June 21, 1927.

F. W. VODOZ

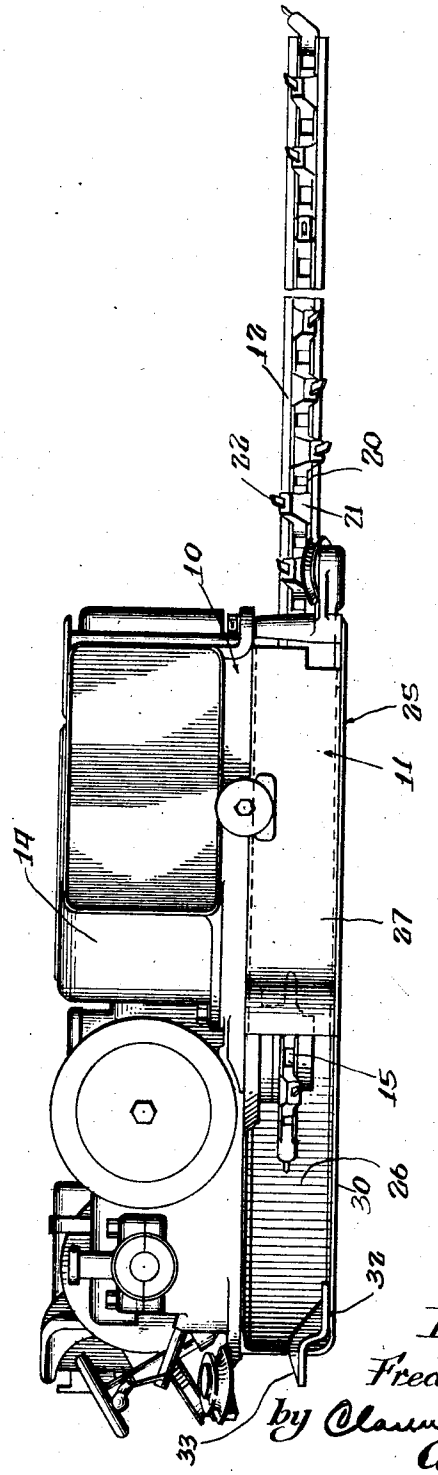
1,632,810

MINING MACHINE

Filed Dec. 24, 1924

2 Sheets-Sheet 1

Fig. 1



Witness
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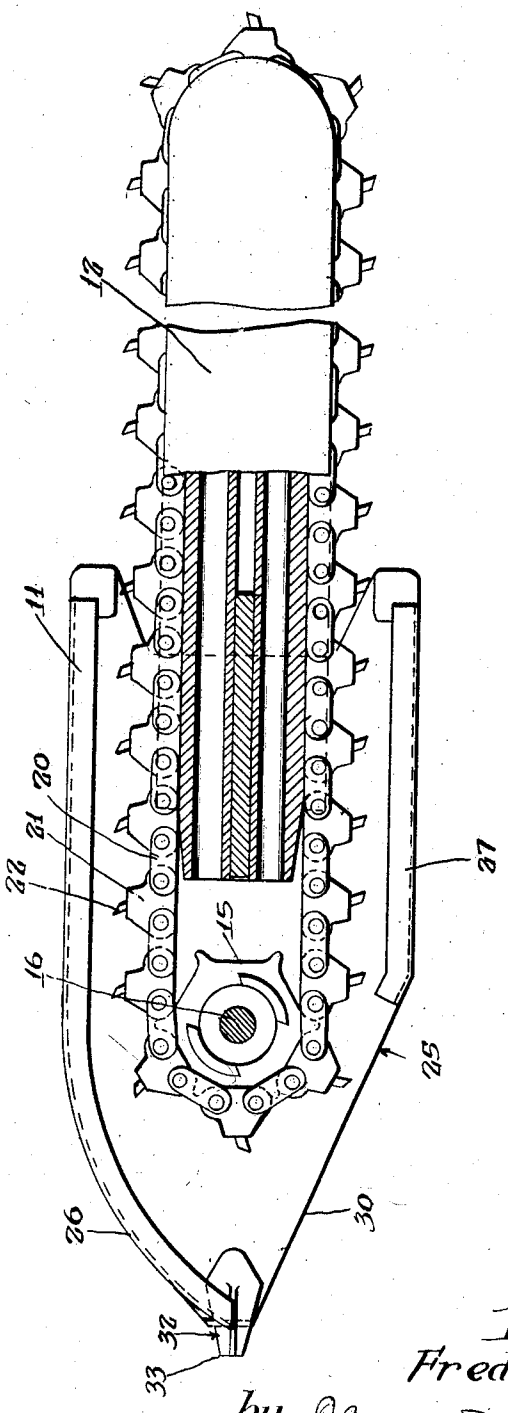


Fig. 2

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UNITED STATES PATENT OFFICE.

