

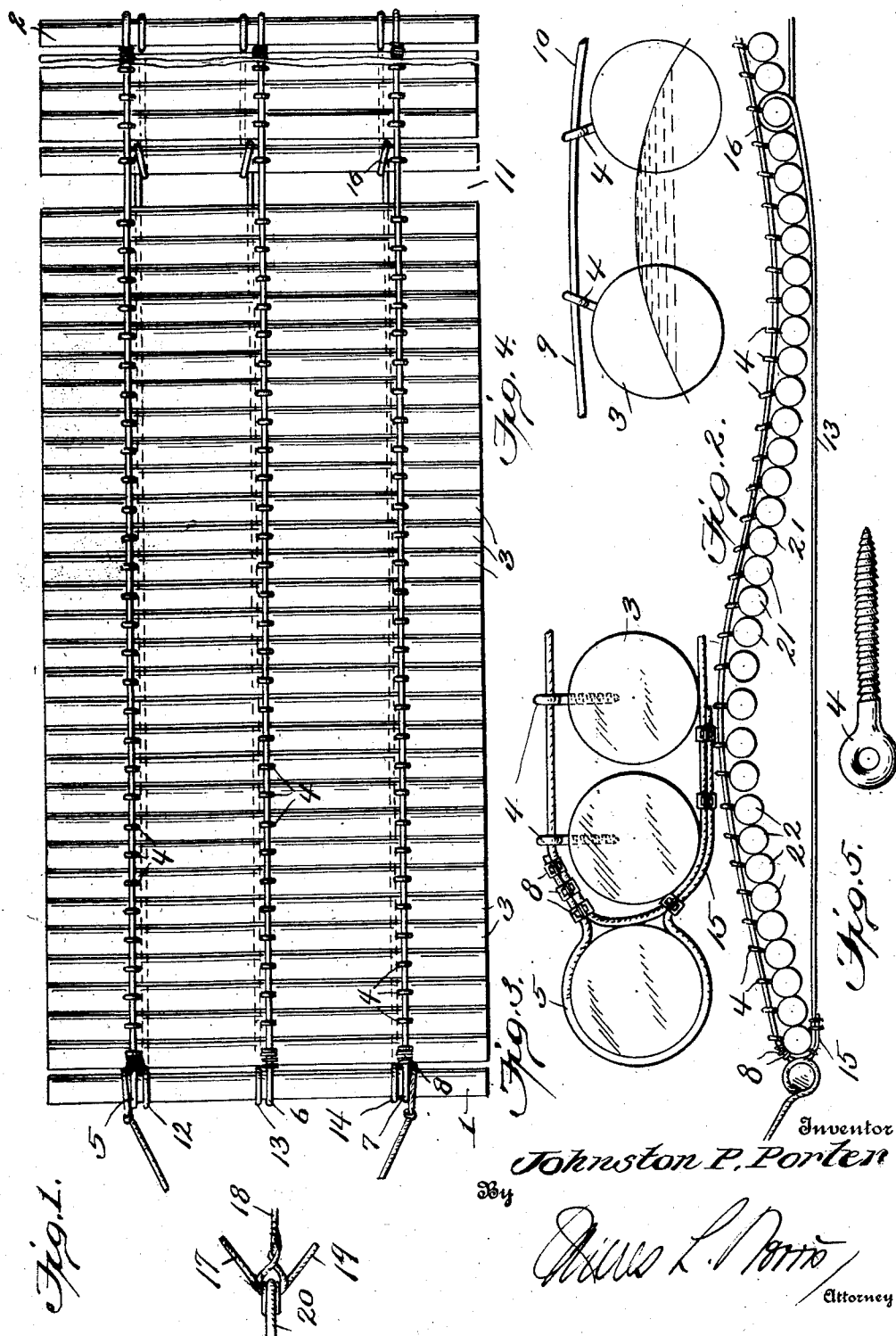
**March 13, 1928.**

**1,662,683**

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SEAGOING LOG RAFT

Filed July 30, 1926



## UNITED STATES PATENT OFFICE.

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## SEAGOING LOG RAFT.

Application filed July 30, 1926. Serial No. 125,993.

This invention relates to sea-going log rafts, and to the method of holding together the logs of which the raft is formed.

The principal object of the invention is the construction of a raft which will be readily towable in shoal water as well as sea worthy and manageable in rough seas.

Another object of the invention is to provide a raft of the character described in which resistance to towage is minimized, the shape of the raft maintained, and in which independent movement of the individual logs is permitted, responsive to undulation of the waves so that friction between the surfaces of the raft and water is materially reduced.

Other objects of the invention will appear as the following description of a preferred embodiment of the same proceeds.

In the drawing:—

Figure 1 is a plan view of a raft constructed according to the principles of the present invention, the rear portion thereof being broken away.

Figure 2 is a side elevation indicating the action of the raft responsive to undulation of the waves.

Figure 3 is a longitudinal section through the forward part of the raft showing the leading log and means for securing the upper and lower cables thereto.

Figure 4 is a longitudinal elevation through an intermediate portion of the raft indicating the rolling action of adjacent logs in passing from one slope of a wave to the other.

Figure 5 is a longitudinal elevation of one of the screw bolts.

