

[54] MINERAL MINING INSTALLATIONS

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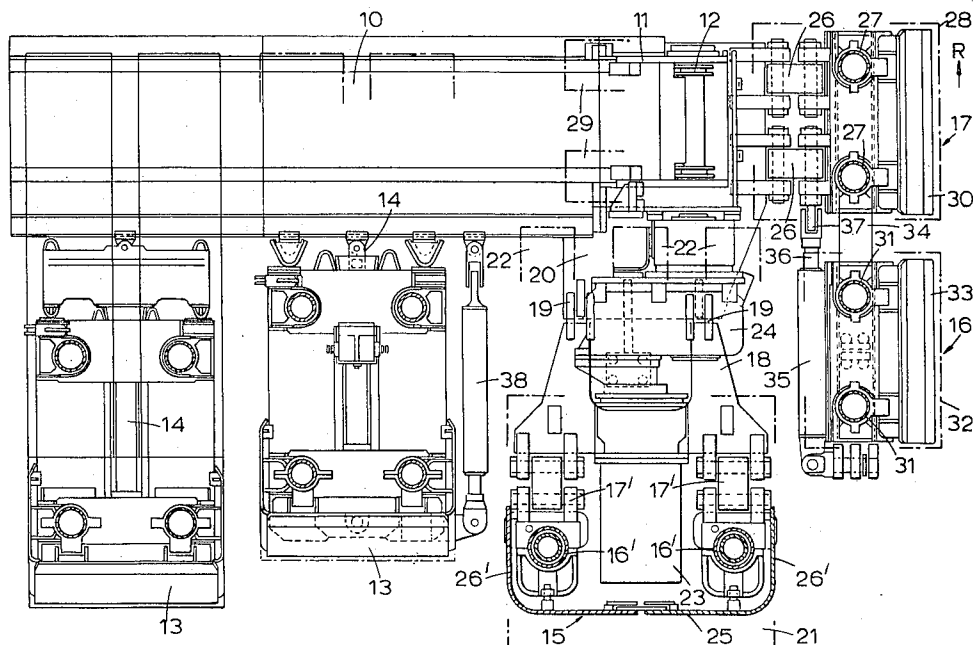
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[57]

ABSTRACT

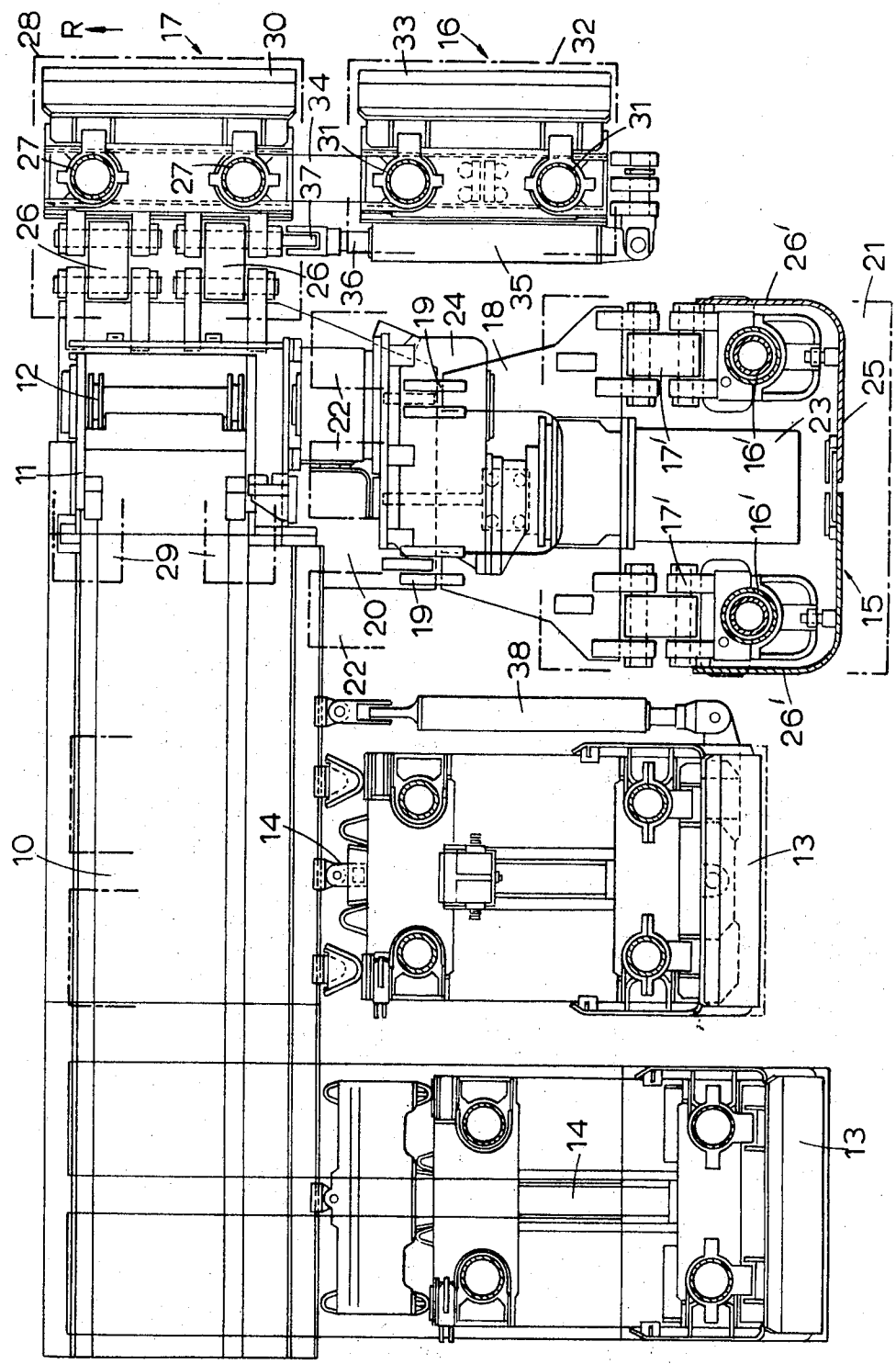
A mineral mining installation composed of a scraper chain conveyor with a drive station, particularly an auxiliary drive station, at one end and a series of movable roof support chocks arranged along the goaf side of the conveyor. Three additional chocks, each having two telescopic props, are disposed around the end and side of the drive station. These chocks have roof caps and cantilevered roof bars which project over the drive station and shields which protect the drive station from the goaf and gallery zones. Two of the three chocks are disposed at the goaf side and gallery end of the station and these chocks are connected to the drive station with joints which permit vertical swinging but restrict horizontal swinging. The other of the three chocks is disposed at the goaf side of the chock at the end of the drive station and these chocks are interconnected by a shifting ram and a guide beam.

