July 27, 1943. R. H. ZEILMAN 2,325,089

REMOVABLE COUNTERWEIGHT FOR EXCAVATING AND LOAD HANDLING MACHINES

Filed Sept. 8, 1941 3 Sheets-Sheet 1

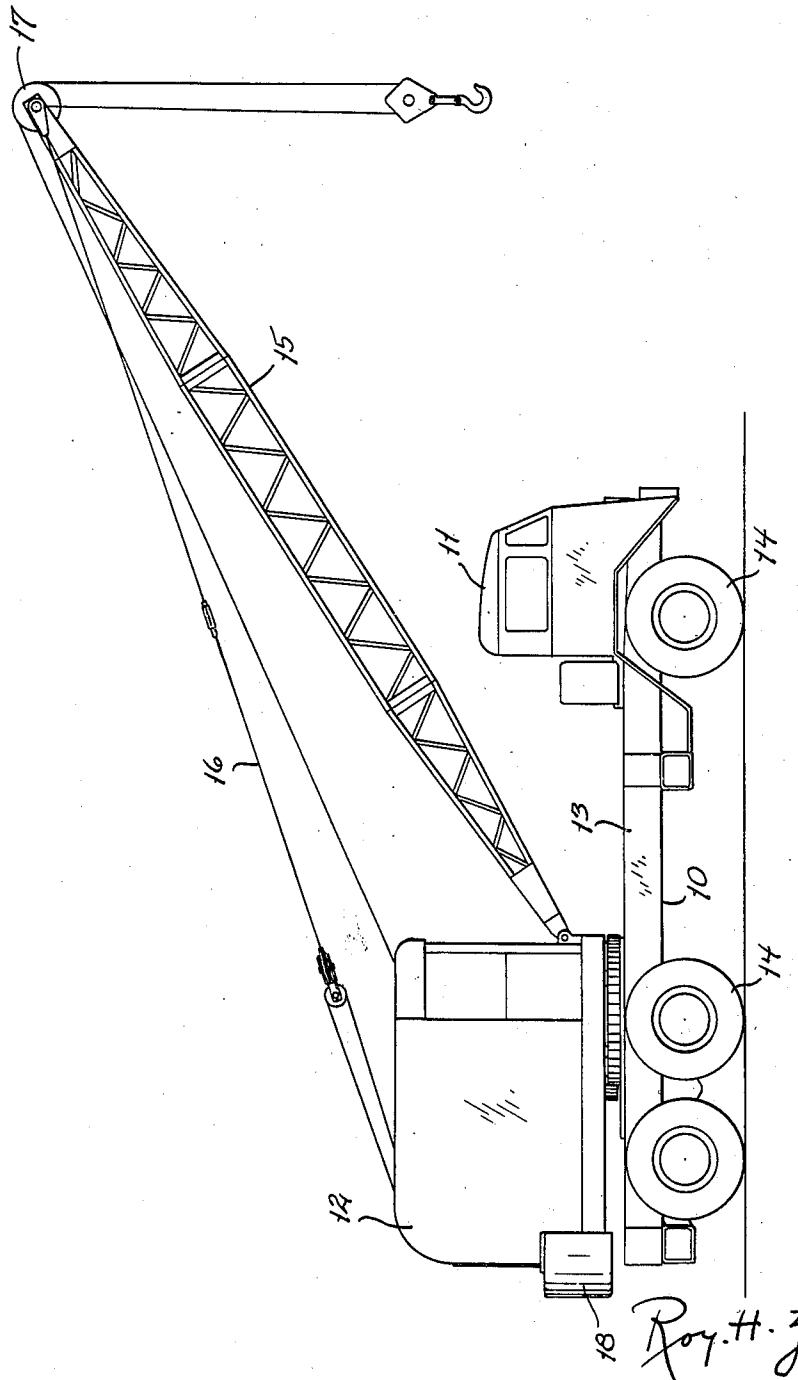


Fig. 1

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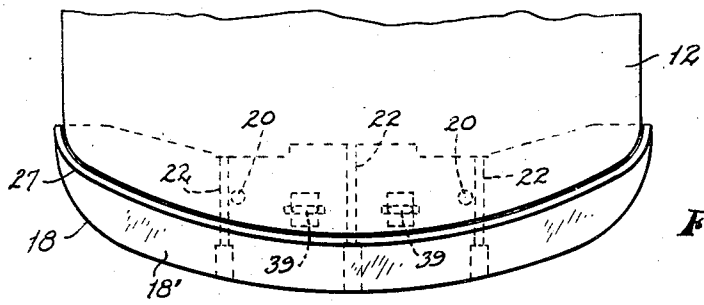
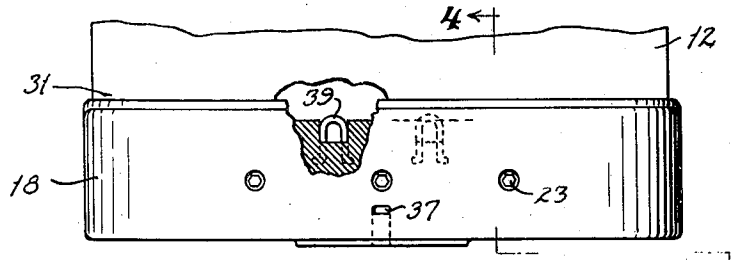


