

L. KIRKUP.
Breakwater.

No. 226,663.

Patented April 20, 1880.

Fig. 1

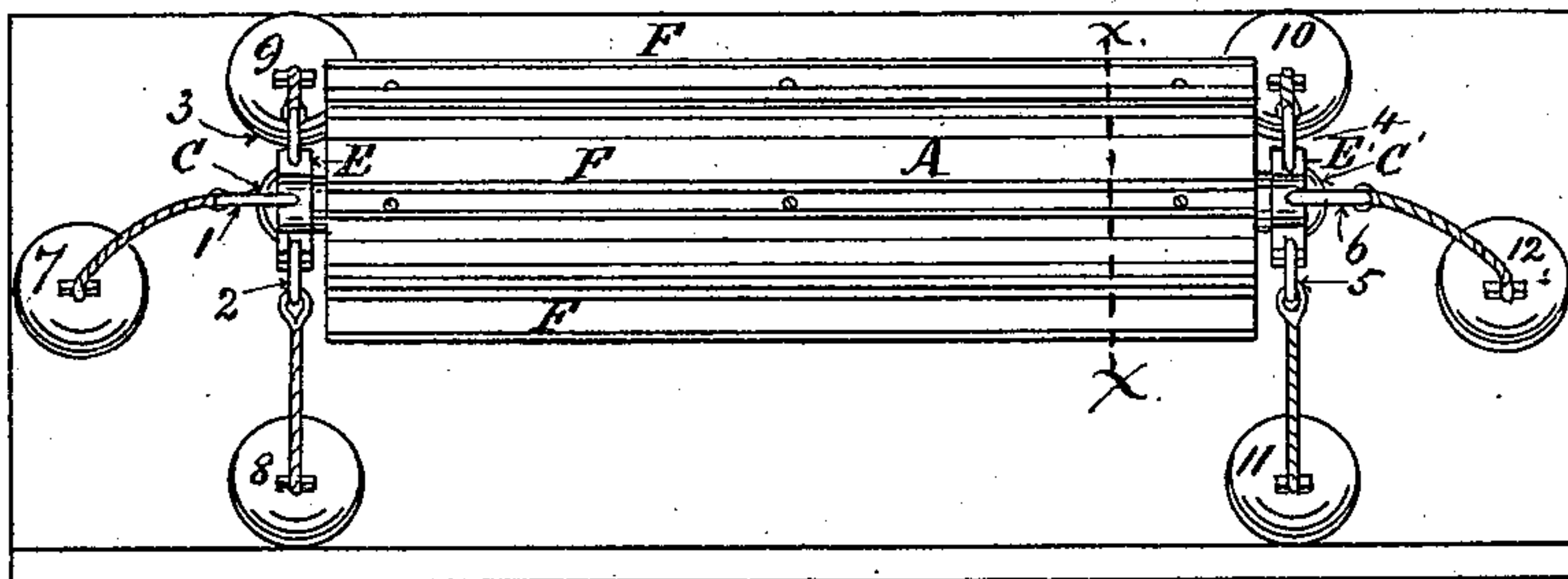


Fig. 2.

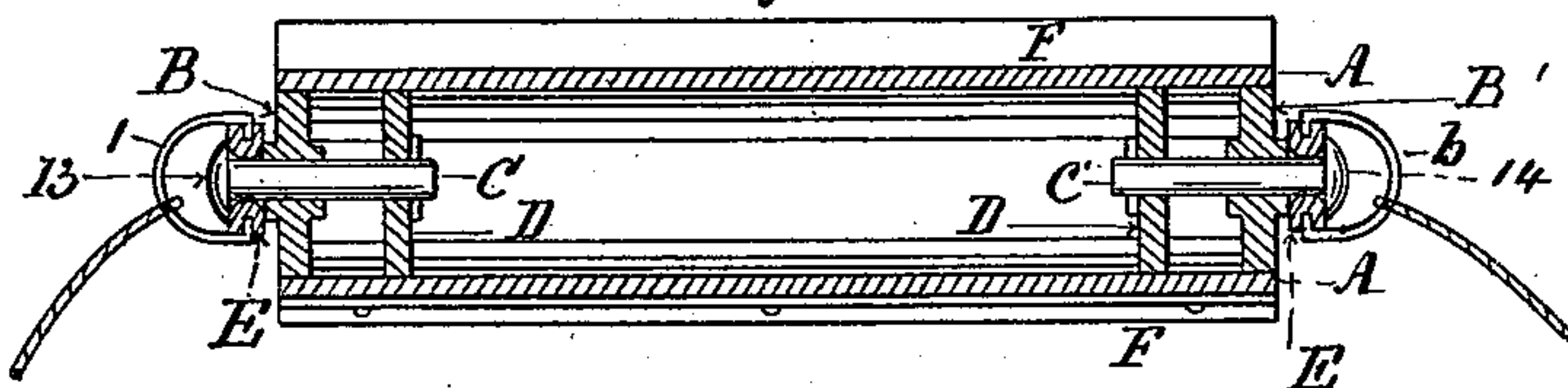


Fig. 3.

