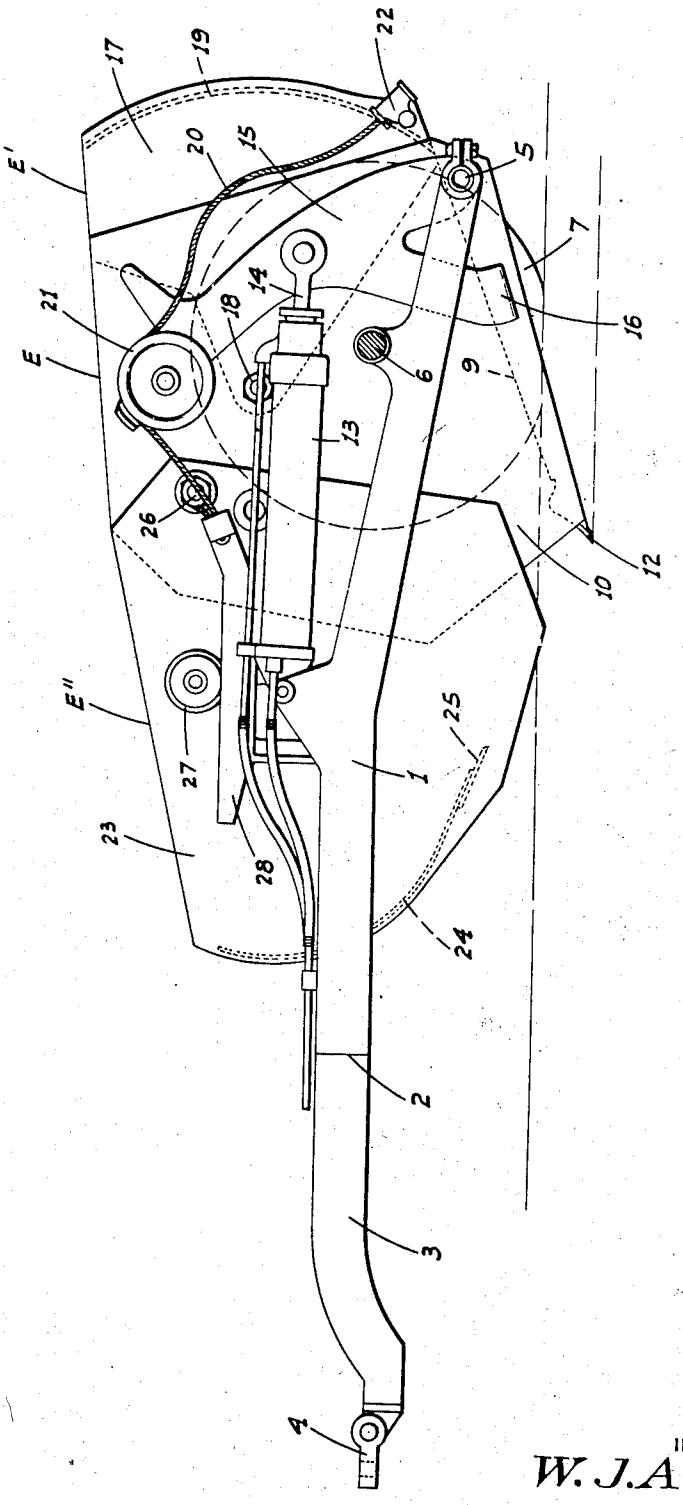
Feb. 20, 1940. W. J. ADAMS 2,190,969

WAGON SCRAPER

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Fig. 1




