

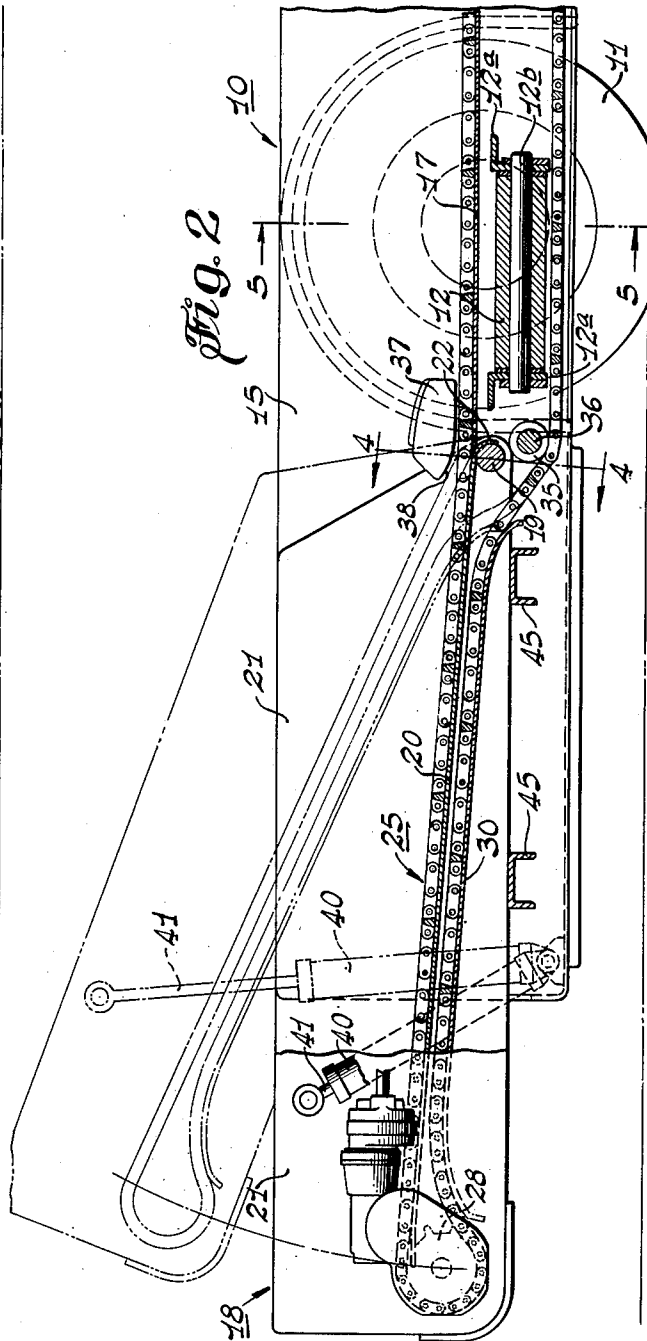
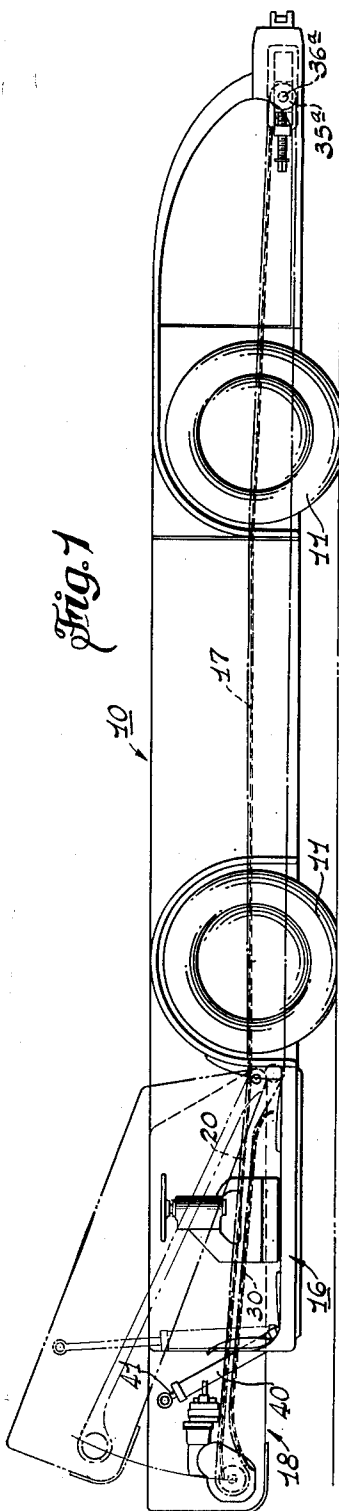
April 15, 1952

