March 14, 1967 G. R. WALTERS ETAL 3,308,565

PROTECTIVE SHIELD ON EARTH-CARRYING SCRAPER

Filed Nov. 18, 1964 2 Sheets-Sheet 1

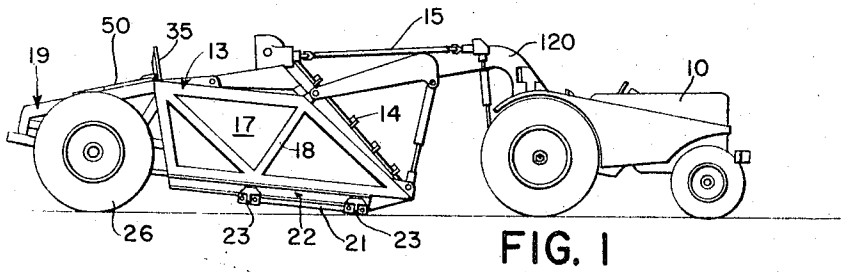


FIG. 1

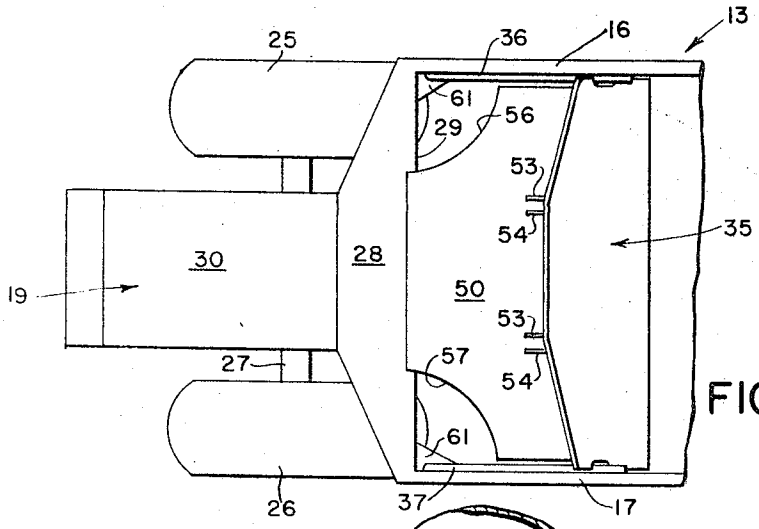


FIG. 2

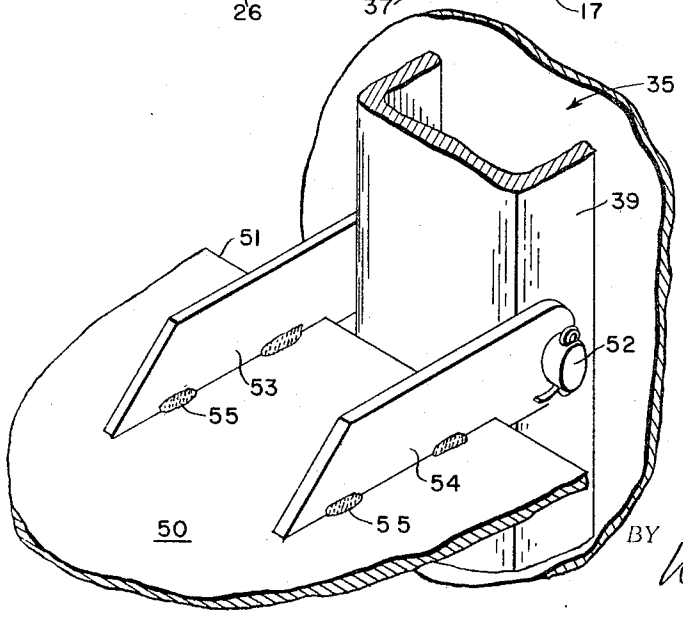


FIG. 5

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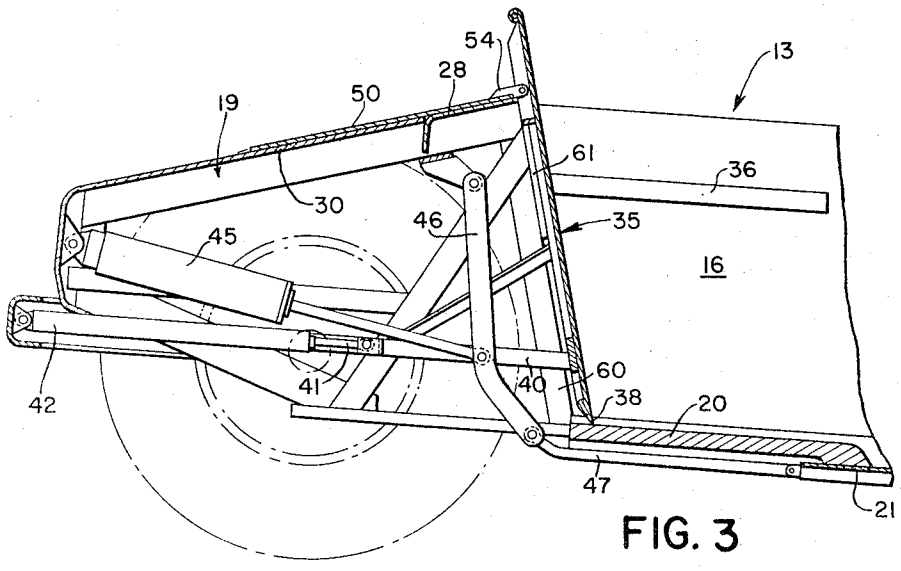


FIG. 3

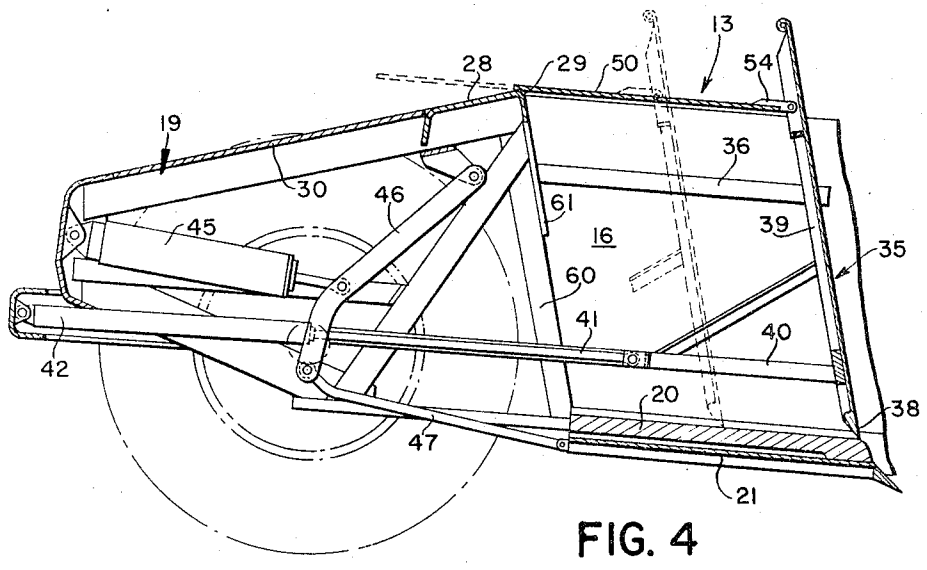


FIG. 4

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PROTECTIVE SHIELD ON EARTH-CARRYING SCRAPER

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4 Claims. (Cl. 37—129)

This invention relates to a material scraper and more particularly to a scraper bowl or material carrier utilizing a rear push-off or ejector plate adapted to move forwardly for driving material out of the forward end of the bowl. Still more particularly this invention relates to a protective shield connected to the rear side of the ejector plate and effective to cover the gap left by the ejector plate as it moves forwardly.

In one of the more conventional type of material carriers, the carrier bowl is composed of transversely spaced upright sides interconnected by a floor structure and having a main frame with a rear frame portion disposed centrally and generally behind the bowl sides. Closing the rear end of the bowl is an upright ejector plate adapted to move forwardly and rearwardly in the bowl for the purpose of ejecting material out of the front end of the bowl. Also utilized in many of these types of scrapers is an elevator disposed in the forward open end of the bowl and operating in complementary relation with a forward cutting edge to move earth, stones, and other material into the rear portion of the bowl.

