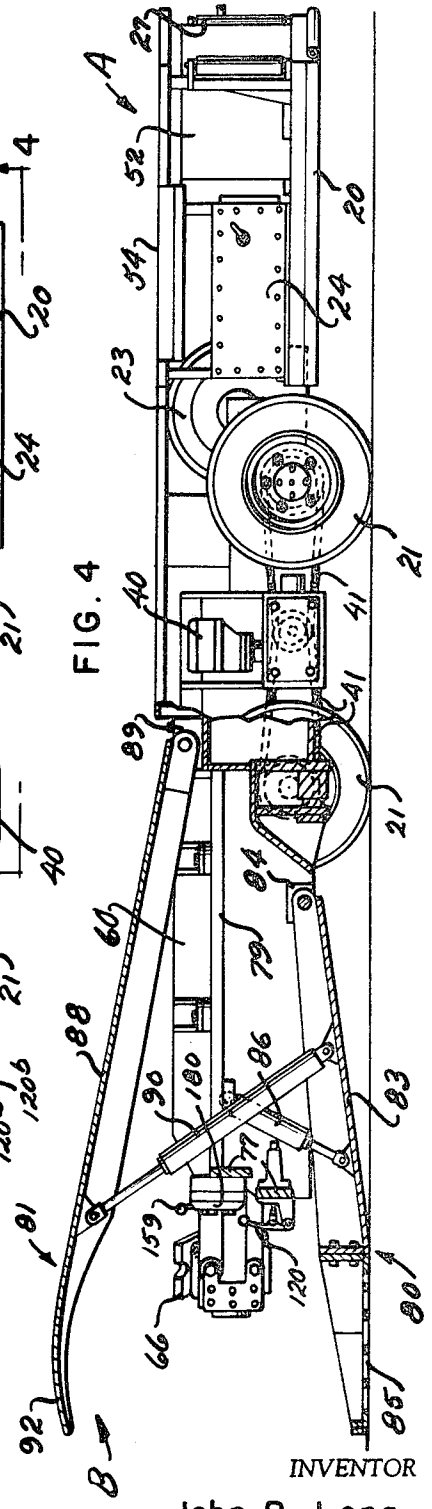


FIG. 4

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FIG. 5

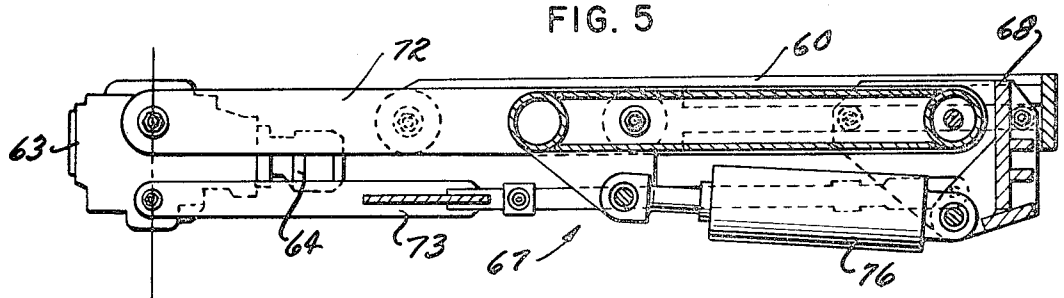


FIG. 6

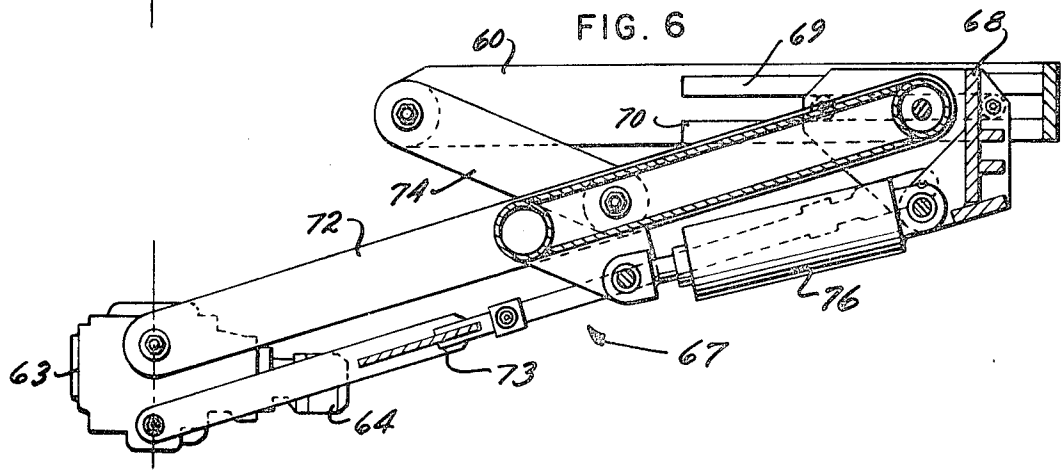
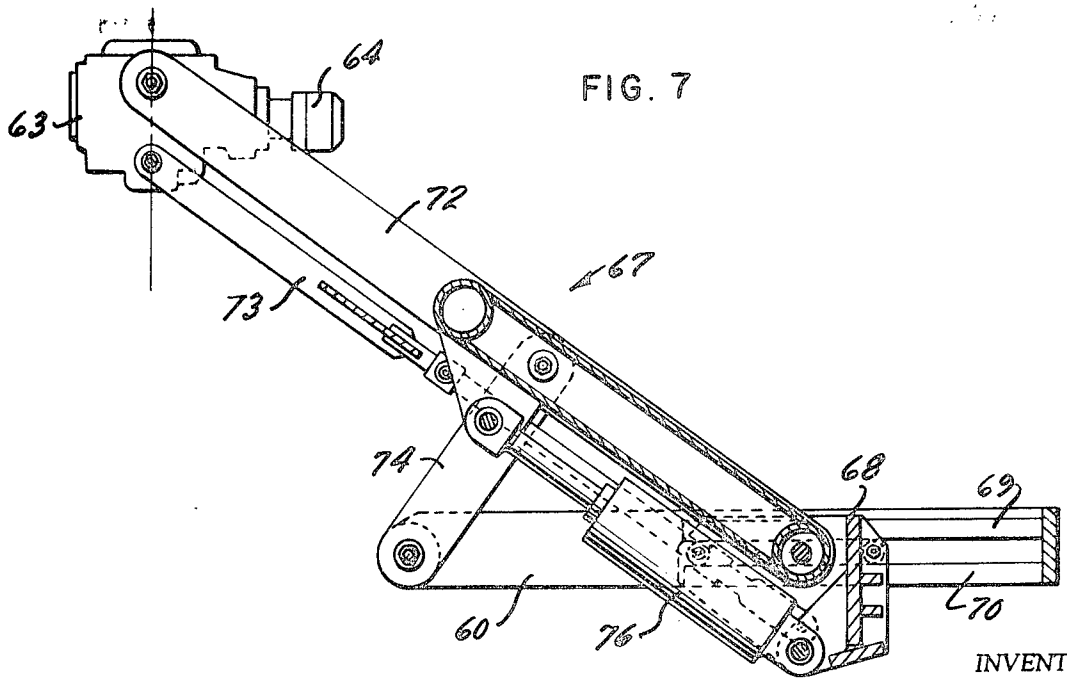


