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3 Sheets-Sheet 1

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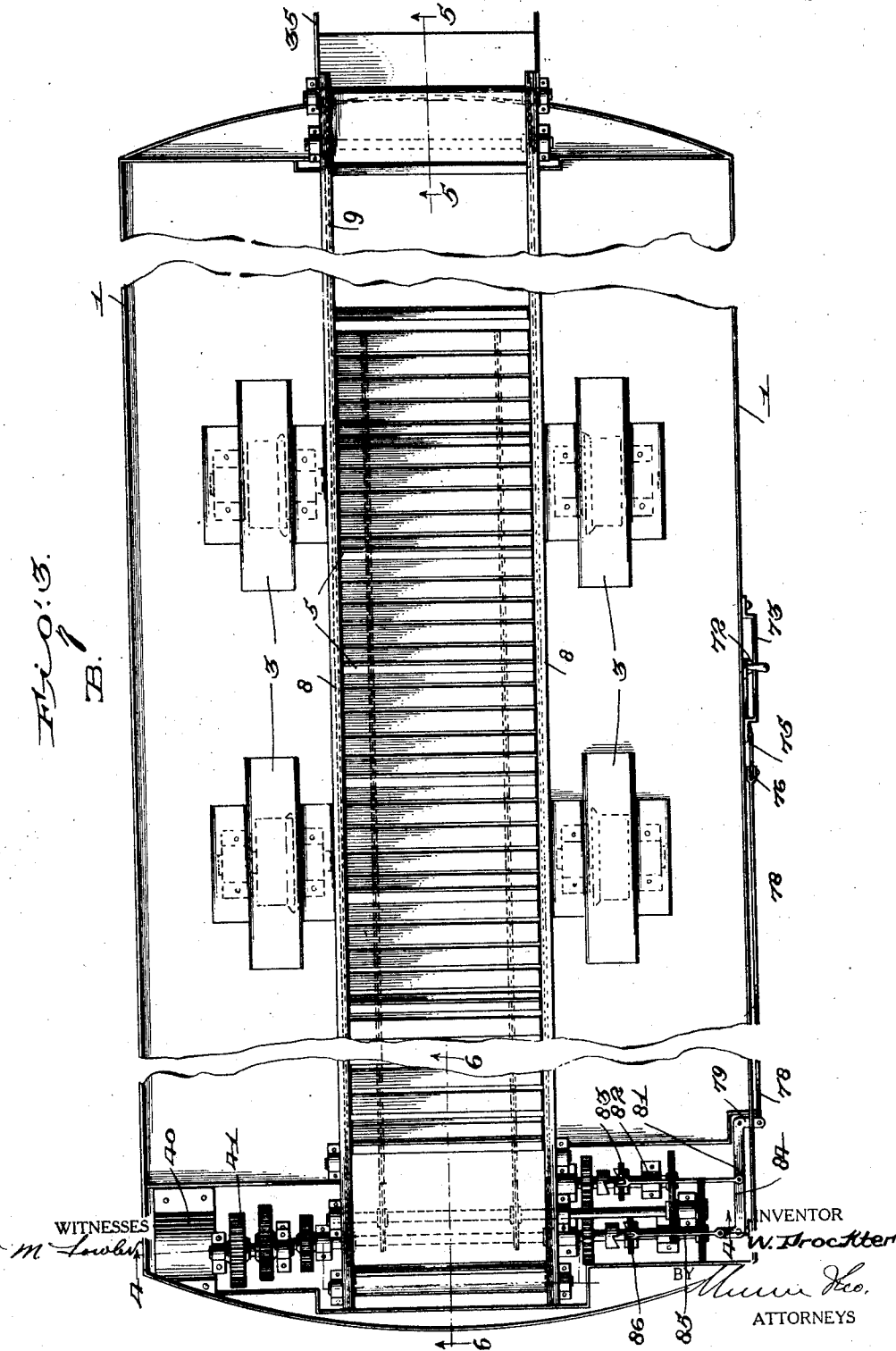
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UNITED STATES PATENT OFFICE.

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SELF-LOADING CAR.

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This invention relates to a self-loading car especially adapted for use in mines such as coal mines or in metal mining operations.

The object of the invention is to provide a self-loading car of such character that when a plurality of such cars are used in a train they can be successively loaded without the necessity of a constant shifting of the cars to and from the face or place from which the material is being loaded. In accordance with the present invention the material is transported or conveyed over all of the cars to the car remote from the place where the material is picked up and is loaded in such remote car. After the loading of the remote car has been completed the car next remote from the place where material is picked up is loaded and this operation is repeated until all of the cars have been loaded. In loading each car the material is piled up in the body of the car throughout the entire length thereof.

