

June 9, 1931.

F. H. WEEKS

1,808,873

METHOD AND APPARATUS FOR TRANSFERRING CARGOES BY CRANE

Filed April 16, 1929

2 Sheets-Sheet 1

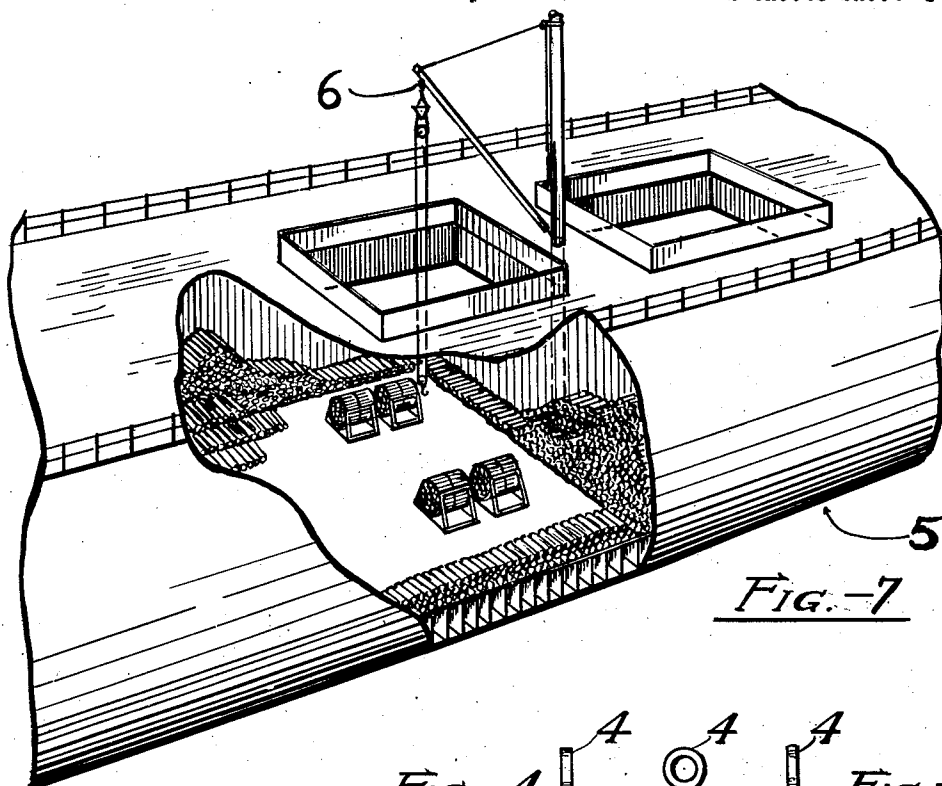


Fig.-7

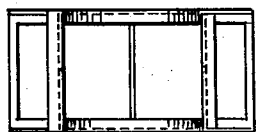


Fig.-3

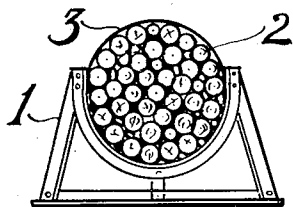


Fig.-1

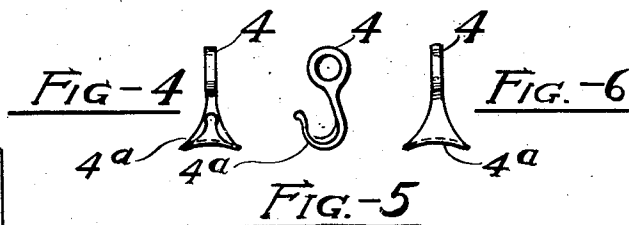
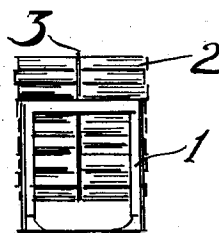