FIG. 7

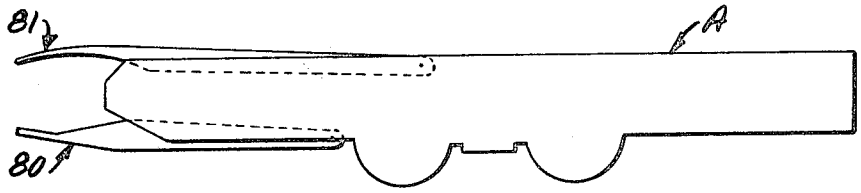


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FIG. 8



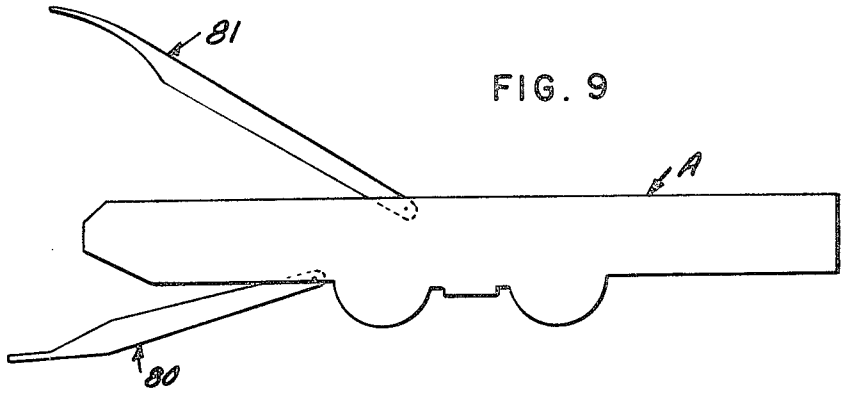


FIG. 9

FIG. 10

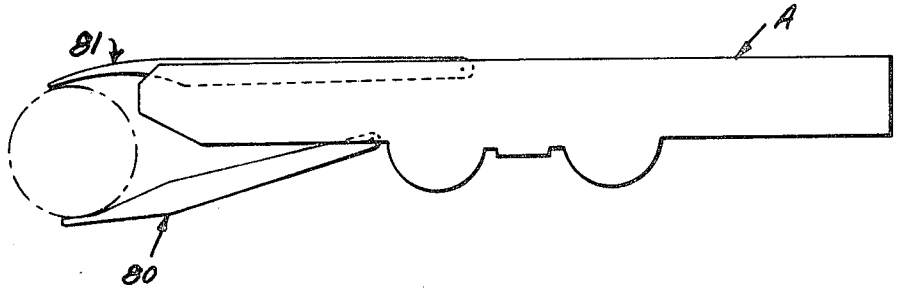
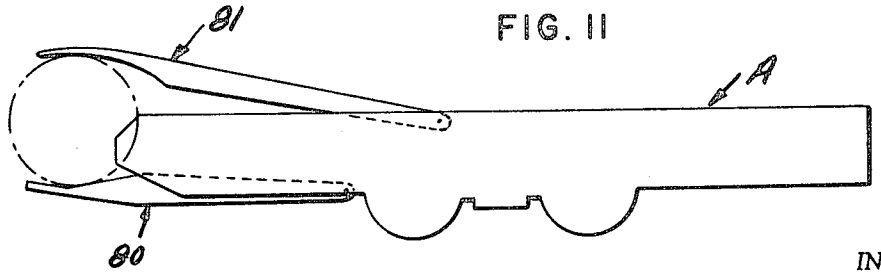


