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Heyer et al.

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[54] **MINERAL MINING INSTALLATIONS**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **299/34**

[51] **Int. Cl.** **E21c 27/35**

[58] **Field of Search** ..... 299/32, 34, 43; 61/45 D

[56] **References Cited**

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[57] **ABSTRACT**

A mineral mining installation composed of a conveyor with a guide member for a plough on one side. The position of the guide member in relation to the floor of a mine working is controlled by means of beams connected to the goaf side of the conveyor. In one construction each beam is pivotably connected to the arms of a U-shaped bracket connected to the conveyor and a locking pin is insertable into various alignable bores in the beam and the arms of the bracket in order to secure the beam in various angular positions. In another construction each beam is composed of a channel member rigidly affixed to a leaf spring. The channel member is connected in the manner of a toggle linkage with a plate affixed to the goaf side of the conveyor and a piston and cylinder unit is connected between the channel member and the plate to effect a change in angular position.

15 Claims, 7 Drawing Figures

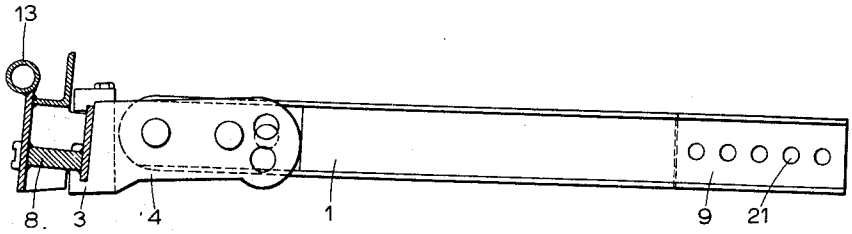


Fig. 1.

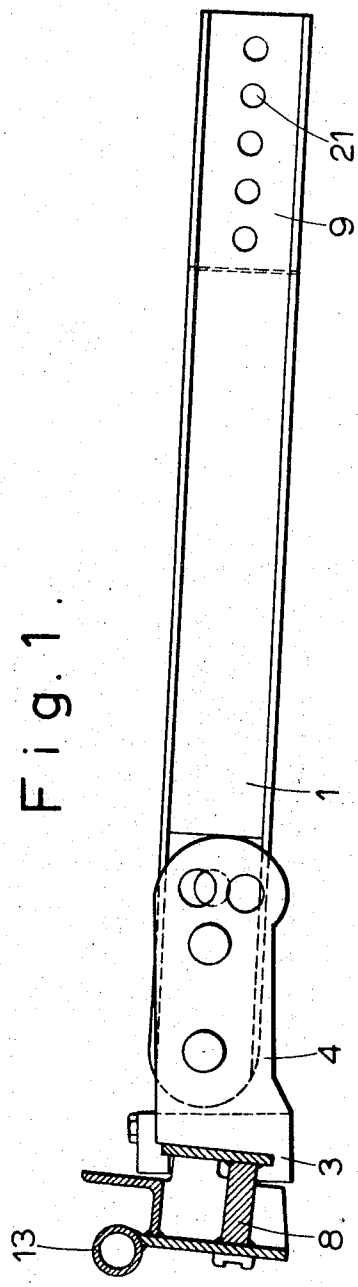


Fig. 2.

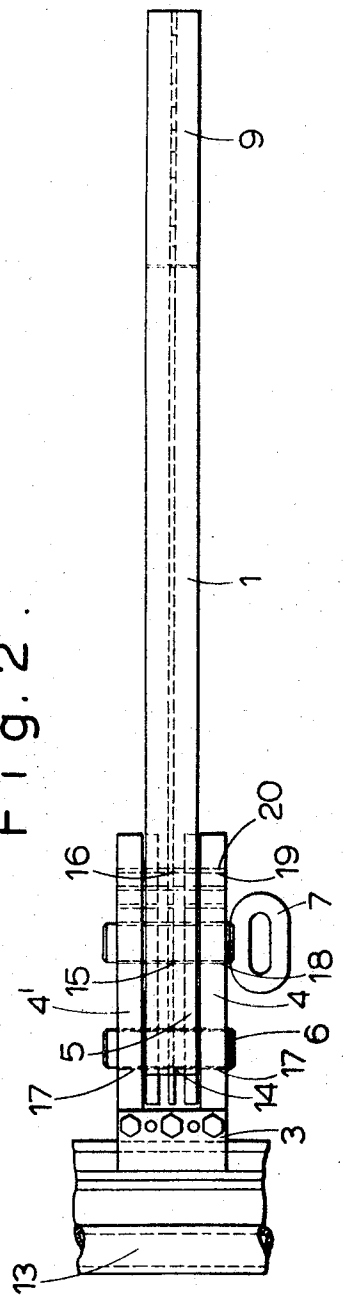


Fig. 3.

