Sept. 9, 1941. L. O. BIRD 2,255,240

HAULING SCRAPER

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Fig. 1

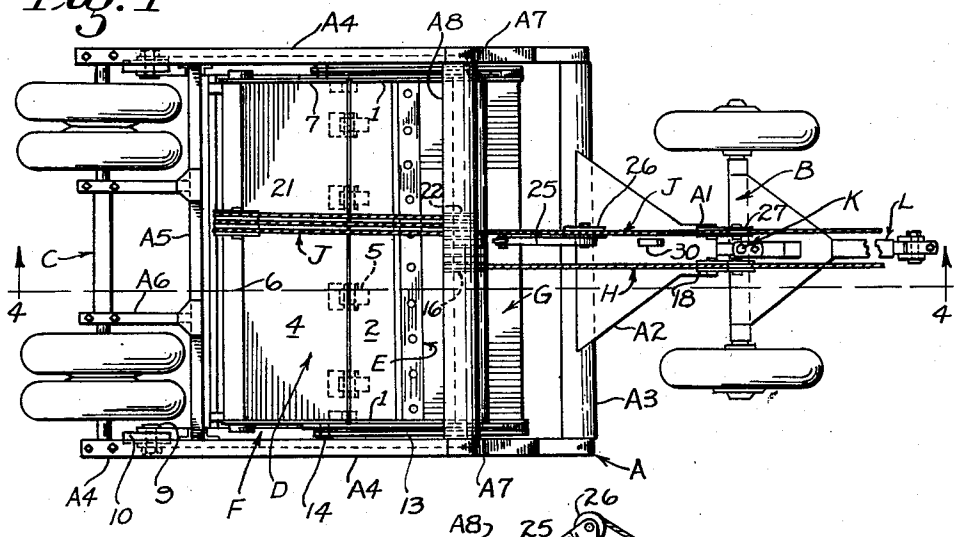


Fig. 2

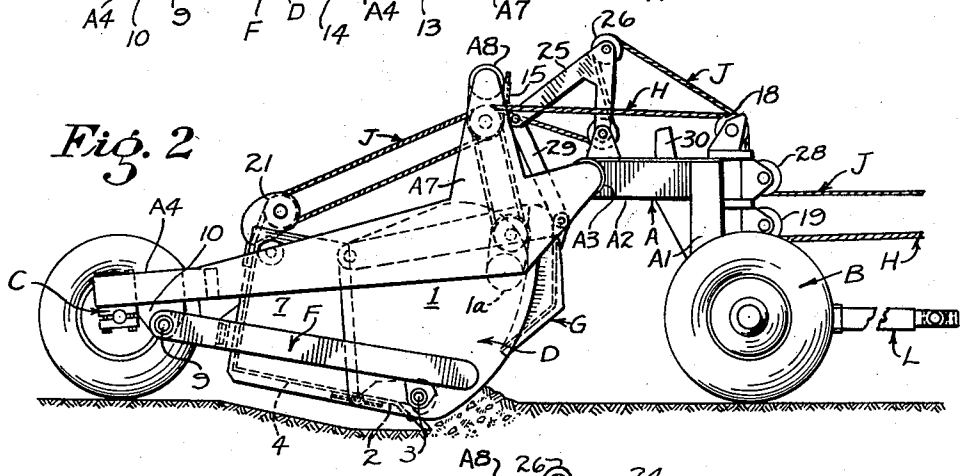
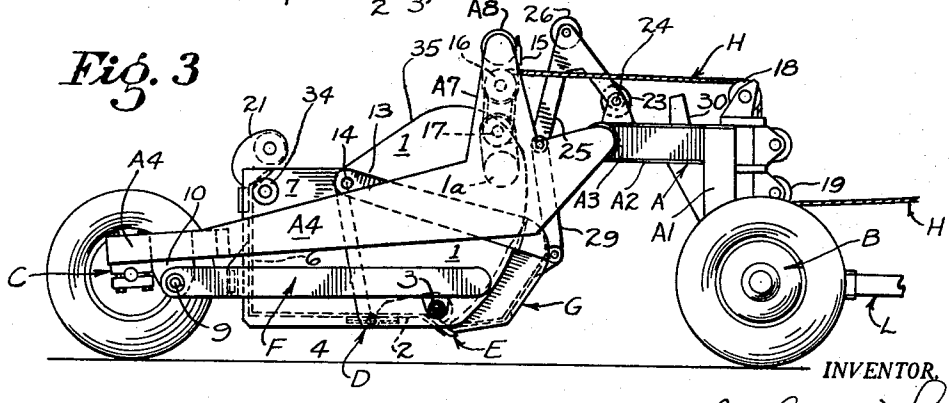


Fig. 3



INVENTOR.

