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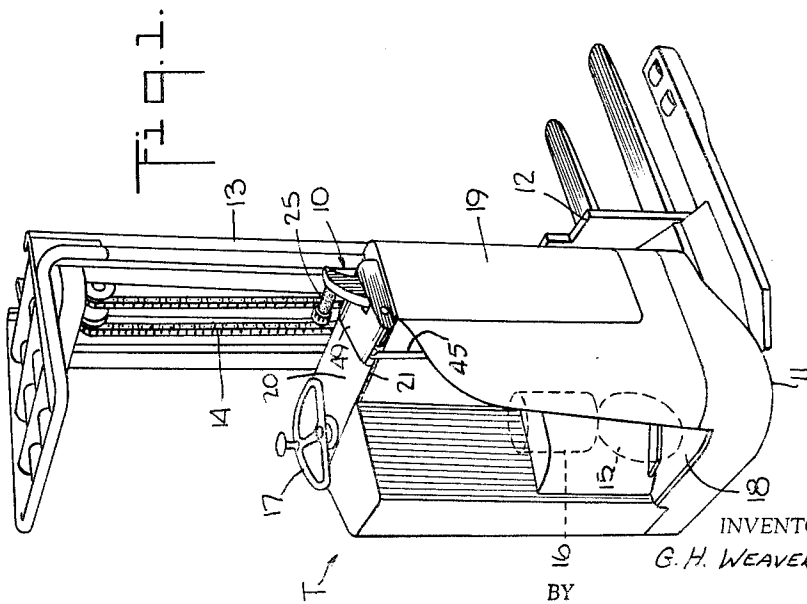
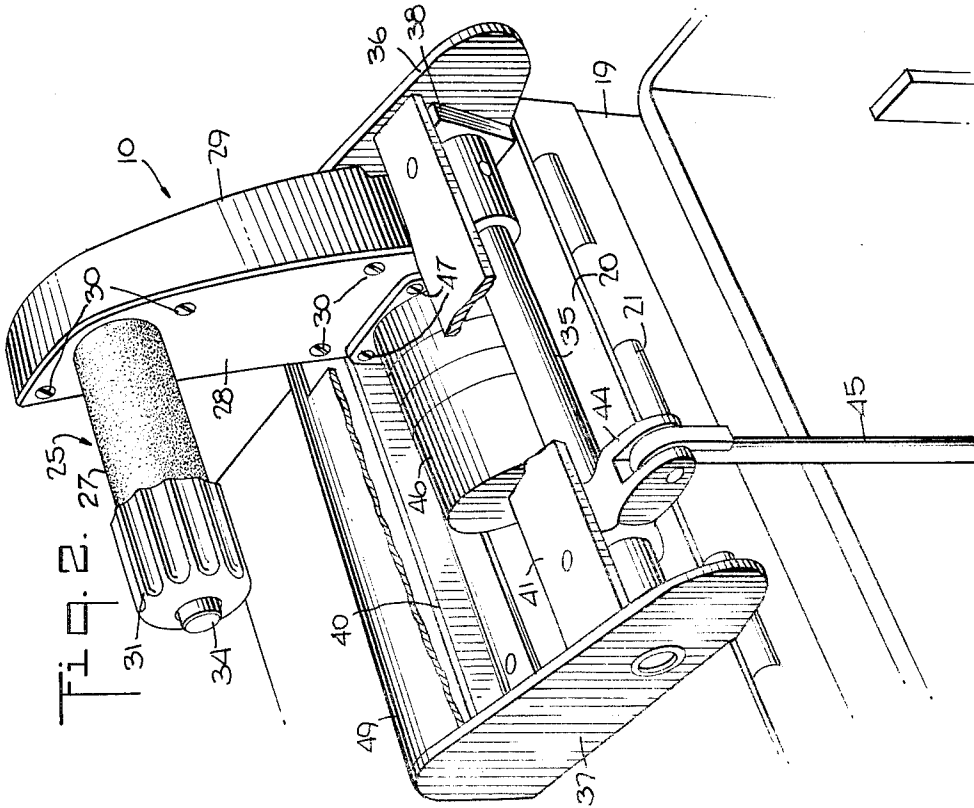
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3,235,035

