

Nov. 17, 1942.

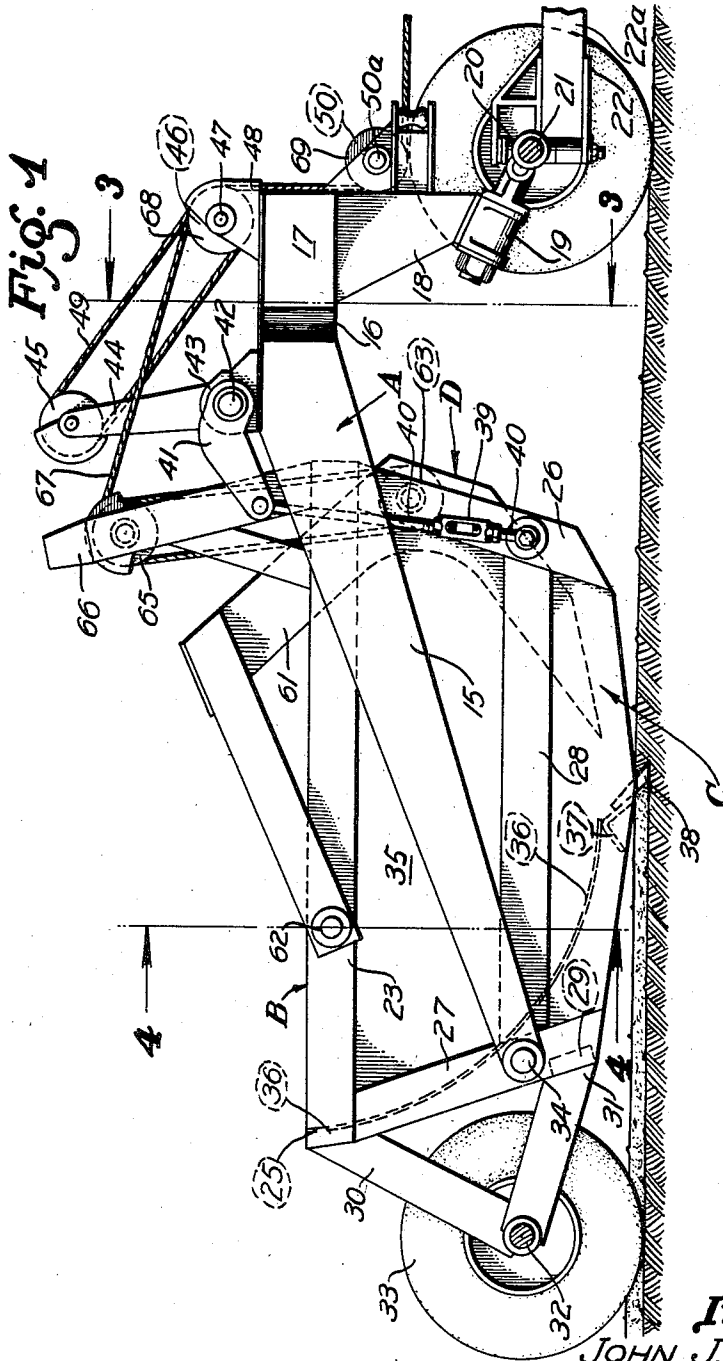
J. J. LOW

2,302,335

CARRYING SCRAPER

Original Filed July 6, 1938

3 Sheets-Sheet 1



Inventor

JOHN J. LOW

By

Edwin D. Jones.
Attorney

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