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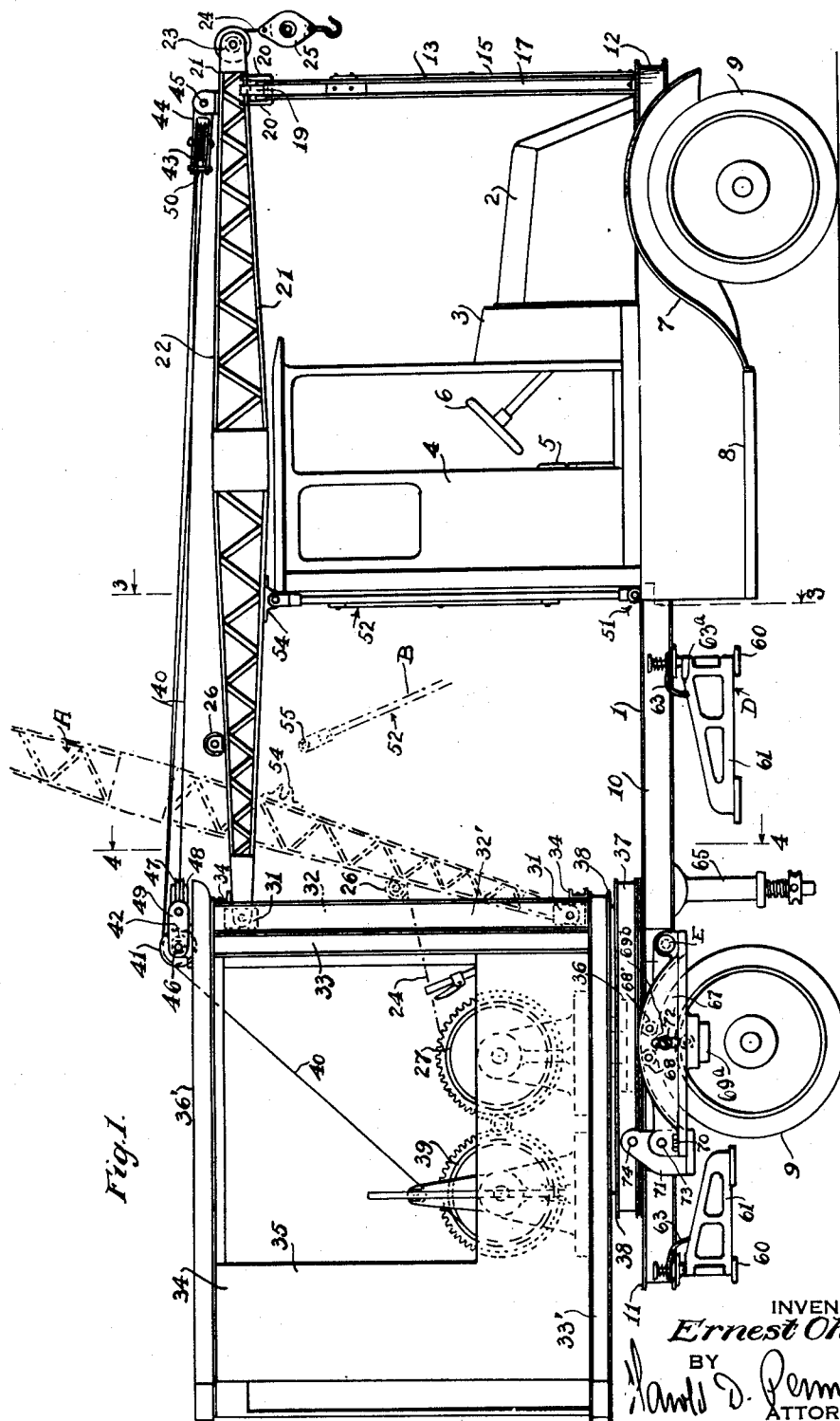
E. OHLIGER