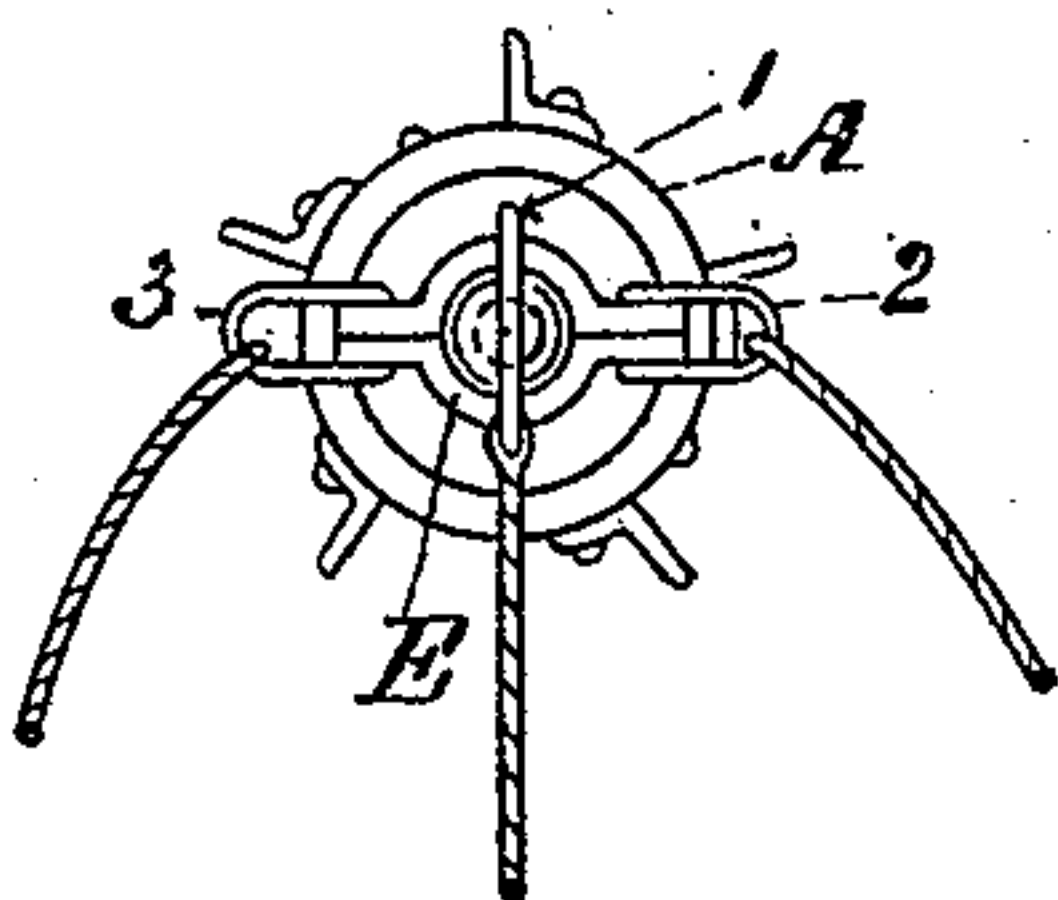


Fig. 4.

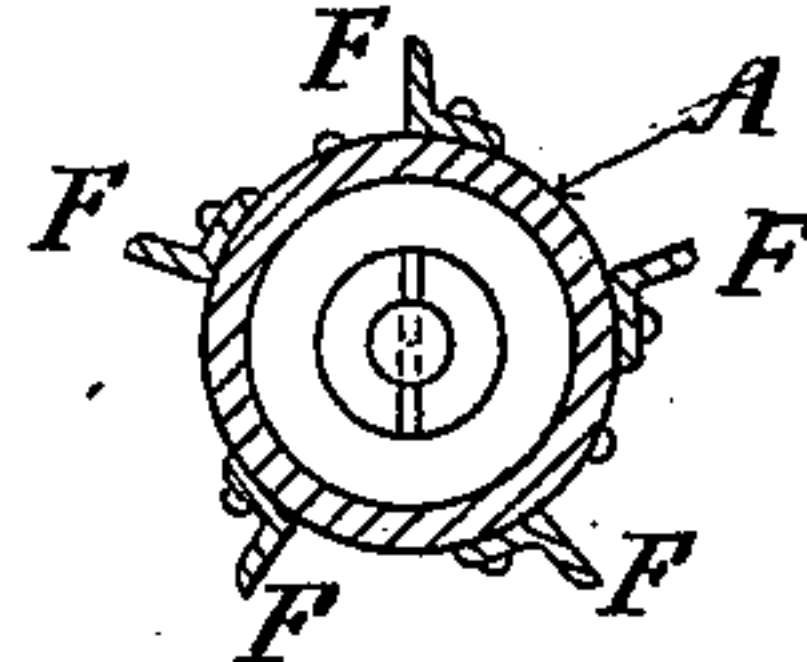
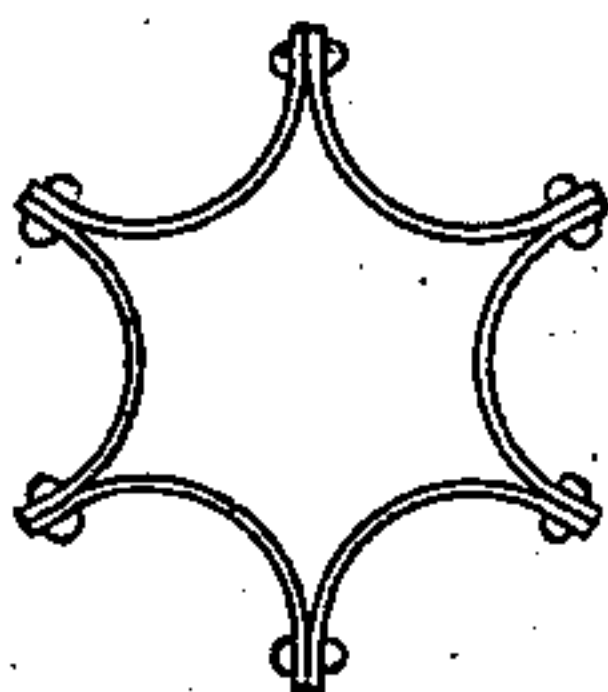


