

May 31, 1932.

B. F. FITCH

1,860,733

TRAVELING CRANE

Filed June 14, 1929

4 Sheets-Sheet 1

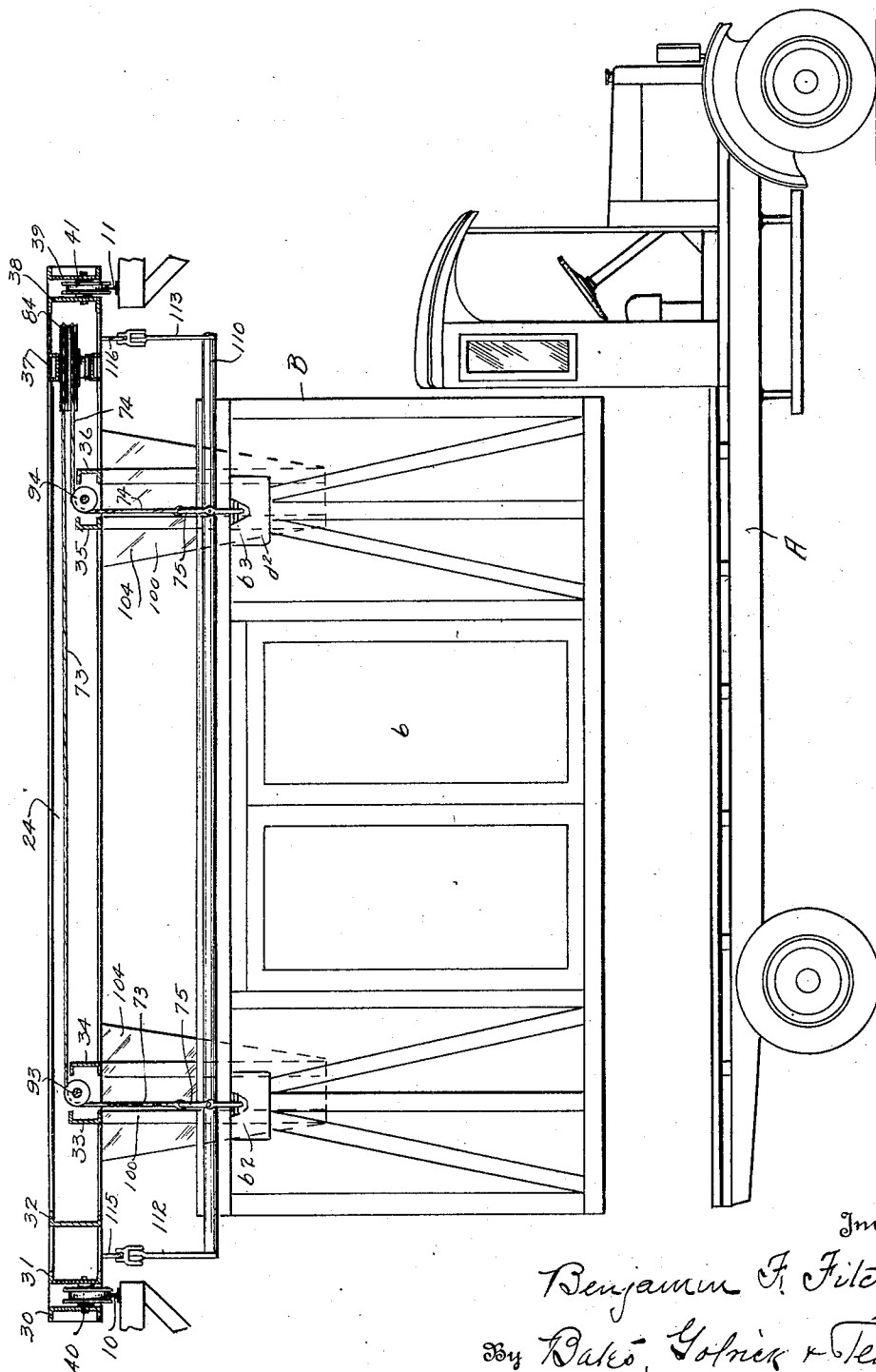


Fig. 1

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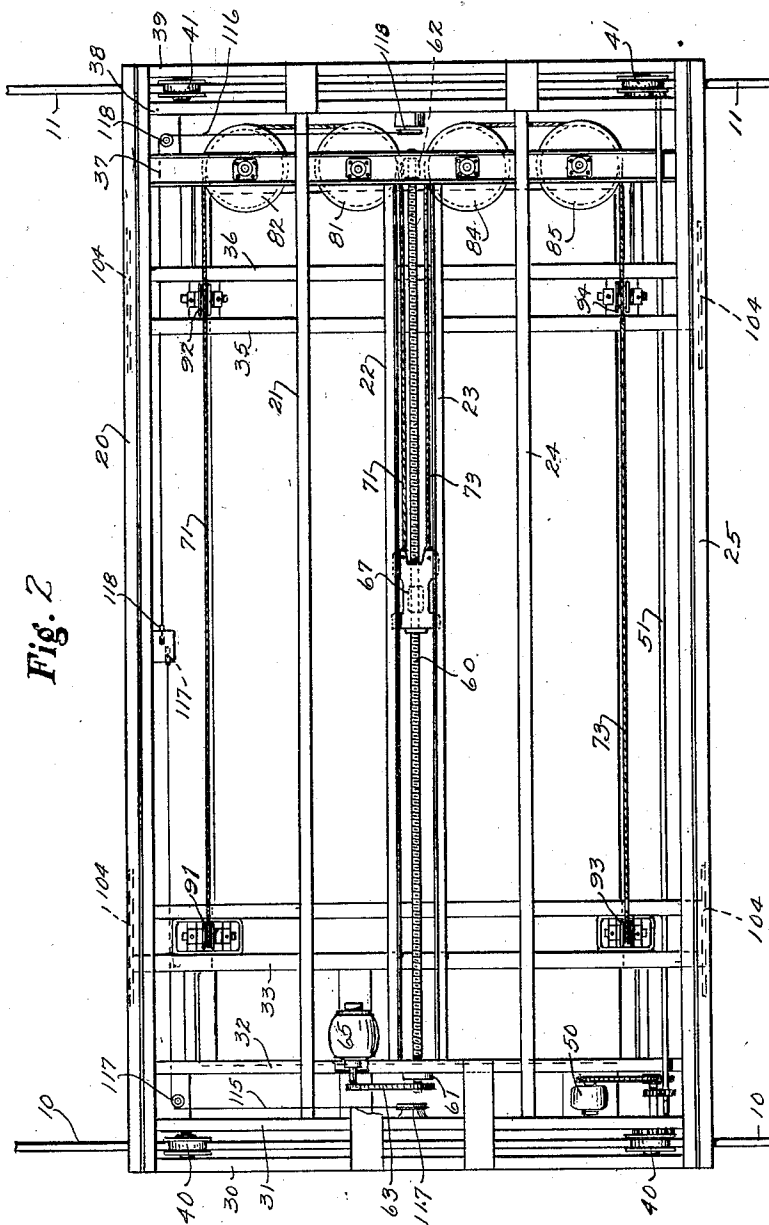
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