CONTROL HANDLE FOR INDUSTRIAL TRUCK

Filed Aug. 14, 1963

2 Sheets-Sheet 1



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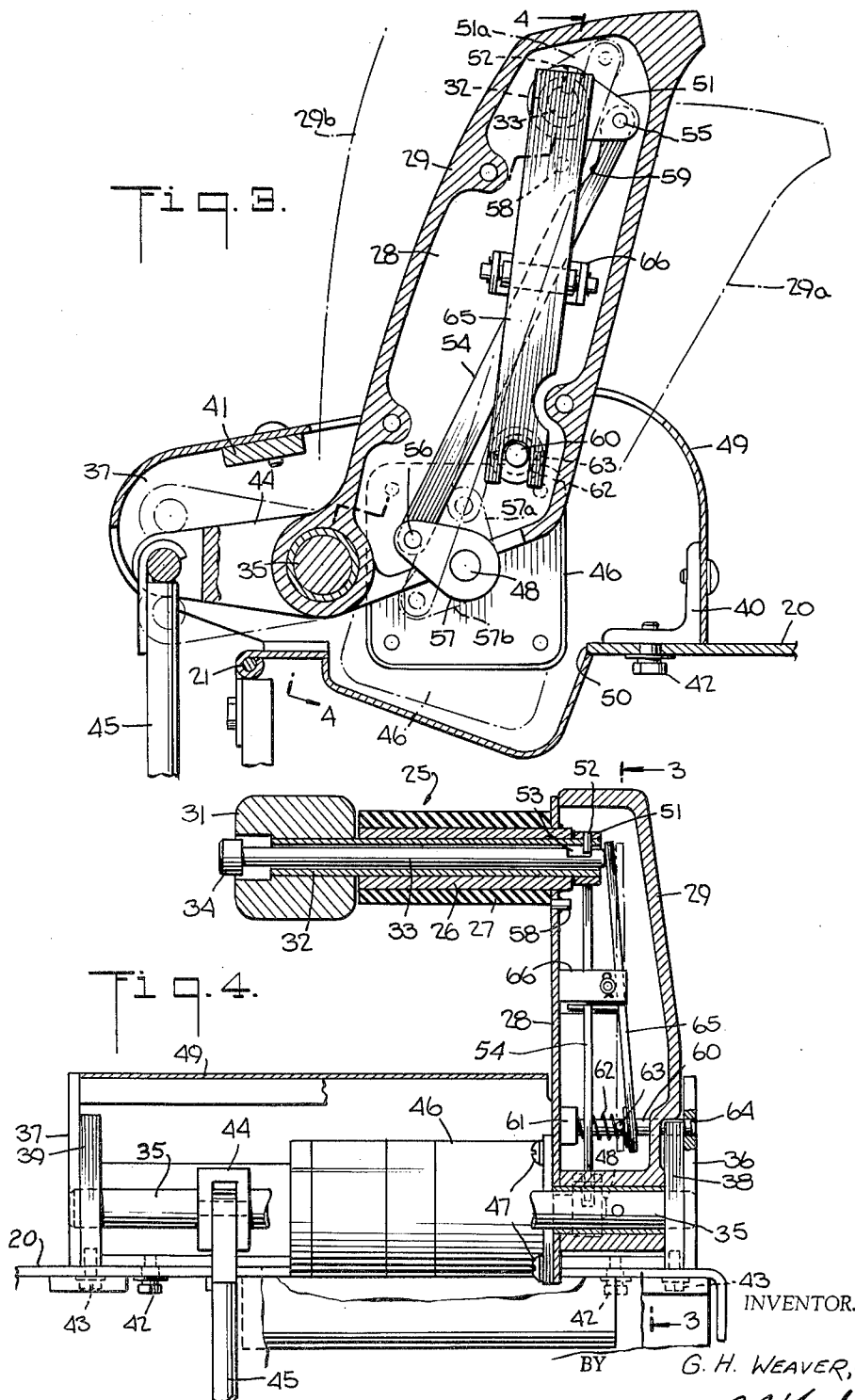
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2 Sheets-Sheet 2



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3,235,035

CONTROL HANDLE FOR INDUSTRIAL TRUCK
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This invention relates to manual controls for industrial lift trucks, and more particularly to a novel control handle that may be operated by one hand to control separate mechanisms on the truck.

