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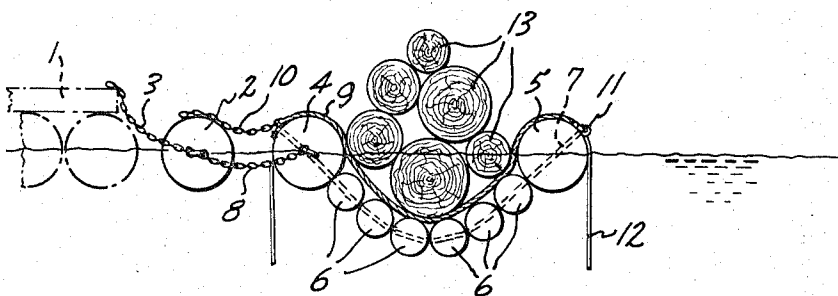
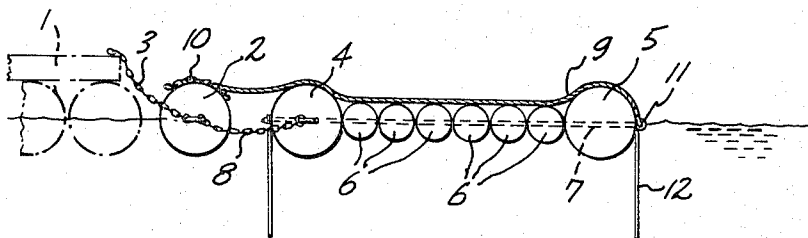
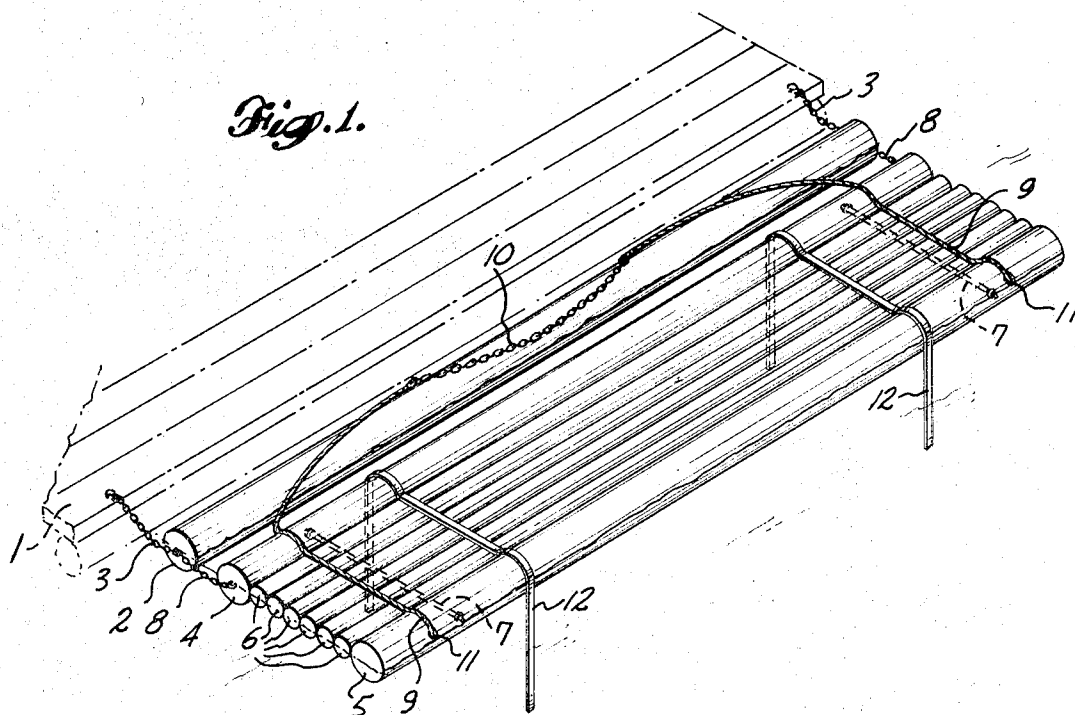
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3,553,752

