

April 18, 1944.

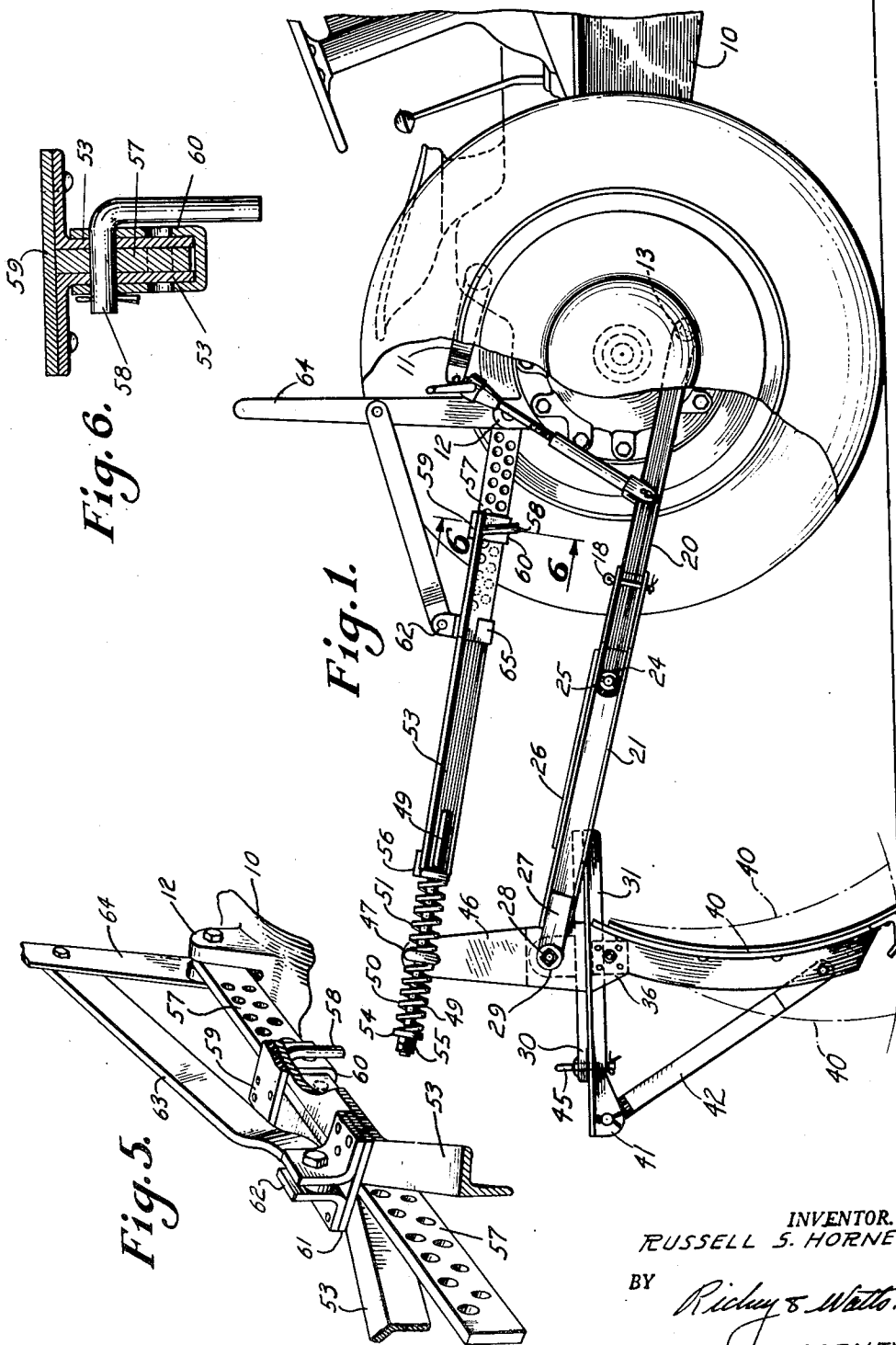
R. S. HORNER

2,346,757

SCRAPER

Filed Sept. 16, 1942

3 Sheets-Sheet 1



INVENTOR.
RUSSELL S. HORNER
BY *Richard S. Watts*
ATTORNEYS

April 18, 1944.

