May 29, 1945. J. H. STRUNK 2,377,112

MATERIAL HANDLING APPARATUS

Filed Nov. 27, 1944 4 Sheets-Sheet 1

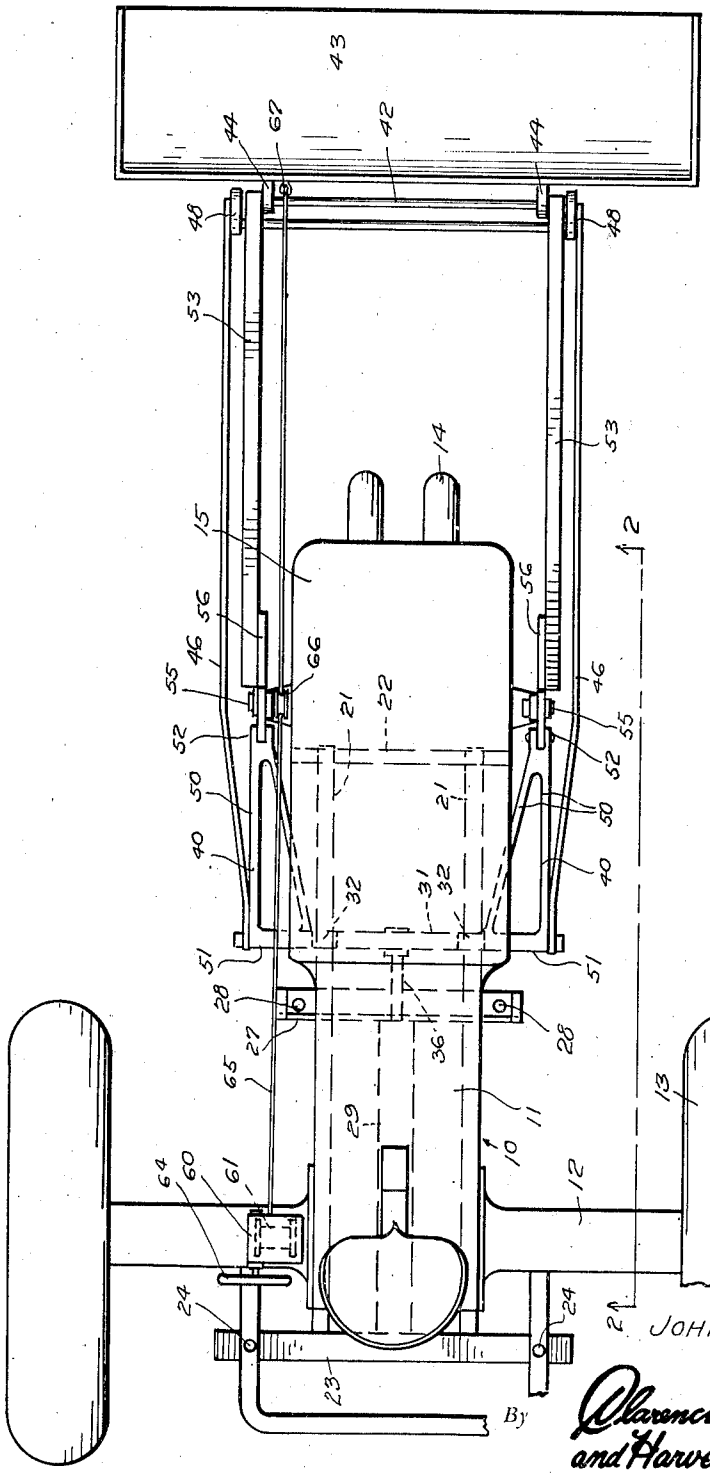


Fig. 1.