In carrying out the present invention there is provided a self-loading car having any desirable type of car body, a conveyor mounted on the car designed to carry the material along and over the top of the car and an adjustable material support also mounted on the car and associated with the conveyor and adapted to be positioned to cause the material to be carried over the car body or to be positioned to cause the material to discharge into the car body at the desired point. In conjunction with the conveyor and adjustable material support there is provided at one end of the car material-receiving means designed to receive material from an adjacent car. At the opposite end of each car there is provided material discharge means designed to deliver the material to the receiving means on the adjacent end of the adjacent car.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a fragmentary view in side elevation showing a train made up of self-loading cars embodying the present invention,

Figure 2 is a view in transverse vertical section on the line 2—2 of Figure 1,

Figure 3 is a fragmentary plan view of a car constructed in accordance with the present invention,

Figure 4 is a transverse vertical sectional view on the line 4—4 of Figure 3,

Figure 5 is a longitudinal vertical sectional view on the line 5—5 of Figure 3,

Figure 6 is a view in longitudinal vertical section on the line 6—6 of Figure 3,

Figure 7 is a diagrammatic perspective view showing the drive for the adjustable or shiftable material support,

Figure 8 is a detail view partly in section and partly in elevation showing one of the clutching elements employed in the driving mechanism for the adjustable material support, and

Figure 9 is a detail perspective view of the discharge means provided on one end of each car.

Referring to the drawings it will be seen that the present invention comprises a self-loading car, a number of which may be coupled up in a train, as shown in Figure 1, one of such cars being designated at A, another at B and a third at C. The cars A, B and C are of identical construction and each includes a car body 1 having suitable running gear including wheels 2 protected and guarded by guards 3.

The present invention proposes the provision of a conveyor, designated generally at 5, and including endless sprocket chains 6 and spaced flights or cross members 7 of angular form, the cross members 7 being connected to and carried by the sprocket chains 6.

In the present embodiment of the invention the endless chains of the conveyor have upper runs extending along and over the top of the car and having runs extending down around the ends of the car and lower ends extending below the car. The upper runs of the sprocket chains 6 travel along in channel guides 8 provided at the upper end of longitudinally extending framing members 9 provided above the car and supported upon extensions of the end walls of the body of the car. At one end of the guides 8 the sprocket chains 6 are trained over idler sprockets 10 and 10^a and extend down along the adjacent end of the car to sprocket wheels 11. The bottom runs of the sprocket chains 6 run along on inturned flanges 12 provided on a depending conveyor casing 13 carried by the body of the car. At one end

of the car the casing 13 extends up outside of the car body, as at 14, to house and protect the end runs of the sprocket chains which travel over the sprockets 10, 10^a and 11. The other end of the casing 13 is extended upwardly and outwardly beyond the car body, as at 15 to house and protect the conveyor and in this extension 15 of the casing idler sprocket mounting shafts 16 are fixed. The shafts 16 have rotatably fitted thereon idler sprockets 17 around which the sprocket chains 6 are trained. A drive shaft 18 is also extended through the casing extension 15 and has drive sprockets 19 fixed thereto and meshing with the sprocket chains 6.

An adjustable or shiftable material support is provided for co-operation with the conveyor in order to cause the material to be carried entirely over the car or to be discharged at the desired point within the car. This adjustable material support consists in the present embodiment of the invention of a plurality or series of transversely extending slats 20 connected together for simultaneous movement by means of endless chains 21 and supported by means of angular lugs 22 and rollers 23 on tracks 24 provided on the longitudinal supporting frame members 9. Each end of each slat 20 has a bracket 22 secured thereto and each bracket 22 rotatably supports a roller 23. The rollers 23 at one side roll on one track 24, whereas, the rollers on the other side roll on similar tracks. Tracks 24 are extended along the top of the car and such portions of the track are, as indicated, mounted on the supporting members 9. At one end of the car the tracks 24 extend downwardly and outwardly, as indicated at 25, and then downwardly and inwardly as indicated at 26. The portions 26 of the track may be constituted by end wall portions of the car body and merge into the bottom wall 27 thereof. Below the bottom wall 27 tracks 28 are provided and serve to accommodate the rollers 23 of that portion of the adjustable material support that is shifted to a position beneath the car body. At one end of each car material-receiving means is provided and consists of an inclined and imperforate plate 30 mounted on the fixed shafts 16. The flights or cross members 7 of the conveyor ride across this plate 30 and pick up the material deposited thereon and carry it from the plate onto the adjustable material-receiving support. If this adjustable material-receiving support is positioned to extend over the entire length of the car the material is carried entirely over the car and delivered onto the material-receiving means of the next car by means of a discharge or delivery mechanism, designated generally at 35, and consisting of a chute or bucket having a bottom wall 36