FIG. 11



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FIG. 12

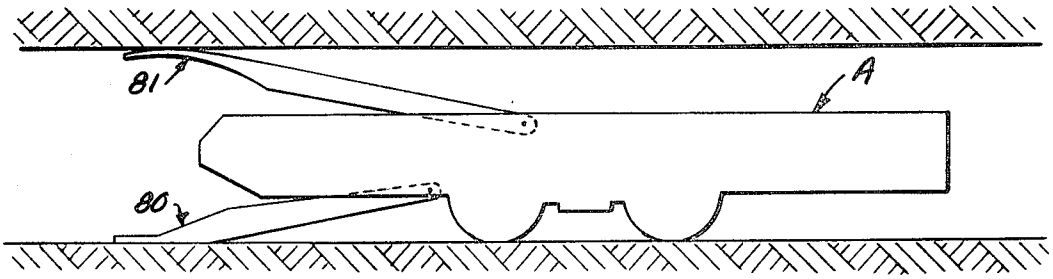


FIG. 13

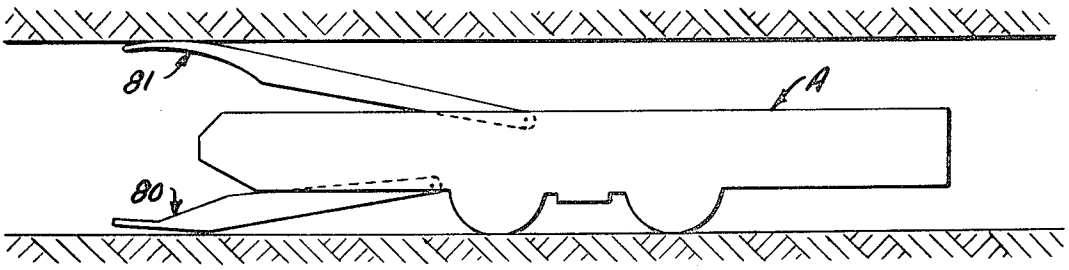


FIG. 14

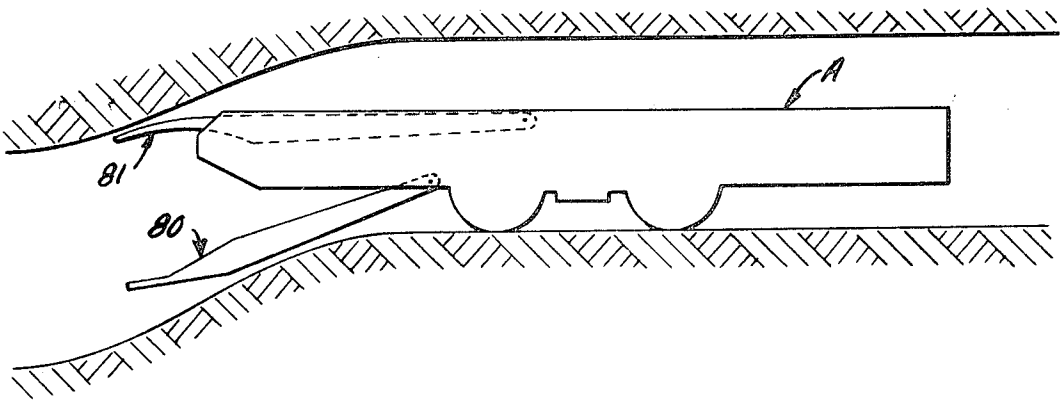
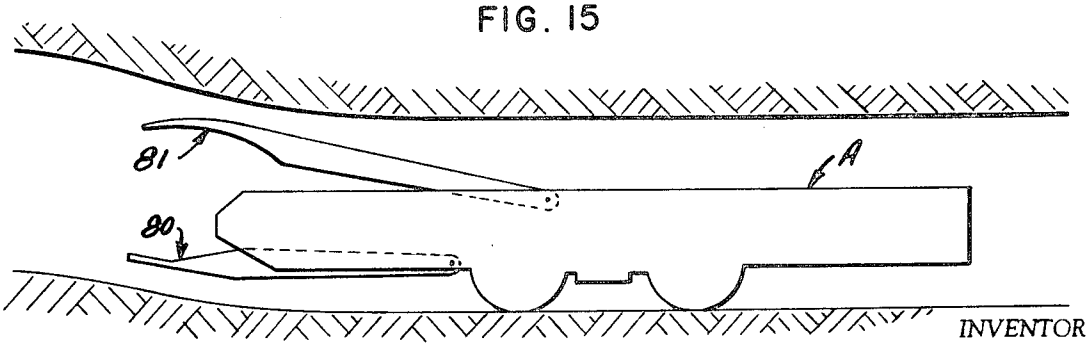


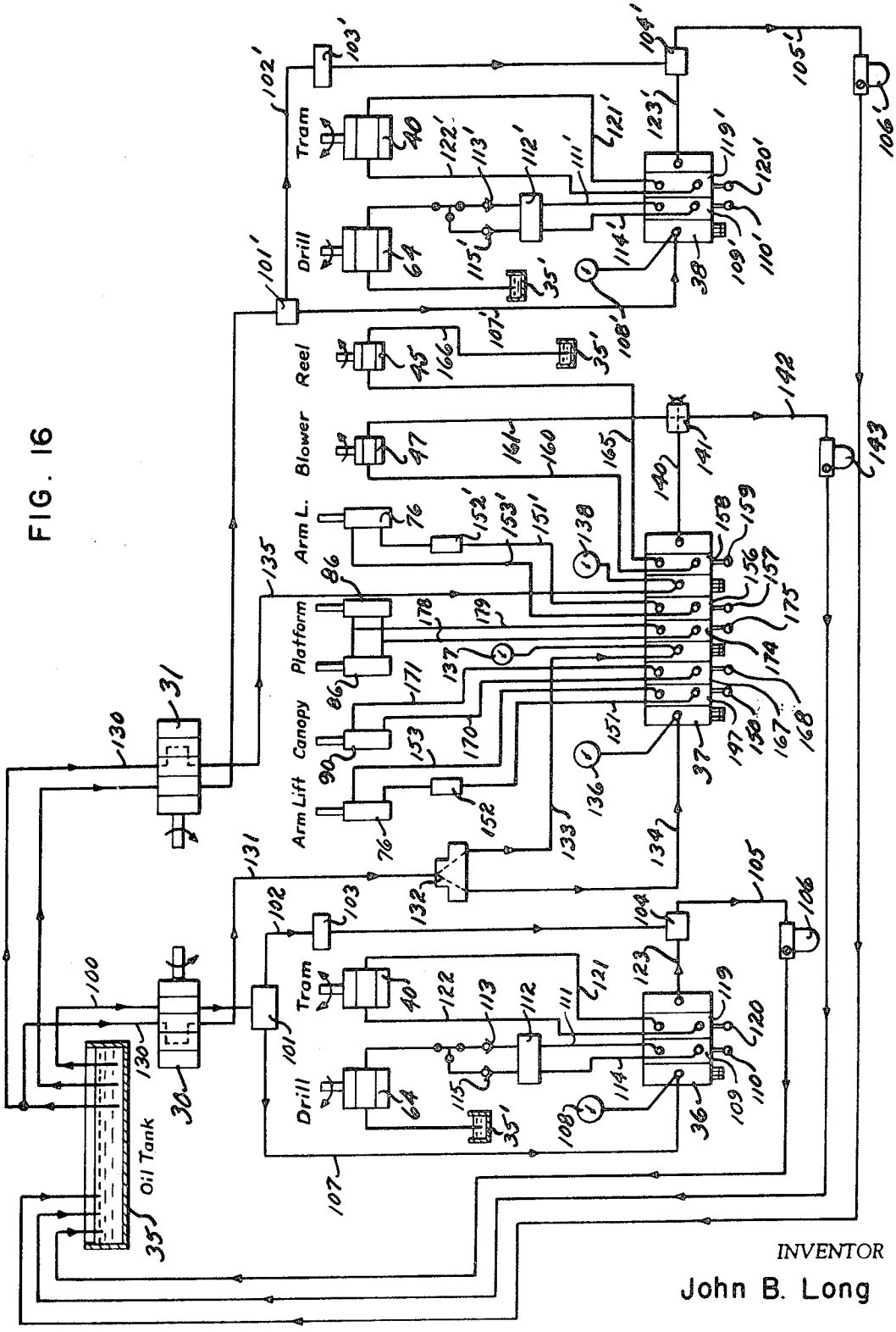
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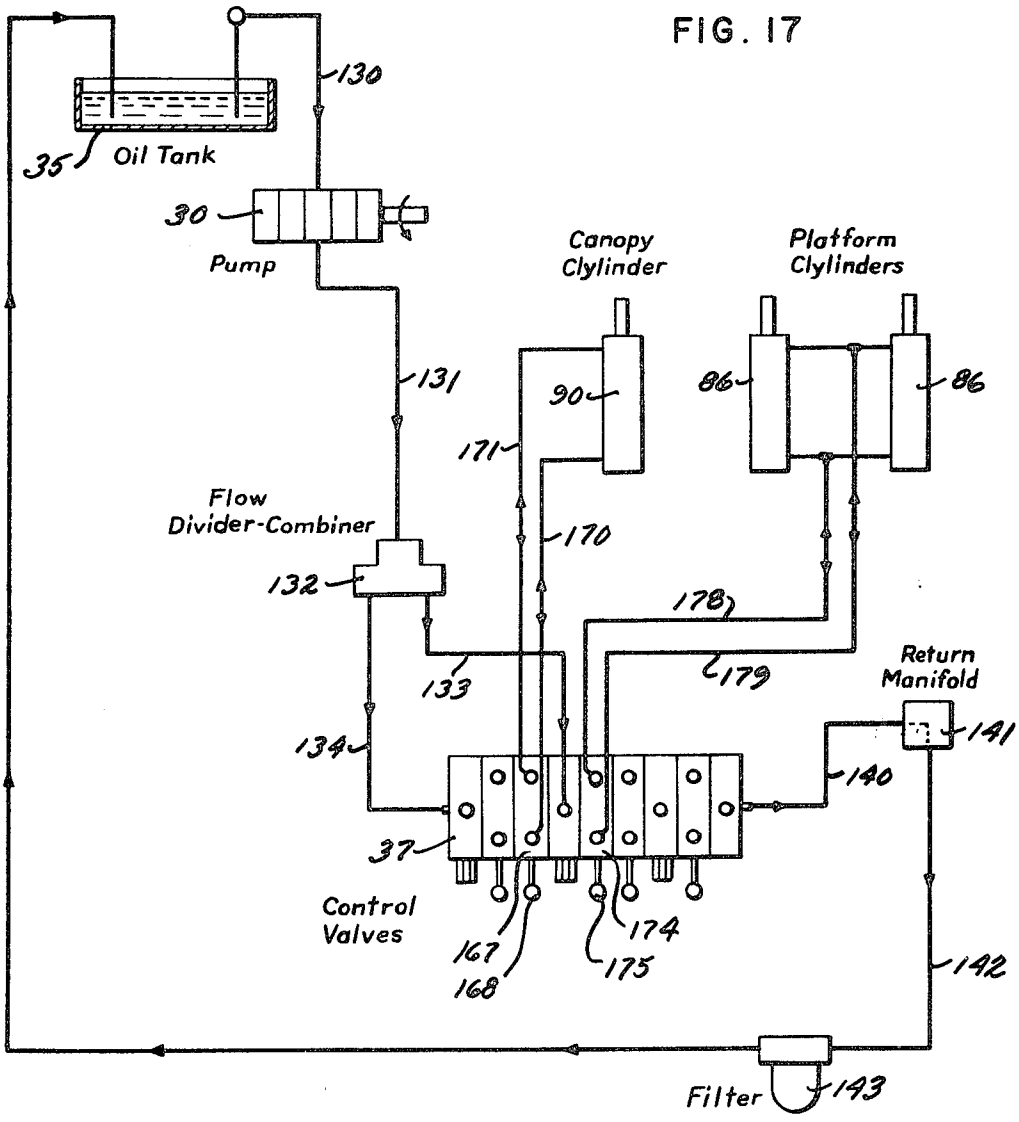
FIG. 16



