

(No Model.)

2 Sheets--Sheet 1.

T. B. LOVDAL.  
SHORE PROTECTOR.

No. 601,663.

Patented Apr. 5, 1898.

Fig. 1.

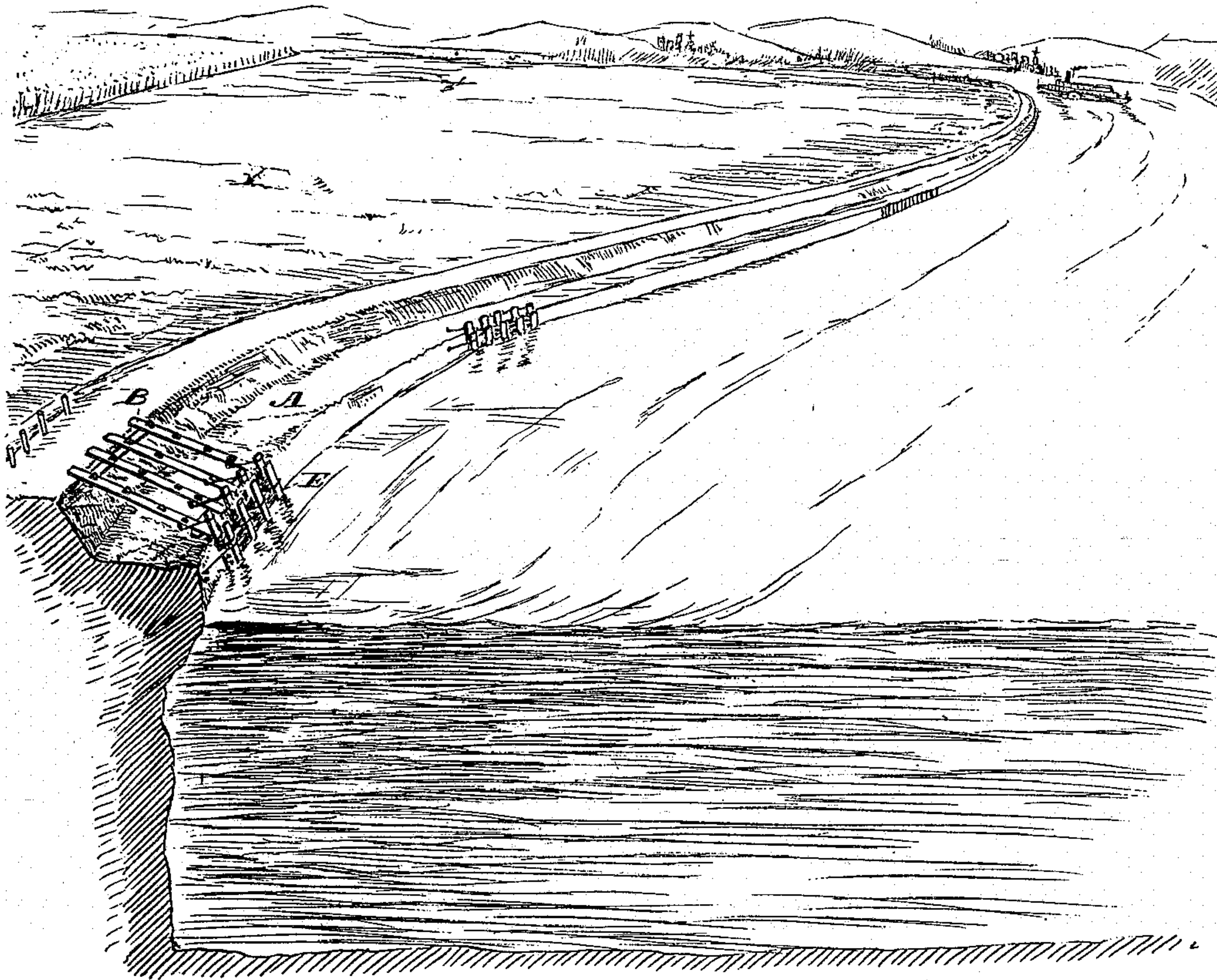
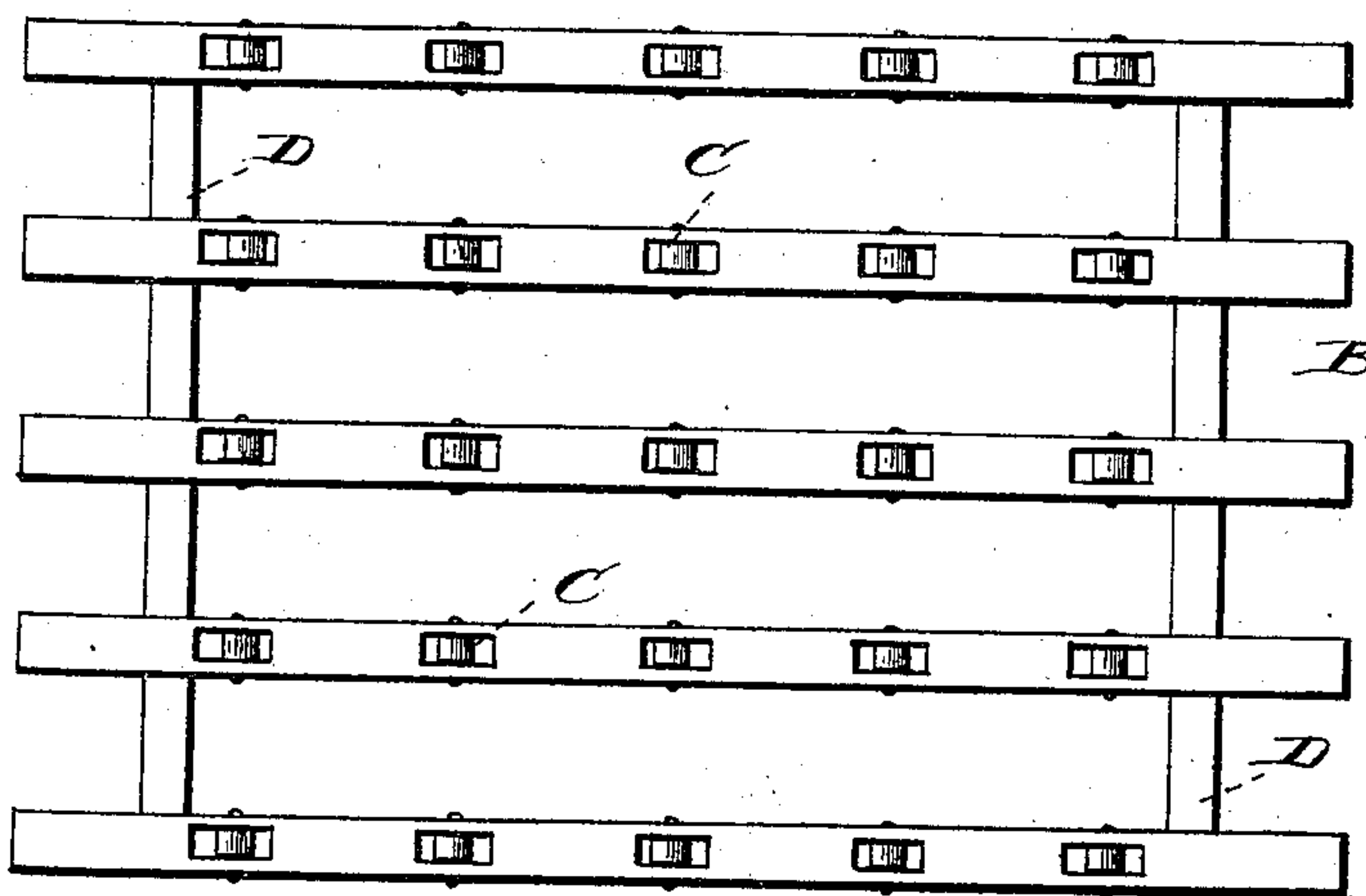