INVENTOR

W. J. Adams

BY

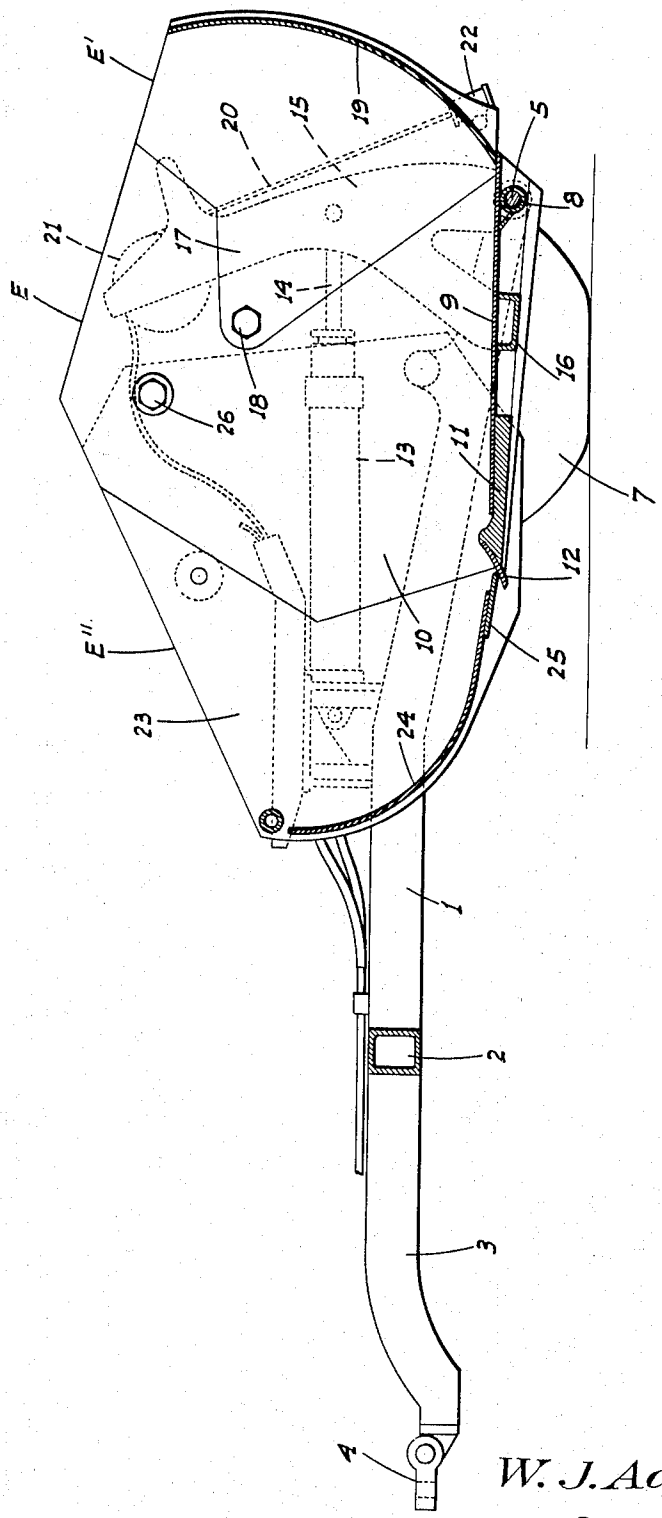
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Fig. 2




