

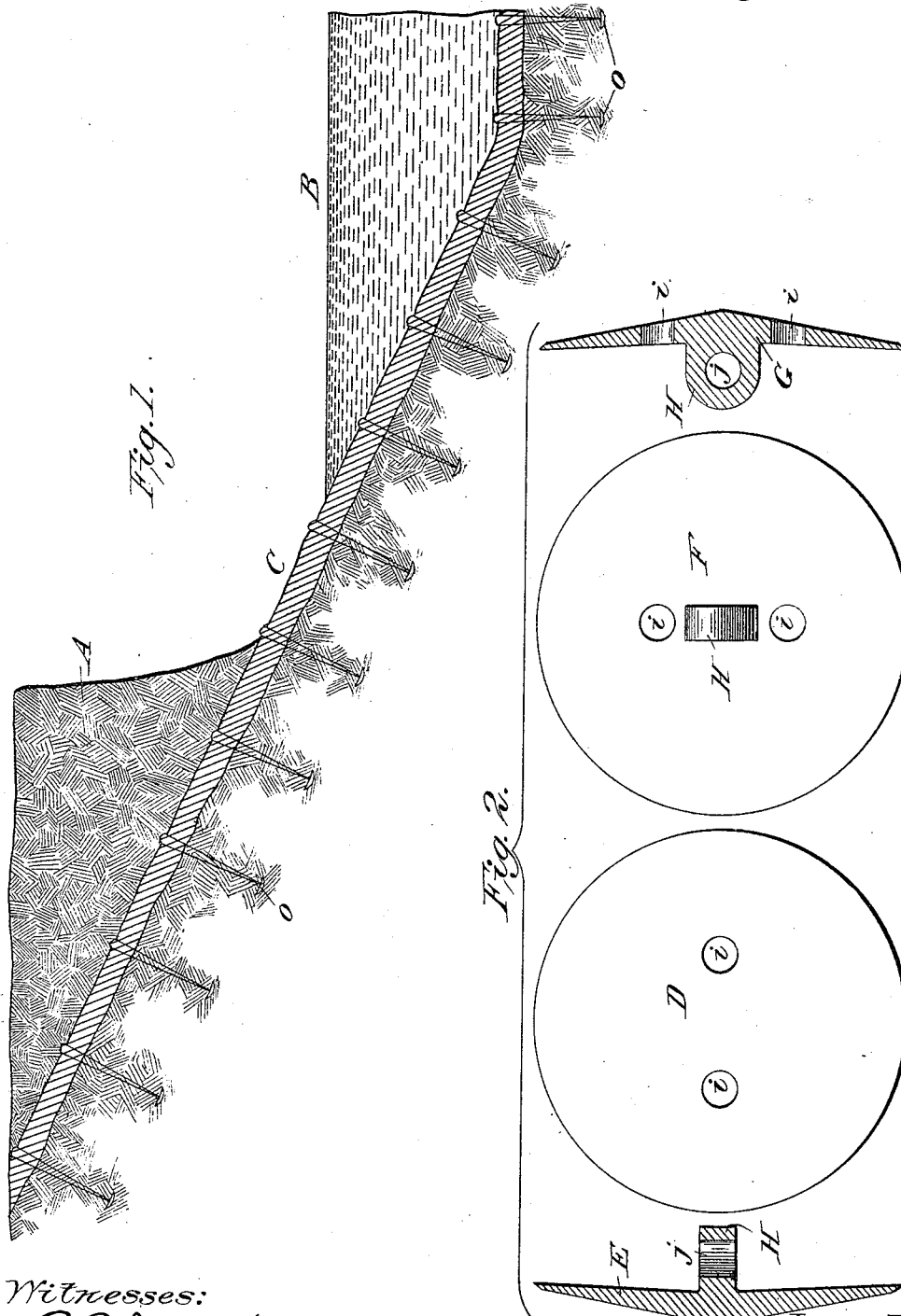
(No Model.)

J. W. NIER.

HOLDING BRUSH MATTRESS FOR REVETTING RIVER BANKS.

No. 457,818.

Patented Aug. 18, 1891.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN W. NIER, OF KANSAS CITY, MISSOURI.

## HOLDING BRUSH MATTRESS FOR REVETTING RIVER-BANKS.

SPECIFICATION forming part of Letters Patent No. 457,818, dated August 18, 1891.

