(No Model.) 2 Sheets—Sheet 1.

F. BALDWIN.

CAISSON AND METHOD OF CONSTRUCTING SAME.

No. 559,116. Patented Apr. 28, 1896.

Fig. 1.

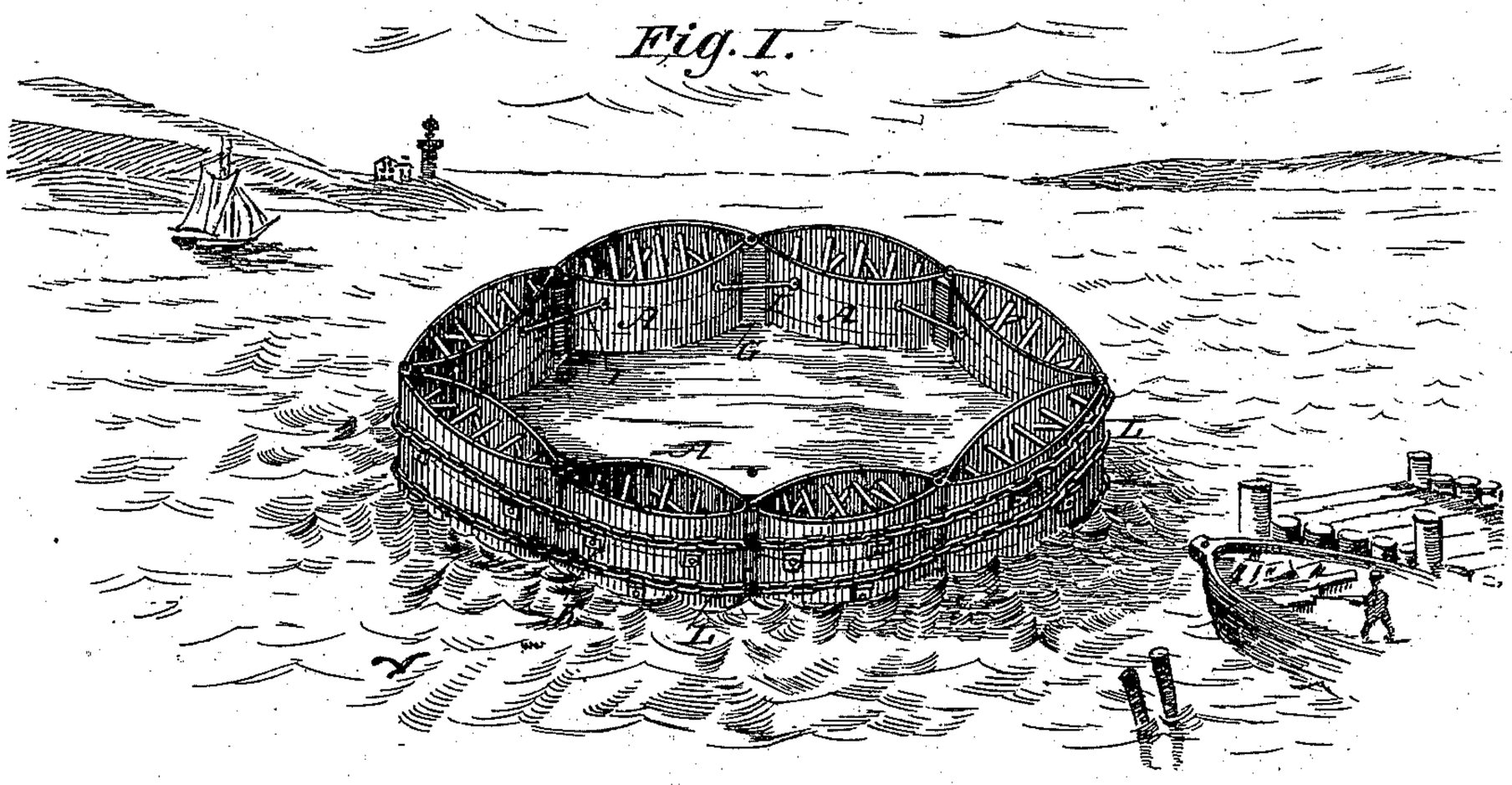
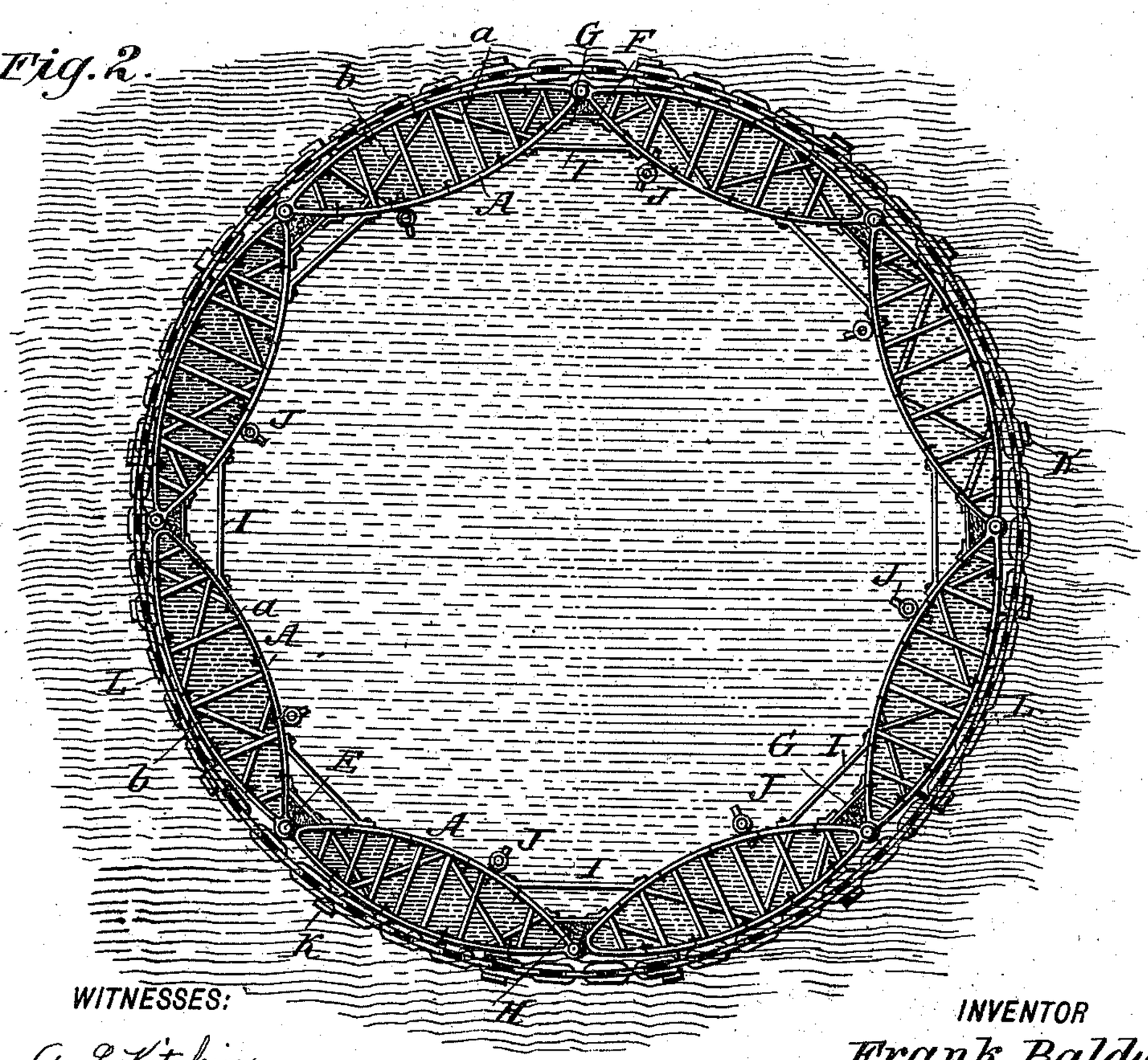