Len O. Bird

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Fig. 4

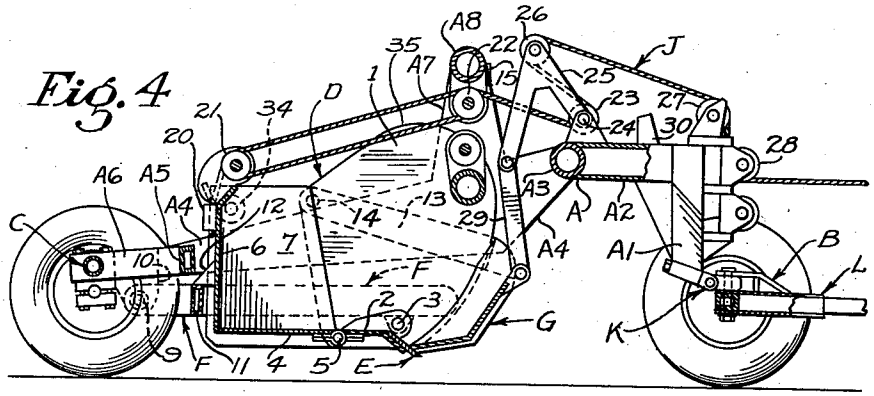


Fig. 5

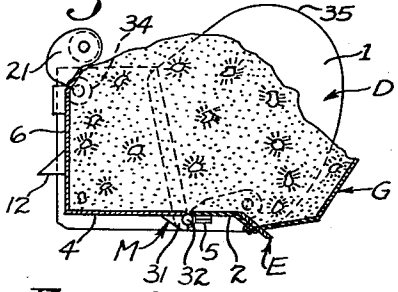


Fig. 6

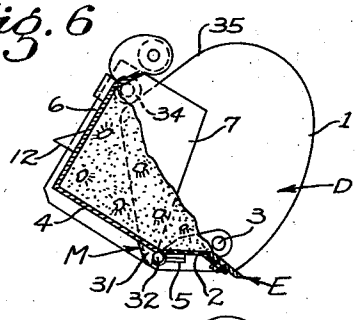


Fig. 7

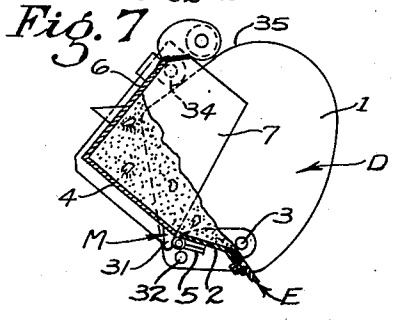


Fig. 8

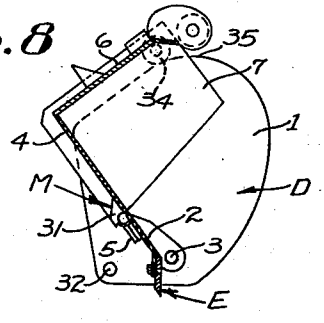


Fig. 9

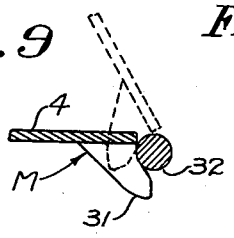
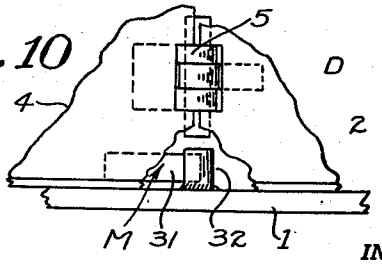


Fig. 10



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HAULING SCRAPER

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Fig. 11

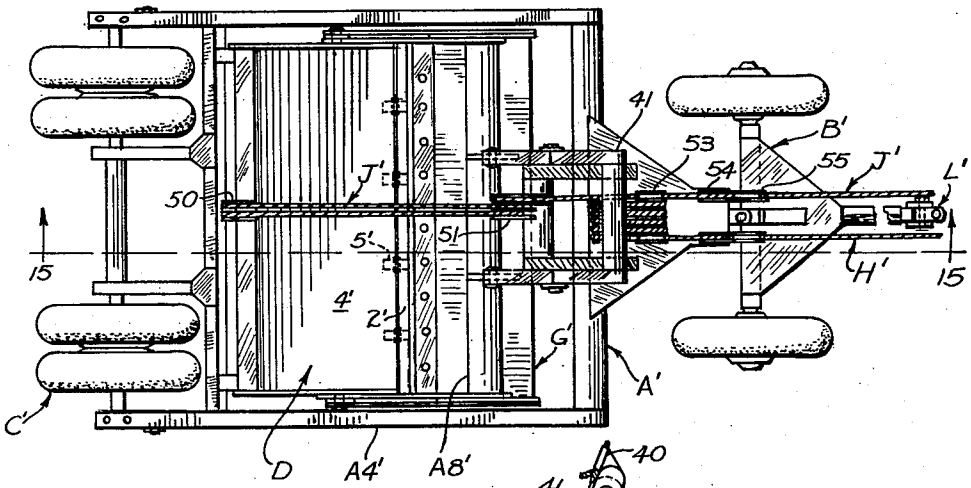


Fig. 12

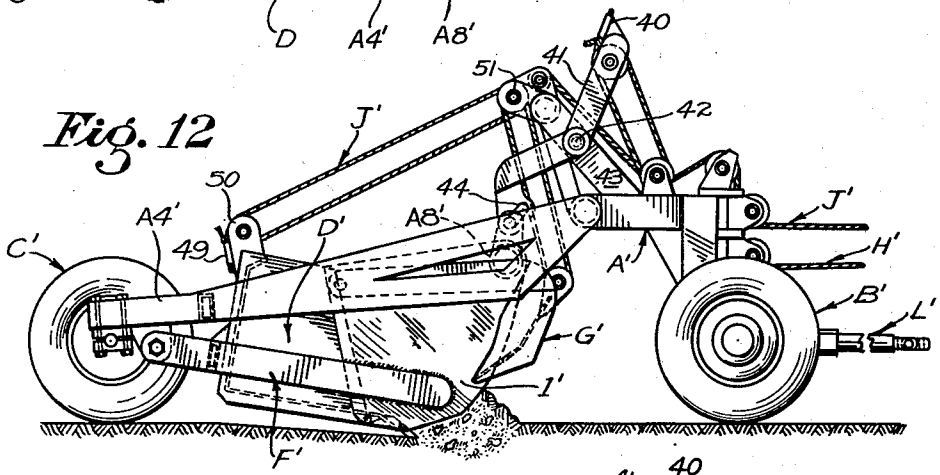
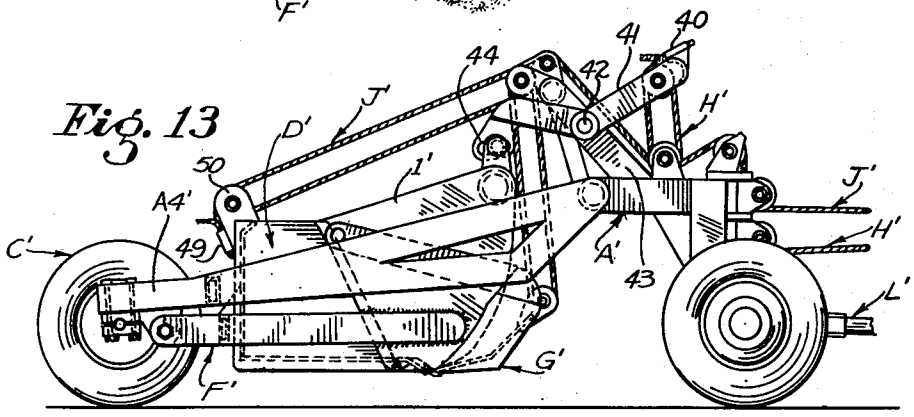


