Feb. 23, 1954

F. E. HRUZA

2,670,217

TWO-LEVEL LOAD-PLATFORM TRANSPORTING VEHICLE

Filed Dec. 4, 1951

2 Sheets-Sheet 1

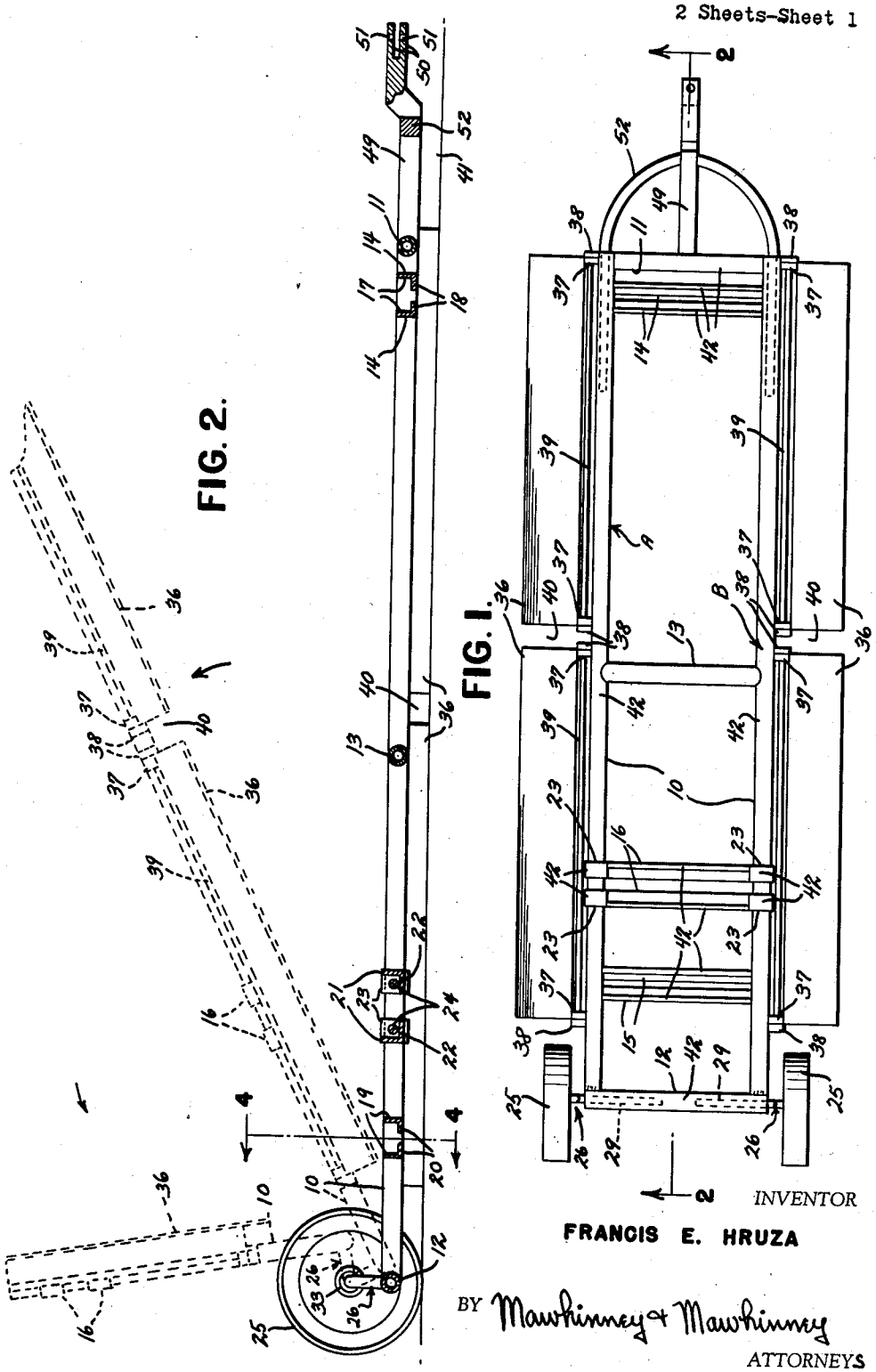


FIG. 1.

FIG. 2.

