Nov. 18, 1930. O. A. BARTHOLOMEW 1,781,943

CRANE OPERATING DEVICE

Filed May 11, 1929 2 Sheets-Sheet 1

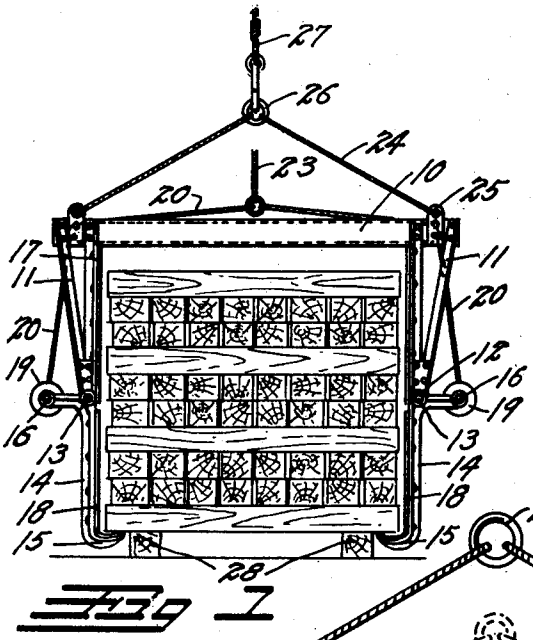



Fig 1

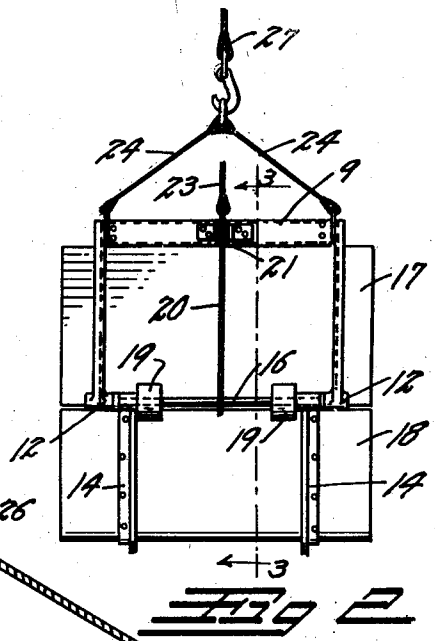



Fig 2

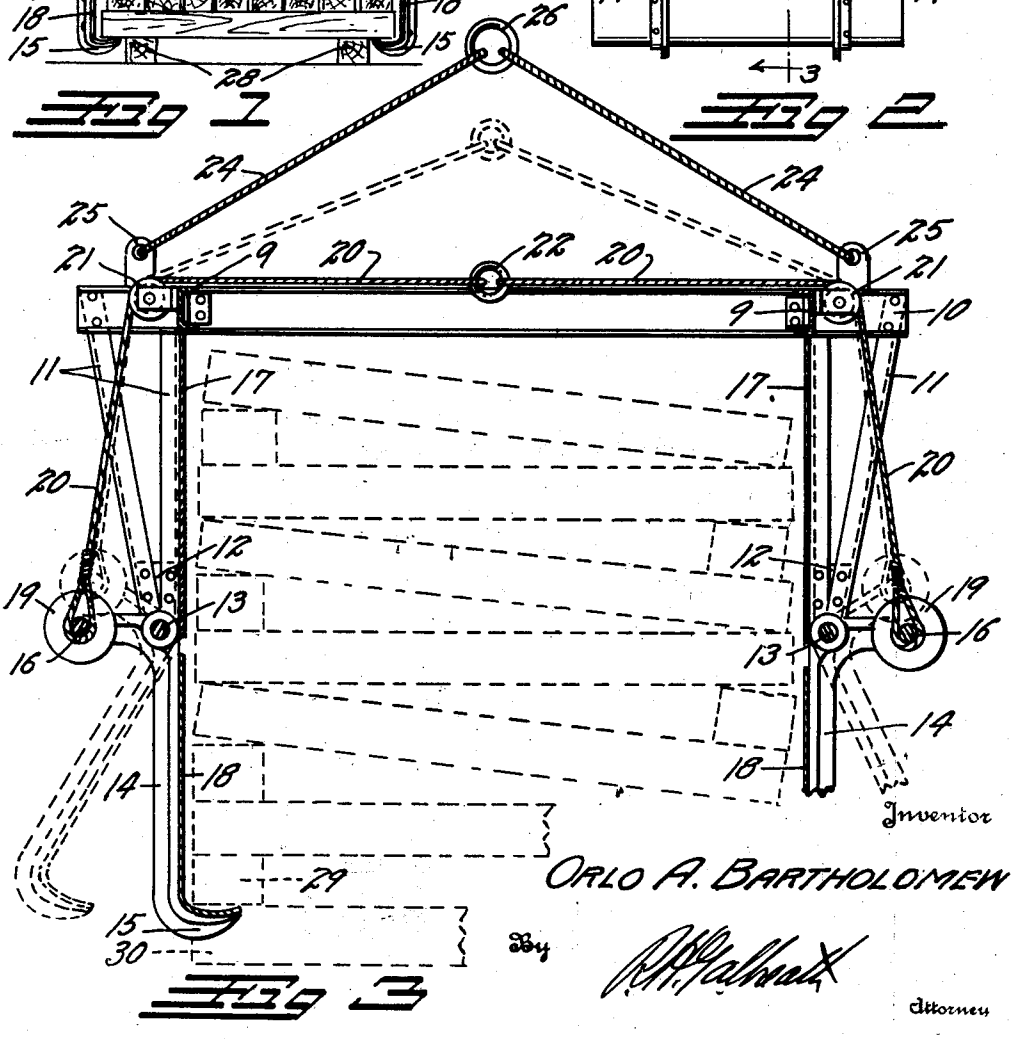



Fig 3

Inventor

ORLO A. BARTHOLOMEW

By

Attorney

Nov. 18, 1930. O. A. BARTHOLOMEW 1,781,943

CRANE OPERATING DEVICE

Filed May 11, 1929 2 Sheets-Sheet 2

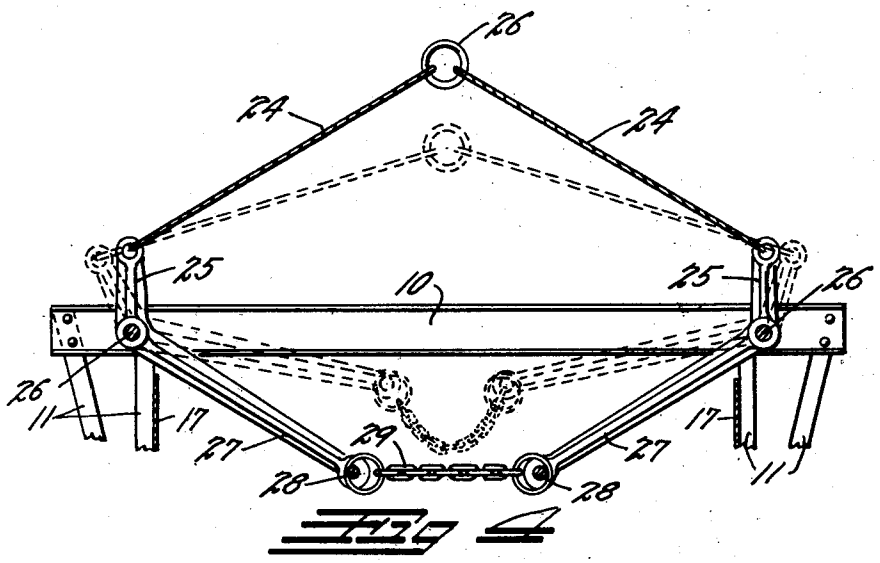



FIG 4

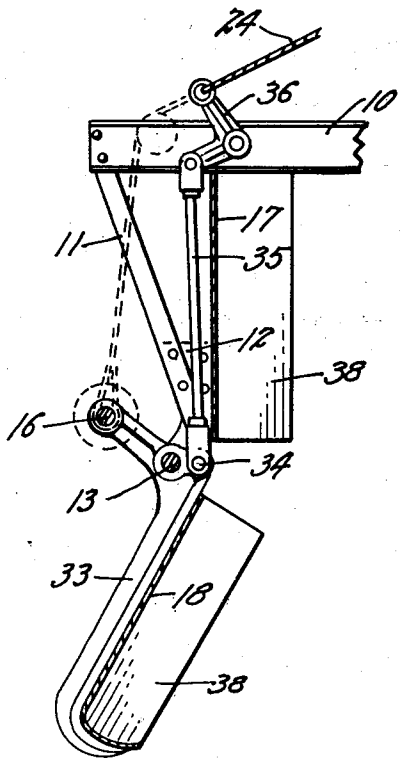



FIG 6

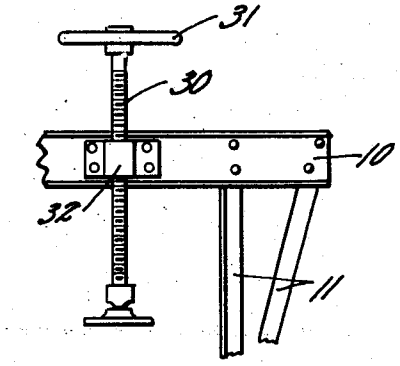



FIG 5

Inventor

ORLO A. BARTHOLOMEW

By R. H. Galbreath

Attorney

Patented Nov. 18, 1930 1,781,943

# UNITED STATES PATENT OFFICE

ORLO A. BARTHOLOMEW, OF ST. LOUIS, MISSOURI

## CRANE-OPERATED DEVICE

Application filed May 11, 1929. Serial No. 362,153.

This invention relates to material handling jaws for cranes and is more particularly, but not exclusively, designed for handling piles of railroad cross ties. The principal object of the invention is to provide a device which can be lowered over a pile of railroad cross ties and which will automatically engage, lift, and deposit the cross ties in any desired position.

Another object of the invention is to provide a device which can be entirely operated by the crane operator without assistance and which will automatically guide itself downwardly over a pile of cross ties.

A further object of the invention is to incorporate with the above device means for clamping the ties in place therein so that danger of ties falling therefrom is eliminated.

Other objects and advantages reside in the detail construction of the invention which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is an end elevation of the invention as it would appear engaging a pile of cross ties.

Fig. 2 is a side elevation thereof.

