C. J. BAER.

BOAT.

APPLICATION FILED JAN. 24, 1921.

1,406,602. Patented Feb. 14, 1922.

2 SHEETS—SHEET 1.

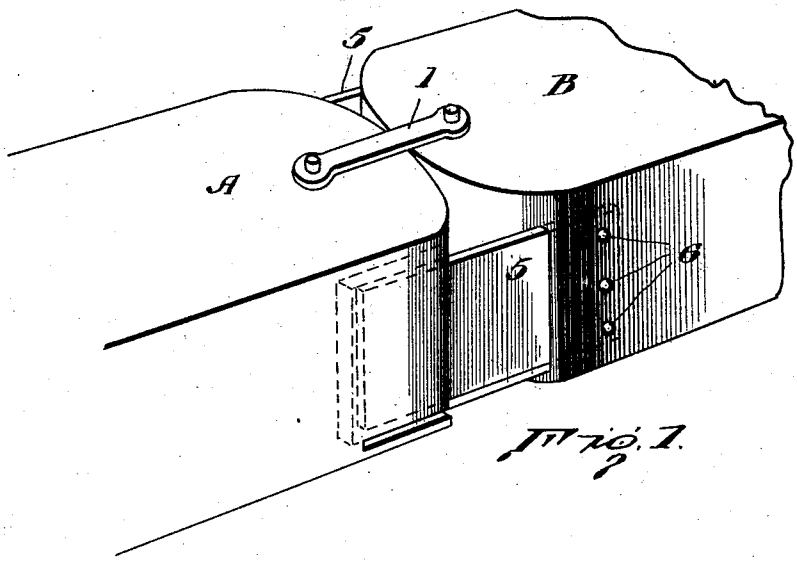


Fig. 1.

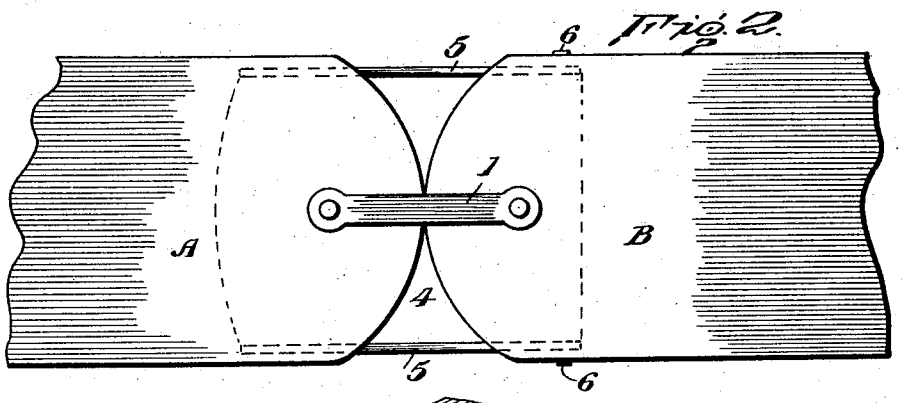


Fig. 2.

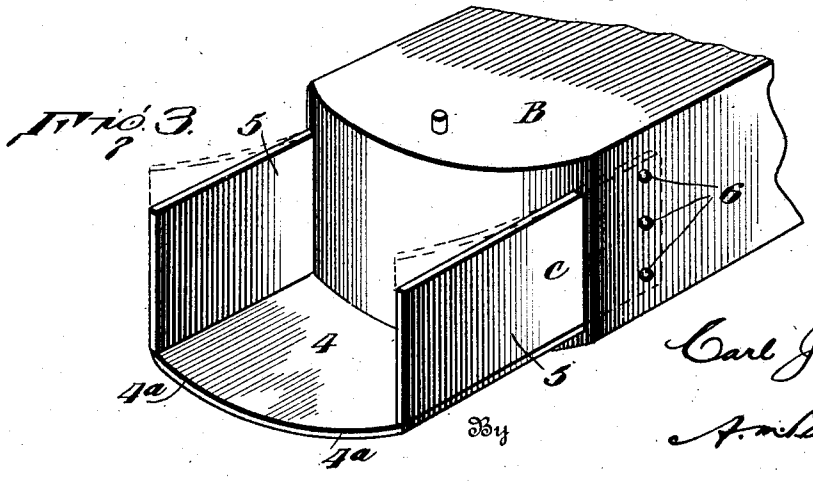


Fig. 3.

