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Weirich et al.

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[54] **MINE ROOF SUPPORT CHOCKS**

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[52] **U.S. Cl.** ..... **61/45 D**; 61/45 D

[51] **Int. Cl.** **E21d 15/44**

[58] **Field of Search** ..... 61/45 D, 63; 299/31, 33; 91/170 MP; 248/357

[56] **References Cited**

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[57] **ABSTRACT**

A mine roof support chock having a beam interconnecting the coal-face-side props and a hydraulic control device positioned on the beam between these props. The device has a maximum dimension extending horizontally and transversely to the beam and is composed of components assembled along this dimension. A manually operable control lever of a selector mechanism of the device is accessible either from the coal face side of the chock or from the gap between the coal-face-side and goaf side props. The device employs a connection unit disposed remote from the lever which projects outwardly from the beam, either inwardly or outwardly of the chock, to connect with service conduits laid along the mine working. A control unit employing valves is connected between the selector mechanism and the connection unit.

13 Claims, 3 Drawing Figures

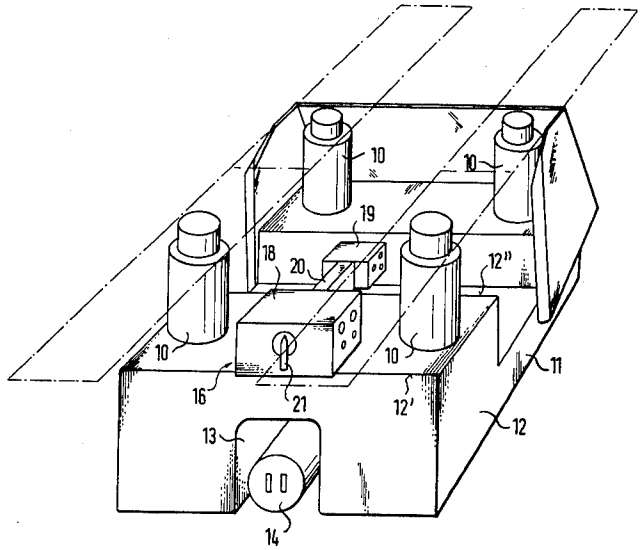


Fig.1

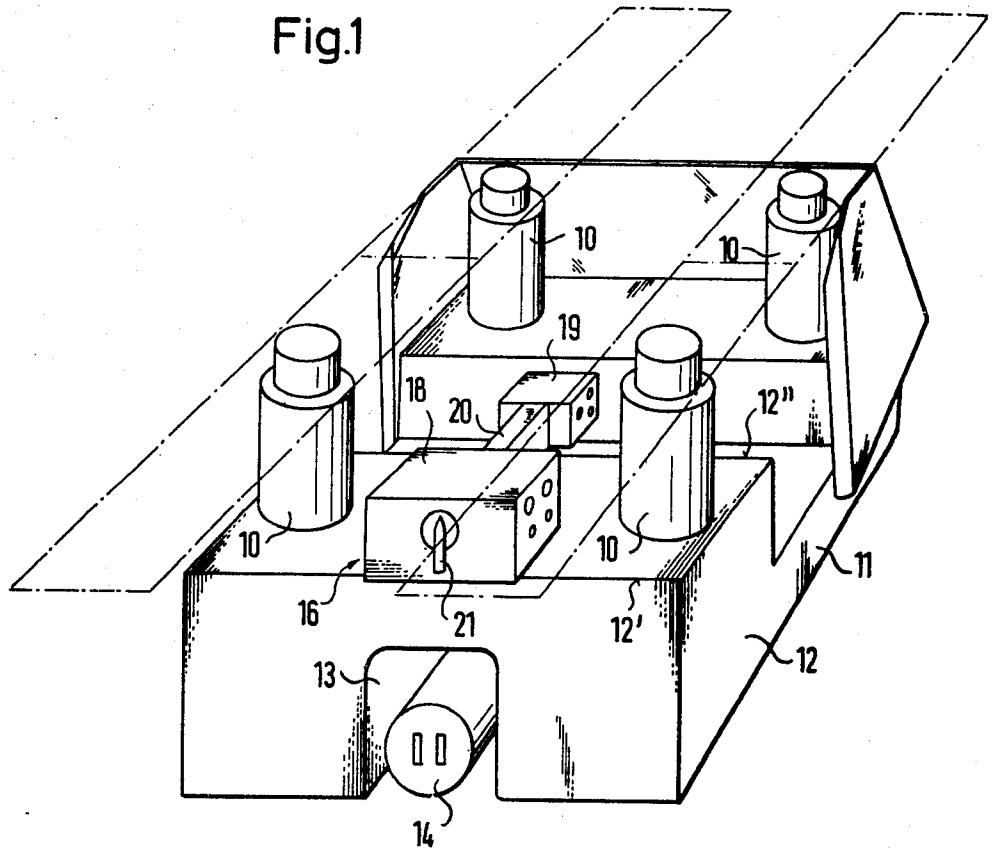


Fig.2

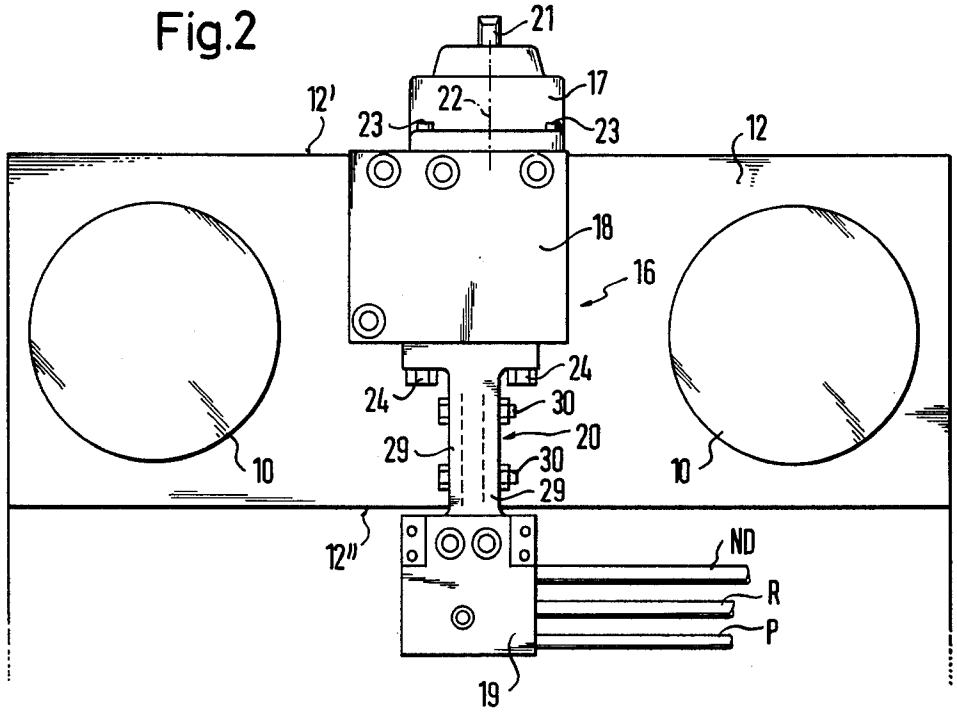
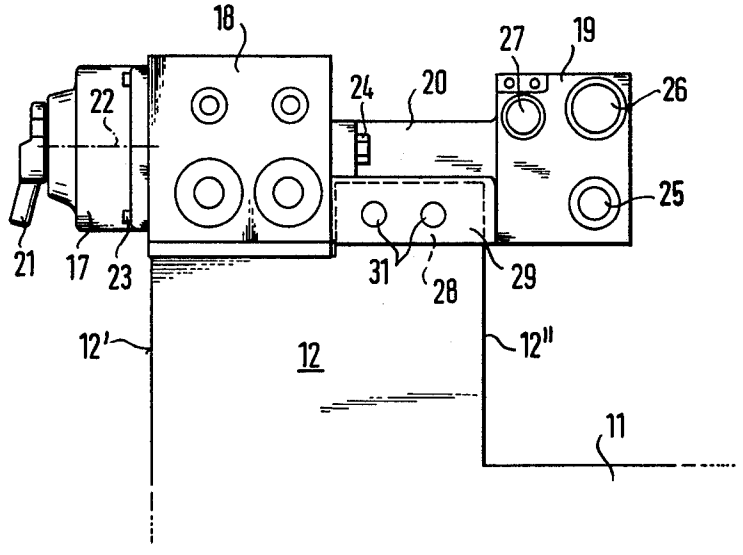