W. R. BECK
SHUTTLE CAR

2,592,532

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3 Sheets-Sheet 1



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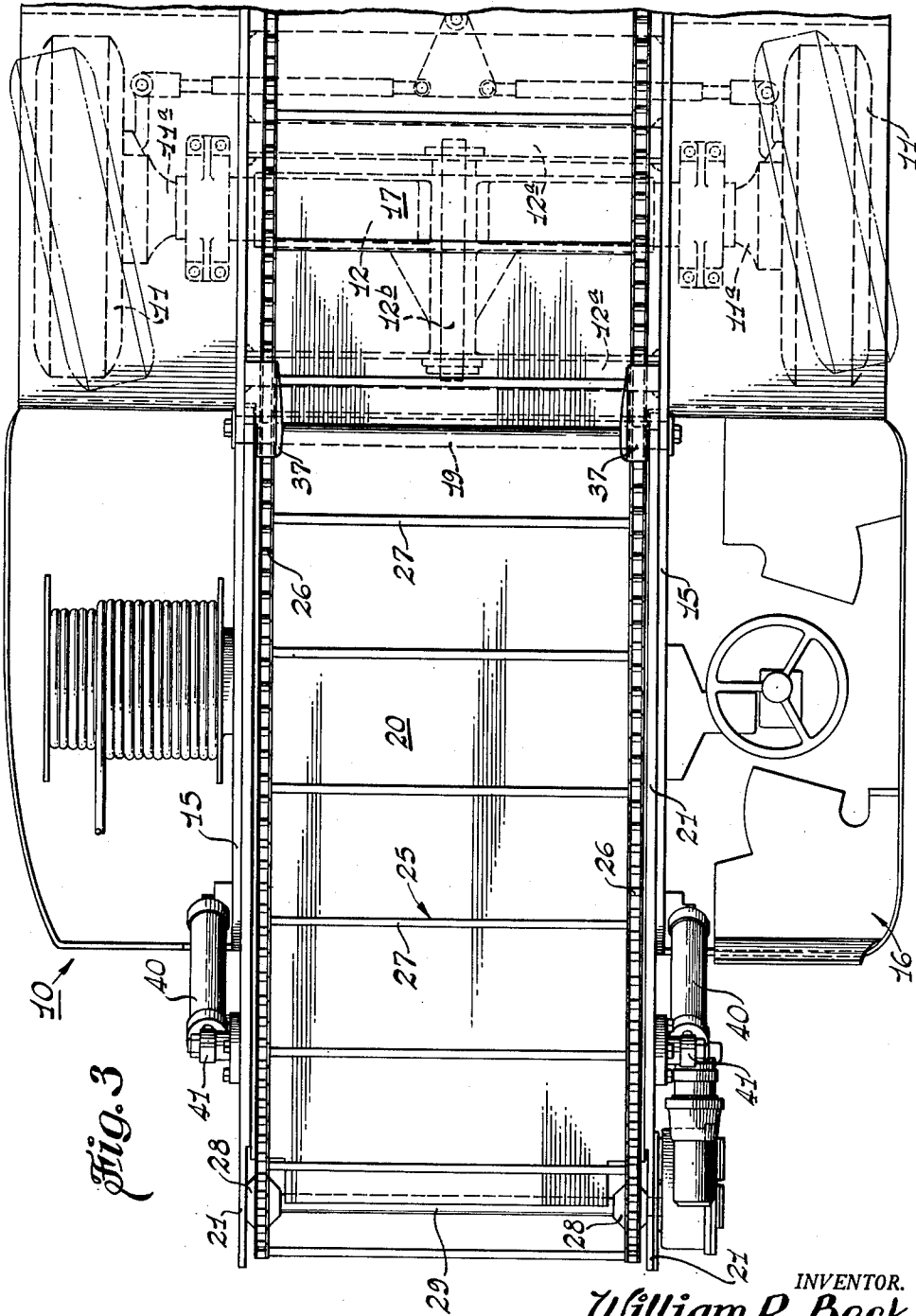