Inventor

Carl J. Baer,

By A. M. Burns

Attorney

C. J. BAER.

BOAT.

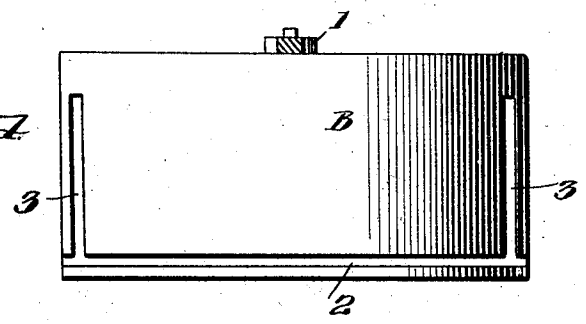
APPLICATION FILED JAN. 24, 1921.

1,406,602.

Patented Feb. 14, 1922.

2 SHEETS—SHEET 2.

Fig. 4.



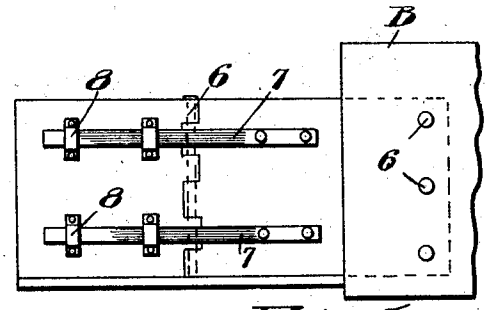


Fig. 5.

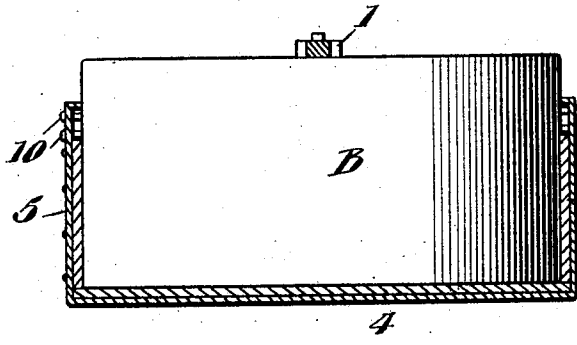


Fig. 6.

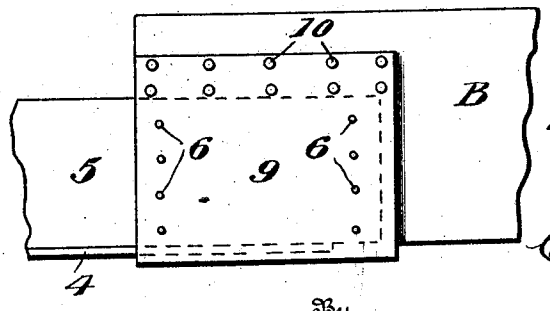


Fig. 7.

Inventor

Carl J. Baer.

By A. M. Dunn

Attorney

UNITED STATES PATENT OFFICE.

CARL J. BAER, OF ST. LOUIS, MISSOURI.

BOAT.

1,406,602. Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed January 24, 1921. Serial No. 439,423.

To all whom it may concern:

Be it known that I, CARL J. BAER, a citizen of the United States, residing at St. Louis and State of Missouri, have invented certain new and useful Improvements in Boats, of which the following is a specification.

The invention broadly relates to the facilitation of the passage of boats or barges through the water. More particularly, the invention pertains to the provision of means adapted for attachment to a boat-like body, whereby the water between said body and the adjacent body, connected thereunto, may be enclosed and carried along with the connected boats, thereby preventing free circulation of water between said boats and eliminating the retarding influence of "draw-backs" and end thrusts.

The invention is especially adapted for use in connection with a plurality of boats or barges joined in a string. Ordinarily such boat-like bodies (hereafter called barges), are of similar formation, provided with abutting ends which are usually convexed to permit of rolling contact in rounding curves. It is to be understood however that the invention is applicable to barges of any suitable bow and stern formation, for it is obvious that, when two connected barges are passing through the water, no matter what the formation of the ends, the space between the opposing ends of said barges is filled with water. In the absence of any means for the prevention thereof the water freely circulates between the ends of the barges, requiring constant displacement thereof as the barge moves. Under these circumstances, the power which moves the barges must be sufficient to overcome the "draw-back" effect at the stern of each, and also the end-thrust of the bow of every barge in the string.