The handle of my invention has two portions that will be engaged by a hand of the truck operator, those portions being so arranged as to enable the operator to move either portion without shifting the position of his hand. The handle portions are mounted for movement in directions that distinguish from one another and that are natural and convenient for manipulation by the particular hand. I utilize one handle portion to control a traction motor and the other a load lifting mechanism on the truck, although various devices naturally may be controlled. Each of the two handle portions will have its own particular type of control movement, and the operator of the truck actually will find it a simple matter to operate either portion of the handle separately when he wishes to effect independent control of the motor or lifting mechanism.

More particularly, my novel control handle includes a hand grip mounted for movement in a particular direction on the truck, and a movable fingerpiece on the hand grip. The operator may at all times rest his hand upon the hand grip, while using fingers of the hand to operate the fingerpiece as he may desire. He naturally may move the hand grip as he wishes. The movement of the hand grip preferably will control the lifting mechanism, while the fingerpiece will control the traction motor.

As a preferred feature, I construct my novel control handle with a hand grip that will normally be locked in fixed relation to the truck, contributing an immovable rest for the operator's hand while allowing operation of a finger piece control on the hand grip. I then equip the handle with means such as a push button that the operator may depress to release the hand grip for movement. The hand grip then can operate as a control that is independent of the finger piece control.

As a further feature, I so construct my novel handle as to simplify to a considerable extent the control connections that are required between the handle and the truck. Thus, in the preferred form of my invention, I mount a motor controller directly on the handle. The controller will be operated through a finger piece, and there need be no linkages or other mechanical connections extending between the controller and truck.

I have thus outlined the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the

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several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

Referring to the drawings:

FIG. 1 shows a perspective view of an industrial truck utilizing my novel control handle.

FIG. 2 shows the handle in more detail.

FIG. 3 shows a vertical section of the handle on the line 3—3 in FIG. 4.

FIG. 4 shows a section on the broken line 4—4 in FIG. 3.

Referring now more particularly to FIG. 1 of the drawings, I show an industrial truck T that is equipped with my novel control handle, which I indicate generally by the numeral 10. The truck T may have a usual construction including a main frame 11, a load carriage 12 that is mounted on uprights 13 at the front of the truck, and lifting mechanism indicated generally at 14 for moving the carriage vertically on the uprights. As shown in dotted lines in FIG. 1, the truck T has a usual rear steering and traction wheel 15 that will be driven by a traction motor 16 and steered through a steering handle 17. There is an operator's platform 18 on a rear portion of the main frame 11, and a battery compartment 19 on a medial portion of the frame. The top of battery compartment 19 has a cover 20 that may be rotated on a hinge 21 so as to allow access to the battery. I believe it will be unnecessary to describe further details of the truck T since those details are not important to an understanding of my invention, and it is merely necessary to know that my novel control handle 10 may be utilized for controlling both the lifting mechanism 14 and traction motor 16, or conceivably other devices on the truck.

In the novel concept of my invention, the control handle 10 includes a hand grip 25 that I prefer to construct as shown in FIG. 4, with a tubular inner member 26 on which is an outer covering sleeve 27 of a suitable material. The tubular member 26 is integrally attached, as by welding, to a cover plate 28 that forms a part of a hollow arm 29. Plate 28 is secured to arm 29 by screws 30, FIG. 2, and supports hand grip 25 in position on an end portion of the arm. The control handle 10 further includes a finger piece 31 that I prefer to form as a knob arranged at one end of the hand grip 25 and having a grooved outer surface somewhat larger in diameter than the hand grip 25.

As shown in FIG. 4, the finger piece knob 31 is integrally secured to a sleeve 32 that is mounted to rotate in the tubular member 26 of hand grip 25. A push rod 33 in turn is mounted to slide axially in the sleeve 32, and is equipped with a push button 34 adapted to move in an opening in the end of knob 31. Both the sleeve 32 and rod 33 extend through the tubular member 26 and into the interior of hollow arm 29 to coact with parts arranged in the arm, as I shall presently describe.

The hand grip 25 of my novel handle 10 has a considerable axial length that the operator of the truck can easily grasp with one hand, and that I prefer to make somewhat shorter than the overall width of the average hand. The finger piece knob 31 is shorter than hand grip 25. When the operator applies his hand to the hand grip 25, the thumb and first or two fingers will be in position to engage the knob 31 while the remaining

fingers grasp the hand grip 25. Thus, the operator may easily use his thumb and first finger to rotate the knob 31 in either direction, while maintaining or relaxing his grasp on hand grip 25 as he may desire. The operator will at times move the hand grip 25, but his hand will rest mainly on the hand grip and there will be no tendency to rotate the knob 31 unless that is what he intends. It will be seen that the operator may rotate the knob 31, or use his thumb to depress the push button 34, or move the hand grip 25, all without shifting the position of his hand to any extent on the control handle 10.