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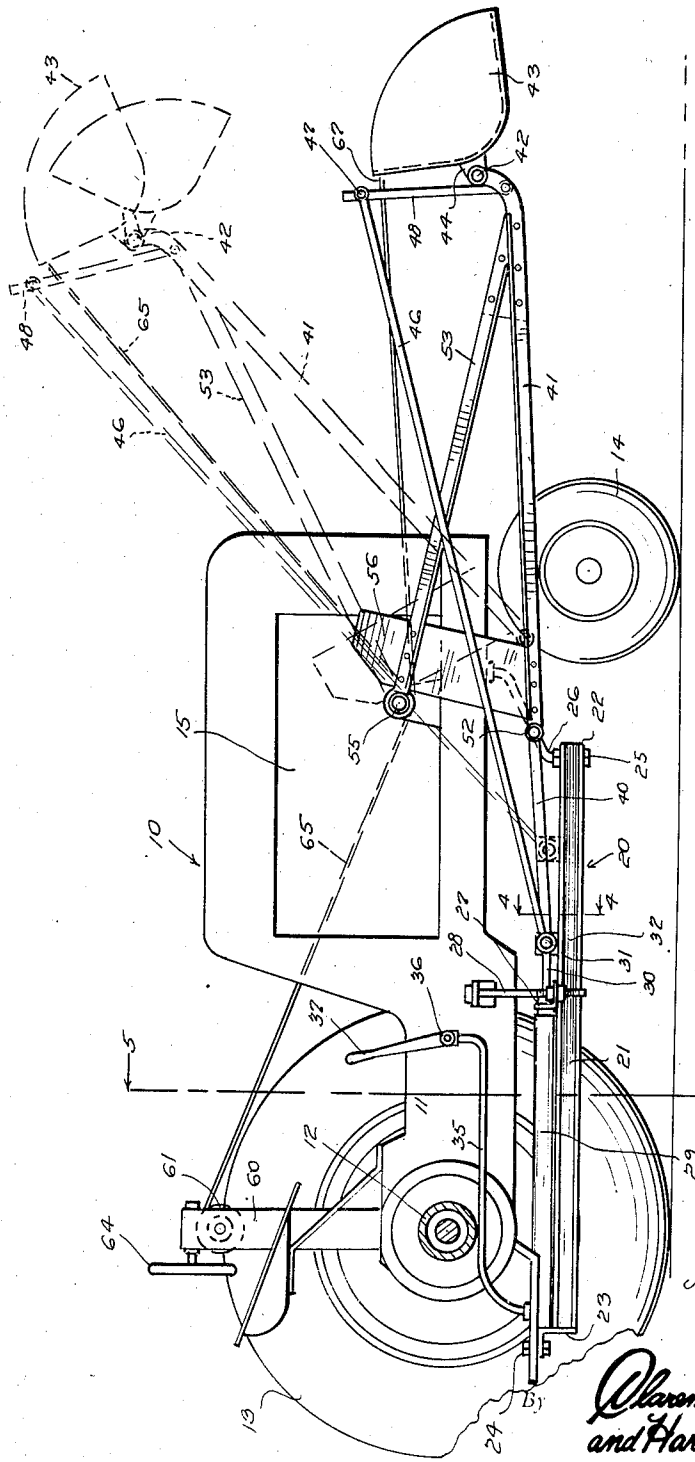


Fig. 2.

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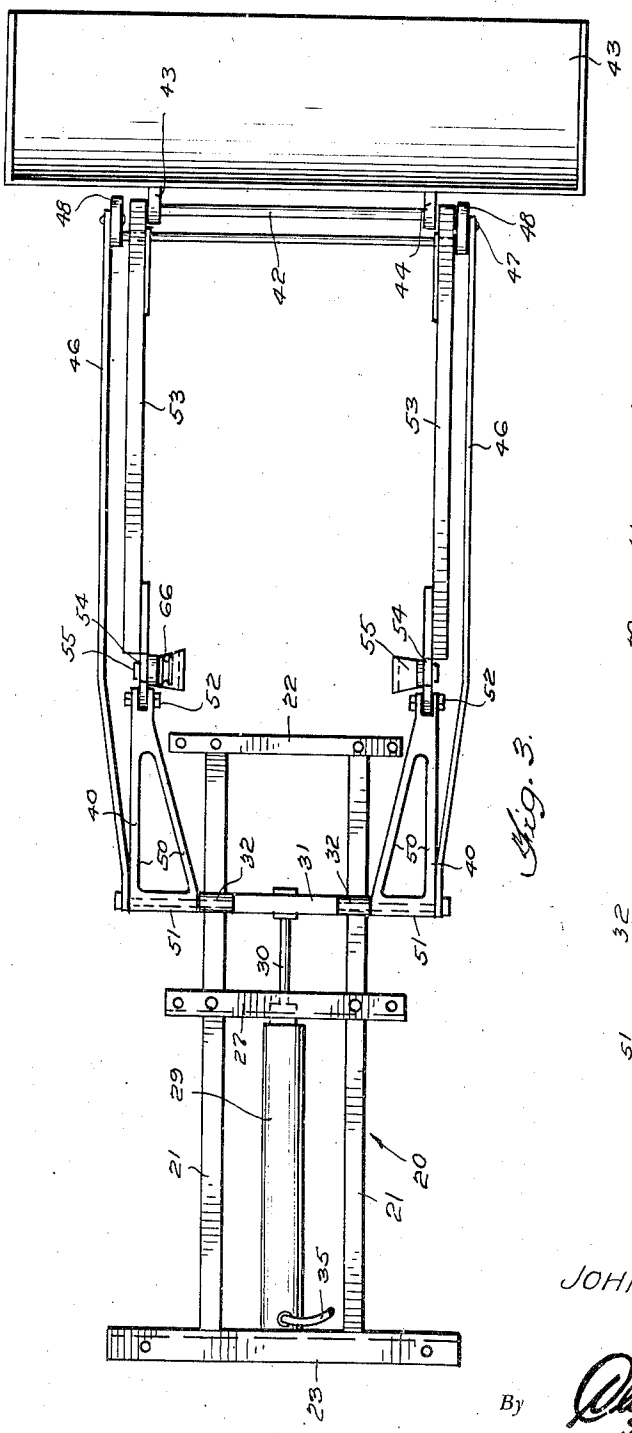


