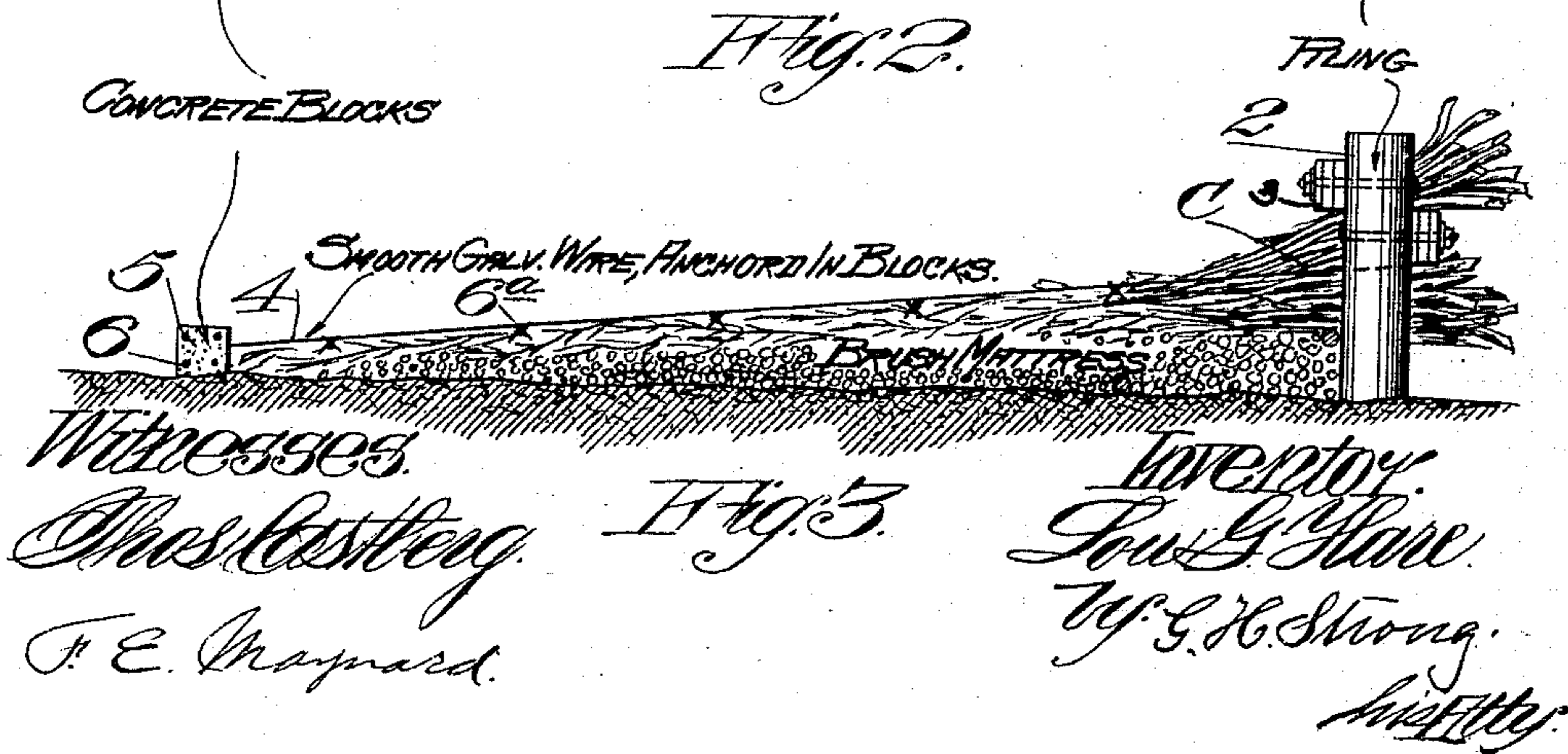
