

[54] **SCRAPER**
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 [51] Int. Cl.² **E02F 3/60**
 [58] Field of Search 172/26.5, 745, 771; 37/71, 37/118

[57] **ABSTRACT**

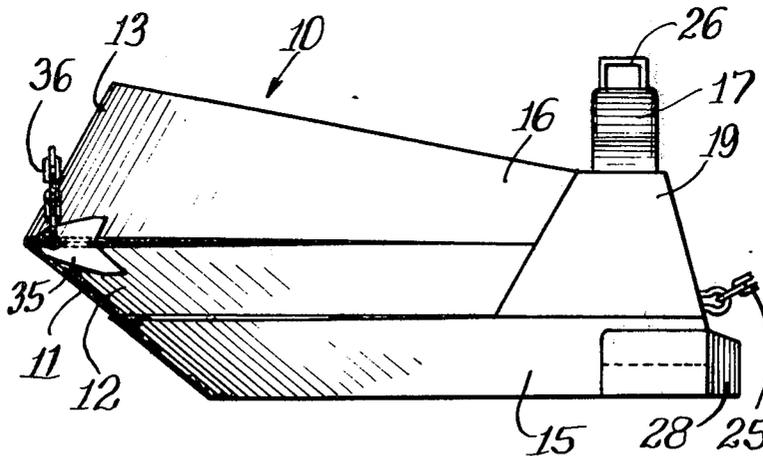
A scraper construction defining a bottomless scraper adapted to be drawn along the upper surface of material to be excavated for delivering the scraped material to a desired delivery position. The scraper includes an arcuate rear wall having a wearing blade removably welded to a bottom portion of the rear wall. A box girder bail is secured at its opposite ends to forwardly extending side portions of the arcuate rear wall. The rear wall may include a belt plate which is flush with the front surfaces of the lower and upper portions of the rear wall to provide facilitated movement of material thereover during the scraping operation.

