Oct. 25, 1932. W. H. WINEMAN 1,884,946

DISLODGING DEVICE

Filed Nov. 20, 1929

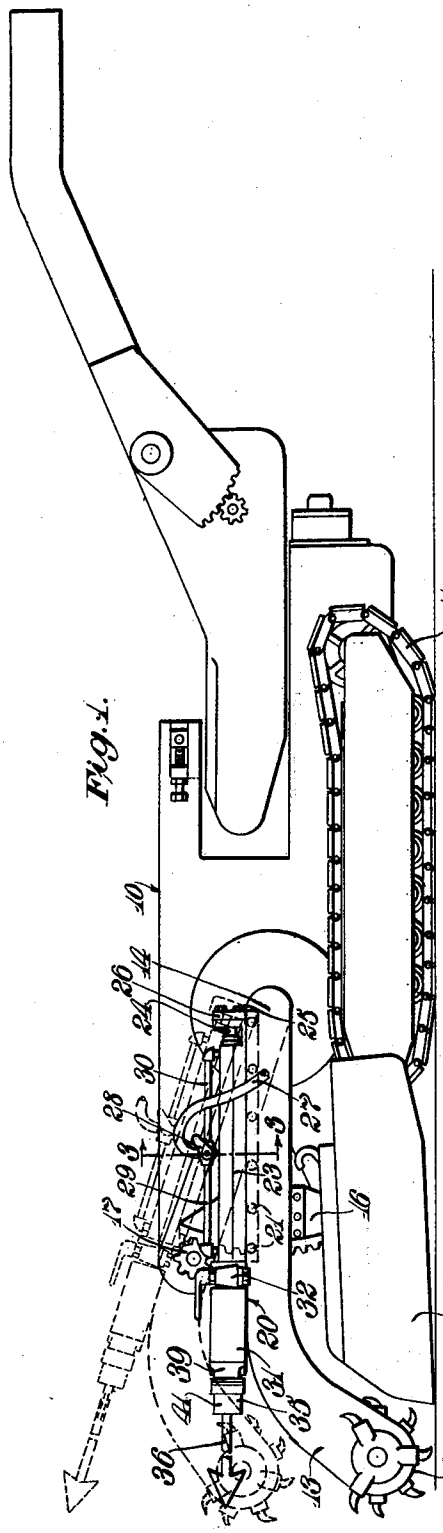


Fig. 1.

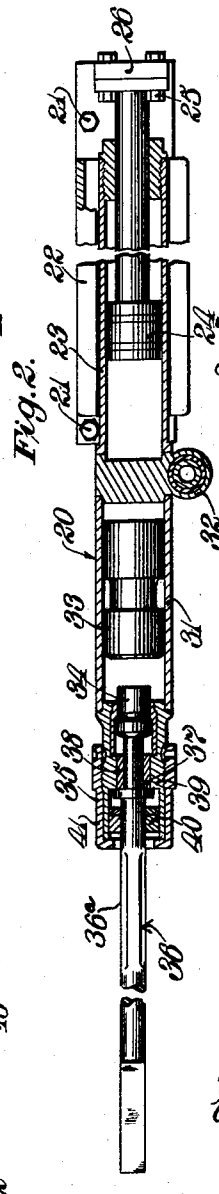


Fig. 2.

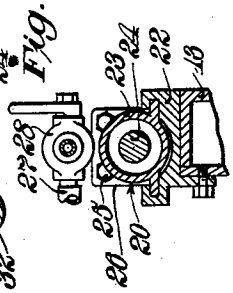


Fig. 3.

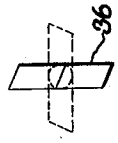


Fig. 5.



Fig. 4.

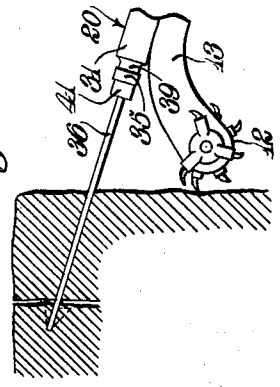


Fig. 6.

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Patented Oct. 25, 1932 1,884,946

UNITED STATES PATENT OFFICE

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DISLODGING DEVICE

Application filed November 20, 1929. Serial No. 408,617.

My invention relates to the mining of coal, and more particularly to the preparation of the coal after the same has been dislodged but not completely broken down by the use of explosives, this preparation making it possible to load the coal into a mine car by means of a loading machine.