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MINING MACHINE.

Application filed December 24, 1924. Serial No. 757,897.

This invention relates to improvements in mining machines and more particularly to mining machines of the Shortwall or continuous cutter type.

Machines of the class specified usually comprise an elongated frame carrying power devices thereon, and a cutter bar extending rigidly from one end of the frame with its axis extending longitudinally of the axis of the main frame. The entire machine is usually propelled bodily along the mine floor by suitable devices such as draft ropes arranged to control the angular position of the machine relative to the working face.

One of the most extensively used forms of machines of this class is of the cutter chain type, in which the chain is of the endless type extending around the cutter bar and thence around a chain driving sprocket adjacent the rear end of the machine. The rear end and the front end of the machine frame on opposite sides of the cutter chain are open so as to form a passageway for the cuttings which are brought rearwardly by the cutter chain during its cutting operation, the greater amount of the cuttings being discharged through the opening at the rear end of the machine. In certain forms of machines of this class, openings are also provided at the retreating side of the machine frame so as to facilitate discharge of cuttings which might not escape at the rear end of the machine. It has been demonstrated that the proper removal and discharge of cuttings is of considerable importance in the most efficient operation of mining machines of this class, since the kerf which is practically cleared of the cuttings offers the least resistance when the coal is subsequently shot down, or dislodged. Heretofore, in the operation of machines of this class, a considerable portion of the cuttings are not properly ejected at the rear end of the machine but are carried back again by the cutter chain at the receding or following side of the machine so as to be finally left in the kerf.

The principal object of the present invention is to provide a new and improved mining machine of the class above described in which the cuttings passageway at the rear end of the machine is shaped so as to most readily discharge the maximum amount of cuttings in a rearwardly direction, causing the least interference with the operation of the machine.

Details of my invention may be best understood from the following drawings, in which:

Figure 1 is a side view of a typical kerf cutting machine constructed in accordance with my invention; and

Figure 2 is a horizontal sectional view taken on line 2—2 of Figure 1.

In the embodiment of my invention illustrated herewith, the kerf cutting machine comprises a main frame 10 resting on an underframe 11 and having a cutter bar 12 projecting forwardly from the underframe. The mining machine may be of any suitable form, details of which need not be herein described excepting to point out a chain driving sprocket 15 mounted on a shaft 16 depending from the main frame 10 at a point adjacent the rear end thereof. The chain driving sprocket 15 has the usual driving connection with the motor carried on the main frame 10, as for instance in the motor casing 14. The chain driving sprocket is substantially in horizontal alignment with the cutter arm so as to form a driving connection for the cutter chain comprising chain straps 20 and cutter blocks 21 with cutter bits 22 thereon. In the form shown the cutter chain is arranged to move in a counterclockwise direction as seen in Figure 2.

The underframe 11 comprises a bottom plate or shoe 25 which is adapted to rest directly upon and slide along the mine floor during the cutting operation, and side walls 26 and 27 forming a supporting connection between the lateral margins of the bottom plate 25 and the main frame 10 above the cutter arm 12. The side walls 26 and 27 are disposed outwardly of respective stretches of the cutter chain on opposite sides of the cutter arm so as to provide passageways on either side, and especially on the side on which the cuttings are brought rearwardly by the chain.

Referring now more particularly to the underframe construction which constitutes the subject matter of my invention, it will be seen in Figure 2 that I form the side wall 26 so as to curve inwardly and rearwardly from a point substantially opposite the drive sprocket 15 to a point substantially on the

longitudinal axis of the machine or intermediate the vertical planes of the stretches of the cutter chain. The rear end of the opposite wall 27 terminates at a point substantially forward of the axis of the cutter chain sprocket, thus forming with the rear terminus of the wall 26 a diagonally disposed passageway opening facing outwardly of the following side and rearwardly of the machine. The margin 30 of the bottom plate 25 extends from the rear terminus of the wall 27 at an angle rearwardly to a point substantially at the termination of the opposite wall 26 on the longitudinal axis of the machine.

This construction affords a convenient location for a bracket 32 extending rearwardly from the underframe at the extreme end thereof, this bracket being secured to the side wall 27 with a projecting part 33 in position to be readily engaged by a jack or the like to assist in the manipulation of the machine, as is sometimes desirable in handling machines of this type.