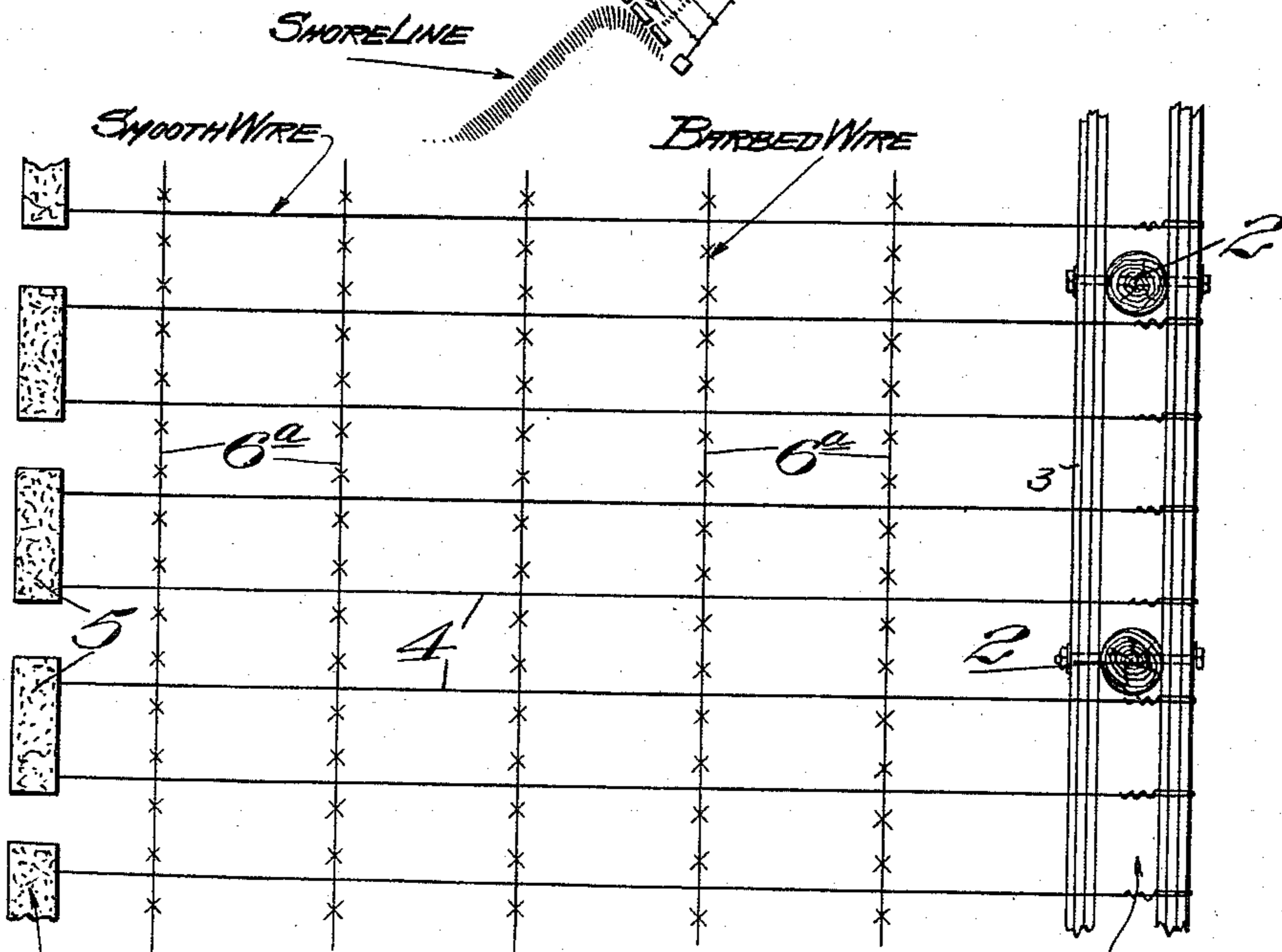