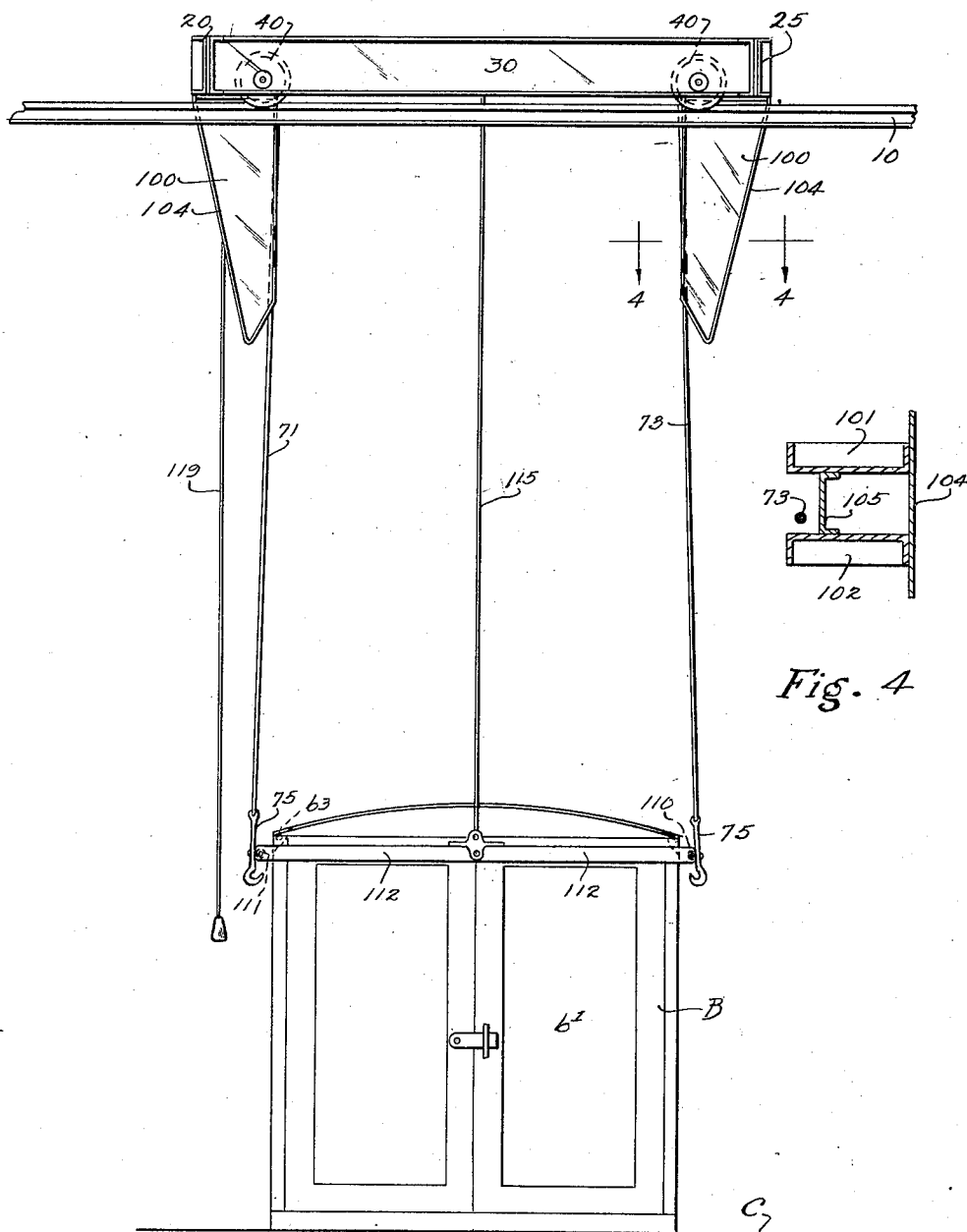


Fig. 4

Fig. 3

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