

Jan. 12, 1954

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2,665,815

PIPE LOADING DEVICE FOR TRUCKS AND THE LIKE

Filed May 6, 1950

3 Sheets-Sheet 1

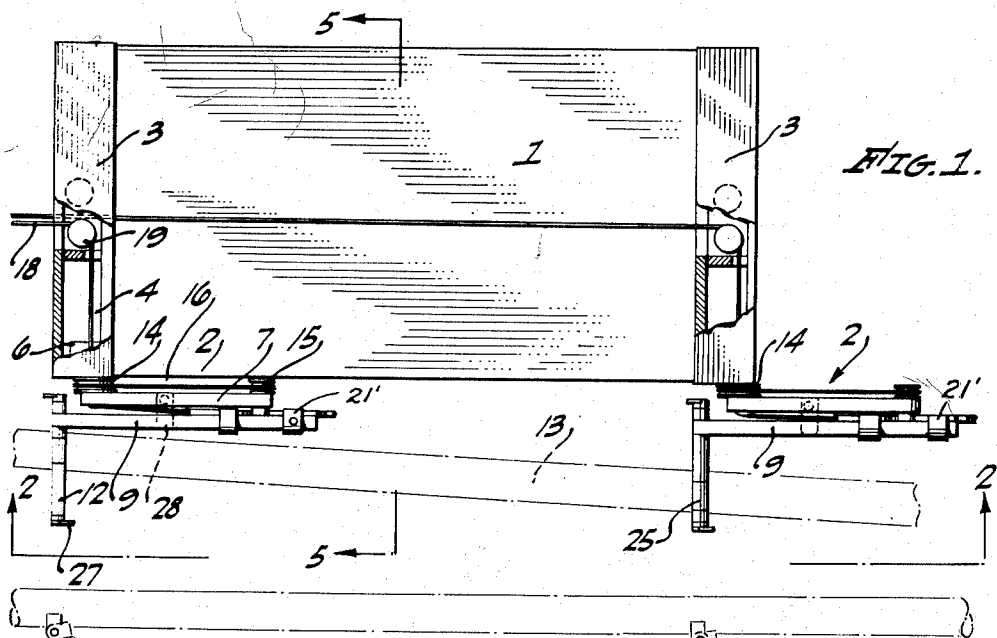


FIG. 1.

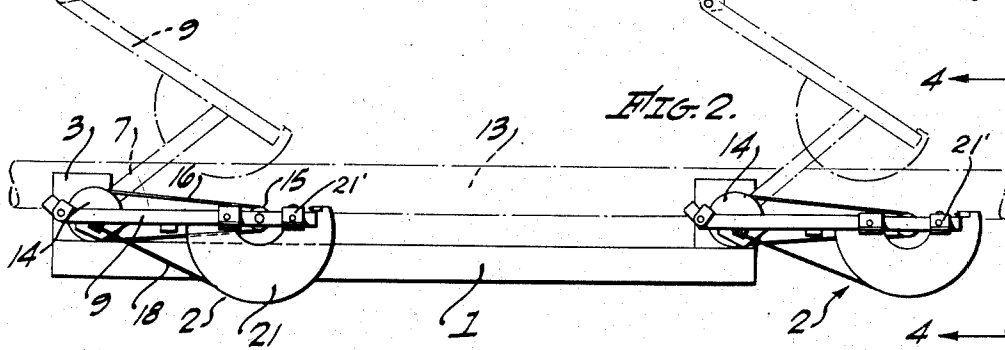


FIG. 2.

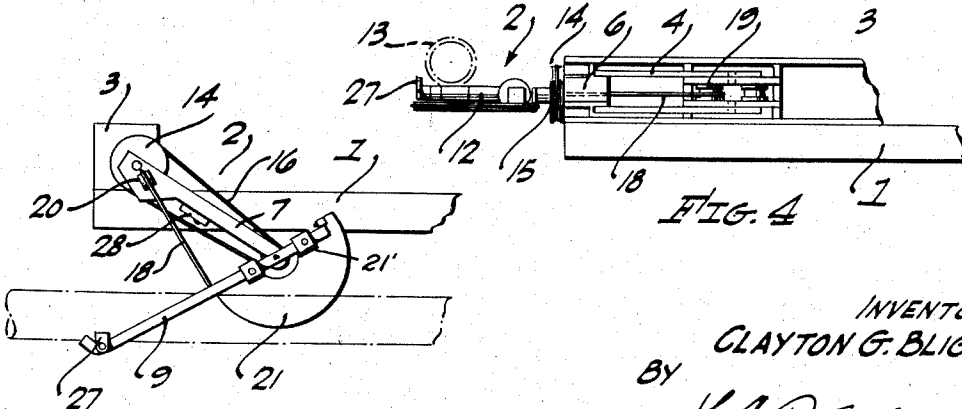


FIG. 3.

