

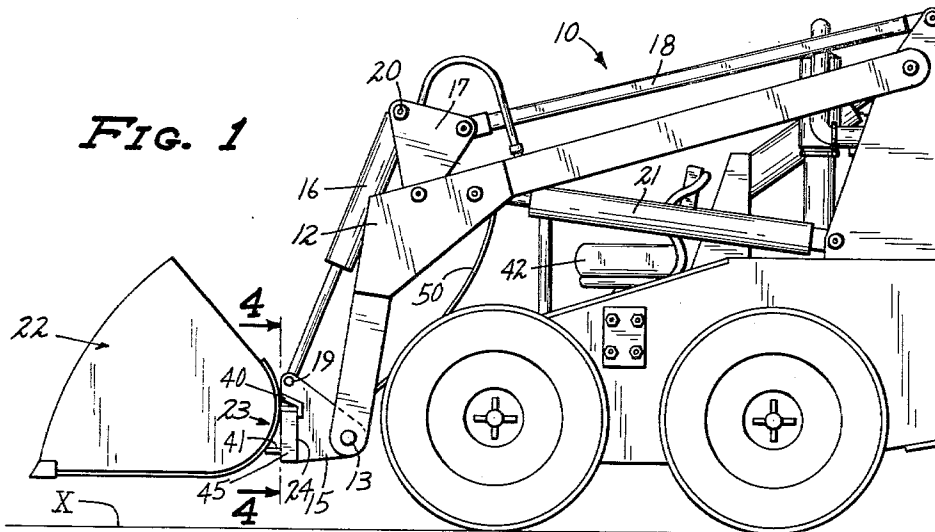
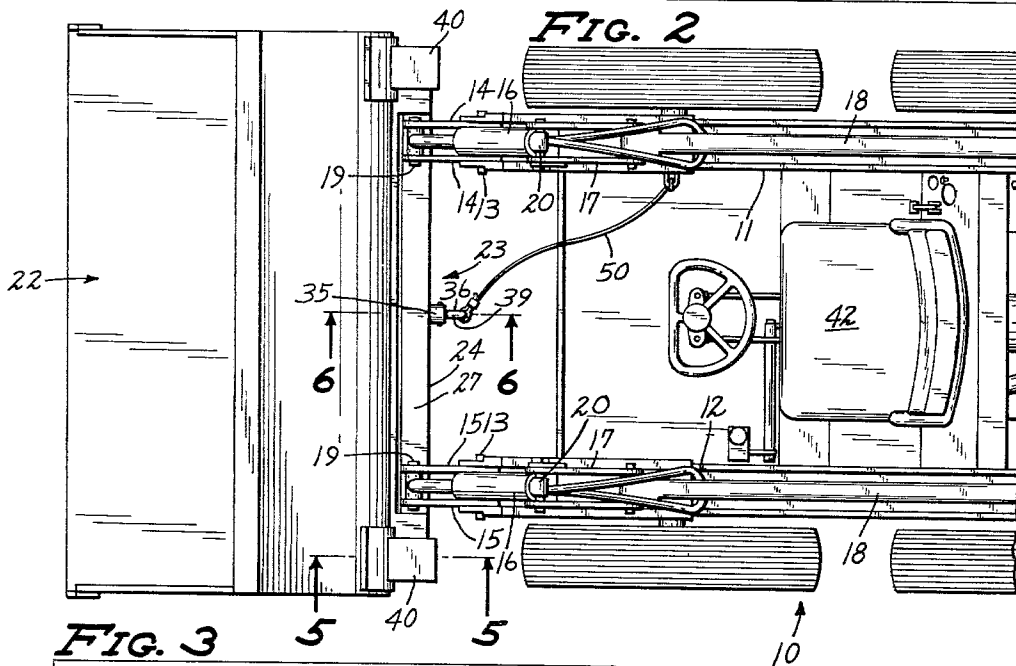
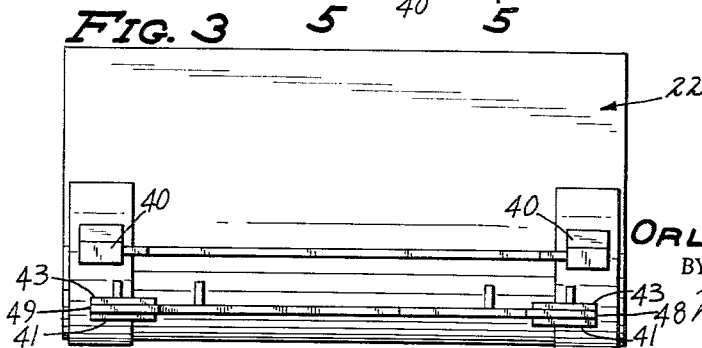
March 1, 1966

