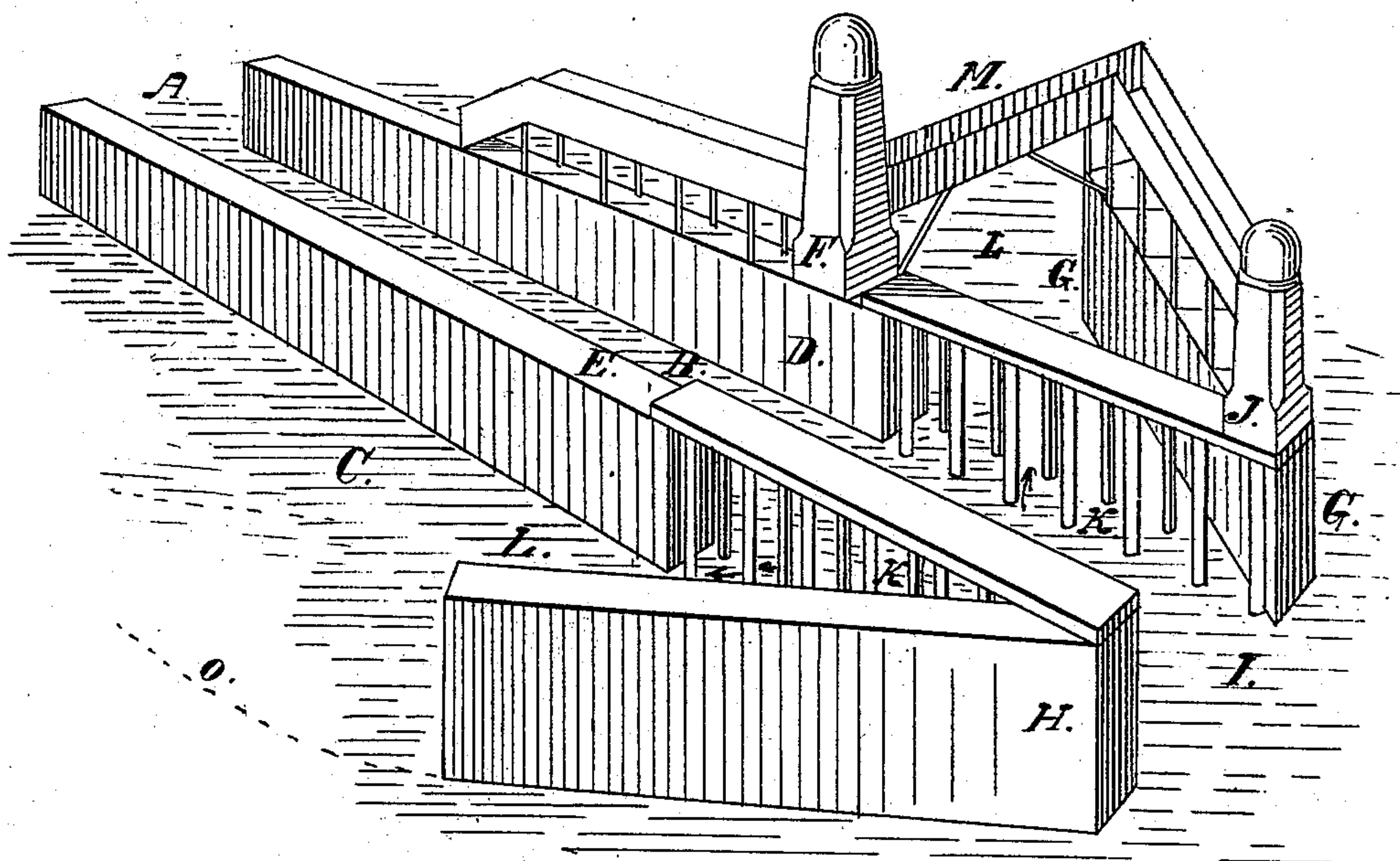


A. M. ELLIOTT.  
BREAKWATER AND PIER.

No. 176,941.

Patented May 2, 1876.

Fig. 1.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ANTHONY M. ELLIOTT, OF KENOSHA, WISCONSIN.

## IMPROVEMENT IN BREAKWATERS AND PIERS.

Specification forming part of Letters Patent No. **176,941**, dated May 2, 1876; application filed April 1, 1876.

*To all whom it may concern:*

Be it known that I, A. M. ELLIOTT, of the city of Kenosha, in the county of Kenosha and State of Wisconsin, have invented certain new and useful Improvements in the Construction of Piers or Breakwaters; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in the construction of piers or breakwaters for the more perfect protection of lake and ocean harbors, and the channels leading to them, from the effects of a rough sea, and whereby the water is prevented from being blown into the channel or harbor by seaward winds.

The accompanying drawing represents a perspective view of my invention.

A in the accompanying drawing is the channel to the harbor. B is the mouth of the channel. D is the right pier. E is the left pier. F is a light-house. G is right breakwater. H is the left breakwater. I is the mouth to the breakwater. J is a light-house upon the outward end of the right breakwater, which, in conjunction with the light-house F, affords range-lights to incoming vessels. K K are a series of piles, which are continued from the ends of the piers D and E, in a direct line with them, to the outer end of the breakwaters G and H, and afford a guide to vessels in entering the mouth of the channel B. L L are water-escapes. M is a bridge connecting the pier D with the breakwater G, which affords a way of communication to the light-house J. By this relative arrangement of the breakwaters or piers G and H with the piers D and E, the influx of water toward the channel is diverted from its direct course, and flows to the right and left of the channel A, through the escapes L L.

It has been observed that when the wind is blowing directly toward the shore the water

is elevated above its natural height in all unsheltered places, and that the waves subside and drop to the common level when shelter is provided.

The piers H and G provide shelter to the spaces C C, included between the dotted lines O O and the channel A. When the waves are driven in through the mouth I they drop to the right and left, as indicated by the arrows, thereby creating side currents, which flow through the escapes L and L into the spaces C and C. When the wind is blowing from the left-hand side the current of water passes from the mouth I out at the right-hand escape L. When it passes in the mouth I from the right-hand side it flows out at the left-hand escape L. The breakwaters or piers G and H are placed at an angle of about twenty degrees to the channel; this angle may, however, be increased or diminished, as circumstances may require.

Harbors have heretofore been protected by constructing a pier at right angles to and in front of the channel; but it is with great danger a vessel enters a harbor with such an obstruction before the channel during a storm, and especially so in the dark, when there is no light-house upon the outer pier.

It is obvious that with my device a harbor is perfectly protected from a storm without these accompanying dangers.

I claim as my invention—

1. The combination and arrangement of the piers G and H with the piers D E and series of piles K K, substantially as and for the purpose specified.

2. The combination and arrangement of the piers G H and D E, series of piles K K, light-houses F J, and bridge M, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ANTHONY M. ELLIOTT.

Witnesses:

GEO. W. SANBORN,  
WM. DANELAND.