

May 24, 1949.

E. RAMSAY

2,471,042

COAL HANDLING SYSTEM

Filed Oct. 30, 1944

2 Sheets-Sheet 1

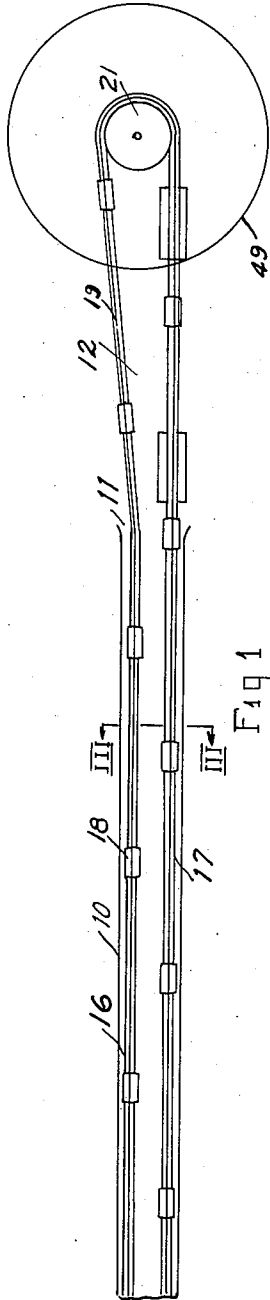


FIG 1

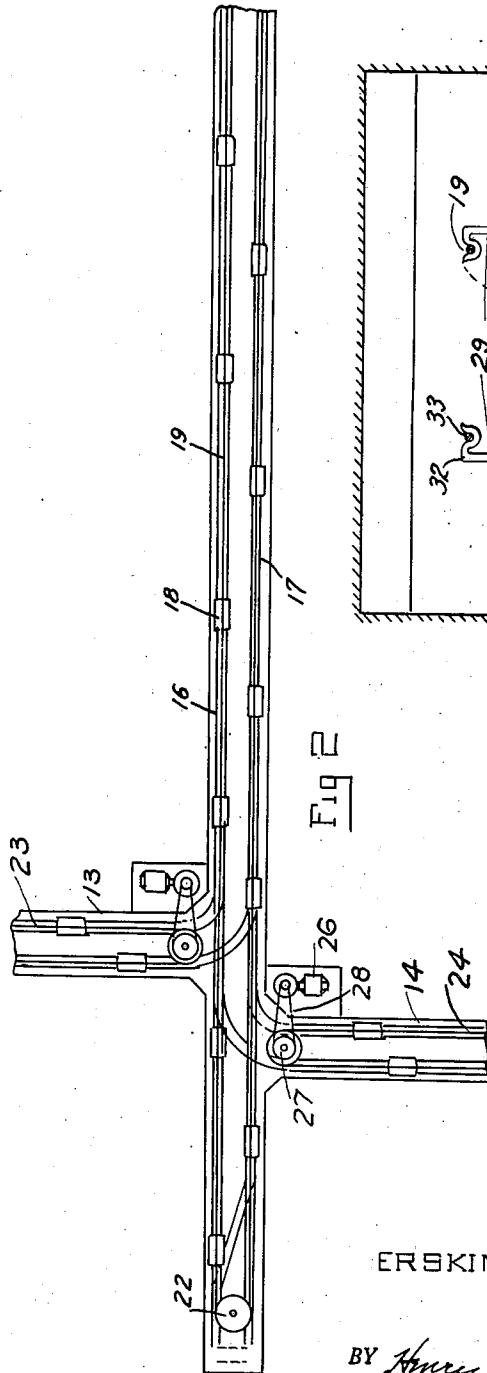


FIG 2

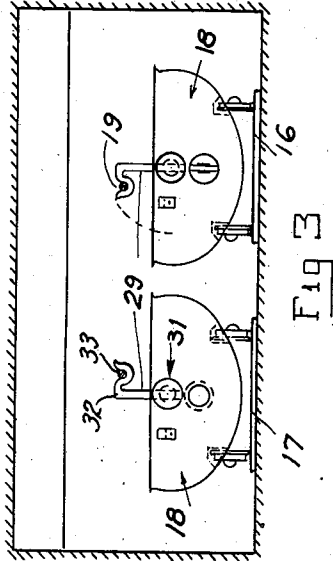


FIG 3

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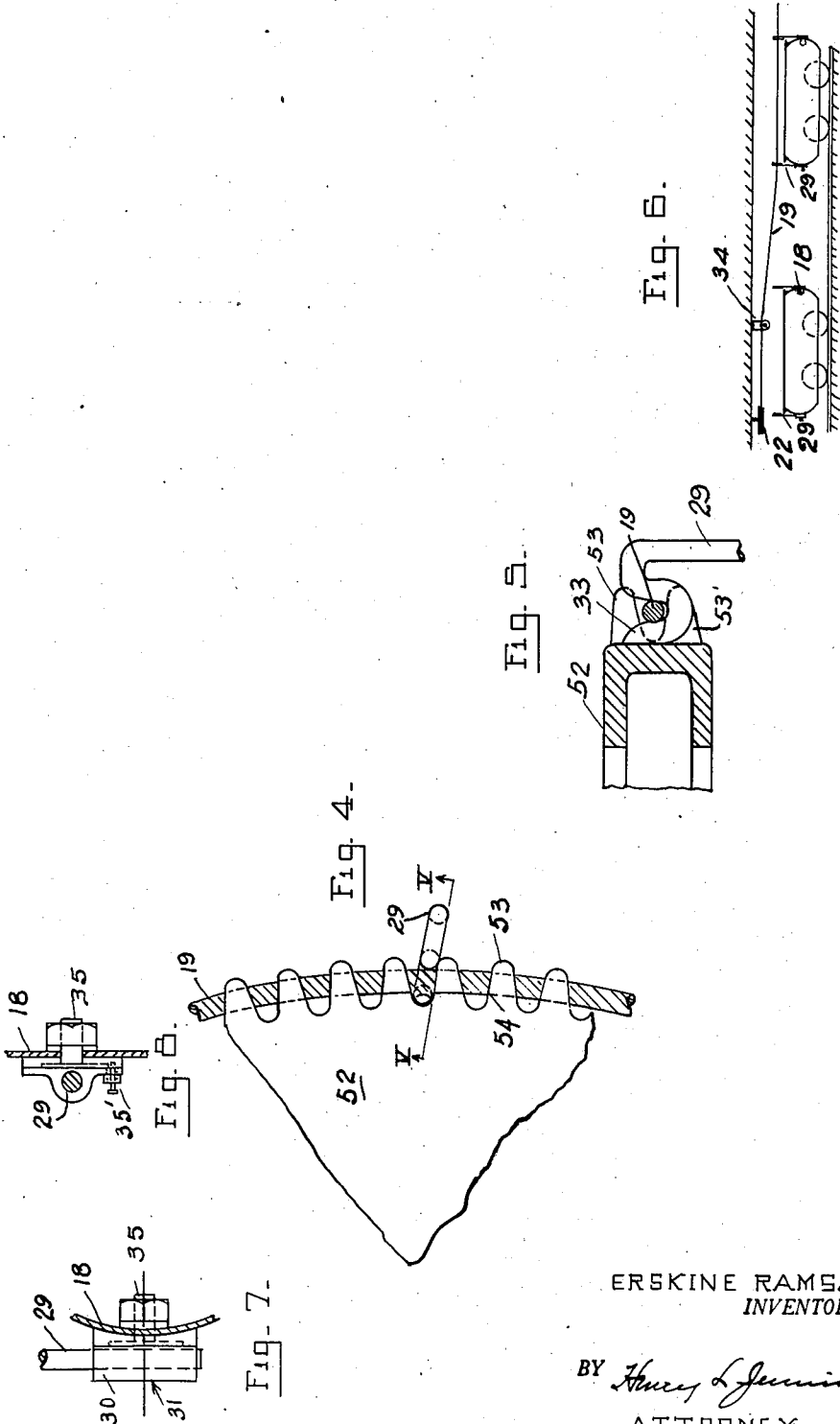
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# UNITED STATES PATENT OFFICE

2,471,042

## COAL HANDLING SYSTEM

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Application October 30, 1944, Serial No. 560,930

4 Claims. (Cl. 104—173)

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This invention relates to a mine haulage system in which an endless cable is employed to haul mine cars into and out of a mine, which cars engage the cable with a detachable grab, and has for an object the provision of apparatus of the character designated which shall be especially adapted to pull cars through a rotary dump through which the cable also passes and which is adapted to dump the cars while in longitudinal action.