One object of my invention is to provide an improved mechanism and method for dislodging coal which has been shattered by explosives but is still standing wedged between the floor and the roof of the mine. A further object of my invention is to provide improved means for penetrating a standing mass of coal by a tool and then retracting the tool so as to bring down the mass of coal in such loose condition that it may be loaded into mine cars by a loading machine. Further and more specific objects will appear during the course of the ensuing description.

In the accompanying drawing there is shown for purposes of illustration one form which the invention may assume in practice.

In the drawing, —

Fig. 1 is a view in side elevation of a loading machine with one illustrative embodiment of my invention applied thereto.

Fig. 2 is a view principally in central horizontal section of a mechanism which may be mounted on a loading machine and employed for penetrating standing coal.

Fig. 3 is a transverse section on line 3—3 of Fig. 1.

Fig. 4 is a view in side elevation of the head of the penetrating tool.

Fig. 5 is a view in end elevation taken from the left side of Fig. 4 and showing in dotted lines the position to which the tool is turned before the same is withdrawn from the coal.

Fig. 6 shows a diagrammatic view, partly in elevation and partly in section through the coal face, of the mechanism of my invention in the position the same assumes when it has been driven into the standing coal and is ready to be retracted.

It is well known that the adoption of mechanical devices for loading coal into mine cars has been attended by several difficult problems, one of which is due to the fact that according to the best mining practice the coal is, in many instances, merely loosened by explosives and not completely shot down. It is highly desirable to obtain lump coal with as small a proportion of "slack" or "fines" as possible; and therefore the minimum amount of explosives is used. When the coal is to be mined with picks it is not very difficult to break the same down from its standing position after shooting. A loading machine, however, is better adapted to load coal from a loose heap on the floor of the mine than from the standing position. At times the additional labor involved in preparing the standing coal by means of picks so as to bring it down into a loose heap onto the mine floor so that it may be loaded, has been the deciding factor against the use of a loading machine. In any event, this step of preparing the coal slows down the process of loading out the coal; and the mechanism disclosed herein is designed to take the place of the hand labor formerly necessary in preparing the standing coal for loading.

My improved mechanism may be mounted on various types of loading machines, or in fact on any machine which may be brought up to the mine face so as to direct the tool into the proper position so that it may penetrate the standing coal. As disclosed in Fig. 1, the same is applied to a loading machine 10 which is mounted on track-laying tread mechanisms 11 of the customary tractor type. The gathering device 12 is mounted upon a pair of side arms 13 which may be swung about a pivot 14 by means of a rack 16 and a pinion 17 to raise or lower the gathering device 12. There is provided also a shovel 15 which may be forced into the coal, the latter being conveyed away by the conveying mechanism of the loading machine.

A mechanism for preparing the coal, and generally indicated by the numeral 20, is mounted by screws 21 on one of the arms 13. It is obvious that a mechanism 20 may be mounted on each arm 13. A bed plate 22 is provided with a slideway along which a cylinder member 23 may reciprocate. The member 23 is formed with a bore within which is disposed a piston 24 whose rear end is fastened by bolts 25 to a lug or standard

26 carried by the bed plate. Actuating fluid is supplied by a pipe 27 (see Fig. 1) to the bore of the member 23. A valve 28 controls the supply of fluid alternatively to one or the other of the branches 29 or 30, the branch 29 communicating with the front end of the bore and the branch 30 communicating with the rear end of the bore. It is obvious that by means of the valve 28 the cylindrical member 23 may be forced away from the lug 26 or retracted towards the same.

A percussive motor 31 is carried by the front end of the cylinder member 23; and actuating fluid is supplied thereto under the control of a valve 32. The motor 31 comprises a floating hammer piston 33, a striking block 34, and a control valve. The control valve is not shown, as this may be of a conventional type adapted to supply the actuating fluid alternately to the front and back of the hammer piston 33. A tool 36 is carried with the end of its shank received within a front head 35; and comprises an elongated shank with an enlargement or collar 37 formed integrally therewith adjacent its inner end. A bushing 38 surrounds the shank to the rear of the collar 37, this bushing being carried in the chuck now to be described. The chuck comprises a chuck member 39 having a bore for receiving the bushing 38, and an enlarged bore in its forward portion which is adapted to receive split rings 40. When the chuck housing 41 is screwed into place, the split rings 40 are held within the forward bore of the member 39 and the enlargement 37 is securely retained within the front head 35, while the rear end of the tool shank projects into a position to be engaged by the striking block 34. The penetrating point of the tool 36 is fashioned somewhat like an arrow head, but it will be noted from Fig. 5 that the edges are both beveled in addition to the arrow-like angularity from front to back. The purpose of these beveled edges of the head is to facilitate turning of the same after it has penetrated the standing coal. The rear portion of the head resists withdrawal of the head from the coal, once the head has penetrated the same, and acts similarly to the barbs on a hook or an arrow.