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FIG. 17



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APPARATUS HAVING AN OPERATOR CARRYING AND PROTECTIVE DEVICE

This invention relates to improvements in an operator carrying and protective device for operator controlled apparatus.

The invention was primarily developed in connection with a mine roof drilling and bolting machine and it is thus shown and described herein. However, it will be readily appreciated that my improved operator carrying and protective device may be used with equal facility in connection with various other types of mining apparatus and with various apparatus used in above ground installations. The description of my improved operator carrying and protective device in association with a mine roof drilling and bolting machine is thus to be understood as by way of example and not as a limit to the scope of invention.

Mine roof drilling and bolting is one of the most dangerous jobs in a mine. It has been found that most injuries usually occur within ten to fifteen feet of the mine face, an area in which roof bolts have not yet been placed, which suggests that the high rate of injury in this area is due at least in part to the fact that the roof bolts are not in. When the roof is drilled for insertion of the roof bolts there is a further disturbing of the strata, which increases the likelihood of roof falls. It can thus be readily appreciated that the matter of protection for operators of mine roof drilling and bolting machines is a prime starting point for increasing miners' safety. The primary object of the present invention is thus to provide an operator protective device which will decrease the likelihood of injury to an operator from falling objects.

A further object is the provision of an operator carrying and protective device which includes a platform upon which the operator may be situated and a canopy extending over at least a portion of the platform, either the platform or the canopy, or both, being movable to selectively increase and decrease the relative spaced apart distance between the platform and the canopy. In use in connection with mine roof drilling and bolting machines, for instance, the platform could be moved against the floor to stabilize the machine and the canopy could be moved against the roof, to inhibit roof falls. In this connection, the means operative to hold the canopy against the roof is preferably provided with some relief means to yield and permit the canopy to yield and move away from the roof under conditions of extreme overload, the canopy also preferably being shaped to provide a deflector portion for deflecting roof falls. This yielding action protects the operator by giving him visual evidence of roof failure while at the same time inducing the roof breakage to be deflected away from the operator.

Since the canopy is movable to positions of abutment with the roof it may also be used to hold objects against the roof. For instance in positioning an elongated tie-plate while performing the necessary drilling and bolting operation for permanent attachment of the tie-plate to the roof.

Some apparatus which includes my improved operator carrying protective device may be used in relatively confined quarters in which the vertical distance available for working is quite small, by way of example, use on a mine roof drilling and bolting machine in a thin seam mine. In such a situation, the mine roof and mine

floor are usually somewhat undulating so that tramming of apparatus therein may be likely to provide some points at which the operator is imperiled by the machine he is riding not being able to vertically articulate to a degree to permit sufficient head room for the operator. I thus preferably provide that my improved operator carrying and protective device may be articulatively interconnected to operator control apparatus in a manner so that, for instance, in use of a platform and canopy for the protective device, the platform and canopy can be moved as a unit with respect to the frame of the apparatus to which it is interconnected, while maintaining a fixed relative spaced apart distance between the platform and the canopy.