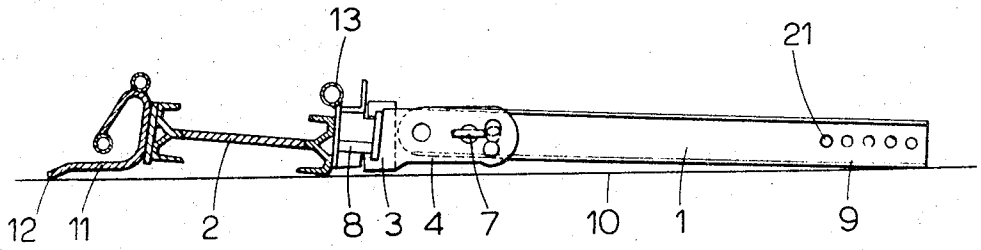
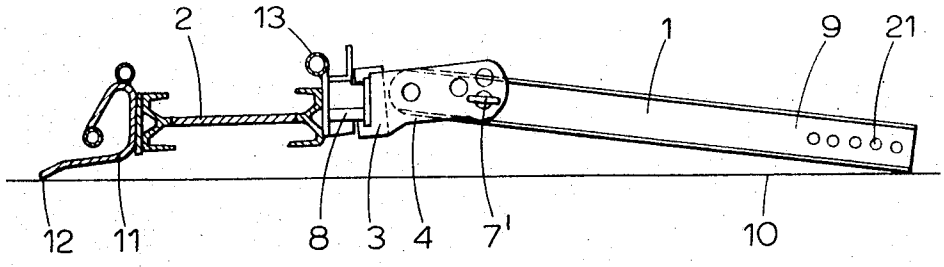


Fig. 4.



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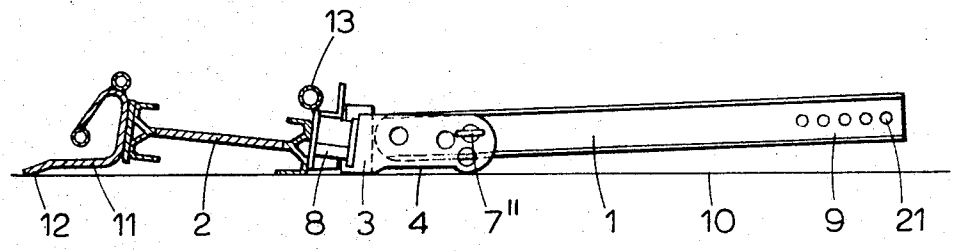

Fig. 6.