Referring to FIGS. 2 and 4, the hollow arm 29 is integrally secured to a control shaft 35 that is mounted at its ends to rotate on a pair of vertical bracket plates 36, 37. As shown, I prefer to equip plates 36, 37 with blocks 38, 39 that have bearing openings for control shaft 35. Upper and lower cross members 40, 41 connect the bracket plates 36, 37 so as to form a frame that is mounted on the cover 20 of the battery compartment 19, as through bolts 42, 43, engaged with cross member 40 and blocks 38, 39. The arrangement is such that the hand grip 25 will extend in a direction transverse to the truck T, and will move in a fore-and-aft direction while rotating control shaft 35.

The control shaft 35 has secured to it a lever 44 which is connected through a vertical rod 45 to means, not shown, for actuating the load lifting mechanism 14 on the truck T. It will thus be seen that the operator of the truck may utilize a natural fore-and-aft movement of his hand to control the operation of the lifting mechanism 14 through the hand grip 25.

I mount a controller 46 upon the arm 29, FIGS. 2 and 4, as through screws 47 engaged with cover plate 28. An operating shaft 48 on the controller then is positioned in the interior of the hollow arm 29. The controller 46 may be of a standard type that is adapted to control a traction motor and that is commercially available, and therefore I believe it will be unnecessary to describe details of the controller 46. As shown, the controller 46 is arranged in position on a lower part of the arm 29, so as to be enclosed with a cover 49 that may be secured to the cross members 40, 41 of the bracket frame. The battery compartment cover 20 has an opening 50, well shown in FIG. 3, that allows clearance for bodily movement of the controller 46 as the arm 29 rotates about the axis of control shaft 35.

The finger piece knob 31 will be utilized for operating the controller 46, and for that purpose I mount a lever 51, shown in FIGS. 3 and 4, in position on the end of knob sleeve 32 within the arm 29. A pin 52 is engaged in openings in lever 51 and sleeve 32, and extends into a slot 53 in the push rod 33, FIG. 4. Thereby the lever 51 is integrally mounted on the sleeve 32 and holds the sleeve and knob 31 assembled to the hand grip 25. Also, the pin 52 holds the push rod 33 assembled for a limited amount of sliding in an axial direction in sleeve 32.

A link 54 is connected at one end through a pivot pin 55 to the lever 51, and at its opposed end through a pivot pin 56 to a lever 57 that is integrally secured to the controller shaft 48. An end portion of the pivot pin 55 extends beyond lever 51 and into opposed relation to a stop pin 58 on the cover plate 28, so as to move against stop pin 58 when lever 51 rotates in a clockwise direction as viewed in FIG. 3.

Further, the link 54 is formed with a cut-away portion 59, FIG. 3, that has a predetermined clearance relatively to a base portion of the lever 51 so as to move against that portion when lever 51 rotates counterclockwise, to the dot-and-dash position 51a. It will be understood that the cut-away portion 59 and the stop pin 58 will act as stops for rotation of the lever 51 from a neutral position in either direction to a limit position.

Through the particular arrangement, the operator of the truck may rotate the finger piece knob 31 in either direction whereby to rotate controller shaft 48 to either of

opposed directional driving positions, corresponding to the position of lever 57 shown by the dot-and-dash lines 57a and 57b in FIG. 3. The controller 46 will act through suitable electrical connections, not shown, to energize the traction motor 16 of the truck. Thus, by rotating the finger piece knob 31, the operator will control the driving of traction wheel 15.

The arm 29 is equipped with a detent pin 60 which will perhaps be best understood when considering FIG. 4. The detent pin 60 is mounted to slide in a guide 61 on the cover plate 28, and has a coil spring 62 acting between the guide 61 and a cross pin 63 to press detent pin 60 to a projected position relatively to an opening in the arm 29. The bracket plate 36 is formed with an opening 64 which will accept the pin 60 as shown in FIG. 4, when the arm 29 is in a predetermined neutral position. Further, a lever 65 is pivoted to rock on a bracket 66 on the inner surface of cover plate 28, with opposed ends of lever 65 engaged with the end of push rod 33 and with the cross pin 63 of detent 60. The push button 34, when depressed by the truck operator, will act through lever 65 to retract the detent pin 60, disengaging it from the opening 64 and enabling the operator to rotate the arm 29 so as to move the vertical lift control rod 45. Then, by moving the arm 29 to forward or rearward positions that are indicated by dotted lines 29a and 29b in FIG. 3, the truck operator will control lifting or lowering movements of the load carriage 12 on the truck.