Fig. 5.



Witnesses,
Joseph J. Sullivan
James C. Dalton.

Inventor
Lancelot Kirkup
by J. P. Fellinghusen
Att'y.

UNITED STATES PATENT OFFICE.

LANCELOT KIRKUP, OF BROOKLYN, NEW YORK, ASSIGNOR TO MANHATTAN
IRON AND STEEL PIER AND BRIDGE COMPANY.

BREAKWATER.

SPECIFICATION forming part of Letters Patent No. 226,663, dated April 20, 1880.

Application filed February 10, 1880.

To all whom it may concern:

Be it known that I, LANCELOT KIRKUP, of the city of Brooklyn, in the State of New York, have invented a new and useful Improvement in Breakwaters, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which my invention most nearly appertains to make and use the same, when taken in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of the breakwater and fastenings. Fig. 2 is a horizontal section of breakwater. Fig. 3 is an end view of the breakwater, showing the eyes on the journal of the central shaft. Fig. 4 is a cross-section of the breakwater at the line *xx* of Fig. 1. Fig. 5 is a cross-section of a modified construction of the breakwater.

The breakwater consists of a cylinder, A, preferably made of sheet-iron, having therein and forming part of it heads or ends B B', through which the central shaft, C C', passes and to which it is firmly fastened. This central shaft may be made continuous through the cylinder, or, as shown in the drawings, of short pieces, one at each end, and passing centrally through secondary heads or bearings D D'.

It is found best in making floats of fifty or sixty feet in length to make the shaft as here shown, the heads B B' D D' being firmly united to the walls of the cylinder.

At or near the end of the central shaft or shafts are placed the journal-boxes E E, carrying the eyes 1 2 3 4 5 6, held on the shafts by the heads 13 14, and being free to turn on the shaft, as they may be impelled by the anchor chains or ropes attached to the eyes and the anchors 7 8 9 10 11 12.

On the outside of the cylinder are fastened, by any suitable means, ribs, flanges, or buckets F F F F, running lengthwise of the cylinder, or, if preferred, spirally about the cylinder. The buckets may be braced in any suitable manner against one another, or to the cylinder.

The interior of the cylinder may be braced in any desired manner, to give stiffness to the cylinder and stability to the walls. Except

when very large cylinders are used, the interior bracing may be omitted, as the walls of the cylinder and the buckets give sufficient strength in ordinary cases.

The cylinder and buckets may be made by fastening together curved pieces of sheet-iron at the edges, the convex sides of the sheets being toward the center of the breakwater, as shown in Fig. 5, which is a cross-section of a breakwater so made. The adjacent edges of each of the abutting pieces of sheet metal of which it is formed may be continued to the edge of the bucket, or only one, as desired, for the stability of the bucket.

The operation of the breakwater is as follows: The cylinder, made as above described, is anchored off the shore it is desired to protect by the anchors 7 8 9 10 11 12, attached to the respective eyes 1 2 3 4 5 6 on the journal-boxes E E', being so placed that the axis of the cylinder is parallel with the shore, or nearly so. The breakwater is loaded so to float that its greatest diameter will be about at the water-line. A wave coming on its broadside in this position will catch in those buckets F F which may be above, and expend its force in revolving the cylinder about its axis, the lower or under buckets F F holding the cylinder to resist such revolution.

By placing a number of these breakwaters in line, or nearly so, or in the proper relative position, a harbor or anchorage may be made on the roughest coast, and the shore kept from washing in the most exposed places. By the proper placing of a number of these cylinders an ocean-canal can be made along the sea-coast between the breakwaters and the coast at comparatively small cost.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

The cylindrical floating breakwater fastened in position by its axis, capable of turning about its axis, provided on its surface with longitudinal buckets, as specified and set forth.

LANCELOT KIRKUP.

Witnesses:

JOSEPH J. SULLIVAN,
JAMES E. DALTON.