Fig. 3 is an enlarged cross section, taken on the line 3—3, Fig. 2. The cross ties are illustrated in broken line in this view piled in a way which allows air circulation for seasoning.

Fig. 4 is a detail view illustrating an alternate method of using the lifting cables so that they will act to clamp the ties within the device.

Fig. 5 is a detail view illustrating an alternate method of clamping the cross ties in place.

Fig. 6 is a detail view of an alternate form of the device in which the lifting cables assist in closing the jaws.

The device is designed to be suspended from the boom of a crane. Referring to Figs. 1 and 2, and 3, the device comprises a horizontal frame formed of longitudinal channel irons 9 and lateral channel irons 10, the latter projecting beyond the sides of the device. Upon the projecting portions of the lateral channels 10, brackets 11 are secured which extend downwardly and terminate in bearing boxes 12. Upper side plates 17 are secured to the inner faces of each of the brackets 11.

A hinge shaft 13 is journaled in the bearing boxes 12 at each side of the device so as to extend longitudinally thereof. Hooked members 14 are carried upon and depend from the axle shafts 13 and terminate at their lower extremity in inwardly turned hooks 15. Lower side plates are secured to the inner faces of each of the hook members 14 and turn inwardly over each of the hooks 15 to form longitudinal shelves.

The upper portions of the hook members 4 extend outwardly to form lever arms 37 which terminate in bearings for a counterweight shaft 16. The counterweight shafts are thereby spaced from, and extend parallel to, the axle shafts 13. Counterweights 19 are carried on the counterweight shaft 16 and act by gravity to swing the hooked members 14 inwardly upon the hinge shaft 13.

