Feb. 18, 1936. M. S. MOORE 2,031,544

LOADING DEVICE FOR MINING MACHINES

Filed April 4, 1934

Fig. 1.

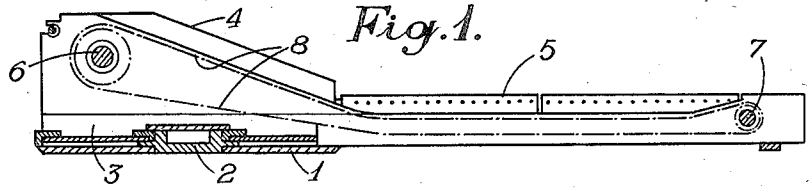


Fig. 2.

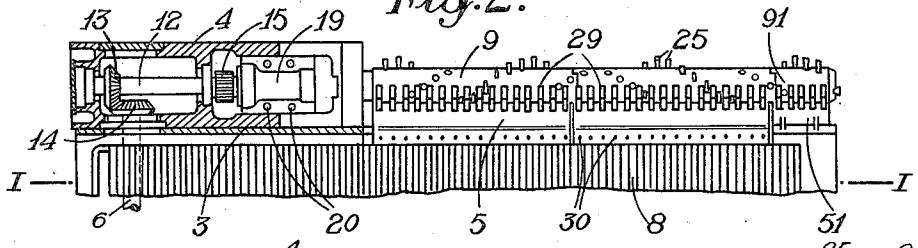


Fig. 2a

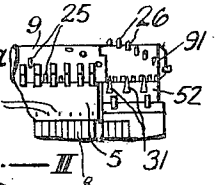


Fig. 3.

Fig. 4.

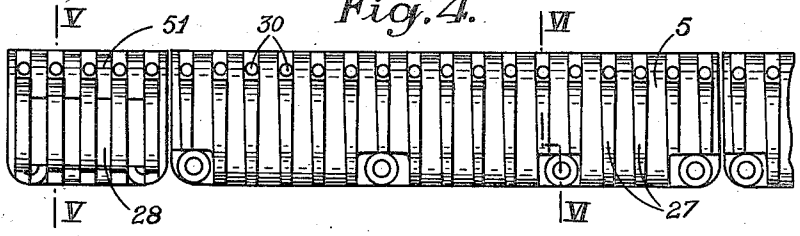


Fig. 5.

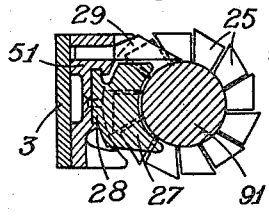


Fig. 7.

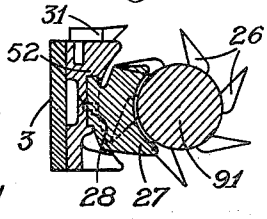
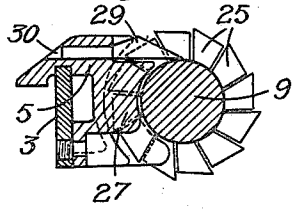


Fig. 6.



M. S. Moore
INVENTOR

By: Marks & Clerk
Attys.

Patented Feb. 18, 1936

2,031,544

UNITED STATES PATENT OFFICE

2,031,544

LOADING DEVICE FOR MINING MACHINES

Matthew Smith Moore, Malvern, England, assignor of one-half to The Mining Engineering Company Limited, Worcester, England, a British company

Application April 4, 1934, Serial No. 718,982
In Great Britain April 7, 1933

11 Claims. (Cl. 198—9)

This invention relates to loading devices for mining machines of the type comprising a rotary loader bar co-operating with a comb or like guiding member over which the broken coal or mineral is tossed onto a conveyor or other suitable device whereby it is removed.

It is an object of my invention to support the loader bar more firmly and to prevent any deflection thereof due to the stresses it has to withstand. Another object is to form the comb so that the space between bar and comb is as fully occupied as possible and undesirable accumulation of coal and clogging in said space are precluded.

A further object is to fit the bar so that it will not jam in the coal, more particularly at the back of the undercut where such jamming is often liable to occur. Other objects still are to provide a loading device which will be compact, simple in construction and more efficient in operation than existing devices of that kind, and to provide a structure which will be particularly strong and adapted to operate under most difficult conditions of use.

In accordance with my invention the side of the comb adjacent the bar is provided with ribs which project towards the bar between the loader picks and encircle it for a substantial portion of its circumference both above and below the axis of the bar. The bar and comb each may have removable end portions, the bar preferably having an end portion adapted to be fitted with cutter picks in order to clear the way through the undercut when the nature of the coal is such that jamming may occur.