Fig. 2.



Witnesses

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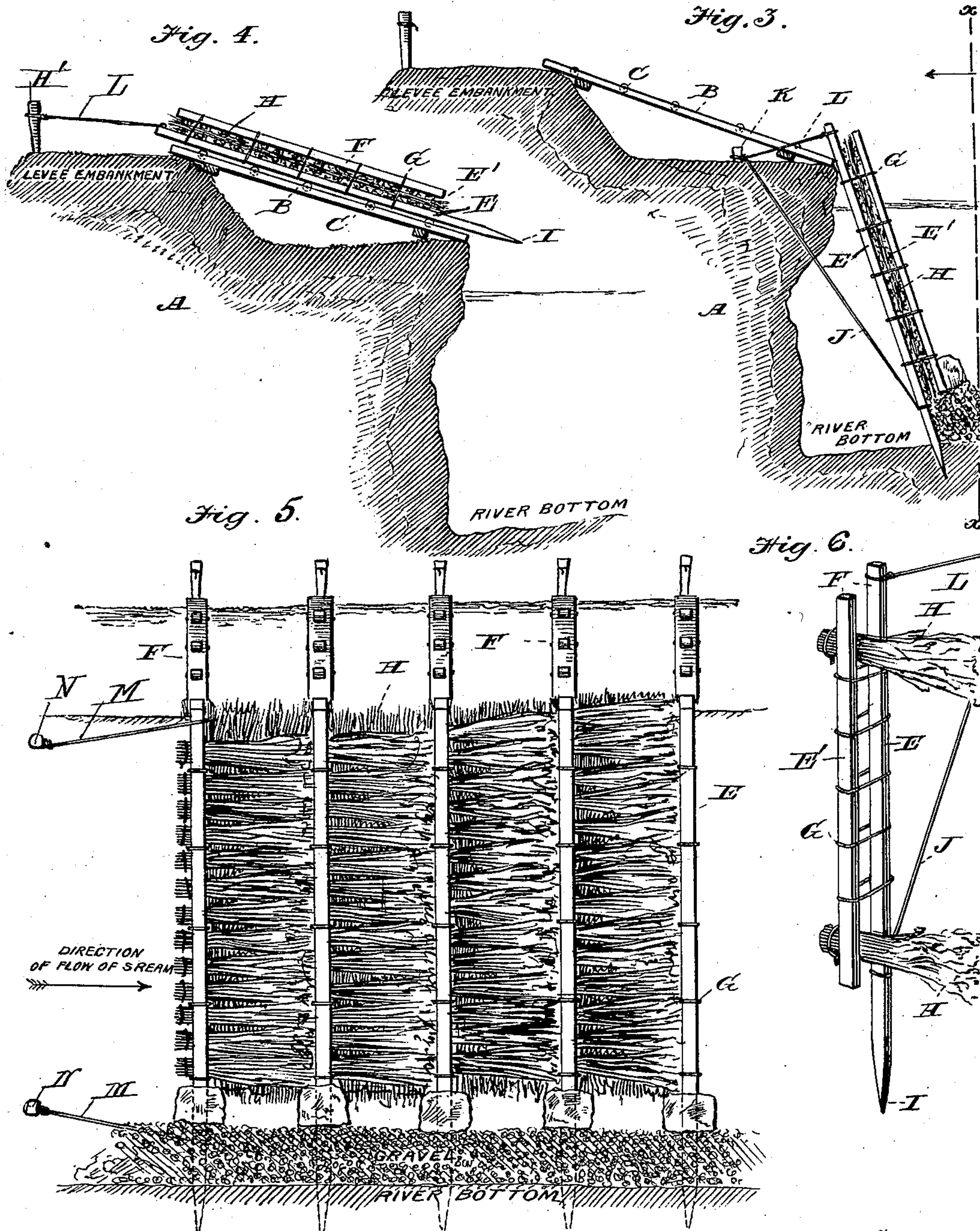
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Inventor

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# UNITED STATES PATENT OFFICE.

THOMAS B. LOVDAL, OF SACRAMENTO, CALIFORNIA.

## SHORE-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 601,663, dated April 5, 1898.

Application filed April 10, 1897. Serial No. 631,565. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS B. LOVDAL, residing at Sacramento, in the county of Sacramento and State of California, have invented a new and useful Shore-Protector, of which the following is a specification.

This invention has relation to certain improvements in brush mattresses for revetting banks or levees.

The object of the invention is to provide a mattress for the purpose described having the brushes located therein for the purposes intended, the same being adapted to be freely movable upon a skid secured to the shore or embankment alongside a stream or river.

Another object of the invention is to provide a mattress for the revetting or protecting of the embankments or levees of a stream or river consisting of a skid on which the mattress is freely movable, adapted to be attached or secured to the shore to permit of the mattress being let down over the said skid, so that the lower end thereof can be sunk in the bottom of the river.

A further object of the invention is to provide a shore-protector comprising the mattress mounted upon a skid, the skid being secured to the shore, and also to provide fastening means whereby the mattress is held in the desired position after the same has been let down or off the skid.

With these and other objects in view my invention consists of certain details of construction and novelties of combination that will be hereinafter more fully described, and particularly pointed out in the claims.