My invention contemplates the substantial enclosure of all the water between the barges, whereby such water may be carried along therebetween and, in effect, become a component of the string. Experiments have proven that it is not necessary to provide an absolutely water-tight joint between the barges; it is sufficient if a free circulation of the water therebetween is prevented. Under such circumstances practically the only resistance to the movement of the string of units through the water, is the end thrust of the first barge, the draw-back of the last, and the frictional resistance along the sides of each. The experiments hereinbefore referred to have disclosed the fact that a 20 per cent increase of speed may be imparted to the barges by enclosing the water in the space between them, and carrying said water along as a unit of the string.

An effective means of accomplishing this desired object, as well as others, as will hereinafter appear, is shown in the accompanying drawings forming a part of this application, in which—

Figure 1 is a side and top elevation showing the ends of two connected barges equipped with my device.

Fig. 2 is a top plan view of the two connected barges.

Fig. 3 is a perspective view of the end of that barge to which my device is secured.

Fig. 4 is a plan view of the end of a barge provided with slots adapted to receive the elements of my device.

Fig. 5 is a plan view of a modification, showing a somewhat different means for obtaining the desired flexibility of certain elements of the device, and

Fig. 6 is a sectional view of a modification showing the barge equipped with an outer shell or casing.

Fig. 7 is a side plan view of the modification shown in Fig. 6.

In the drawings A and B indicate barges which are pivotally connected for the swinging movement which is incident to changes of direction. They are shown as provided with convexed and abutting ends, and connected by a link 1, which permits such swinging. It is to be understood that the showing of the formation of the ends of the barges, and of their pivotal connections, is merely incidental, as it will hereinafter be made clear that the particular formation of the barge ends is immaterial, so long as there is a water space between them, and that the specific form of coupling is not a part of this invention, so long as it is a coupling which permits relative swinging movement of the barges.

In order to enclose the water between the ends of the barges, I provide a housing, designated as a whole by the letter C. Said housing is adapted for attachment either to the stern of the foremost barge, or to the bow of the barge in the rear. It is here shown secured to the stern of the barge B, and will be so described.

Each of the barges is equipped at its end

with a bottom, transversely extending slot 2, and two substantially vertically-extending slots 3, 3, on either side. Said slots may be formed in the body of the barge, as shown in Fig. 4, or may be provided by an outer shell or casing, as illustrated in Fig. 6. The housing C consists of a substantially horizontal floor member 4, and two substantially vertical leaves 5, 5. One end of the housing is inserted into the slots in the end of a barge, and suitably secured thereto by rivets 6, or otherwise. The portions of the leaves 5, 5, enclosed by the slots 3, 3 may be integral with the floor 4, if desired for purposes of assembly, but the outer portions of said leaves are formed and adapted for transverse movement over the top of said floor, as will be hereinafter explained.

The outer ends of the leaves 5, 5, and of the floor 4, are inserted, respectively, into the slots 3, 3, and the slot 2, of the connected boat, the leaves being free for longitudinal movement in said slots, and the floor member being free for lateral rotative movement. In such position, after the barges are connected by the link 1, it will be obvious that any turning movement of the barge B will cause an inward movement of one of the leaves 5, in the slot 3, and an outward movement of the other leaf in its slot. Such movement could not take place, however, without flexure of the leaves, and I therefore prefer to form them of a material which is flexible and inherently adapted to return to its original position when the barges resume their original alignment.

It is desirable also that the floor 4 be formed of a flexible material in order that it may flex under the relative vertical movements of the barge. To permit such movement the vertical slots in the connected barge may be of a greater height than the height of the leaves 5 and somewhat longer than the enclosed portion of said leaves permitting the necessary vertical rocking of the leaves therein, as will be understood and as shown in dotted lines in Fig. 1.

It is very clear that the sole purpose of the leaves 5, 5, and the floor 4, is to enclose the water between the ends of the barges and to carry it along as a unit by preventing free circulation thereof between said ends. Such being the case thin strips of material are all that is necessary, and said leaves and floor may be formed of sheet metal or of any material which is inherently flexible.

If it is desired to provide a different degree of flexibility the leaves 5, 5, may be hingedly connected as shown at 6, in Fig. 5, and spring members 7, 7, secured to one side of the hinge and extended through straps 8, 8, secured to the other side. This construction would cause the sections of the leaves 5, 5, to pivot upon each other in the turning movements of the barges, and the spring members 7, 7, would tend to restore their original positions when the barges are again aligned.