The picks in the end portion of the bar are preferably more closely set than in the other portion or portions of the bar. The ribs of the comb may be integral therewith or they may be formed on a casting secured to the comb or removably fitted in keyways therein. The ribs of the outermost portion are preferably formed on a separate removable unit of bronze or other non ferrous metal, and are adapted to act as a lateral abutment, to oppose any deflection of the loader bar. When a bar is employed, having cutter picks on its end portion, the co-operating portion of the comb may be provided at the top with horizontally wedge-shaped picks or projections adapted to engage grooves made in the coal by the bar picks and break away the sides of such grooves.

The driven end of the bar extends into a gear box provided alongside the rising portion of the conveyor. The top of said box is preferably made sloping to coincide with the slope of the conveyor, in order not to impede pieces of coal overlapping the sides of the conveyor as they are carried up the slope. In the top portion of the box is the conveyor shaft from which the bar extending under it is driven through an idler on an intermediate shaft which is accommodated under the slope, in a housing adapted to rest on a facing provided immediately over the bar bearing.

Referring to the accompanying drawing which illustrates by way of example a loader device embodying my present invention,

Fig. 1 is a sectional elevation of the device on line I—I of Fig. 2.

Fig. 2 is a plan view of the same, partly in section on line II—II of Fig. 3.

Fig. 2*a* is a fragmental plan view showing the end of the comb and bar provided with cutter picks.

Fig. 3 is a sectional elevation on a larger scale of the gear box.

Fig. 4 shows the comb in elevation.

Figs. 5 and 6 are cross sectional views of the bar and comb, the section lines through the latter being shown at V—V and VI—VI respectively, in Fig. 4.

Fig. 7 is a view similar to Fig. 5, showing the end portions of the comb and bar fitted with cutter picks.

In the drawing, 1 denotes the base plate of a loading machine. On said plate is pivoted at 2 the loader frame 3 which forms with the gear box 4 and comb 5 a rigid structure and supports the driving shaft 6 and return shaft 7 for the endless conveyor 8. As shown the top of box 4 has a slope which substantially coincides with that of the rising part of the conveyor, so that it does not hinder the progress of coal along the edge of the conveyor.

Shaft 6 may be driven from the motor on the machine in any suitable way. It also conveys motion to the loader bar 9 which is journalled in bearings 10, 11 in the gear box 4. To this end I provide in the box 4 a shaft 12 above and parallel to the loader bar, said shaft carrying a bevel wheel 13 in mesh with a bevel wheel 14 on shaft 6. Through pinions 15, 16, 17 the motion of shaft 12 is transmitted to bar 9, pinion 16 being on an idle shaft 18 supported in a housing 19 which rests on the top of bearing 11 and is secured thereto by bolts 20 with this construction I am able to use pinions of small size and to accommodate shaft 18 under the slope, a removable cover 21 being provided to give access thereto.

Pinion 17 is slidable on a splined portion 22 of bar 9 and it may be thrown into or out of

engagement with pinion 16 by means of a fork 23 controlled by a spindle 24 operated from outside the box.

The bar 9 may be made of two or more sections which may be spigotally connected with each other. In Fig. 2 three such sections are shown, the outer section 91 being very short and easily removable. Loader picks 25 are secured at intervals on the bar, in staggered relation, such picks preferably being so shaped that the rear of a pick (Figs. 5 and 6) in one row is substantially flush with or overlaps the front of the adjacent pick in the next row. When the nature of the coal is such that jamming may occur at the back of the undercut, the end portion 91 of the bar may be fitted with cutter picks 26 (Fig. 2a), said picks then preferably being more closely spaced than the loader picks on the other portions of the bar.

The comb 5 illustrated herein is also made of three sections, the end section 51 corresponding in length with the end section 91 of the bar and being also easily removable. On the comb are ribs 27 which project laterally towards the bar between the loader picks, almost touching the bar and encircling it for say about one-third of its circumference, thus completely filling the gap between the bar and the comb and preventing accumulation therein of small particles of coal. The ribs preferably taper downwardly. They may be integral with the comb as shown in Fig. 6, or they may be formed on a casting 28 secured to the comb, this being the preferred construction for the end portion of the comb (Fig. 5) where the casting is suitably made of bronze and serves as a side abutment for the end of the bar.

Above the ribs encircling the bar are provided comb picks or teeth 29 tapered in a vertical plane, preferably fitted removably in horizontal holes 30 near the top face of the comb and extending tangentially towards the bar.

When the end portion of the bar is fitted with cutter picks, the end portion 51 of the comb may be replaced by another similar portion 52 which is adapted to accommodate horizontally wedge-shaped picks 31 which are adapted to cooperate with the cutter picks 26 (Figs. 2a and 7). These picks 31 are secured on the top of the comb portion 52 and arranged in alternate setting, in direct alignment with every second bar pick so that, as the machine makes its way through the coal, they are forced into the grooves made in the coal by said bar picks and break away the ribs between such grooves.

