

[54] TRACTOR COUNTER WEIGHT ASSEMBLY

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[57] ABSTRACT

A tractor counter weight assembly including weight members each having a body with a supporting lip formed thereon and a clamping portion spaced from the supporting lip. A supporting frame member on the tractor body is engageable by the supporting lip of each weight member. Clamping means on the tractor body spaced from the supporting frame engages the clamping portion of each weight member when the supporting lip thereof is engaged with the supporting frame to prevent disengagement of the lip from the supporting frame.

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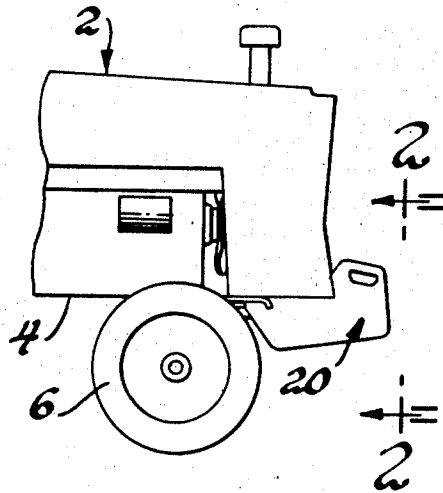
[58] Field of Search 280/150 E

[56] References Cited

UNITED STATES PATENTS

3,492,019	1/1970	Folkerts	280/150 E
3,635,493	1/1972	Barth	280/150 E

16 Claims, 3 Drawing Figures



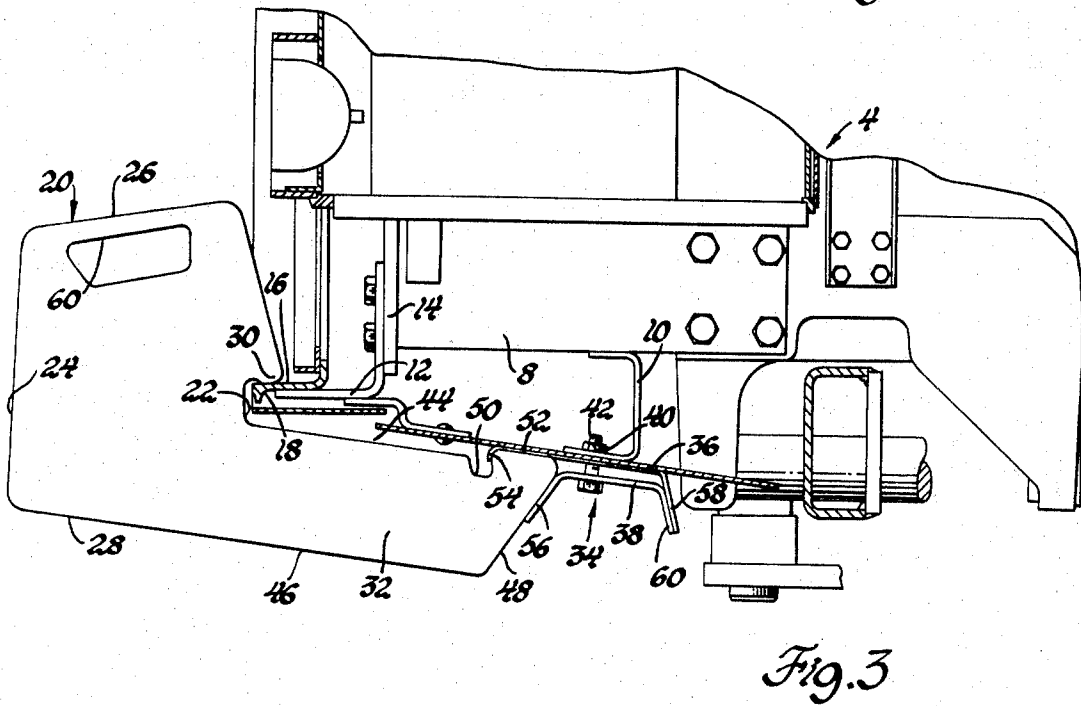
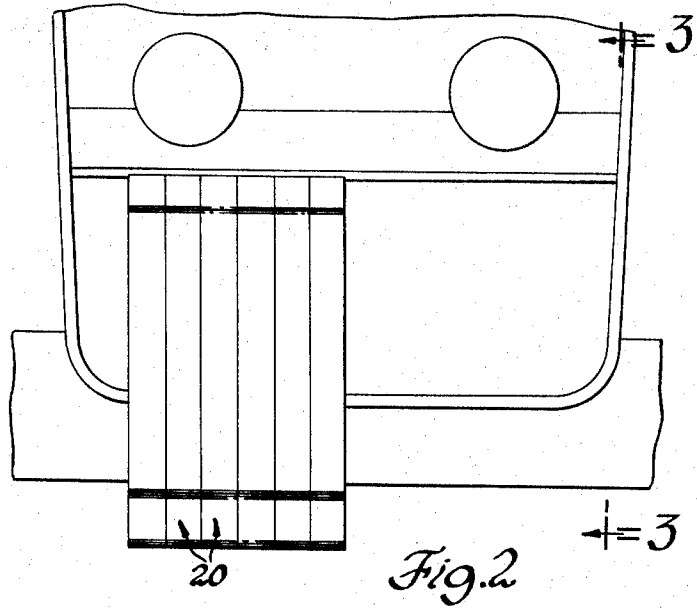
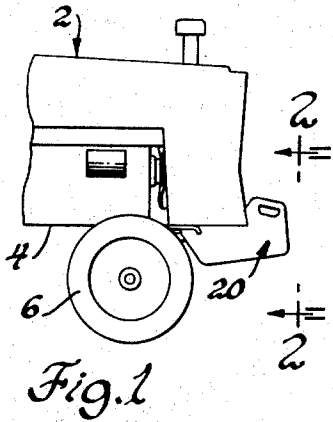


