March 5, 1957 P. J. OMAN 2,783,904

LOADER

Filed Dec. 14, 1953 2 Sheets-Sheet 1

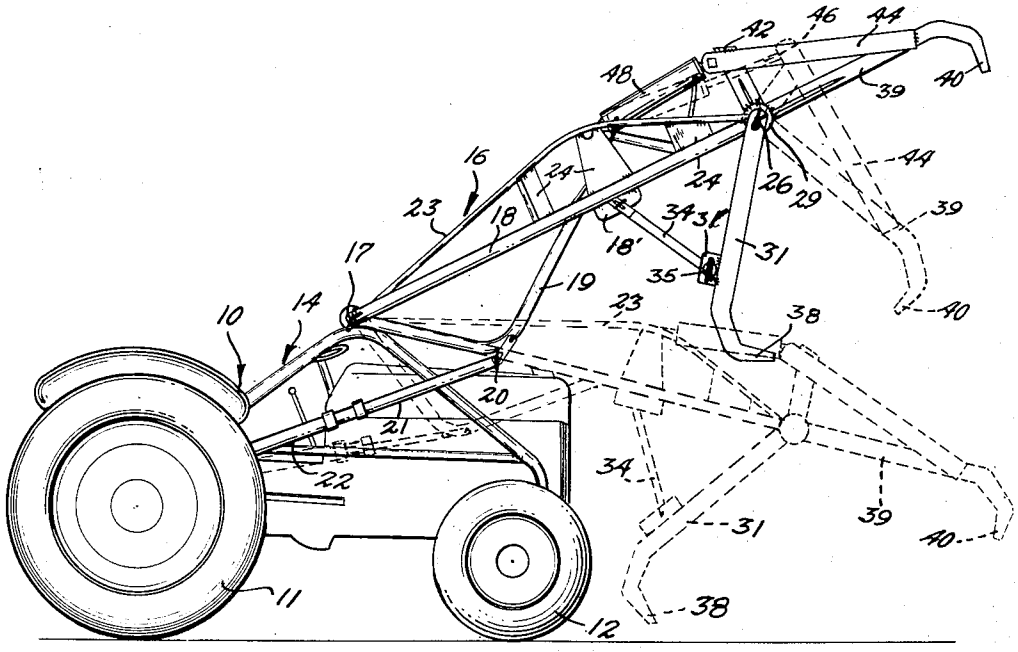


FIG - 1

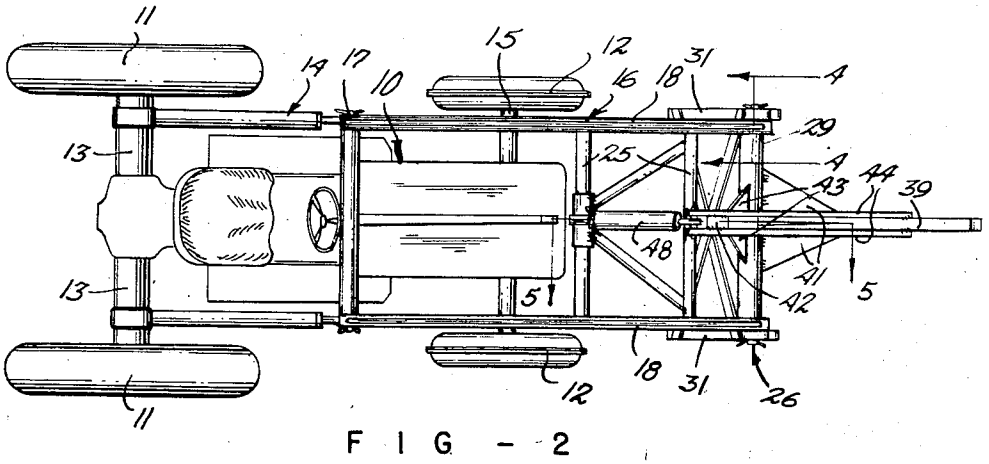


FIG - 2

INVENTOR.

