

Aug. 21, 1945.

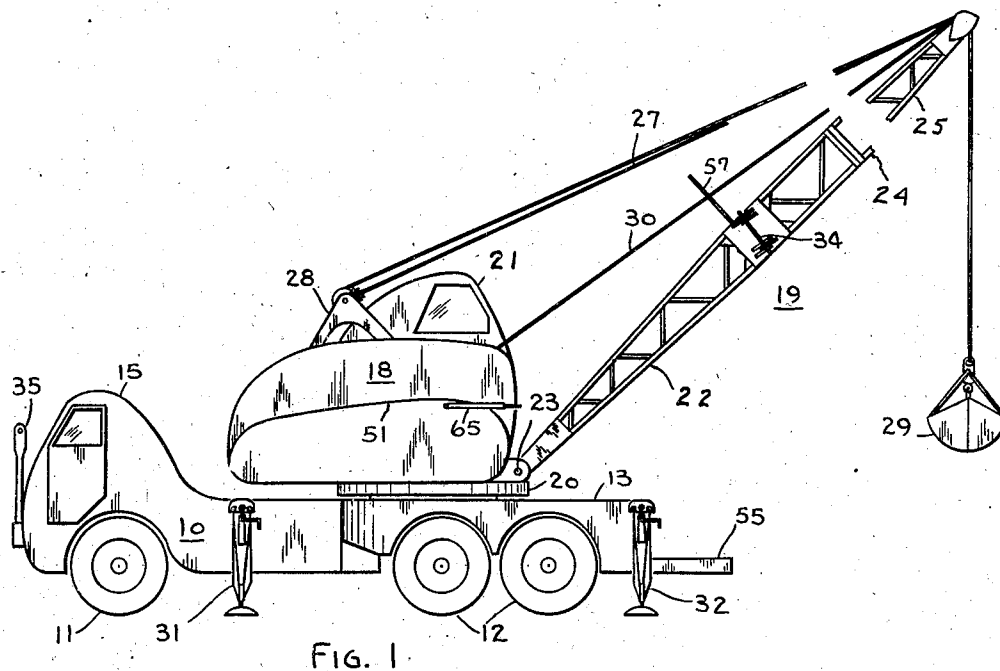
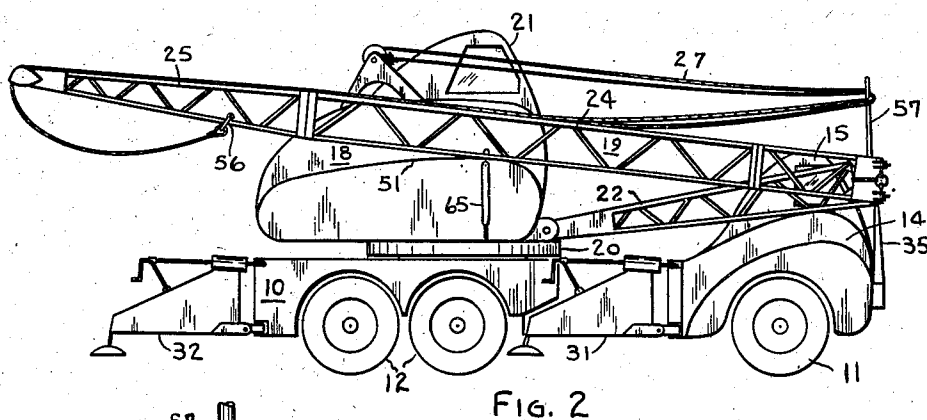
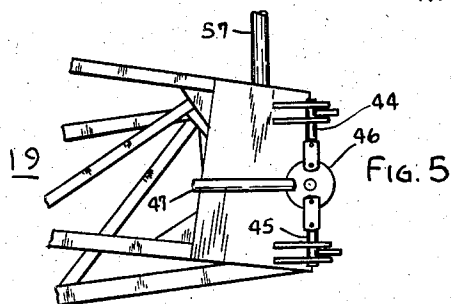
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2,383,172