Fig. 13



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Sept. 9, 1941. L. O. BIRD 2,255,240

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Fig. 14

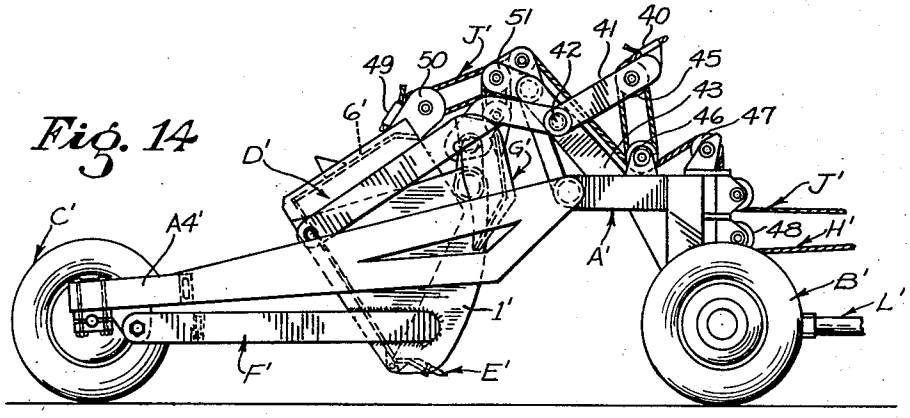


Fig. 15

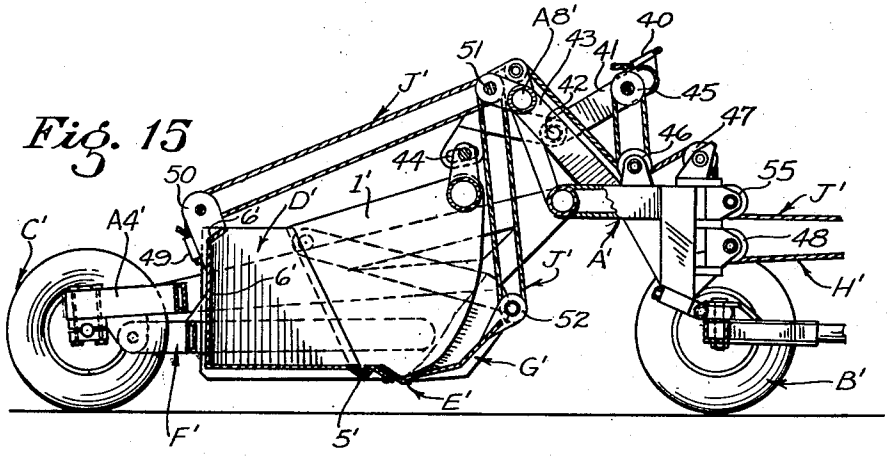
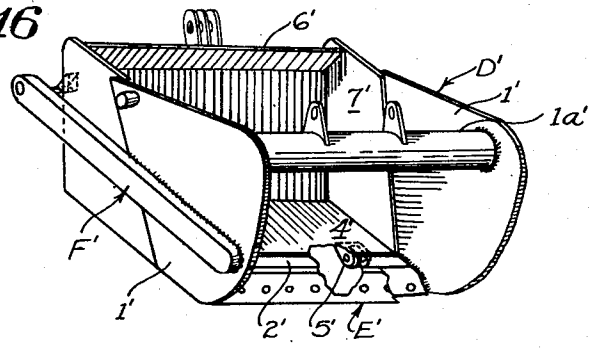


Fig. 16



INVENTOR.

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Patented Sept. 9, 1941 2,255,240

UNITED STATES PATENT OFFICE

2,255,240

HAULING SCRAPER

Len O. Bird, Glendale, Calif., assignor to R. G. Le Tourneau, Inc., Stockton, Calif., a corporation of California

Application May 16, 1939, Serial No. 273,918

19 Claims. (Cl. 37—126)

The present invention relates in general to earth handling apparatus for loading, carrying, and dumping earth or other material and in particular has to do with a new type of rigid and inarticulate wheel-supported frame, a novel type of mounting for the bowl, and an improved bowl construction and arrangement and operating means therefor; all so interrelated and arranged so as to make it possible to dispose the bowl in loading and carrying positions as well as in dumping position, without adjusting the frame, and to set the bowl for a deeper penetration or scraping action than possible with adjustable frame types of scrapers, and also provide for greater stability and ruggedness, a lower center of gravity, a conservation of power and a more efficient operation over rough and uneven ground as well as other advantages as will hereinafter be pointed out.

One of the purposes of my invention is to provide a hauling scraper of the above stated character wherein a tiltable bowl is mounted on a supporting structure pivotally connected to and extending substantially horizontally below a main frame which is rigid and inarticulate between and fixed to the front and rear axles on which the supporting wheels are mounted. This supporting structure is pivoted at points on the lower side of the main adjacent and forwardly of the rear axle and is tilted without raising or adjusting the frame for disposing the bowl in the desired loading, load carrying and other positions, these arrangements and constructions make it possible to set the bowl for scraping or excavating and loading in holes, depressions, and deep rutted ground or when the wheels are on different levels, and also when closer to obstructions than heretofore possible.

Another purpose of my invention is to provide a scraper such as described, wherein the bowl includes side walls which are fixed to the bowl supporting structure, and an articulated sectional bottom operating in part between and having one section in pivotal connection with said side walls and disposed to receive the dirt or material passing over a scraper blade or edge which is associated with said section. As a result of these arrangements it is necessary to tilt but one section of the bottom of the bowl to effect the dumping of the major part of the load, whereby thereafter, the tilting of the entire bottom will complete the dumping operation. In this manner less power is required for dumping the load, and in fact operating the scraper, and the load need not be lifted to such height as would render the structure unstable, it being noted that the lifting of the entire load by vertically tilting the entire bottom of the bowl would require considerably more power and move the load to greater height than is required with the provisions of this invention.