Philip Jim Oman

BY

Glenn L. Tisch

ATTORNEY

March 5, 1957 P. J. OMAN 2,783,904

LOADER

Filed Dec. 14, 1953 2 Sheets-Sheet 2

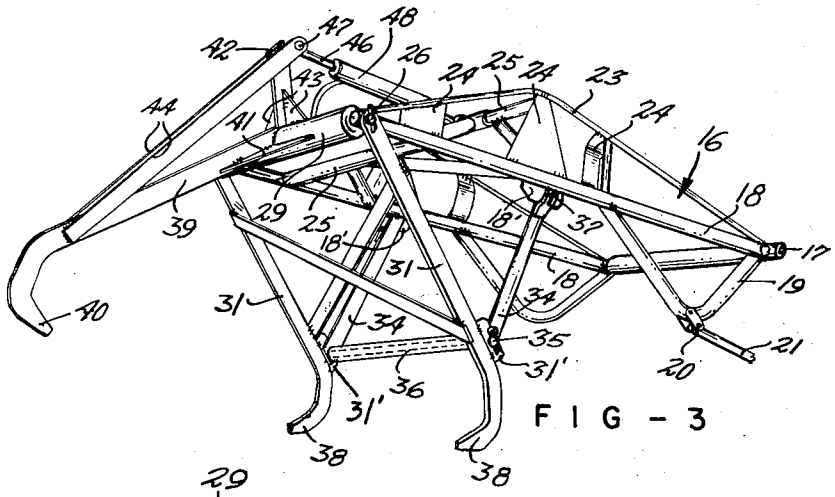


FIG - 3

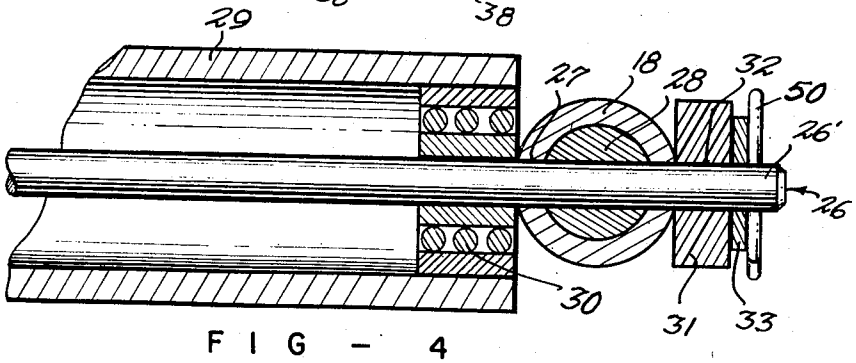


FIG - 4

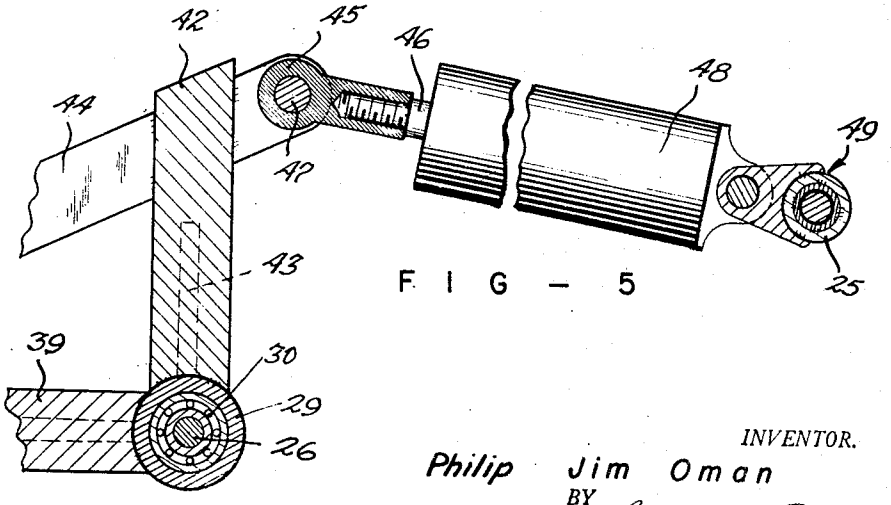


FIG - 5

INVENTOR.

Philip Jim Oman

BY

Glenn L. Tisch

ATTORNEY

United States Patent Office 2,783,904 Patented Mar. 5, 1957

2,783,904

LOADER

Philip J. Oman, Spokane, Wash.

Application December 14, 1953, Serial No. 397,915

3 Claims. (Cl. 214—147)

This invention relates to concrete slab handling devices.

One object of the invention lies in the provision of a gripping device having a transversely spaced pair of claws and a cooperating claw pivotally united for scissor movement relative to each other for very effectively grasping concrete slabs to be lifted and handled by the device.

Another object of the invention lies in the provision of a concrete slab handling device having a gripping device secured on the free end of a vertically tiltable arm and having a pair of transversely spaced claws fixed relative to the arm at an acute angle and a cooperating claw pivotally united for scissor movement relative to said fixed claws and moveable when open to a position in axial alignment with said boom whereby the fixed claws may be thrust into the earth and under the edge of an article to be grasped thereby.

Another object of the invention lies in the provision of a concrete slab handling device which is admirably adapted for grasping slabs of concrete such as sections of sidewalks and removing them from the ground and elevating them for loading into a truck bed.

These and other objects of the invention will become apparent during the course of the following description. The nature and advantages of this invention will appear more fully from the following description and the accompanying drawings wherein a preferred form of the invention is shown. It should be understood however that the drawings and description are illustrative only and are not intended to limit the invention excepting insofar as it is limited by the subsequent appended claims.

