Oct. 3, 1939. H. A. HUTCHINS ET AL 2,174,749

SCRAPER

Filed Feb. 23, 1937 2 Sheets-Sheet 1

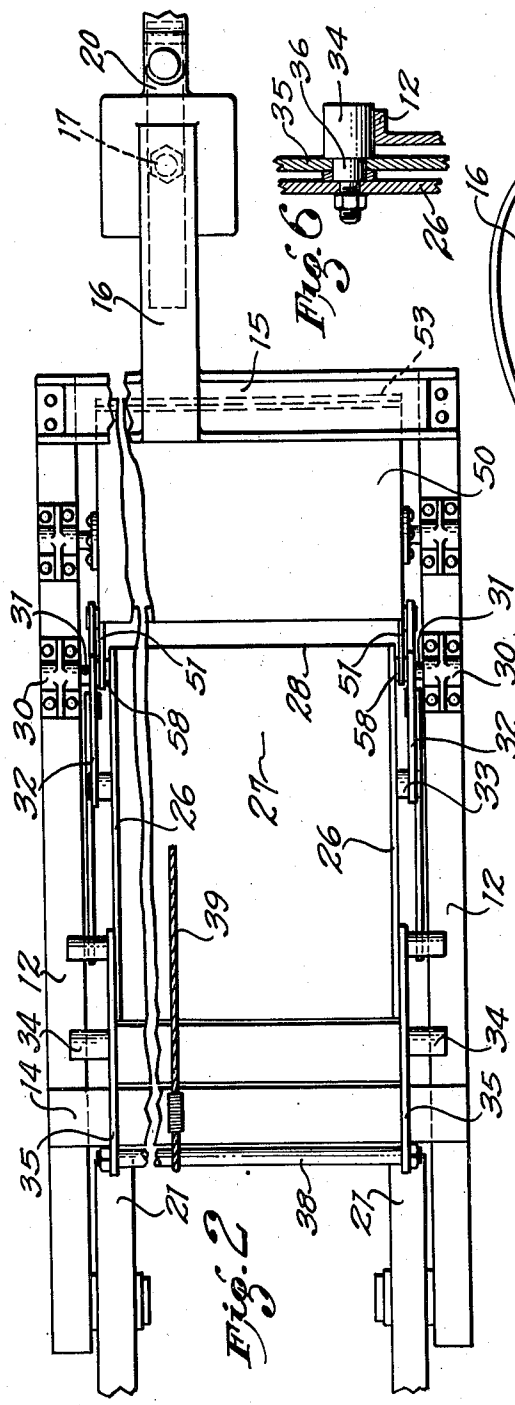


Fig. 2

Fig. 6

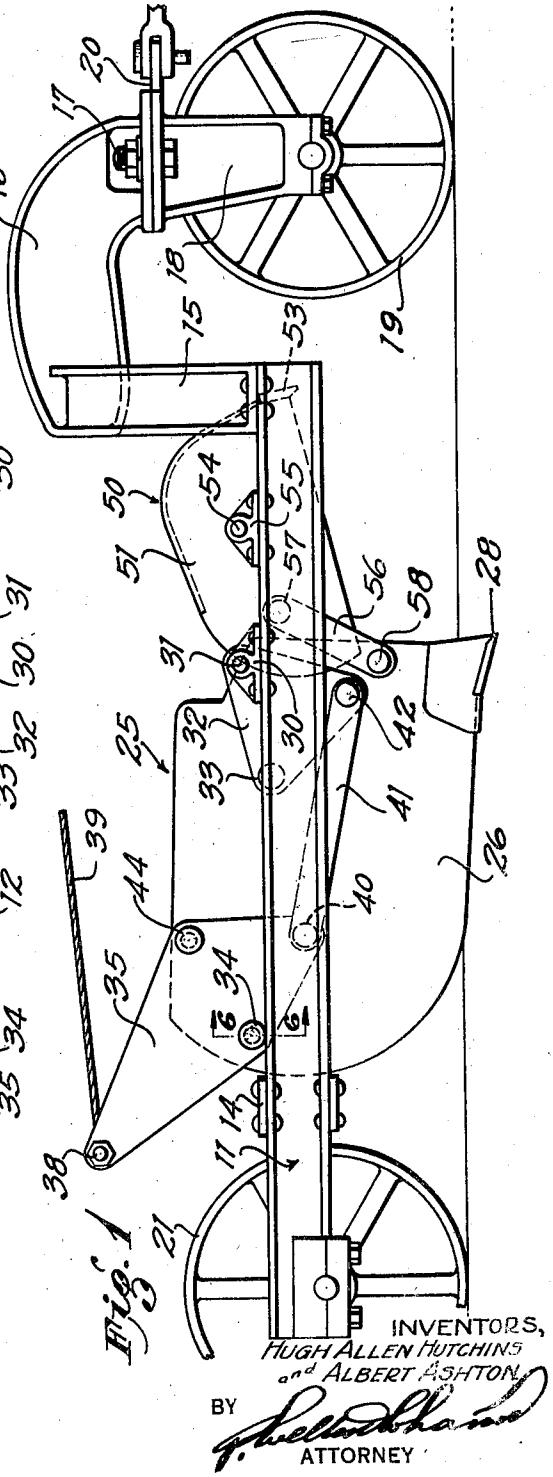


Fig. 1

INVENTORS,
HUGH ALLEN HUTCHINS
and ALBERT ASHTON
BY
ATTORNEY

Oct. 3, 1939. H. A. HUTCHINS ET AL 2,174,749

SCRAPER

Filed Feb. 23, 1937 2 Sheets-Sheet 2

Fig. 3

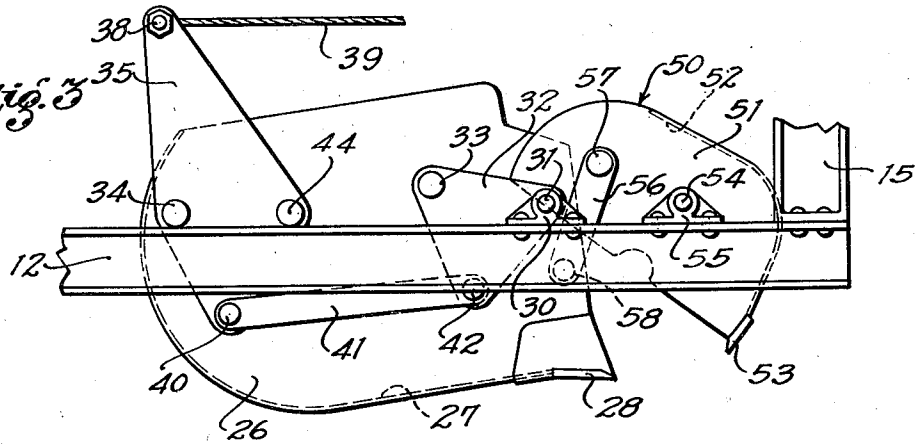


Fig. 4

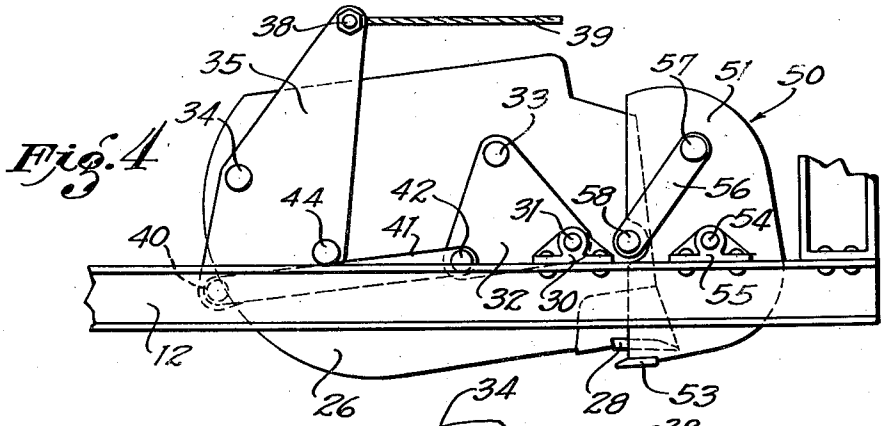
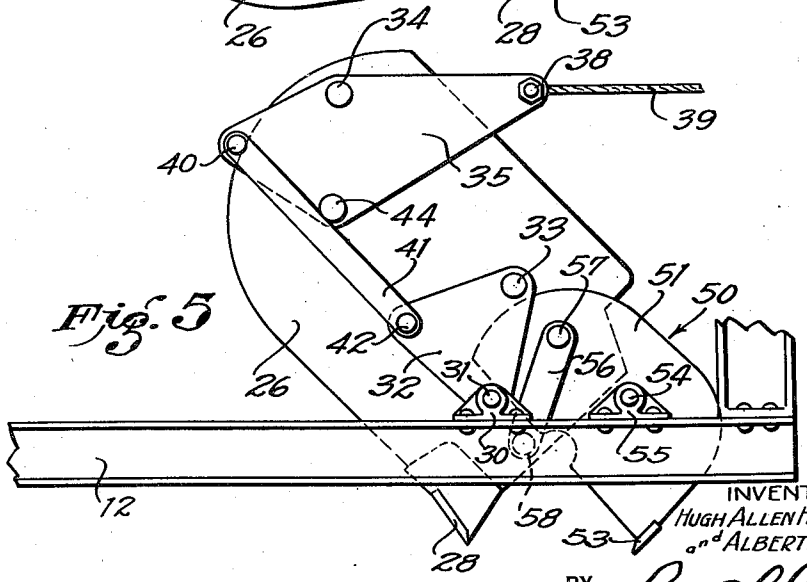


Fig. 5



INVENTORS,
HUGH ALLEN HUTCHINS
and ALBERT ASHTON.

BY

ATTORNEY

Patented Oct. 3, 1939

2,174,749

UNITED STATES PATENT OFFICE

2,174,749

SCRAPER

Hugh Allen Hutchins, Glendale, and Albert Ashton, Los Angeles, Calif., assignors to Emsco Derrick & Equipment Company, Los Angeles, Calif., a corporation of California

Application February 23, 1937, Serial No. 126,968

2 Claims. (Cl. 37—126)

Our invention relates to earth handling apparatus and relates particularly to a scraper which includes a scraper bowl which has a digging or gathering position in which earth is removed from a surface, a carrying position in which the earth is transported, and a dumping position in which the earth is dumped from the scraper bowl.

