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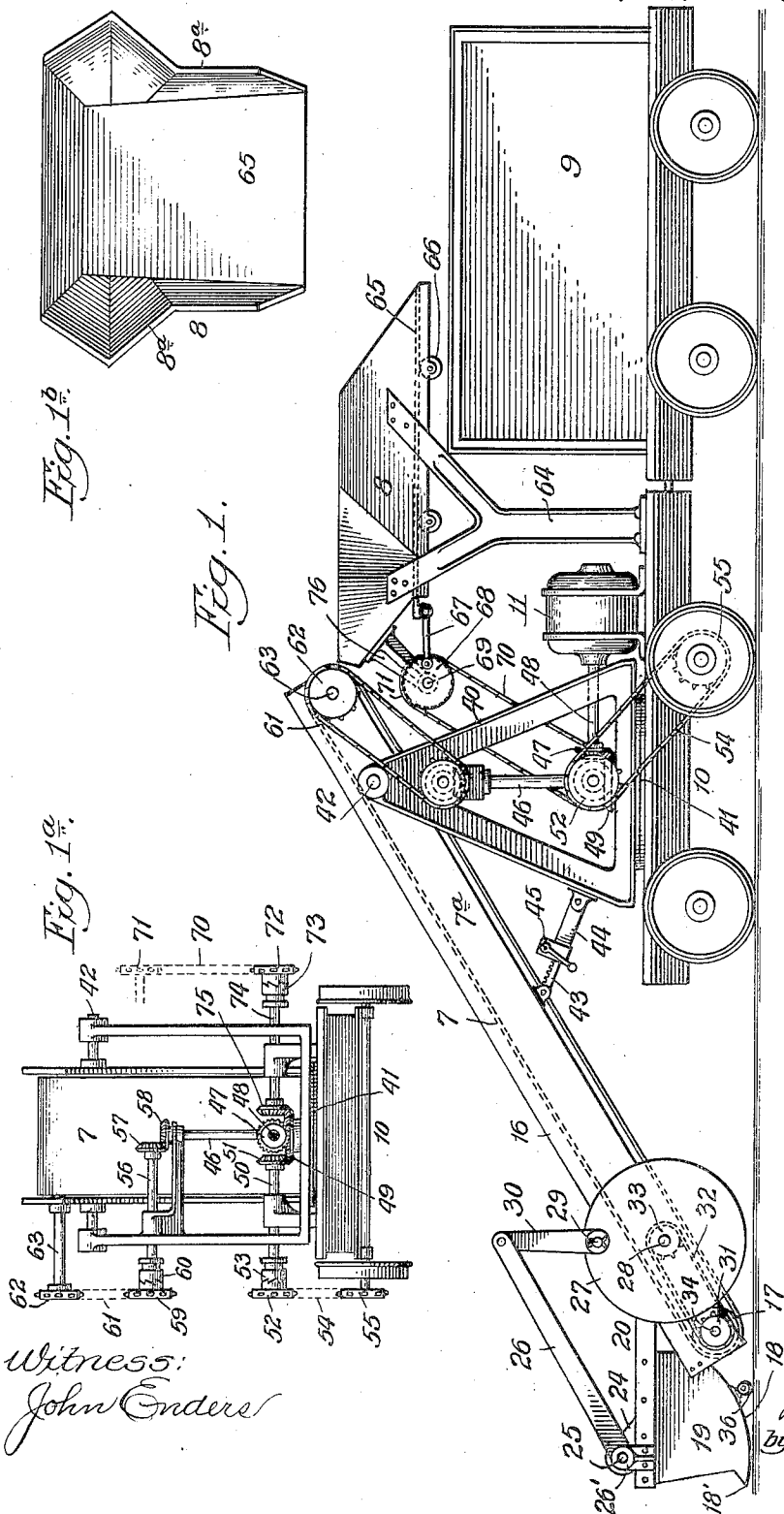
1,470,221

J. M. FREEMAN

LOADING APPARATUS

Filed Nov. 14, 1919

3 Sheets-Sheet 1



Witness:
John Enders

Inventor:
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Fig. 4.