FIG. 2



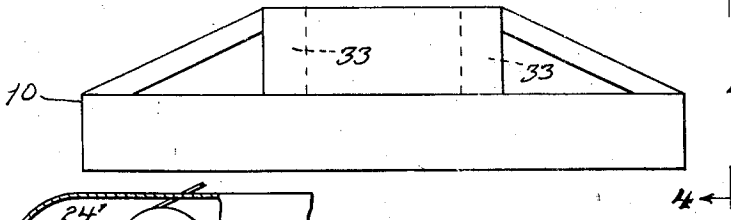


FIG. 3

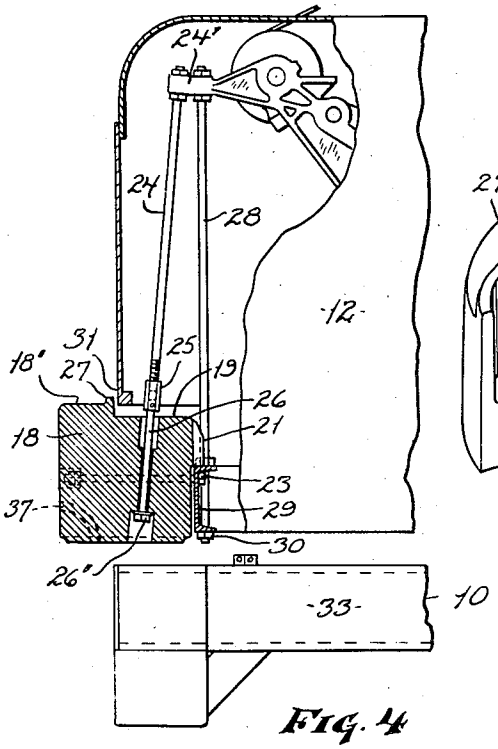


FIG. 4

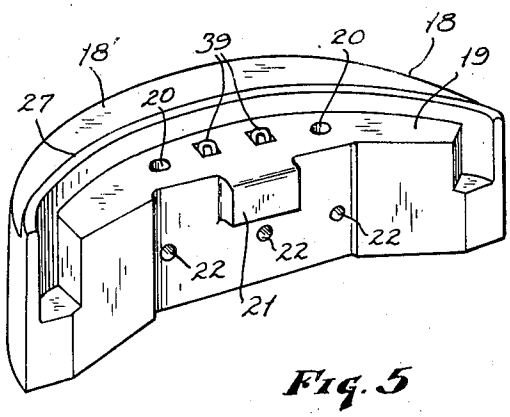


FIG. 5

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REMOVABLE COUNTERWEIGHT FOR EXCAVATING AND LOAD HANDLING MACHINES

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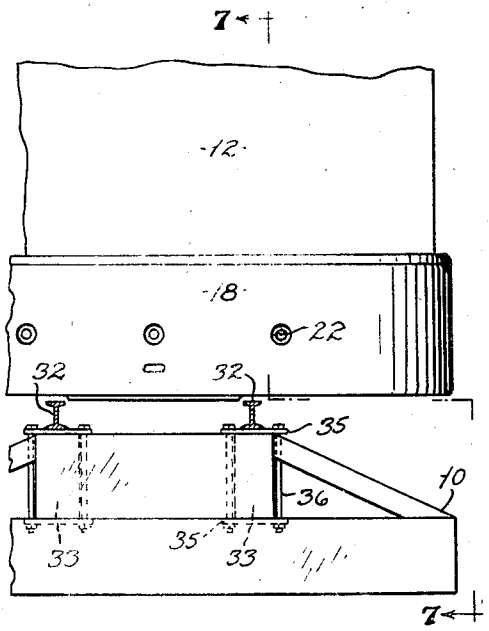