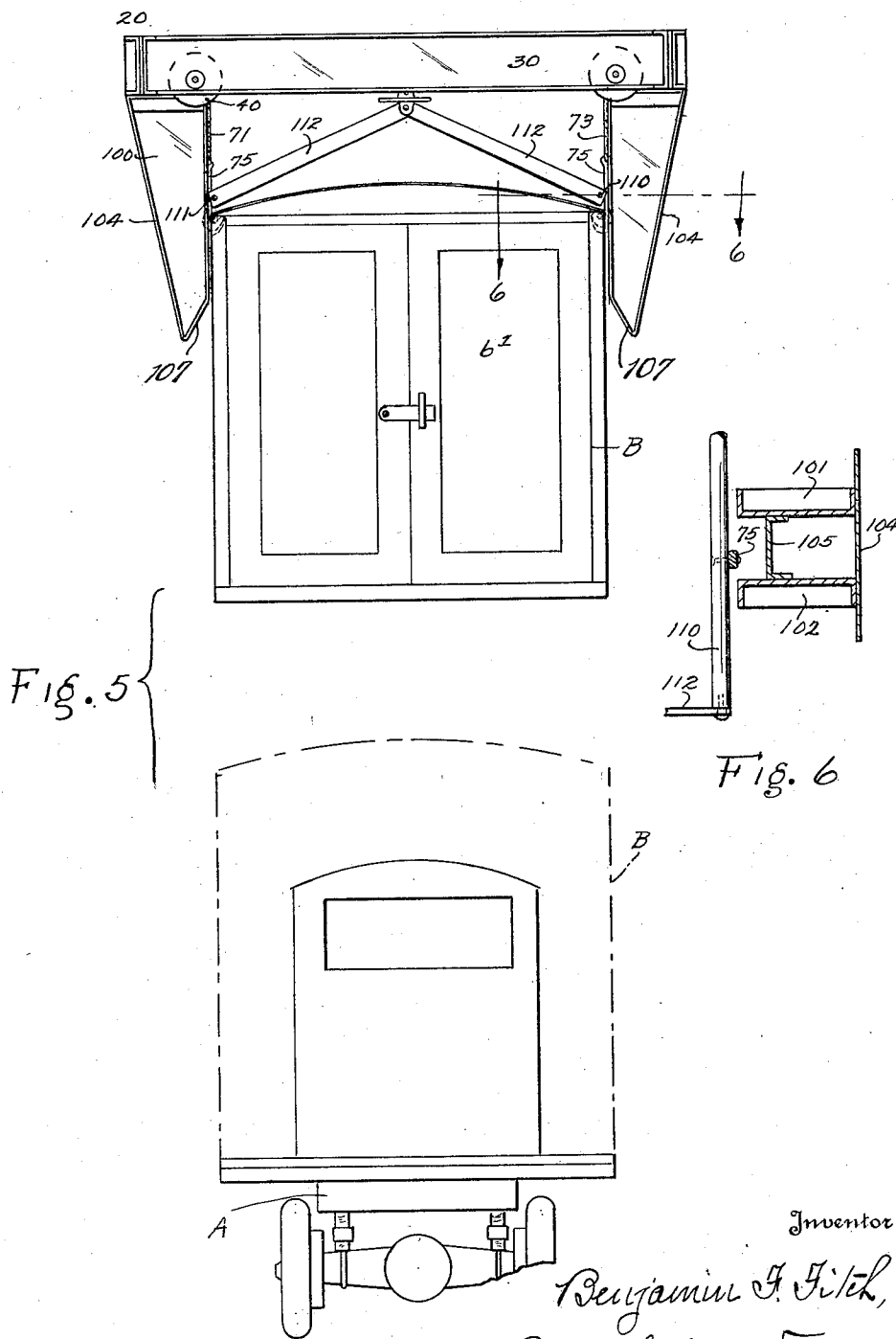
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TRAVELING CRANE