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TRUCK CRANE

Filed Oct. 16, 1929

3 Sheets-Sheet 1



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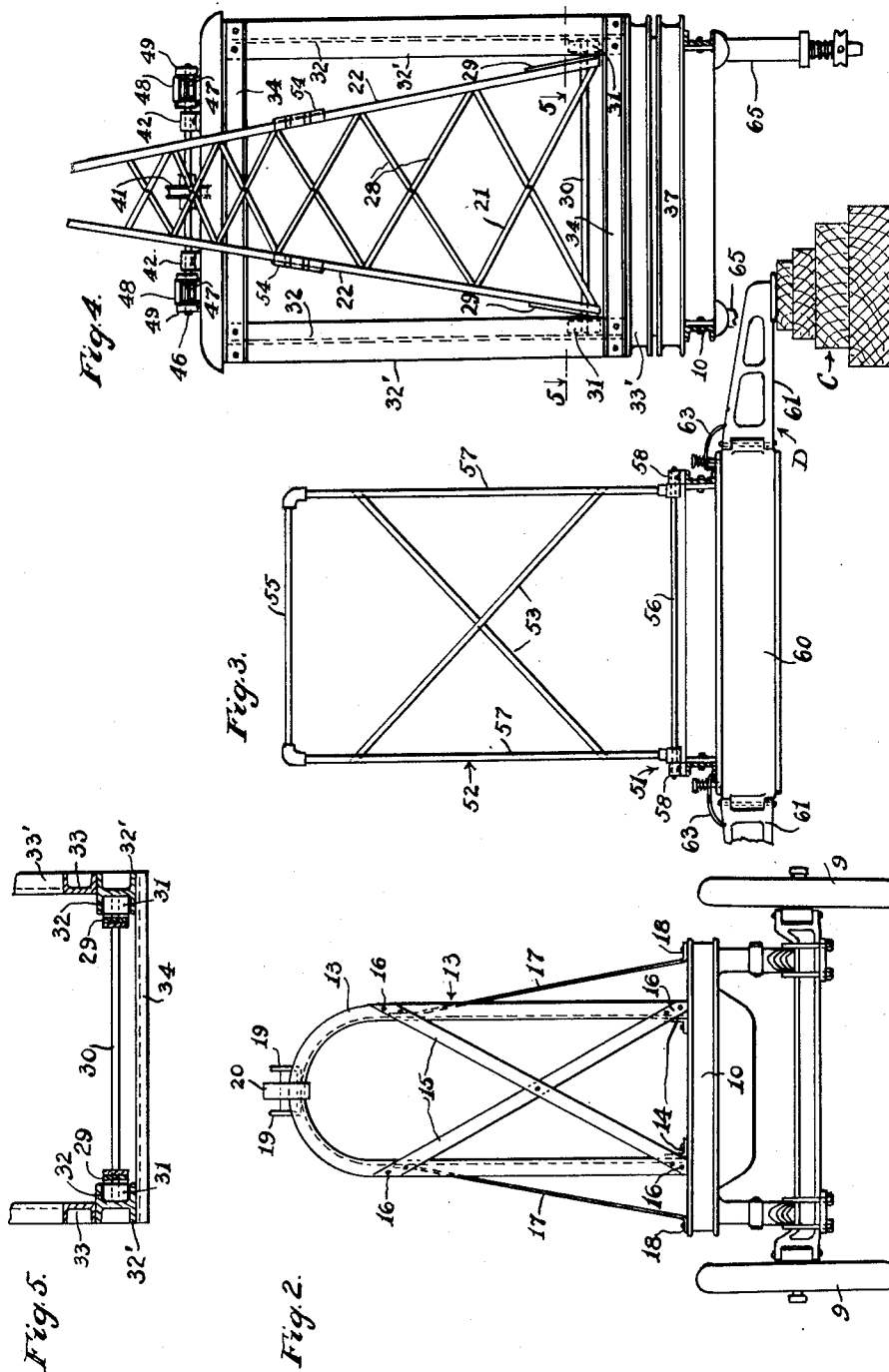
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3 Sheets-Sheet 2