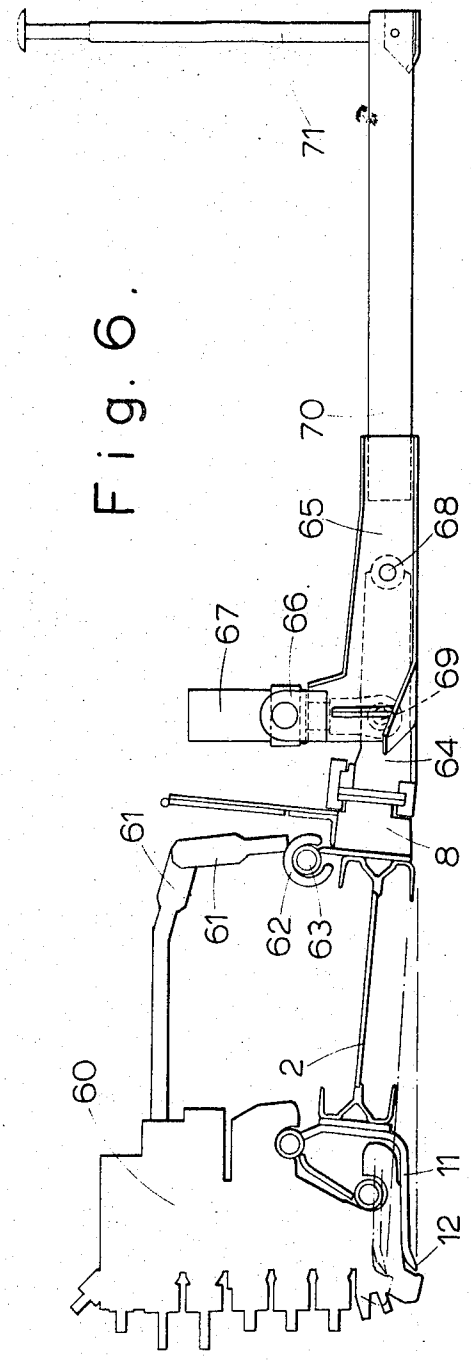
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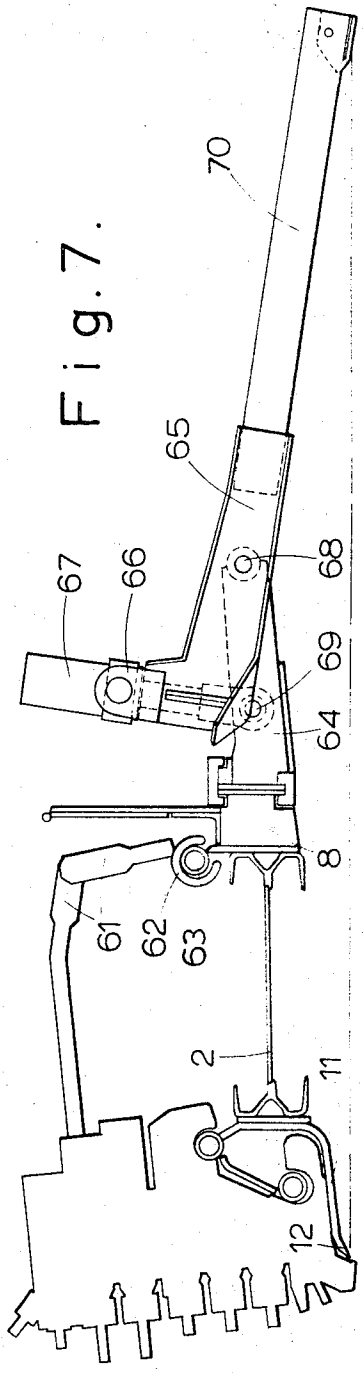
Fig. 7.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MINERAL MINING INSTALLATIONS

BACKGROUND OF THE INVENTION

The present invention relates in general to mineral mining installations and more particularly to an arrangement for controlling the position of a guide member for a cutting machine such as a plough.

Control arrangements known hitherto usually require bulky accessories and are often limited in the type of working in which they can be employed.

A general object of the invention is to provide an improved control arrangement.

A further object of the invention is to provide a control arrangement which is simple and versatile and enables the position of a guide member to be reliably fixed and/or controlled in all mine workings especially in workings employing a single-prop roof support assembly.

SUMMARY OF THE INVENTION

Broadly the invention provides in or for a mineral mining installation having a guide member attached to one side of a conveyor, an arrangement for controlling the position of the guide member; said arrangement comprising an elongate beam, and means for selectively connecting the beam to the conveyor in various angular control positions.

In a preferred embodiment of the invention there is provided a mineral mining installation comprising a conveyor; a guide member attached to the mineral face side of the conveyor; a plurality of beams disposed on the side of the conveyor remote from the guide member; U-shaped brackets connected to the side of the conveyor remote from the guide member the arms of each bracket receiving and end portion of one of the beams therebetween, bores in the end portions of the beam and in the arms of the brackets, a pivot pin inserted into aligned bores in the arms of each bracket and the end portion of the associated beam, to render the beam pivotable in relation to the bracket; and a locking pin insertable into alignable bores in the arms of each bracket and in the end portion of the associated beam to secure the beam in one of several predetermined angular positions.

The aforesaid beams are preferably considerably longer than the width of the conveyor and form cantilevers. Preferably one beam is provided for approximately every third channel section of the conveyor. The cutting machine, the conveyor and the beam can rest on the floor of the working in the manner of a bridge and due to these ample supporting surfaces the wear on the floor is minimized.

Further according to the invention the, or each, beam can be secured in three different positions, namely a central, a lower and an upper position. In the central position, for example, the end of the beam remote from the conveyor, can rest on the floor of the working, thus considerably enlarging the effective base of the conveyor. If the cutting machine or plough tends to "climb" for example, the lower position is adopted, in which case the conveyor is lifted on the goaf or stowage side and the guide member is now inclined downwardly in relation to the floor, so that the plough tends to drop.

Preferably the U-shaped brackets are connected to the conveyor so as to be movable to a limited extent in the longitudinal direction of the conveyor.

The number of different positions in which the beam can be fixed is preferably determined by local conditions with particular regard to the nature of the floor and the length of the beam.