Fig. 3

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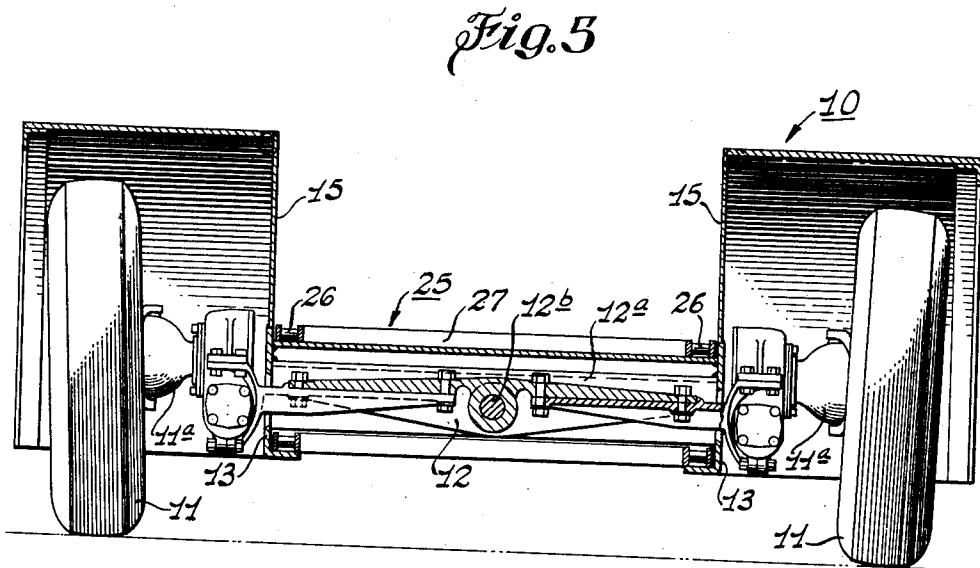
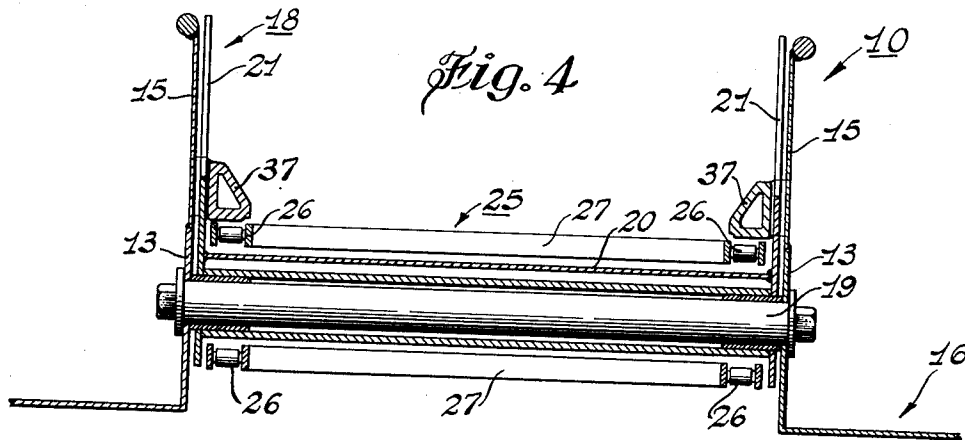
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2,592,532

SHUTTLE CAR

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1 Claim. (Cl. 214—83.36)

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This invention relates to automotive vehicles of self-unloading type commonly referred to as shuttle cars used in mines for transporting coal or other mined material from the working face of the mine to an unloading station.