INVENTOR
Ernest Ohliger

BY

Paul D. Penney

ATTORNEY

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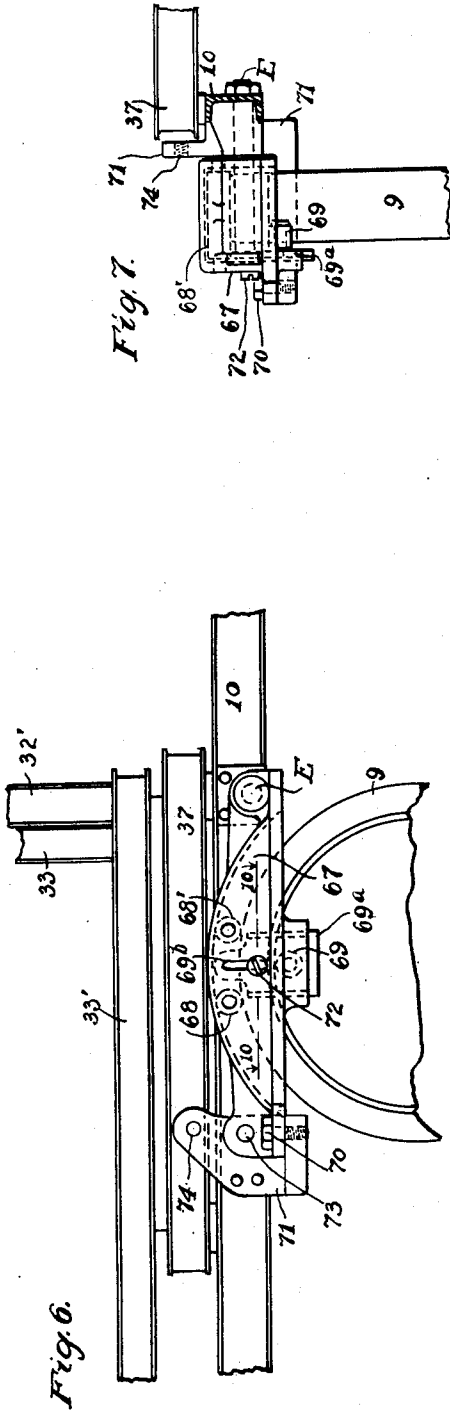
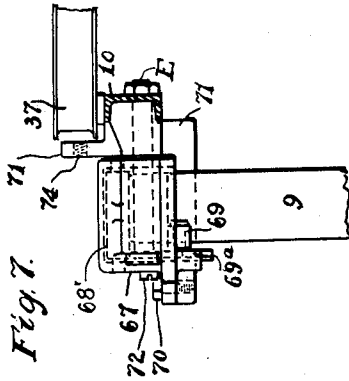
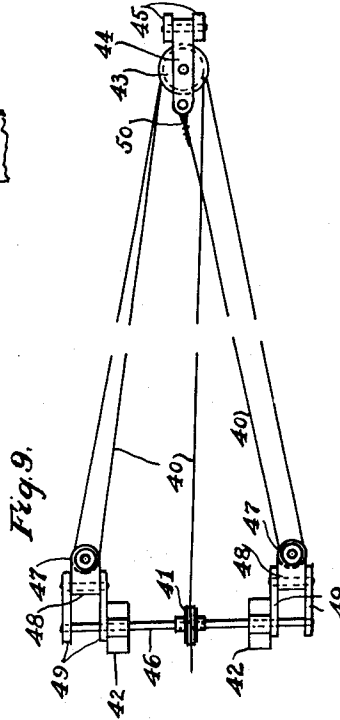
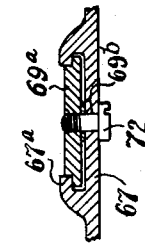
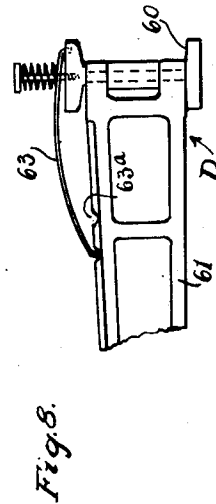
E. OHLIGER

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INVENTOR
Ernest Ohliger

BY

Paul D. Penney

ATTORNEY

UNITED STATES PATENT OFFICE

ERNEST OHLIGER, OF PELHAM, NEW YORK

TRUCK CRANE

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My present invention relates to an improvement in truck cranes and has for one of its objects the provision upon a crane mounted automobile truck, having a pivoted, swinging, lifting crane or boom and appurtenant operative mechanism thereon, of means, whereby to temporarily eliminate the action of the vehicle springs thereof, during the use of the apparatus as a lifting crane, and whereby to lock the crane portion, which is mounted upon the sprung portion or body thereof, to the rims of the wheels or unsprung portion thereof, thereby to make a substantially firm, rigid and stable mounting for the crane during its operation as such and to transmit the reaction of the crane load to the ground. Means are also provided for the release of this stabilizing locking means, as will be hereinafter described in detail.