21
17
22
23
23
12'
12
18
16
24
24
30
20
29
30
29
10
10
12''
ND
R
P
19

Fig.3


18
27
19
22
24
20
26
25
21
17
23
31
28
29
12'
12
12''
11

MINE ROOF SUPPORT CHOCKS

BACKGROUND TO THE INVENTION

The present invention relates to mine roof support chocks.

Conventional mine roof support chocks usually employ four hydraulically-operated telescopic props arranged in a generally rectangular configuration with one pair of props facing the mineral, i.e., the coal face and one pair of props facing the goaf or stowage side. These props may be interconnected at the lower ends by floor rails and cross-girders and carry roof-engaging bars at their heads.

A group of chocks would normally be installed in a longwall working with each of the chocks being connected through a shifting ram to a longwall conveyor so that each of the chocks and the conveyor can be alternately moved up towards the coal face. An hydraulic control device can be provided on each chock to initiate the various operative cycles. These devices are usually bulky and heavy especially, where manual and automatic control of the chocks is to be achieved. It is difficult to position the devices so that the so-called "tracks" between the conveyor and the chocks and between the coal-face-side and goaf side props of each chock are unobstructed. Nevertheless, with comparatively thick coal seams the control devices can have a relatively large height to mitigate these problems but with thin seams this solution is not possible.

A general object of this invention is to provide an improved form of chock of the above-mentioned kind.

SUMMARY OF THE INVENTION

According to the invention there is provided a mine roof support chock composed of hydraulically operated props, a transverse beam connecting the props, which are in use, disposed adjacent a mineral face and a hydraulic control device for effecting operation of the chock, said device being disposed on said beam and having a manually operable level movable about an axis extending substantially perpendicularly to said beam and laterally of the chock to select and initiate an operation of the chock, the maximum dimension of the device extending in the direction of the axis and the lever being spaced from and adjacent a wall of the beam facing outwardly or inwardly of the chock.

The control device can have a comparatively small height above the beam and can be positioned between the coal-face-side props even with thin coal seams. The control level is accessible from either of the tracks, i.e., from the coal face side or from the space between the props depending on the selected positional orientation of the device on the beam.

The device is preferably assembled from separate components connected together along the axis of movement of the lever which is normally horizontal. More particularly the device can be assembled from a connection unit adapted for connection to service conduits, a control unit employing valves and connected to said connection unit and a selector mechanism connected to said control unit and employing a rotary slide valve operated by said lever and connected hydraulically at least to said props. The connection unit can be formed with a projection which connects with the control unit of the device so that the connection unit projects outwardly beyond the wall of the beam facing inwardly or outwardly of the chock. This enables the service conduits which are normally laid along the longwall face to connect with the connection units of the control devices of a group of chocks, to follow a substantially rectilinear course.

The control device can be of simple construction easily assembled and dismantled by employing screws to interconnect its component parts.

The control unit and the connection unit are each in the form of a metal block provided with borings for effecting hydraulic connections, the valves of the control unit being disposed in at least some of the bores of the block constituting the control unit.

