Feb. 29, 1944. T. LANGAN 2,343,014

HOISTING FRAME

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Fig. 1.

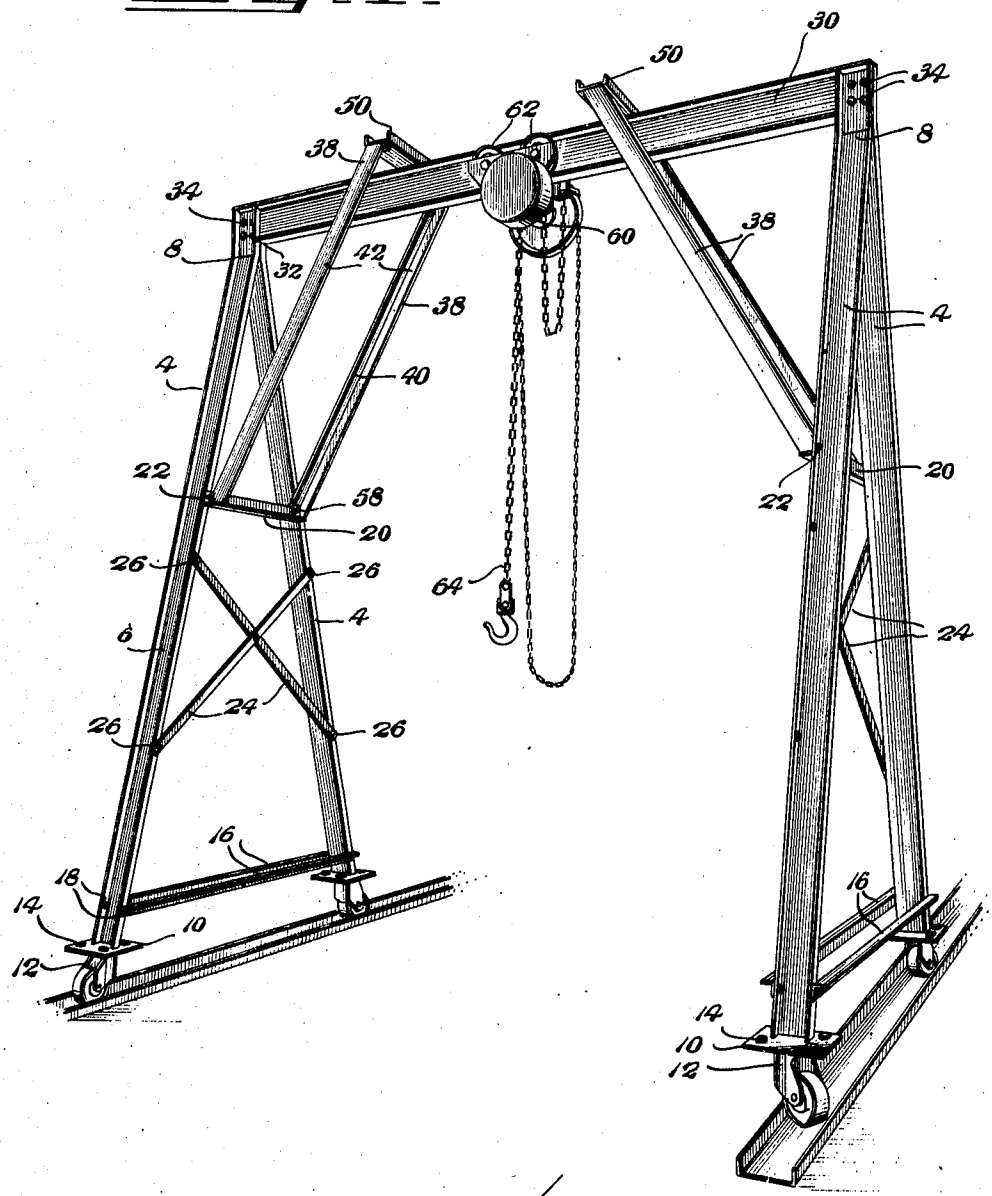

Fig. 4.

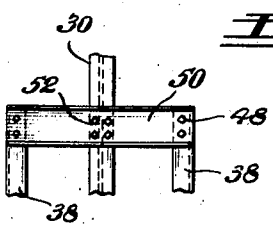

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FIG. 2.