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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CAISSON AND METHOD OF CONSTRUCTING SAME.

No. 559,116. Patented Apr. 28, 1896.

Fig. 3.

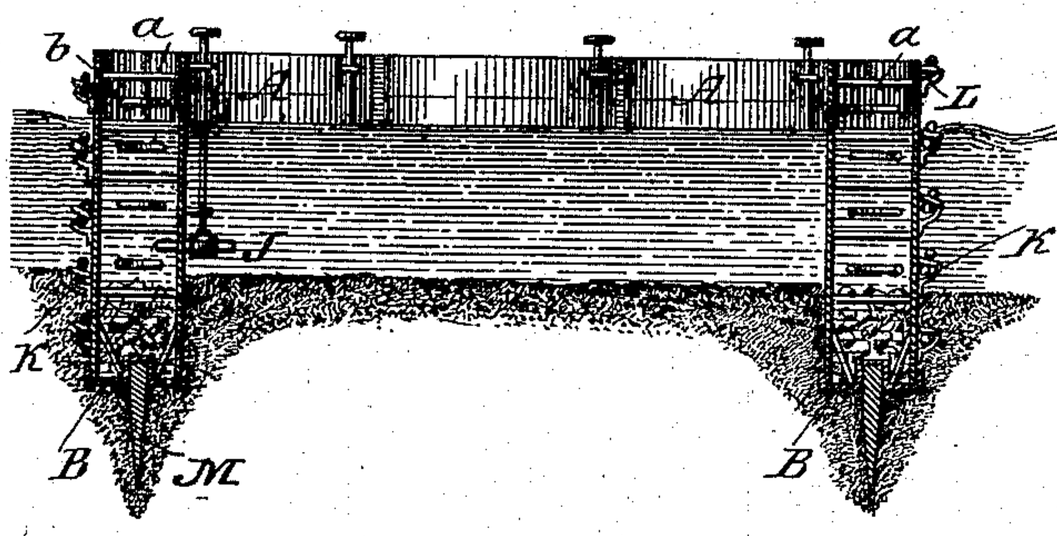


Fig. 5.

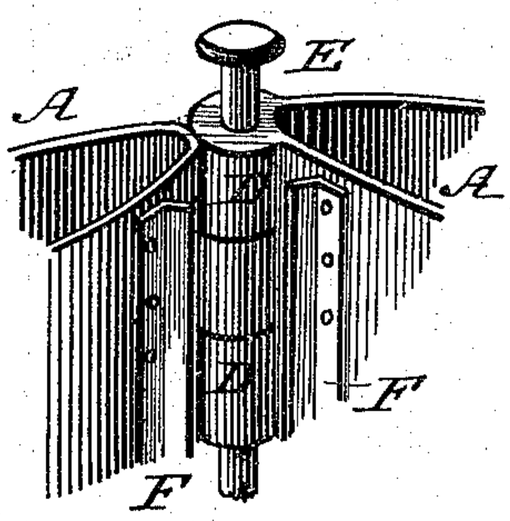


Fig. 4.

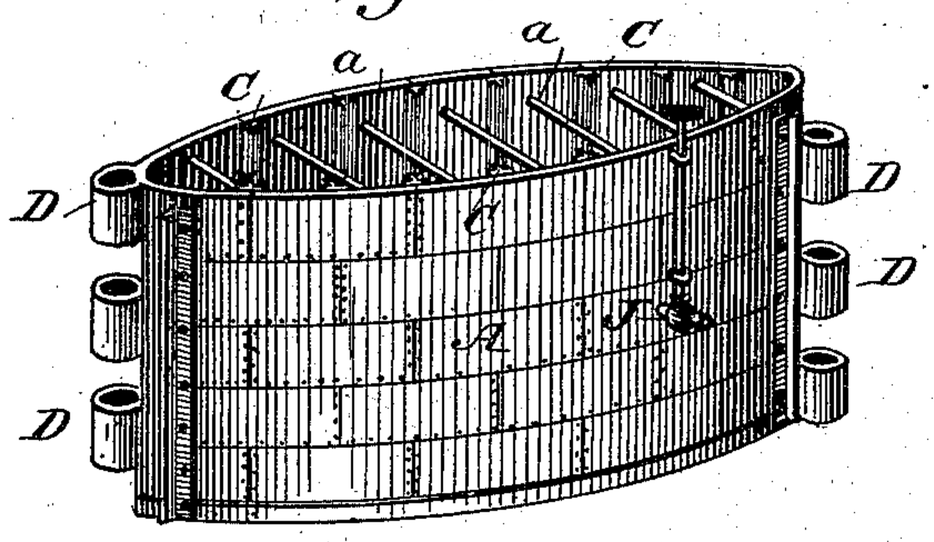


Fig. 6.

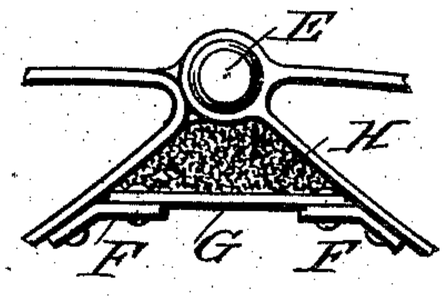


Fig. 7.