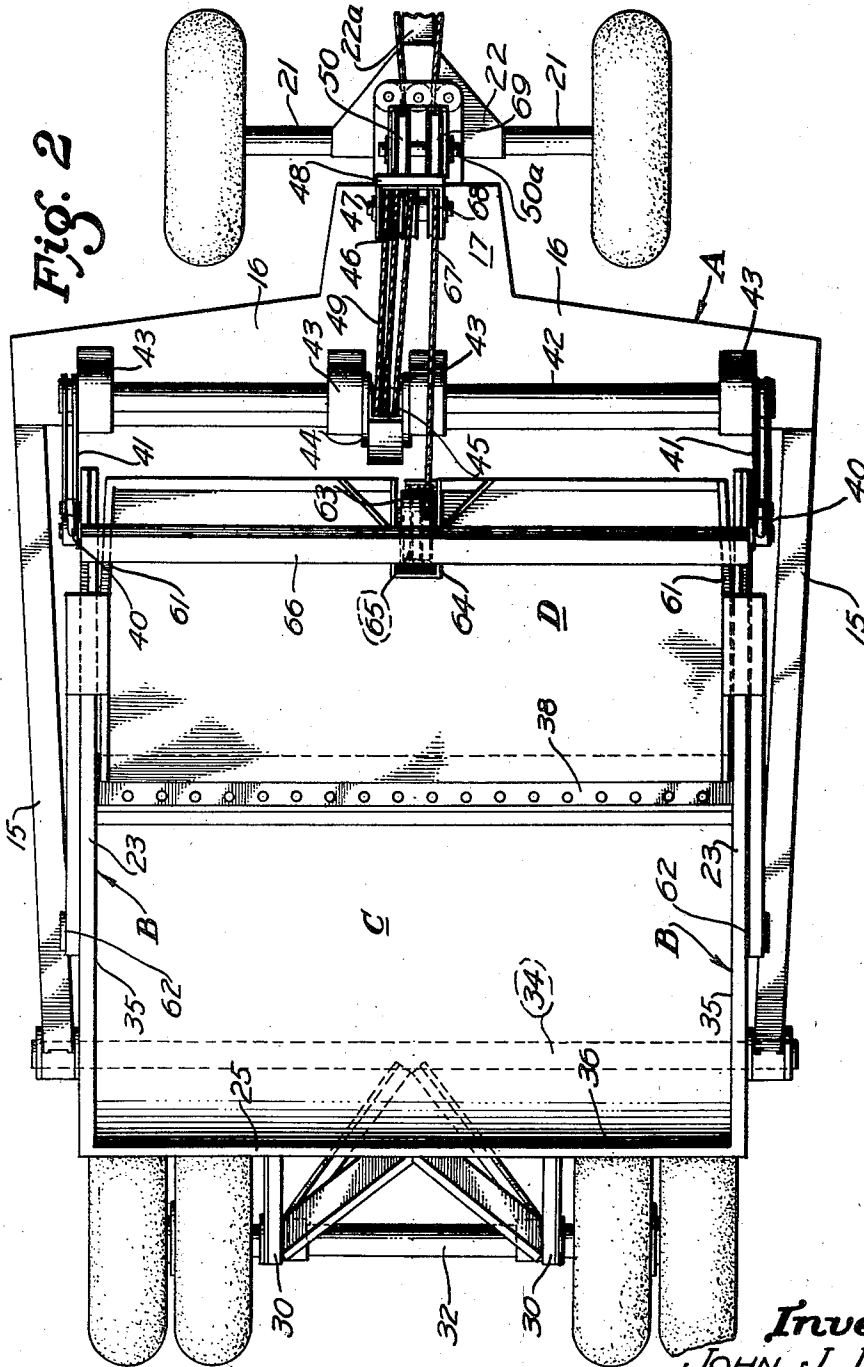
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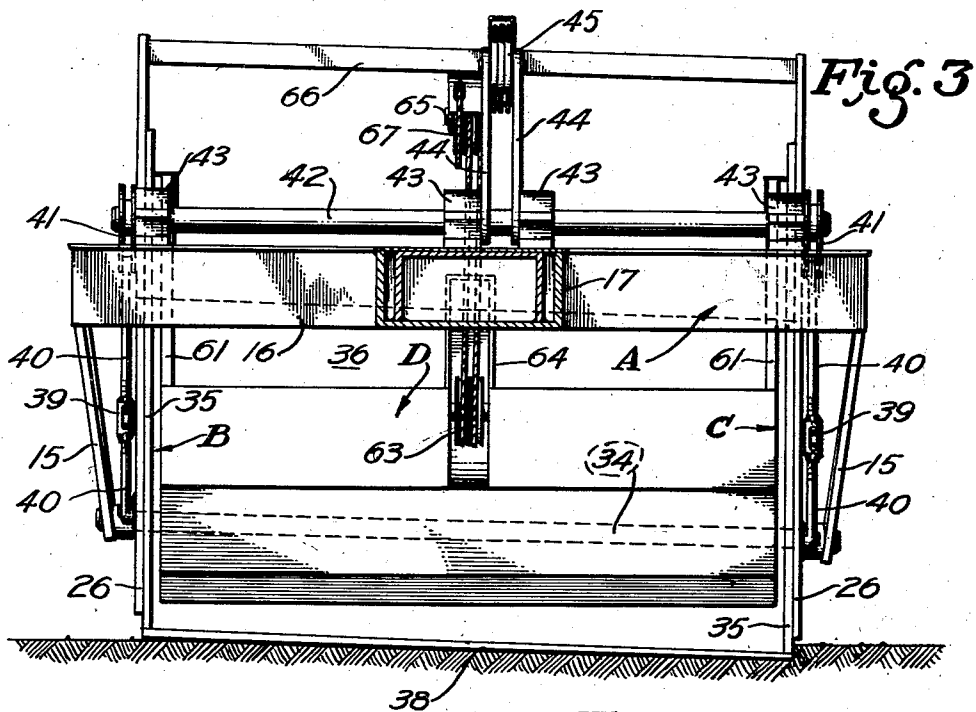
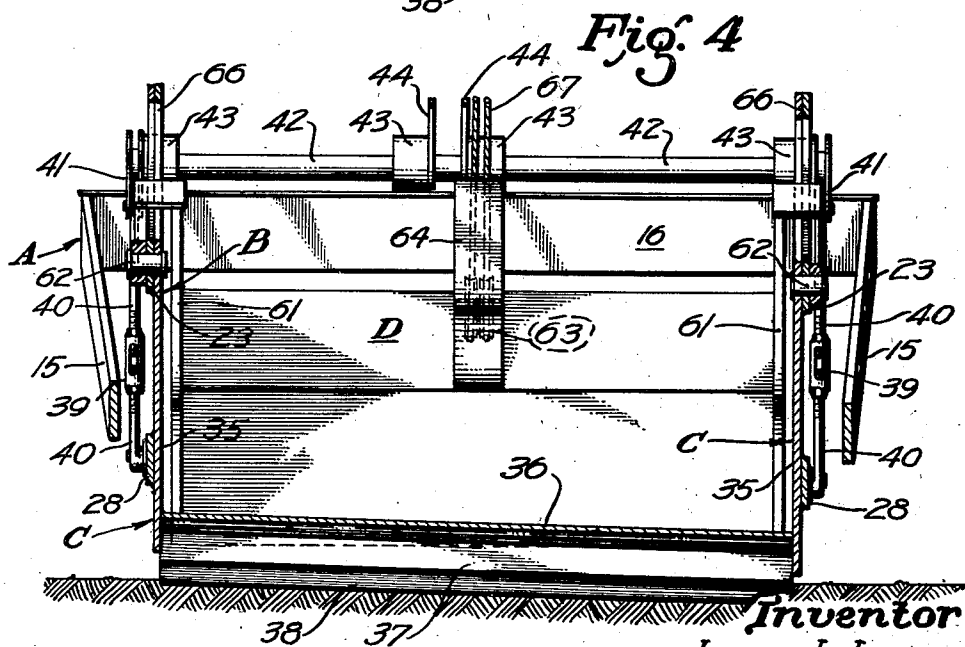
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JOHN J. LOW