In this type of scraper, when discharging material and when using the elevator flights for purposes of discharge, material will move over the upper edge of the ejector plate and into the area behind the plate. This creates a double problem. First, the power means, which normally consists of some type of linkage and hydraulic cylinders, for moving the ejector plate forwardly is positioned behind the ejector plate and material moving over the upper edge of the ejector plate will oftentimes pass onto the linkage or hydraulic cylinders and do damage. Second, there is a certain amount of structural framework behind the ejector plate. As material moves over the ejector plate, it will often become lodged in this framework and upon the ejector plate being forced rearwardly, it will be positioned between the framework and the rear surface of the ejector plate. This, of course, causes considerable damage to the plate, framework, and/or the power means for operating the ejector plate.

With the above in mind, it is the primary purpose of the present invention to provide a laterally disposed shield on the rear surface of the ejector plate that extends rearwardly beyond the forward end of the rear framework. The shield slidably engages the upper portion of the framework rearward of the ejector plate. As the ejector plate moves forwardly, the shield covers the gap between the extended ejector plate and the frame and thereby prevents materials moving onto the shield from passing into the gap.

It is still a further object of the invention to specifically connect the aforementioned shield to the rear surface of the ejector plate by transverse horizontal hinge means so as to permit the shield to raise and lower on the forward portions of the rear framework and to take various positions depending upon the forward location of the ejector plate.

Other objects and advantages of the present invention will become apparent to those skilled in the art as the nature of the invention is better understood from the following description and as shown in the accompanying drawings.

FIG. 1 is a side view of a scraper and tractor utilizing the features of the present invention.

FIG. 2 is a plan view of a rear portion of the scraper.

FIG. 3 is a vertical sectional view of the rear portion of the scraper.

FIG. 4 is a view similar to FIG. 3 but showing the ejector plate in its front ejecting position.

FIG. 5 is a side perspective view of the hinge connection between the protective shield and the rear portion of the ejector plate.

The scraper fundamentally is of the type shown in concise and detailed manner in U.S. Patent 3,048,933 which issued to Mr. Clarence T. Rasmussen and John H. Creighton on August 14, 1962.

The scraper is normally pulled forwardly by a tractor **10** and includes a material carrier connected to the tractor by a goose neck draft member or tongue **120**. The carrier includes a material-carrying bowl **13** open at its forward side except for a material elevating conveyor **14** supported on the bowl **13** and driven by a power take-off drive transmission, indicated in its entirety by the reference numeral **15**.

The material-carrying bowl is composed in part of left and right upright sides **16**, **17** carried on outboard superstructure, such as at **18**, serving as part of the main frame for the bowl. The main frame also includes a rear frame portion **19** rearwardly of the sides and centrally located therebetween. The bowl **13** has a floor structure composed of a rear portion **20** fixed to the sides **16**, **17** and a forward portion **21** slidable under the rear portion **20**. Tracks **22** are provided on the lower edges of the side walls **16**, **17** and the forward floor portion **21** is provided with roller structures **23** engaging the tracks **22**.

The rear frame portion **19** is supported on left- and right-hand transport wheels **25**, **26** on opposite sides thereof and generally within the confines of the planes of the walls **16**, **17**. The rear frame portion **19** includes various structural members of conventional nature including an axle **27** extending to the respective wheels **25**, **26**. The frame portion **19** also includes a forwardly positioned structural plate **28** harving a forward transverse edge flange **29** defining the extreme forward upper end of the rear frame portion **19**. Extending rearwardly from and connected rigidly with the plate **28** is an overlying plate member **30** defining with the plate **28**, an upper inclined side of the frame portion **19** terminating at the front upper transverse edge **29**.