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FIG. 4

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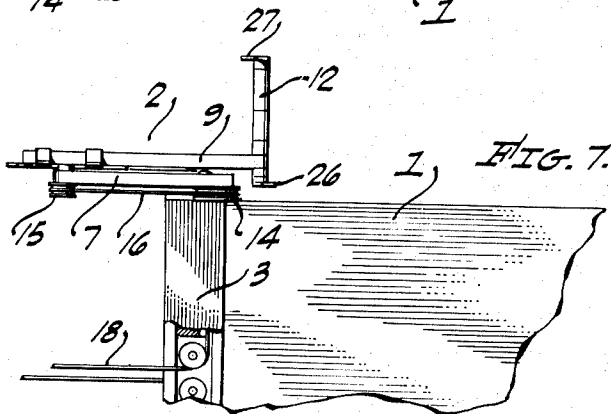
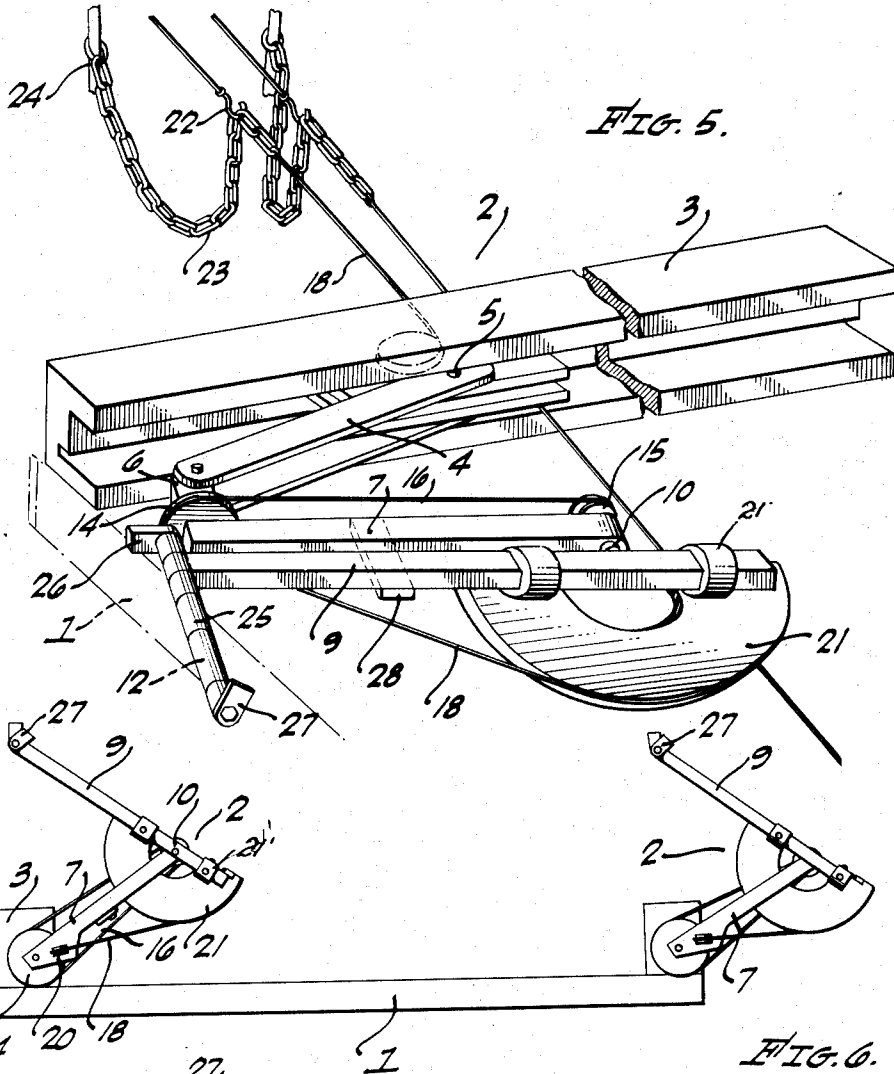
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3 Sheets-Sheet 2