BY

Edwin D. Jones,
Attorney

UNITED STATES PATENT OFFICE

2,302,335

CARRYING SCRAPER

John J. Low, Los Angeles, Calif., assignor to Kay-Brunner Steel Products, Inc., a corporation of Delaware

Original application July 6, 1938, Serial No. 217,658. Divided and this application July 17, 1939, Serial No. 284,875

7 Claims. (Cl. 37—126)

This application is a division of my prior application, Serial No. 217,658, filed July 6, 1938.

My invention relates to carrying scrapers and it has for a purpose the provision of a mechanism for lifting the bowl of the scraper, which is characterized by an adjustment that effects transverse tilting of the bowl frame in a manner to produce an end to end tilting of the scraping blade carried by the bowl, whereby the bowl is caused to scrape the earth at any angle to the horizontal necessary to the formation of a road of any desired transverse inclination. Such blade tilting provides the dual advantage of compensating for unintentional inclination of the blade caused by the rear wheels of the scraper being disposed at different levels as when traveling individually on earth of different degrees of hardness, or where the blade engages a tree stump or boulder resulting in a permanent twisting of the bowl frame and causing a permanent end to end tilting of the blade.

In compensating for the first of these conditions the mechanism for lifting the bowl is so adjusted as to twist the bowl frame to a position in which the blade assumes a horizontal position, while under the other described condition the flexed bowl frame is restored to its normal form to return the blade to a horizontal position.

It is also a purpose of my invention to provide in a carrying scraper a bowl lifting mechanism which is further characterized by a cable means for actuating the same to elevate the bowl, and a leverage system which minimizes the pull necessary to lift the bowl and thereby reduces the possibility of cable breakage.

I will describe only one form of carrying scraper embodying my invention and will then point out the novel features thereof in claims.

In the accompanying drawings:

Fig. 1 is a view showing in side elevation one form of carrying scraper embodying my invention.

Fig. 2 is a view showing the scraper of Figure 1 in top plan.

Fig. 3 is a vertical transverse sectional view taken on the line 3—3 of Fig. 1 and looking in the direction of the arrows.