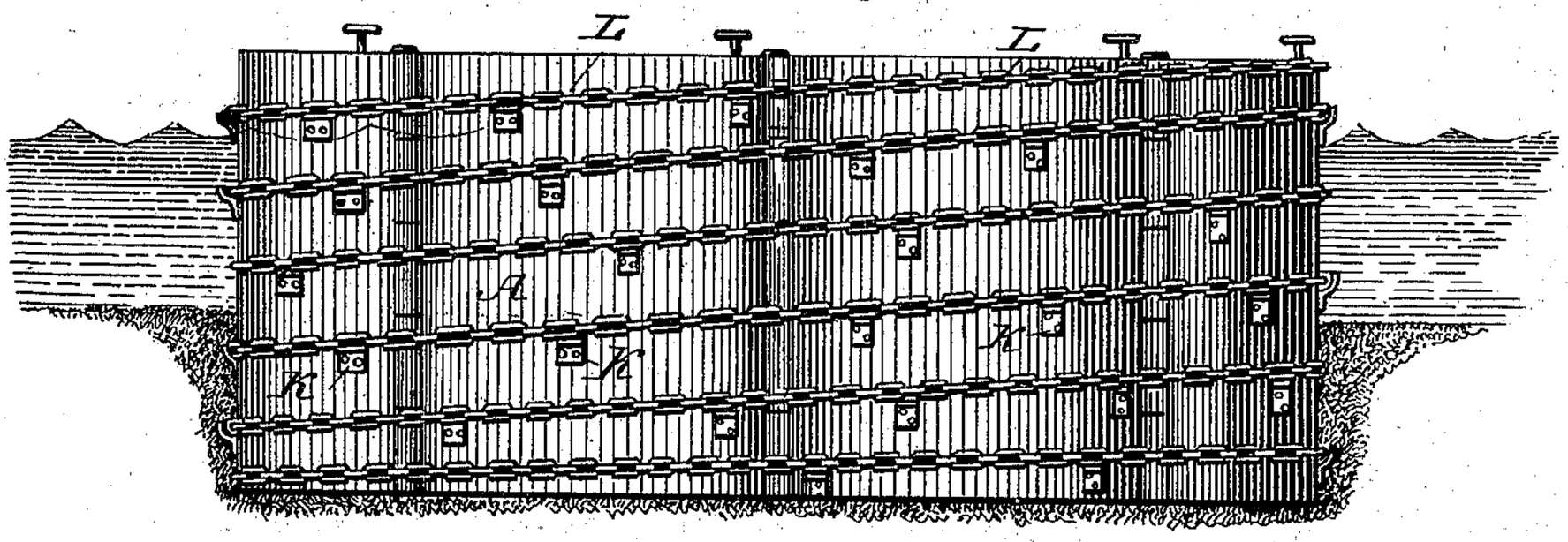
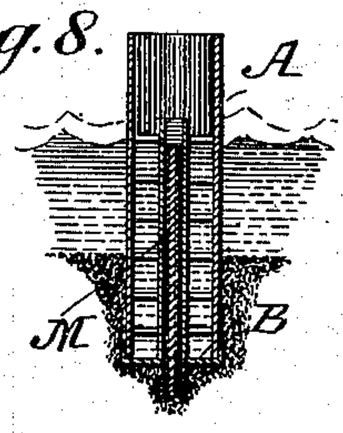


Fig. 8.



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UNITED STATES PATENT OFFICE.

FRANK BALDWIN, OF WASHINGTON, DISTRICT OF COLUMBIA.

CAISSON AND METHOD OF CONSTRUCTING SAME.

SPECIFICATION forming part of Letters Patent No. 559,116, dated April 28, 1896.

Application filed July 30, 1895. Serial No. 557,586. (No model.)

To all whom it may concern:

Be it known that I, FRANK BALDWIN, residing at Washington, District of Columbia, have invented a new and Improved Caisson, of which the following is a specification.

My invention relates to caisson structures for lighthouses, bridges, buildings, &c.; and it primarily has for its object to provide a floating caisson structure which can be towed in a complete form to such point or points at sea, near the coast, or in rivers, where it is impossible to construct a caisson or foundation in the ordinary manner.

More especially my invention seeks to provide a means for setting up a caisson structure for lighthouses at such points upon the coast where the condition of the tides and ground-swells is such as to preclude the possibility of erecting a foundation or caisson at such points.

A further object is to provide a caisson structure which can be conveniently set up at some navy-yard or construction-dock, which will be of great weight, made in the nature of hollow chambers, which, when partially ballasted, will sink sufficient to float and be thereby capable of being readily towed to the point where it is desired to set the same.