Referring now in detail to the several figures, the reference numeral 1 represents the leading log which is selected on account of its strength, size and straightness, there being a rear or following log 2 of similar characteristics. The other logs 3, comprising the raft, are arranged in parallel relation between the leading and following logs, each being provided with eye-bolts 4 inserted preferably three to each log, one adjacent the center and the others any suitable distance, for instance, approximately two feet from each end thereof. Cables 5, 6, and 7 are looped around the leading log and suitably clamped in a manner indicated at 8, said cables being threaded through the eye-bolts from one end of the raft to the other and being then looped around the fol-

lowing log and clamped in a manner similar to that used in securing the cables to the leading log. The apertures in said eye-bolts are larger than the diameter of the cables so that there is considerable freedom between said eye-bolts and cables enabling individual logs to roll relative to each other through a range of positions, the limits of which are indicated at 9 and 10 in Figure 4. The length of the cables 5, 6 and 7 between the leading and following logs is slightly greater than the aggregate diameters of the intermediate logs leaving a space 11, to allow for swelling of the logs so that no log will be forced below the general level of the raft by such swelling and so add to the resistance to towage by increasing the draft of the raft.

Other cables 12, 13 and 14 are looped about the leading and following logs and clamped thereabout as shown at 15 in Figure 3, said cables extending freely between a section of the raft, say, for instance, the first thirty-five logs thereof, then being looped about the next log as shown at 16, in Figure 2 and extending freely beneath the next similar section of the raft, then being looped in similar manner around a log and so on, to the end of the raft defining sections or brails which are preferably approximately of equal length, the total length of the raft being of course determined by the power of the towing vessel and by conditions of sea and water. A bridle which may be constructed in any suitable manner, but is here shown as consisting of lengths of cable 17, 18, and 19 suitably secured to the leading log at points adjacent the center and ends thereof is suitably connected to the towing hawser 20.

It is to be understood from the above description of the raft that the space 11 may occur at any point within the extent of the brails due to shifting of the logs or may be distributed in the form of a plurality of narrow spaces existing between the individual logs thereby facilitating the freedom of movement of the individual logs and in this way enhancing the flexibility of the raft. At the same time, the dividing of the raft into brails limits the shifting of the logs to a single brail, preventing the formation of a cumulative space of excess width at any point in the raft which might lead to a disarrangement or entangling of the cables and being disastrous to the integrity of the raft.

From Figure 2 it will be observed that while the buoyancy of the logs allows them to follow the undulations of the waves or swell, yet the lower cables 12, 13 and 14 remain submerged, assuming the relation of chords to the arc formed by the floating logs so that the draft of the towing vessel is transmitted straight through the lower cable throughout the length of a brail, and substantially straight throughout the length of the entire raft resulting in a steady pull upon the towing hawser instead of the variable strain which would result from the draft being transmitted through the length of the undulating string of floating logs. The cables 12, 13 and 14 play the important part also when taut, particularly in shoal water, of keeping any log or logs from descending below the general level of the raft causing dragging or grounding of the latter.

Moreover, it will be observed from Figure 2 that when a wave is overtaking the towing vessel, that is to say, moving faster than the raft, the logs on the windward side of the wave will assume the position shown at 21, in Figure 2, due to the retarded movement of the water on the upward slope of the wave, with the eye-bolts laid back against the cables in the windward direction, but as soon as the crest of the wave passes, the accelerated speed of the water descending the slope of the wave turns the logs so as to direct the eye-bolts against the cables in the opposite direction as shown at 22 in Figure 2. The rolling of the logs with the direction of movement of the water constitutes anti-friction means which materially reduces the skin friction of the raft against the surface of the water.

It will be understood from the foregoing description that I have devised a raft and the method of forming the same which meets in a simple and efficient manner all the requirements of a raft which must be launched in shoal water and at the same time be strong and flexible enough to stand the buffeting of a sea voyage without undue hardship or strain to the towing vessel, and that while I have disclosed what I believe to be a preferred and practical embodiment of my invention, it is to be understood that the specific details described are not limitative in their effect upon the invention but merely illustrative except in so far as they are expressly prescribed by the terms of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. The method of constructing a sea-going

log raft which consists in arranging a plurality of logs in parallel relation transverse to the direction of movement of the raft, attaching said logs together by passing one or more cables freely through one or more series of apertured members of which one of each series is secured to each log, suspending a cable or cables beneath a number of said logs independently thereof, and securing said upper and lower cables to leading and following logs.

2. The method of constructing a sea-going log raft which consists in arranging a plurality of logs in parallel relation transverse to the direction of movement of the raft, attaching said logs together by passing one or more cables freely through one or more series of apertured members of which one of each series is secured to each log, securing said cables to leading and following logs, suspending a cable or cables beneath said raft looping it at intervals which include a number of logs, about a log or logs, and securing it to said leading and following logs.

3. A log raft comprising a plurality of logs arranged in parallel relation transverse to the direction of movement of said raft, eye-bolts fastened in the upper side of each log forming series of aligned eye-bolts longitudinally of the raft, leading and following logs, and cables secured to said leading and following logs and passing through said aligned eye-bolts, the apertures of said eye-bolts being larger than the diameter of said cables, and other cables likewise secured to said leading and following logs and suspended beneath said raft, said last cable being loosely connected to intermediate logs to divide the logs into brails.

4. A log raft comprising a plurality of logs arranged in parallel relation transverse to the direction of movement of said raft, eye-bolts fastened in the upper side of each log forming series of aligned eye-bolts longitudinally of the raft, leading and following logs, and cables secured to said leading and following logs, and passing through said aligned eye-bolts, the apertures of said eye-bolts being larger than the diameter of said cables, and other cables likewise secured to said leading and following logs suspended beneath said raft, said cables being looped at intervals about a log and independently subtending a number of logs between said intervals.

In testimony whereof I have hereunto set my hand.

JOHNSTON PUGSLEY PORTER.