16 Claims, 1 Drawing Figure



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MINERAL MINING INSTALLATIONS

BACKGROUND TO THE INVENTION

The present invention relates to a mineral mining installation and is particularly concerned with an anchorage for a drive station, particularly an auxiliary drive station, for a scraper chain conveyor.

Different versions of anchoring and bracing arrangements for drive stations are known in the art. Bracing arrangements are known for example which consist of anchoring units, arranged side by side and connected by means of parallel guiding and shifting appliances. One of these units supports the frame of the drive station and can be advanced together with it, whereas the other unit forms the counter abutment for the first unit and the frame while the shifting operation is carried out. It is furthermore known to place the drive station on a sledge which is movable on an anchor and guide beam in the direction of the mining progress. This beam is then connected to props which serve to brace the beam. It is also known to connect one or more of the roof support chocks arranged on the goaf side of the conveyor to a beam which is rigidly connected to the frame of the drive station in such a manner as to prevent any angular displacement therebetween.

It is a general object of this invention to provide an improved form of anchorage for a drive station in a mineral mining installation. It is a further object of the invention to provide an anchorage which surrounds the frame of the drive station as closely as possible, yet does not take up any room on the mineral face side of the frame. It is another object of the invention to provide an anchorage which effectively protects as great an area of the drive station as possible and which conforms with the normal space available in a longwall mine working.

SUMMARY OF THE INVENTION

According to the invention there is provided a mineral mining installation comprising a scraper-chain conveyor; a drive station for the conveyor located at one end of the conveyor, said drive station having a frame with a rotatable drum and means for driving said drum; a series of movable roof support chocks disposed along the goaf side of the conveyor; a first roof support chock disposed at the goaf side of the frame; means for connecting said first chock to said frame; a second roof support chock disposed at the end of said frame; means for connecting said second chock to said frame; a further chock disposed at the goaf side of the second chock; shifting means connected between the second and further chocks; and guide means connected between the second and further chocks.

Each of the chocks of the anchorage may be provided with two props ensuring the chocks take up as little space as possible. The first and second chocks are movable with the frame and are preferably connected thereto with joints, such as parallelogram-type hinges, permitting vertical displacement while restricting horizontal movement. A connecting plate, of U-shape in plan view may be interposed between the first chock and the frame and the drive means may at least include a motor disposed between the props of the first chock.