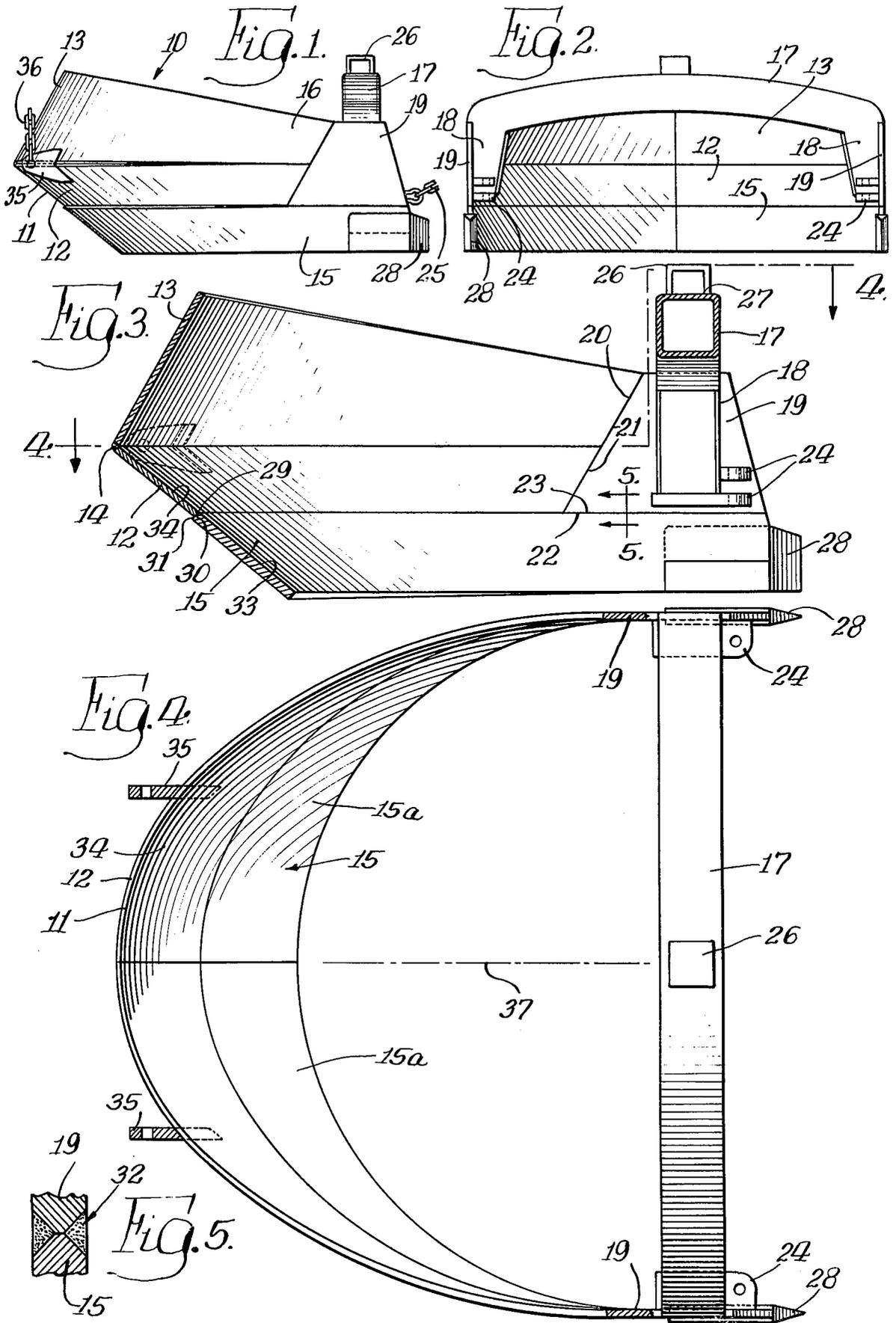
[56] **References Cited**

UNITED STATES PATENTS

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13 Claims, 9 Drawing Figures





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SCRAPER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to material handling means and in particular to scrapers.

2. Description of the Prior Art

An improved form of scraper is shown in U.S. Pat. No. 1,481,273 of Harry A. Roe, which patent was assigned to the predecessor in title of the assignee hereof. As disclosed in the Roe patent, an improved scraper bucket was provided with a generally curved form in plan and cross section for providing an improved scraping action as the scraper bucket was drawn by a cable or the like along the upper surface of material to be excavated. The scraper bucket is unloaded by withdrawing it rearwardly or lifting it after it has been drawn to the desired discharge position, thereby leaving the scraped material at the discharge position and permitting the bucket to be brought back to the excavation point for further scraping operation.

Such scrapers have been improved over the years by the assignee hereof for use with drag scraping machines to provide an improved economical method of excavating and conveying scrapable material. Such improved scrapers are being presently marketed by the assignee hereof under the trademark CRESCENT and are available in a large range of sizes, such as $\frac{1}{2}$ cu.yd. scrapers to 12 cu.yd. scrapers, or larger. Such scrapers vary in weight from approximately 325 lbs. to over 5 tons.

In such scrapers, it is desirable to provide a removable wearing blade as the lowermost portion of the device so as to provide extended useful life thereof. It has been conventional heretofore to secure such removable wearing blades to the lower portion of the scraper body by riveting.

In the scraper bucket of the Roe patent discussed above, the drag line cables were secured to the forwardly extending side portions of the bucket and to a ring at the rear of the bucket for rearward movement of the bucket. To provide for improved control of the scraper bucket, such scraper buckets have been provided with a bail extending over the material receiving space at the front end of the scraper bucket. The bail has been provided with connecting brackets secured to the upper surface thereof for connection of control cables and the like thereto.

In providing improved scraper bucket construction, a number of the scraper portions have been welded together.

SUMMARY OF THE INVENTION

The present invention comprehends an improved scraper construction which is extremely simple and economical while yet providing an improved low maintenance design.

More specifically, the invention comprehends providing such a scraper with a removable wearing blade which is welded to the bottom portion of the body rear wall for facilitated maintenance. The wearing blade may comprise a pair of side portions welded together along the centerline of the scraper and, in turn, welded in edgewise abutment to the lower edge of the rear wall of the body. While such welded assembly provides for facilitated removal of the wearing blade for replacement thereof, such welded construction further provides for a flush arrangement of the front surface of the

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wearing blade relative to the body wall to provide facilitated movement thereover and improved overall scraping action.

In one form of the invention, the scraper is provided with an arcuate belt plate between the lower and upper rear wall portions of the body which has its front surface flush with the contiguous surfaces of the lower and upper wall portions and which is welded therebetween to provide an improved rigid, long life body construction.

The invention further comprehends an improved bail construction for use in such a scraper wherein the bale comprises a box girder having a flat top surface. The bale provides improved rigidity to the scraper at the spaced forward end portions of the body and permits facilitated installation of suitable brackets and the like on the flat top surface for further improved economy in construction and facilitated maintenance in the use thereof. The bail may be secured to the forward side portions of the scraper body by welding and more specifically, may be secured thereto by suitable bevel welds for providing facilitated movement of material thereover in the scraping operation.