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2 Sheets-Sheet 2

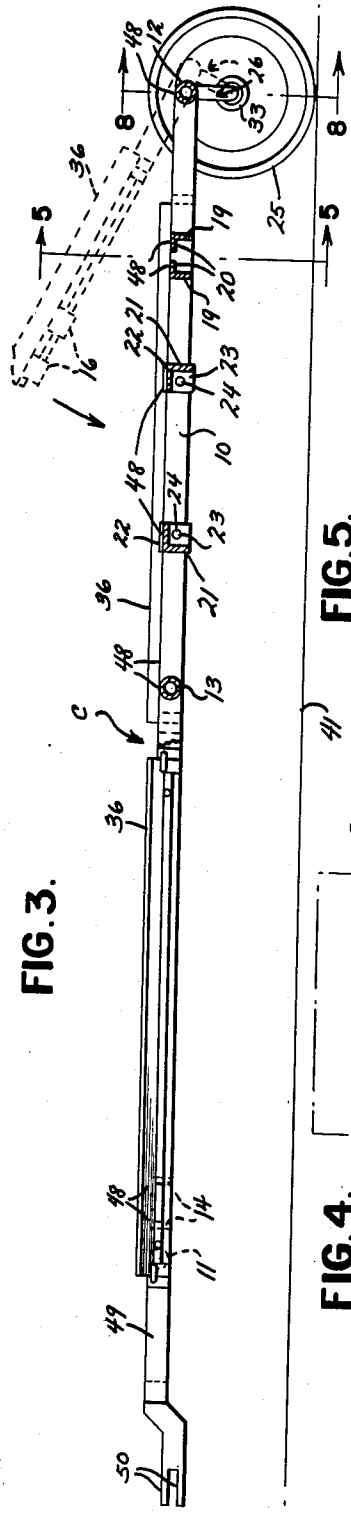


FIG. 3.

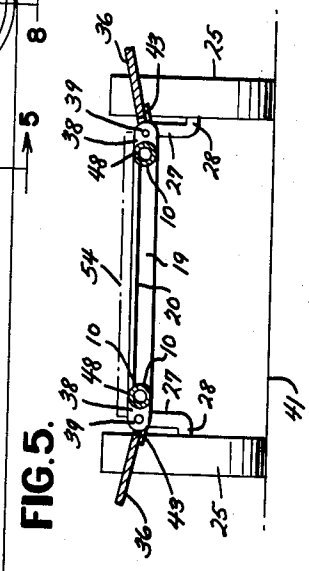


FIG. 5.

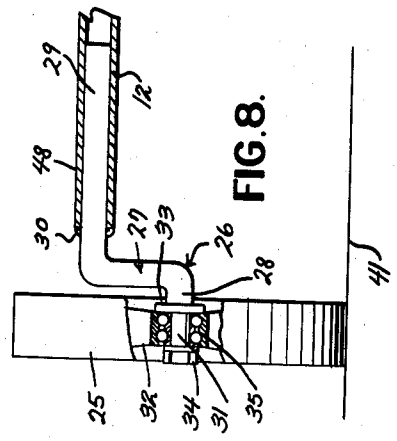


FIG. 8.

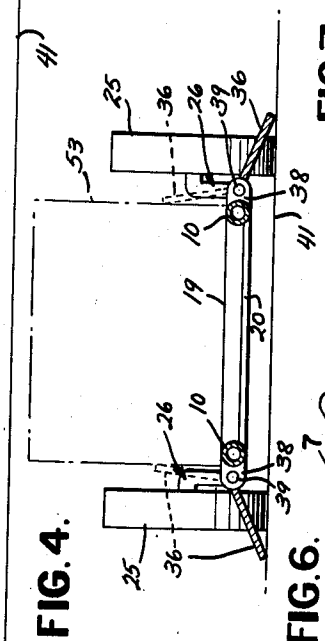


FIG. 4.

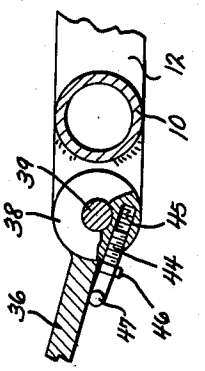


FIG. 7.

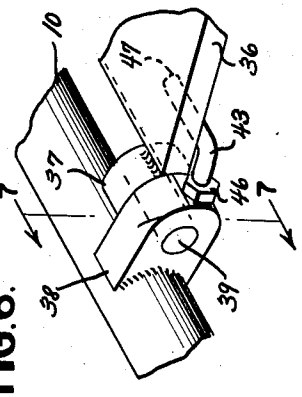


FIG. 6.

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TWO-LEVEL LOAD-PLATFORM TRANSPORTING VEHICLE

Francis E. Hruza, Peetz, Colo.