LOG-BUNDLING APPARATUS AND METHOD

Filed Aug. 12, 1968

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

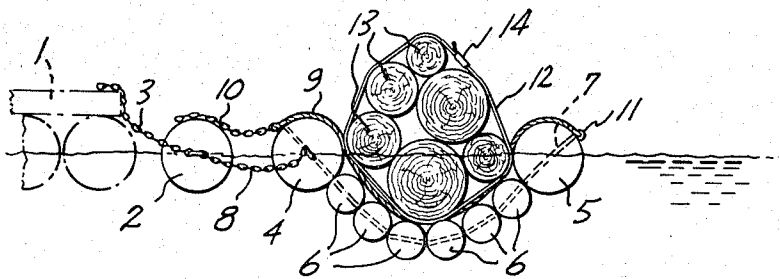


Fig. 4.

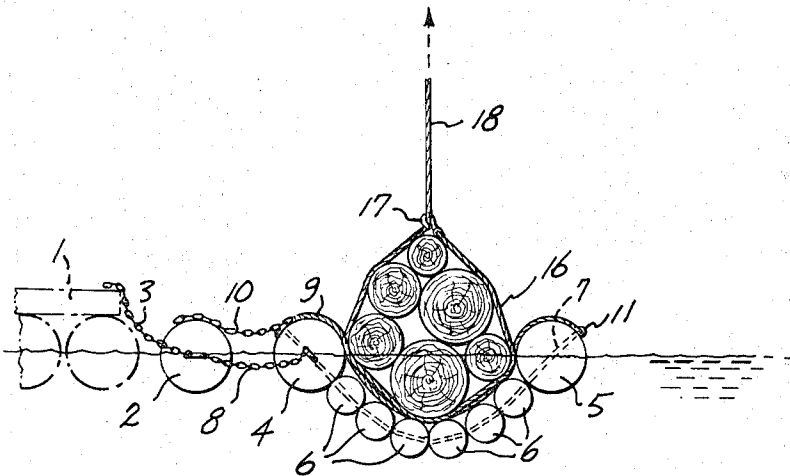


Fig. 6.

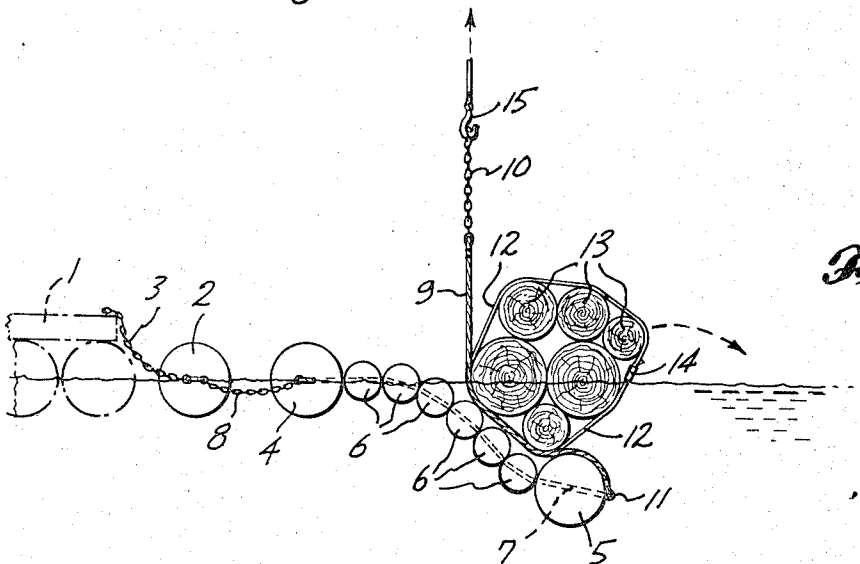


Fig. 5.

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LOG-BUNDLING APPARATUS AND METHOD

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3 Claims

ABSTRACT OF THE DISCLOSURE

A plurality of relatively small intermediate logs are connected to and held between two relatively large side logs in side-by-side relationship by flexible ties threaded through the logs to form a floating buoyant bed. Bundling bands and a parbuckle line are laid over such bed transversely of the length of the logs. A stack of logs placed on such bed will cause it to sag for embracing the logs of the stack to form them automatically into bundle relationship. The bands are then secured around the bundle and the parbuckle is pulled to roll the bundle out of the cradle formed by the sagging bed.