Fig. 4 is a view similar to Fig. 3 taken on the line 4—4 of Fig. 1 and looking in the direction of the arrows, the bowl assembly being twisted in the opposite direction from that of Fig. 3.

In carrying out my invention I provide a main frame A made up of inclined side beams 15, 15 connected at their forward and upper ends by

a cross beam 16 having a medial and forward extension 17 from which depends a standard 18. At its lower end the standard is pivoted as 19 on a block 20 which is turnably mounted on an axle 21 of a front wheel truck 22, which has a draw bar 22a adapted for connection to a tractor.

A second frame B is pivoted on the frame A between the side beams 15 for movement about a transverse and horizontal axis. The frame B comprises an upper rigid structure substantially square and having side beams 23, 23, and a rear cross beam 25. Rigidly fixed to and depending from the front and rear ends of the side beams 23 are four corner beams 26, 26, and 27, 27 rigidly connected at points above their lower ends by a pair of side beams 28.

As best shown in Fig. 2, the rear ends of the beams 28 are rigidly connected by a cross beam 29, and to the center of the beams 25 and 29 rigid frames 30 and 31 respectively, are secured to co-act with an axle 32 and wheels 33 in forming a rear wheel truck for the scraper.

An axle 34 is mounted in and extends through the beams 27, and on the ends of this axle the rear ends of the beams 15 are pivoted to allow vertical movement of the frame B relative to the frame A but about the axle 32 as a center. The frame B has secured therein a bowl C which includes a pair of side plates 35 between which is a combined bottom and end plate 36 curved downwardly and forwardly to a V-shaped shoe 37 to which a scraping blade 38 is secured.

For actuating the frame B to lift the bowl C from scraping positions to carrying position the following mechanism is provided: A pair of turnbuckles 39 are secured to the corner beams 26, and to a pair of rods 40 with the latter in turn pivotally connected to a pair of arms 41 fixed to the opposite ends of a shaft 42 journaled in bearings 43 secured to the cross beam 16. Fixed to the shaft 42 at a point between those bearings 43 at the center of the shaft, are a pair of relatively long arms 44 disposed substantially at right angles to the shorter arms 41.

Sheaves 45 are mounted between the free ends of the arms 44, while a companion set of sheaves 46 are supported on a shaft 47 carried by a block 48 secured on the extension 17. A cable 49 is extended around both sets of sheaves and secured at one end to one set of sheaves or the other, while the other end of the cable is extended downwardly at the front side of the standard and beneath a sheave 50 on a shaft 50a and then to the tractor to which the scraper is adapted to be connected.

The bowl lifting mechanism just described operates as follows: By pulling on the cable 49 the arms 44 are rocked forwardly to rotate the shaft 42 and thus lift the arms 41 to elevate the rods 40 and the turnbuckles 39. With elevation of the turnbuckles the front end of the frame B is lifted to raise the bowl C from scraping position to carrying position.

Manifestly, the multiplication in the power applied to the cable 49 secured by the sheaves 45 and 46, and the compound leverage attained by the arms 41 and 44, combine to secure lifting of the bowl and the other elements carried by the frame B with a minimum pull on the cable 49, thereby reducing the possibility of breakage of the cable.

For retaining the earth in the bowl C after loading, a conventional apron D is provided which includes a pair of side arms 61 pivoted on trunnions 62 secured to the beams 23 so that the apron is movable between the sides of the frame B to occupy open and closed positions with respect to the bowl.

The mechanism for lifting the apron D comprises a set of sheaves 63 carried in a block 64 secured to the apron medially of its width, and another set of sheaves 65 carried in an inverted U-shaped cross beam 66 secured to, spanning and rising above the forward ends of the side beams 23. A cable 67 is extended around the two sets of sheaves with one end secured to the set 56 and the other end extended forwardly over a sheave 68 on the shaft 47, and then downwardly beneath a sheave 69 on the shaft 50a from which it leads to the tractor.

Manifestly, the cable 67 is operable to lift the sheaves 63 and thereby swing the apron D upwardly about the trunnions 62 as a center.

The turnbuckles 39 provide an adjustment by which the bowl frame B can be twisted or flexed in one direction or the other about the major axis of the scraper to tilt the bowl transversely in one direction or the other and thereby effect end to end tilting of the blade 38. By such tilting the blade is caused to scrape the earth at any angle to the horizontal required in the formation of a road of any desired transverse inclination.