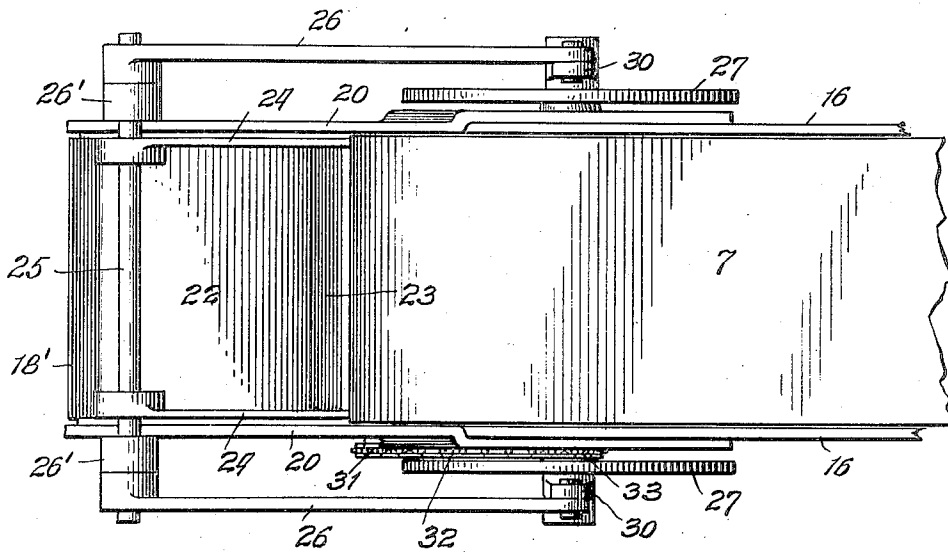
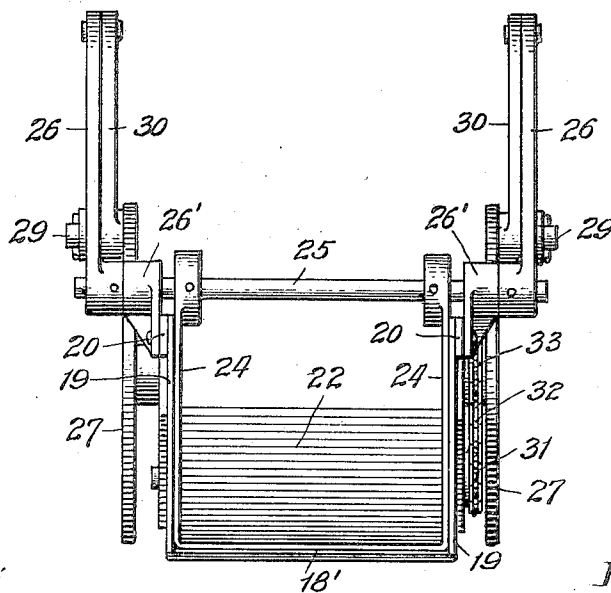


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES M. FREEMAN, OF WASHOE, MONTANA.

LOADING APPARATUS.

Application filed November 14, 1919. Serial No. 338,091.

To all whom it may concern:

Be it known that I, JAMES M. FREEMAN, a citizen of the United States, and a resident of Washoe, in the county of Carbon and State of Montana, have invented certain new and useful Improvements in Loading Apparatus, of which the following is a full, clear, and exact description.

The invention relates to loading apparatus.

The object of the invention is to provide improved loading apparatus which is adapted for use in coal mines or for similar uses.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a side elevation of apparatus embodying the invention. Fig. 2 is a side elevation of the shoveling apparatus. Fig. 3 is a longitudinal section of said apparatus. Fig. 4 is a plan and Fig. 5 is an end elevation of the shoveling apparatus.

The invention is illustrated in connection with a loading apparatus comprising a conveyor and elevator having an endless apron 7 adapted to convey and deliver the material into a chute 8. The apron 7 will be driven by mechanism hereinafter more fully described. From the chute, the material is delivered into a car 9 which is adapted to be coupled to the truck in any suitable manner.

