

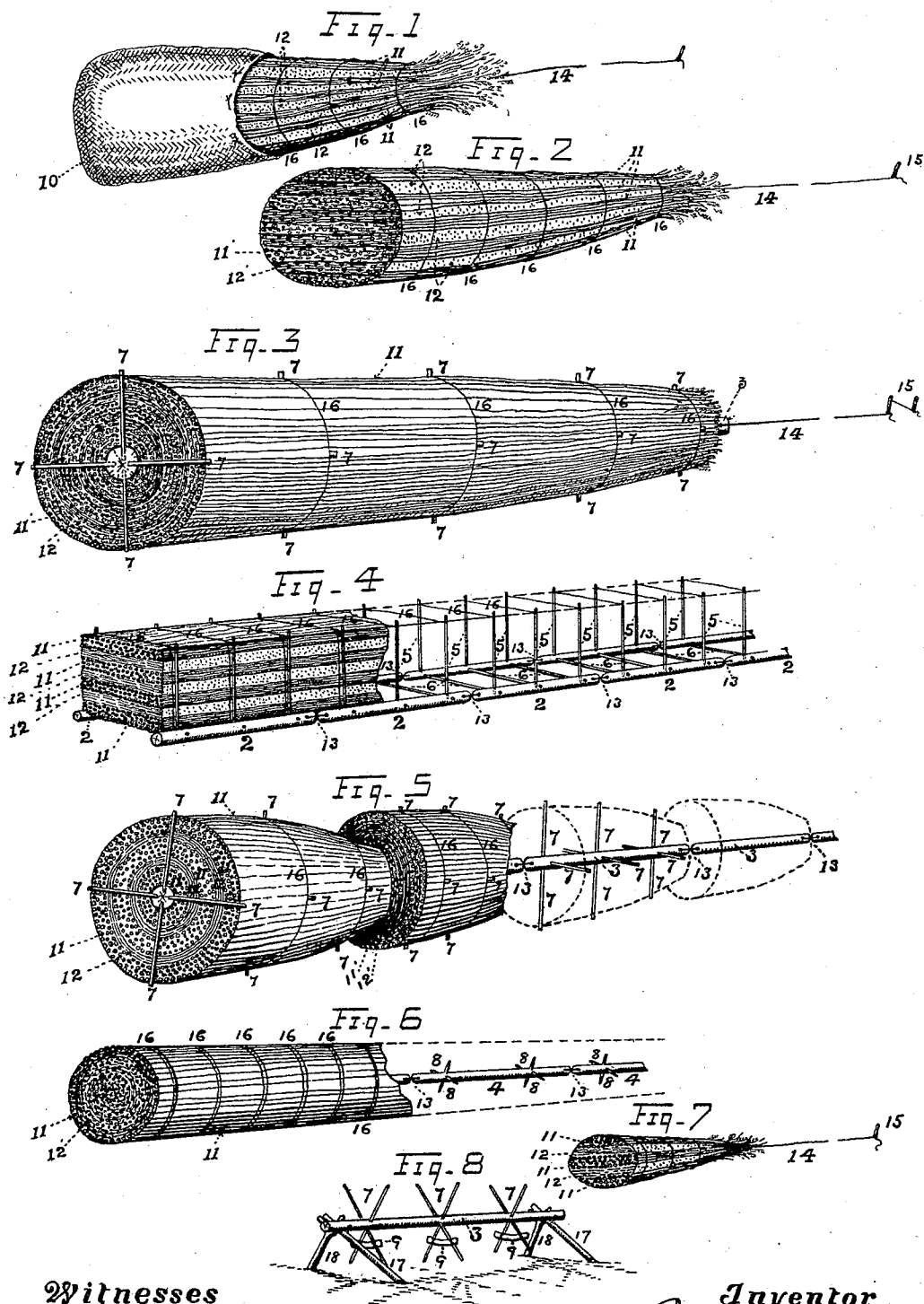
(No Model.)

2 Sheets—Sheet 1.

D. NEALE.
ANCHOR RIPRAP.

No. 465,968.

Patented Dec. 29, 1891.