When it is realized that the scraper to which my invention is applied approximates 25 or more feet in length, and the bowl has an earth carrying capacity of 12 or more cubic yards, it will be appreciated that the length of the beams comprising the frame B provide the requisite flexibility to allow of its twisting or flexing through adjustment of the turnbuckles 39 in the attainment of the desired end to end tilting of the blade 38. In point of fact, when operating a scraper of this size the bowl frame is frequently and permanently sprung or twisted to one side or the other by the blade striking a tree stump or boulder. In such event the blade is permanently tilted from end to end so that a horizontal scraping action is no longer possible. This condition is easily and quickly corrected, however, by adjusting the turnbuckles until the bowl frame is twisted in the opposite direction from which it is sprung, until the blade is brought back to a horizontal position, and in which position it is maintained.

My mechanism is adjustable also to compensate for an unintentional end to end tilting of the blade due to one rear wheel 33 traversing soft ground while the other wheel is traversing relatively hard ground, thus positioning the wheels

at two different levels. Under such a condition the bowl frame is twisted transversely in one direction or the other depending upon which of the wheels is lowermost, and thereby tilting the blade in the same direction as the bowl frame.

To restore the scraping blade to horizontal position the turnbuckles are adjusted to twist the bowl frame back to its normal horizontal position when, under forward movement of the scraper, the blade will produce a truly horizontal scraping action.

Although I have herein shown and described only one form of carrying scraper including only one form of bowl lifting mechanism having only one form of adjusting means by which the bowl frame can be moved to position the scraping blade horizontally or at any desired angle, it is to be understood that various changes may be made therein without departing from the spirit of my invention and the spirit and scope of the appended claims.

I claim:

1. A scraper, comprising; a main frame; a bowl having a transverse blade thereon; a second frame carrying the bowl and pivoted on the main frame; and a mechanism for actuating the second frame to elevate the bowl including two means independently adjustable to twist the second frame transversely in either direction so as to tilt the blade from end to end in either direction.

2. A scraper, comprising; a main frame of U-form having a forward extension at the medial part thereof; a front wheel truck supporting the extension; a second frame between the parallel parts of the main frame and pivoted adjacent its rear end to the rear ends of said parts; a rear wheel truck supporting the rear end of the second frame; a bowl fixed in the second frame; and a mechanism carried by the medial part of the main frame and operatively connected to the forward end of the second frame for lifting said end to elevate the bowl, said mechanism comprising a shaft journaled on said extension, a pair of arms fixed to the shaft, a pair of rods pivoted to the arms, turnbuckles carried by the rods and pivoted to the second frame, an arm fixed to the shaft at an angle to the pair of arms, and means connected to the free end of said arm for actuating the latter.

3. A scraper as embodied in claim 2 wherein an apron is pivoted on the second frame, and mechanism is provided for lifting the apron, comprising sheaves carried by the apron, other sheaves carried by the second frame, and a cable associated with the sheaves.

4. A scraper, comprising; a main frame; a bowl having a transverse blade thereon; a second frame to which the bowl is secured and pivoted on the main frame, the second frame having such inherent flexibility as to allow twisting or flexing thereof in a manner to vary the end to end position of said blade; and mechanism for actuating the second frame to lift the bowl, including means adjustable to flex the second frame for varying the end to end position of said blade.

5. A scraper, comprising; a main frame; a second frame which is pivotally connected adjacent its rear end to the rear end of the main frame; a bowl secured within the second frame and having a transverse blade which is normally horizontal from end to end; the second frame being sufficiently flexible to permit twisting thereof about the major axis of the scraper; and

a lifting mechanism for the second frame mounted on the main frame and having connections with the forward end of the second frame which are adjustable to twist the second frame in either direction for tilting the blade in one direction or the other from horizontal, or when the second frame is accidentally twisted and the blade tilted to restore the frame to its original position to return the blade to horizontal.

6. A scraper, comprising; a main frame; wheels supporting the forward end of the main frame; a second frame pivoted on the main frame; a bowl secured within the second frame and having a blade thereon; a pair of wheels supporting the rear end of the second frame, 15 said second frame having such flexibility as to allow twisting thereof so as to tilt the blade from end to end; and a mechanism for lifting the for-

ward end of the second frame to elevate the bowl, including means adjustable to twist the second frame and effect tilting of the blade, or to twist the second frame to return the blade to horizontal when the second frame is tilted to one side or the other by reason of the wheels supporting the second frame being at different levels.

7. A scraper, comprising; a frame of sufficient flexibility to permit transverse twisting thereof; a bowl fixed to the frame and having a blade transversely of the frame; wheels supporting the rear end of the frame; and means for supporting the front end of the frame including devices adjustable independently to twist the frame transversely in either direction so as to tilt the blade from end to end in either direction.

JOHN J. LOW.