Fig.-5

Fig.-2



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2 Sheets-Sheet 2

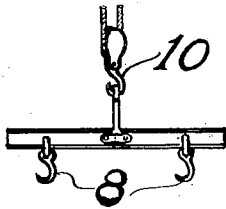


FIG. -10

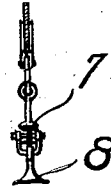


FIG. -11

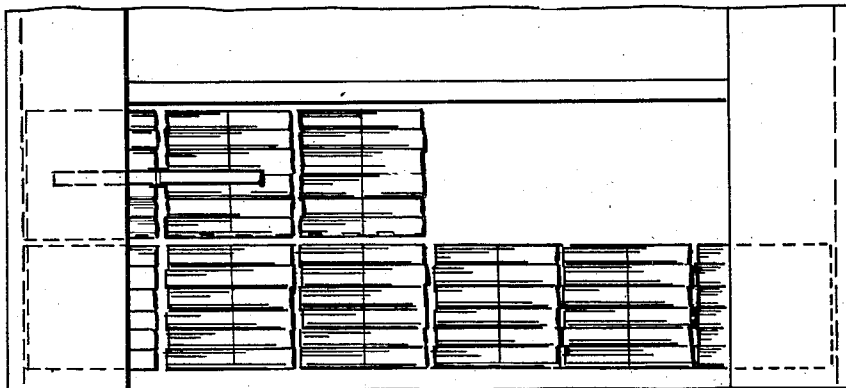


FIG. -9

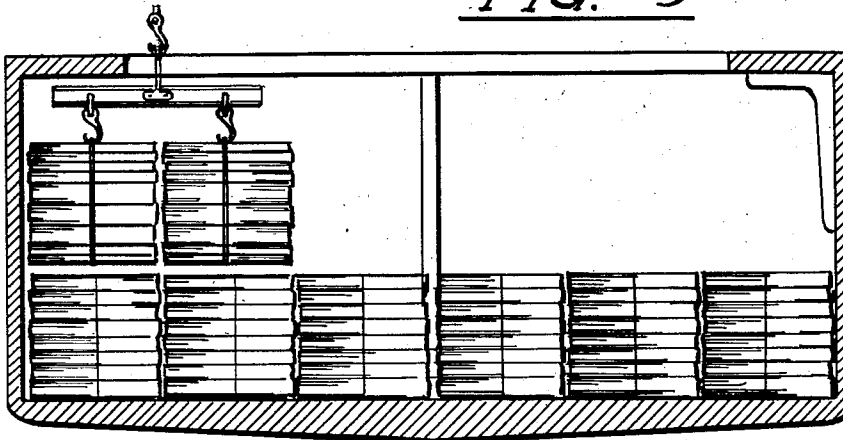


FIG. -8

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METHOD AND APPARATUS FOR TRANSFERRING CARGOES BY CRANE

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This invention will be fully understood from the following description read in conjunction with the drawings, in which;

Fig. 1 is an end view of a cradle for use in forming bundles of cargo adapted to crane transfer, showing also a bundle of cargo in position.

Fig. 2 is an end view of Fig. 1.

Fig. 3 is a top view of the cradle shown in Fig. 1.

Figs. 4, 5 and 6 are views of a form of hook for use in hoisting the bundles shown in Fig. 1.

Fig. 7 is a perspective view of the interior of the hold of a vessel showing cradles in place and bundles of cargo formed ready for transfer.

Fig. 8 is a vertical transverse section thru a barge showing bundles of cargo undergoing stowage together with a form of apparatus suited to this purpose.

Fig. 9 is a top view of Fig. 8.

Fig. 10 is a side view of the bundle stowage apparatus.

Fig. 11 is an end view of Fig. 10.

My invention relates to the movement of cargoes which must be transferred by crane, from the carrier. In its preferred and most profitable application it relates to the movement of cargoes which to reach their destination must be transported in a succession of different cargo carriers. An example of such a cargo is pulp wood which is shipped over considerable distances in a vessel, then transferred to barges and may thereafter be transferred to freight cars for inland transport. Alternatively, of course, such a cargo may be transferred directly from the vessel to freight cars, or may be delivered to its destination by the barges.

A pulp wood cargo has been recited as an example merely, and the invention is applicable to any cargo which in accordance with the previous practice is ordinarily shipped in individual pieces and temporarily collected into bundles by a sling for transfer into or out of the carrier. A preferred application is to the transfer of pieces which are of non-angular cross-section such as tree trunk sections.

The term "cargo" as employed herein, denotes the load carried by any form of carrier and is not restricted to vessels.

The practice in moving such materials has heretofore been to stack the same in individual pieces in or on the carrier, for example the hold or deck of a vessel. When removal is desired a number of such pieces, sufficient to constitute a convenient load for the crane are brought together, usually by hand, and a sling is looped about the group. One end of the sling is connected to the crane-hook and the other end of the sling is slidably looped about the said connected portion so that as the crane lifts, the loop contracts and the bundle tightens. The bundle usually changes substantially in cross-section during this period and owing to the change of form the bundle, not infrequently spills at this point resulting in a loss of time and incidental danger from falling pieces. When the load is delivered into the carrier which receives it, the sling is loosened and the pieces are again individually stowed away. This process is repeated at each transfer with a corresponding loss of time to the cargo carrier and duplication of labor charges. I am aware that, in an effort to solve the problem it has been suggested to leave the slings with the bundles, but the slings loosen, when the bundle is let down and owing to the number of slings required, the expense of this method is excessive.

The term "crane" as herein employed denotes any mechanical device for lifting, by machinery, loads which are too heavy for manual handling.

These difficulties are obviated in my method by collecting the individual pieces into bundles of convenient size to be handled by crane and securing the bundle with a ligament which is of definite length. The ligament is preferably left attached during subsequent transportation so that the time and expense of stowing away the individual pieces for transport and subsequent collecting them into bundles for removal are avoided in each case. The bundles formed in accordance with my method may be picked up by the crane in any manner, thus for example, a sling may be

looped about the preformed bundles. Alternatively, the bundles may be lifted by tongs or by any other device. In this case it is desirable that the lifting means so engage the bundle that the entire strain of lifting it is not carried by the ligament.