Closing the rear end of the bowl **13** is an upright ejector plate **35** guided for fore-and-aft movement relative to the bowl by fore-and-aft extending tracks **36**, **37** on the respective sides **16**, **17**. The ejector plate **35** has a lower edge **38** engaging the upper surface of the rear floor portion **20**. The plate **35** extends the full width of the bowl and has opposite upright edges disposed closely adjacent the respective side walls **16**, **17**. The ejector plate **35** extends upwardly beyond the upper edges of the side walls **16**, **17**, the upper portion serving as a dirt shield preventing most material from moving over the ejector plate **35**. The ejector plate **35** has a pair of upright channels **39** welded to its rear surface and serving as structural reinforcement for the plate **35**. The plate **35** has welded to its rear side adjacent a lower portion thereof a vertically disposed and rearwardly projecting strut structure **40**. The rear portion of the strut structure **40** is connected to the forward end of a rod **41** extending into an hydraulic cylinder **42**, the latter being anchored on the frame portion **19**. Extension and retraction of the rod **41** into and out of the cylinder **42** effects fore-and-aft reciprocation of the plate **35**. Consequently the hydraulic cylinder **42**, rod **41**, and strut structure **40** may be treated as the means for moving the ejector plate.

Also provided under the plates 28, 30 and in the rear frame portion 19 is means for moving the floor portion 21 fore and aft. Basically the latter means is composed of a centrally located hydraulic ram and cylinder 45 anchored at its rear end to the frame structure 19 and pivotally connected at its forward end to a lever 46, the latter having its lower end driving a link 47 connected at its forward end to the rear edge of the floor portion 21. As may be clearly evident from viewing FIGS. 3 and 4, extension and retraction of the hydraulic ram and cylinder means 45 affects the fore-and-aft disposition of the floor portion 21.

In the forward position of the ejector plate 35, as shown in FIGS. 2 and 4, much of the structure for moving the ejector plate fore and aft, as well as the linkages for moving the floor portion 21 fore and aft, would normally be exposed from above. Serving the purpose of covering the gap left by the ejector plate is a laterally disposed plate or shield 50 having a forward transverse edge 51 disposed closely adjacent the channels 39. The plate or shield 50 is of sufficient length to extend rearwardly and overlie the rear frame portion 19. The shield 50 is relatively wide to cover the expanse between walls 16, 17 at its forward end and is arcuately recessed or tapered at 56, 57 at its rear corners so as to accommodate the wheels 25, 26 when in its rearward position, the latter occurring when the ejector plate 35 is in its rear position.

The plate or shield 50 is connected to each of the upright channels 39 by means of a hinge pin 52 extending through the respective channel 39 and a pair of hinge brackets 53, 54 welded at 55 to the surface of the plate 50. As may be clearly evident, the entire plate 50 may, therefore, swing vertically and conform to various vertical positions that may occur as the plate 35 moves forwardly. Specifically, the plate or shield 50 is a flat member and engages the upper forward edge 29 of the rear frame portion 19. The hinge pins 52, as well as the other hinge structure, is slightly above the edge 29 and is at sufficient height to permit the shield 50 to rest on top of the plate portions 30 and 28 when the ejector plate 35 is at its full retracted position. However, as the ejector plate 35 is advanced away from the retracted position, the plate 50 will ride on the edge 29 of the plate 28. In its fully extended position, as shown in FIG. 4, the plate 50 will be almost fully utilized to cover the gap between the ejector plate 35 and the edge 29.

The plate 50 operates to prevent material being thrown over the ejector plate 35, either by the elevator 14 or other ways, from gravitating into the gap between the ejector plate and the frame portion 19. In this respect, it should be recognized that there are various upright frameworks such as upright beam 60, and gusset plates 61 at the rear edge of the sides 16, 17. Normally these frameworks extend into the area between the sides and consequently behind the ejector plate 35. Should material fall between the ejector plate and the frameworks portions 60, 61, they will wedge between them and the rear portion of the ejector plate 35. Consequently upon the ejector plate 35 being retracted, considerable load is created by the cylinders 45, oftentimes sufficiently large to cause the ejector plate 35 to warp or bend due to the pressure of the material between the plate 35 and the frame portions 60, 61. As mentioned also, it is desirable to use the shield 50 for preventing material from passing over the ejector plate 35 and contacting such members as the rods 41, or cylinders 42, 45, or links 46, 47.

While only one form of the invention has been shown, it should be recognized that other forms and variations will occur to those skilled in the art without departing from the spirit of the invention. Therefore, while the preferred form has been shown and described in concise and detailed manner for the purpose of clearly and concisely illustrating the principles of the invention, it should

be understood that there is no intention to limit or narrow the invention beyond the broad concepts set forth in the appended claims.