Fig. 6

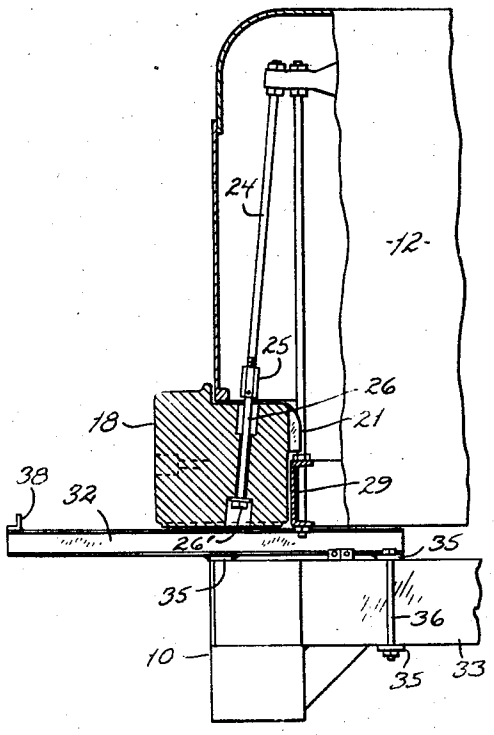


Fig. 7

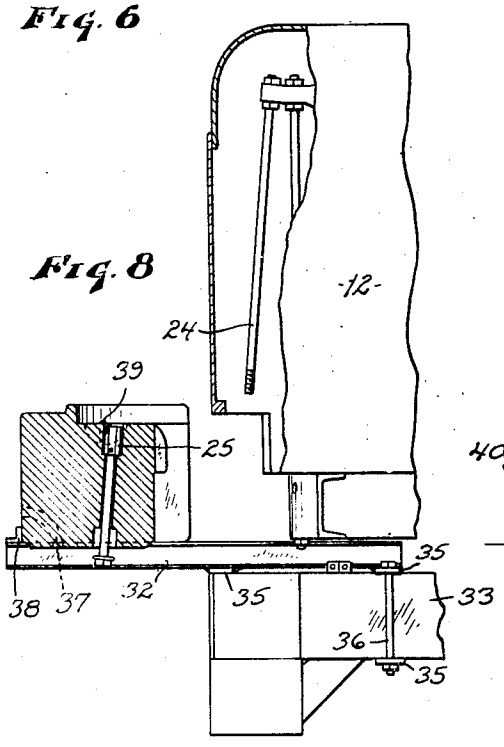


Fig. 8

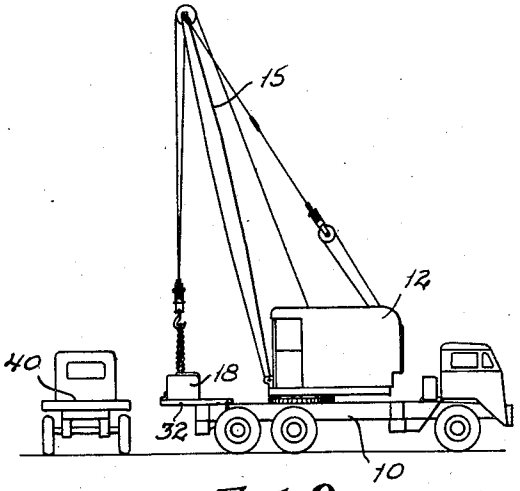


Fig. 9

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Patented July 27, 1943 2,325,089

UNITED STATES PATENT OFFICE

2,325,089

REMOVABLE COUNTERWEIGHT FOR EXCAVATING AND LOAD HANDLING MACHINES

Roy H. Zeilman, Lorain, Ohio, assignor to Thew Shovel Company, Lorain, Ohio, a corporation of Ohio

Application September 8, 1941, Serial No. 409,917

8 Claims. (Cl. 212—49)

My invention relates to a movable counterweight for excavating and load handling machines.

The improved counterweight of my invention is preferably constructed in such manner that the weight of the excavating or load handling machine which is supplemented by the counterweight may be diminished for travelling, whereby the maximum vehicle weight permissible for highway travel of such machines can be conformed to without the necessity of securing special moving permits.

The counterweight of my invention is preferably constructed so that it may be easily mounted on the excavating and load handling machine, of the type desired, to secure additional weight to the machine for operating purposes and may be easily removed therefrom and placed upon a utility truck or the like transported to the job to decrease the weight of the machine for travelling.

It is a primary object of my invention therefore to construct a counterweight which may be removable, said weight being adapted to be used for the usual purposes of balance and to add weight to an excavating and load handling machine when a crane or shovel used in connection therewith is in operative use.

A further object of my invention is to so construct such improved counterweight as to render the same removable from the excavating and load handling machine with which it is adapted to be used.

Other objects of my invention and the invention itself will become more apparent by reference to certain embodiments of my invention and by reference to the accompanying drawings of said embodiments, in which drawings:

Fig. 1 is an elevational view mainly diagrammatic of a motor crane having the improved counterweight of my invention associated therewith;

Fig. 2 is a fragmentary top plan view of Fig. 1 and the weight associated therewith;

