No. 857,733. PATENTED JUNE 25, 1907.

E. GUNNELL

FLOATING DRY DOCK.

APPLICATION FILED MAR. 29, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

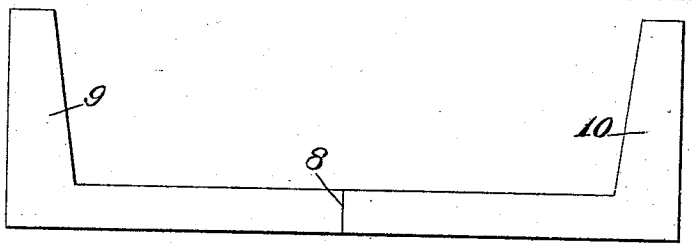


Fig. 2.

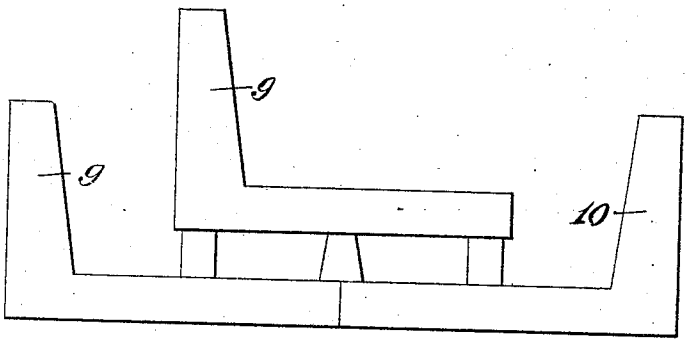


Fig. 3.

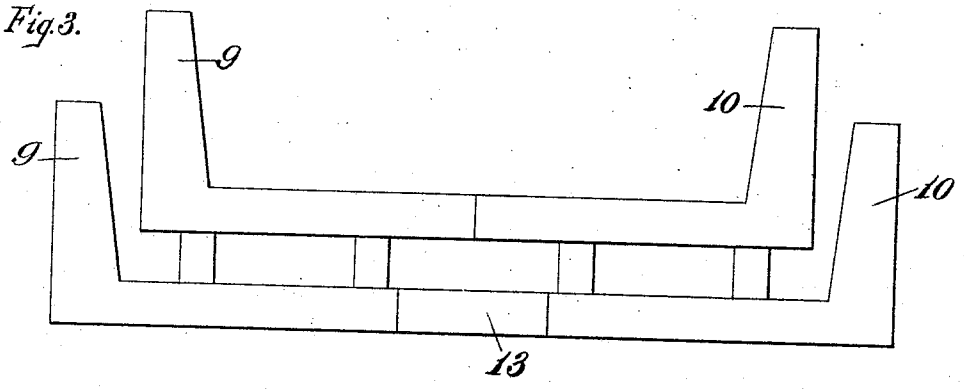
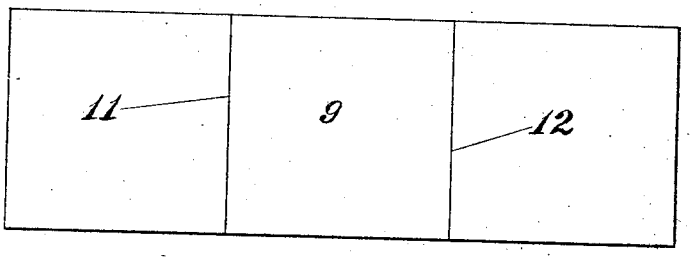


Fig. 4.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5.

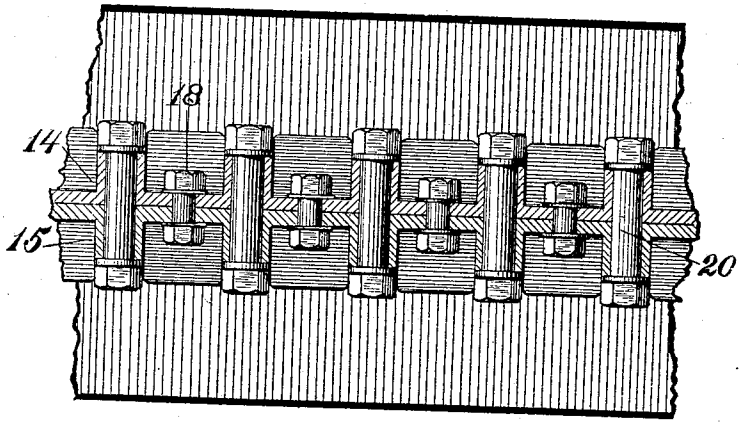


Fig. 6.