Witnesses

J. J. Debut
Sam Vaughan

Inventor

David Neale

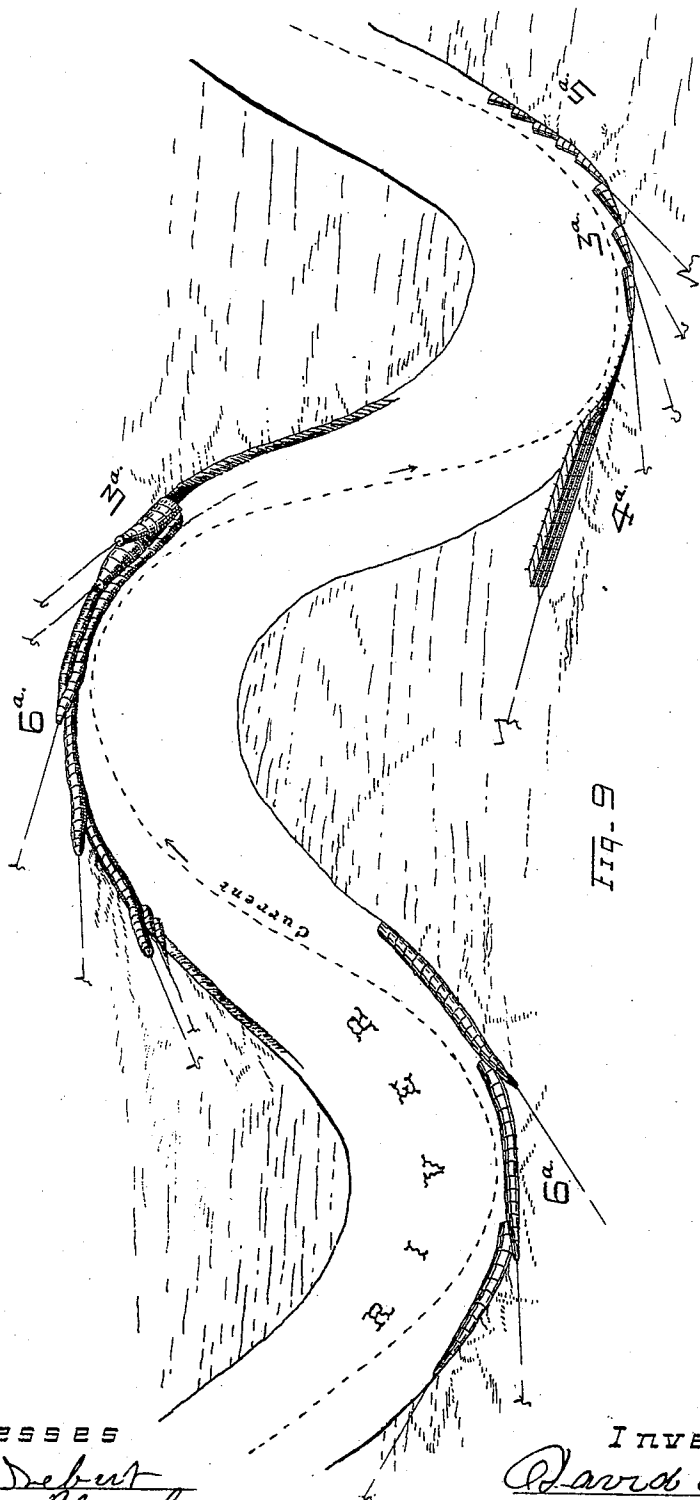
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ANCHOR RIPRAP.

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Witnesses

D. J. Debut
John W. Langham

Inventor

David Neale

UNITED STATES PATENT OFFICE.

DAVID NEALE, OF FORT CALHOUN, NEBRASKA.

ANCHOR-RIPRAP.

SPECIFICATION forming part of Letters Patent No. 465,968, dated December 29, 1891.

Application filed April 8, 1891. Serial No. 388,179. (No model.)

To all whom it may concern:

Be it known that I, DAVID NEALE, a citizen of the United States, residing at Fort Calhoun, in the county of Washington and State of Nebraska, have invented a new and useful Anchor-Riprap, of which the following is a specification.