The operation of my improved device will now be described. The loading machine 10 is maneuvered so as to bring the same in front of the standing coal and the arms 13 are elevated to bring the mechanism 20 to the proper elevation. Thereupon the tool 36 is operated after the manner of a drifter type of drill so as to force the tool into the standing coal (see Fig. 6). When the tool has penetrated to a suitable depth a Stillson wrench or similar tool is used in cooperation with the roughened portion 36[a] to rotate the tool through 90° (see Fig. 5). Thereupon the drive of the tread mechanisms 11 is reversed so as to retract the tool 36. It is to be noted that the front head construction 35 retains the tool within the drilling mechanism 31 and the whole is withdrawn. The arrow-like head, as it is withdrawn, brings with it the coal which has been shattered by the explosives.

It is obvious that by my improved mechanism the standing coal is loosened; and that this preparation of the coal greatly facilitates the loading of the same by a loading machine.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. The method of preparing coal for loading which comprises loosening the coal from the face, causing a vibrating penetrating tool by purely axial thrust to penetrate the standing coal, thereafter locking the tool in the coal when so penetrated, and moving the tool when so locked backward to dislodge the coal.

2. The method of preparing coal for loading which comprises loosening the coal from the face, causing a piercing tool to be thrust by a purely axial movement into the coal to penetrate the standing coal so loosened, thereafter locking the tool by a rotary motion with the coal when so penetrated, and moving the tool when so locked backward to dislodge the coal.

3. The method of preparing a standing wall of shot coal for loading which includes penetrating the coal by a purely axial thrust of a vibrating piercing implement, thereafter actuating the implement to effect interlocking thereof with the inner portion of the wall to be dislodged, and retracting the implement when so interlocked to pull down the wall.

4. A method of preparing coal for loading comprising penetrating the standing coal with an implement by a hammering action while the implement remains in operative contact with the coal, thereafter causing interlocking engagement of the implement with the inner wall of the coal to be dislodged, and retracting said implement when so interlocked to dislodge the coal.

5. A method of dislodging standing coal comprising piercing the coal by a vibrating penetrating element while the latter remains in operative contact with the coal, interlocking the penetrating element in the coal to be dislodged when so penetrated, and withdrawing the penetrating element when so interlocked to dislodge the standing coal.

6. An apparatus for dislodging standing coal comprising a barbed penetrating tool, means for imparting axial thrust to said penetrating tool to pierce the coal, said tool

being rotatable when in its inner position in the coal to cause the barb thereon to interlock back of the block of coal to be dislodged, and means for withdrawing the tool axially when so interlocked with the coal to dislodge the coal.

7. An apparatus for dislodging standing coal comprising a barbed penetrating tool, means for imparting axial thrust to the tool to pierce the coal to be dislodged, means for imparting a vibrating action to the tool during said axial thrust thereof, the barbs on said tool being adapted to interlock back of the wall of coal to be dislodged, and means for withdrawing the tool axially when so interlocked with the coal to dislodge the coal.

8. In combination, a portable base, and material dislodging means carried by said base and movable therewith and including a material penerating tool and supporting means for said tool on said base, said tool being held against withdrawal from its supporting means upon movement thereof with said base or upon movement of the supporting means relative to said base, means for feeding said tool to effect penetrating of the material to be dislodged, said tool being rotatable relative to its supporting means into a position to resist withdrawal from the material penetrated, and said tool being movable bodily with said base to effect retraction of the tool when in withdrawal resisting position in the material to dislodge the material.

9. In combination, a movable support, tool supporting means thereon movable relative thereto, a percussively actuated penetrating tool carried by said tool supporting means and held against removal from said supporting means upon movement thereof with said movable support or upon movement of the tool supporting means relative to said support, feeding means for said tool operative independently of said movable support, said penetrating tool having a head rotatable into a position to resist the withdrawal of said tool from the material being worked upon, and means for retracting said tool to dislodge the material.

In testimony whereof I affix my signature.

WADE H. WINEMAN.