R. S. HORNER

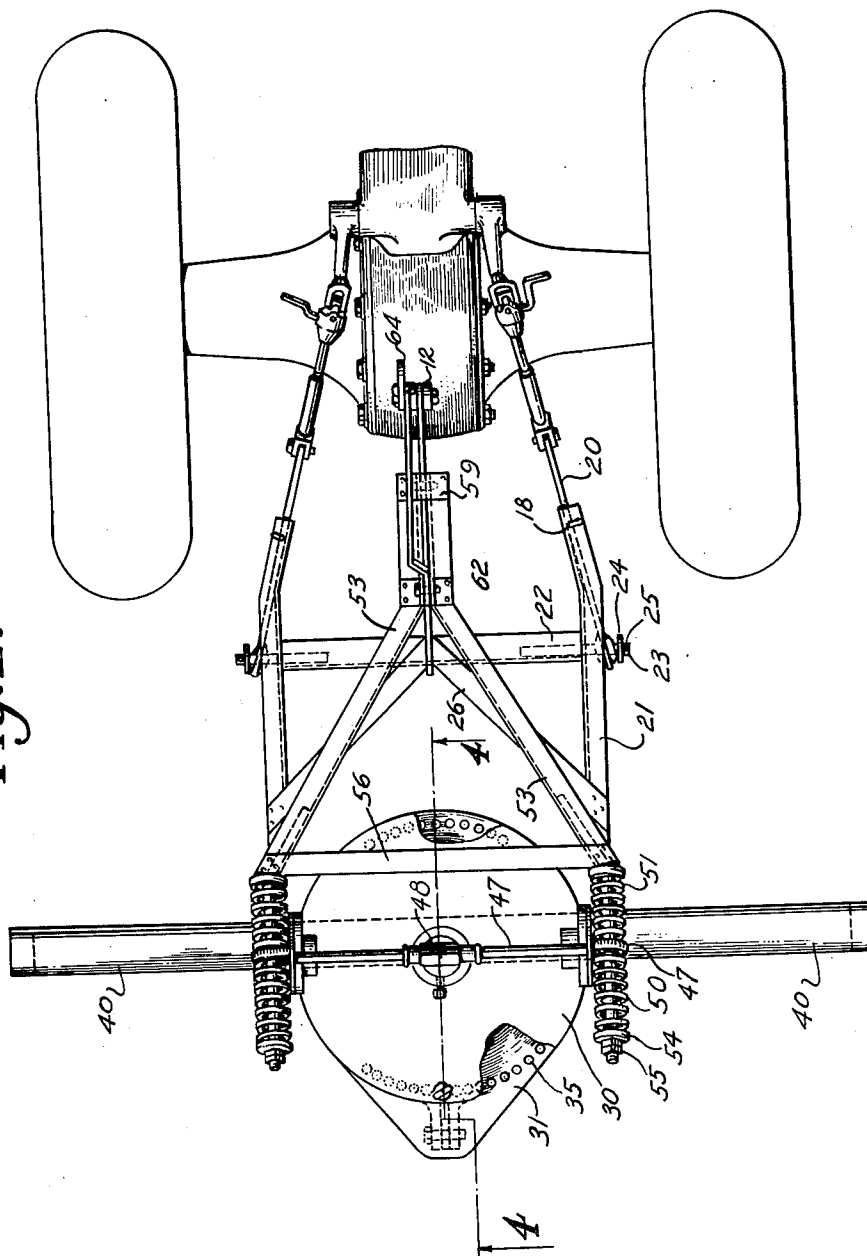
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Fig. 2.



BY

INVENTOR.
RUSSELL S. HORNER.

Richy & Watts
ATTORNEYS

April 18, 1944.