Further qualified my scraper makes possible the foregoing and other purposes, as will be apparent in the following specification, as a result of the combination of front and rear wheel supported axles, a rigid frame supported by and being inarticulate vertically between said axles, a bowl supporting structure pivoted to the frame adjacent said rear axle and extending forwardly beneath the frame, a sectional bowl having side wall sections fixed to said bowl supporting structure whereby the bowl is movable up and down bodily therewith into and out of loading and carrying positions, a tiltable bowl section pivoted on or movable relative to said fixed side wall sections for dumping the load, an apron associated with the bowl for movement relative thereto into and out of position for retaining the load, an operating means for moving said bowl supporting structure to dispose the bowl in loading and carrying positions without requiring vertical movement or any adjustment of the frame, and another operating mechanism for the bowl and apron and operating to first move the apron, out of load retaining position and finally move the tiltable bowl section for dumping the load.

With the foregoing and other objects in view, the invention hereof consists in the combination, correlation and construction of parts, elements and features which will be described in the following specifications and finally pointed out in the claims hereto appended, it being understood that the apparatus of my invention is subject to modification within the scope of said claims.

In the drawings:

Figure 1 is a top plan view of a hauling scraper embodying my invention.

Figure 2 is a side elevation of said scraper as when adjusted for excavating and loading.

Figure 3 is a side elevation of the scraper with the parts thereof in carrying or hauling position.

Figure 4 is a longitudinal section taken on the line 4—4 of Figure 1 but showing the bowl in carrying position.

Figures 5, 6, 7 and 8 are fragmentary sectional views taken longitudinally through the bowl and respectively showing the bowl and its associated parts as shown in carrying, primary dumping, secondary dumping, and final dumping positions.

Figure 9 is a detail section of the locking means.

Figure 10 is a fragmentary top plan view of the bowl showing the hinge connection and the lock means.

Figure 11 is a top plan view of a modified form of the invention.

Figures 12, 13, and 14 are side elevations of said modified form, respectively showing the parts in loading, carrying, and dumping positions.

Figure 15 is a longitudinal section taken on the line 15—15 of Figure 11.

Figure 16 is a perspective view of the bowl of said modified form.

One form of hauling scraper embodying my invention is shown in Figures 1 to 10 inclusive of the accompanying drawings and generally includes a rigid frame A, front and rear wheel-supported axle assemblies B and C, a sectional bowl D including a scraping blade E, a bowl supporting structure including side beams or arms F pivoted on said frame and fixedly connected with a section of the bowl, and an apron G operatively associated with said bowl. An operating means including in the present instance a single cable H is provided for moving the arms F on their pivots for disposing the bowl in loading and carrying positions without moving the frame A. A similar operating means likewise including a single cable J is provided for moving the apron and bowl in the order here named for retaining and dumping the load of the bowl, without requiring movement of said frame on said arms. As here provided the frame A is swiveled as at K to the front axle assembly B to permit of the usual turning and tracking of the scraper when hauled by a tractor (not shown) connected with the tongue L on said front axle assembly. The cables H and J are likewise connected with the tractor carried hoist mechanism not shown and operated thereby as is customary in the art.

In accordance with this invention the frame A may be constructed in any suitable manner provided it is rigid and inarticulate in a vertical plane between and relative to the front and rear axle assemblies B and C. One form of frame as here shown may comprise an upright or post portion A1 having the swiveled connection K with the front axle assembly B. The portion A1 is provided with a rearward extension A2 welded to a tubular cross beam A3 at a point centrally of the latter. Welded to the ends of this cross beam are side members A4 which extend rearwardly to and are connected directly with the rear axle assembly C. A rear cross member A5 is welded or otherwise fixed to and between the side members. A4 adjacent the rear axle assembly and is connected thereto rigidly by means of rearwardly extending arms A6. The side members A4 are provided between their ends with upwardly extending arms A7 integral therewith and welded thereto, between which arms a tubular cross member A8 is fixed. The cross member A8 reinforces the frame structure and affords a convenient mounting for the operating means which include the cables H and J. It is now seen that a frame such as here shown and described will be stronger and more rugged than an articulated or jointed frame as heretofore used in wheeled scrapers, and will also increase the stability and efficiency of the scraper as a whole. Moreover such a frame more effectively lends itself to a desirable fabricated construction and due to the fact that it is in one piece form and requires no adjustment relative to its wheeled supports for manipulating the bowl and apron, it may be made at a lower cost than articulated or jointed frames.

As here shown the bowl D includes a front section and a rear section of which the former is made up of side walls 1 fixed immovably as by welding to the forward ends of the side arms F of the bowl supporting structure, and a bottom 2 pivoted at 3 adjacent its forward edge to and between the side walls 1, the scraping blade E being fixed along said forward edge of the bottom 2. Welded to and extending between the upper portion of the side walls 1 is a tubular cross brace 1a for reinforcing the bowl and affording a convenient connection of the bowl with the operating means including the cable H, whereby to raise and lower the bowl supporting arms F and bowl D, to move the same into carrying and loading positions.

The rear section of the bowl includes a bottom 4 hinged at its forward edge as at 5 to the rear edge of the bottom 2 and extending as a continuation thereof, a back wall 6 carried by the bottom 4 and side walls 7 likewise carried by the bottom 4, joined to the back wall and arranged to overlap the fixed side walls 1 and serve as a continuation thereof. It is now seen that the bowl comprises sectional side walls and a sectional bottom and that the rear section of the bowl may be tilted relative to the front section for dumping the load, after which the bottom of the front section may be tilted together with the rear section on the pivotal connection of said bottom with the fixed side walls, for completing the dumping operation. These relative and joint movements of the bowl sections are made possible through use of a locking means M which will be hereinafter described; it being well to note at this point that said means together with the operating means which includes the cable J, provides a mechanism for effecting and controlling the tilting of the bowl and apron for retaining and dumping the load.