Provision is preferably made to enable the device to be detachably connected to the beam. For example, the projection of the connection unit may have a rib on its underside which locates in a recess formed between spaced-ribs formed on the upper wall of the beam. Screws or bolts can then be received within holes in these ribs.

The invention may be understood more readily and various other features may become apparent from the following description.

BRIEF DESCRIPTION OF DRAWINGS

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. **1** is a diagrammatic perspective representation of a mine roof support chock made in accordance with the invention;

FIG. **2** is a plan view of the front part of the chock showing the hydraulic control device thereof; and

FIG. **3** is a side view of the control device shown in FIG. **2.**

DESCRIPTION OF PREFERRED EMBODIMENT

As shown in the drawings, the mine roof support chock is composed of four hydraulically operated telescopic props **10** which carry roof bars, shown in chain-dotted outline in FIG. **1.** In known manner the props **10** can be raised and lowered to move the roof bars into contact with or away from the roof of a mine working. At the foot of the props **10** there are floor rails **11** extending parallel to the roof bars. At the front, i.e., the coal face side, of the chock the rails **11** are interconnected by a transverse hollow girder or beam **12** in which the front props **10** stand. On the underside of the beam **12** there is ia recess **13** which accommodates a shifting ram **14.** The ram **14** would usually be coupled between the chock and a longwall conveyor so that the chock and the conveyor can be alternately moved by means of the ram **14.** An hydraulic control device **16** is provided on the beam **12** between the props **10** and serves to initiate and control the various operative cycles of the chock. The construction of the device **16** is shown in detail in FIGS. **2** and **3.**

As shown in FIGS. **2** and **3** the device **16** is essentially composed of three components, i.e., a selector mechanism **17,** a control unit **18** and a connection unit **19** having a projection **20.** The selector mechanism **17** employs a rotary slide valve operable by means of a manually actuated lever **21** which can be swivelled to various operating positions about a horizontal axis **22** along which the components **17, 18, 19** are disposed so that the maximum dimension of the device **16** extends along this axis **22.** The unit **18** is in the form of a solid rectangular metal block which has borings accommodating

valves which serve to interconnect the props **10** and the ram **14** with service conduits. The unit **18** is connected to the mechanism **17** with the aid of screws **23.** Similarly the projection **20** of the unit **19** is connected to the unit **18** with the aid of screws **24.** The underside of the projection **20** is provided with a rib **28** which locates in a recess formed between two corresponding ribs **29** on the top of the beam **12.** Screws or bolts **31** are inserted through holes **31** in the ribs **28, 29** to secure the unit **19** and hence the device **16** to the beam **12.**

The unit **19** with the projection **20** is also in the form of a solid metal structure with borings and has connector joints **25, 26, 27** which connect with the service conduits ND, R and P which are respectively, a high pressure line, return line and low pressure line extending along the longwall working. The unit **19** serves to hydraulically connect the conduits ND, R and P with the unit **18** and thence via further external conduits to the props **10** and the ram **14.** The valve of the selector mechanism **17** actuated by the lever **21** serves to selectively connect the service lines ND, R and P to the further conduits. The device **16** serves thus to manually control the operation of raising and lowering the props **10** and the shifting of the chock and conveyor and would normally be an auxiliary control. In certain cases, for example remote group control, it may be desirable to enable the device **16** to perform an automatic control function. In this event provision is made to connect a further control element to the device **16.** More particularly the underside of the unit **18** is provided with some form of connecting means adapted to locate and connect with the aforesaid control element.