BRIEF DESCRIPTION OF THE DRAWING

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

FIG. 1 is a side elevation of a scraper embodying the invention;

FIG. 2 is a front elevation thereof;

FIG. 3 is a longitudinal vertical section thereof;

FIG. 4 is a top plan view thereof partially in section, taken along the line 4—4 of FIG. 3;

FIG. 5 is a vertical section taken substantially along the line 5—5 of FIG. 3;

FIG. 6 is a side elevation of a modified form of scraper embodying the invention;

FIG. 7 is a front elevation thereof;

FIG. 8 is a longitudinal vertical section thereof; and

FIG. 9 is a top plan view thereof partially in section taken along the line 9—9 of FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the exemplary embodiment of the invention as shown in FIGS. 1-5 of the drawing, a scraper generally designated 10 is shown to comprise a body 11 defining a rear wall having a lower portion 12 and an upper portion 13. Rear wall 11 is arcuate and more specifically, each of wall portions 12 and 13 is generally conical. Wall portions 12 and 13 are secured in edgewise abutment by a suitable weld 14, as best seen in FIG. 3, to provide a rigid, generally U-shaped, forwardly opening body, as shown in FIG. 4. Scraper 10 further includes a removable wearing blade 15.

Body 11 further defines forwardly extended opposed side portions 16, which in the illustrated embodiment, are interconnected by a box girder bail 17. The bail defines downturned end portions 18 secured to the side portions 16 of the body by suitable front plates 19. Each front plate 19 defines a rear edge 20 welded to the front edge 21 of the wall portions 12 and 13. Each front plate further defines a bottom edge 22 welded to the top edge 23 of the wearing blade 15 at the front end thereof. Suitable chain attachment lugs 24 may be secured to the downturned ends 18 of the bail at the op-

posite sides of the scraper for attachment of a suitable drag chain 25 thereto as shown in FIG. 1.

A suitable bracket 26 may be secured to the flat upper surface 27 of the bail for use with an additional control line for facilitated manipulation of the scraper in the scraping operation.

As best seen in FIG. 4, runner shoes 28 may be welded to the front end of the body side portions for facilitating loosening of the material to be excavated during the scraping action. In the illustrated embodiment, the wearing blade 15 is shown without teeth, it being understood that suitable lug-type teeth may be secured to the wearing blade to project downwardly and forwardly therefrom for loosening the material to be excavated or scraped.

Wearing blade 15 comprises an arcuate element which, as best seen in FIG. 3, is generally conical. The upper edge 29 of the wearing blade is welded to the lower edge 30 of the lower body weld portion 12 by a suitable bevel weld 31. Similarly, the welding of the lower edge 22 of the front plate 19 to the top edge 23 of the wearing plate may be by a bevel weld 32, as illustrated in FIG. 5.

As shown in FIG. 3, the front surface 33 of the wearing blade is flush with the front surface 34 of the lower body rear wall portion 12 so as to facilitate movement of material thereover during the scraping operation.

Additional lugs 35 may be provided on the rear of the body 11, as shown in FIGS. 1 and 4, such as for attachment of suitable drag lines 36 adapted for effecting rearward or upward movement of the scraper in returning the scraper to the excavation site. Lugs 35 may be welded generally symmetrically to each of the body portions 12 and 13 where the scraper is intended for upward withdrawal use, the lugs being disposed on the lower portion of the scraper where the scraper is arranged for rearward withdrawal.

The wearing blade may comprise a pair of sections 15a and 15b welded along the centerline 37 of the scraper to define the wearing blade element. The wearing blade is adapted to be readily removed from the scraper for maintenance purposes, such as for replacement of a worn wearing blade, when desired. Thus, the worn wearing blade may be cut free from the body bottom wall edge 30, and a new wearing blade installed by provision of the above described improved bevel weld for extended life of the scraper.

The box girder bail 17 provides an improved rigid construction while concurrently permitting facilitated installation of suitable brackets, such as bracket 26, to the flat upper surface thereof for improved low cost manufacture of the scraper.

Referring now to the embodiment of FIGS. 6-9, a modified form of scraper generally designated 110 is shown to comprise a scraper generally similar to scraper 10 but having a body 111 provided with a belt plate 138 welded to the lower edge 139 of the upper wall portion 113 and the upper edge 140 of the lower wall portion 112. Belt plate 138 is generally cylindrical, as best seen in FIG. 8, and defines a front, or inner, surface 141 which is flush with the front surface 142 of upper wall portion 113. Thus, as shown in FIG. 8, the belt plate 141 may be secured to the wall portions 112 and 113 by a suitable bevel weld 114 at the rear of the abutment therebetween. The wearing blade 115 in scraper 110 is illustrated with suitable digging teeth 143 which may be suitably secured thereto as by bolt-

ing, welding, riveting, etc., as desired. As indicated above relative to scraper 10, the wearing blade may be selectively provided with or without such teeth as desired within the scope of the invention.

