

J. A. HOWLAND & W. H. DE NYSE.  
BULKHEAD AND JETTY CONSTRUCTION.

APPLICATION FILED DEC. 10, 1906.

Fig. 1.

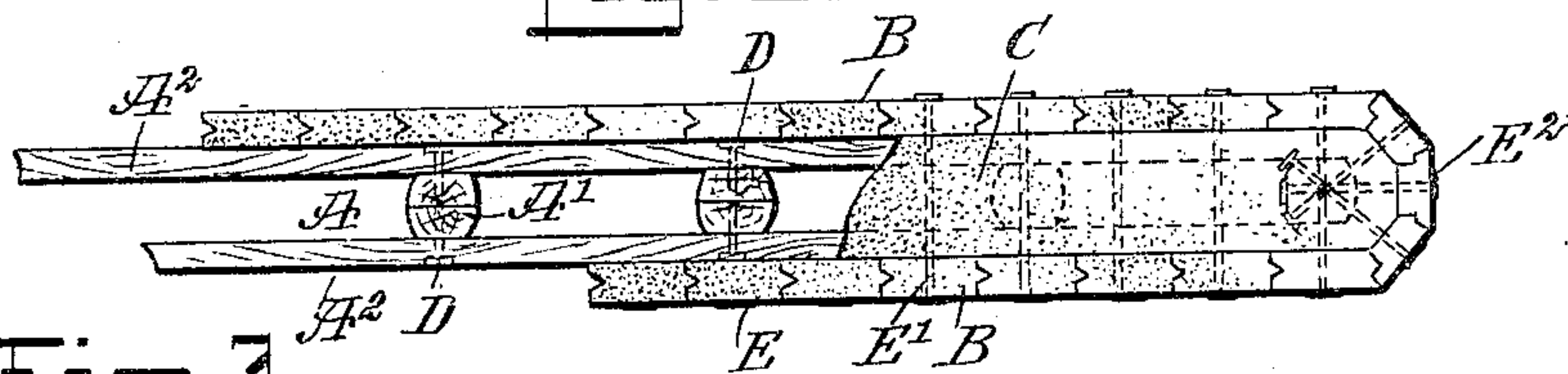


Fig. 3.