Furthermore, my invention has for its object to provide a floatable caisson structure which, when it reaches a predetermined point, can be almost instantly sunk, and which is of such peculiar construction that when sunk it will embed itself in the sea-bed to such a depth as to form a positive anchorage upon which to build the superstructure for the lighthouse or bridge.

Again, my invention has for its object to provide a caisson structure of such a nature, which after being in use can, if desired, be readily again made floatable and removed to another point for reuse.

With other minor objects in view, which hereinafter will appear, my invention consists in the peculiar and novel caisson structure, which will be first described in detail, and then be pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 illustrates my invention as in use. Fig. 2 is a top plan view thereof. Fig. 3 is a transverse section of the same, showing it in its sunk or fixed position. Fig. 4 is a perspective view of one of the caisson-sections. Fig. 5 is a detail view illustrating one way of hinging or connecting the caisson-sections. Fig. 6 is a detail plan view illustrating the watertight joints, formed at the meeting ends of the sections. Fig. 7 is a side elevation of the complete caisson-section, showing the manner of winding and supporting the chain; and Fig. 8 is a sectional view of a caisson-section having a movable centerboard or fin.

In the practical construction my improved caisson is formed of a series of sections, which are linked or joined together to form a mass of sections A, arranged in a circular form. These sections, one of which is shown in Fig. 4, are preferably made of elliptical or monitor-like shape, but may be made elongated or other shape, if desired, such shape, however, being such that the sections can be joined at the ends to form a circular body. Each section A is made of plate-iron, riveted together and provided on the inside with transverse and diagonal brace-bars *a b*, arranged in such a manner as to give the caisson-body the greatest strength possible.

Each caisson A is open at the top and provided with a closed bottom B and made of a depth depending upon the high-water depth at the point where it is desired to place the caisson, such depth being sufficient to allow for the sinking of the caisson structure a desired distance into the sea or river bottom and yet project above the high-water mark.

To add strength to the caisson-sections A, the plates or sheets of which they are composed are riveted to angle-irons C, as clearly shown.

The several sections A have their ends provided with strong eye members D D, which are arranged to intermesh with each other to receive a stout pintle or hinge-bolt E. By joining these several sections in this manner they can be readily assembled to form a circular mass of caissons, as shown in Figs. 1 and 2.

While for simplicity of construction and strength I prefer to join the several sections by the eye-and-bolt connection shown, it is manifest they may be joined by any other

means which will permit of them being arranged in a circular or endless-chain form with their ends held closely together.

To make the joints of the sections A practically water-tight, each section on the inner face near the ends has vertical angle-irons F, back of which are disposed vertical shield-plates G, between which and the joint proper is disposed a filling of rubble, cement, or other solid packing H, which serves, in connection with the plates G, to make the joints water-tight and also add strength to such joints.

I indicates horizontal members which connect the inner faces of the ends of each pair of sections A, as most clearly shown in Fig. 2.

Each of the sections A has a valved inlet J disposed below the normal water-line, preferably on the inner face, the valve-stem of which extends to the top of the section, as clearly shown.

Upon the outer face each section A has a series of diagonally-arranged brackets K, which form supports for a heavy hawser-chain L, which is tightly wound about the mass of such sections A, and is supported on the brackets K. This chain is utilized for two purposes. First, it adds considerable weight to the entire caisson structure, and, secondly, it serves to securely hold the complete structure from spreading outward and keeps, as it were, the several sections compactly joined.

As before stated, my improved caisson is especially adapted for use at places where it is impossible to construct a caisson or foundation, especially at shallow points, sand-bars, shoals, &c., where there is a heavy sea and considerable ground-swells.

By providing a caisson structure as above described and illustrated in the drawings it is clear that by constructing the several sections at some yard or dock suitable for the purpose I can employ the following-described method of construction, viz: first, building each section A, then joining them in the manner stated, then partially ballasting each section, so as to float the entire mass with its bottom at a point, say, four to five feet, more or less, above the shoal or bar on which it is proposed to set the structure, then wrapping the chain about the mass of sections by tug-power or otherwise, and then towing the entire mass to a place near the point where it is desired to sink the structure, where it can remain until the sea is calm or in such a condition as to admit of easy manipulation of the structure, when the mass can be towed to the point of sinking, which sinking operation can be quickly and almost instantly effected by opening the valves of all the sections A to let the water into the same.

It is obvious that the degree to which the entire mass will sink into the sea bottom will depend upon the weight of the structure and the condition of the said bottom.