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PIPE LOADING DEVICE FOR TRUCKS AND THE LIKE

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3 Sheets-Sheet 3

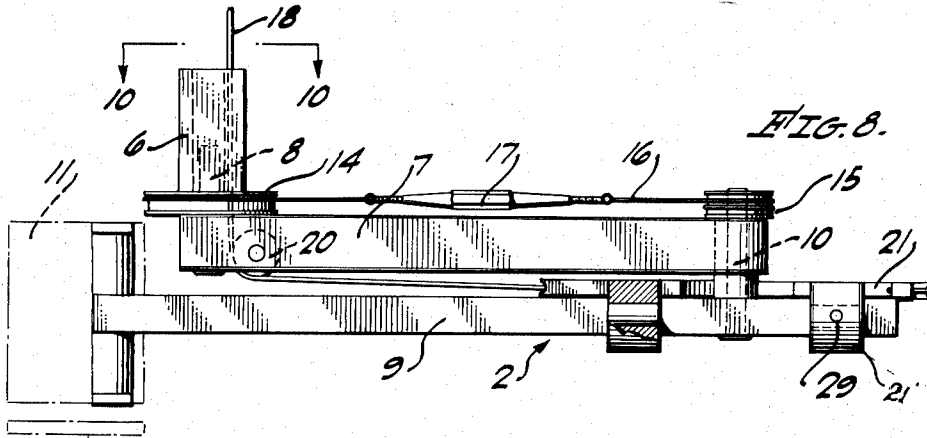


FIG. 8.

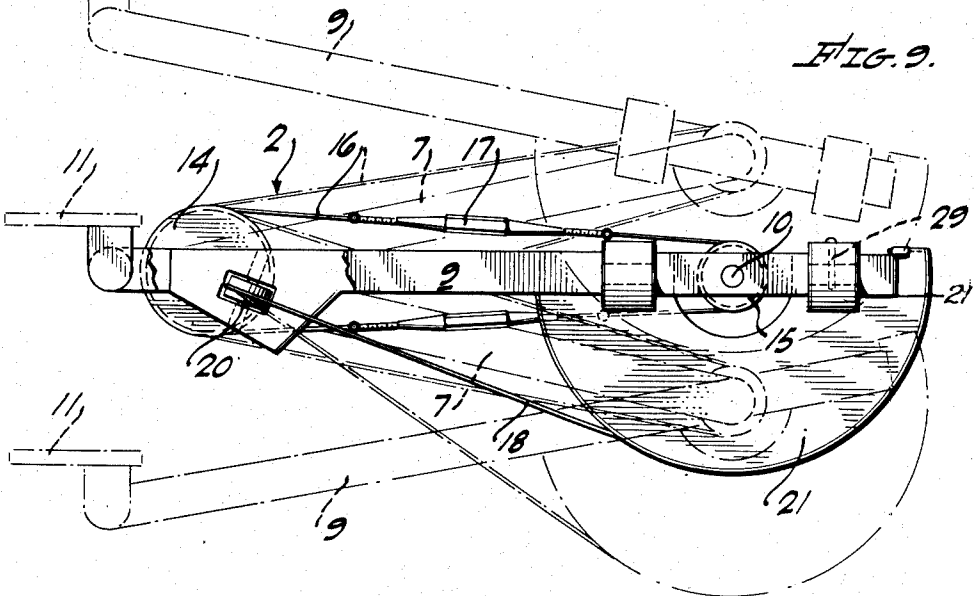


FIG. 9.

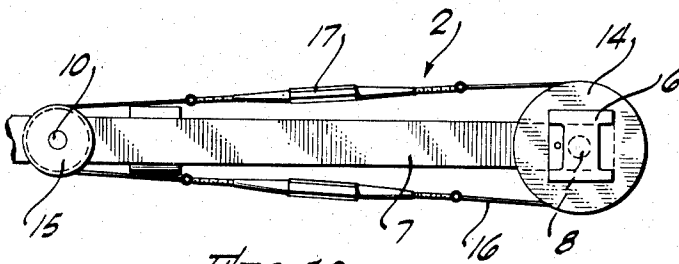


FIG. 10.

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UNITED STATES PATENT OFFICE

2,665,815

PIPE LOADING DEVICE FOR TRUCKS
AND THE LIKE

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Application May 6, 1950, Serial No. 160,520

8 Claims. (Cl. 214-77)

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This invention relates to a vertical lifting device particularly applicable to the lifting of pipes and other long objects, and especially when pipe and other articles of the same character are to be loaded on to or off a truck, a trailer, a platform, etc.

When long objects are to be moved from one position to another, my invention is used in complementary pairs, however, my lifting device may also be used singly for the purpose of lifting other objects vertically, and in this instance a platform or bed may be incorporated with the lifting device.