One of the disadvantages of certain types of scrapers in common use today is that it involves a number of control means, each of which must be operated in order to move the scraper bowl into its different positions. Since it is now common practice to pull heavy duty scrapers by large tractors, which tractors require the attention of the operator, it is sometimes very inconvenient for the operator to be required to operate the tractor and also the various controls of the scraper.

It is accordingly one of the objects of our invention to provide a scraper of the character pointed out above which has but a single control means whereby the scraper bowl may be moved into its various positions. In the preferred form of our invention we provide a single cable control which may be wound onto a drum or unwound from the drum in order to operate the scraper and move the bowl into its various operating positions.

It is a further object of our invention to provide a heavy duty scraper which is particularly designed to gather a relatively large load and in which the scraper bowl when loaded is almost entirely filled. In order to increase the capacity of the scraper of our invention, it is an object of our invention to provide an auxiliary bowl which cooperates with the forward end of the main bowl to close the forward end thereof when the main bowl is in carrying position and to carry any earth which, at the time of closing, is positioned at the forward end of the main bowl.

It is a still further object of our invention to provide a scraper of the character pointed out heretofore which has a main bowl and an auxiliary bowl or closure, and in which the auxiliary bowl or closure does not require a separate operating means but is operated in consequence of the operation of the main bowl. In this way it is not necessary to have a separate control means for the auxiliary bowl, and it is therefore possible to have a heavy duty scraper of the character pointed out in which a single control means operates the main bowl and also the auxiliary bowl.