I believe that the construction and operation of my novel control handle will now be understood. The operator may at all times rest his hand upon the hand grip 25, while utilizing fingers of the same hand to control the traction motor of the truck through rotation of the finger piece knob 31. Normally the hand grip 25 will be locked relatively to the truck, contributing an immovable brace for the operator's hand. When it is desired to effect a lifting or lowering movement of the load carriage 12, that may be done through a natural fore-and-aft movement of the hand to operate the hand grip 25, the push button 34 first being depressed to release the hand grip. However, even when hand grip 25 has been released for movement, the hand grip still may act effectively as a brace since it need move only a short distance in order to be automatically locked by the spring pressed detent pin 60. The hand grip 25 naturally will be in neutral position when it is locked, and there will be no vertical movement of the load carriage 12.

It will be appreciated that the operating movements of the hand grip 25 and finger piece knob 31 are fully distinct from one another. Thus, while grasping the hand grip 25, the operator may utilize an arm movement to move the grip 25 fore-and-aft, and a finger movement to rotate knob 31. No wrist movement need be used, and the operator will find that he can very effectively use one hand to control both the traction motor and the lifting mechanism without confusion between the two operations.

My invention further enables me to simplify the connections between the control handle and truck. Thus, the handle will control a traction motor through a controller that is mounted on the handle. Merely a simple rod need extend from the handle for controlling a lifting mechanism on the truck. Actually, I am able to mount my novel control handle on a hinged battery cover while allowing the cover to be opened at any time, the control handle merely pivoting relatively to the lift control rod.

I believe, therefore, that the very considerable value of my novel control handle will be clearly understood, and that those persons who are skilled in the art will fully appreciate the merits of my invention.

I claim:

1. In a manual control assembly for an industrial truck of the class described, a hand grip mounted for movement on the truck and having a substantial length adapted to be grasped by a hand of the truck operator, a releasable detent for holding said hand grip against fore-and-aft

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movement whereby to act as a brace for the operator's hand relatively to the truck, control means actuated by said hand grip when released from the detent and moved in a fore-and-aft direction on its mounting relatively to the truck, a finger piece located at the outer end of and mounted for rotary movement on said hand grip, a controller connected to said finger piece, and said finger piece enabling the controller to be operated by fingers of the operator's hand independently of the bracing of the hand relatively to the truck.

2. In a manual control assembly for an industrial truck of the class described, a control arm vertically mounted for movement in a fore-and-aft direction on the truck, a handle portion perpendicularly mounted on said control arm, control means connected to said control arm so as to be actuated when said handle portion moves said arm, a releasable detent for locking said control arm and handle portion against fore-and-aft movement whereby to act as a brace for the operator's hand relatively to the truck, a second handle portion mounted for movement in juxtaposed relation to the first portion on the control arm, and further control means mounted on the control arm and connected to the second handle portion so as to be actuated by that portion independently of the locking and the position of the first portion and arm relatively to the truck.

3. In an industrial truck of the class described having a load lifting mechanism and a traction motor, a vertically arranged hollow control arm mounted for movement in a fore-and-aft direction on the truck, a hand grip mounted in a transverse position on said control arm and having a substantial length adapted to be grasped by a hand of the truck operator, control means connected to said arm for actuating the load lifting mechanism, a knob mounted to rotate in axial relation to the hand grip on said control arm, linkage means within said hollow control arm and actuated by rotation of said knob, a controller for the traction motor connected to said linkage means within said hollow control arm and actuated through rotation of the knob by fingers of the operator's hand, a detent normally locking said control arm in fixed relation to the truck so that the operator's hand while controlling the traction motor may be braced on the hand grip, and a depressible push button mounted on said knob and effective through lever means within said hollow arm when depressed to move said detent to release position so that the lifting mechanism may be actuated through the fore-and-aft movements of the control arm.