A further object of my invention is to provide a mine haulage system including an endless cable, tracks, and mine cars on the tracks, with detachable grabs adapted to engage the cable, together with a sheave included in the drive means and adapted to engage the grab and haul the cars around a track disposed beneath the sheave.

Mine haulage systems have heretofore been proposed in which an endless cable was run over parallel tracks in a mine tunnel or slope and in which the cars engaged the cable with detachable grabs mounted on the ends of the cars. All such apparatus with which I am familiar entailed frequent starting and stopping of the drive means for the cable, and for detaching the loaded cars as they came out of the mine for passage through the rotary dump. This necessitated the employment of considerable manual labor for placing the cars in the rotary dump and removing them therefrom, and afterwards for re-engaging them with the cable.

In accordance with my present invention, I employ the endless cable and the parallel tracks in the mine, and include in the driving means for the cable, a relatively large sheave at the head of the tippie beneath and around which the track runs, and provide means associated with the sheave for engaging the mine car grabs and carrying them around the track and the sheave. I also provide a rotary dump through which the endless cable passes, which rotary dump is adapted to dump the cars and right them while they are still in motion longitudinally through the dump. By the means employed, there is no necessity of uncoupling the cars from the cable in order to dump them, and accordingly they are hauled out of the mine, dumped, and returned empty into the mine without ever becoming uncoupled from the cable.

Apparatus embodying features of my invention is illustrated in the accompanying drawings, forming a part of this application, in which:

Figs. 1 and 2 are plan views of a mine having my improved system installed therein;

Fig. 3 is a sectional view taken along the line

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III—III of Fig. 1 and drawn to a larger scale;

Fig. 4 is a fragmentary plan view of the drive sheave for the cable;

Fig. 5 is a sectional view taken along the lines V—V of Fig. 4;

Fig. 6 is a diagrammatic view showing the means for disengaging car grabs from cable in the mine;

Fig. 7 is a detail view showing the manner of mounting a grab on the end of a car; and,

Fig. 8 is a sectional plan view taken at a right angle to Fig. 7.

Referring now to the drawings for a better understanding of my invention, I show diagrammatically in Fig. 1 a mine working embodying a slope or tunnel 10, emerging from beneath the ground at 11, and outside the slope or tunnel a tippie 12. At the lower end of the slope or tunnel 10, drifts may branch off to portions of the mine being worked. It will be understood of course that the showing just described is merely illustrative of a mine working to which my improved hauling system may be applied and that it is adaptable for various other workings. Within the slope or tunnel 10 are parallel tracks 16 and 17 upon which mine cars 18 are adapted to run. The cars 18 are hauled out of, and returned into, the mine by means of an endless cable 19 which passes around a drive sheave 21 at the head of the tippie 12, and around an idler sheave 22 at the innermost end of the slope or tunnel 10. The drifts 13 and 14 may also be provided with parallel tracks and with separate, endless cables 23 and 24, each separately driven as by means of a motor 26, and drive sheave 27, operatively connected to the motor 26, as by means of a drive belt 28.