A further object of our invention is to provide a novel means for moving the main bowl into its various positions, by means of which the front and rear parts of the main bowl are raised or lowered bodily between digging and carrying positions and in which the main bowl is pivotally swung around its forward end into a dumping position when it is desired to dump the contents of the main bowl.

It is a still further object of our invention to provide a heavy duty scraper of the character pointed out above in which there is an adjusting means which raises and lowers the main bowl, and in which the adjusting means is locked relative to the main bowl when a certain position is reached so that further movement of the adjusting means causes the main bowl to pivot near its forward end and thus be swung by a further operation of the adjusting means into a dumping position.

Other objects and advantages of our invention will be pointed out in the course of the following description of one embodiment of our invention. The form of our invention which we have chosen for the purpose of illustrating its principle is not the only form in which our invention may be incorporated. Various modifications and alterations may be made without departing from the spirit and scope of our invention, and we therefore do not wish to be limited to the details of construction disclosed herein, but wish our protection to be commensurate with the appended claims which define the principle of our invention.

Referring to the drawings in detail:

Fig. 1 is an elevational view of a scraper incorporating the features of our invention, the main bowl being in a digging position.

Fig. 2 is a plan view of Fig. 1, a central part thereof being broken away, and the two sides being brought together in order that the entire construction may be illustrated.

Fig. 3 is a fragmentary elevational view illustrating the bowl in a partly raised position.

Fig. 4 is a fragmentary elevational view showing the scraper bowl in a carrying position.

Fig. 5 is a fragmentary elevational view showing the scraper bowl in dumping position.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1.

The numeral 11 designates a main frame having side bars 12, a rear cross-bar 14, a front arch 15, and a forwardly extending arm 16. The front end of the forwardly extending arm 16 is pivotally connected at 17 to a wheel fork 18 which carries a wheel 19. Also connected to the wheel fork 18 is a draft connection 20 whereby the scraper may

be pulled. A pair of rear wheels 21 supports the rearward part of the frame 11 and by the provision of wheel means the frame is rollably supported.

The numeral 25 represents a scraper bowl or main bowl of the scraper which is positioned between the side bars 12 and the rear bar 14 and arch 15. The scraper bowl includes side walls 26 and a bottom and back wall 27. At the lower forward part of the main bowl 25 is a digging or gathering blade 28 whereby earth is removed from the surface and delivered to the interior of the main bowl 25 through the open forward end thereof.

For the purpose of adjustably supporting the forward part of the main bowl we provide forward supporting means which includes a bearing 30 mounted on each of the side bars 12, each of which pivotally supports a shaft 31. Each shaft 31 extends inwardly and is connected to a front lever 32. There are two front levers, each of which is positioned inside the side bars 12 and adjacent the side walls 26 of the main bowl 25. The levers 32 are substantially triangular as shown, and the upper forward corner is pivotally connected by means of an eccentric pivot 33 to the adjacent side wall 26 of the main bowl 25. It will be seen that the weight of the main bowl 25 is eccentrically applied to the pivot shaft 31, and therefore there is a tendency for the parts to be moved into such a position that the pivot 33 rests below the pivot shaft 31. This movement, however, may be restrained by adjusting means which will be described shortly.

The rearward part of the main bowl 25 is supported by rear supports 34 which, as shown in Fig. 6, are secured to the side walls 26 and extend outwardly so that when the scraper bowl is in the position shown in Figs. 1, 2, and 3, the rear supports rest on the upper surface of the side bars 12 and thus support the rear part of the main bowl.