Fig. 3

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TRACTOR COUNTER WEIGHT ASSEMBLY

This invention relates generally to counter weight apparatus for tractors and similar vehicles, and is particularly concerned with a counter weight assembly of the type including a plurality of portable weight members that can be selectively installed on or removed from the vehicle as desired.

Agricultural tractors, and similar vehicles, are generally provided with counter weight assemblies including portable weight members that can be added and subtracted as necessary to respectively increase or decrease the weight on the steerable wheels of the tractor. It is, of course, desirable for the operator to be able to install or remove these individual weight members with relative ease, while at the same time it is necessary for the weight members to be securely held in position on the tractor during operations.

Examples of prior art counter weight assemblies are disclosed in U.S. Pat Nos. 2,701,728; 3,023,024 3,416,814; 3,490,787; and 3,492,019.

The ease of installing and removing the individual weight members depends to some extent on the amount of vertical lifting required for installation or removal. If the weight members are received in an enclosure or the like when mounted on the tractor, a significant amount of vertical lifting is of course required in order to remove or install the weights in the enclosure. In apparatus of the type wherein the weights are formed with slots for receiving supporting frame members, it is also necessary to lift the weight over the edges of the frame members for inserting the frame members into the slots.

It is therefore an object of this invention to provide a tractor counter weight assembly in which the individual weight members of the assembly can be installed with a minimum amount of vertical lifting in such a manner that the weights can be installed onto and removed from the supporting members on the tractor by horizontal movement of the weight members.

A further object of this invention is to provide a tractor counter weight assembly wherein each weight member can be installed onto a supporting frame by horizontal movement and is then biased by its own weight to engage clamping means on the tractor so that manual manipulation of the weight members after engagement with the supporting frame is at a minimum.

In accordance with the present invention, the individual counter weight members comprise a generally flat body formed with a supporting lip and a clamping portion spaced from the supporting lip. A supporting frame member on the tractor body is engageable by the lip upon movement of the weight member onto the supporting frame. When the lip engages the supporting frame, the clamping portion of the weight member is biased by the weight of the weight member into engagement with clamping means on the tractor body. The clamping means is then adjustable to secure the weight member against disengagement from the supporting frame.

The clamping portion of the weight member is in the form of an arm projecting from the body of the weight member, the arm having an upper edge surface located beneath the supporting lip with a notch formed therein. The clamping means includes a fixed clamping member having a locking flange receivable in the notch on the arm member, and a movable clamping member for

wedging the arm member against the locking flange to prevent disengagement of the weight member from the supporting frame.

Other objects, advantages and features of the invention will become apparent from the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a partial elevational view of an agricultural tractor having a counter weight assembly according to the present invention;

FIG. 2 is an enlarged front view of the tractor of FIG. 1 taken on line 2—2 of FIG. 1; and

FIG. 3 is a view taken on line 3—3 of FIG. 2.

In the drawings, reference numeral 2 collectively designates a tractor having a body 4 and front steerable wheels 6. The tractor body 4 includes longitudinal frame members 8, a plate 14 extending transversely of the longitudinal frame members 8 at the front end thereof and lying substantially in a vertical plane, a transverse channel frame member 10 extending beneath the longitudinal frame member 8, and a front angle frame member 12 secured by bolts or other conventional fasteners to the plate 14.