Application December 4, 1951, Serial No. 259,826

2 Claims. (Cl. 280—43)

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The present invention relates to improvements in a carrier and has for an object the provision of a device of this character which is capable of transporting machinery from place to place, such as, farm machinery.

Another object of the present invention is to provide an improved carrier having obverse and reverse material supporting surfaces and means for supporting the obverse surface at a height which is close to the ground when it is uppermost and the reverse surface at a greater height from the ground when it is uppermost.

A further object of the present invention is to provide an improved device of this kind in which the supporting means serves as a fulcrum upon which the carrier may be moved to reverse the positions of its supporting surfaces.

A still further object of the present invention is to provide an improved carrier having side sections or members which cooperate with the obverse surface of the carrier to provide ramps for loading and unloading the machinery upon and from the carrier and cooperate with the reverse surface to provide a hayrack.

The present invention aims to provide a device of this type in which the supporting surfaces are of open framework construction and in which adjustable means are provided for supporting machinery of various lengths within the overall length of the supporting surfaces.

The present invention also aims to provide an improved carrier in which the supporting means is positioned at the extreme rear end of the carrier so a maximum of clearance or free board is afforded for loading and unloading of articles to be transported upon and from the supporting surfaces.

The present invention contemplates the provision of an improved structure which is light in weight but strong, is economical to manufacture and to maintain in operating condition, comprises relatively few parts and may be handled by one man.

With the foregoing and other objects in view, the invention will be hereinafter more fully described and more particularly pointed out in the appended claims.

In the drawings in which the same parts are denoted by the same reference numerals throughout the several views,

Figure 1 is a plan view of the improved device constructed in accordance with the present invention with the obverse surface uppermost,

Figure 2 is a sectional view taken on the line 2—2 of Figure 1,

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Figure 3 is a longitudinal sectional view of the device with the reverse surface uppermost,

Figure 4 is a sectional view taken on the line 4—4 of Figure 2,

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

Figure 6 is an enlarged fragmentary perspective view of one of the supporting means for the side sections,

Figure 7 is a sectional view taken on the line 7—7 of Figure 6, and

Figure 8 is a sectional view taken on the line 8—8 of Figure 3.

Referring more particularly to the drawings, A generally indicates a supporting frame which may be of substantially rectangular shape and of open framework construction. The frame A may comprise parallel sides 10, a front crosspiece 11, a rear crosspiece 12, an intermediate crosspiece 13, front stationary or fixed cross reinforcing braces 14, rear stationary or fixed cross reinforcing braces 15 and adjustable supporting members 16 which may be mounted on the sides 10 between the crosspiece 13 and the adjacent brace 15.

The sides 10 and the crosspieces 11, 12 and 13 may be made of iron or steel pipe or other suitable material. The front crosspiece 11 extends between the sides 10 and has its opposite ends secured as by welding or the like to the forward portions of the inner faces of the sides 10 and the intermediate crosspiece 13 extends between the sides 10 and has its opposite ends secured in a similar manner to the intermediate portions of the inner faces of the sides 10.

The braces 14 may be of angle iron shape in cross section and each has a vertical flange 17 and a horizontal flange 18. The braces 14 extend between the sides 10 adjacent to the crosspiece 11 but rearwardly thereof and have their opposite ends secured to the inner faces of the sides 10. The rear braces 15 may also be of angle iron shape in cross section and each has a vertical flange 19 and a horizontal flange 20 and extends between the sides 10 adjacent to but forwardly of the rear crosspiece 12. The opposite ends of the braces 15 may be secured to the inner faces of the sides 10 by welding or the like.

The braces 14 may be arranged adjacent each other and the horizontal flanges may extend towards each other and the braces 15 may be arranged in a similar manner.

The adjustable supporting members 16 may be of angle iron shape in cross section and each has a vertical flange 21 and a horizontal flange 22.

A collar 23 is secured as by welding or the like to each end of each brace 16. The collars 23 may be substantially semi-circular in shape and engage over and are adapted to slide over the sides 10. Each collar carries on its inner side a set screw 24 which is adapted to be screwed into tight frictional engagement with its side 10 to hold its brace 16 firmly in its adjusted position. The inwardly extending headed end portions of its set screws 24 are housed within the space formed by the vertical and horizontal flanges of its brace 16 so that the set screws are protected against damage by the machinery being transported and against accidental loosening.

The rear crosspiece 12 has the forward faces of its opposite end portions secured as by welding or the like to the open rear ends of the sides 10 so that the entire crosspiece 12 extends rearwardly of the extreme rear end of the sides 10. The length of the crosspiece 12 may be such that its opposite ends lie substantially flush with the outer faces of the sides 10.