As is shown herein, my improved operator carrying and protective device may be used in association with an improved drilling and bolting machine, which such roof drilling and bolting machine may include a pair of drilling and bolting means which extend outwardly from the machine at the same end thereof, an operator station being provided centrally between the drilling and bolting means. The operator may thus be located in a position for more convenient operation of the machine.

The drilling and bolting heads of my improved drilling and bolting machine are movable on vertical axes that are horizontally spaced apart a fixed distance, which distance may be the nominal distance according to the design of spacing of a pair of drilling and bolting places. The operator can thus, for instance, begin bolting operation on one of the drilling and bolting heads while the other drilling and bolting head is still in the act of drilling. This is a considerable safety factor in permitting an operator to increase his speed in setting up roof bolts, which enables him to substantially keep up with a continuous miner, which means that the roof bolting can be maintained closer to the face, thus decreasing the area adjacent the mine face which is subject to roof falls for lack of roof bolts.

Other objects and advantages will become apparent during the course of the following detailed description, taken in connection with the accompanying drawings, and in which drawings:

FIG. 1 is a perspective view of an end of a mine roof drilling and bolting machine which includes my improved operator carrying and protective device.

FIG. 2 is a perspective view of one side of the apparatus of FIG. 1.

FIG. 3 is a top plan view of a mine roof drilling and bolting machine which may include my improved operator carrying and protective device.

FIG. 4 is a longitudinal sectional view taken substantially on the line 4—4 of FIG. 3.

FIGS. 5, 6, and 7 are enlarged longitudinal sectional views taken substantially along the line 5—5 of FIG. 3 and showing various operating positions of the drilling and bolting means.

FIGS. 8–15 are somewhat diagrammatic views showing the relative positions which may be assumed by the platform means and canopy means of my improved operator carrying and protective device.

FIG. 16 is a schematic of the hydraulic circuitry of the roof drilling and bolting machine, including my improved operator carrying and protective device.

FIG. 17 is a schematic of the hydraulic circuitry relating to the canopy means and platform means of my operator carrying and protective device, which has been

removed from the circuitry of FIG. 16, for more thorough understanding.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention, and wherein similar reference characters may designate corresponding parts throughout the several views, the letter A may designate a drilling and bolting machine upon which may be provided my improved operator carrying and protective device B.

Drilling and bolting machine A preferably includes a main frame 20 that may be suitably mounted on wheels 21 for mobility. The basic elements of the electrical system of the drilling and bolting machine may be mounted on main frame 20, including an electric motor 23 that is suitably interconnected to a starter 24, an electric cable 25 being provided to supply power to the electrical system. Drilling and bolting machine A may usually be moved about quite a distance from an electrical source and I therefore preferably provide a cable wheel 26 for carrying a large supply of cable 25, a cable guide 27 being provided to guide cable 25 as it is wound and unwound with respect to cable wheel 26. Electric motor 23 is interconnected to drive hydraulic pumps 30 and 31 which supply hydraulic fluid through the hydraulic system, basic portions of which may likewise be mounted on main frame 20. These may include a hydraulic fluid tank 35; a plurality of valve banks 36, 37 and 38; tram units 40 which may be suitably interconnected by drive chains 41 to provide power to wheels 21; a hydraulic motor 45 for driving cable reel 26; and a hydraulic motor 47 for driving blowers 48 and 49 for collection of dust during the drilling operation through dust conveying hoses 50 which lead to dust collector boxes 51 and 52. Dust collector boxes 51 and 52 are preferably positioned for ready access by the operator in emptying the same.

A cover or deck 54 may be mounted on frame 20 for providing a convenient place upon which to carry parts and equipment which may be used in the drilling and bolting operation, such as roof bolts and tie-plates.

Mounted on one end of main frame 20 may be a pair of drilling and bolting means 55 and 56. Drilling and bolting means 55 and 56 preferably extend divergently outwardly from main frame 20 and provide an intermediate space therebetween which may define an operator and control position.

Each drilling and bolting means 55 and 56 may be of conventional construction. They may, for instance, each include inner and outer side frames 60 and 61 which are welded or otherwise suitable secured to main frame 20 for support of drilling and bolting means 55 and 56 in a substantially horizontally fixed spaced apart position with respect to each other and with the drilling and bolting heads 63 thereof spaced apart a nominal distance according to the design spacing of a pair of drilling and bolting places. Drilling and bolting heads 63 may be driven by hydraulic motors 64 which are suitably connected to the hydraulic system of the machine, as will be subsequently described. Drilling and bolting heads 63 are preferably of the type to provide "through the stem" dust collection during the drilling operation and are suitably interconnected to a dust conveying hose 50 which collects dust and conveys the same to a dust collector box 51 or 52, as is well known in the art.

An auger guide assembly 66 may be mounted on outer side frame 61 for guiding the auger as the drilling and bolting head 63 is raised from its lowermost position as shown in FIG. 6.

Suitable guide means 67 is provided for straight line movement of drilling and bolting head 63.

Guide means 67 may include a carriage 68 that may be slidably supported between runner bars or rails 69 and 70 mounted on side frames 60 and 61. A pair of spaced apart guide arm means 72 and 73 are provided, the same being pivotally interconnected at one end thereof to drilling and bolting head 63 and pivotally interconnected at the other end thereof to carriage 68. A pair of guide linke 74 and 75 are provided, one being pivotally interconnected to each guide arm means 72, guide link 74 being pivotally interconnected at the other end thereof to side frame 60 and guide link 75 being pivotally interconnected at the other end thereof to guide frame 61. A hydraulic cylinder 76 is provided, the same being pivotally interconnected at one end thereof to carriage 68 and at the other end thereof to guide arm 72, the same providing lift means for raising and lowering of drilling and bolting head 63 through its various positions, as is well known in the art, and as is shown in FIGS. 5, 6 and 7.

Transverse cross members 77 may be provided to extend between the outermost ends of drilling and bolting means 55 and 56, providing a main control panel mount which may comprise an operator work station. The facing sides of inner side frames 60 of each drilling and bolting means 55 and 56 may be provided with a substantially horizontally extending flange member 79 for a purpose as will be subsequently described.

Operator carrying and protective device B preferably includes platform or stabilizer means 80 and canopy means 81.