Fig. 3 is a rear elevational view of the cab, the weight and the chassis;

Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of the counterweight of my invention;

Fig. 6 is a rear elevational view showing the first step employed in transferring the weight adapted to be associated with the crane of my invention, as shown in Fig. 1, from such crane to a utility truck;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6;

Fig. 8 is a further step in removing the counterweight from the motor crane; and

Fig. 9 shows the last step in transferring the weight from the motor crane to the utility truck illustrated in said figure.

Referring now to the drawings and particularly to Fig. 1 I have illustrated generally at 10 a motor truck having a driving compartment 11 mounted forwardly thereof and an operator's cab 12 mounted rearwardly thereof, said driving compartment and cab being mounted upon the truck frame 13, said frame being mounted upon pneumatic tires 14. A superstructure including a boom 15 is rotatably supported in the usual manner on the frame and the elevation of the boom is controlled in a well known manner by supporting cable 16 reeved through the sheaves 17 at the boom outer end.

A counterweight is generally shown at 18, said counterweight being affixed to the rear of the cab and employed to assist in the balance of the truck when the superstructure is employed therewith, and said counterweight 18, as contemplated by my invention, is a removable weight consisting of a semi-cylindrical casting or the like having a generally smooth arcuate exterior surface when the same is mounted at the rear of the cab, its inner surface being cut away as shown as best illustrated in Fig. 5 to form a shoulder 18', an upstanding flange 27 and a seat 19, said seat 19 at an intermediate portion being provided with bolt apertures 20 and a downwardly extending lug or ear 21, said lug being adapted to seat upon a rear bed channel 29 disposed at the lowermost portion of said crane operating cab and rigidly affixed thereto. The inner face of said counterweight is adapted to have contact with the face of said rear bed channel and is provided with bolt apertures 22 through which bolts 23 are adapted to project, as best shown in Fig. 4, for the purpose of securing said counterweight to the rear bed channel 29 which is welded or otherwise secured to the rear of the cab.