The bowl supporting structure including the arms on beams F is arranged so that said arms are pivoted as at 9 to ears 10 depending from the lower sides of the frame members A4 at a point close to the rear axle assembly or in other words the rear end of frame A. These arms extend forwardly from the pivots 9 beneath the sides A4 in substantial parallelism therewith to a point approximately mid-way of ends of the frame A, and these forwardly disposed ends are welded as aforesaid to the outer faces of the side walls 1 of the front section of the bowl D as shown in Figures 2 and 3. Thus it is seen that when the arms F are raised and lowered on their pivots 9 the bowl D will be likewise moved whereby it may be disposed in loading and carrying positions. Due to the large range of movement afforded the arms F it is apparent that the bowl may be lowered a greater extent than possible with jointed frames as heretofore used, and therefore the blade E may be set for a deeper scraping or excavating action than heretofore. Moreover this arrangement permits of setting the bowl and blade for operation in depressions and rutted ground and also for operation closer to obstructions than has heretofore been possible. The bowl supporting structure also includes a cross brace 11 fixed between the arms F and rearwardly of the bowl D. Stops or rests 12 fixed on the back wall 6 of the bowl engage the brace 11 for limiting the rearward tilting of the bowl and to facilitate the supporting of the rear part

of the bowl when the latter is in loading and carrying positions.

The apron G acts as a closure for retaining the load in the bowl and when raised effects a partial dumping of the load. As here provided the apron is supported by means of side arms 13 fixed thereto and extending rearwardly to the side plates 1 where they are pivoted thereon as at 14. This provides for the swinging of the apron from its load retaining position engaging the scraping blade E, upwardly in an arc into position fully releasing the load and vice-versa or into any intermediate position suitable for retaining the load in the bowl while raised sufficient to permit the earth to pass between it and the blade during the loading operation.

When it is desired to raise the bowl from a loading position, showing in Fig. 2 to carrying position, shown in Figs. 3, 4, and 5, the operator manipulates the tractor hoist (not shown) to pull the cable H. As this cable is dead ended as at 15 on the frame of a pulley block 16 fixed to the cross member A8 of frame A then reaved between this block and a similar one 17 fixed on cross member 1a between the sides 2 of the bowl, then extended forwardly over a pulley 18 on the forward end of frame A, then under swiveled pulley 19 also on frame A, and thence to the tractor hoist, it is seen that a pull on the cable produces a block and tackle effect between the blocks 16 and 17 whereby to raise the bowl and bowl supporting arms F. Upon releasing the cable H the bowl-supporting arms F and bowl D will gravitate into the desired position subject to the amount of slackening on release of the cable and may be so held by the cable. Thus the bowl may be readily lowered from carrying to the desired loading position at will. When in loading and carrying positions the stops 12 on the bowl rest on the cross brace 11 and thereby support the weight of the bowl at the rear end thereof although the front edge and scraping blade E are tiltable downward with the arms F to the extent desired for scraping and excavating at the desired depth, it being possible to effect a deeper excavating action than can be had with jointed frame types of scrapers.

When it is desired to operate the bowl and apron for dumping the load the operating means including the cable J and the locking means M, is actuated by pulling on said cable through an appropriate operation of the tractor-carried hoist, not shown. The cable J as here arranged is dead-ended as at 20 on the back wall 6 of the bowl and reaved between pulley blocks 21 and 22 respectively fixed on said back wall of the apron and said cross brace A8 of the frame A. From the block 22 the cable is extended as shown in Fig. 4 around a pulley 23 rotatable on the pivotal connection 24 of a bell crank or lever 25 with the main frame portion A2, and is then extended upwardly, and around a pulley 26 mounted on the upper part of said lever and finally extended over and under frame supported pulleys 27 and 28 to the hoist mechanism, not shown. The lever 25 is L shaped and one end is pivoted to frame on the connection 24 whereas the other end is pivoted to one end of a link 29 in turn pivoted to the apron G. With this arrangement when the cable J is pulled the bell crank or lever 25 is rocked without transmitting a tilting pull through the cable to the bowl, due to the bowl being heavier than the apron, and therefore the apron will be lifted before the bowl is tilted. The apron may thus be lifted to load releasing position, being limited by the stops 30 on the main frame or other suitable location, and the load will then be partially dumped from the bowl and apron. This will be apparent from an inspection of Fig. 5, wherein the bowl is fully loaded. As soon as the lever 25 encounters the stops 30, the pull on the cable becomes effective to tilt the rear section of the bowl due to the block and tackle effect between pulley blocks 21 and 22. When this tilting force is first applied to the bowl, the rear section only thereof will tilt on its hinge connection 5 with the bottom 2 of the front section of the bowl and move from position shown in Fig. 5 to position shown in Fig. 6 while the front section, that is, the bottom 2, is held against movement by the lock means M. As shown in Figs. 5 to 10 inclusive this lock means includes hook members 31 fixed to the bottom 4 of the rear section and adapted to engage around pins 32 fixed to the side walls 1. These hooks and pins are alined with the axis of the hinge connection 5 and become an auxiliary hinge means for the bottom 4 while locking the bottom 2 against movement on its pivotal connection 3. However the hooks are so shaped that when the rear bowl section is tilted somewhat past the predetermined primary dumping position shown in Fig. 6 said hooks will clear and be released from the pins 32 so that further pulling on cable J will lift the bottom 4 upwardly from the pins 32 (see Fig. 7) and thereby tilt the bottom 2 on its pivots 3 to the final dumping position shown in Fig. 8.

It is seen with reference to Figs. 5, 6, and 7 that the rear section of the bowl with but a small movement will cause the major portion of the load to be dumped and that when said lock means M releases the front section (bottom 2) for tilting, both the rear section and the bottom 2 will swing upward and forward on the pivots 3 while at the same time moving on the hinge connection 5. Thus the hinged edges of the bottom 2 and 4 push outwardly and assume an alined position during the final dumping operation and thereby push the load forwardly and outwardly.