For shipment overseas logs are loaded into the holds of ships. To facilitate loading and unloading of logs into ships' holds, it is customary for a crane to handle them in bundles. Such bundles can be formed at the time the crane is ready to lift the logs by extending a sling around several logs which will gather them together as the lifting force is applied to the sling. When such a bundle of logs is deposited in the hold of a ship and the lifting force is removed from sling, the logs of such a temporary bundle would roll relative to each other so that the logs would tend to spread out into a row in the ship's hold. To unload the logs it would then be necessary to extend a sling around several logs in the ship's hold again so that a temporary bundle could be reformed by application of a lifting force to the sling.

It has been found that logs can be loaded into and unloaded from the hold of a ship much more conveniently if several logs are formed into a permanent bundle which can be lifted by a crane without dependence on the lifting force provided by the crane to form the bundle. When such a bundle of logs is deposited in a ship's hold, the logs will remain in bundle relationship. When it is desired to remove the logs from the ship's hold, it is not necessary to reform the bundle because such bundle will remain intact so that it need merely be hoisted out of the hold. The present invention is concerned with facilitating the formation of such a permanent bundle of logs for overseas shipment.

It is a principal object of the present invention to stack several logs so that they will be arranged automatically in bundle relationship to facilitate securing them in such relationship. More specifically, it is an object to utilize the buoyancy of the logs and of apparatus associated with the logs to effect such automatic bundle-forming operation.

Another object is to provide apparatus utilized in such bundle-forming operation which is easy and economical to construct and which can be constructed in any desired size, depending upon the size of bundle of logs which it is desired to form.

It is also an object to arrange several logs in a bundle relationship such that they can be secured readily in such relationship, and, after a permanent bundle has thus been formed, it can be removed quickly and easily from the apparatus utilized in forming it to prepare such apparatus for use in forming the next log bundle.

FIG. 1 is a top perspective of log-bundling apparatus

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according to the present invention in condition for initiation of a bundle-forming operation.

FIGS. 2, 3, 4, 5 and 6 are end elevations of log-bundle-forming apparatus shown in different stages of a bundle-forming operation.

In order to utilize the buoyancy of logs to assist in forming a log bundle, the apparatus employed for the bundle-forming operation floats in water. Such water may be a lake, an artificial log pond, a stream or salt water. Access to the log-bundling apparatus is provided from a float 1 which may be a log float or could be a dock. The bundling apparatus may be secured to a mooring log 2 which is tied to the float or dock 1 by chains 3.

The log-bundling apparatus includes a floating buoyant bed formed of relatively large side logs 4 and 5 and relatively small intermediate logs 6 arranged between such side logs in substantially parallel side-by-side relationship. The side logs and intermediate logs are held in such relationship with a reasonable amount of play between them by at least two flexible ties 7 spaced length-wise of the logs. Preferably these ties extend through apertures bored substantially diametrically through the logs and such ties may be lengths of cable. The floating bed formed by the logs 4, 5, and 6 can be connected to the mooring log 2 by chains 8 at opposite ends of the bed.

In order to remove a completed log bundle from the bundling apparatus, a parbuckle including cables 9 and a connecting chain 10 is provided. The ends 11 of the cables are secured to the side log 5, remote from the mooring log 8, and the lines 9 of the parbuckle, which can be cable, are laid across the intermediate logs 6 and the other side log 4 as shown in FIGS. 1 and 2. The chain 10 connecting the parbuckle lines 9 and the adjacent portions of such lines can be laid on the mooring log 2.

In preparation for making up a bundle of logs tying straps 12 can be laid across the floating bed. Such straps should be of a length sufficient to encircle the logs 13 of a bundle and the end of such straps can be secured together by a clam 14 shown in FIG. 4.