PORTABLE CRANE

Filed March 27, 1944

2 Sheets-Sheet 1



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PORTABLE CRANE

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2 Sheets-Sheet 2

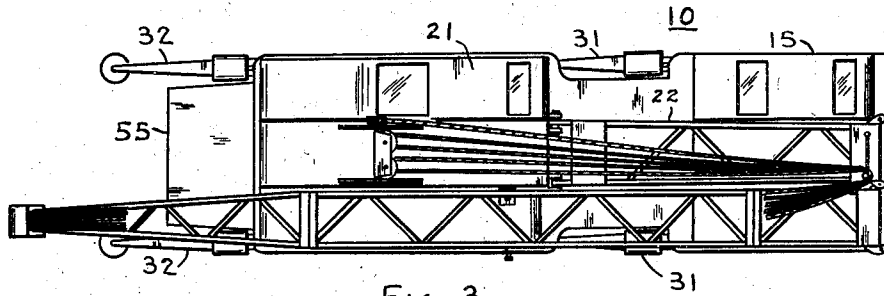


FIG. 3

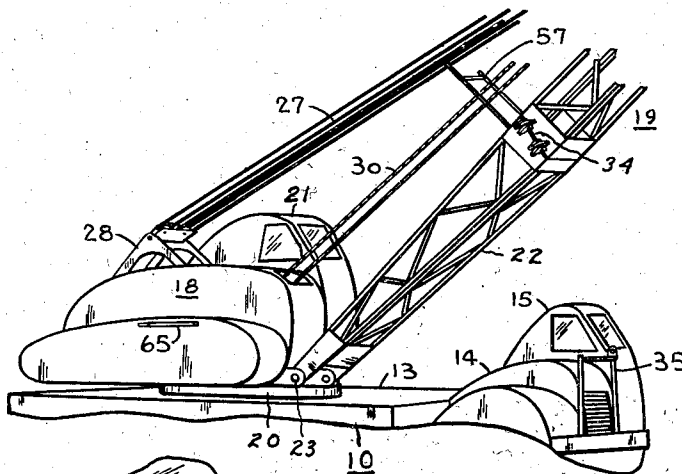


FIG. 4

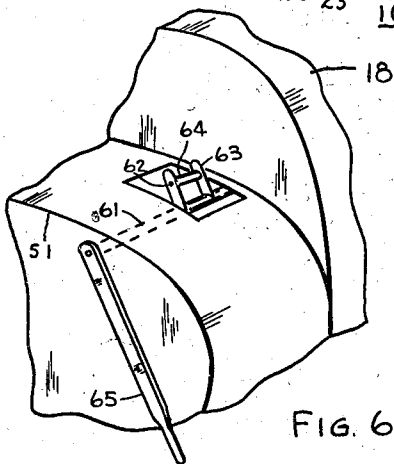


FIG. 6

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2,383,172

PORTABLE CRANE

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Application March 27, 1944, Serial No. 528,212

10 Claims. (Cl. 212-144)

The present invention relates to portable cranes and more particularly to crane structures mounted upon trucks and adapted to be transported thereby in an inoperative position over usual right of ways.

It is desirable to mount general purpose cranes upon a truck vehicle in order that the unit may be readily transported from the site of one operation to the next. It has been impractical heretofore to provide such cranes with a long boom to be transported on the vehicle because of the difficulty in suitably supporting the end of the boom in the horizontal position and also because of the excessive overall length of the machine which rendered travel over ordinary right of ways impossible in many instances so that it has generally been necessary to dismantle the boom and disconnect it from the remainder of the machine for separate transportation. This constitutes a serious limitation for such type of machinery because the setting up and dismantling operations were time-consuming and hence costly.

It is an object of the present invention, therefore, to provide a new and improved truck mounted crane apparatus including a relatively long boom which boom may readily be transported in an adequately supported relation upon the vehicle.

Another object of the invention is to provide a new and improved truck mounted crane apparatus including a relatively long boom, the boom being capable of arrangement in an inoperative position which is compact and suitable for transporting over usual right of ways.

A further object of the invention is to provide a new and improved truck mounted crane apparatus including a relatively long boom which may be quickly and easily folded into a compact condition for transportation.

A still further object of the invention is to provide a new and improved truck mounted crane apparatus including a collapsible boom which is easy to set up and take down for transportation and which, furthermore, is of a relatively simple design and of low manufacturing cost.