In order that my invention may be fully understood, I will proceed to describe the same with reference to the accompanying drawings, in which—

Figure 1 is a perspective view, the same illustrating a stream and the mattress in position along the bank thereof. Fig. 2 is a top plan view of the skid provided with the rollers and adapted to support the mattress ready to be passed over the embankment into the river. Fig. 3 is a view illustrating a section of a levee and embankment with a skid thereon and a mattress in position to protect the bank. Fig. 4 is a similar view before the mattress has been sunk into position. Fig. 5 is a sectional view, partly in elevation on the line  $x x$  of

Fig. 3, looking down in the direction of the arrow, the cross-bars of the skids being omitted. Fig. 6 is a detail perspective view of the bars provided with openings to receive the brush portions.

In the practical embodiment of my invention I have shown a representation of an embankment or levee A.

B indicates a skid constructed in any desirable manner and being preferably provided with the roller C, mounted within the openings in the slats, the slats being connected by cross-bars D near the ends.

E indicates my improved mattress, formed of a series of frames, each of which consists of two poles, the inner pole of each frame being marked E and the outer one E', the poles E being pointed, as at I, to enter the earth at the bottom of the river adjacent to the bottom of the bank or levee, while the poles E' are shorter and cut square off at their lower ends to rest upon the bottom of the river or some foundation placed thereon. In making up this mattress the poles E are laid on the rollers on the skid B with their points I toward the river, they being secured against prematurely sliding off by means of wires or cables L, Fig. 4, secured at their outer ends to the poles and at their inner ends to stakes or posts H'. Bundles of brush or similar material are now piled crosswise on the poles E, and when sufficient has been placed thereon to make a mattress as thick as desired the poles E' are laid on top of the brush parallel with the poles E, with upper ends being about even with those of said poles E and rigidly secured to them by means of bands or rings G, of steel or other suitable material.

It will be observed that the skids are placed at a point which will permit the ends I of poles E to project over the bank and that another line of poles K are erected near the brink of the levee or bank.

Before the mattress is launched it is properly weighted at the bottom to cause it to sink and force points I into the earth of the river-bottom.

Anchor-wires J are provided, attached near the bottom of poles E, and when the mattresses are launched these anchor-wires are secured at their upper ends to the posts K, the wires L also becoming anchor-wires and



being connected at their inner ends to said posts K.

It will be understood from the foregoing that to launch a mattress it is only necessary to sever or unloosen the wires or cables L, when the mattress will slide off the skid over the bank into position, as before described.

Where a number of mattresses are placed side by side, they may be connected by wires, chains, or cables, and the mattress farthest up stream may be anchored against washing down stream by anchor wires or cables M, secured to stakes or posts N, set in the bank.

When in place, as described, the brush will prevent the passage of water to wash out the bank. In order more surely to do this, the layer of bunches of brush of the mattress may be doubled, trebled, or multiplied to any extent desired, each alternate layer being placed at right angles to the preceding layer and the whole secured by any suitable means in addition to those mentioned.

To have the bunches of brush ready and handy, they are usually done up by securing the butt-ends by wire or other analogous fastenings, as shown at O in Fig. 6.

While I have illustrated and described the best means now known to me for carrying out my invention, I do not wish to be understood as restricting myself to the exact details of construction shown or described, but hold that any slight changes or variations, such as might suggest themselves to the ordinary mechanic, would properly fall within the limit and scope of my invention.

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

1. The herein-described shore-protector consisting of a frame having the brushes located thereon, said frame being composed of a series of standards or timbers connected to-

gether by wire bands or the like, the lower ends of said timbers being provided with the pointed ends, in combination with a skid or way having the rollers mounted thereon, for the purpose described.

2. A mattress for the purpose described comprising the framework having the bands or wire rods surrounding the same and adapted to secure the several parts in position, the brushes located within said framework, said framework being provided with the lower pointed ends, and an upwardly-extended bar from the rear portion thereof adapted to be secured to the upper surface of the embankment or shore, substantially as shown and described.

3. The mattress for protecting levees or banks, consisting of parallel poles having pointed lower ends adapted to sink into the river-bottom at the bottom of the bank or levee, the layer of bunches of brush upon said poles, the parallel shorter poles laid upon said layer of brush, and the bands connecting the parallel poles and bending them tightly upon the brush, substantially as described.

4. A shore-protector comprising a way or skid having the rollers mounted thereon as shown, in combination with a mattress, the same consisting of two sections suitably secured together, one of said sections being provided with the downwardly-extended pointed end and a connection secured to the portion carrying said end, the same being adapted to be attached to a stake on the surface of the ground and then to the upper extended end of the portion of the mattress carrying the pointed end, substantially as and for the purpose set forth.

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Witnesses:

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