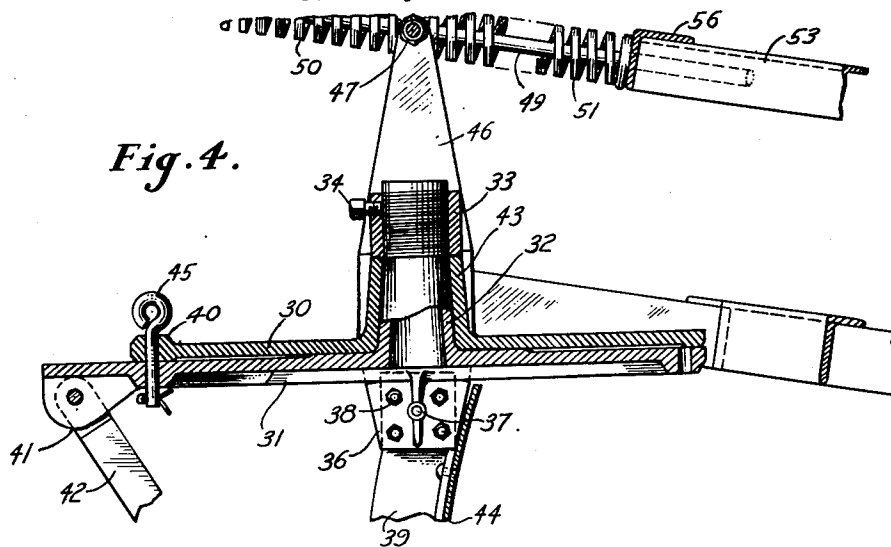
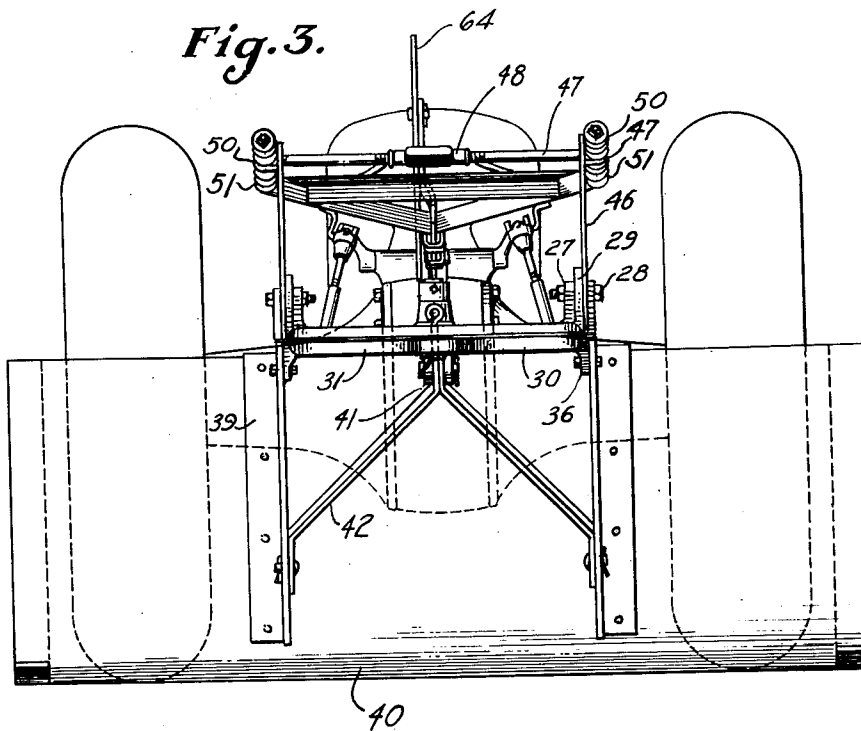
R. S. HORNER

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3 Sheets-Sheet 3



INVENTOR.
RUSSELL S. HORNER

BY *Richy & Watts*
ATTORNEYS

UNITED STATES PATENT OFFICE

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SCRAPER

Russell S. Horner, Geneva, Ohio

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4 Claims. (Cl. 37-156)

This invention relates broadly to earth handling machines and more specifically to tractor drawn scrapers, such as employed in grading, back filling, snow removal and similar highway maintenance operations.

One of the objects of the invention is to provide a scraper blade supporting structure which is designed to facilitate the complete rotation of the blade in a horizontal plane; to accommodate angular adjustments thereof in such plane; to facilitate the elevation of the blade in a vertical plane and accommodate angular adjustments divergent such plane irrespective its elevation or horizontal adjustment.

Another object of the invention is to provide a scraper coupling which is designed to effect the imposition of the load upon the vehicle in such relation to the running gear as to produce the maximum tractive effort thereof.

Another object of the invention is to provide a scraper supporting structure which is constructed to accommodate the use of the implement as a pusher for back filling, terracing, etc., when the vehicle is driven in one direction, and as a grader, snow plow, etc., when the vehicle is driven in the opposite direction.

Another object is the invention is to provide a road scraper which is designed to negotiate sharp bends, abrupt declivities and road undulations without manipulation of the scraper blade elevating mechanism and further to provide a scraper which will dislodge and effect the transposition of loose or broken waste material or soil consonant with the depth of deposit thereof.

Another object of the invention is to provide a shock absorber for the scraper supporting structure which will permit deflection of the blade when engaged with immobile obstructions and the ready recovery thereof after such obstructions have been traversed.