The comb is conveniently so arranged that it forms one side of the flat portion of the endless conveyor, alongside the bar. It is preferably removable and reversible so that it may be fitted to either side of the conveyor, i. e. for loading to the right or to the left.

It will be understood that changes may be made in the constructional details of the arrangement described and illustrated without departing from the scope of my invention as defined in the appended claims.

I claim:

1. In a loading device for mining machine, a frame, a gear box on said frame, an overhung bar journalled adjacent one of its ends in said gear box, picks on said bar, means for rotating said bar, a comb on said frame, the side of said comb adjacent said bar being provided with ribs projecting towards the bar between said picks, said ribs encircling said bar for a substantial portion of its circumferencce both above and below the axis of said bar, said ribs terminating above pavement level.

2. In a loading device for mining machine, a rotary overhung loader bar, picks on said bar, a comb extending alongside said bar, the side of said comb adjacent said bar being provided with downwardly tapering ribs projecting towards the bar between said picks, said ribs encircling said bar for a substantial portion of its circumference both above and below the axis of said bar, but leaving a clear space under them.

3. In a loading device for mining machine, a rotary loader bar, said bar having a removable end portion adapted to receive cutter picks, picks on said bar, a comb extending alongside said bar, said comb also having a removable end portion, ribs on said comb projecting towards said bar between the picks on said bar, said ribs encircling said bar for a substantial portion of its circumference both above and below the axis of said bar.

4. In a loading device for mining machine, an overhanging rotary loader bar, loader picks on the greater part of said bar, cutter picks on the end portion of said bar, a comb extending alongside of said bar, ribs on said comb projecting towards said bar between said picks, the ribs on the end portion of said comb encircling said bar for a substantial portion of its circumference both above and below the axis of said bar and forming a lateral abutment for the end portion of said bar.

5. In a loading device for mining machine, an overhanging rotary loader bar having a removable end portion, cutter picks on said end portion, loader picks on the remaining portion of said bar, a comb extending alongside of said bar, said comb also having a removable end portion, ribs on said comb projecting towards said bar between said picks, said ribs partly encircling said bar and extending both above and below the axis thereof, the ribs on the end portion of said comb being made of anti-friction metal.

6. In a loading device for mining machine, a rotary overhung loader bar, loader picks set on said bar in staggered relation, said picks being so shaped that the rear of a pick in one row is substantially flush with the front of the adjacent pick in the next row, a comb extending alongside said bar, ribs on said comb projecting towards said bar between said picks, said ribs partly encircling said bar over a substantial portion of its circumference both above and below the axis thereof.

7. In a loading device for mining machine, a rotary overhung loader bar, loader picks on said bar, a comb extending alongside of said bar, horizontal picks on said comb, said comb picks having tapering ends extending tangentially to said bar, ribs on said comb projecting towards said bar between said bar picks, said ribs encircling said bar over a substantial portion of its circumference both above and below the axis of said bar.

8. In a loading device for mining machine, a rotary loader bar having cutter picks on its end portion, loader picks on the remaining part of said bar, a comb extending alongside of said bar, ribs on said comb projecting towards said bar between said bar picks and encircling said bar over a substantial portion of its circumference, and means on the top of the end portion of said comb adapted to co-operate with the cutter picks on the end portion of said bar.

9. In a loading device for mining machine, a rotary loader bar having a main portion and a

removable end portion, loader picks on said main portion, cutter picks on said end portion, a comb extending alongside of said bar, said comb also having a main portion and a removable end portion, picks on the main portion of said comb adapted to co-operate with the loader picks on said bar, and wedge-shaped picks on the top of the end portion of said comb adapted to co-operate with the cutter picks on said bar, said wedge-shaped picks being in alignment with every second cutter pick on the bar.

10. In a loading device for mining machine, a frame, a gear box on said frame, a loader bar journalled at the bottom of said box, a comb on said frame extending alongside said bar, an endless conveyor supported in said frame, said conveyor having a horizontal portion adjacent said comb and a rising portion adjacent said box, said box having a sloping top substantially in line with the rising portion of said conveyor, a shaft for driving said conveyor, said shaft extending in the top portion of said box, and means in said box for driving said bar from said shaft.

11. In a loading device for mining machine, a frame, a gear box on said frame, a loader bar, a bearing for said bar at the bottom of said box, a comb on said frame extending alongside said bar, ribs on said comb partly encircling said bar, an endless conveyor supported in said frame, said conveyor having a horizontal portion adjacent said comb and a rising portion adjacent said box, said box having a sloping top, a driving shaft for said conveyor, said shaft extending into the top portion of said box, gears in said box for operatively connecting said shaft and said bar, an intermediate shaft for one of said gears, a housing for said intermediate shaft accommodated under the sloping top of said box, said housing resting on said bar bearing.

MATTHEW SMITH MOORE.