Fig. 3.

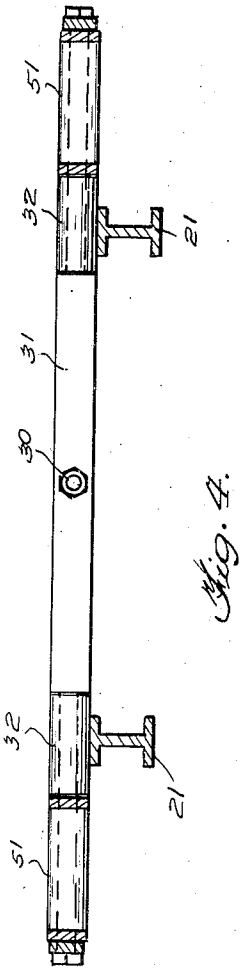


Fig. 4.

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Filed Nov. 27, 1944 4 Sheets-Sheet 4

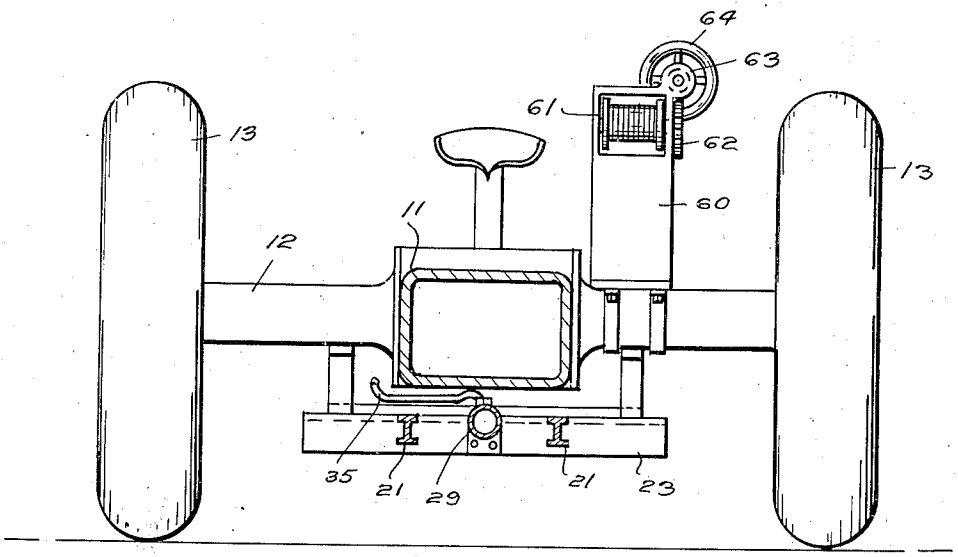


Fig. 5.