Upon releasing the cable J the bowl will buckle first, on the axis of the hinge connection 5 and then gravitate into loading or dumping position, dependent on the position or adjustment of the bowl supporting arms F. The lock members 31 will at this time re-engage with the pins 32 whereby to again lock the section to initially limit the bowl to tilting of the rear section only, as aforesaid.

It should be noted that anti-friction and load supporting rollers 34 are mounted on the side walls 7 of the rear section of the bowl so as to engage and ride upon the curved upper edges 35 of the side walls 1 of the front section of the bowl, from the time the rear section moves from its initial to its final dumping position as shown in Figs. 6, 7, and 8. This arrangement provides for a smooth action of the bowl and insures a gravitational return thereof to loading and carrying positions, without the use of springs. It is now apparent that the rear section of the bowl not only is in effect pivotally connected to the lower portions of the side walls 1 of the front section by means of the bottom 2, but is supported and rides by means of the rollers 34, on the upper edges of the side wall 1 rather than on the frame A, while moving into the final dumping position. This arrangement makes for a desirable ruggedness in the construction of the bowl as well as for a better distribution of

stresses and thereby insures a smooth tilting operation and a conservation of power in the dumping operation.

Referring now to the modification of my invention as shown in Figs. 11 to 16 inclusive, it is seen that the scraper is identical in construction with the form of the invention shown in Figs. 1 to 10 inclusive except for the bowl and of the two operating means for the bowl and apron. Accordingly those of the parts of this modified form of the invention which are identical with corresponding parts of the first described forms will be designated with like reference numerals distinguished by prime characters.

With specific reference to the variational construction of the bowl D' it is seen that the only difference from the bowl D in the other form of the invention is that the bottom 2' is fixed between the side walls 1' instead of being pivoted thereto, the scraping blade E' being fixed to said bottom 2' and side wall 1'. The bottom 4' of the rear section of the bowl is hinged as at 5' to the bottom 2' of the front section of the bowl in the same manner as in the first described form of my invention except that the lock means M is omitted due to the fact that no part of the front section of the bowl is tilted for dumping the load in this modified form of my scraper. In this form of my invention as in the first described form the side walls 1' are fixed to the arms F' which are pivoted on the rigid frame A' in the same manner as are the arms F on frame A.

The operating means for raising and lowering the bowl D' and arms F' to dispose the bowl in carrying and loading positions includes a single cable H' which is dead ended at 40 on one end of a bell crank 41 fulcrumed at 42 on an upward extension 43 of the frame A'. The other end of this bell crank has a pin and slot connection 44 with the cross brace 1A' fixed between the side walls 1', whereby when the bell crank is rocked the bowl D' and arm F' will be raised and lowered relative to the frame A' in the same manner as in the first described form of the invention. The cable H' is reaved between pulley blocks 45 and 46 fixed respectively on the bell crank 41 and the frame A', and then extended over and under frame supported pulleys 47 and 48 for connection with the tractor hoist, now shown, whereby it may be pulled and released to lift and lower the bowl. It is noted that the block and tackle action between pulley blocks 45 and 46 will effect the rocking of the bell crank upon the pulling and releasing of the cable.

The means for tilting the rear section of the bowl D' on its hinge connection 5' includes a single cable J' dead ended at 49 to the back wall 6' of said rear section and reaved between pulley blocks 50 and 51 respectively fixed on said back wall and the cross member A8', then reaved between pulley blocks 51 and a pulley block 52 on the front of the apron G' and finally extended in engagement with pulleys 53, 54, and 55 on the frame A' and to the tractor hoist, not shown. When the cable J' is pulled it will operate to lift the apron G' before tilting the rear section of the bowl, due to the greater weight of the bowl and the block and tackle effect just taking place between pulley blocks 51 and 52. When the apron is raised to release the load, to the limit of its upward movement as determined by the apron engaging the cross brace A8', the continued pull on the cable produces a block and tackle effect between pulley blocks 50 and 51 and thereby tilts the rear section of the bowl D' for dumping the load. Release of cable J' allows the bowl to gravitate, due to the greater weight of the bowl, into a load retaining position as determined by the extent of slackening or release of said cable.

It is now seen that this form of the invention embodies features of improvement and advantage in common with the first described form, and in addition embraces certain advantages as to relative simplicity, reduction of the number of parts, and comparative ruggedness.

I claim:

1. In a hauling scraper, front and rear wheel-supported axles, a rigid frame supported by and between said axles, a bowl, a scraper blade associated with said bowl, bowl supporting arms pivoted to said frame adjacent said rear axle and extending forwardly therefrom beneath the frame for movement exclusively of the frame to move the bowl and blade into or out of loading and carrying positions, said bowl including fore and aft aligned sections of which one is fixed to the forward portion of said arms and another is extended rearwardly of and is tiltable relative to said fixed section into and out of position for dumping the load of the bowl, operating means for moving said arms on their pivots and exclusively of movement of the frame, for moving said bowl and blade into and out of loading and carrying positions, and other operating means for moving the movable section of the bowl relative to the fixed section and said arms into and out of dumping position.

2. In a hauling scraper, a rigid and inarticulate frame, wheeled supports for the front and rear ends of said frame, a bowl encompassed by and movable freely relative to said frame, bowl supporting arms pivoted at their rear ends adjacent the rear end of and extending forwardly and beneath said frame, said bowl having a forward section fixed rigidly to the forward portions of said arms, a rear section pivotally connected with said forward section for tilting movement relative to the forward section for dumping the load, operating means for moving said arms exclusively of said frame for disposing the bowl in loading and carrying positions, and operating means for tilting the rear section into dumping position.

3. In a hauling scraper, a rigid inarticulate frame, wheeled supports for the front and rear ends of said frame, a bowl, a scraper blade associated therewith, bowl supporting arms pivoted adjacent to the rear end of and extending forwardly beneath said frame, said bowl including a forward section fixed to said arms and a rear section pivoted to the forward section and movable into dumping position relative to said forward section, an apron associated with the bowl for movement relative thereto into and out of position to retain the load in the bowl, operating means for moving said arms on their pivots for disposing the bowl in loading and carrying positions, and other operating means common to said apron and bowl for first moving the apron out of load retaining position and then moving the rear section of the bowl into a dumping position.