Platform means 80 preferably includes an elongated frame portion 83 which is pivotally supported adjacent one end thereof between side frames 60 such as by pivot means 84 which provides support means for vertical pivotal movement thereof within the operator and control position defined between drilling and bolting means 55 and 56. The other end of frame 83 may be provided with an enlarged support portion 85 on which an operator may be situated. A pair of hydraulic cylinders 86 provide power means for raising and lowering platform means 80. Hydraulic cylinders 86 may be pivotally attached at one end thereof to frame 83 of platform means 80 and at the other end thereof to a flange member 79 of a side frame 60 of each drilling and bolting means 55 and 56.

Canopy means 81 preferably includes an elongated frame 88 which may be pivotally supported adjacent one end thereof such as by pivot means 89. Pivot means 89 provides support means for mounting of canopy means 81 on main frame 20. Hydraulic cylinder 90 provides power means for vertical raising and lowering of canopy means 81. Hydraulic cylinder 90 may be pivotally interconnected at one end thereof to elongated frame 88 of canopy means 81 and at the other end thereof to elongated frame 83 of platform means 80. Elongated frame 88 may be provided at the outermost end thereof with an arcuately curved portion 92 which overhangs the enlarged support portion 85 of platform means 80 and provides a deflector for deflecting roof falls.

FIGS. 8–15 are illustrative of positioning of platform means 80 and canopy means 81, the same being selectively movable to increase and decrease the relative

spaced apart distance therebetween and also being movable as a unit with respect to drilling and bolting machine A.

FIG. 8 shows the minimal spacing between platform means 80 and canopy means 81, canopy means 81 being lowered to its lowermost position and platform means 80 being raised to its uppermost position. Such minimum opening between the respective elements provides adequate seating height for an operator.

FIG. 9 illustrates maximum spacing between platform means 80 and canopy means 81, canopy means 81 being raised to its uppermost position and platform means 80 being in its lowermost position. The maximum opening between platform means 80 and canopy means 81 accommodates greater seam heights.

FIGS. 10 and 11 are illustrative of the maintenance of a constant spaced apart relationship between platform means 80 and canopy means 81 in respective raised and lowered positions. This shows that the relative relationship between canopy means 81 and platform means 80 may be kept constant while both elements can be varied with respect to both drilling and bolting machine A and/or the ground floor.

FIG. 12 shows the normal stationary position. That is, with platform means 80 in contact with the ground, providing a stabilizing effect for the machine and with canopy means 81 in contact with the roof, thereby simultaneously providing overhead protection and roof support. When in this position, canopy means 81 might be used to hold an object such as a tie-plate against the roof, while performing the necessary drilling and bolting operation for permanent attachment of the same to the roof. In this position, in the event two men may be working the machine, both may crouch beneath canopy means 81, at least protecting their heads and upper torso even though neither may be situated on platform means 80.

FIG. 13 shows relative positioning of platform means 80 and canopy means 81 for relatively even seam conditions. In this condition, platform means 80 is raised just above the ground and canopy means 81 is lowered just below the roof, allowing maximum operator's seating height convenience, overhead protection, and machine stability.

FIGS. 14 and 15 are illustrative of tramming in undulating seam conditions. This is, by simultaneously depressing or raising both platform means 80 and canopy means 81 the machine may be maneuvered through a roll in the seam.

The overall hydraulic system is diagrammatically shown in FIG. 16. As is conventional in diagrammatic showings of such hydraulic systems, some of the return lines are shown as having return flow to a sump 35'. This is a convenience in the diagrammatic showing rather than having the return lines run all of the way back to oil tank 35 which they do in the actual machine.

Taking the left hand drill and tram circuit first:

Line 100 leads from tank 35 through pump 30 to tee manifold 101. Fluid flow then may travel from tee manifold 101 through line 107 to valve bank inlet 36 or through line 102 through flow regulator 103 to return manifold 104, depending upon the manual adjustment of flow regulator 103. Gauge 108 may be provided for showing pressure supplied to valve bank 36. In operation of valve section 109 of valve bank 36, pulling out lever 110 will permit flow through line 111 through cross line relief valve 112 and check valve 113 to drill motor 64. Pushing in lever 110 will provide flow through line 114, relief valve 112, and check valve 115 to drill motor 64.

In operation of valve section 119 of valve bank 36, movement of lever 120 provides for flow through either lines 121 and 122 for movement of tram motor 40 in one direction or the other, for tramming in forward and in reverse. Line 123 is provided for return of fluid to tank 35 from valve bank 36 through manifold 104.

The hydraulic system used in connection with the right hand drilling and tramming operation, through right hand valve bank 38, is identical to that previously described in connection with the left hand side and identical reference characters with a prime character have been applied to corresponding parts of the right hand side.

Both pumps 30 and 31 are used to provide hydraulic fluid to center valve bank 37. They may each withdraw fluid from hydraulic tank 35 through a line 130, flow from pump 30 being through line 131 to flow divider-combiner 132 and through respective lines 133 and 134 to different parts of valve bank 37. Flow from pump 31 is through line 135 to another part of valve bank 37. Gauges 136, 137 and 138 may be provided for showing the fluid pressure in respective parts of valve bank 37. Line 140 may be provided leading from valve bank 37, through manifold 141, through return line 142 and filter 143 to return fluid to tank 35.

In operation of valve section 147 of valve bank 37, pushing in lever 150 provides flow through line 151 and regulator 152 to cylinder 76 for raising drilling and bolting means 55, fluid exhausting from the opposite end of cylinder 76 through line 153 and valve bank 37 to line 140 and return manifold 141. Pulling out lever 150 provides flow through line 153 and reverse flow through line 151 to lower drilling and bolting means 55.

Operation of valve section 156 of valve bank 37 by lever 157 provides for control of hydraulic cylinder 76 for raising and lowering of drilling and bolting means 56. Hydraulic circuitry in connection therewith is identical to that previously described in connection with drilling and bolting means 55 and identical reference characters, with a prime character, have been applied to corresponding parts of this hydraulic circuit.

Valve section 158 is provided for control of both cable reel motor 45 and blower 47. This relationship is permitted in view of the fact that these two motors will not be normally operated at the same time. When lever 159 is pushed in, flow will be provided through line 160 to blower motor 47 and through line 161 to return manifold 141. When lever 159 is pulled out, fluid flow will be provided through line 165, to reel motor 45, and through line 166 to sump 35'. These controls are such that when reel motor 45 is running blower motor 47 is in neutral and when blower motor 47 is running reel motor 45 is in neutral.

In operation of valve section 167 of valve bank 37, pushing in lever 168 provides for fluid flow through line 170 to hydraulic cylinder 90 for raising canopy means 81, fluid exhausting from the opposite end of cylinder 90 through line 171 to line 140 and return manifold 141. Pulling out lever 168 provides flow through line 171 and reverse flow through line 170 to lower canopy means 81. Valve section 167 is preferably provided with a pressure relief valve which permits cylinder 90 to yield in cases of extreme roof overloads.