As can be appreciated from the drawings, the control device **16** is disposed on the beam **12** between the props **10** with the lever **21** adjacent the front wall **12'** of the beam **12** as shown or alternatively the device **16** can be positioned so that the lever **21** is adjacent the rear wall **12''** of the beam **12.** Normally a track or gap is present between the longwall conveyor and the chock so that an operator has readily access to the lever **21** but such a track may be present between the coal face props **10** and the goaf side props **10** so that the lever **21** is more accessible from the rear side wall **12''** of the beam **12.** In either of these alternative positions the unit **19** projects beyond the beam **12** on the side remote from the lever **21** and in the illustrated position the unit **19** is located between the coal face props **10** and the goaf side props **10.** This enables the service conduits ND, R and P to follow a substantially rectilinear course.

We claim:

1. A mine roof support chock composed of hydraulically operated props, a transverse beam connecting the props, which are in use disposed adjacent a mineral face, the beam having front and rear opposing walls facing outwardly and inwardly of the chock and an hydraulic control device for effecting operation of the chock; wherein the device is disposed on one of the front and rear walls of the beam and has a manually operable lever movable about an axis extending substantially perpendicular to the beam and laterally of the chock, the device has a maximum dimension extending in the direction of said axis so that a part of the device projects from the wall on which the device is disposed into a space between the front and rear walls, which part is connected to conduits located in said space, and the lever is spaced from and adjacent that one of the front and rear walls of the beam upon which the device is disposed.

2. A chock according to claim **1,** wherein the beam has a recess on its underside which accommodates a shifting ram which is connected between the chock and a longwall conveyor.

3. A chock according to claim **1,** wherein the control device is assembled from separate components.

4. A chock according to claim **3,** wherein said components are constituted by a connection unit adapted for connection to service conduits, a control unit employing valves and connected to said connection unit and a selector mechanism connected to said control unit and employing a rotary slide valve operated by said lever and connected hydraulically at least to said props.

5. A chock according to claim **4,** wherein the connection unit, the control unit and the selector mechanism are connected together along the axis of movement of the lever.

6. A chock according to claim **4,** wherein the connection unit projects outwardly beyond the wall of the beam facing inwardly or outwardly of the chock.

7. A chock according to claim **4,** wherein the connection unit has a projection which is connected to said control unit, the projection having a rib on its underside which locates in a recess formed between spaced-ribs on the beam.

8. A chock according to claim **7,** wherein the ribs have holes which receive fixing means serving to effect connection between the beam and the projection of the connection unit.

9. A chock according to claim **4,** wherein the connection unit, the control unit and the selector mechanism are connected together with the aid of screws.

10. A chock according to claim **4,** wherein the control unit and the connection unit are each in the form of a metal block provided with borings for effecting hydraulic connections, the valves of the control unit being disposed in at least some of the bores of the block constituting the control unit.

11. A chock according to claim **1,** wherein the axis of movement of the lever is substantially horizontal.

12. A mine roof support chock comprising a beam having a front wall and rear wall separated by a space through which service conduits follow a substantially rectilinear course, a set of hydraulically operated props interconnected by the beam, and a hydraulic control device for selectively connecting the service conduits with the props to effect operation of the same, said device comprising a selector mechanism, a control unit and a connection unit and being of elongate form, each of said walls having positions in which the control device is capable of being secured with the connection unit projecting into the said space thereby to facilitate the connection thereto of the service conduits without causing the latter to deviate unduly from their rectilinear course.

13. A mine roof support chock comprising a beam having a front wall and a rear wall separated by a space through which pass service conduits, a set of hydraulically operated props supported by the beam, and a hydraulic control device for selectively connecting the service conduits with the props to effect operation of the same, said device comprising a selector mechanism, a control unit and a connection unit, said selector mechanism being mounted to a front face of said control unit, said connection unit being connected to a rear

face of said control unit by way of a projection maintaining said control and connection units in spaced apart relationship, said projection having a rib and each of said walls having a respective recess in which said rib may be received to locate said rib, and means for securing said rib in position to a selected wall, in which position the said control unit overlies the selected wall, the selector mechanism projects forwardly of the said selected wall, and the connection unit projects rearwardly of the said selected wall into said space for convenient connection with said service conduits.

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