The cars 18 are detachably connected to the cable 19 by means of a grab 29 which is pivotally mounted at 31 on the ends of each of the cars and which includes an arm 32 extending laterally and terminating in an upwardly opening V shape bend or notch 33. The pivotal mounting 31 includes a sleeve 30 which serves as a bearing for the lower end of the grab 29. See Figs. 7 and 8. The sleeve 30 is also mounted to rotate in a vertical plane by means of a bolt 35 which secures it to the end of the car. The grab is held in an upright position by means of a spring pressed latch 35'. By this means, the grabs may be turned down and detached cars pushed into position for loading where there is a minimum of head room. The cable 19 rests in the V-shaped notch 33 by gravity, and the notch being offset from the pivotal mounting 31 by reason of the

lateral arm 32, grips the cable 19 with a frictional grip varying with the resistance to the pull on the cable. At the lower end of the slope or tunnel 10, near the idler sheave 22, I provide a pulley 34, over which the cable 19 is adapted to run and which raises the cable out of the notch 33 and disengages it from each car 18 as it approaches the lower end of the tunnel whereupon the detached cars are again loaded and hooked onto the cable. See Fig. 6. If desired, pulleys such as 34, disposed to raise the cable 19 out of the notches 33, may be placed in the tunnel at various points where it is desired to disengage or uncouple the cars from the cable. For example, it is desirable that cars be disconnected from the cable in order that they may be run into the side workings represented by the drifts 13 and 14. Accordingly, a pulley 34 should be located at each point along the cable 19 where it may be desired to uncouple the cars.

Referring now particularly to Fig. 4, the drive sheave 21 is supported by a suitable structure, such as the reinforced concrete foundation 49 shown in Fig. 1. It comprises a sheave portion proper 52, in which the cable 19 runs. As shown particularly in Figs. 4 and 5, the sheave portion 52 is provided around its periphery with a double row of fingers 53 and 53', forming angular notches between the rows and between the teeth in a row. The cable 19 runs in the notch between the rows and the grabs 29 enter the notches between the teeth in the rows. The cars are thus hauled around the head end of the tippel, beneath the drive sheave 21, where the tracks 16 and 17 join. As shown in Figs. 4 and 5, the fingers 53 are provided with rounded ends and are formed with relatively widely diverging angles 54, whereby the grabs 29 which are round in cross section are caused to enter the notches and retain their grips on the cable 19. If a grab should engage the rounded ends of the teeth 53 and 53', they would cause it to slip on the cable 19, a sufficient amount to enter the adjacent notch.

Except as otherwise specified herein, car dumps suitable for use with my present invention are constructed and operated in a manner similar to the car dump shown in my prior Patent No. 1,787,762, dated January 6, 1931. Reference is accordingly made to said patent for their details of construction and manner of operation.

From the foregoing it will be apparent that I have devised an improved mine haulage system by means of which the products of a mine may be economically removed and disposed of in a minimum of time and with a minimum of labor. It will furthermore be apparent that this improved system embodies an improved cable driving and car dumping mechanism which obviates the necessity of uncoupling the cars from the cable as they are brought out of the mine.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a mine haulage system including an endless cable, mine cars with detachable grabs adapted to engage the cable at random, and drive means for the cable, the combination of a sheave included in the drive means and having spaced fingers thereon shaped to engage and cause the grabs to enter into the spaces between the fingers, and a track for the cars passing around beneath the sheave.

2. In a mine haulage system including an endless cable and driving means for said cable, a plurality of mine cars disposed at random along the cable, a grab pivotally mounted with a vertical pivot to project upwardly from the car and having a notch adapted to engage the endless cable and disposed on one side of its pivot, a drive sheave included in the driving means for the endless cable, diverging fingers on the sheave adapted to engage the grabs on the cars and shaped to cause the grabs to enter into the notches between the fingers, and tracks for the cars extending around beneath the sheave.

3. In a mine haulage system including an endless cable, mine cars adapted to be hauled by the cable and drive means for the cable, detachable grabs each comprising a crank arm rounded in cross section mounted centrally of the end of each car for full rotary movement about a vertical axis with one end free and formed into an open notch disposed to one side of its axis of rotation and adapted to engage the cable at random, a drive sheave about which the cable passes, and rounded divergent teeth on the sheave for engaging the notched ends of the grabs and hauling the cars around with the cable, and causing the grabs to enter the notches between the teeth.

4. Apparatus as defined in claim 3 in which the grabs have their ends mounted on the car to rotate in a horizontal plane and also in a vertical plane whereby they may be turned out of the way of the cable when the car is stopped.

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