A counter weight supporting frame member 16 is mounted on the tractor body and extends transversely thereof. The supporting frame member 16 has a depending stiffening flange 18 and engages one leg of the angle frame member 12 as shown in FIG. 3. The supporting frame member 16 provides the vertical support for a plurality of portable weight members 20 which are detachably mounted on the tractor body.

Each of the weight members 20 is in the form of a generally flat body having inner and outer edges 22 and 24, respectively, and upper and lower edges 26 and 28, respectively. Projecting from the inner edge is a supporting lip 30 which engages the supporting frame member 16.

The weight member 20 has a clamping portion in the form of an arm 32 extending from the inner edge 22 for engagement with clamping means designated generally by reference numeral 34 when the lip 30 is supported on the supporting frame member 16. The clamping means 34 prevents disengagement of the lip 30 from the supporting frame 16.

The clamping means 34 includes a fixed clamping member 36 secured beneath the transverse frame member 10, and a movable clamping member 38 which is adjustable toward and away from the fixed clamping member 36. One or more threaded nuts 40 are secured to the lower flange of the transverse frame member 10 for engagement by a bolt 42 which supports the movable clamping member 38. By rotating the bolt 42 in one direction, the movable clamping member 38 moves vertically towards the fixed clamping member 36, and vice versa.

The arm 32 has an upper edge surface 44, a lower edge surface 46 which is coextensive with the lower edge 28 of the body of the weight member 20, and an end edge surface 48 extending between the upper and lower edge surfaces. A notch 50 is formed in the upper surface 44 of the arm 32 for engagement with the fixed clamping member 36.

The fixed clamping member 36 includes a base portion 52 engageable by the upper surface of the arm 32 that extends between the notch 50 and the end surface 48, and a locking flange 54 depending from the end of the base portion 52. The locking flange 54 is received

in the notch 50 when the lip 30 engages the supporting frame member 16.

The movable clamping member 38 is formed with a flange 56 for engaging the end surface 48 of the arm 32, the end surface 48 being inclined to provide a wedging action upon vertical movement of flange 56. The fixed clamping member 36 includes an inclined wedging flange 58 which is engageable by an inclined flange 60 of the movable clamping member 38. The wedging flange 58 also depends from the base portion 52 of the fixed clamping member 36 and is spaced from the locking flange 54.

The distance from the inner edge 22, from which the lip 30 and arm 32 project, to the side surface of the notch that is engaged by the locking flange 54, is greater than the distance from the outer edge of the supporting frame member 16, from which the stiffening flange 18 depends, to the locking flange 54. Accordingly, when the lip 30 is placed into engagement with the surface of the supporting frame member 16, the arm 32 is biased by the weight of the weight member 20 to swing into the approximate position shown in FIG. 3 but can clear the locking flange 54 so that the locking flange 54 is received in the notch 50 between the side surfaces thereof. Subsequent tightening of the bolt 42 to draw the movable clamping member 38 upwardly as viewed in FIG. 3 towards the fixed clamping member 36 provides a wedging action to clamp the arm member 32 between the locking flange 54, base member 52 and flange 56 of the movable clamping member 38.

Each of the weight members includes an opening 60 near the upper edge 26 thereof via the hand grip. Consequently, the operator can manipulate the weight 20 onto or off of the upper surface of the supporting frame member 16 by moving the weight member 20 in a horizontal direction after the lower surface of the lip 30 has been brought to the level of the supporting frame member 16.

The clamping means 34 extends transversely across the body of the tractor to accommodate all of the weight members 20 that can fit onto the space provided by the length of the supporting frame member 16. Weights can be removed as desired by loosening the movable clamping member 38 thereby permitting the locking flange 54 to be disengaged from the notches 50 of the respective weight members by slight clockwise movement of the weight member 20 about the supporting lip 30, as viewed in FIG. 3, whereupon the weight member can be moved horizontally to the left to disengage it from the supporting frame member 16.

While specific embodiments of the invention have been disclosed in the accompanying drawings and described in the foregoing specification, it should be understood that the invention is not limited to the exact construction shown. Alterations in the construction and arrangement of parts, all falling within the scope and spirit of the invention, will be apparent to those skilled in the art.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A counterweight assembly on a tractor comprising: a supporting frame member secured to a forward position of said tractor; at least one weight member extending fore and aft to said tractor and having a body and an arm extending rearwardly from said body under the

tractor and comprising a substantial portion of the weight of said weight member, a supporting lip intermediately formed on said weight member and mountable on said supporting frame member, and a clamping portion spaced rearwardly from said lip and at the end of said arm; clamping means secured to the underside of said tractor and spaced rearwardly from engagement of said lip on said supporting frame member and at the end of said arm; said clamping portion of said weight member being engageable and cooperating with said clamping means when said supporting lip is positioned on and engaged with said supporting frame member to prevent disengagement of said lip from said supporting frame member.