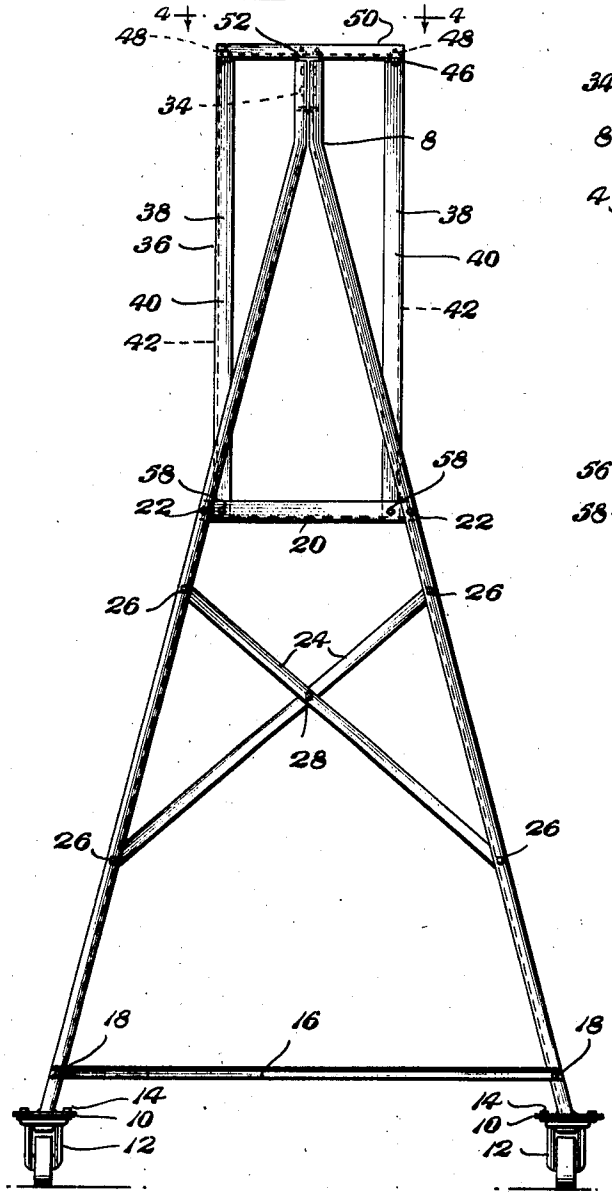
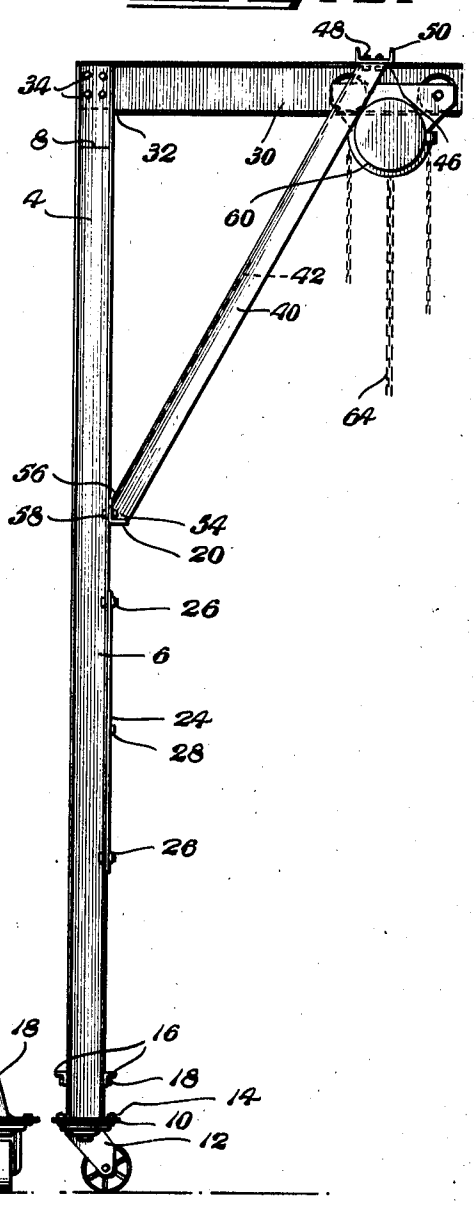


FIG. 3.



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UNITED STATES PATENT OFFICE

2,343,014

HOISTING FRAME

Thomas Langan, Annapolis, Md.

Application May 8, 1943, Serial No. 486,483

4 Claims. (Cl. 212—13)

This invention relates to hoisting apparatus and, more particularly, to a hoisting frame for lifting heavy machinery and the like.

The primary object is to provide a hoisting frame which can be moved over a machine, or beneath which a machine may be moved, for lifting off part of the machine and then transporting the lifted part. Although it may be used for multifold other purposes, the hoisting frame has particular utility in removing turrets and other heavy parts from military vehicles, such as tanks, in which operation the frame is disposed over the tank and a chain hoist slidably supported on the frame is adjusted on the work. The turret, lifted upwardly by the chain hoist, may then be moved laterally along the transverse dimension of the frame, if need be, or the entire frame and turret may be rolled away. In keeping with these functions, it is intended to form the hoisting frame as an ambulatory vehicle which can be wheeled at will around a shop with the load suspended therefrom.

Another objective is the provision of a hoisting frame which, while rugged and capable of handling heavy loads, may be quickly dismantled and packed in a small, compact package. Furthermore, it is proposed to form many of the component parts identical with ane another so that the frame may be re-assembled with the minimum of trying and fitting. In the furtherance of this object, the upright members are substantially A-shaped in end elevation, the apexes of the A's being joined by a horizontal I-beam so that the frame, in front elevation, forms an inverted U. It is also an object to provide diagonal bracing between the uprights and the horizontal beam, the arrangement being such that the diagonal braces do not interfere with the travel along the beam of a chain block trolleyed on the beam.