My invention relates to improvements in riprapping by the use of anchored fascines or mattresses of different sizes and construction, according to the nature of the stream to be operated on; and the objects of my improvement are, first, to employ cheaper, more easily manipulated, and more effectual means for building out or forming alluvial deposits and arresting the erosion of their banks by the currents of silt or sand bearing streams; second, to provide fascines or mattresses for riprapping that will become self-weighted, dispensing with the use of stones or sand-bags in the same, and, third, the construction of continuous flexible fascines and mattresses for riprapping where the nature of the stream demands such. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a hollow or pocket fascine. Fig. 2 is a perspective view of a fascine without the covering 10 shown in Fig. 1. Fig. 3 shows a single section of Fig. 5. Fig. 4 shows a large continuous flexible square mattress of similar construction. Fig. 5 illustrates the manner of constructing and linking together an unlimited number of fascines, like Fig. 3. Fig. 6 is a view showing the construction of a continuous flexible fascine; Fig. 7, a small hand-fascine, like Fig. 2. Fig. 8 shows a convenient means of constructing the fascine shown in Fig. 3 and of making the same hollow—that is, with a large pocket or void at center. Fig. 9 shows the application of the different constructions to a river. Figs. 2 to 6, inclusive, are details of parts 2 to 6, inclusive, of Fig. 9. Similar numerals refer to similar parts throughout the several views.

The outside layer of Fig. 1 is made of fine leafy brush, hay, straw, bagasse, or all combined, and has an envelope of coarse canvas, which is firmly attached at its open end to and enveloping a large portion of the fascine,

which is constructed of alternate layers of coarse crooked brush 11 and layers of finer brush, hay, straw, or bagasse 12, bound firmly together with wire, withes, or thongs 16. In constructing care is used to have a larger proportion of coarse crooked brush at center, so as to increase the voids, and the layers of finer material are made more sparse at and about the opening of the envelope 10, allowing the free ingress of water, which in passing through leaves an accretion of silt and sand deposited in the voids of the fascine and soon sinks it permanently to the bottom. The cable 14, attached to the pile 15 or to a sunken stone or log anchor, the other end of the cable attached to the top or open end of the fascine, retains its open end to the current until permanently sunk to position in the bed of the stream by its own accumulated weight.

A fascine made in horizontal layers of alternate coarse and fine material firmly bound together by the wires 16 is shown in Fig. 2, and is to be used without the envelope 10 where the silt and sand are abundant and the accretions rapid, the mode of anchoring being the same as in Fig. 1.

The log 3, extending centrally and longitudinally through the fascine shown in Fig. 3, has radial arms projecting laterally through alternate annular layers 11 and 12. This construction admits of large size, the log serving as a point of attachment at its end for the cable 14, and thus relieves the top ends of the brush to flare out and catch the silt and sand. The log also furnishes facilities for connecting an unlimited number of fascines end to end together by the joints 13 in a continuous jointed line, as shown in Fig. 5, and applied to the stream at 5* in Fig. 9.

3* in Fig. 9 shows the application of Fig. 3 where they are anchored separately. Being made in sections, they are easily transported over long distances and attached together as deposited.

Fig. 8 illustrates a convenient way of supporting the log 3 so that it may be revolved while applying the annular layers 11 and 12 and binding each in position with the wires or withes 16. There will also be seen the cross-bars 9, extending from one radial arm to another, by means of which the annular lay-

ers are supported away from the log 3, forming a perfect hollow or void for the reception and retention of the alluvial deposits.

In Fig. 6 is shown another modification, the log 4 being in short sections with the joints 13, and having the short pointed radial arms 8, and the annular layers 11 and 12 being longitudinally continuous, making a flexible continuous fascine of unlimited length, usually constructed on the ground near where used and rolled into the stream, the lower end first, as fast as completed. (See 6^a in Fig. 9.)