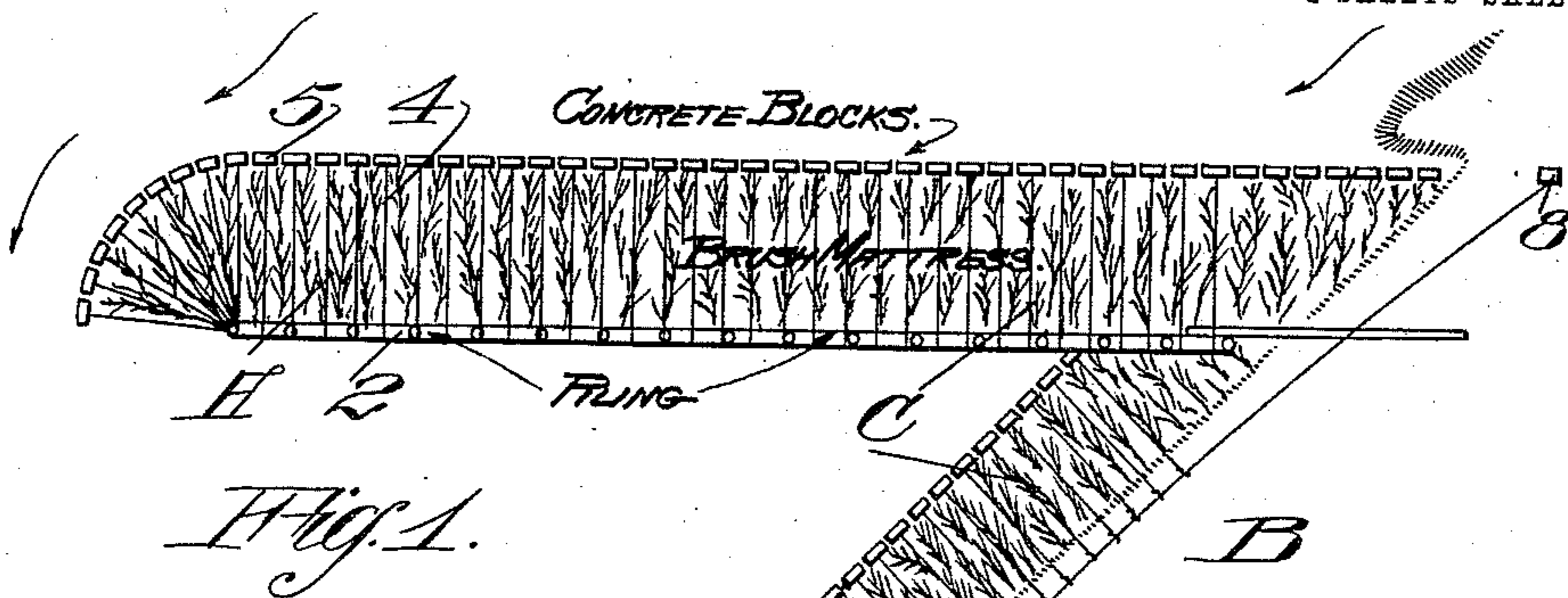