In the accompanying drawings, forming a part of this specification;

Figure 1 is a side elevation of a tractor vehicle having a vertically tiltable boom supporting the gripping device of this invention;

Figure 2 is a plan view of the mechanism shown in Figure 1;

Figure 3 is a perspective view of the gripping device and the supporting arm disassociated from the tractor;

Figure 4 is a fragmentary vertical cross section as at line 4—4 of Figure 2; and

Figure 5 is a fragmentary longitudinal vertical cross section as at line 5—5 of Figure 2.

Referring now more particularly to the drawings, the numeral 10 designates generally a movable support or tractor vehicle, here shown as a wheeled tractor having rear driving wheels 11 and front steering wheels 12. The rear wheels 11 are journaled at the ends of axles enclosed in axle housings 13.

A boom support frame 14 is secured to the tractor 10 in any suitable manner as on the front and rear axles 15 and 13. The boom or arm 16 is provided with a pair of transversely spaced beams 18 journaled for vertical tilting movement at 17 on the tractor 10 and these arms are provided with depending angular frame members 19 pivotally secured at 20 to the end of piston rod 21 associated with hydraulic servo-motors 22 secured to the

frame 14 or the axle housings 13. It will thus be seen that the arm 16 may be vertically tilted by action of motors 22.

The beams 18 are suitably strengthened by means of truss bars 23, one secured above each beam 18 at the extreme ends thereof and extending over spacing plates 24 welded intermediate the length of their respective beam 18. The arm is suitably cross braced as at 25 to provide a rigid vertically tiltable arm or boom 16.

At the free end of the arm 16 a transversely extending rod 26 is passed through horizontal apertures 27 formed in axial alignment through the beams 18 and the rod is of sufficient length so that its end portions 26' are disposed outwardly of the outside marginal edge of the beams 18. Before drilling or otherwise forming the apertures 27, the beams 18 are provided with metallic plugs 28 thus forming enlarged surfaces for supporting the rod 26.

Intermediate the spaced beams 18, I provide concentric with the rod 26 a thick walled sleeve 29 which has bearings 30 pressed in the opposed ends. The bearings 30 are adapted to fit over the rod 26 snugly and yet permit removal of the rod 26 when desired. Outside of the beams 18, the rod supports the upper ends of rigid claws 31 by passing through apertures 32 formed therein. Suitable diagonal bracing transversely braces claws 31. A washer 33 and cotter key 50 are provided to complete the structure and locate the various elements in their relative positions and yet permit removal of the rod 26 when desired.

The claws 31 extend downwardly from the beams 18 at an acute angle and are provided with flanges 31' which are welded or otherwise formed on the rear edges of the claws 31. On the under side of the beams 18 I provide flanges 18' secured by welding or otherwise. Brace bars 34 are secured to the flanges 31' by means of transversely extending rod 35 which passes through aligned apertures in the flanges 31' and the lower ends of brace bars 34. A spacing sleeve 36 is placed over the rod 35 intermediate the flanges 31' to maintain the claws in proper transverse spacing. The upper ends of the brace bars 34 are bifurcated and receive the flanges 18' where removable pins 37 are employed to releasably secure the brace bars 34 to the arm 18. Claws 31 are provided with forwardly extending fingers 38 which are disposed at approximately 90° from the longitudinal dimension of the claws 31 and are adapted to be hooked under the edge of a concrete slab.

Secured midway the length of the sleeve 29 and extending radially therefrom, I provide a cooperating claw 39 having a downwardly or inwardly turned finger 40 also disposed at substantially 90° from the longitudinal dimension of the claw 39. The finger 40 is fixed in opposed relation to the fingers 38, thus forming a device for gripping when the claw 39 is moved toward the claws 31. The claw 39 is welded or otherwise secured to the sleeve 29 and suitable gussets 41 are employed to strengthen the claw against transverse pressures.

At substantially right angles to the claw 39, the sleeve 29 is provided with a lever 42 extending radially therefrom and welded or otherwise secured thereto and is supported by means of gussets 43. Angle brace bars 44 are welded or otherwise secured along both sides of the lever 42 at a point spaced from the sleeve 29 and extend forwardly to a point adjacent to the hook end or finger 40 of the claw 39 forming a rigid unit of the claw 39 and lever 42 and brace bars 44. The brace bars 44 extend rearwardly beyond the lever 42 and define a bifurcation into which the transverse sleeve 45 provided on the end of piston rod 46 may be inserted and removably secured by means of a removable pin 47. A piston rod 46 extends outwardly of a double acting hydraulic ram 48 movement of which will cause the claw 39 to pivot about

the rod 26 thus providing a relative grasping and releasing scissor action of claw 39 with the claws 31. It will be noted in Figure 1 that the claw 39 is movable to an open position wherein it is in substantially parallel axial alignment with the beams 18 at which position it is somewhat more than 120 degrees from the claws 31, thus providing a wide grip so necessary and effective for handling concrete slabs. At its rear end, the hydraulic ram 48 is pivotally united at 49 to a cross brace 25.