The guide means may be a beam extending in a direction laterally of the conveyor, said beam being slidably guided on one of the second and further chocks and

rigidly connected to the other of said second and further chocks. Preferably the chocks are provided with shields or screens directed outwardly towards the goaf and gallery zones.

The chocks may have two props supporting a roof cap. Preferably cantilevered roof bars are connected to the roof cap of the first chock; said bars projecting inwardly towards the conveyors and laterally thereof and to the roof cap of the second chock said bars projecting inwardly towards the conveyor and longitudinally thereof. In this way a large area of the roof is supported over the drive station. Normally, the cap of the further chock need not be provided with connected roof bars.

During use, the further chock acts as a counter abutment for the shifting of the first and second chocks and the frame connected thereto. It may be desirable for the endmost of said series of chocks which is adjacent said first chock to be provided with an additional shifting ram connected between the chock and the conveyor and directed laterally of the conveyor.

BRIEF DESCRIPTION OF DRAWINGS.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawing which is a schematic part-sectional plan view of one end of a mineral mining installation made in accordance with the invention.

DESCRIPTION OF PREFERRED EMBODIMENT

As shown in the drawing, the mineral mining installation has a longwall scraper chain conveyor 10 which has an auxiliary drive station at one end. This drive station includes a machine frame 11 with a base plate 20 and side walls supporting a drum 12 over which the scraper-chain assembly of the conveyor 10 is entrained. A mineral winning machine such as a plough would normally be guided for movement along the conveyor 10 in known manner. The roof along the working is supported by means of movable chocks 13 arranged side-by-side on the goaf side of the conveyor 10 and connected thereto through shifting rams 14. Each chock 13 has four hydraulic telescopic props. The endmost chock 13 nearest the frame 11 is provided with a further shifting ram 38 which is pivotably linked to the chock 13 and to the conveyor.

To anchor the auxiliary drive station, three additional chocks 15, 16, 17 are provided which extend around the station in the manner of an inverted 'L' shape. The chock 15 has two hydraulic telescopic props 16' supported on a baseplate engaging on the floor of the working and disposed side-by-side. The props 16' are connected through double parallelogram hinge joints 17', known per se, to a substantially U-shaped plate 18. The joints 17' enable the plate 18 and the chock 15 to relatively swing in a vertical sense while inhibiting horizontal movement therebetween. The plate 18 is itself hinged through pivot joints 19 to the baseplate 20 of the frame 11. The joints 19 similarly permit vertical displacements and inhibit horizontal movement. Thus, in the horizontal plane, the chock 15 is rigidly connected to the frame 11 but vertically the chock 15 and the frame 11 can be relatively displaced. The two props 16 of the chock 15 carry a common, substantially rectangular, roof cap 21, which is represented by chain dotted lines in the drawing. This common roof cap 21 is connected on its mineral face side to three parallel cantilevered roof bars 22, again represented by chain-dotted

lines, which project substantially up to the frame 11. A drive motor 23 for the station is disposed between the props 16' of the chock 15. This motor 23 drives the drum 12 through a gearing unit 24 located above the connection plate 18. The chock 15 is provided with a goaf screen or shield 25 of U-shaped profile with lateral wall portions 26'. The shield 25 protects the drive station from the goaf zone.

The chock 17 disposed at the end of the conveyor 10 is also provided with two telescopic hydraulic props 27 disposed side-by-side and resting on a floor plate. The chock 17 is also connected to the frame 11 by means of double parallelogram hinge joints 26 in such a way that the chock 17 and the frame 11 are displaceable vertically but are rigid in the horizontal plane. The two props 27 of this chock 17 similarly carry a roof cap 28, of rectangular form indicated in the drawing by chain-dotted lines. Two parallel cantilevered roof bars 29 are attached to the inner end of this roof cap 28 and overlap the frame 11, again as shown in chain-dotted lines. The chock 17 is provided at the rear end with a shield 30 which protects the drive station from the gallery.

The chock 16, located towards the goaf from the chock 17, is also provided with two telescopic hydraulic props 31 which carry a roof cap 32 of substantially rectangular shape denoted by chain-dotted lines. The chock 16 has a shield 33 which also protects the drive station from the gallery. The chock 16 carries a piston and cylinder unit 35, the piston rod 36 of which is pivoted to the chock 17 at a joint 37.

The two chocks 16 and 17 are connected to a guide beam 34 which may be resilient. The beam 34 may be rigidly attached, for example, to the chock 16 and slidably guided on the chock 17 or vice versa.