The hook members 14 and the lower plates 18 are swung outwardly by means of operating cables 20 which extend upwardly from the counterweight shaft 16 over pulleys 21 upon each of the channel irons 9 and terminate in a ring 22 to which a crane lowering cable 23 it attached. The entire device is supported upon four supporting cables 24 extending from brackets 25 at each extremity of the channel irons 10 and terminate in a lifting ring 26. The lifting cable of the crane illustrated at 27, is attached to the lifting crane ring 26.

### *Operation*

It is to be understood, of course, that the lowering cable 23 and the lifting cable 27 extend to the boom of a suitable crane most probably of the locomotive type. To engage

a pile of cross ties the crane operator supports the entire device upon the lowering cable 23. This causes the hook members 14 and the lower plates 18 to swing outwardly, as indicated in broken line in Fig. 3. He will then lower the device over a pile of cross ties. The outwardly extending plates 18 will act as guides to guide the device over the pile.

When the bottom of the pile has been reached or when a desired depth in the pile has been reached, the crane operator picks up the weight upon the lifting cable 27 and releases the weight upon the lowering cable 23. This allows the counterweights 19 to swing the lower plates 18 inwardly so that the hooks 15 will engage under the extremities of a lateral tier of cross ties. The entire pile above this tier can then be lifted upon the lifting cable 27 and can dump the ties at any desired time by picking up the weight upon the lowering cable 23 and releasing the lifting cable 27. Ordinarily this would not be done until the pile has been rested upon supporting members or base ties such as indicated at 28, in Fig. 1 or upon a tram or railroad car for transportation.