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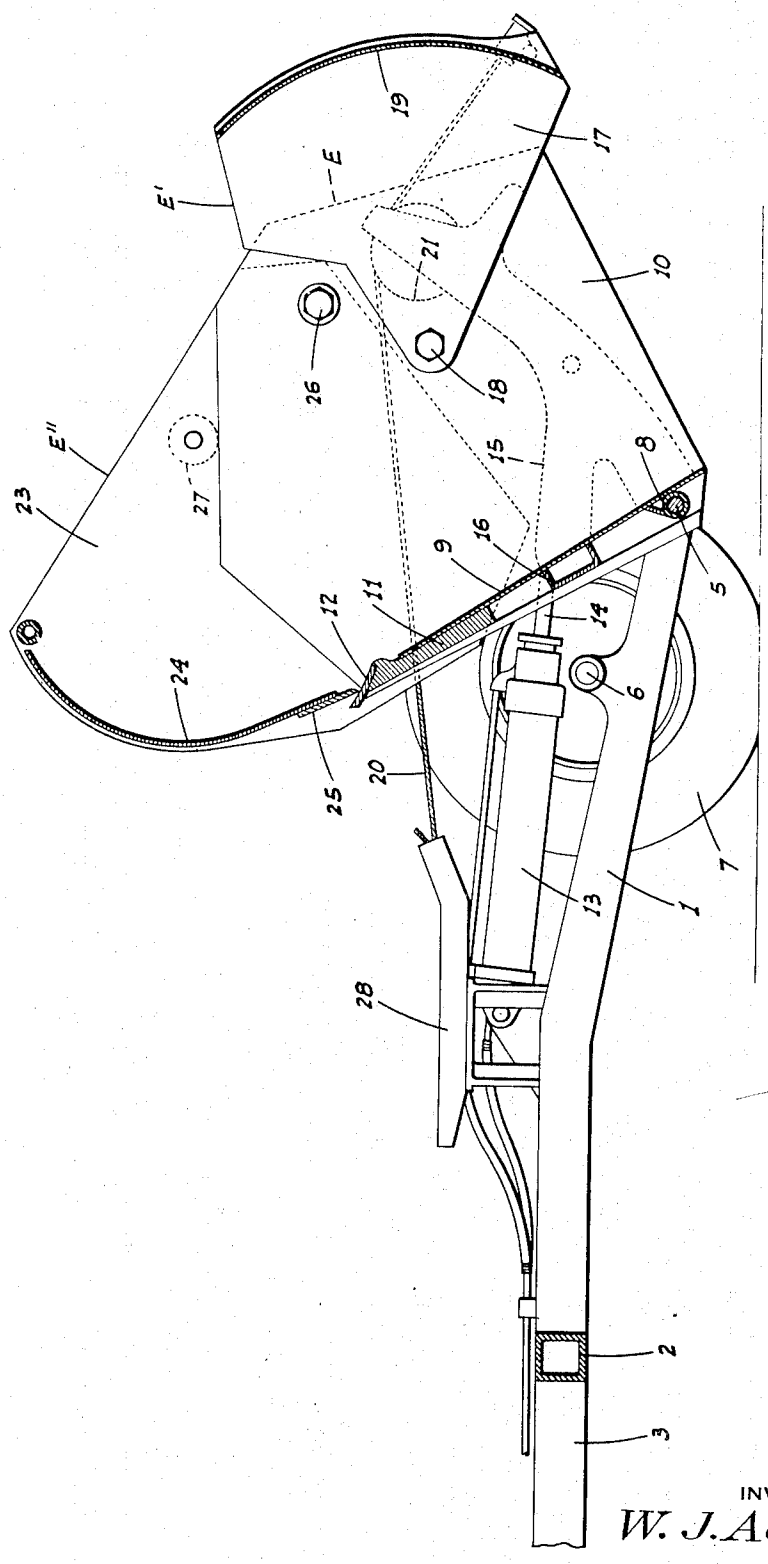
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Fig. 3




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2,190,969

# UNITED STATES PATENT OFFICE

2,190,969

## WAGON SCRAPER

William J. Adams, Santa Cruz, Calif., assignor, by mesne assignments, to Gar Wood Industries, Inc., a corporation of Michigan

Application September 11, 1937, Serial No. 163,418

4 Claims. (Cl. 37—133)

This invention relates to large capacity tractor drawn wagon or carrier scrapers and particularly represents improvements and refinements over the structure shown in my Patent No. 2,010,801 dated August 13, 1935.

The improvements particularly deal with the construction, arrangement and operation of the rear door, the design of the side plates, the provision of a larger dirt discharge opening when the bowl is in a dumping position and the reinforcement of the bottom plate of the bowl; the advantages of these improved features over those of the original scraper being fully set forth and explained in the subsequent portion of this specification.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of a scraper in a digging position.

Figure 2 is a sectional elevation of the scraper in a carrying position.

Figure 3 is a similar view of the scraper as dumping.

Referring now more particularly to the characters of reference on the drawings, the frame of the scraper comprises a pair of side beams 1 connected at their front end by a cross beam 2 from which a tongue 3 projects forwardly. The front end of the tongue has a swivel element 4 for connection to a tractor so that the frame is supported against vertical movement at that end. The rear ends of the side beams, which slope down somewhat from a point rearwardly of the cross beams, are rigidly connected by a cross shaft 5. Outwardly projecting trunnions 6 are mounted on the beams 1 near their rear ends on which either wheels 7 or the frames of endless track units may be mounted as operating conditions may require.

Turnable on the shaft 5 between the side beams is a sleeve 8 which is rigidly welded onto the bottom plate 9 of the main bowl adjacent the rear end of said plate. This bowl has side plates 10 rigid with the bottom plate, which extend below the bottom plate sufficiently to engage the sleeve 8 and also the sides of a heavy long block 11. This extends under and braces the bottom plate 9 from ahead of its front end some distance and carries the scraping blade 12. The back edges of the side plates are disposed at substantially right angles to the bottom plate 9 while their forward edges slope forwardly some distance and then rearwardly to the top edges E, which slant down at an angle relative to the bottom plate to their junction with the back edges.