The operation of the machine is perhaps already understood from the above decription. When the machine is working in the coal the cutter chain is driven in a counterclockwise direction. As viewed in Figure 2 the cuttings are brought rearwardly from the kerf into the passageway formed between the cutter frame and the side wall 26. Some of the cuttings are of course deposited upon the base plate and tend to fill this passageway but the continued movement of the cutter chain is sufficient to keep this passageway fairly clear and propel the major portion of the cuttings rearwardly until they reach the driving sprocket about which the chain is driven to change its course of movement. At this point the cuttings have a tendency to be thrown outwardly and tangentially of the cutter chain, thereby clearing themselves from the chain as it passes around the driving sprocket. As will be seen in Figure 2 the wall 27 curves rearwardly to form a deflector directing the cuttings toward the following side of the machine, while the opening along the margin 30 of the bottom plate 25 and extending between the side plates 26 and 27 is sufficient to permit substantially all of the cuttings to escape from the machine on the following side and rearwardly of the axis of the cutter chain sprocket.

Although my invention is adapted for use with cutter chains of the ordinary construction it is particularly desirable in cases where the cutter chain is provided with special devices for clearing the cuttings from the kerf and propelling them rearwardly. With such propelling devices movable at the relatively high speed of the chain, the cuttings are sometimes thrown rearwardly with considerable force and in such instances the side wall 27 confines the discharge of the cuttings to a predetermined area opening toward the rear and following side of the machine. In all cases, however, the opening is positioned to discharge the cuttings at a point removed from the working face and distribute them over a relatively wide area rather than in a narrow path such as heretofore formed when the discharge was made from an opening with its lower margin formed at substantially right angles to the path of movement of the machine as it progressed along the working face.

While I have shown and described one embodiment of my invention, it will be understood that the construction and arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting myself to this particular construction, excepting as specifically limited in the appended claims.

I claim as my invention:

1. In a mining machine having a frame, a cutter arm projecting forwardly from the front end of said frame, a cutter chain driving sprocket adjacent the rear end of the frame, a cutter chain passing about said arm and sprocket, and cuttings passage forming frame members connected with said frame and disposed outwardly of respective stretches of said chain and extending therealong, the frame member on the advancing side of the machine extending rearwardly farther than that on the following side and extending at the rear of said sprocket partially about the same to and terminating at a point between the vertical planes of said stretches of the chain.

2. A mining machine having a frame, a cutter arm projecting forwardly from the front end of said frame, a cutter chain driving sprocket adjacent the rear end of the frame, a cutter chain passing about said arm and sprocket, and cuttings passage forming frame members connected with said frame and disposed outwardly of respective stretches of said chain and extending rearwardly from the front end of the frame, the frame member on the advancing side of the machine extending rearwardly of the sprocket and partially about the same to and terminating at the rear end of the machine at a point intermediate the vertical planes of said stretches of the chain, and the frame member on the following side of the machine terminating rearwardly adjacent said sprocket, the rear termini of said frame members forming a diagonally disposed passageway opening facing outwardly of the following side and rearwardly of the machine.

3. In a mining machine having a frame, a cutter arm projecting forwardly from the

front end of said frame, a cutter chain driving sprocket adjacent the rear end of the frame, a cutter chain passing about said arm and sprocket, cuttings passage forming frame members connected with said frame members connected with said frame and disposed outwardly of respective stretches of said chain and extending therealong, the frame member on the advancing side of the machine extending rearwardly farther than that on the following side and extending at the rear of said sprocket partially about the same to and terminating at the rear of the machine intermediate the vertical planes of said stretches of the chain, and a bracket arranged for use with a jack, carried at the rear end of the machine at the rear terminus of said longer frame member.

4. In a mining machine having a frame, a cutter arm projecting forwardly from the front end of said frame, a cutter chain driving sprocket adjacent the rear end of the frame, a cutter chain passing about said arm and sprocket, cuttings passage forming frame members connected with said frame and disposed outwardly of respective stretches of said chain and extending therealong rearwardly from the front end of the machine, the frame member on the advancing side of the machine extending rearwardly of the sprocket and partially about the same to and terminating at the rear end of the machine at a point intermediate the vertical planes of said stretches of the chain, the frame member on the following side of the machine terminating rearwardly adjacent the sprocket, the rear termini of said frame members forming a diagonally disposed passageway opening facing outwardly of the following side and rearwardly of the machine, and operating means including a motor on said frame and disposed above the plane of the cuttings passage formed by said frame members.

Signed at Chicago, in the county of Cook and State of Illinois, this 20th day of December, A. D. 1924.

FREDERICK W. VODOZ.