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G. T. FELBECK ET AL
CONTINUOUS MINING MACHINE HAVING ROOF FALL
RECEIVING CONVEYING MEANS

2,978,235

Filed May 15, 1958

2 Sheets-Sheet 1

Fig. 1.

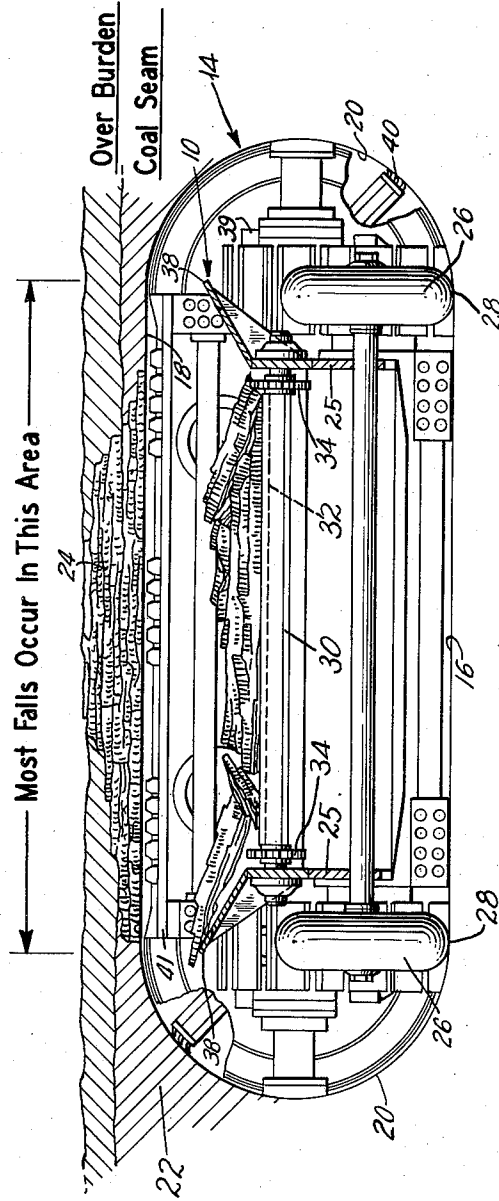
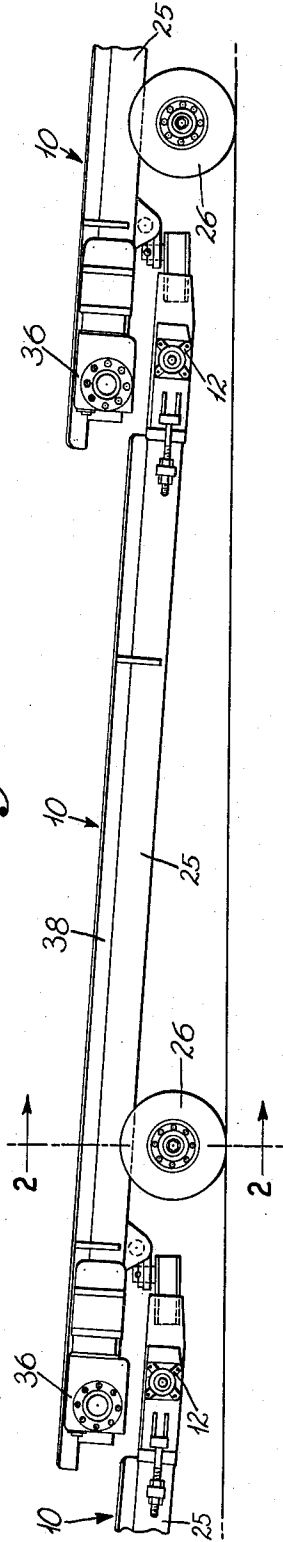


Fig. 2.

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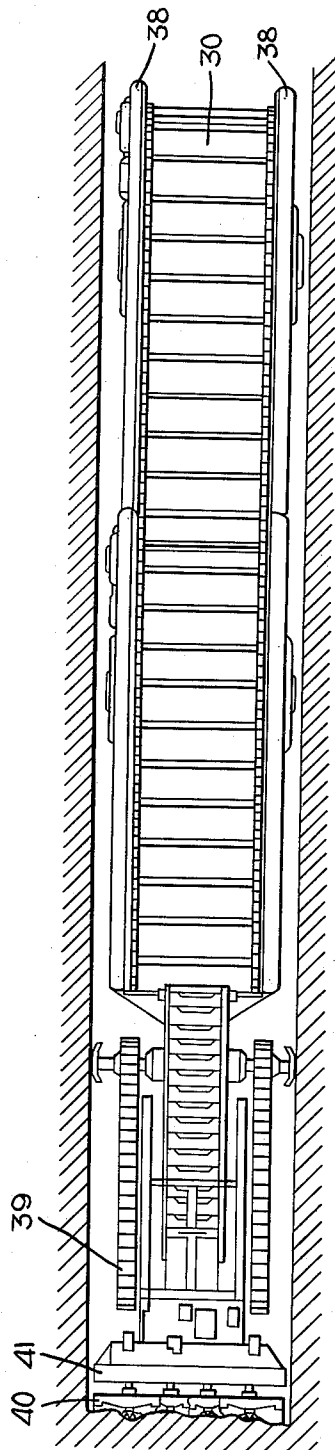


Fig. 3.