and side walls 37, the ends of the bucket or chute being opened. This bucket or chute has bearings 38 fixed thereto, as at 39, and rotatably mounted on the shaft 9^a on which the idler sprockets 9 are mounted. The rotatable or pivotal mounting of the buckets or chutes permits them to be swung to the inoperative position shown in dotted lines in Figure 1.

Means is provided for continuously driving the conveyor 5 while the car is in operation. This means may include an electric motor 40 geared to the shaft 18 by means of reduction gearing 41 (see Fig. 4).

For the purpose of driving the adjustable material support in either direction suitable motion transmission means is provided between the shaft 18 and a shaft 45 which has drive sprocket wheels 46 fixed thereon and meshed with the chains 21 connected to the slats 20 which make up the adjustable material support. This motion transmission means includes a shaft 50 aligned with the shaft 18 and adapted to be driven therefrom by means of a clutch made up of a clutch member 51 fixed on the shaft 18 and a clutch member 52 splined on the shaft 50. The shaft has fixed thereto a sprocket wheel 53 over which a sprocket chain 54 is trained. The sprocket chain 54 is also trained over a sprocket wheel 55 fixed on the shaft 45. When the clutch members 51 and 52 are engaged the shaft 45 is driven in one direction. For the purpose of driving the shaft 45 in an opposite direction a shaft 56 is provided and is driven in an opposite direction from the shaft 18 by means of gears 57 and 58. The shaft 56 has a clutch member 58 fixed thereto and co-operable with a movable clutch member 59 splined on the shaft 60 aligned with the shaft 56. The shaft 60 has a sprocket wheel 61 fixed thereto, a sprocket chain 62 being splined over the sprocket wheel 61 and over a sprocket wheel 63 fixed on the shaft 45.

A single control means may be provided for the two clutches made up of the clutch members 51 and 52 and 58 and 59. This control mechanism includes a hand lever 70, pivoted as at 71, on the side of the car and having a hand grip released and spring set detent 72 co-operable with the recesses or teeth on a quadrant 73. A rod 75 is pivotally connected to the hand lever 70 at one end and to a rocking lever 76 at its other end, the rocking lever being fulcrumed, as at 77, on the side of the car. A rod 78 is pivotally connected to the rocking lever 76 at the end of the lever opposite its connection to the lever 75 and this rod 78 is pivotally connected to one arm of a bell crank lever 79. The bell crank lever 79 is fulcrumed, as at 80, on the car and has an arm 81 pivotally connected at its outer end to a rod 82 pivotally connected to a forked lever 180

83 which controls the clutch member 59. The outer end of the arm 81 is also pivotally connected to an arm of the bell crank lever 84, an arm of which is pivotally connected to a rod 85 connected to the forked lever 86 which controls the clutch member 52. With this arrangement when the lever is swung to the right, as viewed in Figure 1, the adjustable material support is shifted to the left; whereas, when the lever 70 is shifted to the left, as viewed in Figure 2, the adjustable material support is shifted to the right.

In loading a train of cars constructed in accordance with the present invention the delivery or discharge means 35 of each car of the train except the car remote from the material to be loaded are swung, as shown in full lines in Figure 1, so that they will discharge or deliver the material onto the plates 30. At the start of the operation the adjustable supports of all of the cars except the car remote from the material to be loaded are arranged to extend below the upper run of the conveyors 5 for the full lengths of the cars. With this arrangement when the conveyors 5 are driven the material is carried over the first car to the second car, over the second car to the third car, and so on until it reaches the car remote from the material to be loaded into which car it is delivered, the adjustable material support being shifted to effect this purpose. The adjustment of the adjustable material support is illustrated in Figure 1 in connection with the car B. Figure 1 shows the car B being loaded, the car C having been loaded. The loading of the car C is effected by gradually shifting the material support to the left so that the material carried along the slats 20 of the support by the flights 7 falls into the body of the car off the end of the support. As the material support is gradually driven around over the car the loading of the material into the car progresses from one end of the car to the other. In this way, first one and then another car may be loaded without shifting the train or any of the cars thereof.