O. W. KROMER
MEANS FOR DETACHABLY SECURING WORK HEADS TO BOOM-EQUIPPED
POWER TRUCKS AND THE LIKE

3,237,795

Filed Sept. 24, 1964

2 Sheets-Sheet 1



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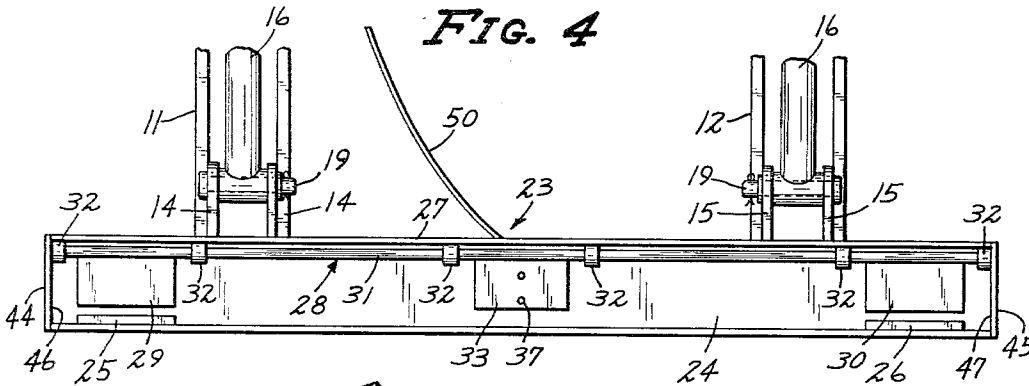
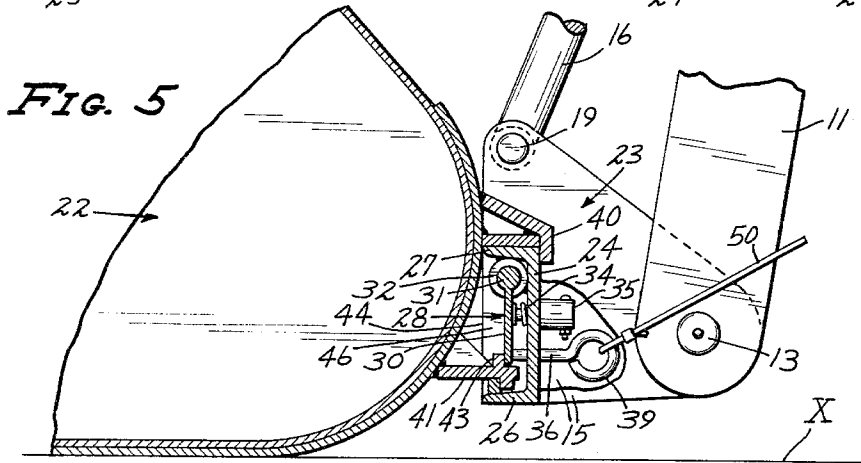
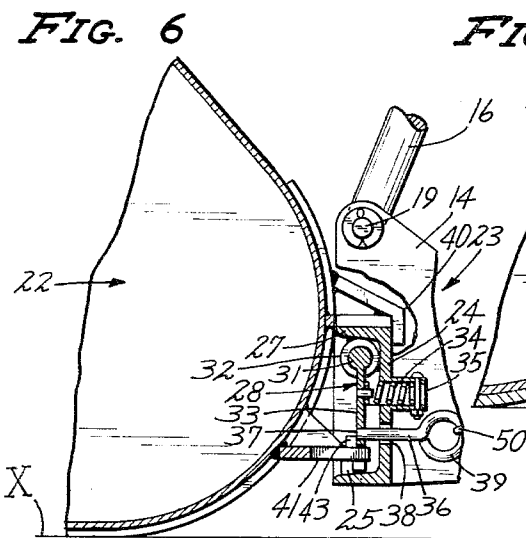
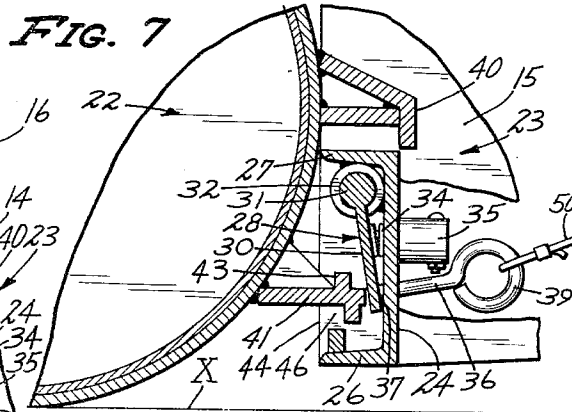
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MEANS FOR DETACHABLY SECURING WORK HEADS TO BOOM-EQUIPPED POWER TRUCKS AND THE LIKE