The bowl tilting mechanism comprises a pair of substantially horizontal hydraulic cylinders 13, one on each side of the bowl. These cylinders are pivoted at their forward end on the beams 1 intermediate their ends and ahead of the trunnions 6. Piston rods 14 project from the rear ends of the cylinders and are pivoted on rigid arms 15 intermediate the ends thereof. These arms are disposed between the side plates and the beams 1, being welded against said plates, and are rigid both longitudinally and laterally of the bowl.

These arms branch at their lower ends so as to engage the sleeve 8 and also a cross channel 16 which extends under and supports the bottom plate 9 between the sleeve 8 and the block 11, the arms being welded to the sleeve and channel. A positive controlling movement is thus imparted to the bowl without any direct strains being placed on the relatively thin side plates themselves and without any possible distortion of the bowl. The need for a cross brace at the back of the bowl at the top, and which was necessary with my previous scraper, is therefore eliminated, giving advantages which will be seen later. Also the bottom plate of the bowl is strongly reinforced against buckling by the block 11, the channel 16, and the sleeve 8.

The rear closure or door for the bowl comprises side wings 17 disposed closely inside but projecting rearwardly beyond the plates 10. These wings are pivoted on said plates intermediate their ends and intermediate the top and bottom at points ahead of the arms 15 as shown at 18, and the back plate 19 forming the door proper is curved concentric with the pivots 18 and adapted at its lower end to rest on the bottom plate 9 at its rear end rearwardly of shaft 5. It will be noted that the pivots 18 are nearer the top of the bowl than the bottom, so that the lower portion of the curved door plate has a considerable forward slope. This gives it a relatively large dirt retaining capacity as compared with the door in the original scraper.

The top edges E' of the rear portion of the wings, when the plate 19 is resting on the bot-

tom plate of the bowl, form a straight line extension of the top edges E of the bowl plates as shown in Figs. 1 and 2. By reason of the fact that any cross brace in the rear upper corner of the bowl is unnecessary as above pointed out, it is possible to obtain a much wider door opening than was previously obtained, since there is nothing in the way of unlimited upward swinging of the door. Also a slightly greater ground clearance may be had when the door is in a wide open dumping position. At the same time the advantages of the original door construction are retained, with respect to the wings being partly enclosed and protected by the bowl, and being automatically lifted by outside means. By reason of the relatively high pivot points of the door as previously stated, not only will it, itself, carry a certain amount of dirt, thus in effect increasing the length of the bowl, but it allows for a greater percentage of dirt being carried rearwardly of the bowl pivot shaft 5 than was previously the case. This gives a better balance of the loaded bowl, requiring less power to raise and dump the load.

By eliminating the previously mentioned cross brace I have been able to reduce the height of the side plates of the bowl at the rear and which was previously necessary to allow for sufficient door opening clearance. The previous side plates, however, were thus necessarily too deep (with relation to the width of the bowl) for easy loading of the dirt. It might be argued that it is not necessary to load the bowl to this excessive depth, but the tendency of the operators is to use the top edges of the bowl as a load gauge line. As a consequence the scraper and tractor were over-strained in an endeavor to manipulate this actually excessive load.

As in the original scraper the rear door is opened only after the bowl has been raised to a carrying position and is being further swung toward the dumping position. This opening of the door is effected by normally slack cables 20, one on each side. These are anchored at their forward end in connection with the frame beams 1 and extend over pulleys 21 mounted on the arms 15 at the top, and then down to a connection with the wings 17 at the bottom and rearwardly of the main bowl plates as at 22. The opening movement of the rear door thus takes place in the same manner as in the previous structure. However, the pulleys 21 being on the relatively heavy rigid arms 15 instead of on the bowl itself, no strain is placed on the latter with the opening of the door. Also by the present position of the pulleys relative to the door pivot, a faster opening of the door is obtained than was previously the case.

As in the original scraper I have also provided a front dirt carrying apron or auxiliary bowl. This comprises side plates 23 which at the rear overlap the side plates 10 and extending some distance forwardly therefrom, and a front and bottom plate 24 the upper front portion of which is curved while the lower bottom portion is straight and terminates in a blade 25. The plates 23 and 10 are pivoted together near the top as at 26 and the plates 23 are provided ahead of the pivots and on the outside with rollers 27 adapted to ride on horizontal tracks 28 fixed on the beams 1. The top edges E'' of the front apron sides are disposed with a downward slope to the front from the point where they normally overlap or intersect the bowl plates 10 and are on a converging slope relative to the bottom portion of the plate 24.