4. In a hauling scraper, a frame, wheeled-supports for the front and rear ends of said frame, a sectional bowl providing for loading, carrying and dumping operations and including aligned, contiguous, hingedly connected sections, and mounting means supporting said bowl for vertical movement into and out of its loading, and carrying positions exclusively of movement of said

frame, including members pivoted on said frame and supporting one section of said bowl, and means for swinging another section of the bowl upwardly and forwardly for dumping the load therefrom through the first named section.

5. In a hauling scraper, front and rear wheeled-supports, a frame mounted on and being inarticulate in a vertical plane between said supports, bowl supporting arms pivoted to said frame, a bowl including a section fixed to and immovable relative to said arms and a section supported by and extending rearwardly of said fixed section and tiltable relative thereto for dumping the load, means for moving said arms on their pivots for disposing the bowl in loading and carrying positions, and means for moving the tiltable bowl section into dumping position.

6. In a hauling scraper, front and rear wheeled supports, a frame fixed to said supports, a sectional bowl providing for loading, carrying and dumping operations of the scraper, a bowl supporting structure mounted on said frame for movement to lift and lower said bowl, said bowl including a front section immovably fixed to said bowl supporting structure for supporting the entire bowl for up and down movement with said structure, and a rear section pivotally supported on the front section for upward and forward movement relative to the bowl supporting structure into position for dumping the load thereof forwardly over the front section.

7. In a hauling scraper, front and rear wheeled supports, a frame fixed to said supports, a sectional bowl providing for loading, carrying and dumping operations of the scraper, a bowl supporting structure mounted on said frame for movement to lift and lower said bowl, said bowl including a front section immovably fixed to said structure for supporting the entire bowl for up and down movement with said structure, and a rear section pivotally supported on the front section for upward and forward movement relative to the bowl supporting structure for dumping the load thereon over the front section, an apron supported on said front section for movement relative thereto and bodily therewith for retaining and releasing the load.

8. In a hauling scraper, front and rear wheeled supports, a frame supported by and being inarticulate in a vertical plane between said supports, a bowl supporting structure mounted on said frame for up and down movement relative thereto, a bowl related to the frame for loading, carrying and dumping operations and including side walls mounted on and immovable relative to said bowl supporting structure, and load carrying and dumping sections in front and in rear of said side walls and including upright walls, and means pivotally connecting said load carrying and dumping sections with said side walls for movement relative thereto and to one another in the loading, carrying and dumping operating of the bowl, an operating means for moving said bowl supporting structure up and down to dispose the bowl in loading and carrying positions, and an operating means for moving said carrying and dumping sections on their pivotal connections with said side walls for retaining and releasing the load.

9. In a hauling scraper, a frame, wheeled supports therefor, a bowl, a bowl supporting structure mounted on said frame for movement independent of the frame for the purpose of disposing the bowl in loading and carrying positions, said bowl including side walls mounted on and immovable relative to said bowl supporting structure, a sectional bottom having one section pivoted to and between said side walls for tilting movement relative thereto for dumping the load, and another section extending rearwardly of and pivoted to the first named section, side and rear walls on the rear section of said bottom and movable therewith independent of said bowl supporting structure, means for raising and lowering said bowl supporting structure for disposing the bowl in carrying and loading position, and an operating mechanism which when actuated tilts the rear bottom section to a dumping position, means for holding the front bottom section against tilting until the rear section reaches said dumping position, then releasing the front bottom section whereby continued operation of said mechanism will tilt both sections about the pivotal connection of said front bottom section with said fixed side walls.

10. In a hauling scraper, a frame, wheeled supports therefor, a bowl, a bowl supporting structure mounted on said frame for movement independent of the frame for the purpose of disposing the bowl in loading and carrying positions, said bowl including side walls fixed to and immovable relative to said bowl supporting structure, a sectional bottom having one section pivoted to and between said side walls for tilting movement relative thereto for dumping the load, and another section extending rearwardly of and pivoted to the first named section, side and rear walls on the rear section of said bottom and movable therewith independent of said bowl supporting structure, means for raising and lowering said bowl supporting structure for disposing the bowl in carrying and loading positions, an operating mechanism which when actuated tilts the rear bottom section to a dumping position, means for holding the front bottom section against tilting until the rear section reaches said dumping position then releasing the front bottom section whereby continued operation of said mechanism will tilt both sections about the pivotal connection of said front bottom section with said fixed side walls, an apron pivotally connected with said fixed side walls for movement into and out of load retaining position relative to the bowl, and means forming a part of said operating mechanism for moving the apron out of load retaining position first, in response to the initial actuation of said operating mechanism.

11. In a hauling scraper, a wheel supported frame, a bowl, a bowl supporting structure mounted on said frame for movement independently of the frame for the purpose of disposing the bowl in loading and carrying positions, said bowl including side walls fixed on and immovable relative to said supporting structure, a scraper blade structure disposed between said side walls, a bowl bottom hinged to said scraper blade structure and extending rearwardly thereof, side and rear walls connected by said bottom and forming therewith a rear bowl section, an apron pivotally connected with and movable into and out of position for retaining the load between said fixed side walls, said side walls of said bottom overlapping and serving as rearward extensions of said fixed side walls, means for raising and lowering said bowl supporting structure independent of the frame for disposing said bowl in entirety into carrying and loading positions, and means common to the apron and

said rear bowl section for first moving the apron out of load retaining position and then tilting said rear bowl section for dumping the load.

12. In a hauling scraper, a wheel supported frame, a bowl, a bowl supporting structure mounted on said frame for movement independently of the frame for the purpose of disposing the bowl in loading and carrying positions, said bowl including side walls fixed on and immovable relative to said supporting structure, a scraper blade structure fixed to and between said side walls, a bowl bottom hinged to said scraper blade structure and extending rearwardly thereof, side and rear walls connected by said bottom and forming therewith a rear bowl section, an apron pivotally connected with and movable into and out of position for retaining the load between said fixed side walls, said side walls of said bottom overlapping and serving as rearward extensions of said fixed side walls, means for raising and lowering said bowl supporting structure independent of the frame for disposing said bowl in entirety in carrying and loading positions, and means common to the apron and said rear bowl section for first moving the apron out of load retaining position and then tilting said rear bowl section for dumping the load, said means for raising and lowering said bowl supporting structure including a bell crank fulcrumed on said frame, an actuating means for rocking said bell crank and means for pivotally connecting the bell crank with said fixed side walls of said bowl.