The modification shown in Fig. 6 more readily adapts my device for application to barges at present in use. In this construction a hanger or casing 9 is suspended from the upper sides of the barge, by rivets, or bolts, and extends downwardly and under the bottom thereof, as shown in Figs. 6 and 7. Said casing may be rigidly connected to the barge by fastening devices 10, and the free ends of the leaves 5, 5, and the floor 4, are slidably inserted in the casing of the connected barge, as shown in Fig. 7.

It will be observed that, in all cases, the free end of the floor 4 is rounded or cut away at its edge, and especially near the corners, as indicated at 4^a, to permit turning movement of the barges.

From the foregoing it will be obvious that I have devised a construction adaptable for attachment to boats and barges, and which will effectively house and enclose the water between the ends of the connected barges and carry said water along as a unit, by preventing free circulation of said water therebetween.

Various modifications may be suggested to those skilled in the art, but I claim as my invention all such embodiments as fall fairly within the scope of the appended claims.

I claim:

1. The combination with two connected boats having a water space therebetween, of a plate projecting from each side of the central line of one boat and extending into recesses in the connected boat, substantially as described.

2. The combination with a boat provided on each side of its central line with a member projecting from its end, of a boat adapted to be connected to said first mentioned boat and provided with recesses adapted to receive said members, whereby, when said boats are coupled, the water between said members is enclosed.

3. The combination with two connected boats having a water space therebetween of means extending between said boats and into recesses provided adjacent the ends thereof, whereby the water between said boats is enclosed, said means including elements adapted to flex under relative movements of the boats.

4. The combination with two connected boats having a water space therebetween of plate-like members extending between said boats and into recesses provided adjacent the ends thereof on each side of the central line of the boats, whereby the water between said boats is enclosed, said means including members adapted for longitudinal movement in the recesses in one of said boats.

5. The combination with two connected

boats having a water space therebetween of means extending between said boats and into recesses provided adjacent the ends thereof, whereby the water between said boats is enclosed, said means including members adapted for longitudinal movement in the recesses in one of said boats and a member adapted for lateral movement in a recess in one of said boats.

6. The combination with two connected boats having a water space therebetween, of means carried by one of said boats and provided with flexible members extending into recesses formed in the other boat, said members being adapted for flexure and longitudinal reciprocation in said recesses under the turning movements of the boats.

7. The combination with two connected boats having a water space therebetween, of a housing provided with plate-like members extending into recesses provided in one boat, and secured thereto, the free ends of said members extending into corresponding recesses provided in the other boat, on each side of the central line thereof and free for movement therein, whereby the water between said boats is enclosed, substantially as described.

8. The combination with two connected boats having a water space therebetween, of a housing provided with members extending into recesses provided in one boat, and secured thereto, the free ends of said members being flexible and extending into corresponding recesses provided in the other boat, and free for movement therein, whereby the water between said boats is enclosed at the sides and bottom and said members are flexed in the movements of the boats, substantially as described.

9. The combination with a boat provided with a trough-like housing extending from the end thereof and having a bottom member and two side members, of another boat adapted to be coupled thereto and provided with recesses adapted to receive said members when the boats are to be coupled, whereby the water between said boats is enclosed at the sides and bottom.

10. The combination with two connected boats having a water space therebetween, of a housing extending between said boats and adapted to enclose the water therebetween at the sides and bottom, said housing comprising substantially vertically extending spaced plates adapted to enclose said water at the sides and having ends extending into recesses in the ends of one of said boats, and a floor adapted to enclose the said water at the bottom and extending into a recess in the end of one of said boats, substantially as described.

11. The combination with two connected boats having a water space therebetween, of a housing extending between said boats and adapted to enclose the water therebetween at the sides and bottom, said housing comprising two substantially vertically extending side plates, extending into recesses in the end of one of said boats, and a floor plate extending into another recess in said boat, the side plates being adapted for movement laterally across the face of the floor plate, substantially as described.

12. The combination with a boat provided on each side of its central line with a member projecting from its end, and with a member projecting from its bottom in a plane at an angle to the plane of the first mentioned member, of a boat adapted to be connected to said first mentioned boat and provided with recesses adapted to receive said members, substantially as described.

In testimony whereof I affix my signature.

CARL J. BAER.