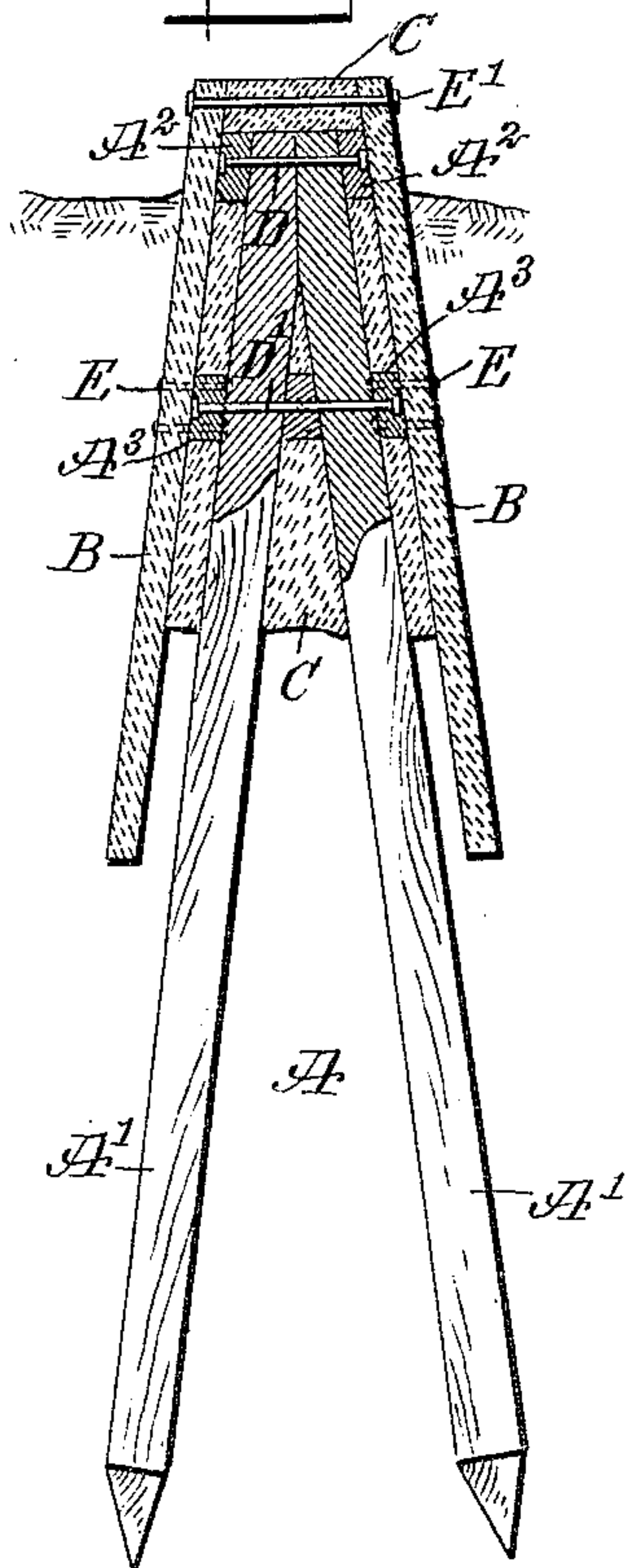


Fig. 2.