Other objects and advantages more or less ancillary to the foregoing and the manner in which all the various objects are realized will appear in the following description, which considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

Referring to the drawings wherein the preferred embodiment of the invention is illustrated:

Fig. 1 is a side elevational view of the improved scraper including a fragmentary portion of a tractor;

Fig. 2 is a plan view thereof;

Fig. 3 is a rear elevational view of the scraper and tractor shown in Fig. 1;

Fig. 4 is a vertical sectional view of the pivotal support for the scraper blade, the section being taken on a plane indicated by the line 4-4 in Fig. 2;

Fig. 5 is a view in perspective of a fragmentary portion of the blade adjusting mechanism; and

Fig. 6 is a vertical section through the adjusting linkage, the section being taken on a plane indicated by the line 6-6 in Fig. 1.

As illustrated in Fig. 1, the vehicle chosen herein for purposes of illustration comprises a tractor 10 embodying a power actuated arm 11, a pair of lugs 12 and a draw bar pivot 13 provided for the support of various agricultural implements.

The scraper embodying the present invention comprises a pair of arms 20 connected to the draw bar pivot 13 and telescopically engaged with the forward end portions of channel irons 21 constituting the side rails of the scraper blade supporting frame. The frame, as will be seen in Fig. 2, comprises in addition to the channels 21 a cross member 22 having pintles 23 welded to the end portions thereof which are arranged to extend through and project beyond the webs of the channels (Fig. 2). The outer ends of the arms 20 are upset and cross drilled for engagement with the pintles 23, being laterally retained thereon by washers 24 and cotter pins 25. The frame further includes diagonal braces 26 welded or otherwise firmly affixed upon the channel side rails 21 and the cross member 22. The outer ends of the rails 21 are provided with bearing blocks 27 which are drilled for the reception of bolts 28 mounted in lugs 29 in the upper plate 30 of the scraper supporting structure. As will be seen in Fig. 4 the lower mating plate 31 of the supporting structure is formed with a spindle 32 in the central portion thereof, the free end of which is threaded for the reception of a sleeve 33 for the retention of the hub 43 of the plate 30. The outer edge of the plate 31 is drilled to provide a continuous series of holes 35 disposed in equidistant relation with each other, in a common bolt circle, concentric with the spindle 32. The plate 31 is cast with depending ears 36 machined for the reception of dowels 37 and bolts 38 for the support of angle irons 39 constituting reinforcing members for the scraper blade 40. The plate 31 is further formed with spaced lugs 41 drilled to support a pair of struts 42 coupled for pivotal movement with the angle irons 39.

The contiguous faces of the plates 30 and 31 are undercut adjacent the outer portions thereof in order to reduce the frictional resistance incident

rotative adjustments of the plate 31. The plate 30 is formed with a boss 44 drilled for the reception of a pin 45 disposed for reentrant engagement in the openings 35 in the plate 31. The lugs 29 in the plate 30 are machined for the support of arms 40 having openings in the ends thereof for the reception of eye bolts 47, the inner ends of which are threaded and united by a turn buckle coupling 48. In assembly the heads of the eye bolts 47 are drawn into abutting engagement with the outer faces of the arms 40, the opening in the eyes having rods 49 extended therethrough for the support of contractile springs 50 and 51. The inner ends of the rods 49 are welded to angle irons or bars 53, the springs 50 being retained by cup washers 54 and nuts 55, the springs 51 being supported by an angle cross brace 56 welded upon the ends of angle irons 53.

The frame for effectuating the angular adjustment of the blade in a vertical plane comprises a bar 57 mounted for pivotal movement on a bolt in the lug 12 formed in the tractor frame 10. The bar is drilled, as shown in Figs. 1 and 5 with a double series of holes disposed in staggered relation to facilitate the support of a pin 58 mounted in openings in the free ends of the angle irons 53. As will be seen in Fig. 6, the inner ends of the angle irons are united by a gusset plate 59 disposed to support the top flanges of the angles in spaced relation so that the bar 57 may slide freely between the parallel portions thereof. The lower legs of the angle irons 53 are further united by a U-clip 60 which is welded thereto, the base thereof being formed to bridge the opening between the angle irons. Adjacent the ends of the parallel portions of the angle irons 53 there is a gusset plate 61 having a pair of angle clips riveted thereto forming a bracket 62 (see Fig. 5) for the support of a link 63 pivotally connected to a lever 55 fulcrumed on the lug 12. The outer end of the bar 57 is further supported by a U-clip 65 secured to the depending flanges of the angle irons 53 and designed to span the opening defined by the parallel portions thereof.