The adjusting means includes an operating lever which includes a pair of operating lever members 35 positioned at each side of the rearward part of the main bowl and conveniently pivotally mounted on the main bowl on reduced bearing portions 36 of the rear supports 34. This is done as a matter of convenience, but, if desired, separate pivot means can be provided. The upper ends of the members 35 are connected together by a cross-bar 38 to which an operating cable 39 is connected, this operating cable 39 extending forwardly to the draft vehicle (not shown), the cable 39 constituting a means for applying an operating force to the operating lever 35. Each member 35 is of the shape shown and the lower end thereof is connected, by means of a pivot 40, to a connecting link or connecting means 41, there being a connecting link positioned on each side of the main bowl, and each connecting link extending forward and being pivotally connected at 42 to the lowermost corner of one of the front levers 32.

The construction just described constitutes a means for adjusting the elevational position of the forward end of the main bowl 25. It will be seen that the weight applied to the front levers 32 by the main bowl 25 tends to swing these levers in an anti-clockwise direction. This in turn tends to pull the connecting links 41 forwardly, and the connecting links tend in turn to rotate the operating lever, including the members 35, in an anti-clockwise direction. This applies a pull to the cable 39 in a rearward direction, and unless the cable is released at the draft vehicle the movement of the various parts will not occur. To lower the main bowl 25 it is merely necessary to allow the operating cable 39 to move rearwardly. The weight of the main bowl accomplishes the movement of the various parts and a lowering of the main bowl. When it is desired to raise the main bowl, the operating cable 39 is pulled forwardly which moves the operating lever in a clockwise direction and pulls the connecting links 41 rearwardly, which in turn rotates the front levers 32 in a clockwise direction, thus raising the forward end of the main bowl.

In Fig. 1 the parts are shown in the positions which they occupy when the scraper is in a digging position. After the main bowl has been loaded the cable 39 is pulled forwardly in order to move the parts into the position shown in Fig. 3. In this position the forward end of the main bowl has been raised. However, the rearward end thereof is still in a depressed position and in order to give more clearance it may be desirable to raise the rearward part of the main bowl. I therefore provide eccentric fulcrums 44 which extend outwardly from the operating lever members 35 and which are positioned eccentrically with respect to the axis of pivoting of the operating lever. It will be seen that when the parts reach the position shown in Fig. 3 the fulcrums 44 move into engagement with the upper surfaces of the side bars 12. When the operating lever is moved forwardly from the position shown in Fig. 4 the operating lever fulcrums around the fulcrums 44 and the pivots 36 of the members 35 are raised from the position shown in Fig. 3 into the position shown in Fig. 4. This movement raises the rearward part of the main bowl 25 into a raised position. This additional movement of the operating lever also swings the front levers 32 an additional distance and produces a further raising of the front end of the main bowl. When the parts have arrived at the position shown in Fig. 4 the main bowl is in a carrying position.

In order to dump the contents of the main bowl it is necessary to swing the main bowl around the pivot shafts 31 from a position shown in Fig. 4 into a position shown in Fig. 5. In order to produce this movement by a further operation of the cable 39 it is necessary to lock the adjusting parts relative to the main bowl 25 so that upon a further movement of the parts the main bowl is swung on the front pivot. This I accomplish by providing a lock means. As a matter of simplicity of construction I employ the fulcrums 44 as the lock means of my invention. When the parts reach the positions shown in Fig. 4 the fulcrums 44 and the connecting links 41 move into engagement with each other, and upon a further pull on the cable 39 the parts 35 and 41 are locked in relative movement. This also locks the members 35 from movement relative to the main bowl 25. This also locks the front levers 32 from movement relative to the main bowl 25. In other words, the parts operatively connecting between the cable 39 and the pivotal connection 33 between the forward end of the main bowl 25 and the front levers 32 become a rigid connection to the main bowl 25. Therefore, upon further forward movement of the cable 39 the main bowl 25 is swung in a clockwise direction around the pivot shaft 31 and from a position shown in Fig. 4 into a position shown in Fig. 5. The parts may be returned to the various positions just described by allowing the cable 39 to move rearwardly.