A further important object is the provision of means whereby the boom portion of the crane may be fixedly mounted or shipped in a rigid convenient position upon the truck above the roof of the driver's cab, and lashed or locked in such position when not in use, and the further provision of means whereby said crane boom may be shifted from inoperative to operative position, or vice versa, by controlled power means, such power being obtained, when desired, from the motor located within the hoisting cab.

One of the distinct advantages gained by the above noted construction of the boom, hereinafter to be disclosed in detail, lies in the fact that in most cases in practice the booms are quite long and, therefore, stand upwardly when in non-operative position, in an awkward manner. When the truck crane is moved from place to place, and where ordinary bridges are met, it is difficult, if not sometimes impossible, to pass the apparatus thereunder. My present apparatus may be readily moved under said bridges, without difficulty, as I have provided means whereby, when the boom is in non-operative position, it will readily pass under ordinary bridges, and the boom may be firmly locked, when in said position, in such a manner as to permit the driver of the

vehicle to have substantially uninterrupted vision, and operative freedom, in driving, and the boom is prevented from moving about by reason of its being rigidly confined.

A further object is the provision of means whereby the boom may be shipped and placed in operative position by supplemental means, which cause it to be moved from operative boom position to inoperative position or vice versa, by means which coact with the motor power of the vehicle to throw the boom into either position.

A further object is the provision of means, which coact with a means for stabilizing the boom and platform against lateral turning movement, as hereinafter described, whereby the rear or boom end of the vehicle may be rigidly and firmly supported on the ground, against lateral reactions or forces, the frame of said truck being provided with a plurality of swinging brackets or arms, which, when in normally inoperative condition, are carried by and are movable to and out of the way position along the sides of said frame, but, when in operative condition, they may be swung outwardly and be jacked or blocked up, thereby to form a stable non-yielding and extensive support for the live load on the crane and the dead load on the truck between the ground and the frame of the truck upon which they are carried, whereby the center of gravity of the combined live and dead load will always fall within the limits of said support and the lateral reactions of the boom will be amply met by the resistance of the widened base to overturning.

A further object is the provision of means whereby the boom, when in non-operative condition, may be firmly seated and supported near its outer or block end by a rigid framing support, which coordinates with the vertical boom guides to hold said boom in rigid non-swaying position when the truck is being driven.

These and other capabilities will be ascertained as the herein description proceeds, and it is obvious that modifications may be made in the structure herein without departing from the spirit thereof or the scope of the appended claims.

In the drawings,

Fig. 1 is a side elevation of the complete device, the boom being shown in reposed or non-operative position.

Fig. 2 is a front view of the vehicle showing the boom support means at the front of the vehicle.

Fig. 3 is a sectional view of parts of my truck crane on the line 3—3, Fig. 1, looking in the direction of the arrows.

Fig. 4 is a sectional view on the line 4—4, Fig. 1, looking in the direction of the arrows, but showing the boom in end elevation.

Fig. 5 is a fragmentary section of parts of the truck crane taken on the line 5—5, Fig. 4, showing the vertical boom guides in section.

Fig. 6 is a fragmentary side view of the rear wheels, showing a means for transferring the crane load to the rims of the wheels.

Fig. 7 is an end view of the parts shown in Fig. 6, looking from right to left in Fig. 6.

Fig. 8 is an enlarged view of part of one of the chassis swinging support arms, shown as held in non-operative position by a spring pressed pawl.

Fig. 9 is a plan view of boom control cable and pulleys.

Fig. 10 is a horizontal section on the line 10—10 of Fig. 6.

My device, in its preferred embodiment, is in the form of a portable truck crane, constructed to do heavy loading, and movable from place to place where required. This predicates driving of the truck to distant points along which bridges may be encountered and, in the event the boom is a long high member, it is necessary to provide means, whereby the boom, when not in operation, may be readily set and locked in a low position, permitting passage under such bridges, and at the same time not to interfere with the vision of the driver of the vehicle.

In Fig. 1 there is shown the usual type of motor truck 1, having at its forward end the motor, which is covered by a bonnet 2, said truck has a hood 3 thereon, for enclosing an instrument board, and is provided with a roofed driver's cab 4, a seat 5 therein, the steering wheel 6 and the appurtenant parts of such truck, such as the front mud guards 7, running board 8, and vehicle wheels 9, all connected and mounted together in the well known manner, and need no further description.