L. G. HARE.
CURTAIN MATTRESS FOR RIVER WORK.
APPLICATION FILED FEB. 15, 1911.

994,999.

Patented June 13, 1911.

2 SHEETS—SHEET 1.



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F. E. Maynard.

Inventor:
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Fig. 4.

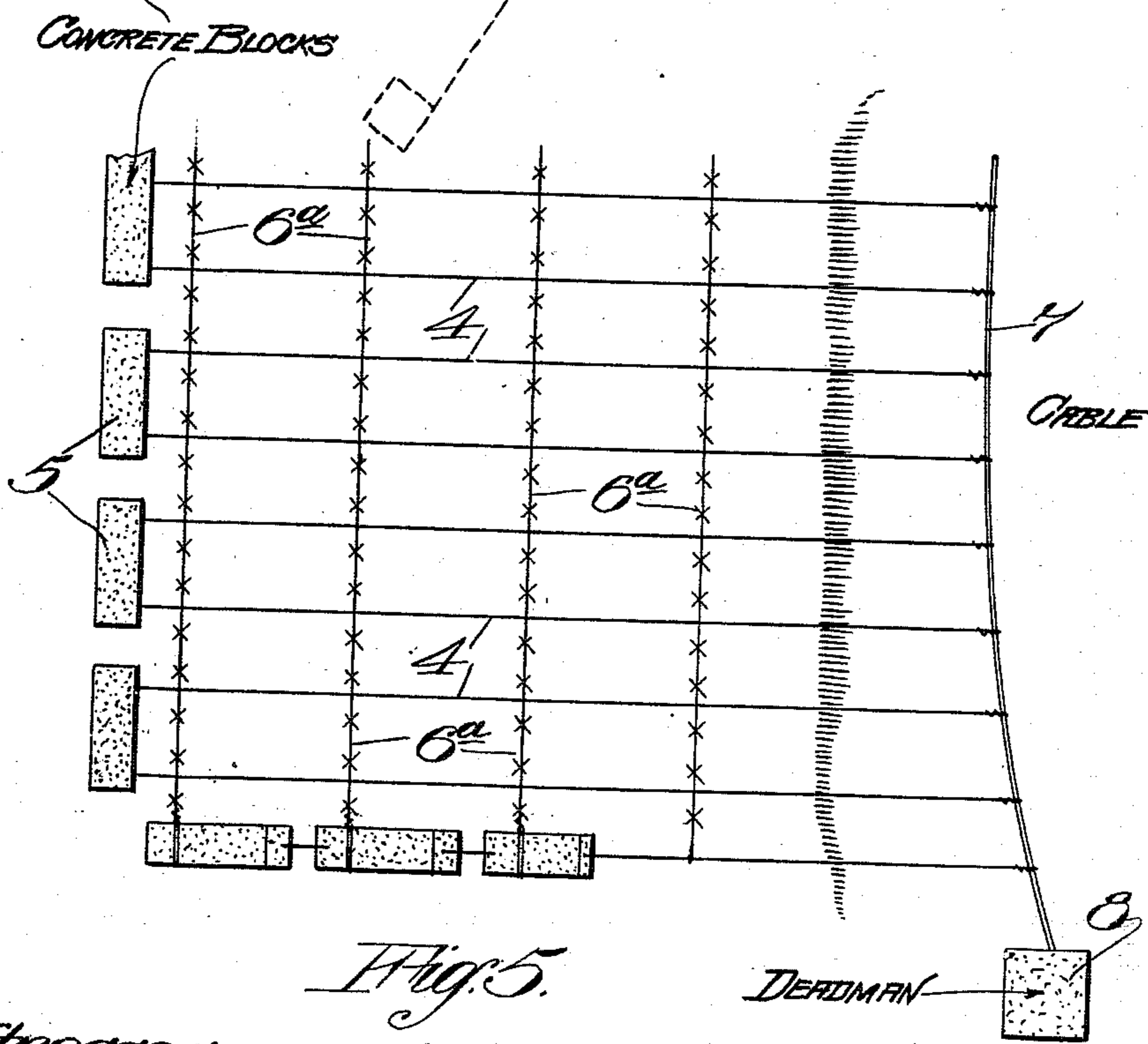
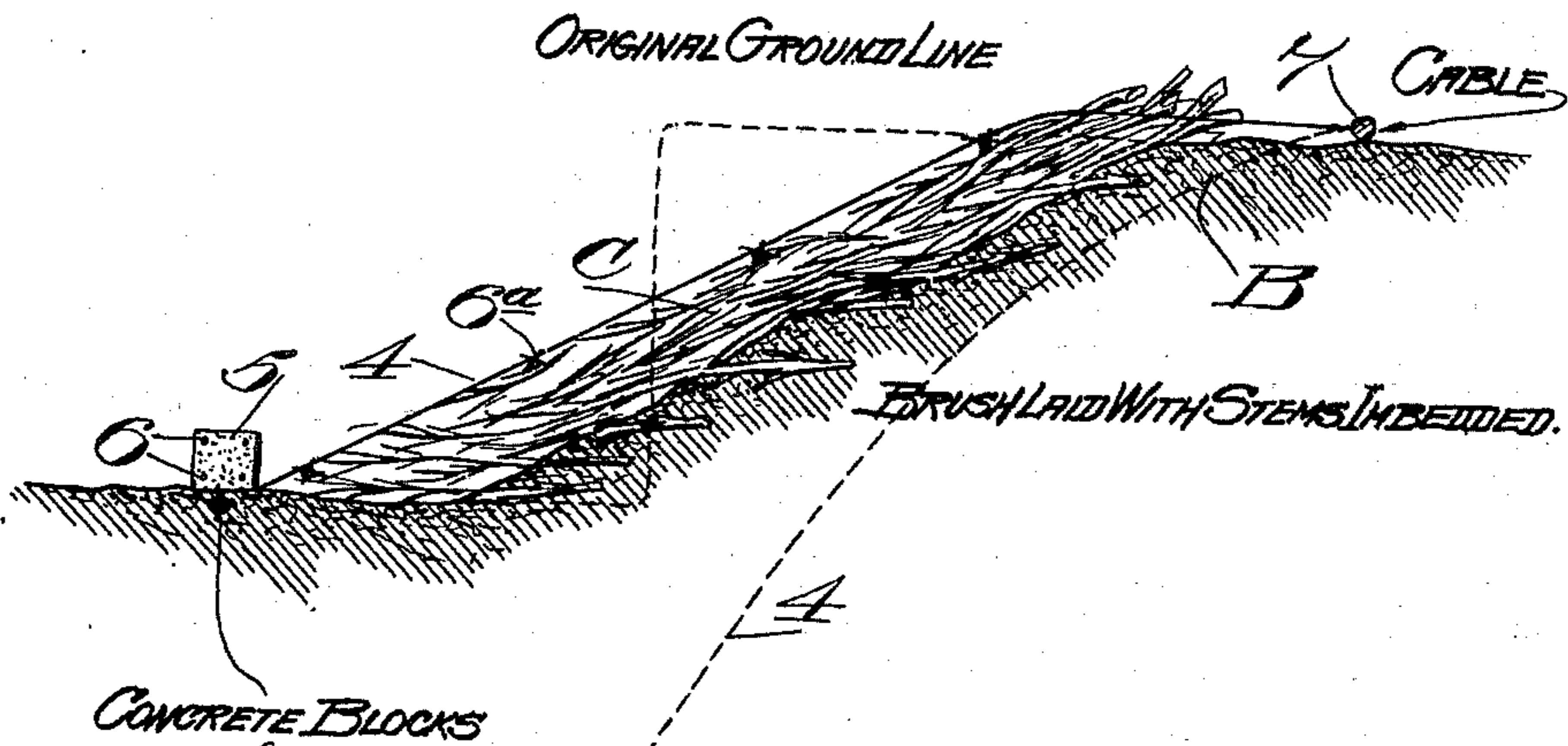


