Aug. 6, 1929. A. SMITH 1,723,213

RAFT OF FLOATING PONTOONS

Filed March 19, 1928

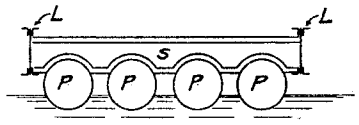


Fig. 1

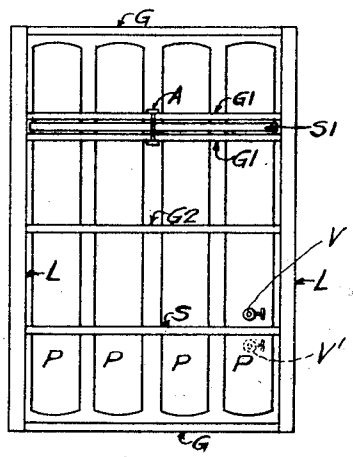


Fig. 2

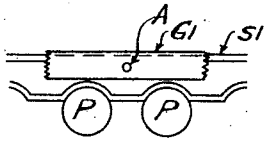


Fig. 4

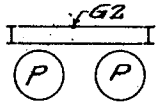


Fig. 5

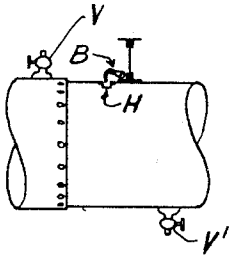


Fig. 3

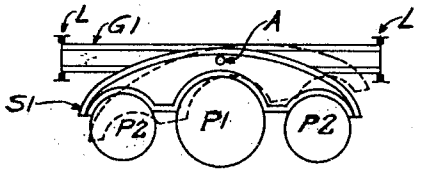


Fig. 6

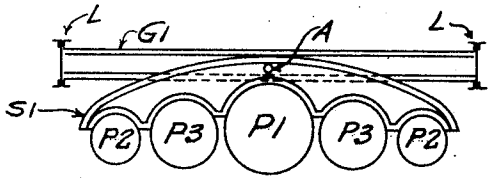


Fig. 7

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UNITED STATES PATENT OFFICE.

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RAFT OF FLOATING PONTOONS.

Application filed March 19, 1928. Serial No. 262,884.

This invention relates to rafts and more particularly to rafts supported by pontoons.

An object of the invention is to provide an improved floating platform or deck to carry a house or for other purposes. A further object is to make possible the construction upon a raft of a superstructure, which shall be free from distortion by irregular plunging of the pontoons subject to wave motion. Still a further object is to provide a convenient construction in which the pontoons may be removed for painting without transferring the entire raft to a drydock or marine railway. Other objects will appear upon consideration of this specification.

The invention is shown by way of illustration in the accompanying drawings, wherein

Figure 1 is a side view showing one of the saddle girders forming part of the raft and the pontoons which support it,

Fig. 2 is a plan view of a raft constructed in accordance with the invention from which the flooring and floor joists have been removed,

Fig. 3 is a fragmental view showing one method of attaching a pontoon to a girder supporting the raft,

Fig. 4 is a fragmental view showing a saddle girder and connections,

Fig. 5, illustrates one of the cross girders which may be employed in building the raft,

Fig. 6, shows one form of saddle girder and connections, and

Fig. 7, shows another form of saddle girder and connections.

An important feature of the invention consists in providing a geometrical plane in which lie the axis of a saddle girder carried by a number of pontoons and the pivotal point of a second saddle girder which is free to rock as the pontoons are acted upon by wave motion.

Referring now more specifically to the drawings, three or more pontoons P, preferably cylindrical in form and of hollow metal, are yoked together by a saddle cross girder S. The saddle cross girder S, supports at each end a longitudinal girder L, which extends the whole length of the raft and forms its apparent side. Another saddle girder S^1 is disposed between a pair of simple cross girders G^1 G^1, which in turn support the longitudinal girders L, and the weight is transmitted from the pair of simple cross girders G^1 G^1 to the saddle girder S^1 through a pin or axle bolt A on which the cross girders G^1 and the saddle girders S^1 are free to rock with respect to each other to accommodate themselves to wave motion (see particularly Figs. 2 and 4).

End girders G connect the ends of the longitudinal girders L and form apparent ends of the raft. One or more additional cross girders G^2, depending upon the size of the raft, are connected between the longitudinal girders L and span over the pontoons, but do not touch them (see Fig. 5). The cross girders G^2 provide convenient means for carrying the floor load to the longitudinal girders constituting a span to which, if desired, wooden floor joists may be connected. Such floor joists may be inserted between an end girder G and a cross girder G^1 at one end of the raft and between the other end girder G, and the saddle girder S at the other end of the raft, and also between the saddle girder S and the intermediate cross girder G^2, and between the intermediate cross girder G^2 and other intermediate cross girders G^2 if the raft is sufficiently long, or between the intermediate cross girder G^2 and the cross girder G^1 if the raft is constructed as illustrated in Fig. 2.