Filed June 14, 1929

4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

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TRAVELING CRANE

Application filed June 14, 1929. Serial No. 370,990.

The object of this invention is to provide a traveling crane suitable for raising and transporting removable automobile bodies. Freight may be very readily transferred by loading the same into a demountable automobile body; transporting such body by an automobile truck to a suitable transfer station; then raising the body from the truck by a suitable crane, and shifting it laterally, and depositing it on a platform, where it may be unloaded. Immediately after the removal of such body from the truck, it may be replaced by another loaded body on the truck, so that the latter may be immediately dispatched.

To minimize the waste time in the transfer operation referred to, it is desirable that the lateral transporation of the body by the crane be performed rapidly. However, as such body may weigh many tons, there is a decided element of inertia when the travel begins and when it stops or when the rate of travel changes. It is the particular object of this invention to provide the crane with effective means for preventing lateral swaying of the body due to inertia, so that the transportation may be performed comparatively rapidly.

To the above end, I provide the crane frame with downwardly projecting braces or shoes which are adapted to engage opposite sides of the body as it is elevated by the crane. My invention includes this feature broadly, and also the more specific adaptation thereof shown in the drawings hereof and hereinafter more fully described.

In the drawings, Fig. 1 is a side elevation of my traveling crane shown in the act of raising a body from an automobile truck; Fig. 2 is a plan of the crane; Fig. 3 is an end elevation, illustrating the crane about to engage and raise a body; Fig. 4 is a detail in cross section on the line 4—4 on Fig. 3; Fig. 5 is an end elevation illustrating the crane and a body raised thereby, illustrating also a truck in position beneath the raised body; Fig. 6 is a detail in cross section on the line 6—6 on Fig. 5.

In the drawings, A indicates a suitable automobile truck, B a demountable body

adapted to rest thereon. The body is preferably equipped with side doors *b* and end doors *b1* to enable its convenient loading and unloading. The body is preferably equipped near its eaves with four devices *b2* for the attachment of four elevating cables. These devices are preferably made in accordance with my Patent No. 1,485,972, and comprise metal members having pockets across which extend bars *b3* which may be engaged by hooks depending from the crane.

10 and 11, in Figs. 1 and 2, indicate a pair of tracks for the traveling crane. These tracks are suitably supported in any desired manner at a proper elevation over the runway for the trucks and over the storage platform. Such platform is indicated at C in Fig. 3. The tracks 10 and 11 may be a distance above this platform somewhat more than twice the height of a demountable body, which enables bodies to be trollied over bodies standing on the platform. The platform may extend for a considerable length, and the bodies trollied sideways from the truck and passing over other bodies standing on the platform, may be deposited in any vacant space on the platform. Reference is made to my prior Patent No. 1,437,968 for such a platform and system of trolleying bodies.