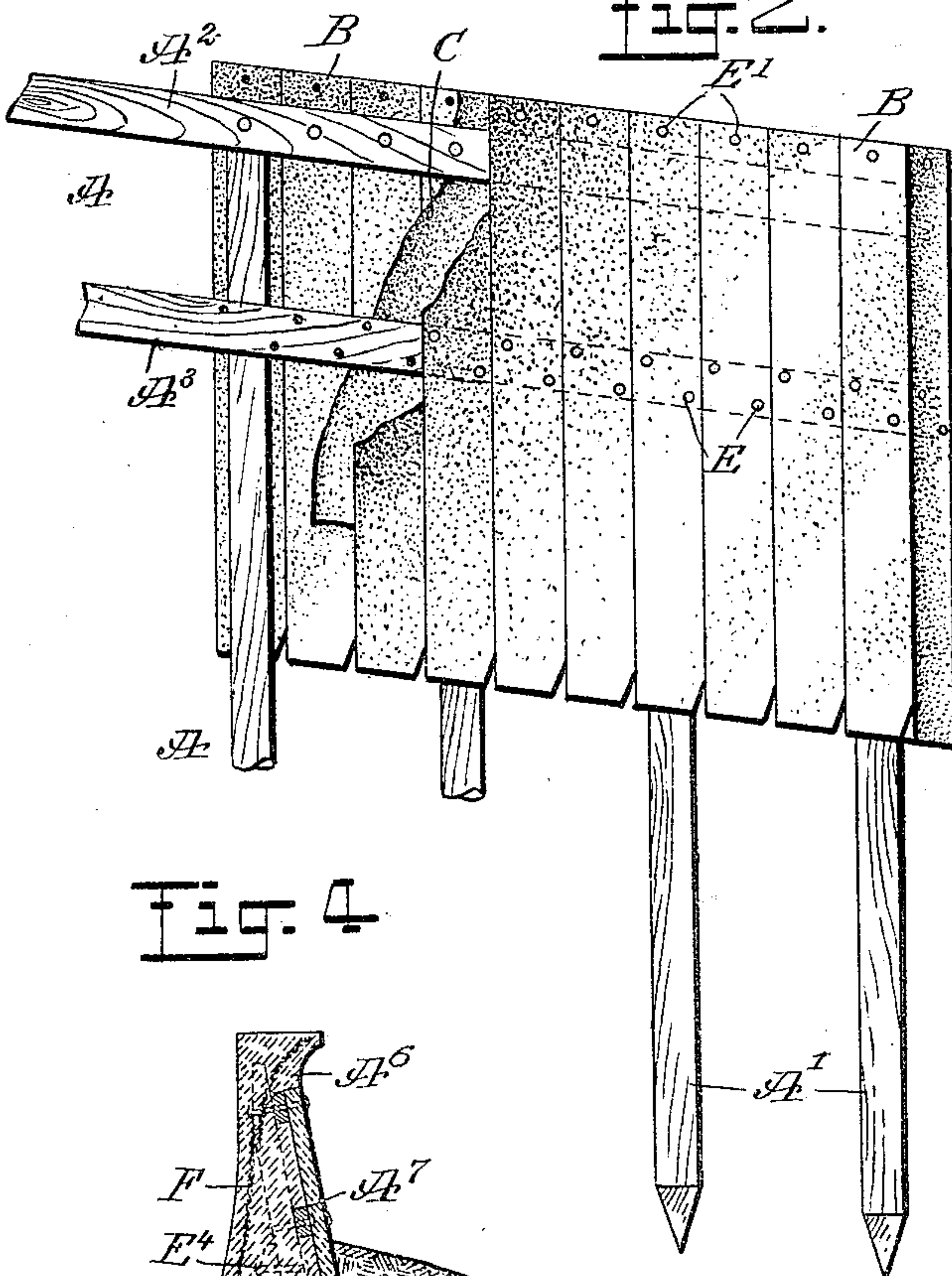
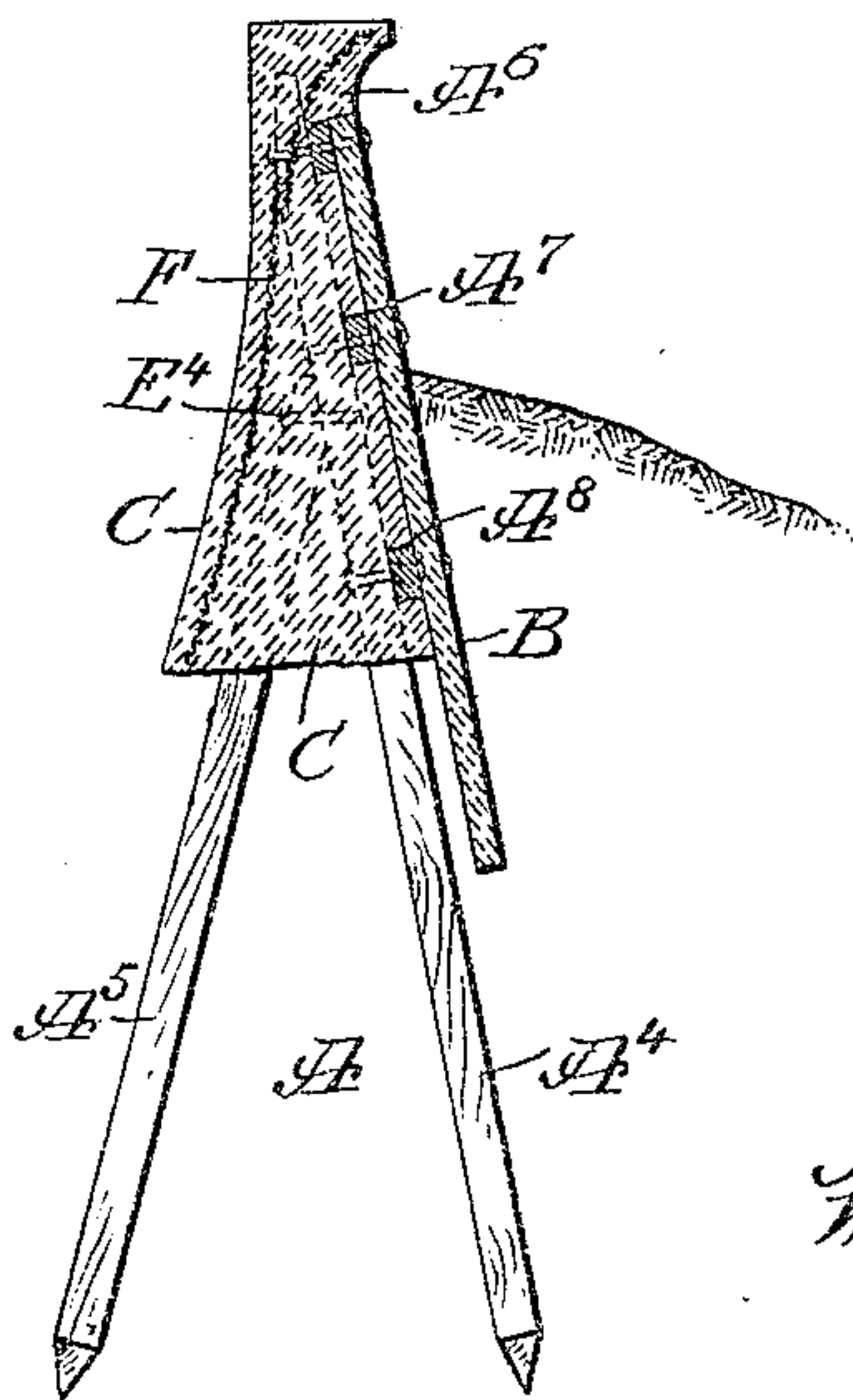