In operation of valve section **174** of valve bank **37**, pushing in lever **175** provides for flow through line **178** to hydraulic cylinders **86**, fluid exhausting from the opposite ends of cylinders **86** through line **179** to line **140** and return manifold **141**, which lowers platform means **80**. Pulling out lever **175** provides flow through line **179** and reverse flow through line **178** to raise platform means **80**.

The respective operating handles are preferably mounted on transverse frame members **77** in a central operator control position. At this position is also preferably provided a push button switch control station **180** for starting and stopping electric motor **23**. An auxiliary operator control position may also be provided on the right hand side of the machine, which position may include an auxiliary push button control station **181** for starting and stopping motor **23** and tram levers **120**^{a} and **120**^{b} for respective operation of the left and right hand tram units **40**.

In order that the hydraulic circuitry in connection with operation of platform means **80** and canopy means **81** may be clearly understood, and since the same may form a part of either an independent circuit or one which is not associated with a drilling and bolting machine, the same is shown separately in FIG. **17**. The same reference characters have been applied to the parts as shown in FIG. **17** as were applied in connection with the showing of FIG. **16**.

In normal operation the operator positions himself, on the stabilizer platform between drilling and bolting means **55** and **56**. A complete set of conveniently located control handles are thus situated immediately in front of the operator, as shown in FIG. **1**.

The canopy and platform control levers are preferably located side-by-side for ease of simultaneous operation of both functions. Note that pushing both levers in will respectively set both the canopy and the platform against the roof and bottom. Pulling both levers out simultaneously will retract both the canopy and stabilizer into their normal tramming positions. During both of these operations the operator is situated snugly between platform means **80** and canopy means **81**, avoiding any exposure to the hazards of roof falls. During his entire drilling and placing of bolts he is constantly protected from roof debris by overhead canopy means **81**.

The attachment of canopy hydraulic cylinder **90** to platform means **80** enables canopy means **81** to move up and down as platform means **80** is raised and lowered for maintaining a fixed relationship between these two elements. This is particularly valuable when tramming in low roof conditions. Platform means **80** can then be lowered near the bottom, which also lowers canopy means **81** away from the floor, allowing the machine to pass through.

OPERATION

Drilling and bolting machine A is trammed into place and positioned in the desired location for the first two bolts. Platform means **80** and canopy means **81** are set simultaneously by pulling out levers **175** and **168**. When platform means **80** has picked up an appropriate amount of the machine weight and canopy means **81** is secured against the roof, the control levers are released, being spring centered so that they will return to their neutral position. Drill head **63** of left hand drilling and bolting means **55** is lowered to its bottom position by pulling out lever **150**. Just before the drill head contacts the mine floor, the lever should be returned to its central position to prevent impacting the bottom of drill head **63** against the mine floor.

The blowers **48** and **49** are started by pushing in lever **159**, which starts motor **47** that operates blowers **48** and **49**. Auger guide assembly **66** of drilling and bolting means **55** is set into operating position and the drill steel (not shown) which may be carried on a conveniently located rack **185** is inserted into the chuck of drill head **63** and positioned in auger guide assembly **66**. The drill steel is then raised by pushing in drill lever **150** until the bit contacts the mine roof and lever **150** is then returned to neutral. The next operation involves a rapid sequence of lever operations. While steadying the drill steel with his left hand, the operator pushes in left drill motor lever **110** and locks the same at the appropriate drill speed. Lever **150** is also locked for correct lift. The left hand drill is now drilling and feeding under its preset controls. Both the speed of the drill motor and the speed of the lift should be selected to obtain the optimum drilling rate without stalling so that the entire drilling function can be performed by the machine without the operator's constant attention.

While the operator leaves the left hand drill performing its drilling function, he can lower right hand drilling and bolting means **56** to the bottom by pulling out lift lever **157**. The same precautions and control actions are utilized in connection with right hand drilling and bolting means **56** as were used on the left. The right hand drill motor **64** is started by pressing in lever **109'** as was the case with the left hand drill motor. All other functions for the right hand drill are sequenced and performed in the same manner as they were in connection with the left hand drill.

Now we have both drills going simultaneously with the left hand drill ready to be stopped while the right hand drill continues its drilling function. Just before the chuck of the left drill head contacts the roof, the left drill lift is stopped by pulling lever **150** into its neutral position. Immediately after stopping the lift, the operator should stop the drill motor by pulling lever **109** into its neutral position. With the hole drilled to the desired depth, the drill is then lowered, the drill steel (not shown) is removed and placed back in a storage rack and a spring mounted bolting chuck (not shown) placed on the drill head for transmission. Generally, by the time the left hand bolt is ready for installation, the right hand drill has completed its hole and should be shut off in the same manner as was the left hand drill. Roof bolts should be made up in advance and placed in their storage tray ready for installation. The made up roof bolt is started into the hole and the head of the bolt placed in the bolting chuck. The left hand lift **76** is then engaged, raising the bolt in position with its plate flat against the roof, and the lever left in to hold the bolt in place. The bolt is ready for torquing and the drill motor lever **109** is then pulled out. In this position the drill motor is automatically regulated to the amount of its output torque by its separately adjusted relief valve **112** and will tighten the bolt to its optimum tensioning ability (approximately 200 foot pounds). When the drill motor has run the bolt up tight and reached the stalled condition, its lever is returned to neutral and the drill head is lowered into its normal tramming position. The right hand drill is now ready for disengagement of the drill steel and subsequent bolt installation. These functions are performed in exactly the same sequence and

manner as previously described for the left hand side.

REPOSITIONING

With both drill heads in their neutral tramming positions, stabilizer and canopy controls **175** and **168** are pulled out until platform means **80** and canopy means **81** are retracted into their normal tramming positions. Releasing these levers to return to their spring centered neutral positions, the operator is free to tram the machine into its next position. Tram levers **120** and **120'** are pushed or pulled in the direction the operator wishes the machine to travel. Reverse shifting of either lever will produce crawl or steering action about the machine's own center in the same direction as the levers are shifted, giving a natural steering reaction to the input lever action.