4. In an industrial truck of the class described having a load lifting mechanism and a traction motor, a control arm arranged vertically and pivoted to rotate in a fore-and-aft direction on the truck, a hand grip integrally mounted at one end on an end portion of said control arm with the axis of said grip extending transversely of the truck, said hand grip having a substantial length adapted to be grasped by a hand of the truck operator, lift control means connected to the control arm for actuating the load lifting mechanism when the hand grip rotates said arm on its pivotal mounting, a controller for the traction motor mounted on the control arm and moving with said arm, a knob mounted on the opposed end of the hand grip for rotation in the axis of said hand grip, means through which said knob when rotated actuates the traction motor controller on the arm, a detent pin mounted on said arm and spring pressed to a position engaging a part on the truck to lock the control arm and hand grip in fixed relation to the truck, said hand grip when so locked acting as a brace for the operator's hand while enabling fingers of that hand to control the traction motor through the knob, a push button arranged at one end of said knob, and means through which the push button when depressed retracts the spring pressed detent pin so that the load lifting mechanism may be actuated through fore-and-aft rotation of the hand grip.

5. In an industrial truck of the class described, a plat-

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form for supporting the truck operator while facing in a forward direction relatively to the truck, a hollow control arm adjacent said operator's platform, means mounting said arm for fore-and-aft movement relatively to the truck, locking means for releasably holding the control arm against said fore-and-aft movement, a handle perpendicularly secured to the control arm and adapted to be grasped by one hand of the operator for moving said arm in the fore-and-aft direction, said handle including a first portion which is fixed against movement relatively to the control arm and a second portion forming an extension of said first portion and mounted for rotation relatively to said first portion, first control means operatively connected to the control arm whereby movement of said arm in the fore-and-aft direction actuates said first control means, second control means including linkage means within said hollow control arm operatively connected to the second portion of said handle whereby rotation of said second portion of said handle relatively to said first portion operates said second control means, and means on said handle for releasing said locking means to permit the control arm to be moved in said fore-and-aft direction to actuate said first control means.

6. In an industrial truck of the class described, a platform for supporting the truck operator while facing in a forward direction relatively to the truck, a hollow control arm adjacent said operator's platform, means mounting said arm for fore-and-aft movement relatively to the truck, locking means for releasably holding the control arm against said fore-and-aft movement, said locking means including a transversely mounted pin means within said hollow control arm releasably engaging a detent mounted outside of said hollow arm, a handle perpendicularly secured to the control arm and adapted to be grasped by one hand of the operator for moving said arm in the fore-and-aft direction, said handle including a first portion which is fixed against movement relatively to the arm and a second portion forming an extension of said first portion and mounted for rotation relatively to said first portion, said first and second portions of the handle being each of a length less than the width of the operator's hand whereby the operator will normally grasp both portions of the handle while moving the control arm in the fore-and-aft direction by means of said handle, first control means operatively connected to the control arm whereby movement of said arm in the fore-and-aft direction actuates said first control means, second control means including linkage means within said hollow control arm operatively connected to said second portion of said handle whereby rotation of said second portion of said handle relatively to said first portion operates said second control means, and means on the handle operatively connected to lever means within said hollow control arm for releasing said locking means to permit the control arm to be moved in said fore-and-aft direction to actuate said first control means.

7. In an industrial truck of the class described, a platform for supporting the truck operator while facing in a forward direction relatively to the truck, a hollow control arm adjacent said operator's platform, means vertically mounting said arm for fore-and-aft movement relatively to the truck, locking means for releasably holding the control arm against said fore-and-aft movement, a handle perpendicularly secured to said control arm and extending horizontally in a direction transverse to the truck, said handle including a first portion secured at one end to said control arm and fixed against movement relatively to said arm and a second portion at the other end of said first portion mounted for rotation relatively to said first portion, said second portion of the handle being of a length substantially less than the width of the operator's hand whereby the operator will normally grasp at least a part of said first portion of the handle while moving said control arm in the fore-and-aft direction by means of said handle, first control means op-

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eratively connected to the control arm whereby movement of said arm in the fore-and-aft direction actuates said first control means, second control means including linkage means within said hollow control arm operatively connected to said second portion of said handle whereby rotation of said second portion of said handle relatively to said first portion operates said second control means, a push button mounted at the end of the second portion of the handle adapted to be pressed by the thumb of one hand of the operator while the fingers of said hand are engaged with said first and second portions of said handle, and means including a lever and pivoting means opera-

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tively connecting said push button to said locking means whereby pressing of said push button releases said locking means to permit the control arm to be moved in said fore-and-aft direction to actuate said first control means.

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