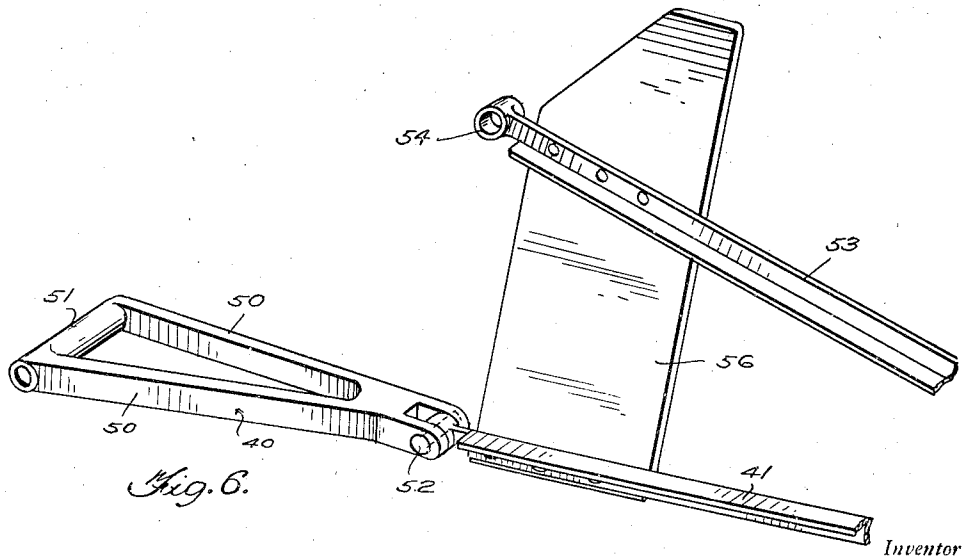


Fig. 6.

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Patented May 29, 1945 2,377,112

UNITED STATES PATENT OFFICE

2,377,112

MATERIAL HANDLING APPARATUS

John H. Strunk, Abilene, Kans.

Application November 27, 1944, Serial No. 565,280

3 Claims. (Cl. 214—140)

This invention relates to an apparatus for handling material, and more particularly such an apparatus adapted to be associated with a tractor or the like for excavating and loading various materials, such as dirt, manure, or the like.

A primary object of this invention is the provision of an improved loading apparatus adapted to be associated with a tractor, provided with means whereby material may be readily excavated, elevated, and loaded into any desired container therefor.

A further object of the invention is the provision of such an apparatus which may be readily and simply mounted on a conventional tractor.

Still another object of the invention is the provision of such a device which may be readily removed, when its use is not desired, and which may have certain parts thereof as, for example, the shovel blade, removed and additional apparatus for accomplishing alternative functions substituted therefor.

Still another object is the provision of such a device which will be sturdy and durable in construction, reliable and efficient in operation, and relatively simple to manufacture, assemble, and install.

Other objects reside in the combination of elements, arrangement of parts, and features of construction, all of which will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there is shown a preferred embodiment of this inventive concept.

In the drawings:

Figure 1 is a top plan view of one form of device embodying the instant invention disclosed as applied to a tractor, certain concealed parts thereof being indicated in dotted lines.

Figure 2 is a side elevational view of the apparatus disclosed in Figure 1, certain parts thereof being shown in section, certain alternative positions of adjustment being indicated by dotted lines.

Figure 3 is a top plan view of a portion of the apparatus disclosed as removed from the tractor.

Figure 4 is an enlarged sectional view taken substantially along the line 4—4 of Figure 2.

Figure 5 is a sectional view taken substantially along the line 5—5 of Figure 2 as viewed in the direction indicated by the arrows, and

Figure 6 is an enlarged fragmentary perspective view of a constructional detail.

Like reference characters refer to like parts throughout the several views of the drawings.

Having reference now to the drawings, there is generally indicated at 10 a conventional tractor, comprised of a body or frame 11, a main drive axle 12, rear wheels 13, front wheels 14, and the customary motor or source of power 15.

Secured to the under side of the frame 11, is a frame-work generally indicated at 20 and comprised of two longitudinally extending I-beams 21 joined at their extremities as by transversely extending members 22 and 23 respectively. The member 23 may be secured to the draw-bar of the tractor as by bolts 24, while the member 22 may be secured as by bolts 25 to depending brackets 26 secured in any desired manner to the tractor frame. As best shown in Figure 3, an intermediate transverse member 27 is secured across the I-beams 21 as by bolts 28 or the like, and support, one end of a hydraulic cylinder 29, the other end of which is suitably secured to the member 23. The cylinder 29 is provided with an operating rod 30 which extends through a suitable aperture in the member 27, and has secured to its extremity a cross head member 31. As best shown in Figure 4, the member 31 is provided with two oppositely disposed rollers 32 adapted to ride on the top surface of the I-beams 21, which thereby form a track for the movement of the member 31 there along, when actuated by the operating rod 30 of the hydraulic cylinder.

Fluid for operating the hydraulic cylinder 29 may be supplied as through a line 35, from any suitable source. Line 35 is provided with a valve 36, controlled by an operating handle 37, and the tractor is provided with a suitable pump of conventional design adapted to force the hydraulic fluid through the line 35 into the cylinder 29.

The extremities of members 31 are rounded to form pivots, and have secured thereto for pivotal movement thereabout the extremities 40 of a pair of oppositely disposed load-lifting members 41. The opposite extremities of members 41 have passed therebetween a rod or axle 42, on which is mounted for pivotal movement thereabout, a scoop or blade 43, the mounting means taking the form of apertured lugs 44 secured to the back of the blade, through which the axle 42 is passed.