In operation the scraper is preferably drawn behind the tractor, the blade therefor being adjusted with the concave face thereof adjacent the vehicle so that the accumulated load imposed thereon will be biased upon the rear wheels of the tractor. The position of the scraper in a vertical plane may be altered to meet the varying road conditions encountered in grading or snow removal by adjusting the angle irons 53 in lineal relation to the bar 57. In making such adjustment the scraper blade is first elevated, by actuation of the arm 11, to a point slightly above the earth's surface, the pin 58 is then removed and the angle irons then shifted forward or backwards along the bar 57 by manipulation of the lever 55.

The scraper blade is adjusted in horizontal plane by first removing the pin 45, then rotating the plate 31 relative to the plate 30, the pin being finally reset in the selected opening 35 to lock the plates together in their adjusted relation. When the scraper is used as a pusher the blade 40 may be revolved 180° so that the concave surface thereof will face rearwardly. When the blade is so adjusted the vehicle may be operated in reverse gear. The springs 50 and 51 are constructed to withstand the normal loads imposed upon the blade during grading operations or snow removal but to yield and permit the scraper blade assembly to rock about its fulcrum when the blade

engages an immovable object such as a large or deeply embedded boulder, curb stones and the like.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. In combination with a tractor having a power actuated elevating arm thereon and a draw bar pivot, a scraper comprising a frame coupled with said draw bar pivot and said arm, a plate pivotally mounted on said frame, a second plate pivotally connected to the first named plate, a scraper blade mounted thereon normal thereto, said second plate having openings therein disposed in equi-distant spaced relation on a center line defining a complete circle, a pin in the first named plate mounted for reentrant engagement in the openings in the second named plate, arms affixed upon the first named plate normal the upper face thereof, bars pivotally connected therewith, springs disposed in abutting engagement with the opposed sides of said arms supported by said bars, and a second bar having spaced holes therein adjustably connected with the first named bars and pivotally connected to the tractor.

2. In combination with a tractor having a power actuated elevating arm thereon and a draw bar pivot, a scraper comprising a frame coupled with said draw bar pivot and said arm, a plate pivotally mounted on said frame, a second plate pivotally connected to the first named plate having holes therein disposed in equi-spaced relation in a complete circle, a pin in the first named plate engageable with the holes in the second named plate, a scraper blade on the second named plate, vertically disposed arms on the first named plate, bars resiliently coupled therewith, a second bar coupled with the tractor, an adjustable connection between the first named bars and the last named bar and a lever pivoted to the tractor and connected with said bars to facilitate lineal movement thereof.

3. In combination with a vehicle having a draw bar pivot thereon and an elevating mechanism, a scraper, comprising a frame coupled with said draw bar pivot and coupled intermediate its ends with said elevating mechanism, a circular plate, pivot pins thereon coupled with said frame, a hub in the center thereof, a disc engaged with said plate, a spindle on said disc engaged with said hub, a sleeve threaded on said spindle and engaged with said hub, said disc having a plurality of openings in the face thereon, arranged in equi-spaced relation with each other and concentric the axis of said spindle, a scraper blade mounted on said disc, a pin in said plate engageable with said openings in said disc for the securing of the disc in adjusted position relative to the plate, vertically disposed arms affixed to said plate, eye bolts in said arms, bars extended through said eyes, abutments on said bars, springs on said bars impinged between the heads of said eye bolts and said abutments on said bars, a second bar having a plurality of openings therein pivotally mounted upon the vehicle, and a pin in said bars engageable with the openings in said

bar for the securement of the bars in adjusted position relative to each other.

4. In combination with a vehicle having an elevating mechanism thereon, a scraper comprising a frame pivotally coupled with said vehicle and with said elevating mechanism, a circular plate, a pivotal connection thereon coupled with said frame, a hub on said plate, a second circular plate, a spindle thereon engaging said hub, means for locking the first and second, 10 named plates in rotative adjustment throughout

360°, a concave scraper mounted on said second plate, a second frame for rocking said plate angularly about said pivotal connection on the first named frame, the leading edge of said scraper blade being disposed beyond the edges of said plates when the concave face of the blade is faced forwardly or rearwardly normal to the medial axis of the frame and the plates are rocked angularly about the pivot on the first named frame.

RUSSELL S. HORNER.