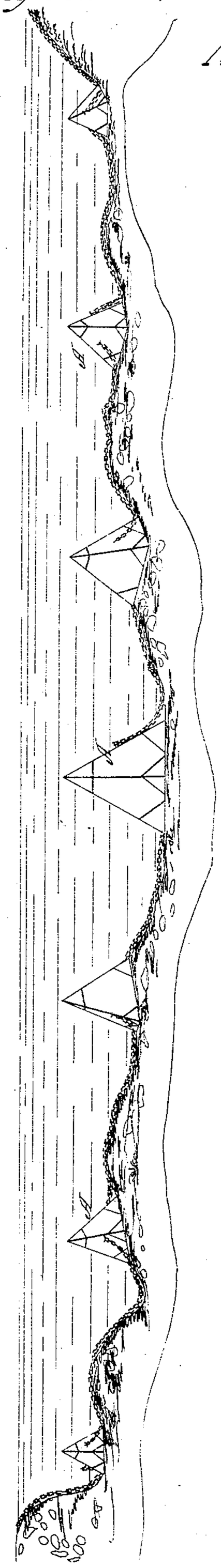
A. B. Cooley.

Obstructing Harbors.

No. 37,613. Patented Feb. 10, 1863.



Witnesses:

Charles G. Fessler
H. Albert Steel

Inventor:

Henry Howson
Atty for A. B. Cooley

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

AARON B. COOLEY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN THE MODE OF OBSTRUCTING RIVERS.

Specification forming part of Letters Patent No. **37,613**, dated February 10, 1863.

To all whom it may concern:

Be it known that I, A. B. COOLEY, of Philadelphia, Pennsylvania, have invented certain Apparatus for Obstructing Rivers, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in obstructing navigable rivers, creeks, inlets, or entrances to harbors, by a series of submerged angular blocks or frames, constructed and chained to each other and to the shore, substantially as described hereinafter, so as to present formidable barriers for impeding the progress of and damaging war-vessels.

In order to enable others to carry out my invention, I will now proceed to describe the manner of constructing and applying the same.

The figure in the annexed drawing, which forms a part of this specification, represents in section the bed of a river, creek, inlet, or entrance to a harbor as obstructed by my apparatus. The latter consists of a number of frames, A, chained together and anchored to the shore or banks of the river. Each frame is made in the form of a "tetrahedron"—a solid figure bounded by four equal equilateral triangles. Although the shape of the frames or blocks may be varied without departing from the main feature of the invention, I prefer the above form to any other, for the reason that a sharp apex will always be presented, no matter which of the four triangular planes of the frame forms the base.

Different modes of construction may be adopted in the manufacture of the frames. The following, however, will suffice to instruct others as to what I consider the best plans for making them: When wood is employed as the principal material in the structure of the frames, beams and stays should be arranged in a proper form as a foundation for the planking, each of the four corners being furnished with a substantial metal socket, and the whole being made sufficiently heavy by the introduction of weights or ballast (if necessary) into the frame to allow the latter to sink readily. Another plan of constructing the frames is that of making them simple skeletons formed of beams properly secured at the four corners by metal sockets. There is an objection to this mode of constructing the frames, however, which is this: that being open, the sand and soil forming the bed of the river can accumulate about them to such an extent as to prevent their removal when a further obstruction of the river is unnecessary. The frames may be made of plate-iron properly stayed in the inside and strengthened at the corners.

In order to apply my invention it will be necessary, in the first instance, to ascertain the depth of the river or inlet to be obstructed, and the sectional form of the same, or an approximation to the sectional form. This will determine the size of the frames, the apex of each being from four to five feet below the surface of the water, and the frames being arranged at such a distance apart from each other that no war-vessel of a formidable tonnage and armament can pass through the channel without coming in contact with one or other of the frames.

The connection of the frames to each other by means of chains, and the anchoring of the whole to the shore, prevents any extended displacement of the said frames by the force of strong tides or currents. At the same time the connecting and anchoring chains serve as useful aids in removing the frames prior to the navigation of the river being resumed.

Two, three, or more series of frames may be arranged at a suitable distance apart from each other, the frames of one series being so situated in regard to those of the other that if a vessel should pass one series of frames without being obstructed, it would be certain to come in contact with one or more of the frames of the other series.

It will be seen without further description that the submerged frames present a most formidable barrier to the navigation of a river or inlet; that contact of a vessel with the sharp points of any one of the frames must insure its certain destruction; and that if any one or more of the frames be turned over their efficiency is in no way impaired, as a sharp destructive apex must always present itself. While the frames present such an effective bar to the navigation of a river or inlet, it

will be seen that they can be readily removed when danger from armed vessels is past.

As an adjunct to shore or floating batteries the importance of my obstructing apparatus will be apparent when we consider the helpless condition of war-vessels damaged by and entangled among the frames.

I claim as my invention and desire to secure by Letters Patent—

Obstructing rivers, harbors, inlets, &c., by a series of angular frames or blocks constructed, chained to each other, and anchored, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AARON B. COOLEY.

Witnesses:

HENRY HOWSON,

JOHN WHITE.