As in the original scraper, the rollers 27 ride on the tracks when the bowl is in a digging position as shown in Fig. 1 and the blade 25 is then above ground level and also ahead of the scraper blade 12 a certain distance. The side plates 23 then substantially form a closure between the blade 25 and the plates 10 at ground level, preventing the dirt as scraped from spilling out laterally in the gap otherwise formed between the blades 25 and 12. As the bowl is swung up to a carrying position the blade 25 engages and rests on the blade 12 and provides a closure therewith as shown in Fig. 2 so that all the dirt loaded is retained.

When the bowl is in a digging position and the front apron is in a dirt receiving position the top edges E'' of the apron plates are substantially parallel to the top edges E of the bowl plates, and both slope down toward the front. When the bowl and apron are shifted to a carrying position however the edges E'' and E are disposed at an appreciable downward slope away from each other forming a hump or peak at the point of intersection of said edges. This hump and slope, which may now be at the proper height relative to the width of the scraper for easy loading to capacity by reason of the elimination of any brace across the bowl at the rear, is an important factor in enabling the bowl to be properly loaded. This is because practically all types of dirt when scraped up tend to hump substantially at the center of length of the mass of dirt. With this new bowl construction therefore the side plates of the various cooperating parts of the bowl may be made sufficiently low at all points so that there is no tendency to overload the scraper. At the same time the desired slope of the top edges of the dirt enclosing structure, when in carrying position is provided which substantially conforms to the slope normally assumed by the loaded dirt. Any spilling of the dirt at its peak and which occurred with the original scraper is therefore prevented.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A scraper comprising a frame supported from the ground, a bowl having side plates and a bottom plate, a transverse member under and rigid with the bottom plate, means pivotally supporting said member whereby the bowl may swing between scraping and dumping positions about the member as an axis, side arms rigid with the side plates on the outside upstanding from and rigid with said member, means to swing the bowl applied to said arms, another transverse member extending under and reinforcing the bottom plate ahead of said first named member and rigid branches extending forwardly from the arms intermediate their ends and rigidly secured to the ends of said other transverse member.

2. A scraper comprising a frame supported from the ground, a bowl having side plates, means

pivoting the bowl on the frame for swinging movement between scraping and dumping positions, side arms rigid with the side plates extending upwardly from the pivot points of the bowl, a normally closed rear door for the bowl having side wings overlapped by the side plates, means pivoting said wings on the plates, means to swing the bowl applied to said arms intermediate their ends, and means causing the door to open with swinging movement of the bowl beyond a carrying position and including cables at the sides of the bowl and door, means anchoring the front and rear ends of the cables on the frame and door respectively, and pulleys on the arms above the point of application of the swinging means and engaging the cables intermediate their ends.

3. In a scraper, a main bowl having a bottom and side plates, a front apron having a bottom and side plates overlapping and projecting forwardly from the side plates of the bowl, means pivoting the overlapping portions of the side plates of the bowl and apron together, the apron forming a closed forward extension of the bowl when the latter is in a carrying position and means acting on the apron to dispose the rear end of the bottom of the same spaced ahead of and above the bottom of the bowl when the latter is in a digging position; the top edges of the side plates of the bowl and apron being cut so as to be substantially parallel to each other when the apron is in the latter position and so as to slope downwardly from their point of intersection when the bowl and apron are in carrying position.

4. A scraper comprising a frame supported from the ground, a bowl, means pivoting the bowl on the frame for swinging movement between scraping and dumping positions, side arms rigid with the bowl extending upwardly from the pivot points of the bowl, means to swing the bowl applied to said arms, a normally closed rear door for the bowl, means pivoting the door intermediate the top and bottom thereof on the bowl for opening movement in an upward direction and means to thus move the door with the swinging movement of the bowl beyond a carrying position and including a normally slack cable at one side of the bowl and door, means anchoring the front and rear end of the cable on the frame and door respectively and a pulley on the adjacent arm over which the cable passes intermediate its ends.

WILLIAM J. ADAMS.