Application filed December 8, 1890. Serial No. 374,001. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. NIER, a citizen of the United States, residing at Kansas City, in Jackson county, State of Missouri, have invented certain new and useful Improvements in the Method of Holding Brush Mattress in Place when Used for Revetting River-Banks and Similar Places; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters of reference marked thereon, which form a part of this specification.

It is well known that "brush mattress" has long been used in revetting river-banks to protect them from being cut into and washed away by swift currents. At the present time the method of fastening or holding brush mattresses in place is by means of rock or gravel deposited upon the mattress in suitable quantities—a method which requires great quantities of these materials when so employed upon such brush mattress to hold it firmly in place and keep it from being carried away by high waters and swift currents. It will be readily seen that in many places where stone and gravel are scarce and have to be hauled or shipped from long distances it is a very expensive method of fastening or holding said brush mattress in place.

My invention has relation to improved means of fastening or holding said brush mattress in place without using stone or gravel in large quantities, but by substituting a system of anchorage which is stronger, more durable, and very much less expensive. My invention, therefore, it will be seen, is novel in all its parts, as will be hereinafter fully described, and particularly pointed out in the claims.

I have fully and clearly illustrated my invention in the accompanying drawings, where—

Figure 1 is a transverse section of revetment, showing river and river-bank, brush mattress, and the disposition of the anchors. Fig. 2 shows different views of one kind of anchor used in my method or process.

Referring now to the drawings, A designates the river-bank as cut down preparatory to laying the brush mattress.

B designates the river or water.

C designates the brush mattress.

o o o o designate one kind of anchor used in my method or process, which is of a circular shape, having its bottom side convex and its upper side or surface smooth or flat and being provided with two suitable finger-holes for easy handling and a lug on the upper surface, through which runs a wire cable which connects it with the main cable laid over the brush mattress to keep it in place.

In Fig. 2, D designates the convexed side of the anchor; F, the concaved side. E designates the main body of the anchor. H designates a lug formed on the concaved side of the anchor at its central part. This lug is provided with the opening *j*, through which the wire cable passes to secure the anchor to the cable. *i i* designate finger-holes, which are provided to permit the anchor to be easily grasped from its convex side. G designates the point of connection of the lug with the main body of the anchor. This lug can be formed and molded as a part of the anchor when desired.

The brush mattress is held in place as follows: I anchor the mattress in a most thorough manner by means of these anchors. These anchors are provided with short pieces of wire cable for the following purpose: One end of the wire cable is firmly attached to the anchor and the other end to the main cables used to keep the mattress in place. These anchors are connected in this way to the main cables at suitable distances apart by means of the short cables attached to the anchors. A hole is bored or drilled in the bank or river-bottom by means of a water-jet and the anchor is sunk into the hole thus made. When the water-jet is drawn up, the sand, mud, and gravel rush in and fill up the hole or opening and cover the anchor many feet deep and hold it in place so firmly that it would require a large amount of direct pull to start one of these sunken anchors.

I also claim the use of any other anchor of any suitable shape for the purpose specified.

It will be readily seen that my means of anchoring brush mattress has the following advantages over any other means employed, viz: When brush mattress is so held by anchors so placed, it will not only stand the most violent strains from high water and swift currents, but it will be much more durable than stone ballasting, which is liable to break through the brush mattress when a little decayed and sink; also, by using these means employed by me the point of anchorage is not accessible to the scour of the river by currents and does not add any weight to the bank, which tends to make the same unstable.

Furthermore, my means does away with the use of stone to a very large degree to keep the brush mattress in place, and thereby is very much less expensive.

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

1. The combination, with a brush mattress C, of the anchors o, provided on their concaved sides with lugs having an opening, wire cables stretched along the face of the mattress, and other wire cables vertically attached to said cables at one of their respective ends

and to the lugs on the anchors o at their other end, substantially as shown and described.

2. The protector for embankments, formed of a layer of branches, stalks, or analogous material rapped together to form a brush mattress and held in place by disk anchors sunk in the embankment and wire cables stretched along the face of the covering and secured to shorter cables, which in turn are secured to the sunken anchors, said anchors being provided with suitable lugs having an opening through which said cables may be attached, all substantially as described.

3. A circular-shaped disk or mushroom anchor having its under surface convexed and its upper surface flat, provided with finger-holes for easy handling, and a lug on its upper surface suitable for attaching to an ordinary wire cable, all substantially as described, and for the purpose specified.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN W. NIER.

Witnesses:

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GUY C. RICH.