In such truck construction, owing to the heavy uses to which it is put, the chassis frame is usually made up of a heavy channel beam 10, bent to U-form, having its square cut ends at the rear, as at 11, and its bent portion, as at 12, at the front, thus forming a U-shaped frame, upon which all of the appurtenant mechanisms and structures are mounted.

At the front end of the truck, as in Figs. 1 and 2, there is mounted a front end boom

support 13, and, as will be noted in Fig. 2, this is made of a bent U-shaped channel chamber, the square ends of which are properly secured to the truck framing 10 and affixed thereto by riveted angles 14.

The support is further reinforced by two cross tie bars 15, which are riveted as at 16 to the faces of the webs of the support 13. To further reinforce the support in its mounted position against undesired vibration or movement, there is also provided a pair of tie straps 17, which are riveted at their upper ends to the inner web of the channel formed support member 13, and are also riveted at their lower ends as at 18 to the flanges of the chassis frame 10. Thus, it will be seen that this support member is rigidly located on the forward rounded end of the truck frame in a rigid manner.

There is further provided, at the upper most rounded portion of the support, a boom seat, which comprises a series of riveted upstanding arms 19 and 20, located in such a position and being of such dimensions that, when the forward end of the boom 21 is located therein, it will engage into and between the interstitial lattices of the forward boom end and hold the same firmly in position against movement. If desired, the boom may then be lashed to said seat in a suitable manner, to further reinforce it in its shipped and non-operative position against undesired movement.

The boom 21, Figs. 1 and 4, may be made after the usual type of such members, of a riveted together lattice construction and, as shown in Fig. 4, may be in the form of an A frame, comprising two upstanding side lattices 22, the apex of which terminates in a trunnion or bearing, in which is mounted a cable sheave 23 for supporting a cable 24, at the end of which is mounted a pulley or hook block 25 of the usual kind.

The cable 24 may be carried rearwardly and under an idler sheave 26, Fig. 1, and thence it may run rearwardly to the clutch operated drum 27 at the rear thereof.

When the boom is in its operative position, as indicated by the dotted lines A, Fig. 1, the pulley 26 is located at approximately the position shown dotted, with the cable 24 in its operative position, as indicated also by a dotted line and in connection with cable drum 27.

The boom 21—22 is provided between its downwardly divergent side lattices 22, Fig. 4, with a plurality of reinforcing struts 28 and at its divergent lower ends with reinforcing plates 29, riveted thereto, and through the lower ends of said plates 29 there is mounted a boom supporting shaft 30, which passes through the plates 29 at said divergent end and is receptively mounted into a pair of guiding blocks or bearings 31, which are rectangular in shape and of suitable dimen-

sions, to fit into vertical guides 32, which are formed of structural I-beam bars 32', riveted or otherwise affixed to a crane platform 33', which may be of rectangular formation having sides and ends.

The upper ends of the I-beams 32' are affixed together by a cross beam or header 34, see Fig. 4, made of channel section and suitably riveted to the I-beams 32', thereby to form a rigid rectangular upright boom guide construction.

In Figs. 1 and 4 the boom slide blocks or bearings 31 are shown as riding in the guide channels 32, formed by the opposing webs in the I-beam supports 32'. Thus, a clear passage is formed for the movement of the slide blocks or bearings 31 from the bottom to the top of the herein construction, this passage being clearly shown in Fig. 5, whereby said boom 21-22 may be placed above the roof of said cab 4 when in shipping position.

At the rear of the I-beams 32' and adjacent thereto there is shown in Figs. 4 and 5, as a framing reinforcement, a pair of reinforcing vertical frame channels 33.

The remainder of the details of construction of the hoisting cab 34 are of the usual type of construction, made of riveted together structural iron shapes to form a suitable cab closure frame, which is partly enclosed by sidings 35 and the like, with a suitable roof 36' thereon, to substantially enclose the hoisting and boom operating apparatus. It is believed that this portion of the structure is understood and hence it needs no further description.

The cab 34, which mounts upon its base frame 33' all of the contained boom operating mechanisms, is revolvably mounted upon a central trunnion 36, shown dotted in Fig. 1, which is mounted upon and suitably affixed to the framing 10 and acts to hold the cab 34 in a pivotal position upon the truck frame 10, whereby the boom and its appurtenant mechanism may be swung in a circle, to permit the boom to be operated from either side of the truck or from the rear thereof or from any circumferential point thereof.