During operation if the props 16' 27 are retracted and the props 31 remain set then the ram 35 can be pressurized so that its piston rod 36 is extended. The chock 17 and thus also the frame 11, which is rigidly connected to the chock 17 so as to allow no horizontal angular displacement, will then be advanced together in the direction of the arrow R. The chock 15 will additionally be drawn along by the frame 11 and to assist in moving the frame 11 and the associated unit 24 and motor 23 the ram 38 may also be pressurized while the props of the associated chock 13 remain set. The chocks 13, 16 form an abutment for the shifting forces during operation of the rams 35, 38. The chock 17 is guided while being moved by the ram 35 by means of the guide beam 34 and since the frame 11 is rigidly connected to the chock 17 so as to allow no angular horizontal displacement, the frame 11 is similarly also guided by the beam 34.

After the frame 11 and the chocks 15 and 17 have been shifted the props 16', 27 would be re-set and the props 31 retracted. The chock 16 can now be shifted up by pressurizing the ram 35 to cause the piston rod 36 to retract. The chock 16 is guided by the beam 34 while it is shifted in the direction of arrow R.

As can be seen in the drawing, the chocks 15, 16 and 17 which serve to anchor the auxiliary drive station closely surround the station and protect it towards the goaf side as well as towards the gallery side. Practically the entire surface of the roof within the area of the drive station is at the same time supported by the roof components of the chocks. The frame 11 has no attachments on the mineral face side and it is consequently

possible to move the winning machine close to the chain drum 12.

It can furthermore be seen from the drawing that the chock 15 is positioned approximately in a straight line with the face support chocks 13 thus ensuring a continuous roof support within the terminal area of the conveyor 10.

We claim:

1. A mineral mining installation comprising:

- a. a scraper-chain conveyor;
- b. a drive station for the conveyor located at one end of the conveyor, said drive station having a frame with a rotatable drum and means for driving said drum;
- c. a series of movable roof support chocks disposed along the goaf side of the conveyor;
- d. a first roof support chock disposed at the goaf side of the frame;
- e. means for connecting said first chock to said frame;
- f. a second roof support chock disposed at the end of said frame;
- g. means for connecting said second chock to said frame;
- h. a further chock disposed at the goaf side of the second chock;
- i. shifting means connected between the second and further chocks; and
- j. guide means connected between the second and further chocks.

2. An installation according to claim 1, wherein the means for connecting the second chock to the frame is in the form of joints permitting relative vertical movement between the frame and the second chock while restricting relative horizontal movement between the frame and the second chock.

3. An installation according to claim 1, wherein the means for connecting the first chock to the frame is in the form of a connecting plate disposed between the first chock and the frame, and joints linking the plate to the frame and to the first chock, said joints permitting vertical movement between the plate and the frame and the first chock and restricting horizontal movement therebetween.

4. An installation according to claim 3, wherein the means for connecting the second chock to the frame is in the form of joints permitting relative vertical movement between the frame and the second chock while restricting relative horizontal movement between the frame and the second chock.

5. An installation according to claim 4, wherein said connecting plate is substantially U-shaped in plan view.

6. An installation according to claim 4, wherein the first chock has two telescopic props and the driving means is in the form of a motor located between the props of said first chock and a gearing unit located above said connecting plate.

7. An installation according to claim 1, wherein each of the first, second and further chocks is provided with two telescopic props.

8. An installation according to claim 1, wherein the guide means is a beam extending in a direction laterally of the conveyor, said beam being slidably guided on one of the second and further chocks and rigidly connected to the other of said second and further chocks.

9. An installation according to claim 1, wherein the shifting means is a ram connected between the second

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and further chocks and arranged to extend in a direction laterally of the conveyor.

10. An installation according to claim 1, wherein the first chock is provided with a goaf screen which is substantially U-shaped in plan view.

11. An installation according to claim 1, wherein each of the second and further chocks is provided with a shield disposed on the side of the chock remote from the drive station.

12. An installation according to claim 1, wherein each of the first, second and further chocks has a roof cap which is substantially rectangular.

13. An installation according to claim 12, wherein cantilevered roof bars are connected to the roof cap of the first chock; said bars projecting inwardly towards

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the conveyor and laterally thereof.

14. An installation according to claim 12, wherein cantilevered roof bars are connected to the roof cap of the second chock; said bars projecting inwardly towards the conveyor and longitudinally thereof.

15. An installation according to claim 1, wherein each of said series of chocks is connected to the conveyor by means of a shifting ram directed laterally of the conveyor.

16. An installation according to claim 15, wherein the endmost of said series of chocks which is adjacent said first chock is provided with an additional shifting ram connected between the chock and the conveyor and directed laterally of the conveyor.

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