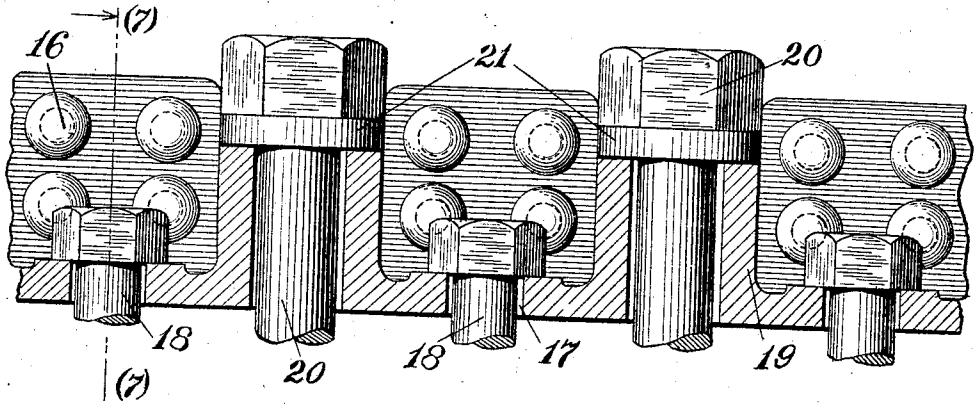
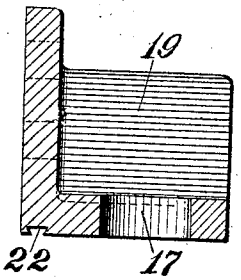


Fig. 7.



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FLOATING DRY-DOCK.

No. 857,733. Specification of Letters Patent. Patented June 25, 1907.

Application filed March 29, 1906. Serial No. 308,740.

To all whom it may concern:

Be it known that I, ELIAS GUNNELL, a citizen of the United States, residing at Manitowoc, in the county of Manitowoc and State of Wisconsin, have invented certain new and useful Improvements in Floating Dry-Docks, of which the following is a specification.

The invention relates to sectional floating dry docks, and has for its objects; to provide a dry dock which may be divided longitudinally thereby providing sections for passage through narrow channels; to provide a sectional dock of the usual U-type which is so divided longitudinally that the sections when disconnected are each in stable equilibrium; to provide a dock especially adapted for self docking; to provide a dock whose width may be easily increased when desired to thereby augment its capacity, and in which the sections are particularly adapted for shore docking; and to provide improved means for securing the sections together. One form of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is an end elevation of the dock;

Figure 2 is an end elevation of the dock with one of the half sections of the dock supported thereon for self docking;

Figure 3 is an end elevation of the dock and shows such dock increased in width by the addition of a pontoon at the center and carrying a full section of the dock for self docking;

Figure 4 is a side elevation of the dock;

Figure 5 is a detail section showing the means for securing the edges of the pontoons together;

Figure 6 is an enlarged detail section of one of the securing angles shown in Figure 5, and

Figure 7 is a section through Figure 6 on the line (7) (7), with the bolt 18 removed.

It is not broadly new to make docks divisible into independent sections, both transversely and longitudinally, but it is new in so far as I am aware to divide a dock U-shaped in cross section into independent sections in the manner hereinafter to be more particularly described, whereby certain advantages as to self docking, increase in capacity and stability are attained.

In the practice of my invention I make the dock divisible longitudinally into independent sections as indicated at the line of division 8 in Figure 1, thereby forming two half docks 9 and 10 of L-shape in cross section. These half docks are each complete and adapted to sustain themselves when separated and are provided with detachable securing means at their edge 8, whereby the two half docks may be rigidly secured together to form the U-shaped dock of Figure 1. As indicated in Figure 4, the dock may be divided transversely into any number of independent sections, which sections are detachably secured together in the usual way. As indicated in this figure the dock is divided transversely along the lines 11 and 12 into three sections, but it will be apparent that this number may be varied to suit the requirements as to the size of the vessel docked. In Figure 2 I have shown the dock as utilized for self docking. To accomplish this it is only necessary to separate one of the sections along the transverse line of division, separate the U-section thus provided into its component L's and dock such L's upon that part of the dock remaining intact. In Figure 3 I have shown a dock as increased in width and capacity by the insertion of the additional independent pontoon 13 between the ends of the horizontal portions of the L-sections. This addition to the width of the dock is necessary when it is desired to dock a portion of the dock without separating into its component L-sections or when it is desired to increase the capacity of the dock in order to handle a larger vessel than would be possible with the dock as shown in Figure 1. It will be apparent that the size of the pontoon 13 may be varied to suit the requirements and that the number of such sections 13 may be increased. The section 13 constitutes in effect an extension of the horizontal portion of one of the L's and may be so considered.