Still again, it is intended to teach the formation of a hoisting frame of stock bars and beams which may be worked into form principally by simple cutting and drilling, with comparatively little welding and bending. These and other objects will be apparent from the following specification and drawings, in which:

Fig. 1 is a perspective view of the assembly;

Fig. 2 is a side elevation;

Fig. 3 is a front elevational half view; and,

Fig. 4 is a plan detail looking down along 4—4 of Fig. 2.

Referring now to the drawings, in which like reference numerals denote similar or identical elements, a pair of generally A-shaped uprights 4—4 are provided at each end of the frame, only one of which will be detailed since they are identical. Supports 4 consist of a pair of identical U-beams 6 which converge upwardly to form the legs of an A, the upper ends being bent at 8 so as to lie parallel to one another. On the lower ends of the uprights, base plates 10 are welded to form platforms to which caster units 12 are bolted, as indicated at 14.

The bracing for uprights 4 comprises an opposed pair of inverted L-bars 16 bolted at each end 18 to the flanges of the U-beams 6 adjacent their lower ends so as to extend horizontally therebetween. An upper horizontal brace 20 in the form of a short L-bar is bolted at each end 22 to the inner flanges of uprights 6, and the cross bracing is completed by a pair of diagonal braces 24 of flat strip metal bolted at each end 26 to the U-beams and at their intersection 28 to each other.

The cross member of the hoisting frame consists of an I-beam 30 having its lower flange cut away at 32 adjacent each end so that its web may be sandwiched between the bent upper ends 8 of the U-beams 6 of the uprights and bolted, as at 34. The I-beam is of such length as to space the uprights on each side of the tank, vehicle, or other machine to be serviced, and likewise the uprights 4 are sufficiently high to support the I-beam well above the work.

Corner braces 36 are removably connected between uprights 4 and I-beam 30, it being noteworthy that the corner bracing does not interfere with the free travel of the block along the length of the I-beam as described below. This is accomplished by the box-like form of the corner braces, which consist of a pair of L-bars 38 having flanges 40 and 42, flanges 40 being cut away adjacent their tops and flange 42 being bent over and bolted at 48 to a horizontal U-beam which, in turn, is bolted intermediate its ends to I-beam 30. The lower end of flange 42 is cut wedge-shape so as to nest in the crotch of upper horizontal cross brace 20, and flanges 40 are bent down and bolted as at 58 to provide a rigid assembly.

The hoisting proper is accomplished with a chain block 60 of the type well known to the art, having a pair of trolley wheels 62 on each side riding the flanges of I-beam 30 and the usual load chain 64. The block may be fitted to the I-beam before the beam is bolted between uprights 4 and, when the frame is assembled, the flanges of the U-beams forming the uprights comprise stops to prevent running-off of the block.

In operation, the frame is wheeled to position astride the tank or other machine to be worked on, and the block travelled along the I-beam to the desired position over the work. Then, after the load chain has been lowered and engaged, the load is then lifted and wheeled away with the frame.

When it is desired to dis-assemble the frame, the knock-down is accomplished simply by removing the bolts holding the various parts together. Likewise, the initial and re-assembly is done by bolting.

It is manifest that the frame may be used for hoisting and transporting various types of work where the problem is to get at the work from above, and then, if necessary, to transport the work to another location; and that the elements shown and described herein may be altered in size, type, and may be replaced by equivalents without departing from the scope of the following claims.

I claim:

1. A hoisting device comprising, in combination, a pair of spaced uprights, a horizontal cross beam extending between the upper ends of the uprights so as to form a frame substantially of inverted U-shape in front elevation, casters on the lower ends of said uprights, a hoisting block, means slidably mounting said hoisting block on said cross beam for adjustment along the length thereof, and diagonal braces between said uprights and said cross beam, said braces each comprising a relatively short beam affixed intermediate its ends to the top of said cross beam and extending transversely thereof, and a pair of members extending between the ends of said short beams and said uprights, whereby to leave a free pathway along said cross beam for the travel of said block.

2. The combination claimed in claim 1, said uprights being substantially A-shaped in end elevation of the frame, the lower ends of said members being affixed to the cross bars of the A-shaped uprights.

3. In a knock-down type hoisting frame, a pair of spaced uprights comprising a pair of elongated members having upper end portions bent so as to lie parallel to one another while the remaining portions diverge, cross braces bolted between the diverging portions so that said uprights substantially form an A, a cross beam comprising a vertical web and a pair of flanges projecting laterally from each side of the lower edge thereof, said flanges being cut away adjacent each end of said cross beam, the respective ends of the web of said beam being sandwiched and bolted between the upper end portions of said members, casters on the lower ends of said members, a hoisting block, and trolley wheels on said hoisting block riding the flanges on each side of the web of said cross beam.

4. The combination claimed in claim 3, and diagonal braces extending between said cross beam and said uprights, said braces each comprising a relatively short beam bolted intermediate its ends to the top of said cross beam and extending transversely thereof, and a pair of bracing members having their upper ends bolted to the ends of said short beam and their lower ends bolted to a cross bar of the adjacent A-shaped upright.

THOMAS LANGAN.