13. In a hauling scraper, front and rear wheeled supports, a frame between said supports, a bowl supporting structure mounted on said frame for up and down movement relative thereto, a bowl related to the frame for loading, carrying and dumping operations and including side walls mounted on and immovable relative to said bowl supporting structure, load carrying and dumping sections in front and in rear of said side walls, each of said sections having upright walls, means pivotally connecting said sections to said side walls for movement relative thereto and to one another, an operating means for moving said bowl supporting structure up and down to dispose the bowl in loading and carrying positions, and an operating means for moving said carrying and dumping sections on their pivotal connections with said side walls for retaining and releasing the load, and a scraper blade disposed between said side walls and intermediate said sections.

14. In a hauling scraper, front and rear wheeled supports, a frame between said supports, a bowl supporting structure mounted on said frame for up and down movement relative thereto, a bowl related to the frame for loading, carrying and dumping operations and including side walls mounted on and immovable relative to said structure, and load carrying and dumping sections in front and in rear of said side walls and pivotally connected therewith for movement relative thereto and to one another in the loading, carrying and dumping operating of the bowl, an operating means for moving said bowl supporting structure up and down to dispose the bowl in loading and carrying positions, an operating means for moving said carrying and dumping sections on their pivotal connections with said side walls for retaining and releasing the load, a rigid cross member extending between and fixed to said side walls adjacent the upper edges thereof, said means for moving the bowl supporting structure including members connected with said cross member and said frame for effecting and controlling the up and down movement of said bowl supporting structure.

15. In a hauling scraper, a wheel supported frame, a bowl, a bowl supporting structure mounted on said frame for movement independently of the frame for the purpose of disposing the bowl in loading and carrying positions, said bowl including side walls fixed on and immovable relative to said supporting structure, a scraper blade structure between said side walls, a bowl bottom hinged to said scraper blade structure and extending rearwardly thereof, side and rear walls carried by said bottom and forming therewith a rear bowl section, an apron pivotally connecting with and movable into and out of position for retaining the load between said fixed side walls, the side walls on said bottom overlapping and serving as rearward extensions of said fixed side walls, means for raising and lowering said bowl supporting structure independent of the frame for disposing said bowl in carrying and loading positions, and means common to the apron and said rear bowl section for first moving the apron out of load retaining position and then tilting said rear bowl section for dumping the load, said means for raising and lowering said bowl supporting structure including a bell crank fulcrumed on said frame, an actuating means for rocking said bell crank, a rigid cross member fixed to and between the upper portions of said fixed side walls, and means for connecting said bell crank with said rigid cross member.

16. In a hauling scraper, a wheel-supported frame, a bowl associated therewith for loading, carrying and dumping operations, a bowl supporting structure pivoted on the frame adjacent to and extending forwardly from one end of the frame including opposed arms embracing opposite sides of the bowl, said bowl having sectional overlapping side walls the forward sections of which are fixed on and immovable relative to said arms while the rear sections are tiltable relative to said fixed sections, a bottom for the bowl in pivotal connection with said fixed side wall sections and fixed to the rear side wall sections, a back wall joined to said bottom and the rear side wall sections, an apron pivotally connected with said forward side wall sections and movable into and out of position to retain the load therebetween, a scraper blade contiguous with said bottom and disposed between the forward side wall sections, operating means for raising and lowering said bowl supporting structure independent of movement of the frame, for disposing the bowl in carrying and loading positions, and operating means for effecting and controlling the movements of the pivoted parts of the bowl and said apron.

17. In a hauling scraper front and rear wheeled supports, a frame between said supports, a bowl supporting structure mounted on said frame for up and down movement relative thereto, a bowl related to the frame for loading, carrying and dumping operations and including side walls mounted on and immovable relative to said bowl supporting structure, load carrying and dumping sections in front and in rear of said side walls and pivotally connected therewith for movement relative thereto and to one another in the loading, carrying and dumping operating of the bowl, an operating means for moving said bowl supporting structure up and down to dispose the bowl in loading and carrying positions, and an op-

erating means for moving said carrying and dumping sections on their pivotal connections with said side walls for retaining and releasing the load, and a rigid cross member extending between and fixed to said side walls adjacent the upper edges thereof, and rollers on one of said load carrying and dumping sections arranged to ride upon the upper edges of said side walls during movement of said one carrying and dumping section into and out of dumping position.

18. In a hauling scraper front and rear wheeled supports, a frame between said supports, a bowl supporting structure mounted on said frame for up and down movement relative thereto, a bowl related to the frame for loading, carrying and dumping operations and including side walls mounted on and immovable relative to said bowl supporting structure, and load carrying and dumping sections in front and in rear of said side walls and pivotally connected therewith for movement relative thereto and to one another in the loading, carrying and dumping operating of the bowl, an operating means for moving said bowl supporting structure up and down to dispose the bowl in loading and carrying positions, and an operating means for moving said carrying and dumping sections on their pivotal connections with said side walls for retaining and releasing the load, the section in the rear of said side walls being arranged to engage and move along the upper edges of said side wall during movement into and out of dumping position.

19. In a hauling scraper, a sectional bowl; a wheeled supporting structure including a vertically movable portion on which one of the sections of the bowl is mounted for bodily movement vertically therewith; means connecting another section of the bowl with the first named section for tilting movement relative thereto and vertical movement therewith, a lever fulcrumed on said wheeled supporting structure and having a portion extending rearwardly and then downwardly to a point over the first named bowl section, means for pivotally connecting said portion of said lever with the first named section of the bowl, and means for moving said lever for raising the entire bowl.

LEN O. BIRD.