The crane proper has four raising cables depending at the four corners of a rectangle into position to engage the attaching devices *b2* of the body. The mechanism for simultaneously raising and lowering these cables may comprise a rotatable screw with traveling nut to which the cables are anchored, and suitable sheaves about which the cables pass, such construction being shown and claimed in my application Serial No. 550,254, filed April 1, 1922. It is illustrated particularly in Fig. 2 of the drawings and will now be described.

The crane frame comprises transverse beams 20 to 25 inclusive, which span the trackways, and longitudinal beams 30 to 39 inclusive, all suitably connected together to make a rigid rectangular frame. Mounted between the longitudinal beams 30 and 31 are a pair of wheels 40 which ride on the rail 10. Similarly, a pair of wheels 41 are shown

between the beams 38 and 39, riding on the rail 11. I have shown a suitable motor 50 connected to a shaft 51 geared with one wheel of each pair 40 and 41, whereby the hoist may be trollyed as desired.

Rotatably mounted between the central transverse beams 22 and 23 is a screw 60 extending from a point near one end of the crane to a point near the other. This screw is indicated as having bearings in the transverse beams 32 and 37. It has a thrust bearing 61 on a far side of the beam 32 resisting a pull on the screw. The other end of the screw is slidable through its bearings 62 in the beam 37. Beyond the bearing 61 is suitable gearing 63 connecting the screw with a driving motor 65. On the screw is a nut 67 to which the load cables referred to are attached, the nut being slidably guided by engaging in the troughs of the channel bars 22 and 23.

There are four load cables, which are all anchored to the nut 67 and extend in the same direction therefrom. The load on these cables tends to pull on the nut, putting the portion of the screw between the nut and the thrust bearing 61 under tension, while the free bearing 62 at the other end of the screw prevents any portion of the screw being under compression.

In the plan, Fig. 2, one of the cables is directly beneath the cable 71 and another cable (shown at 74 in Fig. 1) is directly beneath the cable 73 and hence these lower cables are not specifically visible in Fig. 2. The cable 71 passes from the nut about sheaves 81 and 82, then leads parallel with the screw, passes downwardly over a sheave 91. The cable directly beneath 71 passes about sheaves directly beneath the sheaves 81 and 82 and thence passes downwardly over a sheave 92. Similarly, the cable 73 passes in the opposite direction about sheaves 84 and 85 and thence downwardly over a sheave 93. The cable 74 passes around sheaves directly beneath the sheaves 84 and 85 and downwardly over the sheave 94. The four sheaves 91 to 94 inclusive are shown as suitably carried by the transverse beams 33, 34, 35 and 36. They are so located that the four cables depend in position so that load hooks 75 on the ends of the cables may be in position to coact with the attaching device 62 on the body. It will be seen that when these four hooks engage the body at four points, the operation of the motor 65 rotating the screw may move the nut longitudinally to pull on the four cables and thus raise the body. The pitch of the screw is such that the device is self-locking, the nut holding the load in any elevation to which it may be raised.

As the body is suspended by its four cables during the lateral travel of the hoist, the body has a tendency to sway whenever the speed of travel changes, and particularly when the

hoist starts or stops. To eliminate this swaying, I provide downwardly projecting braces on the hoist frame adapted to engage the demountable body on opposite sides. These braces are generically designated 100 in the drawings.

The braces 100 are shown as comprising downwardly projecting members of channel shape 101 and 102 directly beneath the transverse beams 33, 34, 35 and 36, the upper flanges of the channel shaped shoes being riveted or otherwise secured to these beams. The shoes may be braced further by gusset plates 104 secured to their outer faces, and to the endmost transverse beams 20 and 25 of the hoist. Intermediately the two shoes may be braced by a transverse member 105. The lower ends of the shoes are beveled outwardly, as shown at 107, to allow the entrance of the body between them, though it may be swaying.

It will be seen that the shoes 100 are stiff abutment members depending from the hoist frame, there being four of these members adjacent the four raising cables. The intermediate brace 105 stands back from the inner edge of the shoe, as illustrated in Fig. 4, leaving ample space for the passage of the cable, shown in this figure at 73. It will be seen that these shoes 100 do not interfere at all with the passage of the load cables or the raising or lowering operation of the hoist, but serve when the body is raised to engage its opposite sides, as illustrated in Fig. 5, and prevent its swaying. This enables rapid operation of the crane to transfer the body from one location to another.