I claim:—

1. A self-loading car having a body, a conveyor mounted on the car and designed to carry the material along and over the top of the car, and an adjustable material support also mounted on the car and associated with the conveyor and adapted to be positioned to cause the material to be carried over the car body and also adapted to be positioned to cause the material to discharge into the car body at the desired point.

2. A self-loading car having a body, a conveyor mounted on the car and designed to carry the material along and over the top of the car, an adjustable material support also mounted on the car and associated

with the conveyor and adapted to be positioned to cause the material to be carried over the car body and also adapted to be positioned to cause the material to discharge into the car body at the desired point, material receiving means at one end of the car, and material discharge means at the other end of the car.

3. A self-loading car having a body, a conveyor mounted on the car and designed to carry the material along and over the top of the car, means for continuously driving the conveyor in one direction, an adjustable material support also mounted on the car and associated with the conveyor and adapted to be positioned to cause the material to be carried over the car body and also adapted to be positioned to cause the material to discharge into the car body at the desired point, and controllable means for shifting the adjustable material support in either direction.

4. A self-loading car having a body, a conveyor made up of endless sprocket chains and transverse flights connected to the chains at spaced intervals, mounting means for supporting the conveyor on the car whereby a run of the conveyor extends over the car for the full length thereof, an adjustable material support co-operable with the conveyor and including a plurality of transversely extending slats over which the conveyor flights run, means for interconnecting the slats for simultaneous movement, and means for supporting the slats in all positions.

5. A self-loading car having a body, a conveyor made up of endless sprocket chains and transverse flights connected to the chains at spaced intervals, mounting means for supporting the conveyor on the car whereby a run of the conveyor extends over the car for the full length thereof, and adjustable material support co-operable with the conveyor and including a plurality of transversely extending slats over which the conveyor flights run, means for interconnecting the slats for simultaneous movement, means for supporting the slats in all positions and including tracks carried by the mounting means and by the car body, rollers running on the tracks, and offset brackets connecting the rollers and the slats.

6. A self-loading car having a body, a conveyor mounted on the body and having a run extending over the body for the full length thereof, said conveyor having spaced transversely extending flights, an adjustable material support also mounted on the car body and shiftable to co-act with the conveyor to cause the material to be carried entirely over the car body and also shiftable so as to co-act with the conveyor to cause the material to be discharged into the car body at the desired point, material-receiving

means including an inclined plate co-operatively disposed with respect to the conveyor and the adjustable material support, and material-discharge means at the end of the car opposite said material-receiving means.

7. A self-loading car having a body, a conveyor mounted on the body and having a run extending over the body for the full length thereof, said conveyor having spaced transversely extending flights, an adjustable material support also mounted on the car body and shiftable to co-act with the conveyor to cause the material to be carried entirely over the car body and also shiftable so as to co-act with the conveyor to cause the material to be discharged into the car body at the desired point, material-receiving means including an inclined plate co-operatively disposed with respect to the conveyor and the adjustable material support, and material-discharge means at the end of the car opposite said material-receiving means; said material discharge means including a pivoted chute.

8. A self-loading car having a body, a conveyor including a pair of endless sprocket chains, mounting members extending longitudinally of the car and having guides for supporting the upper runs of said chains in overlying relation with respect to the car for the full length of the car, a housing having a portion underlying the bottom of the car and portions extending up along the sides of the car, said casing having means for guiding and supporting end and bottom runs of the sprocket chains, transverse flights connected with the chains and

carried thereby at spaced intervals therealong, an adjustable material-support including a plurality of transversely extending slats over which the flights of the conveyor run, endless chains connecting the slats, means for mounting the endless chains on the support, means for driving the chains to shift the support, and means for mounting the slats for shifting movement on the mounting members and on the casing.

9. A self-loading car having a body, a continuously operable conveyor mounted on the car body and having a run extending over the car body for the full length of the car body, and a longitudinally shiftable material support mounted on the car and co-operable with the conveyor to the end of causing the material to be carried entirely over the car body and also co-operable with the conveyor to the end of causing the material to be discharged into the car body at the desired point.

10. A self-loading car having a body, a conveyor, means adjacent the ends of the car for mounting the conveyor on the car body with a run of the conveyor extending over the car body for the full length of the car body, means for driving the conveyor, and means independent of the conveyor and its mounting means for causing the conveyor to discharge the material carried by the run extending over the car body to any point within the car body and also operable to cause the run extending over the car body to carry the material entirely over the car body.

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