An object of my invention is to provide a novel loading device which may be operated by a cable or the like extending from a winch, the cable causing arms to swing on respective pivots, thus moving a finger or platform in a vertical direction.

Another object of my invention is to provide a novel loading device, particularly for trucks, platforms, and the like, which can be folded under the load in such a manner that it does not project beyond the side of the truck, platform, or the like.

A feature of my invention resides in the means to swing the loading device to either side of the truck, platform, or the like, so that the load can be picked up or delivered from either side of the truck.

Another feature of my invention resides in the means to adjust the loading devices when the devices are used in pairs so that one loading device will move a greater or lesser amount than the other.

Another object of my invention is to provide a novel loading device for trucks and the like, which can be mounted on the truck and remain there at all times so that it is always available to the workmen.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

Figure 1 is a top plan view of a truck body or platform with my loading device mounted thereon.

Figure 2 is a side elevation of the same taken from the line 2—2 of Figure 1.

Figure 3 is a fragmentary side elevation of one loading device and showing this device in lowered position.

Figure 4 is a fragmentary end view taken from line 4—4 of Figure 2.

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Figure 5 is a perspective view of a loading device partly folded and viewed from the line 5—5 of Figure 1.

Figure 6 is a side view of a truck body, or the like, showing the lifting devices in raised position.

Figure 7 is a fragmentary plan view showing one of the lifting devices swung to the other side of the truck body.

Figure 8 is a plan view of a loading device which utilizes a platform on the end of the lifting arm.

Figure 9 is a side elevation of the same and showing the lifting device in different positions.

Figure 10 is a side view of a lifting device, as viewed from the line 10—10 of Figure 8.

Referring more particularly to the drawing, the numeral 1 indicates a truck bed, a platform, or a similar stationary object, and on which one or more of my lifting devices 2 are mounted. Since the detailed construction of each lifting device is identical, only one will be described.

Each loading device is mounted in a channel 3, which extends transversely of the platform 1. A mounting arm 4 is pivotally secured to the channel 3, as shown at 5, and it will be evident that this mounting arm can swing from one side of the body 1 to the other, as may be required, and this operation is best shown in Figure 5. A bolster 6 is pivotally mounted on the other end of the mounting arm 4 and this bolster fits tightly in the channel 3 in either operating position of the mounting arm 4, thus non-rotatably holding the bolster and still permitting the arm and its attached bolster to be swung from side to side when necessary. That is the bolster is held against rotation in a vertical plane when the bolster is in the channel 3. It will be evident that there is considerable stress placed on the bolster 6 when there is a weight on the arm 4 and, consequently, it is necessary to reinforce this bolster against these torque stresses and the channel 3 performs this function.

An operating arm 7 is pivotally mounted in the bolster 6 on the trunnion 8, this trunnion is journaled in the bolster 6 and permits the operating arm 7 to swing with the trunnion 8, as a pivot. A lifting arm 9 is pivotally mounted on the outer end of the operating arm 7 by a shaft 10 which extends through both of these arms. The swinging end of the lifting arm 9 may have attached thereto either a platform 11 or a finger 12, depending on the type of material which is to be handled. With the finger 12, pipe 13 is moved and the type of pipe here considered is quite

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heavy, such as drill pipe, casing, or line pipe, used in the oil industry.

In order that the arms 7 and 9 may always be properly positioned relative to each other, and also that these two arms may move synchronously, I provide the following arrangement:

A pulley 14 or a similar mechanical structure is fixedly secured to the bolster 6. A second pulley 15 or a similar mechanical structure is fixedly secured to the shaft 10. A cable 16 or a similar flexible member extending over the pulleys 14 and 15 and is attached to both of these pulleys with a non-slipping connection, that is, a cable may be bolted or clamped to the pulleys. With this arrangement, the amount of swinging movement of the arm 7 is proportional to the amount of swing of the arm 9. By varying the relative sizes of the pulleys 14 and 15 it is possible to determine the vertical movement of the swinging end of the arm 9. I prefer that the ratio between the pulleys 14 and 15 shall be two to one, that is the pulley 14 is twice the size of the pulley 15. With this arrangement, the outer or swinging end of the arm 9 will move twice as far as the swinging end of the arm 7. Also, with this arrangement the relative position of the arm 7 to the arm 9 will be constant at all times but will be proportional. To keep the cable 16 tight I provide any suitable tightening means, such as the screw coupling 17.