More particularly, the present invention relates to a shuttle car wherein one end of the material-carrying compartment includes an endless conveyor moving along the bottom thereof which is adjustable for vertical swinging movement so that the material may be discharged from the car at various levels.

The principal object of the present invention is to provide a simple and compact arrangement for the vertically swingable discharge end of the bottom conveyor relative to the axle structure having a supporting wheel at the adjacent end of the car so as to produce an especially low structure wherein the conveyor, and particularly the adjustable discharge portion thereof, can be disposed in a relatively low plane either during the transportation of material or during the discharge of material from the end of the car, thereby increasing the potential capacity of the car over previous structures having a vertically swingable discharge portion.

Other objects and disadvantages of my invention will appear from time to time as the following description proceeds.

My invention may best be understood by reference to the accompanying drawings in which:

Figure 1 is a side view of a shuttle car constructed in accordance with my invention;

Figure 2 is an enlarged fragmentary side view of the unloading end of the shuttle car shown in Figure 2, with parts broken away to show details of construction of the conveyor and the wheel supporting axle structure at the adjacent end of the vehicle;

Figure 3 is a plan view of the structure shown in Figure 2;

Figure 4 is a detailed section taken on line 4—4 of Figure 2; and

Figure 5 is a detailed section taken on line 5—5 of Figure 2.

Referring now to the details of the embodiments of my invention illustrated in the drawings, a shuttle car having a main frame indicated generally at 10 is provided with pneumatic-tired wheels 11 which may be driven and steered in any suitable manner well known in the art.

Said wheels are suitably connected to the main frame 10 in any conventional manner. In the form shown, the wheels at the discharge end of the car, shown at the left side of Figure 1, are

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mounted for equalizing movement on opposite ends of a horizontally disposed equalizer bar 12 which has stub axles 11a, 11a for the adjacent wheels 11 secured at opposite ends thereof.

Parallel side frame members 13, 13 extend lengthwise of the main frame 10. These side frame members 13, 13 are cross-connected by supports at suitable intervals including angle bars 12a, 12a, between which the equalizing bar 12 is pivoted centrally of the vehicle as by a pivot pin 12b. Such an equalizing structure is old and well known in the art so need not be further described.

A material carrying compartment extends substantially the full length of the car and includes a pair of upright side walls 15, 15 which in the form shown consist of upright extensions of side frame members 13, 13 of the main frame. As usual, an operator's platform, indicated generally at 16, may be provided on the outer side of one of the side walls 15, at the discharge end of the vehicle.

The bottom of the material carrying compartment consists generally of a fixed horizontal bottom plate 17 extending between the side frame members 13, 13 and terminating at its front or discharge end at the rear end of a vertically swinging conveyor frame section, indicated generally at 18. Said conveyor frame section is hinged on a suitable transverse pivot pin 19 having its opposite ends supported on the main frame members 13, 13. Said conveyor frame 18 is guided for vertical movement between the upright side walls 15. Said conveyor frame includes a floor plate 20 and upright side walls 21, 21, which together form a trough-like extension of the material carrying compartment, in vertical alignment with and forming a continuation of the fixed floor plate 17 toward the rear of the car. In the preferred form shown herein, the rear terminal end portion 22 of the floor plate 20 is curved downwardly around the pivot pin 19 and the front terminal edge of the fixed floor plate 17 meets the curved terminal portion 22 of the floor plate 20 with but slight clearance therebetween, so as to minimize the escape of fine material from the compartment at the point of juncture of the two floor plates in the various permissible positions of vertical swinging adjustment of the conveyor frame 18.

An endless flexible conveyor of the flight type, indicated generally at 25, is trained for movement along the upper surface of the fixed floor plate 17 and thence along the floor plate 20 in the various permissible positions of the latter for moving ma-