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CONTINUOUS MINING MACHINE HAVING ROOF FALL RECEIVING CONVEYING MEANS

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1 Claim. (Cl. 262-7)

This invention relates to mining selected earth strata material continuously, and more particularly to solving the problem of handling objectionable roof falls during the operation.

The development of a successful system for mining by remote control having eliminated the need for men in the immediate area being mined, and thus greatly reducing the hazards inherent in mining by conventional methods, it became desirable to minimize the number of times it was necessary for men to enter the bore being created by the mining machine. Particularly in the case of a bore hole having a horizontal ceiling of unsupported strata, minor falls of material from the roof of the bore frequently occur, and, while such falls do no physical damage to the mining equipment, it was sometimes necessary in the past with prior equipment for men to enter the bore to clean up such fallen material, to insure withdrawal of the mining equipment from the bore.

A cross section of the bore closely approximates two widely spaced semi-circles at opposite sides, with their diameters vertical, connected by horizontal lines above and below such bore. Roof falls invariably occur only in the area represented by the upper horizontal line, and the slabs rarely exceed six inches in thickness, inasmuch as the ceiling obviously is not supported at all from below in this kind of mining.

It is one object of this invention to provide novel conveyor means for receiving such roof falls, and removing the fallen material from the mine during operation of the conveyor, thereby avoiding the hazard of sending men into the bore for such purpose.

Another object is to provide greater continuity of operation, and to eliminate the expense of providing safe working conditions for men when cleaning up falls of roof material.

Specifically, this invention provides in combination with a mining machine having cutting means for boring in selected earth strata a transversely oblong hole that is subject to undesirable roof falls, conveying means in tandem relation with such mining machine for conveying material mined by the machine rearwardly thereof through such hole. Such conveying means includes a train of overlapping, substantially horizontal conveyors the effective roof fall receiving area of each of which is at least as wide as the greater part of the transverse extent of said cutting means. As a result such undesirable roof falls throughout the entire length of the hole are caught by said train of overlapping conveyors and removed from said hole together with the so-mined material.

In the drawing:

Fig. 1 is a fragmentary view in side elevation of a conveyor system illustrating the invention;

Fig. 2 is a fragmentary view in transverse cross section

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of a conveyor taken on line 2-2 of Fig. 1, the forward part of the machine being shown in elevation; and

Fig. 3 is plan view of the mining machine and part of the conveyor train in a bore hole with the adjacent ground shown in section.

As shown in the drawing, there is provided a novel train of relatively wide conveyors 10 that are connected by couplings 12 to follow a remotely controlled mining machine 39 of the type disclosed in the application of Alspaugh, Heimaster and McNeill, Serial No. 353,932, filed May 11, 1953, now Patent No. 2,826,402. Such machine is provided with a head 40 comprising front cutting means 41 that bore a transversely oblong hole 14 having a substantially horizontal floor 16 and roof 18, and semi-circular side walls 20, 20 in the selected earth strata material, such as a coal seam 22. Most roof falls occur in the unsupported ceiling area 24 extending between the tops of the semi-circular side walls.

To catch such falls each conveyor consists of a horizontal frame 25 mounted on rubber-tired wheels 26 which roll on the floor 16 in the area of bottoms 28 of semi-circular walls 20. A conveyor bed in the form of a horizontal steel plate 30 is mounted in the frame, providing a path for spaced transverse flights 32 which are connected to chains 34, 34 that are driven by a motor 36. Upwardly and outwardly flaring steel wings 38, 38 are mounted on the sides of the frame for catching and directing material including roof falls downwardly and inwardly toward the conveyor bed. The wings 38 extend into the areas under the top of the semi-circular walls 20 above the wheels 26. Thus, the effective width of the conveyor matches the width of the bore hole 14 that is cut by the mining machine, so that all roof falls are caught thereby during the mining operation.

Past and current experience demonstrates that roof falls are the most serious single cause of down-time: coal and rock which fall from the ceiling, missing a narrow conveyor of conventional width, clog the bore hole and prevent the retreat of the boring machine from the hole. It was often necessary to send men into the bore hole to remove such fallen material before the machine could be backed out of the hole. Such problems are solved by the present invention.

What is claimed is:

In combination with a mining machine having cutting means for boring in selected earth strata a transversely oblong hole that is subject to undesirable roof falls, conveying means in tandem relation with said mining machine for conveying material mined by said machine rearwardly thereof through such hole, said conveying means including a train of overlapping, substantially horizontal conveyors the effective roof fall receiving area of each of which is at least as wide as the greater part of the transverse extent of said cutting means, whereby such undesirable roof falls throughout the entire length of such hole are caught by said train of overlapping conveyors and removed from said hole together with the so-mined material.

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