Rods or bars 45 are also pivotally secured to the extremities of the member 31, and have their opposite ends secured as by pivots 47 associated with uprights 48, the opposite extremities of which are pivotally secured to the extremities of members 41, and which serve as a support for the rear of the blade 43, when the same is utilized in excavating, and also to preclude pivotal movement of the device beyond a pre-deter-

mined point when the shovel is lifted in a manner to be hereinafter described.

Referring back to the main load-lifting members 41, it will be seen that the portions 40 include a pair of bifurcated members 50 joined at their extremities by a sleeve 51 adapted to fit over the rounded extremities of the member 31, and each is pivotally secured as by a pivot 52 to the portion 41.

Secured fixedly to the outer extremities of each member 41 is an angularly disposed member 53 terminating in a sleeve 54 adapted to be mounted on a pivot 55 securely affixed to the main frame of the tractor. Relatively strong reinforcing and guide-plates 56 fixedly connect the inner extremities of the members 41 and 53.

Means are provided for controlling the dumping of the blade or scoop 43, and take the form of a post 60 suitably mounted on rear axle 12 at a point adjacent the operator of the vehicle, and having a winch 61 thereon provided with a gear 62 adapted to be engaged by a suitable worm 63 controlled by a hand-wheel 64. A rope or cable 65 is adapted to be reeled on the winch 61 and extends downwardly about a pulley 66 (see Fig. 4) adjacent one of pivots 55 and thence to a lug 67 secured to the rear upper portion of blade 43.

From the foregoing, the operation of the device should now be readily understandable. When it is desired to excavate a pile of dirt or the like, the pressure in the cylinder 29 is relieved by means of the valve 36, and the lower surface of the blade or scoop 43 permitted to rest on the ground. The tractor is then driven forwardly until the scoop is full, whereupon hydraulic fluid is re-admitted to the cylinder 29, which acts, through operating rod 30, to move the transverse member 31 forwardly. This action correspondingly moves the members 40 and member 41 forwardly causing a pivotal movement of the entire device about the fixed pivot 55, which elevates the blade or shovel 43 to any desired extent. The tractor is then run to a position where it is desired to discharge the load, and the rope 65 loosened by means of the hand-wheel 64, permitting the scoop to dump into the receptacle.

Obviously, other useful tools, such as a hay fork or the like, may be substituted for the scoop 43 if desired.

From the foregoing it will now be seen that there is herein provided a device accomplishing all the objects of this invention and others including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. In a device of the character described in combination, a frame adapted to be supported beneath a tractor, a hydraulic cylinder supported by said frame, said frame comprising a pair of longitudinally extending I-beams, a cross head slidably mounted on said I-beams, said cross head being provided with flanges adapted to engage one of the flanges of said I-beam, said cross head being adapted for movement by said cylinder, lifting arms pivotally secured to said cross head, a shovel blade secured to the opposite end of said arms, angularly extending arms fixedly secured to said first mentioned arms at a point adjacent said shovel blade, means pivotally securing said last mentioned arms to said tractor body, and means to connect the extremities of said first and second mentioned arms whereby movement of said cross head on said frame raises and lowers said shovel blade.

2. In a device of the character described in combination, a frame adapted to be supported beneath a tractor, a hydraulic cylinder supported by said frame, said frame comprising a pair of longitudinally extending I-beams, a cross head slidably mounted on said I-beams, said cross head being provided with flanges adapted to engage one of the flanges of said I-beam, said cross head being adapted for movement by said cylinder, lifting arms pivotally secured to said cross head, a shovel blade secured to the opposite end of said arms, angularly extending arms fixedly secured to said first mentioned arms at a point adjacent said shovel blade, means pivotally securing said last mentioned arms to said tractor body, and means to connect the extremities of said first and second mentioned arms whereby movement of said cross head on said frame raises and lowers said shovel blade, and means, including a flexible means, and a winch mounted on said tractor adapted for varying the relative length of said flexible means, to permit dumping of said shovel blade.

3. In a device of the character described, in combination, a frame adapted to be supported beneath the tractor, a hydraulic cylinder supported by said frame, said frame comprising a pair of longitudinally extending track ways, a cross head slidably mounted on said track ways, said cross head being provided with means adapted to secure the same in slidable relation with said track ways, said cross head being adapted for movement by said cylinder, lifting arms pivotally secured to said cross head, a shovel blade secured to the opposite ends of said arms, angularly extending arms fixedly secured to said first mentioned arms at a point adjacent said shovel blade, means pivotally securing said last mentioned arms to said tractor body, and means to connect the extremities of said first and second mentioned arms whereby movement of said cross head on said frame raises and lowers said shovel blade.

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