The end of the beam remote from the conveyor can be secured at various distances from the floor to provide a control function. This can be achieved, for example, by placing this remote end of the beam on a support shoe which can slide on the floor. The end of the beam can then be made adjustable in height in relation to the support shoe by means of bolt connections or similar devices. The support shoe itself preferably also supports a drag prop.

In another aspect the invention provides a mineral mining installation having a guide member attached to one side of a conveyor an arrangement for controlling the position of the guide member; said arrangement comprising an elongate beam, means for pivotally connecting the beam to a plate extending from the side of the conveyor remote from said one side and means for effecting relative displacement between said plate and the beam to thereby control the position of the guide member.

Preferably the beam is composed of a channel member receiving the plate and a leaf spring affixed to the end of the channel member remote from said plate.

The means for effecting displacement can be a piston and cylinder unit operably connected between the beam and the plate whereby the beam and the plate can move in the manner of a toggle linkage.

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

BRIEF DESCRIPTION OF DRAWINGS

Embodiments of the invention will now be described, by way of examples only, with reference to the accompanying drawing, wherein:

FIG. 1 is a side view of part of an installation made in accordance with the invention;

FIG. 2 is a plan view of the structure shown in FIG. 1;

FIGS. 3 to 5 are diagrammatic part sectional end views of the installation depicting the beam in various operating positions;

FIG. 6 is a side view of part of a further installation made in accordance with the invention; and

FIG. 7 is a side view of the installation of FIG. 5 but showing the parts in a different operating position.

DESCRIPTION OF PREFERRED EMBODIMENT

A shown in FIGS. 1 to 5, a conveyor 2 has a guide member 11 on its mineral face side. The guide member 11 has a lower end 12 which can normally rest on the floor of the mine working. The guide member 11 serves to guide a mineral cutting machine such as a plough for movement along the conveyor 2 to win mineral from the face. On the goaf or stowage side of the conveyor 2 attachments generally designated 8 are affixed to the conveyor 2. These attachments 8 permit shifting rams to be connected to the conveyor 2. By way of example the attachment 8 shown in FIG. 1 has a pipe socket 13 secured thereto. In addition some of the attachments 8 are each connected to a U-shaped bracket 3 in such manner as to allow the brackets 3 to move to a limited extent longitudinally of the conveyors 2. Preferably

each third conveyor channel section is provided with such a bracket 3. Each bracket 3 has two parallel arms 4, 4' between which is disposed the end portion of a control beam 1. Each beam 1 is 'I' shaped in cross-section and the end portion between the arms 4, 4' of the associated bracket 3 has bores 14, 15 and 16 in the central upright web. The arms 4, 4' of each bracket 3 are also provided with four bores 17, 18, 19 and 20. The bore 14 in each beam 1 is aligned with the bores 17 in the arms 4, 4' of the associated bracket 3 and these bores 14, 17 receive a pin 6 about which the beam 1 can pivot. Each beam 1 is however securable in three selectible operating positions represented in FIGS. 3 to 5. To secure one of the beams 1 in any of these positions a locking pin 7 is provided which can be inserted into the appropriately aligned bores 15, 16, 18, 19. Thus, in the central position depicted in FIG. 3 the pin 7 is located in the bores 15, 18, in the lower position depicted in FIG. 4 the pin, here designated 7', is located in the bores 16, 20 and in the upper position depicted in FIG. 5, the pin, here designated 7'', is located in the bores 16, 19.

By angularly positioning the beam 1 the conveyor 2 and hence the guide member 11 can be made to assume various positions in relation to the floor 10 of the working and hence the working position of the machine guided on the member 11 can be controlled.

At the end remote form the conveyor 2, the beam 1 has a group of bores 21 which are attachable to a device used for setting the height of the end 9 of the beam 1. Such a device may be a shoe slidably contacting the floor 10 and a connectible to the beam 1 at various heights. The support shoe may support a drag prop.

As shown in FIGS. 6 and 7 a further form of installation has a conveyor 2 with a guide member 11 disposed on its mineral face side. The member 11 has a lower end 12 which rests on the floor of the mine working. A plough 60 is guided for movement along the guide member in known manner. The plough 60 is additionally supported by a linkage 61 extending over the conveyor 2 and slidably guided with a shoe 62 on a rail 63 extending along the goaf side of the conveyor 2. In an analogous manner to the construction shown in FIGS. 1 to 4 the rail 63 can accommodate cables or the like and is mounted at the top edges of attachments 8. Some of the attachments 8 are connected to outwardly projecting plates 64 each of which extends within a channel member 65. Each channel member 65 is pivotably connected to the free end of the associated plate 64 by means of a pivot pin 68 and has an upper portion 66 which retains the cylinder or a vertically orientated piston and cylinder unit 67. Each unit 67 has a piston rod which is connected to a pivot pin 69 received by the associated plate 64. The channel members 65 are each rigidly connected to a horizontally disposed leaf spring 70 which in turn is connected to a drag prop 71 (FIG. 6). Each of the channel members 65 and the leaf spring 70 connected thereto constitute a control beam analogous to the member denoted 1 in FIGS. 1 to 5.