As a support for the rotative action of the boom and its load, there is provided upon the frame 10 and under said platform 33' a circular frame 37, between which and the platform 33' are mounted a plurality of ball bearings 38, whereby, when the boom is swung from side to side about the trunnion 36, the movable boom mechanism on said platform 33' is firmly supported without play and for easy rotary movement. This form of structure for mounting booms upon trucks is also well known and it is thought not necessary to describe this portion of the structure in detail.

As a means for moving the boom from shipped to operative position and for also

swinging the boom for lifting the load and boom, when in operative position, as shown by the dotted lines in Fig. 1, there is provided a second drum 39, to which is attached a cable 40, which passes over an idler sheave 41, rotatably mounted upon a shaft 46, located in bearings 42, which are mounted on the top of the boom guide structure, and the cable 40, as shown in Fig. 9, runs from the sheave 41 around a sheave 43, which is of double groove construction and is secured to the pivoted yoke member 44, which in turn is pivotally held by lugs 45, which are mounted upon the outer end face of the boom 21-22.

The cable 40 passes around the pulley 43 then around one of two idler pulleys 47, which are rotatably connected to a pair of yokes 48, which are pivotally held each by a pair of links 49, which in turn are supported by the ends of the shaft 46. The cable 40 thence returns to the second groove in the pulley 43, passing around it and to the opposite idler pulley 47, then returning to an anchorage 50, located at the rear end of the yoke member 44, thereby forming a block and fall arrangement for multiplying the force of said cable on the end of the boom 21.

Located to the rear of the driver's cab 4, and pivotally mounted on the chassis 10, as at 51, Figs. 1 and 3, is a rear end boom support member 52, of rectangular shape, as shown in Fig. 3, formed of tubing, and suitably braced as at 53, and located, to be swung rearwardly, as shown in dotted lines at B, Fig. 1, at a time when the boom 22 is to be lowered and the truck moved to a new location. As the boom 21-22 begins to ascend, the slotted brackets 54, secured to the lower side of the boom 21-22, as shown in Fig. 1, engage the upper tube 55 of the boom support member 52. The lower tube 56 of the member 52 has its ends extended beyond the side tubes 57 and into brackets 58, serving as pivots for the support member 52, and also to carry the load when the boom 21-22 is in the position shown in full lines in Fig. 1.

To increase the lateral stability of my truck crane I provide chassis blocking extension arms D which are shown in Figs. 1, 3 and 8. In Fig. 3 wood blocks C are shown under one of a pair of hinged extension pieces or arms 61 which is in its outward position and thereby supports the chassis. The extension piece 61, as shown in the several figures, are hinged to the ends of a pair of heavy I-beams 60, which are positioned transversely to the chassis and are riveted to the under side of the chassis in suitable locations. When the extension pieces or arms 61 are not in use, spring pressed pawls 63 engaging notches 63^a on said arms 61 hold the extension arms against the sides of the chassis 10, as shown in Figs. 1 and 8.

Chassis jacks 65 are also shown in the

several figures as suitably joined and located on the underside of the chassis, for supporting the truck when desirable.

Means for transferring the load from the crane to the rims of the drive wheels for a purpose, which is hereinbefore described, are shown in Figs. 1 and 6, Fig. 6, being an enlarged view, shows on each side of the chassis a segmental hood 67, pivoted to the chassis at E; it has therein a slot 69^b through which passes a screw 72, which is engaged with a tapped hole in a bracket 69^a, which is held in contact with said hood 67 by means of ribs 67^a thereon.

The hood 67 is shown as provided with two rolls 68, 68', to contact with the rim of the drive wheel at the outer side thereof; an adjustably positioned roll 69 is carried by said bracket 69^a, which is slidably connected to said hood 67.

Opposite the pivot end E of said hood 67 there is shown a screw 70, which locks the hood in its active position to a bracket 71, which is riveted to the chassis 10, whereby the load of the truck and crane may be removed from the chassis springs and transferred to the rims of the drive wheels, which are more unyielding as a support than said springs.

When the hood 67 is not in use it can be moved upwardly by lowering the bracket 69^a with said roll 69 thereon after loosening the adjustable screw 72, which passes through said slot 69^b, and disconnecting the screw 70 from said bracket 71.

When the hood 67 is in its upper position it may be locked by connecting the screws 70 to the hole 73 or to the tapped hole 74, which is provided in the bracket 71.