In accordance with an illustrated embodiment, the invention comprises a truck vehicle having a crane cab mounted rearwardly thereon for rotation about a vertical axis. The base end of the boom is pivotally secured to the base of the crane cab and is adapted to be raised and lowered by means of cables arranged in a conventional manner. In order to facilitate the transportation of the apparatus the boom is provided with a hinge joint intermediate its ends so that when

the boom is lowered to the inoperative position the hinge joint may be released for permitting pivotal swinging movement of the end portion of the boom in a horizontal direction upon the base portion. With the boom hinged in the manner disclosed and by the cooperating design of the cabs for both the truck vehicle and the crane the machine can be arranged in a compact manner with the overall dimensions within reasonable limitations.

Other objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawings while the features of novelty will be pointed out with greater particularity in the appended claims.

In the drawings Fig. 1 is a side elevation illustrating the truck mounted crane in a typical operating position; Fig. 2 is a side elevation illustrating the crane apparatus of Fig. 1 in the inoperative position ready for transporting; Fig. 3 is a plan view of the crane apparatus as shown in Fig. 2; Fig. 4 is a fragmentary view in perspective illustrating more clearly the general configuration of the truck and crane cabs; Fig. 5 is a fragmentary detail view of the hinge joint of the boom and Fig. 6 is a fragmentary detail view illustrating the means provided for supporting the boom in the folded position.

Referring to the drawings, a truck vehicle 10 is shown comprising a set of front wheels 11, a dual rear wheel assembly 12 and a frame 13. The truck is provided with a prime mover engine (not shown) mounted, in this case, over the front axle within the enclosure hood 14. The control cab 15 for the truck vehicle is also mounted upon the forward end of the vehicle but at one side of the engine enclosure 14 for reasons as will subsequently appear.

A crane unit is mounted rearwardly of the truck and is suitably supported upon the frame 13 for rotation about a vertical axis so that the crane may be swung throughout 360 degrees. The crane unit comprises a cab and a boom, indicated generally at 18 and at 19, respectively, mounted upon the base 20. The cab 18 provides a housing for the crane operating engine, the winch drums, the drive mechanism and the various control apparatus. The cab 18 also includes an operator's compartment 21 arranged on one side thereof and will be described with greater particularity hereinafter. The boom 19 includes a base portion 22 hinged as at 23 onto the cab base 20 and a main portion including a removable section 24 and a tip section 25. In the operative position, the

boom is adapted to be guyed in the desired upwardly extending angular position by the cables 27 arranged between the tip of the boom and the sheaves mounted in the frame 28 extending above the cab 18. The bucket 29 is adapted to be controlled by cables 30 also extending into the cab.

In order to provide requisite stability to the truck frame while the crane is in use the truck is provided with a plurality of outriggers or stabilizing arms as indicated at 31 and 32. These are shown in the outwardly extended position in engagement with the ground in Fig. 1 and in the folded or inoperative position against the sides of the truck frame in Fig. 2. The particular type of stabilizing means shown in the drawing form no part of the present invention, but are separately disclosed and claimed in our copending application S. N. 521,651, filed February 9, 1944.

When the crane is set up for operation in a manner illustrated in Fig. 1 the crane may be operated throughout 360 degrees about the truck, the boom in this case being of such a length that it can easily reach beyond either end of the truck vehicle. It will be readily apparent that in the case of a boom 30, 60 or more feet in length it would be rather difficult to transport the machine with the boom extending its full length either fore or aft of the truck vehicle in the lowered position. In accordance with the present invention the boom is so constructed and arranged that when lowered to the inoperative position it may be collapsed or folded back upon itself in a manner as illustrated in Figs. 2 and 3. The boom is provided with a hinge joint 34 intermediate its ends and preferably in the outer end of the base portion 21 in order that the removable sections 24 may be rendered more readily interchangeable or to simplify the addition of further sections. When it is desired to fold up the boom, the crane cab 18 is first rotated into a position facing forwardly of the truck as illustrated in the view of Fig. 4 and the boom is then lowered into a position of rest upon the horizontal support 35 extending upwardly from the forward end of the truck frame in front of the engine hood 14.