Various changes in the shape, size and arrangement of parts herein shown and described may be made without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In combination with operator controlled apparatus having a frame and an operator work station, an operator protective device including canopy means having an elongated frame provided adjacent one end thereof with a cover portion extending over and in a spaced apart position with respect to at least a portion of the work station of said apparatus and provided adjacent the other end thereof with support means for attachment of said canopy means to said frame of said apparatus, said support means including pivot means for permitting vertical pivotal movement of said canopy means, and means for selective movement of said canopy means to selectively increase and decrease the relative spaced apart distance of said cover portion of said canopy means above the work station of said apparatus.

2. The combination as specified in claim **1** wherein said apparatus includes platform means having an elongated frame provided adjacent one end thereof with an operator receiving portion upon which an operator may be situated at the work station and provided adjacent the other end thereof with support means for attachment of said platform means to said frame of said apparatus, said cover portion of said canopy means extending over and in a spaced apart position with respect to at least a portion of said operator receiving portion of said platform means, each said support means including pivot means for vertical pivotal movement of both said platform means and said canopy means with respect to said frame and each other and said means for selective movement of said canopy means includes means for movement of both said platform means and said canopy means relative to each other to selectively increase and decrease the relative spaced apart distance between said operator receiving portion of said platform means and said cover portion of said canopy means.

3. The combination as specified in claim **2** wherein said means for selective movement of the part having said pivot means includes means for movement of both said platform means and said canopy means as a unit with respect to said frame of said apparatus while maintaining a fixed relative spaced apart distance between said operator receiving portion of said platform means and said cover portion of said canopy means.

4. The combination as specified in claim **3** wherein said means for movement of said platform means comprises power means operably interconnected to said frame of said apparatus and said platform means for vertical pivotal movement of said canopy means with respect to said platform means of said apparatus.

5. In combination with operator controlled apparatus of the type which is normally operative in relatively confined places having a ground floor and a roof, such as mine passageways and the like, said apparatus including a frame, an operator carrying protective device including platform means upon which an operator may be situated and canopy means extending over at least a portion of said platform means and having at least an overhanging portion thereof spaced apart from said platform means to provide a protective cover over an operator situated on said platform means, support means for mounting of said platform means and said canopy means on said frame of said apparatus, and means for movement of both said platform means and said canopy means relative to said frame of said apparatus and to each other to selectively increase and decrease the relative spaced apart distance between said platform means and said portion of said canopy means which extends thereover and is spaced apart therefrom, said last mentioned means including means for selectively moving said platform means into abutment with a ground floor and said canopy means into abutment with the roof of the confined place being worked.

6. The combination as specified in claim **5** wherein said means for movement of said platform means and said canopy means with respect to each other and with respect to said frame of said apparatus includes means for movement of both said platform means and said canopy means as a unit with respect to said frame of said apparatus for maintaining a fixed relative spaced apart distance between said platform and said portion of said canopy means which extends thereover and is spaced apart therefrom.

7. The combination as specified in claim **5** wherein said means for movement of both said platform means and said canopy means relative to each other includes relief overload means for permitting said canopy means to yield and move away from the roof under conditions of extreme roof overload, and said canopy means includes a deflector portion for deflecting roof falls.

8. The combination as specified in claim **5** wherein said platform means includes an elongated frame provided adjacent one end thereof with an operator receiving portion upon which an operator may be situated and provided adjacent the other end thereof with pivot means, said pivot means comprising said support means for mounting of said platform means on said frame of said apparatus and providing a pivotal interconnection for said platform means to said frame of said apparatus for vertical pivotal movement of said platform means with respect to said canopy means and with respect to said frame of said apparatus, and said canopy means includes an elongated frame provided adjacent one end thereof with a cover portion extending over and in a spaced apart position with respect to at least a portion of said operator receiving portion of said platform means and provided adjacent the other end thereof with pivot means, said pivot means comprising said support means for mounting of said canopy means on said frame of said apparatus and providing a pivotal interconnection for said canopy means to said frame of

said apparatus for vertical pivotal movement of said canopy means with respect to said platform means and with respect to said frame of said apparatus.

9. The combination as specified in claim **8** wherein said means for movement of both said platform means and said canopy means relative to each other and to said frame includes a first means operatively interconnected between said main frame of said apparatus and said platform means for relative movement of said platform means with respect to said frame of said apparatus and means operatively interconnected between said platform means and said canopy means for relative movement of said canopy means with respect to said platform means.

10. The combination as specified in claim **9** wherein said last mentioned means includes relief overload means for permitting said canopy means to yield and move away from the roof under conditions of extreme roof overload and said canopy means includes a deflector portion for deflecting roof falls.

11. In combination with operator controlled apparatus having a frame and an operator work station adjacent an end thereof, an operator protective device including canopy means having an overhanging cantilever portion extending outwardly beyond the end of said frame having the operator work station and support means for mounting said canopy means on said frame of said apparatus with said overhanging cantilever portion extending as a cantilever over at least a portion of the work station of said apparatus in a spaced-apart relation above the work station of said apparatus to provide a protective cover over an operator situated at the work station of said apparatus, and means for selective movement of said canopy means to selectively increase and decrease the relative spaced-apart distance of said overhanging cantilever portion of said canopy means above the work station of said apparatus.

12. The combination as specified in claim **11** wherein said apparatus includes platform means having a cantilever portion extending beyond the end of said frame having the operator work station and being adjacent to the operator work station, and support means for mounting said platform means on said frame of said apparatus with said cantilever portion of said platform means extending as a cantilever adjacent the operator work station and beyond the end of said frame having the operator work station, with said overhanging cantilever portion of said canopy means extending in a spaced-apart relation over at least a portion of said cantilever portion of said platform means to provide a protective cover over an operator situated on said cantilever portion of said platform means, said support means for said canopy means and said platform means including means for selective movement of at least one said platform means and said canopy means with respect to the other to selectively increase and decrease the relative spaced-apart distance between said platform means and said overhanging cantilever portion of said canopy means which extends over said cantilever portion of said platform means and is spaced-apart therefrom.

13. The combination as specified in claim **12** wherein said means for selective movement of at least one said platform means and said canopy means includes means for movement of both said platform means and said canopy means as a unit with respect to said frame of said apparatus while maintaining a fixed relative spaced-apart distance between said cantilever portion of said platform means and said overhanging cantilever portion of said canopy means which extends thereover and is spaced-apart therefrom.

14. The combination as specified in claim **12** wherein said means for selective movement of at least one said platform means and said canopy means includes means for movement of both said platform means and said canopy means as a unit with respect to said frame of said apparatus while maintaining a fixed relative spaced-apart distance between said cantilever portion of said platform means and said overhanging cantilever portion of said canopy means which extends thereover and is spaced-apart therefrom.

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