In addition to the parts just described, our invention provides a closure member or auxiliary bowl 50 which constitutes an important part of

our invention and which, as will be explained, is operated in consequence of or as a result of the operation of the main bowl 25. The auxiliary bowl 50 includes side walls 51 and a front and bottom wall 52. The lower rearward part of the auxiliary bowl 51 has a blade 53. The auxiliary bowl 50 is pivotally mounted on outwardly extending trunnions 54 which are pivotally supported in bearings 55 mounted on the side bars 12. A closure operating means in the form of an operating link 56 is pivotally connected by pivots 57 to each of the side walls 51. The other end of each of the operating links 56 is pivotally connected by a pivot 58 to the forward parts of the side walls 26 of the main bowl 25. As shown, the side walls of the auxiliary bowl are positioned outside the side walls of the main bowl, and the blade 53, when the parts are in the position shown in Fig. 4, extends below the blade 28 of the main bowl. In other words, when the parts are in the position shown in Fig. 4 the auxiliary bowl surrounds and encloses the forward end of the main bowl.

The auxiliary bowl is so positioned and so connected to the main bowl that when the main bowl is in digging or gathering position as shown in Fig. 1, the auxiliary bowl is in a substantially horizontal position as shown in order that it will not interfere with the gathering of earth and will provide a large entrance space to the main bowl. When the parts are moved into the position shown in Fig. 3, the raising of the forward end of the main bowl moves the operating links 56 upwardly and thus swings the auxiliary bowl in a clockwise direction. When the parts are moved into a carrying position as shown in Fig. 4, the auxiliary bowl has been moved into a closed position, at which time the forward end of the main bowl is completely enclosed and any earth therein cannot be spilled. It will be seen that any earth which tends to spill forwardly is supported inside the auxiliary bowl. When the main bowl is moved into a dumping position the operating links 56 are moved downwardly. This is because of the fact that the main bowl moves pivotally on the pivot shafts 31 and the pivotal connections 58 are connected to the main bowl to the front of the pivots 31 or to that portion which at that particular time moves downwardly. This movement of the operating links 56 moves the auxiliary bowl a short distance in an anticlockwise direction and into the position shown in Fig. 5, in which position the forward end of the main bowl is open, and at the same time the auxiliary bowl is moved into a dumping position so that any earth which is supported therein may slide downwardly from the bottom wall and be dumped therefrom.

Due to the simplicity of construction of our invention the parts may be made very strong, and it is therefore possible to produce a relatively large scraper capable of handling large capacities yet at the same time, in view of its simplicity of construction, being operable by a single control cable 39. If the scraper is built so large that additional power is required to operate the main bowl, a block and tackle arrangement may be included in the cable control as desired.

We believe our invention to be broadly new not only in the preferred arrangement of parts which we have illustrated herein but also in the principle of operation herein disclosed.

We claim as our invention:

1. In a scraper of the class described, the combination of: a frame; a main bowl; means for supporting the rearward part of said main bowl; a forward supporting means pivotally connected to said main bowl and said frame, the forward part of said main bowl being raised and lowered by movement of said forward supporting means relative to said main bowl; an operating means pivotally connected to the rearward part of said main bowl; connecting means connected to said forward supporting means and said operating means, whereby upon pivotal movement of said operating means said forward supporting means is moved to raise or lower the forward part of said main bowl; and restraining means whereby upon a predetermined movement of said operating means relative movement between said operating means and said main bowl is restrained and said forward supporting means and said operating means move bodily with said main bowl to move same into dumping position.

2. In a scraper of the class described, the combination of: a frame; a main bowl; means for supporting the rearward part of said main bowl; a front lever pivotally connected at its forward part to said frame and at its rearward part to the forward end of said main bowl; an operating lever pivoted to the rear part of said main bowl; means for applying an operating force to said operating lever; a connecting link connected to said operating lever eccentric of its pivot, and to said front lever eccentric of its pivotal connections; and restraining means operable upon a predetermined movement of said operating lever for restraining relative movement between said operating lever, said front lever, and said main bowl, whereafter said parts move bodily around the pivotal connection of said front lever and said frame.

HUGH ALLEN HUTCHINS.
ALBERT ASHTON.