terial along the compartment and discharging it from the front end of the conveyor frame 18. In the form shown herein, the conveyor 25 consists of a pair of chains 26, 26 spaced along opposite sides of the floor plates 17 and 20 and cross-connected by a plurality of longitudinally spaced flights or bars 27, 27. The chains 26, 26 are trained over suitable drive sprockets 28, 28, herein shown as fixed on a drive shaft 29 journaled in the side walls 21, 21 at the front end of the conveyor frame 18. From thence, the lower or return reach of the conveyor is guided beneath the floor plate 20 as by a secondary floor plate 30 fixed to the inner faces of the side plates 21 and thence over idler sprockets 35, 35 on an idler shaft 36 disposed adjacent and below the transverse pivot pin 19 so as to guide the lower reach of the conveyor chain beneath the equalizing bar 12 and the fixed cross bars 12a, 12a to the main frame. From thence, the conveyor chain passes to idler sprockets 35a, 35a on an idler shaft 36a at the extreme rear end of the car, so that the conveyor is then returned to material engaging position along the upper surfaces of the fixed floor plate 17.

The upper reach of the conveyor 25 is guided between angle plates 37, 37, fixed to the side walls 15, 15 adjacent the pivot pin 19. In the form shown, said angle plates 37, 37 are relatively short and terminate in an upwardly curved arcuate portion 38, as shown in Figure 2. These angle plates 37, 37 and their terminal portion 38 constitute a hold-down means for the conveyor as it moves along the fixed floor plate 17 and passes on to the floor plate 20 of the vertically swinging conveyor frame 18.

The adjustable conveyor frame 18 is swung vertically by any suitable power means about the transverse axis defined by the pivot pin 19. In the form shown herein, the power means consists of a pair of telescoping jacks 40, 40 pivotally mounted at their lower ends on the forward end of the main frame members 13, 13 just outside of the latter. Said hydraulic jacks have piston rods 41, 41 pivotally connected at their upper ends to the side walls 21, 21 of the conveyor frame 18. Hydraulic power is supplied to the hydraulic jacks 40, 40 through any suitable means under control of the operator, which may be of any suitable form well known in the art.

One or more cross bars 45, 45 may be fixed between the main frame members 13, 13 adjacent the front end of the vehicle in position to form stop members for the side walls 21, 21 of the conveyor frame 18 to limit the downward swinging movement of said frame.

It will be particularly noted from Figures 1 and 2 that the transverse pivot pin 19, about which the frame 18 is swung for vertical adjustment, is located forwardly of, and in close proximity to, the transverse axle structure for the adjacent front wheels 11, 11, which axle structure in the present instance consists of the equalizing bar 12. By reason of this location of the pivot pin, it is possible to lower the conveyor frame 18 to the position indicated in full lines in Figure 2, wherein the floor plate 20 of the adjustable conveyor portion is substantially in

horizontal alignment with the floor plate 17 of the main or fixed portion of the material carrying compartment. In this manner, the floor plate 17 of the material carrying compartment can be lowered to a point where it only requires vertical clearance over the front axle structure, herein consisting of the equalizer bar 12. The front plate 20 of the adjustable conveyor frame can thus be lowered to the same level as the floor plate 17 without interference with the axle structure. Thus, the carrying capacity of the compartment, including the conveyor frame 18, is considerably increased as compared with shuttle car structures of the prior art, wherein the adjustable conveyor frames have been pivoted at a point on the opposite side of the axle structure, so as to limit the amount of depression or lowering of the adjustable conveyor frame.

Although I have shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the 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 my invention to the specific embodiment illustrated, excepting as it may be limited in the appended claim.

I claim as my invention:

In a shuttle car, a main frame including a pair of laterally spaced side frame members, upright side walls and a floor plate fixed on said main frame defining a material carrying compartment extending longitudinally of the car, an endless conveyor movable along said floor plate for discharging material at one end of the car, wheel supporting and driving means for said car including a transverse axle structure connecting the side frame members adjacent the discharge end of the frame and immediately below the level of said floor plate, a vertically swingable elongated frame including upright side walls and a floor plate pivotally mounted at the discharge end of said frame on a transverse axis disposed closely adjacent said transverse axle structure and toward the discharge end of the frame, said vertically swingable frame also supporting a portion of said endless conveyor and forming an extension of said material carrying compartment, with its floor level adjustable from a substantially horizontal alignment with the adjacent fixed floor plate of said car, to an elevated angle with respect to the latter for discharging material from said material carrying compartment in all positions of pivotal adjustment.

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