It will be observed that the operator's control compartment 19 when facing forwardly is on the same side of the truck as the operator's cab 15. The boom in the lowered position over the engine hood 14 extends directly along side the cab 15 of the truck and since the hinge joint is provided at such a point in the boom section 22 slightly beyond the support bracket 35 the forward field of vision of the truck operator will not be seriously interfered with by the end of the boom structure. The boom is hinged on the side opposite the cab 15 while the side of the boom toward the cab is releasably secured together by a suitable sliding pin arrangement such as is illustrated more clearly in the fragmentary view of Fig. 5. This arrangement comprises a pair of slide bolts 44 and 45 connected to a disc 46 which in turn is provided with an operating handle 47. The slide bolts are adapted to extend through aligned openings in cooperating bracket members secured to the adjacent ends of the hinged boom sections for making the joint rigid in the straightened position of the boom. By disconnecting the one side of the boom it may be swung around upon the hinge pin 34 and pulled back upon itself into a position alongside the crane cab. The axis of the hinge pin 34 is preferably vertically arranged so that in spite of the relative angular relation of the two boom sections when in the lowermost position, the outer end portion

of the boom will balance upon the hinge pin 34 and will swing in the horizontal direction. Thus one man can easily fold or unfold the boom with little effort.

To permit folding of the boom in the manner described, the truck and crane cabs must be arranged so as not to interfere therewith. Accordingly, the operator's compartments are both arranged on the side opposite to that about which the boom is to be folded. The side portion of the crane cab opposite to the crane operator's cab 21 is also of a reduced height as indicated at 51 and above which portion the folded boom end extends. With the crane operator's compartment arranged on the side shown it may be positioned as high as desirable in order that the crane operator can view to better advantage the operation of the bucket suspended from the tip of the boom.

Prior to the folding of the boom the bucket 29, rigging, or other apparatus on the end of the cable 30 is first disconnected and it may be conveniently stowed onto the platform 55 extending rearwardly from the rear end of the truck vehicle. None of the cables need be unthreaded from the sheave blocks to fold the boom into position for transportation. The end of the cable 30 may be suitably secured to the boom itself as in Fig. 2. The various cables 27 may be supported upon a bracket frame 57 secured to the top side of the base boom section 22 adjacent the hinge joint and about which bracket the cables will automatically loop as the boom is folded upon itself.

In the fragmentary view of Fig. 6 is illustrated a simple arrangement which is provided for supporting the folded boom end over the reduced height cab portion 51 and for locking it in position. A shaft 61 is suitably journaled at its opposite ends within the cab framework and is provided with a pair of spaced apart lugs 62 and 63 at the inner end and between which is arranged a roller 64 eccentric of the shaft 61. The shaft 61 may be rotated by means of a handle 65 rigidly secured to the outer end thereof. After the boom portion 24 is swung into final position above the reduced height cab portion 51 the handle 65 is rotated from the position shown in Fig. 1 to the position shown in Fig. 5 in which latter position the roller 64 is moved upwardly into engagement with the stringer forming the corner of the boom and thus relieving the hinge pin 34 of a large portion of the weight of the folded boom section. The ends of the lugs 62 and 63 projecting beyond the surface of the roller 64 therebetween will extend upwardly on each side of the boom stringer thus securely locking the boom in the folded position and in readiness for travel.

Having described the principle of the invention in what is considered to be a preferred embodiment thereof it will be obvious to those skilled in the art that numerous changes and modifications may be made therein. It is intended in the appended claims, however, to cover all such obvious variations from the illustrated embodiment as fall within the true spirit and scope of the invention.

We claim:

1. A portable crane comprising a truck, an operator's compartment on said truck, a cab on said truck supported for rotation about a vertical axis, a boom pivotally secured to the base of said cab centrally thereof, an operator's compartment on one side of said cab, said two operator's compartment being on the same side of said

truck, a portion of said cab on the opposite side with respect to said operator's compartment being of reduced height, a hinge joint intermediate the ends of said boom, the axis of said hinge joint extending vertically with said boom extending in a lowered inoperative position, the outermost end portion of said boom being foldable back upon the remainder of said boom in the inoperative position and along the side of said truck opposite to said operator's compartment, said outermost boom portion extending over said reduced height cab portion.