To swing the arms 7 and 9, I employ the following construction:

A cable 13 extends from a winch or drum (not shown) and thence over a pulley 19 journaled in the channel member 3. The cable then extends laterally through the bolster 6 and then through the operating arm 7, and around one or more pulleys 23 in said arm. The outer end of the cable 13 is fixedly secured to a semi-circular plate 21, which is fixedly attached to the arm 9, concentric with the shaft 10. The method of securing the plate 21 to the arm 9 may be by means of bolts or pins which pass through the boss 21' on the plate and which extend into the arm 9. It will be evident that when the cable 13 is reeled in, the force applied to the plate 21 will cause the arms 7 and 9 to swing on their respective pivots and thus raise the finger 12 and the load thereon. By permitting the cable 13 to move in the other direction, the finger 12 can be lowered.

When two of my loading devices are employed, the vertical positions of the fingers 12 can be changed relative to each other in the following manner:

A hook 22 is provided in the cable 13 and this hook can engage any one of the links of the chain 23, thus changing the overall length of the cable 13 and, therefore, raising or lowering the finger 12, as desired. Also, one of the loading units can be caused to stop before the other by hooking the chain 23 over a fixed pin 24.

It is sometimes desirable to move the pipe 13 endwise and for this purpose I provide a roller 25 on each of the fingers 12. These rollers 25 are not aligned so that the pipe, when in normal position, namely, parallel to the edge of the body 1, will not slide off of the fingers. It is necessary to set the pipe at an angle, as shown in Figure 1, in order to move the pipe endwise.

To prevent the pipe 13 from rolling off of the fingers 12, I provide an adjustable lug 26 at the inner end of the finger, and a second lug 27 at the other end of the finger. These lugs can be rotated so that one lug will be projecting up-

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wardly to prevent the pipe from rolling off of the finger while the other one is horizontal so that the pipe can be rolled either inwardly or outwardly.

To fold the loading device on the platform 1, a cleat 28 attached to the arm 7 is rotated to extend under the arm 9. This holds the two arms in horizontal alignment. A lock pin 29 extends into the arm 9 and holds the plate 21 against rotation. By removing this pin, the plate 21 can be rotated to a horizontal position, as shown in Figure 5, and then the arms 7 and 9 can be swung inwardly and folded under the load. When it is desired to move the loading device from one side of the body to the other, the same procedure is employed and, additionally, the mounting arm 4 is rotated on its pivot 5. The method of securing the plate 21 to the arm 9 is the lock pin 29 which extends through the boss 21' and fits in the arm. The boss 21' is shaped to receive the arm 9 therein.

Operation

Assuming the parts in the position shown in Figure 1:

The cable 13 is slacked off and the arms 7 and 9 will move downwardly until the finger 12 is adjacent the ground. This position is shown in Figure 3. The pipe 13 is now rolled on to the fingers 12, thereafter the cable 13 is reeled in, causing the arms 7 and 9 to move upwardly, either to a position to load the pipe on to the body or platform 1, or to raise it above that platform, as shown in Figure 2. By slacking off the cable 13, the arms 7 and 9 are again lowered and the operation is repeated. The arm 4 will be at an angle to the channel 3, so that the outer swinging end of the arm and the bolster 6 will pass free of the outer end of the channel 3 when moving out of that channel. Tension on the cable 13 will force the bolster 6 and pulley 14 into the channel 3 and with the pulley 14 pressed against the end of the channel.

Having described my invention, I claim:

1. A pipe loading device for trucks, comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, and means to exert a lifting force on said lifting arm.

2. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, and a lifting cable secured to one end of said lifting arm.

3. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, a plate mounted on said lifting arm, and a lifting cable secured to said plate.

4. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a

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bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, an arcuate plate pivotally mounted on said lifting arm, latch means connecting said plate and lifting arm to releasably secure the plate to the lifting arm, and a lifting cable secured to said arcuate plate.

5. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, and means to exert a lifting force on said lifting arm, a pulley fixedly secured to the operating arm, a second pulley fixedly secured to the lifting arm, and a cable fixedly secured to both of said pulleys and extending therebetween.

6. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, and a lifting cable secured to one end of said lifting arm, and means to adjust the length of said lifting cable.

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7. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, and means to exert a lifting force on said lifting arm, and a roller journaled on said finger.

8. A pipe loading device for trucks comprising a channel fixedly mounted on the truck, a mounting arm pivotally mounted on said channel, a bolster pivotally mounted on said mounting arm, an operating arm pivotally mounted in said bolster, a lifting arm pivotally mounted on said operating arm, and a finger mounted on the swinging end of said lifting arm, and means to exert a lifting force on said lifting arm, and a lug at both the inner and outer ends of said finger, and means to rotatably adjust said lugs relative to said finger.

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