Fig. 4 shows another modification of similar construction, being a continuous mattress built up square of the layers 11 and 12 on cross-bars 6, connecting the two lines of jointed logs 2 at the lower longitudinal angles, having the uprights 5 to retain the layers until the bindings 16 are placed. Any number of jointed logs with arms may be inserted longitudinally in the center of this mattress, according to the strength required. This mattress is constructed on the bank where a large stream is fast encroaching on the land and it is desired to stop such action at a certain point or line, the lower or downstream end being nearer the bank, so as to be first immersed, settled, and anchored by the silt or sand. (See 4^a in Fig. 9.) The small fascines are to be used in connection as soon as the lower end is attacked and as the judgment and case suggests. A modification of this mattress has a more important use in being built up in a trench cut in time of low water at the line where it is desired to stop the erosive action of a stream, and as the different layers are deposited a filling of mud, silt, or sand is worked and tamped in, so as to be thoroughly incorporated with all the layers, not depending wholly on the alluvial deposit to weight the mattress down. This trench and construction should generally be located at an angle of from thirty to forty-five degrees to the course of the stream, so that the downstream end is first attacked.

It will be observed that the construction consisting in alternate layers of coarse and fine material, while it allows the free filling in of sand and silt prevents the sudden or entire washing out of the same, as the water can only act on small surfaces and not on those any great depth.

I am well aware that prior to my invention brush mattresses and fascines weighted with stones and sand-bags have been used. I therefore do not claim these things or their combination, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. A riprapping consisting of continuous flexible or jointed fascines and mattresses with short fascines, all constructed with alternate layers of coarse and fine material deposited and anchored, substantially as shown and described.

2. In an anchor-riprap, a fascine having a

core of coarse crooked brush within an annular layer of finer material, as hay, straw, bagasse, or fine leafy brush, and an envelope of canvas incasing a larger part of the downstream end, the upstream end anchored by a cable and pile, substantially as shown and described.

3. In an anchor-riprap, the combination of a fascine composed of alternate layers of coarse brush and layers of fine leafy brush, hay, straw, or bagasse bound together by wires or withes, and a cable, one end attached to the fascine, the other end attached to a pile or sunken stone, substantially as shown and described.

4. In an anchor-riprap, the combination, with a cable and a pile, of a fascine consisting of a central longitudinal log having radial arms and enveloped with annular alternate layers of coarse and fine material, substantially as shown and described.

5. A fascine for riprapping, consisting of alternate layers of coarse crooked brush and layers of fine leafy brush, hay, straw, or bagasse bound together by wires or withes, substantially as shown and described.

6. A fascine for riprapping, consisting of alternate annular layers of coarse and fine material, and an envelope of canvas covering a larger part only, substantially as shown and described.

7. A fascine consisting of a central longitudinal log having lateral radial arms, the whole enveloped by alternate annular layers of coarse and fine material, such as brush and straw or bagasse, bound together by wires or withes, substantially as shown and described.

8. A hollow fascine consisting of a central longitudinal log having radial arms, cross-bars extending from one arm to another around and a distance from the log, the whole enveloped by one or more layers of brush, straw, or bagasse, substantially as shown and described.

9. A continuous jointed fascine consisting of a series of central longitudinal logs separately and loosely jointed together at their ends, each provided with radial arms and enveloped by annular layers of coarse and fine material bound together by wires or withes, substantially as shown and described.

10. A continuous flexible fascine consisting of short central longitudinal logs loosely jointed together at their ends, having radial arms and enveloped by one or more longitudinally-continuous annular layers of brush alternated with layers of fine leafy brush, straw, or bagasse bound together by wires or withes, substantially as shown and described.

11. A mattress for riprapping, consisting of alternate layers of coarse and fine material, with sufficient sand or earth incorporated to prevent floating, all bound together by wires located in a trench cut in the earth to receive the same, substantially as shown and described.

12. A mattress for riprapping, consisting of

alternate layers of coarse and fine material
built up with a frame of logs loosely jointed
together end to end and connected laterally by
cross-bars rigidly attached, the whole bound
5 together by wires, substantially as shown and
described.

Signed at Blair, in the county of Washing-

ton and State of Nebraska, this 22d day of
August, 1891.

DAVID NEALE.

Witnesses:

MINNIE NEALE,
GEORGE NEALE.