Fig. 4.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JESSE A. HOWLAND, OF SEA BRIGHT, AND WILLIAM H. DE NYSE, OF LONG BRANCH,  
NEW JERSEY.

## BULKHEAD AND JETTY CONSTRUCTION.

No. 897,370.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed December 10, 1906. Serial No. 347,062.

*To all whom it may concern:*

Be it known that we, JESSE A. HOWLAND, a resident of Sea Bright, in the county of Monmouth and State of New Jersey, and  
5 WILLIAM H. DE NYSE, a resident of Long Branch, in the county of Monmouth and State of New Jersey, both citizens of the United States, have invented a new and Improved Bulkhead and Jetty Construction,  
10 of which the following is a full, clear, and exact description.

The invention relates to hydraulic engineering, and its object is to provide a new and improved bulk-head or a jetty construction, more especially designed for use along  
15 the coast in harbors, rivers and other water ways and arranged to form a lasting protection against the ravages of the sea, teredos and other destructive causes.

20 The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention  
25 is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement  
30 in the form of a jetty, parts being broken out; Fig. 2 is a face view of the same, parts being broken out; Fig. 3 is a transverse section of the same, and Fig. 4 is a like view of the improvement in the form of a bulk-head.

35 On a suitable support or like structure A driven into the bed of the water way is secured a driven sheet planking B, and a backing C of concrete is arranged at the rear of the planking B and embeds the upper portion  
40 tion of the support A. Now for a jetty the sheet planking B is arranged on both sides of the support A as well as on the end thereof, as will be readily understood by reference to Figs. 1 and 2, but for bulk-heads such as  
45 illustrated in Fig. 4, it is only necessary to use the planking B on the front face of the support A.

The support A shown in Figs. 1, 2 and 3 consists of spaced pairs of piles A', the piles  
50 in each pair abutting at their upper ends, to then diverge in a downward direction, and to the outer sides of the pairs of piles A' are secured by bolts D, D' the upper and lower stringers A<sup>2</sup>, A<sup>3</sup>, thus forming a strong supporting structure for the planking B. The

driven planking B consists of concrete reinforced tongued and grooved planks, such as more fully shown and described in the application for Letters Patent, Serial No. 347,061 filed under even date herewith. The planks  
60 are driven down into the bed of the water way along the stringers A<sup>2</sup>, A<sup>3</sup> as guideways, and as the planks interlock with each other by their tongues and grooves (see Fig. 1), it is evident that a continuous sheet planking  
65 is produced and which extends a desired distance into the bed of the water way. The individual planks are secured by bolts E to the lower stringers A<sup>3</sup>, and bolts E' connect the upper ends of the planks on both sides of  
70 the support A with each other, the said bolts E' also extending through the upper portion of the concrete backing C.

Now in forming the jetty, the piles A' are first driven into the bed of the water way,  
75 after which the stringers A<sup>2</sup>, A<sup>3</sup> are secured in place by the bolts D, D', and then the concrete planks are driven down into the bed of the water way along the stringers A<sup>2</sup>, A<sup>3</sup> as guide ways, after which the planks are bolted  
80 in place, as above described. Now the material of the bed of the water way extending between the plankings on opposite sides of the structure A is excavated, if necessary, to the desired depth and the space is filled with  
85 the concrete C which on setting forms an exceedingly strong backing for the plankings B, at the same time the concrete embeds the upper portion of the support A, thus rendering the entire structure exceedingly strong  
90 and durable, so as to readily withstand the force of the waves. The planks at the end of the jetty are fastened in place by bolts E<sup>2</sup> engaging the end pair of piles, as plainly indicated in Fig. 1.