2. A portable crane comprising a truck, a cab on said truck supported for rotation about a vertical axis, a boom pivotally secured to the base of said cab centrally thereof, a truck operator's compartment on said truck at one side thereof, a crane operator's compartment in the upper portion of said cab and at one side thereof, a portion of said cab on the opposite side thereof with respect to said crane operator's compartment being of reduced height, a hinge joint intermediate the ends of said boom, means on the end of said truck at one side of said truck operator's compartment for supporting said boom adjacent said hinge joint and means for engaging and supporting the outermost end portion of said boom over said reduced height cab portion, in the folded condition of said boom.

3. A portable crane comprising a truck, a cab on said truck, said cab having a width corresponding substantially to the width of said truck, a boom secured at one end to said cab, hinge means intermediate the ends of said boom permitting the outermost end portion of said boom to be folded back along the remainder of said boom in the inoperative position thereof, a portion of said cab being of a reduced height, said outermost end portion of said boom in said folded position extending over said reduced height cab portion.

4. A portable crane comprising a truck, a cab on said truck supported for rotation about a vertical axis, a boom comprising a base portion and a main portion, said base portion being hingedly secured to said cab for pivotal movement between an upwardly extending operative position and a lower inoperative position, hinge means arranged on one side of said boom for securing said base and main boom portions together, said main boom portion being foldable back upon said base boom portion in an inoperative position of said boom, operating cables extending from said cab to the outermost end of said main boom portion and bracket means on said boom adjacent said hinge means for automatically engaging and supporting said cables adjacent said hinge means as said main boom portion is folded back upon said base boom portion.

5. A portable crane comprising a truck, a cab on said truck supported for rotation about a vertical axis, a boom comprising a base portion and a main portion, said base portion being hingedly secured to said cab for pivotal movement between an upwardly extending operative position and a lower inoperative position, hinge means extending along one side of said boom for securing said base and main boom portions together, said main boom portion being foldable back upon said base boom portion in an inoperative position of said boom, operating cables extending from said cab to the outermost end of said main boom portion for supporting said boom

in the operative position thereof, and means on said boom adjacent said hinge joint for supporting the intermediate portions of said cables in the folded condition of said boom.

6. A portable crane comprising a truck, a cab on said truck supported for rotation about a vertical axis, a boom comprising a base portion and a main portion, said base portion being hingedly secured to said cab for pivotal movement between an upwardly extending operative position and a lower inoperative position, hinge means extending along one side of said boom for securing said base and main boom portions together, means for releasably securing the side portions of said boom opposite said hinge means together, said main boom portion being foldable upon said base boom portion in the inoperative position of said boom, means on said truck for supporting the hinge ends of said boom portions in the folded position thereof, and means on said cab for supporting the main boom portion intermediate the ends of said main portion.

7. A portable crane comprising a truck, a cab mounted on said truck for rotation about a vertical axis, a boom pivotally secured at one end to said cab for movement between an upward operative position and a lower inoperative position, a hinge joint in said boom intermediate its ends about which joint said boom may be folded upon itself with a swinging movement in the horizontal direction, means on one end of said truck for supporting said boom adjacent said hinge joint in the folded condition thereof and means on said cab for supporting the outer end portion of said boom.

8. A portable crane comprising a truck, a cab mounted on said truck for rotation about a vertical axis, a boom pivotally secured to the forward end of said cab for movement between an upwardly extending operative position and a lower inoperative position, a hinge joint in said boom intermediate its ends, the axis of said joint extending in the vertical direction in the lowermost position of said boom and at one side of said boom about which joint said boom may be folded upon itself with a swinging movement in the horizontal direction, the outermost end of said boom in the folded position extending beyond the rear end of said cab.

9. A portable crane comprising a truck, a cab on said truck supported for rotation about a vertical axis, a boom comprising a base portion and a main portion, means securing said base portion to the forward end of said cab, hinge means securing said base and main portions together along one side thereof, means on the opposite side of said boom portions for rigidly securing said portions together in an aligned relation, said main portion being adapted to be folded back against said base boom portion to a position extending beyond the rear end of said cab.

10. A portable crane comprising a truck, a cab on said truck, a boom secured at one end to one end of said cab, hinge means intermediate the ends of said boom permitting the outermost end portion of said boom to be folded back upon the remainder of said boom in the inoperative position thereof to a position extending beyond the opposite end of said cab and means on said cab for supporting said outermost end portion of said boom in the folded position thereof.

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