The advantages of my form of divisible dock may be stated as follows. It is often necessary to transport floating docks through very narrow channels and it often happens that the channel through which it is desired to float the dock is not of sufficient width to accommodate an integral dock of the desired capacity. It will be seen that by my arrangement of longitudinal division the dock may be gotten through a channel of half the width necessary if the dock were not divisible. It is also apparent that when the L-sections are separated each will be in stable equilibrium because of its horizontal leg, and that each L-shaped dock may be used independ-

ently for handling small vessels or may be used as a shore dock by securing the vertical leg slidably to a vertical shore support in the well known manner. The advantages as to self docking will also be apparent from inspection as it is clear that the docking of a half section may be very easily accomplished as indicated in Figure 2, or the docking of a whole transverse section may be conveniently accomplished by the use of the supplemental pontoon as indicated in Figure 3. It will also be seen that in the matter of adjustment to secure the desired capacity to accommodate vessels of varying widths, the construction of Figure 3 is a convenient and desirable one.

The means whereby the various dock sections are secured together at their edges is illustrated in Figures 5, 6 and 7. This fastening means consists of two continuous opposing angle shaped sections, each of which is secured to its pontoon so that the other wings of the angles may be detachably secured together. These angle sections 14 and 15, respectively, are preferably cast and are provided with rivet holes 16, whereby one wing of the angles may be rigidly secured to the pontoons. The other wings of the angles which are to be detachably secured together are provided with a plurality of spaced holes 17 to receive the bolts 18 and are also provided with a plurality of pairs of spaced ribs 19 adapted to receive between them the shanks of the bolts 20, which bolts have their heads supported upon the tops of the ribs 19 by the washers 21. The ribs 19 not only provide a receiving slot for the bolts 20, but also serve to greatly stiffen the angle sections which is especially necessary, of course, where cast angle sections are employed. The members 14 and 15 are made in as great lengths as can be conveniently cast and handled. The fastening constitutes a very cheap and rigid one. If desired a tight fit between the faces of the angle sections may be secured by placing rubber strips in the slot 22, as indicated in Figure 7.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. A dry dock comprising similar independent L-shaped sections with the opposing horizontal legs of substantially uniform lengths from one end of the dock to the other, and means for securing the inner ends of the horizontal portions thereof detachably in fixed relation to each other and in contact.

2. A dry dock comprising independent L-shaped sections, and an independent middle section between the horizontal portions of the L-sections, and means for securing the ends of the horizontal portions of the L-sections detachably to the sides of the middle section.

3. A dry dock composed of independent L-shaped sections each of substantially uniform cross section throughout its length and means for securing the inner ends of the horizontal legs detachably together.

4. An angle fastening for pontoons comprising a wing adapted to be secured rigidly to one of the pontoons, a wing extending at right angles to the first wing and provided with holes for bolt shanks and pairs of ribs intermediate the bolt holes and adapted to secure additional bolts between them.

5. A fastening for pontoons comprising a pair of cast securing angles each of which is adapted to be secured to the pontoons by one wing and having bolt receiving openings on the other wing and spaced pairs of ribs between the wings, bolts for the bolt openings and other bolts for the pairs of spaced ribs adapted to have the heads and nuts thereof rest upon the tops of the ribs.

6. A fastening angle for pontoons comprising wings at an angle to each other and pairs of holding and stiffening ribs spaced along the angle and adapted to receive the shanks of securing bolts between them.

7. In combination, in a fastening means for pontoons, an angle comprising wings at right angles to each other and pairs of holding and stiffening ribs spaced along the angle and adapted to receive the shanks of bolts between them, fastening bolts and washers for the bolts.

8. A fastening angle for pontoons comprising a wing adapted to be secured on one of the pontoons, a second wing at right angles to such first wing and provided with bolt holes, and pairs of holding and stiffening ribs connecting the wings at intervals and adapted to receive the shanks of securing bolts.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

ELIAS GUNNELL.

Witnesses:

PAUL CARPENTER,

ALBERT G. MILLER.