Alternatively, tongs or ropes may be attached to one or more of the individual pieces in the bundle while the ligament previously applied holds the bundle together thereby dispensing with the necessity for a sling. In this latter method of handling, the ligament must be of sufficient strength to lift the bundle without the assistance of a sling. One preferred method consists in lifting the bundle by connecting directly to the ligament so that the lift of the individual pieces is accomplished by the ligament itself.

In forming the bundles I prefer to use a cradle of cylindrical capacity, so that the bundle will have a substantially circular cross-section. Such a bundle has a minimum perimeter in proportion to its cross sectional area and shows a maximum stability when handled in the manner disclosed. I find it additionally helpful to apply the binding under tension so that the binding will not slacken to any great extent when the bundle is picked up for transfer.

Figs. 1, 2 and 3, show a cradle 1 adapted to the formation of the bundles hereinbefore described. This may have a chamber for holding the individual pieces the cross-section of which is a circular segment. The bundle may be formed by laying individual pieces in the cradle until a complete bundle of roughly circular cross-section is made. The ligament 3 is then placed about the bundle 1, preferably centrally with respect to the length and fastened, for example, by twisting its ends together while under tension. Devices for locking or otherwise securing the ends of the ligament are available and need not be herein described. It will of course be understood that any alternative means of securing the ends to form a binding of definite length may be employed. The ligaments or bindings may be formed of a single turn of wire surrounding the bundle at about the center of its length, applied in tension and having its ends twisted together or otherwise secured in order to prevent loosening. Multi-strand wire or cable may alternatively be used and several turns about the bundle may be taken if desired.

The term "definite length" does not mean that the bindings are all of the same over-all length, but indicates that the binding when applied has a definite, unchanging length in contradistinction to a sling which tightens and contracts as the load is lifted.

Figs. 4, 5 and 6, show a form of hook 4 which may be employed where it is desired to lift the bundles by means of the bindings.

This hook has a relatively broad lifting portion 4a the surface of which is adapted to fit the wire binding for a considerable portion of length and thereby to avoid cutting the same.

Fig. 7 shows a cargo carrying vessel 5 with a portion of the exterior cut away. The portion of the hold thereby uncovered shows a cargo of pulp wood viz. tree trunk sections of roughly uniform length being formed into bundles, of the kind described, for removal by crane 6.

These bundles may if desired be picked up in groups by means of the apparatus 7 shown in Figs. 10 and 11 which comprises hooks 8 for lifting the said bundles suspended from a beam 9 at symmetrical distances from the point 10 by which the beam is suspended from a crane. By the use of this device, bundles may be conveniently placed under the deck over-hang of a barge, as for example, the barge shown in Figs. 8 and 9. The apparatus may of course be conversely employed for removing bundles; although, its maximum utility resides in the fact that bundles may be stowed or let down in any desired position, even though this position cannot be brought directly beneath the crane hook owing to some vertically intervening structure.

Although I have described a specific example of my invention as applied to the transfer of a cargo from one vessel to another vessel, it will of course be understood that transfers through any number of successive carriers may be made with a corresponding saving of the time required to stow cargo in pieces and of the time required to re-assemble bundles for lifting by sling in each case. It is my intention that the invention be limited only by the appended claims or their equivalents, in which I have endeavored to claim broadly all inherent novelty.

I claim:

1. Method of transferring a cargo consisting of tree trunk sections, the length of which is several times the diameter, by means of a number of successively employed cargo carriers, which comprises assembling a number of said sections into a bundle of substantially circular cross-section, binding said bundle transversely with a closed ligament of fixed length, thereafter transferring said bundle by crane out of a cargo carrier and into a second cargo carrier, maintaining said bundle during transportation in said second cargo carrier, and thereafter removing said bundle and applied ligament by crane as a unit from said second cargo carrier, whereby the labor of stowing said sections individually and of assembling same into crane loads for successive transfers is obviated.

2. Method of transferring a cargo consisting of tree trunk sections, the length of which is several times the diameter, by means of a

number of successively employed cargo carriers, which comprises assembling a number of said sections into a bundle of substantially circular cross-section, binding said bundle transversely with a closed ligament of fixed
5 length and sufficient strength to hold said bundle together during transfer by crane, thereafter transferring said bundle by crane out of a cargo carrier and into a second cargo
10 carrier while utilizing said ligament in lieu of a sling to hold said bundle together, maintaining said bundle during transportation in said second cargo carrier, and thereafter removing said bundle and applied ligament by
15 crane as a unit from said second cargo carrier, whereby the labor of stowing said sections individually and of assembling same into crane loads for successive transfers is obviated and
whereby the use of slings is obviated.

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