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Filed Sept. 24, 1964, Ser. No. 398,856

5 Claims. (Cl. 214-140)

My invention relates generally to material handling devices or machines such as power-operated lift trucks.

Devices of the class above described not uncommonly come equipped with specifically different work heads, such as scoops, fork lifts, and the like. The primary object of my invention is the provision of novel means for facilitating the attachment and removal of such work heads to the extended ends of the booms.

A further object of my invention is the provision of means of the type above described which incorporates but a minimum of parts, which is extremely simple to operate, and which is completely foolproof in use.

A still further object of my invention is the provision of means of the type above described which enables the operator of a mobile lift truck to change work heads without leaving his operator seat.

A further object of my invention is the provision of a device of the class above described which is inexpensive to produce and adds but a minimum of weight to the work head and boom.

The above and still further objects of my invention will become apparent from the following detailed specification, appended claims, and attached drawings.

Referring to the drawings wherein like characters indicate like parts throughout the several views:

FIG. 1 is a view in side elevation of my novel attachment as utilized with a lift truck;

FIG. 2 is a view in top plan;

FIG. 3 is a view in rear elevation of the work head utilized in FIGS. 1 and 2;

FIG. 4 is a view in front elevation as seen from the line 4-4 of FIG. 1 on an enlarged scale, the work head thereof being removed;

FIG. 5 is an enlarged view in vertical section as seen from the line 5-5 of FIG. 2;

FIG. 6 is an enlarged view in vertical section as seen from the line 6-6 of FIG. 2; and

FIG. 7 is a view similar to FIG. 5, showing a different position of the parts thereof, on an enlarged scale.

Referring with greater particularity to the drawings, there is shown a conventional power-operated lift truck 10. Lift truck 10 is of the front loader type and includes a pair of laterally spaced, forwardly extended booms 11, 12. The extended ends of booms 11, 12 have mounted thereon, on horizontal axes 13, pairs of generally vertically disposed mounting bracket elements 14, 15, respectively, the plane of each of the bracket elements 14, 15 being normal to the axes 13. For the purpose of maintaining bracket elements 14, 15 in a desired position, during all positions of raising and lowering of booms 11, 12, pairs of control links 16, 17, and 18 are provided. Links 16 each have one end pivotally connected to one pair of bracket elements 14, 15, as indicated at 19, and opposite ends pivotally connected as at 20 to links 17, and are in the nature of extensible-retractable hydraulic cylinders. Links 16 impart pivotal movement about the axes 13 to bracket elements 14, 15 and parts carried thereby for a purpose which will hereinafter become apparent. Raising and lowering of booms 11, 12 is accomplished through the medium of hydraulic cylinders 21, one of which is shown in FIG. 1.