Ground engaging or supporting wheels 25 are rotatably mounted on crank axles generally indicated at 26. Each crank axle comprises a crank arm 27 from one end of which a wheel mounting portion 28 extends outwardly and from the opposite end of which an elongated shank 29 extends inwardly. The major portion of each shank 29 is received by the adjacent end portion of the rear crosspiece 12 and has a tight fit therein to afford a substantial purchase therein. The shanks 29 may be further secured by welding 30 or the like to the crosspiece 12 to prevent relative rotation between the crank axles and the crosspiece 12.

The portion 28 of each crank axle has its outer part 31 of reduced diameter which extends through a suitable opening in a hub 32 of its wheel 25. A washer 33 carried by the portion 28 of each crank axle engages the inner face of its wheel 25 to prevent inward movement of the wheel and the outer extended end portion of each part 31 is screw threaded to receive a nut 34 for preventing outward escape of the wheel 25 from the crank axle. Ball bearings 35 of the conventional type may be mounted in the opening of the hub of each wheel to assure free relative rotation between the wheels 25 and the crank axles 26.

There are two side section members or ramps 36 pivotally mounted on each side 10. Each of the members 36 may be in the form of a plate of substantially rectangular shape and may be made of steel or other appropriate material. Each member 36 is disposed with its inner long side in spaced parallel relation to its adjacent side 10 and has an apertured lug 37 extending inwardly from its inner side adjacent each end thereof. The lugs 37 may be formed integral with the members 36 or they may be secured thereto by welding or the like. Cooperating pairs of apertured lugs 38 are secured to the outer face of each side 10 by welding or the like. A pivot rod 39 extends through the aligned apertures in each pair of lugs 38 and the cooperating lugs 37 of the adjacent member 36 for pivotally supporting each member 36 on its side 10. It will be noted from Figures 1, 2 and 3 of the drawings that there is a space 40 between the adjacent ends of the members 36 on each side of the frame A.

When the obverse supporting surface of the frame A, which is generally indicated as B, is uppermost as illustrated in Figures 1, 2 and 4 of the drawings, the members 36 will extend outwardly and downwardly so that the outer free edge portions of the members 36 will engage the ground 41 to serve as ramps by which machinery or the like may be loaded upon or unloaded from the obverse surface of the carrier. The surfaces 42 of the frame A of the collars 23 comprise the obverse supporting surface B.

In order to support the members 36 in the outwardly and upwardly inclined position shown in Figures 3, 5, 6 and 7 of the drawings when the reverse supporting surface of the frame A which is generally indicated at C is uppermost, locking pins 43 are provided. Each locking pin 43 is substantially L-shaped and one leg of which is screw threaded as at 44 to be partially received by a screw threaded socket 45 formed in each of the lugs 38 to that side of the aperture therein which is closer to the obverse surface B.

A lock nut 46 is received by the threaded part of the pin 43 which extends from the socket 45. The other leg 47 of the locking pin 43 constitutes a supporting leg and engages the member 36 to retain it in its upwardly and outwardly inclined position to form sides and to cooperate with the reverse supporting surface C to provide a hayrack. The surfaces 46 of the frame A comprise the reverse supporting surface.

A draft bar 49 has its rear end secured as by welding or the like to the intermediate portion of the forward face of the front crosspiece 11 and it extends forwardly therefrom. The forward end portion of the draft bar is vertically offset from the horizontal plane of the main body portion of the draft bar and is bifurcated to provide vertically spaced apart legs 50 having vertically aligned openings 51 for the reception of a pin by which the carrier may be hitched to a tractor or the like.

A yoke 52 has its opposite free end portions received by the forward open end portions of the sides 10. The end portions of the yoke have a tight fit in the sides 10 to afford a substantial purchase therein and they may be secured therein by welding or the like. The intermediate portion of the yoke is received by a suitable opening in the draft bar 49 immediately to the rear of the offset forward end of the draft bar to support it at this point.

In the use of the device, assuming that it is desired to transport some machinery from one place to another the frame A will be swung on the wheels 25 as a fulcrum to the full line position illustrated in Figures 1, 2 and 4 of the drawings in which the obverse supporting surface B is uppermost and the ramps 36 are resting on the ground 41 and the locking pins 43 may be removed or rotated out of the path of the machinery.