95 When building the bulk-head shown in Fig. 4, pairs of piles are driven into the bed of the water way, each pair consisting of two piles A<sup>4</sup>, A<sup>5</sup>, of which the front pile A<sup>4</sup> is pressed by the rear pile A<sup>5</sup>, and the two piles  
100 are fastened together at their upper ends by a bolt E<sup>4</sup>. The stringers A<sup>6</sup>, A<sup>7</sup>, A<sup>8</sup> are secured to the outward face of the front piles A<sup>4</sup>, and to the stringers are secured the planks for forming the planking B, and then  
105 the concrete backing C is placed in the rear of the planking so as to embed the upper portion of the support A. As shown in Fig. 4, the concrete backing C is reinforced from the top to the bottom by a suitable metallic rein- 110



forcing material F such as wire netting, and the backing is preferably extended above the top of the planking B as well as the support A, so as to form a coping for the structure, the coping having a tendency to deflect the water back into the water way.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A bulk-head, jetty or like structure comprising a support formed of a plurality of spaced and connected piles driven into the bed of the water way, a driven concrete sheet planking held on the said support, and backing for the said sheet planking and embedding the upper portion of the said support.

2. A bulk-head, jetty or like structure comprising a support formed of spaced pairs of piles driven into the bed of the water way, the piles of each pair of piles diverging downwardly, and stringers connecting the pairs of piles, driven interlocked concrete planks attached to the said support, and concrete backing for the said planks and embedding the upper portion of the said support.

3. A bulk-head, jetty or like structure comprising a support, sheet plankings on opposite sides of the said support, and a backing of concrete for the said sheet plankings and embedding the upper portion of the said support.

4. A bulk-head, jetty or like structure comprising a support formed of a plurality of pairs of piles connected together, the piles of each pair of piles being secured together and having their lower ends diverging, concrete planking secured to the support, and a backing of concrete for the said planking and embedding the upper portion of the piles.

5. A bulk-head, jetty or like structure comprising a support, and sheet plankings on opposite sides of the said support and formed of interlocked concrete planks, driven down on the said support as guideways and firmly secured thereto.

6. A bulk-head, jetty or like structure comprising a support, sheet plankings on opposite sides of the said support and formed of interlocked concrete planks driven down on the said support as guideways and firmly secured thereto, and a concrete filling between the said plankings and embedding the upper portion of the said support.

7. A bulk-head, jetty or like structure

comprising a support formed of spaced pairs of piles driven into the bed of the water way, the piles in each pair of piles diverging in a downward direction, and stringers secured to the outside of the pairs of piles, and concrete planks driven down into the bed of the water way along the said stringers as guideways, the said planks being of reinforced concrete and interlocked to form an uninterrupted sheet of planking on each side of the said support.

8. A bulk-head, jetty or like structure comprising a support formed of spaced pairs of piles driven into the bed of the water way, the piles in each pair of piles diverging in a downward direction, and stringers secured to the outside of the pairs of piles, concrete planks driven down into the bed of the water way along the said stringers as guideways, the said planks being of reinforced concrete and interlocked to form an uninterrupted sheet of planking on each side of the said support, and concrete interlocked planks around the end of the support and interlocked with the sheet plankings at the sides of the supports.

9. A bulk-head, jetty or like structure, comprising a support formed of spaced pairs of piles driven into the bed of the water way, the piles in each pair of piles diverging in a downward direction, and stringers secured to the said outside of the pairs of piles, concrete planks driven down into the bed of the water way along the said stringers as guideways, the said planks being of reinforced concrete and interlocked to form an uninterrupted sheet of planking on each side of the said support, and a backing of concrete between the said plankings and embedding the upper portion of the said support.

10. A bulk-head, jetty or like structure comprising a support, a driven concrete sheet planking held on the said support, and a backing for the said sheet planking and embedding the upper portion of the said support, the said planking and the said backing extending upward beyond the top of the said support.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JESSE A. HOWLAND.

WILLIAM H. DE NYSE.

Witnesses:

BELVILLE VAN BRUNT,  
GRACE SHAPTER.