2

Mechanism for detachably securing a work head such as scoop 22 to the bracket elements 14, 15 carried by the extended ends of booms 11, 12, is indicated generally by the numeral 23. Mechanism 23 includes an elongated mounting plate 24 which is secured to mounting brackets 14, 15 by means of welding or the like, and is disposed in a plane generally normal to the plane of mounting bracket elements 14, 15. With particular reference to FIGS. 4-7, there is shown the pair of forwardly projecting upwardly opening hook portions 25, 26, one each disposed adjacent an end of plate 24. Plate 24 is further formed along its upper edge to define a forwardly projecting lip portion 27 which overlies hook portions 25, 26. Latch means indicated by the numeral 28, is carried by said mounting plate 24 in underlying relationship to the lip 27, and includes the latch plate members 29, 30. Latch members 29, 30 are each pivotally mounted for swinging movements of the lower ends thereof toward and away from plate 24 in closely spaced relation to their respective portions 25, 26, by means of a pivot shaft 31. Pivot shaft 31 extends along the length of plate 24 and is journaled for rotation by means of the bearings 32 welded or otherwise secured to the plate 24. To impart such movements to latch plate members 29, 30, there is provided the plate-like lever 33 secured to the shaft 31 intermediate latch members 29, 30 and co-planar therewith.

Yielding means in the nature of a coiled compression spring 34, which biases lever 33 (and consequently latch members 29, 30 away from plate 24), is mounted intermediate lever 33 and plate 24, as indicated at 35. Limiting movement of lever 33 and latch members 29, 30 away from plate 24, under the bias of spring 34, is a pin 36. One end of pin 36 is secured to the lower end of lever 33 as indicated at 37 in FIG. 6, and the other end thereof projects rearwardly through an opening 38, where it terminates in an enlarged head 39, which, as shown, is incapable of passing through the opening 38.

Fixedly carried by the scoop 22 are upper and lower downwardly opening hook elements 40, 41 which cooperate with the above described structure to permit attachment or detachment of a scoop 22 from the extended end of the booms 11, 12. Attachment of scoop 22 is easily accomplished by an operator, not shown, without the need of his leaving his point of control, such as the seat 42, merely by causing the loader 10 to assume a position rearwardly of the scoop 22 with plate 24 adjusted to a vertical position by means of cylinder 16 and with lip portion 27 underlying upper hooks 40 and hook portions 25, 26 of plate 24 underlying lower hooks 41 of scoop 22. As illustrated particularly in FIG. 7, this causes lower hooks 41 to engage latch plates 29, 30 moving same against the bias of spring 34 into engagement with plate 24. In this position it is now possible to move plate 24 vertically upwardly by means of the power equipped booms 11, 12 whereby to cause lip 27 to become snugly received within the downwardly opening upper hooks 40. Simultaneously hook portions 25, 26 come into interlocking engagement with downwardly opening lower hooks 41. As shown in FIGS. 5, 6, the lower end of latch members 29, 30 are now free to move into a position closely overlying the upper surface of lower hooks 41. A stop member 43, carried by and secured to the upper surface of hooks 41, positions latch members 29, 30 in such overlying relationship wherein relative vertical and horizontal forward and rearward movements of brackets 14, 15 with respect to scoop 22 are positively precluded.

To prevent relative movements of scoop 22 with respect to mounting brackets 14, 15 in directions axially of the axes 13, there is provided the end plates 44, 45 carried by opposite ends of plate 24. The inner surfaces 46, 47 of end plates 44, 45 are engageable by the outer adjacent

edges 48, 49 of lower hooks 41 when same are in interlocking engagement with hook portions 25, 26.