A scoop having an arcuate bottom 18 and sides 19 is supported by bars 20 which are secured to the conveyor-sides 16. The front edge 18' of this scoop is adapted to penetrate the pile of coal or material when the truck is driven toward the pile and the rear or upper end of the bottom 18 terminates where the material discharged therefrom will fall onto the lower portion of the apron 7.

An oscillatory shovel comprises an arcuate wall 21 conforming substantially to the wall 18 of the scoop, an inclined top 22, a back-wall 23 and sides or suspension arms 24 which are supported by, and fixed to, a shaft 25 which is supported in bearings 26 which are secured to the supporting bars 20. Crank-disks 27 on a cross-shaft 28 which is suitably supported by the conveyor-sides 16, are provided with wrist-pins 29 which are respectively connected by links 30 to the dis-

tal ends of the arms 26 which are rigidly secured to the outer ends of said shaft. Crank-shaft 28 is driven from the shaft 34 of the lower conveyor-roll 17 which is driven by the conveyor by a sprocket 31 on shaft 34, a chain 32 and a sprocket 33 on the crank-shaft 28.

If desired, a roller 36 may be placed under the scoop.

The operation of the improved shoveling mechanism will be as follows: The conveyor and elevator apron 7 will be operated by power derived from the motor 11. The front end of the loading apparatus will be forced into a pile of coal or material, the edge 18' being adapted to penetrate the pile of material. The operation of the apron 7 will, through sprocket 31, chain 32 and sprockets 33, rotate the shaft 28, and the pins 29, links 30 and arms 26 will rock shaft 25. This movement will cause the movable shovel to oscillate into and out of the pile. When the shovel penetrates the pile, it will pass into position indicated by dotted lines in Figs. 2 and 3, loosen the material and cause it to slide down the inclined top 22 of the movable shovel and onto the bottom 18 of the scoop. The back wall 23, during the retraction of the removable shovel, will act as a pusher to forcibly discharge the material onto the conveyor-apron 7. This operation will be continued until all of the material has been loaded.

The loading apparatus is mounted upon a wheeled truck 10 which is equipped with an electric motor 11. A frame 40 is mounted upon a turn-table 41 which permits horizontal rotation to swing the conveyor and elevator and the shoveling apparatus at the lower end thereof into different positions. The sills 7^a of the conveyor are provided with studs 42 which are pivotally held in bearings in the upper end of frame 40 to permit the conveyor and elevator to be swung vertically to raise and lower the shoveling apparatus. An adjustable connection consisting of a rack 43 pivoted to the conveyor, a socket 44 pivoted to the frame 40 and a crank 45 mounted in the socket and provided with a pinion (not shown), is adapted to raise or lower the conveyor to adjust the loading apparatus on the lower end of the conveyor. A vertical shaft 46 is mounted in bearings on the truck co-axially with the turn-table and is driven by a gear 47

on the motor-shaft 48 and a gear 49 adjacent its lower end. The coaxial arrangement of the turn-table and shaft 46 permits the driving connection between gears 47 and 49 to be maintained in all positions of the frame 40. The truck 10 may, if desired, be driven from the motor 11 and for this purpose a horizontal shaft 50 is mounted in a bearing fixed on one side of the truck, a gear 51 on said shaft meshes with gear 49 on the vertical shaft 46, a sprocket-wheel 52 on the shaft is adapted to be driven from shaft 50 through a clutch 53 and to drive a sprocket-chain 54 which drives a sprocket-wheel 55 on one of the axles of the truck.

The conveyor-belt 7 is driven from the motor 11 by a shaft 56 which is journaled in a bearing in one side of the frame 40, a gear 57 fixed to the inner end of shaft 56 which meshes with a gear 58 on the upper end of shaft 46, a sprocket-wheel 59 on shaft 56 adapted to be driven thereby through a clutch 60, and a sprocket-chain 61, which drives a sprocket-wheel 62 on the shaft 63 of the upper pulley for the conveyor-belt 7.