It is to be noted that two counterweight suspension rods 24, which are secured to the upper portion of the machinery frame, as at 24', for the superstructure, are threadingly engaged by sleeve nuts 25 pinned to relatively short suspension rods 26, which suspension rods are projected through the bolt apertures 20 and support the weight on their lower heads 26'.

The upper portion of the machinery frame, adjacent the mounting of said counterweight sus-

pension rods 24 thereon, is tied to the bed of the cab by rods 28 and nuts 30 in the usual manner.

Hence, it will be seen that when the counterweight is secured in position on the excavating and load handling machine, it is retained thereon by means of the counterweight suspension rods 24, the relatively short suspension rods 26 and bolts 23 which project through the rear bed channel 29. It is hence suspended from the machinery frame and secured at the rear of the operator's cab with the upstanding flange 27 thereof abutting a lower portion 31 of the cab.

It is to be noted that the improved counterweight of my invention when in this position is easily removable from its secured position with the cab in the following manner: The counterweight bolts 23, preferably three in number, which are projected through the apertures 22 in the counterweight and aligned apertures in the rear bed channel 29, are removed, whereupon the counterweight is then raised by turning the sleeve nuts 25 with a wrench or similar tool to the position illustrated in Figs. 6 and 7.

Skid beams 32 are next installed on top of the crane chassis side rails 33 by fastening in place with clamp bars 35 and clamp bolts 36, and the top of said skid beams are then covered with a coating of axle or cup grease.

The counterweight is then lowered by again turning the sleeve nuts 25 downwardly until the counterweight rests on the top of the skid beams 32. The sleeve nuts are loosened, as illustrated, until they are free from the suspension rods 24 and the sleeve nuts hold the rod 26 in place in the counterweight.

The counterweight is then skidded back on the skid beam 32 by either pulling the counterweight with a cable looped through the cord pocket 37 in the counterweight or the vehicle carrying the superstructure could be started in reverse and the brakes then jammed on to skid the counterweight back against the stops 38 on the skid beams. The weight is then removed from the skid beams by revolving the crane or other superstructure and hooking onto the counterweight lifting eyes 39 with a hoisting hook block or the like whereby the counterweight can be placed in a utility truck 40, as illustrated in Fig. 9, for transportation either to or away from a job.

To install the counterweight on an excavating or load handling machine, the reverse procedure is followed. The counterweight is placed on the skid beams extended rearwardly of the operator's cab, the counterweight drawn underneath the operator's cab to a position such as illustrated in Fig. 7, the sleeve nuts lifted to engage the threaded rods 24 and turned up as by a wrench to lift the counterweight from the skid beams, the skid beams removed, the weight lowered to engage the lip 21 on the channel 29, and bolts 23 used to fasten the counterweight to the rear bed channel.

Hence, it can be seen that the counterweight of my invention is adapted to be removed from or secured to a load handling or excavating machine in an inexpensive and efficient manner and that the same is only placed on the machine when the same is desired for the purpose of balance or additional weight to compensate for operations of the superstructure which tend to unbalance the excavating or load handling machine and when the excavating or load handling machine and the superstructure thereof is placed in travelling position that portion of the superstructure which extends over the forward portion of the vehicle carrying the same balances the same and a weight is then unnecessary whereby the weight of the machine for travelling purposes is reduced.

It is to be understood that although I have described my invention in connection with certain specific embodiments various other forms of the invention will become apparent and that numerous and extensive departures may be made therefrom without, however, departing from the spirit of my invention or the scope of the appended claims.