When it is desired to disengage or interchange scoop 22 with one of the various other work heads such as a fork lift or the like, not shown, the operator has merely to lower the scoop 22 into resting engagement with a supporting surface X. Thereafter the operator, while still in his control position such as seat 42, may grasp the lanyard 50, the lower end of which is secured to pin 36, and move lever 33 and latch members 29, 30, against the bias of spring 34, into engagement of their lower ends with plate 24. Plate 24 may now be further lowered to cause disengagement of upper and lower hooks 40, 41 with their respective portions of plate 24. Rearward movement of loader 10 now completely disengages scoop 23 from mounting brackets 14, 15.

My invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects; and while I have disclosed a preferred embodiment thereof, same may well be capable of modification without departure from the scope and spirit of the appended claims.

What is claimed is:

1. Means for detachably securing a work head element to the mounting bracket element pivotally secured on a horizontal axis to the extended end of a power-operated boom, said invention comprising means on said elements and including:

- (a) a generally upright mounting plate carried by one of said elements,
 - (b) said mounting plate at its lower end defining an upwardly opening hook portion which extends in the direction of said other of said elements,
 - (c) a plate-like latch member carried by said one element in laterally disposed relationship to said mounting plate and mounted thereon for movements towards and away from said mounting plate in closely spaced overlying relationship to said hook portion,
 - (d) means yieldingly biasing said latch member away from said mounting plate, and
 - (e) means limiting said last mentioned movement;
- the cooperating structure carried by the other of said elements including:
- (1) upper and lower downwardly opening hook elements,
 - (2) said upper hook element being adapted to be received over the upper end portion of said mounting plate,
 - (3) said lower hook element adapted to have interlocking relationship with said upwardly opening hook portion when said upper hook element is placed over said mounting plate and when said latch member is moved toward said mounting plate against the bias of said yielding means,
 - (4) said latch member being movable into a position closely overlying the upper surface of said lower hook element by said yielding means when said lower hook element is in hooking relationship with said hook portion, whereby to positively preclude relative vertical and horizontal forward and rearward movements between said elements.

2. The structure defined in claim 1 in further combination with means limiting relative movement between said elements in directions axially of said pivotal connection.

3. The structure defined in claim 1 in which said one

element is the mounting bracket and in which the other of said elements is the work head.

4. The structure defined in claim 3 in which said latch member is mounted for pivotal swinging movements of its lower end toward and away from said mounting plate, and in which the means limiting the movement of said latch member away from said mounting plate comprises a pin secured to the lower end of said latch member and projecting rearwardly through an opening in said mounting plate, said pin terminating at its projected rear end in an enlarged head incapable of passing through said opening.

5. Means for detachably securing a work head to a mounting bracket carried by the extended end of a boom, said invention comprising:

- (a) a generally upright mounting plate carried by said mounting bracket and projecting laterally therefrom in a plane generally normal thereto,
- (b) said mounting plate at its lower end defining a forwardly projecting upwardly opening hook portion, and at its upper end defining a forwardly projecting lip portion which overlies said hook portion,
- (c) a plate-like latch member carried by said mounting plate in underlying relation to said lip portion, and mounted for pivotal swinging movements of its lower end towards and away from said mounting plate in closely spaced relation to said hook portion,
- (d) means yieldingly biasing said latch member away from said mounting plate in a forward direction, and
- (e) a pin secured to the lower end of said latch member and projecting rearwardly through an opening in said mounting plate,
- (f) said pin at its projected rear end terminating in an enlarged head incapable of passage through said opening and limiting movements of said latch plate under the bias of said yielding means forwardly of said hook portion;

the cooperating structure carried by said mounting head including:

- (1) upper and lower downwardly opening hook elements,
- (2) said upper hook element being adapted to be snugly received over the upper end portion of said mounting plate and said lip portion,
- (3) said lower hook element adapted to have interlocking relationship with the upwardly opening hook portion defined by the lower end of said mounting plate when said upper hook element is placed over the upper end of said mounting plate and when said latch member is moved toward said mounting plate against the bias of said yielding means,
- (4) said yielding means moving said latch member to a position closely overlying the upper surface of said lower hook element when said lower hook element is in hooking relationship with said hook portion, whereby to positively lock said work head and mounting bracket against relative vertical and horizontal forward and rearward movements.

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HUGO O. SCHULZ, *Primary Examiner.*