With the ties piled, as illustrated in Fig. 3, the lowermost longitudinal ties, indicated at 29, are rested at their extremities upon laterally placed base ties 30 so that entrance of the hooks 15 is facilitated. Should it be desired to remove just the upper four tiers of the pile of Fig. 1, the device will be lowered to that depth in the pile and the hooks allowed to swing inwardly. The hooks will push the longitudinally piled ties inwardly to allow them to grip the extremities of the lateral ties in the fourth tier. It will thus be seen that any desired number of ties can be picked off from a pile.

Ordinarily the weight of the ties upon the shelves of the hooks 15 will be sufficient to hold them in place especially since they are usually piled in interlocked relation. For greater safety, however, the forms of Figs. 4 and 5 may be used in connection with the device.

*Alternate construction*

In Fig. 4 the supporting cables 24 are connected with bell crank levers 25 pivoted at 26 to the lateral channels 10. The levers 25 are constructed with relatively long arms 27 which, when the cables 24 are tightened will swing downwardly and force longitudinal bars 28 againsnt the pile of ties to securely clamp them in position. The amount of movement of the levers can be limited by means of a cross chain 29, as illustrated, if desired.

Another method for clamping the ties in place within the device is illustrated in Fig. 5, in which a clamp screw 30 operated by a hand wheel 31 is placed at each corner of the device. The screws 30 are carried in nuts 32 secured to the channels 10. After a pile of ties has been engaged an assistant can screw the screws 30 downwardly to engage the pile top.

It will usually be found that the counterweights 19 are sufficient to swing the hooks 15 and plates 18 under the pile. Should additional power be desired or should it be desired to provide a positive lock for the swinging portions, the construction of Fig. 6 may be employed. In this construction modified hook members 33 are carried on the hinge bars 13 and provided with crank pins 34. Connecting rods 35 extend upwardly from the crank pins 34 to bell crank levers 36 at each corner of the device. The supporting cables 24 are connected directly to the levers 36 so that when they are tightened they will act through the levers 36 and the rods 35, to swing the hook members 33 inwardly and hold them in place while the weight is being lifted.

It is desired to be understood that all of these modifications are interchangeable, that is, the bell crank levers 36 could be incorporated with the bell crank lever 25 of Fig. 4, so that the supporting cables 24 would exert both a downward and inward clamping action upon the ties.

If desired the extremities of the plates 17 and 18 can be turned inwardly to form end flanges 38, as shown in Fig. 6, to prevent the ties from sliding from the extremities of the device. These flanges, however, can not be used in operating on long continuous piles of ties.

While specific forms of the improvement have been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. A crane operated device for engaging piled material comprising: a top frame; sides depending downwardly from said top frame; and hook members hinged to the lower extremity of said sides and arranged to swing inwardly to support the load between said sides; and counterweights arranged to swing said hook members inwardly.

2. A crane operated device for engaging piled material comprising: a top frame; sides depending downwardly from said top frame; hook members hinged to the lower extremity of said sides and arranged to swing inwardly to support the load between said sides; counterweights arranged to swing said hook members inwardly; and positively operated means arranged to swing said hooked members outwardly.

3. A crane operated device for engaging a pile of cross ties or the like comprising: laterally placed frame members; brackets ex-

tending downwardly from the extremities of said members; hinged members on the lower extremity of said brackets; hooks on said hinged members arranged to extend inwardly under said pile; and means for swinging said hinged members inwardly, said means comprising: outwardly projecting arms on said hinged members so as to provide a counterweight to swing said hinged members inwardly.

4. A crane operated device for engaging a pile of cross ties or the like comprising: laterally placed frame members; brackets extending downwardly from the extremities of said members; hinged members on the lower extremity of said brackets; hooks on said hinged members arranged to extend inwardly under said pile; means for swinging said hinged members inwardly, said means comprising: outwardly projecting arms on said hinged members so as to provide a counterweight to swing said hinged members inwardly; and flexible means operatively connected with said lever arms and arranged to swing said hinged members outwardly.

5. A crane operated device for engaging piled material comprising: a top frame; sides depending downwardly from said top frame; and hook members hinged to the lower extremity of said sides and arranged to swing inwardly to support the load between said sides; and means for swinging said hook members inwardly comprising: levers; connecting rods between one extremity of said levers and said hook members; and a lifting cable secured to the other extremity of said levers so that when said cable is tightened said levers will operate to swing said hook members inwardly.

In testimony whereof, I affix my signature.

ORLO A. BARTHOLOMEW.