The machinery will then be rolled up the ramps 36 from either side of the frame and it will be noted that the obverse surface is only a relatively short distance above the ground 41 so that the vertical distance through which the machinery must be moved is small and the inclination of the ramps is slight. It will also be noted that the supporting wheels 25 will offer a minimum of obstruction to the movement of the machinery upon the frame A so that a maximum of clearance or free board is afforded for the loading or unloading of the carrier and for the receiving and supporting the material to be transported. This is made possible by location of the rear crosspiece 12 which supports the wheels rearwardly of the rear end of the sides 10.

In order to more adequately support machinery of different length the members 16 may be ad-

justed along the sides 10 by loosening the set screws 24 and sliding the collars 23 along the sides 10 to the desired location. The set screws 24 will then be tightened against the sides 10 to hold the members 16 in their newly adjusted positions. When the machinery has been loaded upon the frame A, the ramps 36 may be swung up to the dotted line position shown in Figure 4 against the opposite sides of the machinery 53 shown in phantom lines.

When it is desired to use the carrier as a hayrack or for hauling feed, the draft bar 49 is unhitched and the frame A will be swung from the full line position shown in Figure 2 in the direction of the arrows through the dotted line positions shown in Figures 2 and 3 to the full line position illustrated in Figure 3 in which the reverse supporting surface C is uppermost. This movement may be effected by one man as the wheels 25 will support the frame A and the bearings 31 in the hubs 32 of the wheels 25 will serve as pivots on which the parts 31 of the crank axles will rotate. The frame A will now be at a much greater height above the ground 41. Boards 54 may be placed longitudinally upon the crosspieces and braces to form a floor.

The sections 36 may be supported in the outwardly and upwardly inclined position shown in Figures 5, 6 and 7 of the drawings by loosening the lock nuts 46 and rotating the locking pins 43 until the legs 47 thereof engage the underface of the sections 36. The lock nuts 46 are then tightened to hold the pins 43 in their supporting position.

The locating of the mounting for the supporting wheels 25 at the extreme rear end of the frame permits the frame to be swung about on the hubs of the wheels as fulcrums through substantially 180 degrees to its two positions of use without the rear end of the frame striking the ground and without the necessity of raising the wheels or the frame.

When the frame is in its lowermost position the offset hitching portion of the draft bar is offset upwardly and when the frame is in its uppermost position the offset hitching portion of the draft bar is offset downwardly so that when hitched to a vehicle the level horizontal plane of the supporting surface will be maintained as nearly level as possible.

The carrier is adapted to transport farm machinery, such as, spring tooth, rod weeder and drill, but it is not limited to transporting this type of machinery. The carrier may be made of any desired size and shape, for example, the sides 10 and the crosspieces 11, 12 and 13 may be made of pipe having a diameter of 4 inches. The length of the frame may be about 18 feet and the width 4 feet. Each ramp 36 may be made of steel plate ¼ inch thick, about 8 feet long and 1½ feed wide. When the obverse supporting surface is uppermost the frame A will clear the ground by about five inches and when the reverse supporting surface is uppermost the frame A will clear the ground by about two feet. These clearances may be altered by changing the length of the crank arms 27.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What I claim is:

1. A carrier comprising a reversible frame having an obverse material supporting surface and a reverse material supporting surface, means supporting said frame during movements of translation and serving as supporting fulcrums for the frame when the frame is being reversed to bring its obverse and reverse surfaces selectively uppermost and to low and high elevations with respect to the ground, said means comprising a pair of crank axles each having a shank fixedly carried by the frame and a bearing portion, a ground engaging wheel rotatably mounted upon the bearing portion of each axle the shank of each axle being eccentric to its bearing portion, the upper face of at least the low elevation supporting surface being unobstructed throughout substantially the entire length of the frame and disposed in substantially one plane and said wheels being disposed adjacent one end portion of the frame so that there is provided an unobstructed free board throughout substantially the entire length of the frame to permit side loading of the material to be transported upon said low elevation supporting surface.

2. A carrier comprising a reversible frame having an obverse material supporting surface and a reverse material supporting surface, means supporting said frame during movements of translation and serving as supporting fulcrums for the frame when the frame is being reversed to bring its obverse and reverse surfaces selectively uppermost and to low and high elevations with respect to the ground, said means comprising an axle having a part fixedly carried by the trailing end of the frame, shank and bearing portions fixed to said part, a ground engaging wheel rotatably mounted upon each bearing portion, each shank portion being eccentric to its bearing portion, the upper face of at least the low elevation supporting surface being unobstructed throughout substantially the entire length of the frame and disposed in substantially one plane and said wheels being disposed adjacent said trailing end of the frame so that there is provided an unobstructed free board throughout substantially the entire length of the frame to permit side loading of the material to be transported upon said low elevation supporting surface.

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