The front plates 119 are further secured to the front edge 144 of belt plate 138 by weldment of the rear edge 120 thereto as well as to the front edges 121 of the lower and upper wall portions 112 and 113, as shown in FIG. 8.

The rear cable lugs 135 may be welded to the belt plate 138, as best seen in FIG. 6.

Thus, scraper 110 is similar to scraper 10 and is identified by reference numerals which are similar to the reference numerals identifying corresponding elements of scraper 10, but 100 higher. Scraper 110 functions in substantially the same manner as scraper 10 in providing an improved low cost, low maintenance, long lived scraper construction permitting facilitated replacement of the wearing blade, as desired.

In each of the embodiments, the wearing blade is preferably thicker than the lower wall portion to which it is welded. In the illustrated embodiments, the wearing blade illustratively has a thickness of twice the thickness of the lower wall to provide extended useful life of the wearing blade, minimizing the necessity for replacement thereof. More specifically, illustratively, in the 2 cubic yard scraper construction, the wearing blade is provided with a thickness of 1 inch and the lower wall portion was provided with a ½ inch thickness.

The wearing portions of the scraper, such as the lower body wall portion and wearing blade, are preferably formed of a 0.40-0.50 carbon steel or other suitable abrasion-resistant steel. The upper wall portion may be formed of a mild steel, as desired.

The foregoing disclosure of specific embodiments is illustrative of the broad inventive concepts comprehended by the invention.

I claim:

1. A scraper comprising: a body having an arcuate, downwardly narrowing rear wall portion defining a lower edge and forwardly extending opposed side wall portions, said rear and side wall portions defining a forwardly opening material receiving space; a pair of front plates extending flatwise forwardly one each from and in welded edgewise abutment with said side wall portions; a wearing blade having an arcuate, downwardly narrowing rear portion defining an upper edge welded in edgewise abutment with said body lower edge to continue straight downwardly from said body rear wall portion and having a front surface flush with the front surface of said body rear wall portion, said wearing blade having side portions welded in edgewise abutment with said front plates to be inwardly flush with said front plates, said wearing blade and front plates having a thickness greater than that of said body rear wall portion; and a bail extending between said side plates above said material receiving space.

2. The scraper of claim 1 wherein said wearing blade comprises a pair of half blades welded together along the longitudinal centerline of the scraper.

3. The scraper of claim 1 wherein said wearing blade is welded to said rear wall bottom portion by a bevel weld.

4. The scraper of claim 1 wherein said bail includes downturned end portions welded to said front plates.

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5. The scraper of claim 1 wherein said bail comprises a box girder defining a flat top surface.

6. The scraper of claim 5 wherein said box girder bail includes end portions welded to said front plates.

7. The scraper of claim 5 wherein said box girder bail includes end portions welded in edgewise abutment to said front plates.

8. The scraper of claim 5 wherein said box girder bail includes end portions welded in edgewise abutment to said front plates with a bevel weld.

9. A scraper comprising: a body having an arcuate, downwardly narrowing rear wall portion including lower and upper portions, an arcuate belt plate in edgewise abutment with the lower edge of the upper wall portion and the upper edge of the lower wall portion, and forwardly extending opposed side wall portions, said lower portion defining a lower edge, said rear and side wall portions cooperatively defining a forwardly opening material receiving space; a wearing blade having an arcuate, downwardly narrowing rear portion defining an upper edge welded in edgewise abutment with

said lower edge of said rear wall lower portion to continue straight downwardly from said body rear wall portion and having a front surface flush with the front surface of said body rear wall portion, said wearing blade having a thickness greater than that of said body rear wall portion; and a bail extending between said side wall portions above said material receiving space.

10. The scraper of claim 9 wherein said belt plate is flush with the front surfaces of said lower and upper wall portions at the abutment therebetween.

11. The scraper of claim 9 wherein said bail comprises a box girder defining a flat top surface.

12. The scraper of claim 9 wherein said bail comprises a box girder defining a flat top surface end portions welded to said rear wall side portion and provided with chain-connection lugs.

13. The scraper of claim 9 wherein said belt plate is substantially cylindrical and said lower wall portion is substantially conical.

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