It will thus be seen that this construction provides a frame in which the axis of the saddle girder S and the pivotal point of the axle bolt A both lie in a plane. This plane is defined by a line (the axis of the saddle girder S) and a point (the pivotal point of the axle bolt) outside of that line. The construction described is in effect a three point suspension. It provides a frame upon which a floor can be laid. A superstructure erected upon this floor will be free from distortion by irregular plunging of the pontoons when subjected to wave motion.

If the wave motion to be encountered, is of serious magnitude, the outside pontoons, shown in Fig. 1, may be made of smaller diameter than the central pontoons thereby affording a greater arc for rocking of the saddle girders S^1 without striking the floor of the raft and without having the cross girders G^1 strike the outside pontoons.

To provide for still greater wave motion, it may be desirable to employ an uneven number of pontoons, the centre pontoon being of larger diameter than the outside pon-

toons as illustrated in Fig. 6, in which a construction employing three pontoons is shown. Where more than three pontoons are employed their diameters may be progressively decreased from the centre of the raft outward, as shown in Fig. 7. In constructions of this character, I prefer to build the saddle girder S^1 with a curved top so as to permit of the maximum free rocking motion about the axle pin A, without interference with the floor of the raft.

In order to provide a convenient way of painting or otherwise caring for the pontoons without removing the entire raft to a drydock or marine railway, it is possible to attach the pontoons to the saddle girders without rigidly fastening them thereto. For this purpose I prefer to connect the pontoons loosely to the saddle girders, depending largely upon the buoyancy of the pontoons under normal conditions for maintaining contact. A hinged pin or bolt of any kind may be used, such for instance, as the hinged pin B illustrated in Fig. 3, which is dropped into a hole or socket H in the pontoon. The construction illustrated is sufficient to prevent the pontoons from rolling under the saddle girders or to prevent longitudinal motion with respect to the saddle girders. The only objection to fastening the pontoons more securely to the saddle girders is the trouble required to disconnect them.

Means may also be provided for altering the buoyancy of the pontoons, either by admitting water to them or by adding weight. Thus their removal from beneath the saddle girders will be facilitated. Such means may consist, for instance, of two valves one on top of, and one beneath the pontoon. Such valves are illustrated by way of example by the elements V and V′ in Figs. 2 and 3.

When it is desired to remove the pontoons, as for painting, in the case of a four pontoon raft as shown in Fig. 1, the two outer or the two inner pontoons or any one pontoon may be submerged by admitting water thereto or otherwise adding weight so as to sink it free of the saddle girders. The pontoon is disconnected from the saddle girders for instance by lifting the bolt B shown in Fig. 3 clear of the hole or socket H. The weighted pontoon, having lost buoyancy, may then be pulled out from under the raft, pumped free of ballast water or otherwise relieved of weight, and rolled up on a beach on a pair of skids where it can be conveniently painted or otherwise renovated. After painting or renovation, the pontoon may be restored to its position under the raft by reversing the process which has just been indicated.

In the case of a four pontoon raft the buoyancy of the pontoons should be sufficient for any two to carry the load safely, while the other two are out of service. In the case of a three pontoon raft, as shown in Fig. 6, the central pontoon would have to provide sufficient buoyancy to carry the whole load alone while the smaller wing pontoons were being "docked." In the latter case only one wing pontoon should be removed at a time, the other being retained with temporary lashings or fastenings to the saddle girders, in order that it may pull down as well as lift up and thus prevent the raft from capsizing. In this latter case the two outer pontoons, together, should provide sufficient buoyancy to float the raft while the central pontoon is temporarily removed. In the case of a raft supported by five or more pontoons, such as that shown in Fig. 7, docking would obviously be easier.

I claim:

1. In a raft, a plurality of pontoons, and a framework, in combination with a saddle girdle supported by said pontoons rigidly connected to said framework, and a second saddle girder supported by said pontoons pivotally connected to said framework.

2. In a raft, a plurality of pontoons, and a framework in combination with a saddle girder supported by said pontoons rigidly connected to said framework near one end thereof, and a second saddle girder supported by said pontoons pivotally connected to said framework near the other end thereof.

3. In a raft, a plurality of pontoons, a framework, and a saddle girder rigidly connected to said framework, in combination with a second saddle girder, and an axle bolt, pivotally connecting the mid-point of said second saddle girder to said framework, substantially as described.

4. In a raft, a plurality of pontoons, and a framework, in combination with a saddle girder supported by said pontoons rigidly connected to said framework, a second saddle girder supported by said pontoons pivotally connected to said framework, and means for detachably connecting said pontoons to said saddle girders.

5. In a raft, a plurality of pontoons, and a framework, in combination with a saddle girder supported by said pontoons rigidly connected to said framework, a second saddle girder supported by said pontoons pivotally connected to said framework, and means for detachably connecting said pontoons to said saddle girders, and other means for altering the buoyancy of said pontoons, substantially as described.

In testimony whereof I have signed my name to this specification.

AUGUSTUS SMITH.