I find it convenient to provide mechanism for automatically spreading the loading hooks to allow them to pass readily onto opposite sides of the body, and for then drawing them inwardly to engage the body. This mechanism may be made for instance in accordance with my Patent No. 1,525,772 and is illustrated in Figs. 1, 3 and 4 of the drawings. As there shown, the pair of hooks 75 on one side are connected by a longitudinal bar 110, and the pair of hooks on the other side by a corresponding bar 111. These bars are connected together at opposite ends by a pair of hinged bars 112 and 113; that is to say, the outer ends of the bars 112 are pivoted to the bars 110 and 111, while their inner ends are pivoted to each other. The bars 113 are similarly connected. To the hinged joint of the bars 112 and 113 are connecting cables 115 and 116 which pass upwardly about suitable sheaves 117 and 118 carried by the hoist frame and then are joined and depend in a common hand-cable 119, Fig. 3.

When the spreading structure described is idle, the straightening of the hinged bars, by gravity, as 112, spreads the hooks 75, as shown in Fig. 3, so that they may be lowered into position on opposite sides of the body

B. Now, when the operator pulls down on the hand-cable 119, this results in pulling up on the depending portion of the cables 115, 116, and buckling the joint of the hinge bars, thus drawing in the four hooks so that they pass into the pockets of the attaching devices 62 and engage the cross bars 63, as illustrated in Fig. 5. Then, when the power is applied to the four raising cables 71 etc., this maintains the spreading device buckled, as shown in Fig. 5, so long as the body remains suspended. After the body has been deposited on a platform, the relief of the tension on the raising cables frees the hinged bars, and their weight causes them to straighten into the form shown in Fig. 3, thus freeing the hooks from the body so that the whole cradle may be raised in that position, being pulled up by the unloaded cables.

I claim:

1. In a traveling crane, the combination of a frame, raising mechanism carried thereby and adapted to raise a demountable automobile body, four depending shoes carried by the crane frame in a position corresponding to the four corners of a rectangle and adapted to engage the body, when raised.

2. In a traveling crane, the combination of a frame, hoist mechanism carried thereby, including four cables depending over four sheaves, located in a position corresponding to four corners of a rectangle, means for attaching the depending portions of the four cables to a demountable body at four points, two on each side, and means for engaging opposite sides of the body when raised, to prevent its swaying as the crane travels.

3. A traveling crane, the combination of a frame, hoist mechanism carried thereby, including four cables depending at locations corresponding to four corners of a rectangle, means for attaching the depending portions of the four cables to a demountable body at four points, two on each side, four shoes secured to the crane frame and depending two on each side of the body, the cables being adapted to raise the body into position between the shoes.

4. In a traveling crane, the combination of a frame, four depending cables carried thereby, four shoes secured to the hoist frame and depending adjacent the four cables, and means on the hoist frame for pulling up on the four cables to raise a container into position between the shoes.

5. In a traveling crane, the combination of a frame, four cables depending therefrom, four depending shoes secured to the hoist frame, each shoe comprising a pair of flanged members spaced apart, the cable being adapted to depend in the space between the flanged members, and means on the hoist frame for pulling up simultaneously on the four cables to raise a container into position between the shoes.

6. In a traveling crane, the combination of a frame, raising mechanism thereon, trolleying mechanism, and fixed shoes depending from the frame into a region below the top of the load when elevated, said shoes having their inwardly facing lower portions beveled outwardly and downwardly and being so located as to engage the sides of the load to resist the swaying of the load in the direction of trolley-travel.

7. In a traveling crane, the combination of a frame, depending flexible raising mechanism thereon, trolleying mechanism on the frame adapted to move the frame sidewise, four shoes depending from the frame, two on each side, said shoes being adapted to engage the load and having their inwardly facing lower portions beveled outwardly and downwardly.

8. In a traveling crane, the combination of a frame, raising mechanism and trolleying mechanism thereon, and shoes depending from the frame, said shoes each comprising a pair of flanged members suitably braced and secured to the hoist frame and adapted to engage the side of the load when elevated and being so located as to resist the swaying of the load in the direction of trolley-travel.

In testimony whereof, I hereunto affix my signature.

BENJAMIN F. FITCH.