Variations are possible, and parts of my invention may be used without other parts; I do not, therefore restrict myself to the details as shown, but I intend to include also all mechanical equivalents and obvious modifications of the same within the scope of my invention.

I claim as my invention and desire to secure by Letters Patent:

1. In a truck crane a chassis, a boom, a hoisting member, rotatably mounted on said chassis, one or more upwardly extending guides on said member, the inner end of said boom being slidably pivotally connected to said guides, a hoisting mechanism on said member, a flexible means on said mechanism, secured at the outer end thereof to a part at the outer end of said boom, whereby said outer boom end may be raised or lowered, another flexible means on said mechanism, for moving thereby loads with relation to said boom, movably connected to said boom, a fixed means on said chassis for supporting said outer boom end in the lowest position thereof, and a swinging support on said chassis, pivotally connected thereto, for intercepting and raising an intermediate por-

tion of said boom, located nearer to the inner end thereof, thereby sliding said inner end upwardly in said guides, whereby said boom may be brought into a substantially horizontal position over said chassis, when said crane is in an inoperative position.

2. In a truck crane a chassis, a boom, a hoisting member, rotatably mounted on said chassis, one or more upwardly extending guides on said member, the inner end of said boom being slidably pivotally connected to said guides, a hoisting mechanism on said member, a flexible means on said mechanism, secured at the outer end thereof to a part at the outer end of said boom, whereby said outer boom end may be raised or lowered, another flexible means on said mechanism, for moving thereby loads with relation to said boom, movably connected to said boom, a fixed means on said chassis, for supporting said outer boom end in the lowest position thereof, and a swinging support on said chassis, pivotally connected thereto, for intercepting and raising an intermediate portion of said boom, located nearer to the inner end thereof, thereby sliding said inner end upwardly in said guides, whereby said boom may be brought into a substantially horizontal position over said chassis, when said crane is in an inoperative position, said swinging support being located forwardly of said guides and disposed to be swung rearwardly with relation to said chassis towards the inner end of said boom, and joining means at the upper end of said support and on said boom, for detachably movably connecting the said portion of said boom to said support.

3. In a truck crane a chassis, an A-shaped boom, a roofed driver's cab, a hoisting cab, rotatably mounted on said chassis, a pair of upwardly extending guides on said cab, a pair of bearings for the inner double end of said boom, slidably connected to said guides and pivotally connected to said double inner end, a hoisting mechanism on said hoisting cab, a flexible means, secured at one end thereof to a part at the outer end of said boom and at the other end thereof to said mechanism, whereby said outer end may be raised and lowered, an idler pulley for the intermediate part of said flexible means, a shaft, pivotally connected to said idler pulley and revolvably mounted above said guides, a double periphery pulley at said part and a pair of pulleys, universally pivoted to the ends of said shaft, said pulleys being arranged for said flexible means to pass thereover in a way to multiply the force from said mechanism to said part, a means for supporting said outer end in its lowest position and a means for supporting the portion of said boom at said inner end when said boom is in a substantially horizontal position and extending over the roof of said driver's cab.

4. In a truck crane a chassis, a boom, a
hoisting member, rotatably mounted on said
chassis, one or more upwardly extending
guides on said member, the inner end of said
5 boom being slidably pivotally connected to
said guides, a hoisting mechanism on said
member, a flexible means on said mechanism,
secured at the outer end thereof to a part at
the outer end of said boom, whereby said
10 outer boom end may be raised or lowered,
another flexible means on said mechanism,
for moving thereby loads with relation to
said boom, movably connected to said boom,
a fixed means on said chassis, for supporting
15 said outer boom end in the lowest position
thereof, and a means for intercepting and
raising an intermediate portion of said boom,
located nearer to the inner end thereof,
thereby sliding said inner end upwardly in
20 said guides, whereby said boom may be
brought into a substantially horizontal posi-
tion over said chassis, when said crane is in
an inoperative position.

5. In a truck crane a chassis, a boom, a
25 hoisting mechanism, a means for pivotally
connecting the inner end of said boom to said
mechanism, a means for raising and lower-
ing the outer end of said boom, a means for
supporting said outer end in its lowest posi-
30 tion and a means for supporting the portion
of said boom at said inner end above the
point of the normal pivotal connection of
said inner end to said mechanism when said
crane is in action.

35 Signed at Pelham in the county of West-
chester and State of New York, this 24th day
of August A. D. 1929.

ERNEST OHLIGER.

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