In practice the caisson structure is made of the greatest possible floatable weight, so that when sunk it will go to a considerable depth and be thereby securely anchored from displacement by any ground-swells.

I desire to particularly state that by forming a structure capable of being sunk as an entire mass and having an interior space it is not necessary to pump out the water held in such interior space previous to placing in position the structure which it is intended to support, as in this case the interior water body forms a dead weight and serves to hold the caisson structure against displacement by the outer water-pressure.

It should be stated that before the caisson structure is sunk the bottom on which it is intended to rest is first sounded to get the surface condition thereof, so as to provide against a possible irregular settling of the caisson mass, which when of a small degree can be overcome by regulating the influx of water through the valved inlets of the sections A. Thus should it be found that the sections at one side settle a little faster than the sections opposite the valves may be temporarily closed on the lowermost side and left open on the highest side until the structure assumes a level condition.

For very irregular bottoms a number or all of the sections A are provided with a center-board-like pendent member or fin M, which may be made integrally with or fast to the bottom B, as shown in Fig. 3, or it may be made vertically movable, as shown in Fig. 8, and provided, if desired, with openings to receive the jet-pipes of hydraulically-operated means for sinking the same into the sand, such fins serving to materially increase the anchorage of the structure.

At points where the bottom is of an extremely irregular condition the caisson mass may be made to sink true by jettying. After the caisson structure has settled to the position desired the hollow piles of the superstructure are sunk within the interior space formed by the caisson-sections in the ordinary manner and made fast by bracing to the upper end of the caisson. After the required number of hollow piles have been sunk and made fast to the caisson the water held in the interior space may be pumped out and such interior space filled with rubble or masonry to produce a solid rock-bottom foundation for the lighthouse, bridge, or other structure.

Should at any time it be found necessary or desired to abandon or remove the caisson structure and the structure it supports, it is manifest that by removing the said upper structure and removing the ballast from the sections A, by pumping or otherwise, the caisson-body can be made to float again and towed to some other point for use.

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

1. A caisson composed of a series of similar sections having hinges at each end whereby said sections are united and formed into a circular body, the interior tie-rods connect-

ing each adjacent pair of sections and the stop-plates between each adjacent pair of sections substantially as shown and described.

2. A caisson composed of a series of hollow sections hinged together at the ends to provide a hollow or ring-like body, the plates arranged at each angle or corner of said body and a filling arranged between said plate and body substantially as shown and described.

3. A caisson composed of a series of floatable sections connected at their ends to form a circular or polygonal shaped body capable of being moved as a whole, and the tie-rods arranged upon the interior and connecting the adjacent sections substantially as shown and described.

4. A caisson comprising a series of floatable hollow sections hinged to one another to form a circular or polygonal shaped hollow body, and the stop-plates arranged at the joints of the sections to make water-tight joints between the sections substantially as shown and described.

5. A caisson comprising a series of sections hinged together and having an exterior binder for holding the sections in proper position substantially as shown and described.

6. A caisson consisting of a series of hollow sections hinged together said sections being connected upon the interior by a series of tie-rods and an exterior binding member applied about the exterior of the caisson as a whole substantially as shown and described.

7. A caisson construction comprising a number of floating caisson-sections having their ends joined with each other, and a chain wound about the whole body, to add weight and strength to such body as specified.

8. A caisson construction comprising floating caisson-sections having hinged joints for connecting them to form a complete mass, each section having spirally-arranged supports or brackets and a chain wound about the entire mass of sections held to rest on the brackets whereby to add weight to the mass and compactly hold the same together as set forth.

9. A caisson construction as specified, consisting of a series of floating caisson-sections having their ends joined whereby to make an endless chain of sections, internal brace members connecting the ends of each pair of sections substantially as shown and described.

10. In a caisson construction as specified the combination with a pair of caisson-sections having their ends hinged to each other, and having each vertical guides on their inner face of a guard-plate held to cover such guides over the inside face of the joint, and packing for closing the space between the said plate and the joint whereby to make such joint water-tight as set forth.

11. A caisson construction comprising a series of caisson-sections, each made floatable, one or more of such sections having a pendent fin or centerboard member, each section having a valved inlet operated from the top, whereby water can be let into each section to sink the same and a chain wrapping held on the outer face of the complete mass of caisson-sections substantially as shown and for the purposes described.

FRANK BALDWIN.

Witnesses:
MARIE L. BALDWIN,
FRED G. DIETERICH.