The chute 8 is supported by standards 64 and is provided with a bottom 65 which is slidably mounted on the rollers 66. This bottom is reciprocated to feed the material forwardly through the chute. The bottom 15 is connected to a pair of links 67 which are connected to and operated by crank-disks 68 on a shaft 69 which is mounted in brackets 76 fixed to the chute. Shaft 69 is driven by a sprocket 71 on shaft 69, a chain 70, a sprocket 72 on a shaft 74 which is mounted in a bearing fixed on the truck and is driven by said shaft through a clutch 73, and a gear 75 which meshes with gear 49. The chute 8 is preferably shaped, as at 8^a, to adapt it to receive material from the conveyor-belt 7 while the latter is adjusted in different angular relations to the chute.

The invention exemplifies shoveling apparatus which is adapted for coal mines for loading coal and which may be used for handling similar material. Provision is made for positively delivering the material to the endless conveyor and, as a result, the necessity of a workman to shovel the coal from the pile onto the conveyor is dispensed with.

The invention also exemplifies improved shoveling mechanism which is adapted to be adjusted horizontally into different positions whilst its driving connections are maintained.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In loading apparatus, the combination of a truck, a conveyor pivoted to swing horizontally and supported on the truck for lateral adjustment, a shovelling device adjacent one end of and adjustable with the conveyor, a hopper stationarily mounted on the truck independently of the conveyor and having fixed sides and one of its ends extended to receive material from the conveyor in its different lateral adjustments and its other end extended to overhang the truck and discharge the material in a car behind and adjacent the truck, said hopper having a movable bottom, a motor on the truck, mechanism for driving the conveyor from the motor, mechanism also driven by the motor for reciprocating said bottom, and mechanism for operating the shoveling device from the conveyor.

2. In loading apparatus, the combination with a conveyor and a support, of a shovel provided at one end with an edge for penetrating a pile of material and pivoted to swing on a constant axis on the support so said edge will swing upwardly and outwardly into the pile, the shovel being formed to permit the loosened material to pass over it, and mechanism for oscillating the shovel to swing into and out of the pile.

3. In loading apparatus, the combination with a conveyor and a support, of a shovel provided at one end with an edge for penetrating a pile of material and pivoted to swing on a constant axis on the support so said edge will swing upwardly and outwardly into the pile, the shovel being provided with a surface for directing the loosened material inwardly and downwardly towards the conveyor while it is swung outwardly into the pile.

4. In loading apparatus, the combination with a conveyor, and a support, of a shovel provided at one end with an edge for penetrating a pile of material and pivoted on the support so said edge will swing upwardly and outwardly into the pile, the shovel being provided with a surface for directing the loosened material inwardly and downwardly towards the conveyor while it is swung outwardly into the pile, and with a wall at its inner end adapted to positively push the loosened material towards the conveyor during the retraction of the shovel.

5. In loading apparatus, the combination with a conveyor and a support, of a scoop fixedly secured to the support, a shovel provided at one end with an edge for penetrating a pile of material and pivoted on a substantially horizontal axis so said edge will swing upwardly and outwardly from the scoop in penetrating a pile formed to deflect the loosened material onto the scoop, a wall at the other end of the shovel for

positively pushing the loosened material from the shovel towards the conveyor, and mechanism for oscillating the shovel to swing it back and forth over the scoop.

6 6. In loading apparatus, the combination with a conveyor and a support, of a shovel provided at one end with an edge for penetrating a pile, pivoted to said support to swing on a substantially horizontal axis
10 and so that said edge will swing upwardly and outwardly into a pile of material, and provided with separated relatively fixed top and bottom walls converging to said edge, and means to oscillate said shovel into and
15 out of a pile of material.

7. In loading apparatus, the combination with a conveyor and a support, of a shovel provided at one end with an edge for penetrating a pile, pivoted to said support to swing on a substantially horizontal axis 20 and so that said edge will swing upwardly and outwardly into a pile of material and provided with separated relatively fixed top and bottom walls converging to said edge, a scoop fixedly secured to the support and 25 disposed so the shovel will swing back and forth over it, and mechanism for oscillating the shovel into and out of a pile and over said scoop.

JAMES M. FREEMAN.