2. An assembly as claimed in claim 1 wherein said clamping means includes a fixed clamping member and a movable clamping member for engaging said arm therebetween.

3. An assembly as claimed in claim 2 wherein said arm has an upper edge surface, a lower edge surface spaced from said upper edge surface, and an end edge surface extending between said upper and lower edge surfaces, and further including a notch in said upper surface engageable by said fixed clamping member.

4. A tractor counterweight assembly comprising: at least one weight member having a body with a supporting lip formed thereon and an arm projecting from said body, said arm has an upper edge surface, a lower edge surface spaced from said upper edge surface, and an end edge surface extending between said upper and lower edge surfaces; a clamping portion on said arm and spaced from said lip; a supporting frame engageable by said lip; a fixed clamping member and a movable clamping member spaced from said frame; said clamping portion being engageable with said clamping members when said supporting lip is engaged with said supporting frame member; a notch in said upper surface; said fixed clamping member includes a base portion engageable by the upper edge surface of said arm, and a locking flange depending from one edge thereof for engagement with said notch.

5. An assembly as claimed in claim 4 wherein said movable clamping member is engageable with the end edge surface of said arm and is adjustable in one direction to force said locking flange into clamped engagement with said one surface of said notch, and in the opposite direction to permit said locking flange to disengage from said notch.

6. An assembly as claimed in claim 5 wherein said fixed clamping member includes a wedging flange depending from said base portion and spaced from said locking flange, said movable clamping member having a wedging surface engageable with said wedging flange.

7. An assembly as claimed in claim 6 wherein said body has an inner edge, and said supporting lip and said arm project from said inner edge.

8. An assembly as claimed in claim 7 wherein the distance from said inner edge to said one surface of said notch is greater than the distance from the outer edge of said weight supporting frame member to said locking flange.

9. An assembly as claimed in claim 8 wherein the center of gravity of said weight member is located with respect to said supporting lip to cause said arm to pivot into engagement with the base portion of said fixed clamping member.

10. An assembly as claimed in claim 9 wherein the portion of the upper surface of said arm extending between said inner edge and said notch is spaced below the portion of the upper surface of said arm extending between said notch and said end edge surface.

11. An assembly as claimed in claim 10 including an opening in said weight member defining a hand grip.

12. A tractor counterweight assembly comprising: a tractor body; a supporting frame member on said tractor body and extending transversely thereof; at least one portable weight member supported on said supporting frame member; said weight member having a generally flat body with an inner edge and a supporting lip projecting from said inner edge; an arm member projecting from said inner edge beneath said supporting lip and extending beneath said supporting frame; said arm member having an upper edge surface, a lower edge surface, an end surface extending therebetween, and a clamping notch formed in said upper edge surface; clamping means on said tractor body and extending transversely thereof, said clamping means including a fixed clamping member having a base portion with a locking flange depending therefrom and engaged with said notch, and a movable clamping member engaged with the end surface of said arm and adjustable to clamp said arm between said locking flange, base portion and movable clamping member.

13. A tractor counterweight assembly comprising: a generally flat body having an inner edge, an outer edge, and upper and lower edges; an arm projecting from said

inner edge; said arm having spaced upper and lower edge surfaces and an end edge surface extending therebetween; a supporting lip projecting from said inner edge in spaced relationship with the upper edge surface of said arm for supporting said body, a supporting surface; clamping means horizontally and fixedly spaced from said support surface; said arm having a length such that said end edge surface is located a substantially greater distance from said outer edge than said supporting lip whereby said arm can swing into engagement with said clamping means and when said supporting lip supports said body on a supporting surface.

14. An assembly as claimed in claim 13 including a notch formed in said upper edge surface.

15. A tractor counterweight comprising: a generally flat body having an inner edge, an outer edge, and upper and lower edges; an arm projecting from said inner edge; said arm having spaced upper and lower edge surfaces and an end edge surface extending therebetween; a supporting lip projecting from said inner edge in spaced relationship with the upper edge surface of said arm; and a notch formed in said upper edge surface, the portion of the upper surface of said arm extending between said inner edge and said notch being spaced below the portion of the upper surface of said arm extending between said notch and said end surface.

16. An assembly as claimed in claim 15 including an opening in said weight member defining a hand grip.

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