By charging the units 67 with hydraulic pressure fluid the associated members 65 and plates 64 may perform a toggle-like movement as represented in FIG. 7 so that the position of the plough 60 can be controlled.

We claim

1. In or for a mineral mining installation having a guide member attached to one side of a conveyor, an arragement for controlling the position of the guide member; said arrangement comprising an elongated beam with an end remote form the conveyor raisable and lowerable to effect such control and means for selectively connecting the beam to the conveyor in various angular control positions.

2. An arrangement according to claim 1, wherein the beam is connected to a bracket disposed on the side of the conveyor remote from the guide member.

3. An arrangement according to claim 2, wherein the bracket is U-shaped and there is provided means for pivotably connecting the beam to the bracket.

4. An arrangement according to claim 2, wherein the bracket is U-shaped, the arms of the bracket and the beam having alignable bores therein and wherein the selective connecting means is a locking pin insertable into various alignable bores in the beam and the arms of the bracket.

5. An arrangement according to claim 2, wherein there is provided means for connecting the bracket to the conveyor so as to permit the bracket to move to a limited extent in the direction of the longitudinal axis of the conveyor.

6. An arrangement according to claim 1, wherein the selective connecting means serves to connect the beam to the conveyor in one of several pre-determined angular positions.

7. An arrangement according to claim 6, wherein there are three said pre-determined angular positions.

8. A mineral mining installation comprising

a. a conveyor:

b. a guide member attached to the mineral face side of the conveyor;

c. a plurality of beams disposed on the side of the conveyor remote from the guide member;

d. U-shaped brackets connected to the side of the conveyor remote from the guide member, the arms of each bracket receiving an end portion of one of the beams therebetween;

e. bores in the end portions of the beam and in the arms of the brackets;

f. a pivot pin inserted into aligned bores in the arms of each bracket and the end portion of the associated beam to render the beam pivotable in relation to the bracket; and

g. a locking pin insertably into alignable bores in the arms of each bracket and in the end portion of the associated beam to secure the beam in one of several pre-determined angular positions.

9. In or for a mineral mining installation having a guide member attached to one side of a conveyor an arrangement for controlling the position of the guide member; said arrangement comprising an elongate beam, a plate extending from the side of the conveyor remote from said one side, means for pivotably connecting the beam to the plate and a generally upstanding piston and cylinder unit for effecting relative displacement between said plate and the beam in the manner of a toggle linkage to thereby control the position of the guide member.

10. An arrangement according to claim 9 wherein the beam is composed of a channel member receiving the plate and a leaf spring affixed to the end of the channel member remote from said plate.

11. In or for a mineral mining installation having a guide member attached to one side of a conveyor, an arrangement for controlling the position of the guide member; said arrangement comprising an elongate

beam, a U-shaped bracket disposed on the side of the conveyor remote from the guide member, a pivot pin connecting the beam to the bracket, alignable bores in the arms of the bracket and the beam and a locking pin insertable into aligned bores of the beam and the arms of the bracket to thereby connect the beam to the conveyor in one of several angular control positions.

12. A mineral mining installation comprising:

a. a conveyor;

b. a guide member attached to the mineral face side of the conveyor;

c. at least one plate at the side of the conveyor remote from the guide member;

d. an elongate beam disposed at the side of the conveyor remote from the guide member;

e. means for pivotably connecting the beam to the plate; and

f. a generally upstanding piston and cylinder unit operably connected between the plate and the beam to thereby effect relative displacement between said plate and said beam in the manner of a toggle linkage to control the position of the guide member.

13. An installation according to claim **12,** wherein the beam is in the form of a channel member receiving the plate and a leaf spring affixed to the end of the channel member remote from the plate.

14. An installation according to claim **13,** wherein said leaf spring is connected to a drag prop.

15. An installation according to claim **12,** wherein a plough is guided for movement along the guide member, there being further provided a linkage connected to the plough and extending over the conveyor and a slidable guide locating the linkage on a rail at the side of the conveyor remote form the guide member.

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