What is claimed is:

1. In an earth-moving carrier including a forwardly opening earth-moving carrier bowl having a pair of transversely spaced upright sides with a floor structure extending between the sides, a frame including a rear frame portion rearwardly of the sides and centrally located relative thereto with a forward upper edge section extending between the sides, a transverse upright ejector plate positioned between the side walls and adapted to move fore and aft relative to the bowl to effect discharge of material forwardly of the bowl, power means between the frame rear portion and ejector plate for moving the ejector plate between a rear position in close proximity to the frame rear portion and an advanced position spacedly forwardly of the frame rear portion, the combination therewith of a laterally disposed shield supported for sliding movement on the frame rear portion and having a front edge portion closely adjacent the ejector plate; and transverse horizontal hinge means connecting the front edge portion to the ejector plate whereby the shield will move with the ejector plate is it moves to and from its rear position and the underside thereof will engage and slide over the upper edge section of the frame rear portion to thereby cover the gap between the ejector plate and upper edge section.

2. On a material carrier including a carrier bowl having a pair of upright sides interconnected by a floor structure and a rear upright ejector plate extending between the sides and above the floor, a frame for the bowl including a rear portion disposed behind the ejector plate with a forward transverse edge closely adjacent the ejector plate, and a pair of transversely spaced transport wheels supporting the rear portion of the frame, and power means between the rear portion and ejector plate for moving the latter fore and aft, the combination therewith of a laterally disposed shield extending across the bowl between the sides rearwardly of the ejector plate with a forward edge portion closely adjacent the ejector plate and extending rearwardly therefrom in an overlying relation to the frame rear portion and beyond the forward transverse edge of the frame rear portion, the shield further having rear outer recessed portions for accommodating the wheels; means hingedly connecting the forward edge portion of the shield to the back of the ejector plate to swing vertically whereby the shield member may engage and slide on the forward edge of the rear frame portion as the ejector plate is moved to and from its rearwardmost position and the shield will close from above the gap between the ejector plate and the rear frame portion.

3. In an earth-moving carrier including a forwardly opening earth-moving carrier bowl having a pair of transversely spaced upright sides with a floor structure extending between the sides and terminating at a front transverse edge, a frame including a rear frame portion rearwardly of the bowl with an inclined upper side terminating at an upper forward edge, a transverse upright ejector plate positioned between the side walls and adapted to move fore and aft relative to the bowl and for ejecting earth over the front transverse edge, power means between the frame rear portion and ejector plate for moving the ejector plate between a rear position in close proximity to the frame rear portion and an advanced position spacedly forwardly of the frame rear portion, the combination therewith of a laterally disposed shield having a front portion connected to the ejector plate by transverse hinge means at a height thereon and in relation to the rear frame portion whereby the shield will rest on the upper side upon the ejector being in its rear position and will ride on said upper forward edge when in advanced position, the shield extending rearwardly from the plate to overlie the rear

frame portion whereby the shield will move with the ejector plate as the latter moves to and from its rear position to cover the gap and overlie the power means between the ejector plate and frame rear portion.

4. In an earth-moving carrier including a forwardly opening earth-moving carrier bowl having a pair of transversely spaced upright sides with a floor structure extending between the sides and terminating at a front transverse edge, a frame including a rear frame portion rearwardly of the bowl, a transverse upright ejector plate positioned between the side walls and adapted to move fore and aft relative to the bowl and for ejecting earth over the front transverse edge, transversely spaced wheels supporting the rear frame portion and disposed at least partially within the confines of rearward extensions of the planes of the side walls, power means between the frame rear portion and ejector plate for moving the ejector plate between a rear position in close proximity to the frame rear portion and an advanced position spacedly forwardly of the frame rear portion, the combination

therewith of a laterally disposed shield having a front portion connected to the ejector plate and extending rearwardly therefrom to overlie the rear frame portion whereby the shield will move with the ejector plate as the latter moves to and from its rear position to cover the gap and overlie the power means between the ejector plate and frame rear portion, the shield being recessed at its rear outer portions for accommodating the wheels when the ejector plate is at its rear position.

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