I claim:

1. In an excavating or load handling machine, a truck chassis having mounted thereon a turntable upon which a superstructure is erected, a machinery frame for said superstructure and a cab structure, a counterweight removably secured adjacent the rear end of said cab structure consisting of a semi-cylindrical weight, said weight being adapted to be suspended from the upper portion of the machinery frame for the superstructure, skid beams being adapted to be mounted on said truck chassis under the counterweight and removably secured thereto, said counterweight being adapted to be removed from said suspended relation with said machinery frame and from said mounting and being supported by said skid beams whereby said counterweight may be readily removed from its association with said excavating and load handling machine.

2. In an excavating or load handling machine, a truck chassis having mounted thereon a turntable upon which a superstructure is erected, a machinery frame for said superstructure and a cab structure, a counterweight removably secured to the rear end of said cab structure, said weight adapted to be supported by the upper portion of the machinery frame for the superstructure, skid beams adapted to be disposed upon said chassis and disposed beneath said counterweight whereby said counterweight may be removed from said cab and superstructure machinery frame and disposed upon said skid beams.

3. In an excavating or load handling machine, truck chassis having mounted thereon a turntable upon which a superstructure is erected, a machinery frame and a cab structure, a counterweight removably secured to the rear end of said cab structure, said weight adapted to be supported by the upper portion of the superstructure machinery frame, skid beams being adapted to be mounted on said chassis under said counterweight whereby said counterweight may be removed from said superstructure and disposed upon said skid beams, said superstructure being rotatable with said turntable and adapted to have locking engagement with said counterweight whereby said weight may be removed from said truck chassis.

4. In an excavating or load handling machine, a truck chassis having mounted thereon a turntable, a superstructure being mounted upon said turntable, a machinery frame for said superstructure, a cab mounted upon said turntable, a counterweight movably secured to the rear of said cab, skid beams being adapted to be mounted on said truck chassis under the counterweight, said counterweight being adapted when removed from said cab to rest on said skid beams, said superstructure being adapted to be brought into locking engagement with the counterweight when said counterweight is positioned upon said

beams whereby the counterweight may be removed from said excavating or load handling machine.

5. In an excavating or load handling machine, a truck chassis, a turntable mounted thereon, a crane supported by said turntable, a machinery frame for said crane structure, a cab mounted upon said turntable, chassis side rails associated with said chassis and extending rearwardly and longitudinally thereof, said skids being adapted to be removably secured to the truck chassis, skid beams clamped to said side rails, a counterweight being adapted to be placed on said skid beams rearwardly of the said cab, said counterweight being movable forwardly of its said position on the said skid beams whereby said counterweight may be positioned adjacent the rear portion of the cab and support means adapted to be associated with said cab which may be engaged with said counterweight whereby said counterweight is removably secured to said cab.

6. In a machine of the class described, a truck frame, a turntable rotatably mounted thereon, a load handling device supported by said turntable, said truck frame having a pair of side rails, skid beams removably secured to said rails, a counterweight disposed adjacent the rear portion of said truck and removably secured thereto, said skid beams being adapted to be mounted on the truck frame under the said counterweight whereby said counterweight may be supported thereby, said weight being moved from said truck by said load handling device.

7. In a machine of the class described, a truck frame, a turntable rotatably mounted thereon, a load handling device supported by said turntable, said truck frame having a pair of side rails, skid beams removably secured to said rails, a counterweight being adapted to be disposed adjacent the rear portion of said truck upon said skid beams and to be removably secured to said truck, said weight being moved on said truck by said load handling device.

8. In a machine of the class described, a truck chassis, a turntable rotatably mounted thereon, a load handling device supported by said turntable, a frame therefor, a cab supported on said turntable, said frame for said load handling device being secured to said cab, a counterweight removably secured to said cab and to said frame, means being adapted to remove the counterweight therefrom, said truck being adapted to have skid means associated therewith and extending rearwardly thereof which skid means are adapted to be disposed beneath said counterweight whereby said weight may be moved thereon and be engaged by said load handling device.

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