From the foregoing description it is obvious that the gripping device may be quickly attached to or detached from the arm 18 by manipulation of pins 37 and 47 and rod 26, thus forming a device which is quickly and easily applied or removed as the job requires. It is obvious from inspection of figure 1 that the device is particularly adapted for thrusting the stationary claws 31 into the earth to catch the fingers 38 under the edge of a concrete slab after which the hydraulic ram 48 may be operated to pivot the claw 39 toward the claws 31 wherein the finger 40 will be thrust under the opposing edge of the slab, thus grasping or gripping the slab. Raising of arm 18 thus lifts the slab from the earth where it may be deposited on a truck or at another place.

The fixed claws are thrust into the earth by simultaneous lowering of the arm 16 and forward movement of the tractor vehicle 10. Thence the scissor movement of claw 39 by means of ram 48 will force the finger 40 into position at the opposed side of the slab.

Having thus described my invention, I claim:

1. In a concrete slab handling device, the combination with a tractor vehicle having a load support arm pivotally secured at one end to said vehicle and having its free end movable in a vertical plane; said load support arm comprising a pair of transversely spaced parallel beams rigidly united; of a gripping device carried by the free end of said arm; said gripping device comprising a transversely extending rod carried at the free ends of said beams and having its end portions terminating outwardly thereof; a sleeve concentric with said rod and intermediate said beams; bearings pressed in the ends of said sleeve and carried by said rod adjacent to the inner margins of said beams; a pair of transversely spaced claws having their upper ends releasably supported on the outer end portions of said rod and extending downwardly at an acute angle relative to said beams; flanges on said beams spaced from their outer free ends; brace bars releasably secured to said flanges and secured at their opposed ends to said claws rigidly fixing the claws relative to said arm; said claws being provided with forwardy extending fingers disposed at substantially 90° from the longitudinal axis thereof; a cooperating opposed claw having its inner end secured to said sleeve midway the first named fixed claws; a lever secured to said sleeve and fixed relative to said second named claw; a manually controllable hydraulic ram secured at one end to said arm and at the opposed end to said lever at a point spaced from said sleeve, for selective operation of said second named claw toward and away from said first named claws; said second named claw having an inturned finger on the outer end thereof; and a stiffening brace secured to said second named claw adjacent to the finger and extending rearwardly and fixed to said lever.

2. In a concrete slab handling device, the combination with a tractor vehicle having a load support arm pivotally secured at one end to said vehicle and having its free end movable in a vertical plane; of a gripping device carried by the free end of said arm and comprising a pair of transversely spaced claws releasably secured in fixed relation to said arm and having forwardly disposed fingers at their lower ends adapted to be thrust into the earth and under the edge of a slab of concrete; a cooperating opposed claw operably united with respect to said first named claws for gripping a slab by its edges and for relative scissor movement therewith; said second named claw being hingedly movable to an open position in substantially parallel axial alignment with said arm, whereby to provide clearance to permit said first named claws to penetrate the earth to a predetermined depth determined by the relative position of said second named claw with respect to the upper surface of the slab; and manually controllable means for selective gripping movement of said second named claw.

3. In a concrete slab handling device, the combination with a tractor vehicle having a load support arm pivotally secured at one end of said vehicle and having its free end movable in a vertical plane; of a gripping device carried by the free end of said arm and comprising a pair of transversely spaced claws releasably secured in fixed relation to said arm and having forwardly disposed fingers at their lower ends adapted to be thrust into the earth and under the edge of a slab of concrete; a cooperating opposed claw operably united with respect to said first named claws for relative scissor movement therewith for gripping a slab by its edges; said second named claw being hingedly movable to an open position disposed at least 120 degrees from said first named claws, whereby to provide clearance to permit said first named claws to penetrate the earth to a predetermined depth determined by the relative position of said second named claw with respect to the upper surface of the slab to be handled; and manually controllable means for selective gripping movement of said second named claw.

References Cited in the file of this patent

UNITED STATES PATENTS

994,506	Falcone	June 6, 1911
1,263,790	Moynihan	Apr. 23, 1918
1,773,478	Dovel	Aug. 19, 1930
2,041,926	Herwander	May 26, 1936
2,433,754	Belko	Dec. 30, 1947
2,445,076	Munson	July 13, 1948
2,639,826	Welden	May 26, 1953

FOREIGN PATENTS

648,608	Great Britain	Jan. 10, 1951