As shown in FIGS. 1 and 2, the log-bundling apparatus is prepared for reception of logs to be bundled. One or more logs 13 are laid onto the log-bundling bed by a crane until a sufficient number of logs to form the bundle have been thus placed. As the logs are laid on the central portion of the bed between the side logs 4 and 5, as shown in FIG. 3, the weight of the logs will cause the bed to sag. At least the central intermediate logs 6 will be fully submerged by the weight of the logs 13 to be bundled and perhaps all of such intermediate logs will be submerged completely. The flexible ties 7 will be deflected into downwardly bent shape and the side logs 4 and 5 will be rolled from the positions of FIG. 2 to positions such as shown in FIG. 3, in which the bores through which the tie members 7 extend are inclined downwardly and inwardly toward the intermediate logs 6. Such deflection of the ties 7 will draw the side logs toward each other so that the sagging bed will cradle the stack of logs to be bundled, such as in the relationship shown in FIG. 3.

During such operation of loading the floating bed with logs to be bundled, the added buoyancy of the submerged intermediate logs 6, the greater buoyancy provided by perhaps forcing the side logs 4 and 5 downward to a somewhat greater extent than when they are floating freely and the buoyancy afforded by the portions of the stacked logs beneath the surface of the water will balance the weight of the logs and log portions 13 in the stack above the water level. Because of the concave shape assumed by the depressed floating bed when loaded with a stack of logs and the drawing together of the side logs 4 and 5, the stacked logs 13 will form a bundle of generally cylindrical shape as shown in FIG. 3. The straps 12 can then be pulled around the logs thus assembled and ten-

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sioned to bind the logs permanently in such a bundle. The overlapping ends of the tensioned bands 12 can then be secured in such overlapping relationship by conventional strapping clamps 14.

Logs can be assembled into bundles in this fashion to be loaded later into a ship's hold. When each bundle has been completed, therefore, it can be removed from the log-bundling apparatus and stored in floating condition. The easiest way to remove the completed log bundle from the floating bed is to use the parbuckle 9, 10. In FIG. 5 a crane hook 15 has been engaged with the chain 10 connecting the parbuckle lines 9 and hoisted so that the log bundle is rolled toward the side log 5 to which the ends 11 of the parbuckle lines are secured. As the bundle of logs is thus rolled onto the side log 5 as shown in FIG. 5, the weight of such log bundle will depress the side log so that the bundle can be rolled more easily over it. In such operation it is not necessary for the parbuckle to support the entire weight of the log bundle because at least a portion of the bundled logs will be below the surface of the water as shown in FIG. 5. As soon as the parbuckle has rolled the bundle of logs beyond the side log 5, such bundle will float freely and the side log 5 and adjacent intermediate logs 6 will rise to the surface. The parbuckle may then be lowered and the lines 9 again laid across the floating bed as shown in FIGS. 1 and 2 preparatory to the formation of another log bundle.

FIG. 6 illustrates an alternative procedure for removing a completed log bundle from the floating bed. In this instance a sling or hoisting line 16 is extended around the log bundle and a hook 17 is caught around the bight 18 of the hoisting line. By pulling the line 18 upwardly the bundle of logs is lifted bodily out of the sagging floating bed so that such bundle can either be deposited directly in the hold of a ship or can be loaded onto some other vehicle, such as a truck or railway car, or could be swung and lowered into dry storage or could simply be moved over the side of the floating bed and released to be held in floating storage.

We claim:

1. Log-bundling apparatus comprising a floating bed

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including, in side-by-side relationship, opposite side logs and a plurality of intermediate logs between said side logs, flexible ties connecting said logs and holding them in such side-by-side relationship of a length sufficient to enable sagging of said floating bed under the weight of a stack of logs placed thereon to cradle such logs in bundle relationship, and a parbuckle including a line attached to one of said side logs and extending across said intermediate logs to the other side log for rolling a bundle of logs from the sagging bed.

2. The method of bundling logs which comprises flexibly connecting opposite side logs and a plurality of intermediate logs in side-by-side relationship and thereby forming a floating bed, placing a stack of logs to be bundled on the floating bed and thereby effecting sagging of the floating bed to cradle the stacked logs automatically in bundle relationship, binding such stacked logs in such bundle relationship, and parbuckling out of such sagging bed the logs bound in such bundle relationship.

3. The log-bundling apparatus defined in claim 1, in which each of the intermediate logs has a plurality of bores extending transversely through it, spaced lengthwise of it and disposed in registry, respectively, with a plurality of bores in adjacent logs on opposite sides thereof, and the flexible ties extend through such registering bores in the intermediate logs and are connected to the side logs.

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