Fig. 5.

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UNITED STATES PATENT OFFICE.

LOU G. HARE, OF SALINAS, CALIFORNIA.

CURTAIN-MATTRESS FOR RIVER-WORK.

994,999.

Specification of Letters Patent. Patented June 13, 1911.

Application filed February 15, 1911. Serial No. 608,680.

To all whom it may concern:

Be it known that I, LOU G. HARE, citizen of the United States, residing at Salinas city, in the county of Monterey and State of California, have invented new and useful Improvements in Curtain-Mattresses for River-Work, of which the following is a specification.

This invention relates to means for protecting river embankments, jetties or dams where the same are subjected to the eroding action of flowing streams.

The object of the present invention is to provide an improved protecting mattress or revetment to be used on river improvement work in conjunction with jetties or wing dams, for the purpose of diverting the current of the stream or for the purpose of protecting banks, and especially to provide a mattress applicable to silt bearing streams with sandy beds and banks of friable soil.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan view, showing a jetty and embankment mattress. Fig. 2 is a plan view of the mattress omitting the brush. Fig. 3 is a transverse section through the jetty mattress. Fig. 4 is a transverse section through a bank revetment or mattress. Fig. 5 is a plan view of the same.

The mattress forming the present invention is composed of brush and wire or other material, so weighted with concrete blocks placed along one or more edges of the mattress that when the scouring action begins in a river bed the concrete blocks will sink and carry with them the edge of the mattress until the scouring limit is reached or until the mattress hangs in a vertical position.

The elements of which the mattress is composed may be variously arranged and secured according to divers conditions, and in the accompanying drawings I have shown the mattress as part of a jetty indicated at A and also forming a protection over a bank B.

When the mattress is to be used for the erection of jetties, a line of piles indicated at 2 is driven across stream and the river bed prepared for the reception of green brush, indicated at C. I have found that green willow is particularly adaptable for

the purpose, as this rapidly takes root and thus forms a natural embankment in the course of time. For the purpose of retaining the brush in position on the edge there are fastened to the piling 2, or waling 3 secured upon the piling, a plurality of substantial anchoring wires 4 of suitable pitch. Upon the outer ends of the spaced anchoring wires 4 are secured individual, curtain weights or blocks 5, and I have found that these may be easily, cheaply and rapidly made of concrete, during the molding of which the anchor wires 4 may be inserted so that when the blocks 5 have become rigid the wires 4 are permanently embedded therein. If desired, these weight blocks may be reinforced with reinforcing rods or wires, as indicated at 6, Fig. 3.

To further safeguard the brush forming the mattress from dislodgment by the action of the current of the stream, I provide a plurality of tie wires, indicated at 6^a, in Figs. 2 and 5, which may be placed upon the brush before the anchoring wires 4 are placed and the wires 6^a are preferably barbed and secured to the anchor wires 4 at their intersections in any well known manner.

The protecting mattress thus formed in the construction of jetties is faced up stream, so that the independent concrete blocks 5 rest upon the river bed and during the flooded season the current of the water coming down stream will be deflected by the mattress, and during the erosion of the river bed adjacent to the foot blocks 5. These blocks will automatically and gradually settle forming a curtain over the brush mattress and preventing the latter from being carried away.

In the construction of bank revetments, such as shown in Figs. 4 and 5, the piling 2 may be omitted and the shore end of the mattress forming wires 4 may be connected to the anchor, here shown as a cable 7 located well up on the river bank and having its ends attached to deadmen 8, which I prefer to construct of concrete blocks embedded in the river bank. The several anchoring wires 4 are connected at the shore ends at suitable intervals to the cable 7 and carried outward over the brow of the river bank and the weighted blocks 5 deposited upon the bed of the river.

In constructing bank revetments the bank is graded down to a suitable angle, as indi-

cated at Fig. 4, the green brush C laid thereon, the transverse, barbed wires 6^a stretched across the brush and the anchoring blocks 5 carried out so that the strands 4 overlap the mattress brush C and the transverse strands 6.

In the form of revetment for the protection of banks, such as shown in Fig. 4, when erosion occurs along the river bed adjacent to the blocks 5, these gradually settle as the river bed works away, tightly drawing down the anchor wires 4 over the brush mattress, thus firmly embedding the latter upon the bank; and under extreme circumstances, as when the river bed is much scoured away, the blocks 5 will hang suspended from the lower ends of the anchor wires 4, as indicated in dotted lines, Fig. 4.

On jetties consisting of a row or rows of piling, the use of this mattress renders the jetty less permeable, especially along the zone situated between the ordinary low water river bed and the scouring line of extreme high water. This zone is particularly inaccessible for construction work during the low water period on account of the deposit of sand and during the high water period on account of the flooded condition. The mattress is preferably constructed during the dry season or low water period and when the high water period arrives the scouring action commences and the mattress is automatically worked into its most effective position. After the water recedes the willow brush sprouts and in the course of a few years the roots of the vegetation become interwoven with the system of wiring and concrete blocks and stubs of piling, so that by the time the piling is rotted away it will be replaced by a line of willow trees which will continue the work of diverting the stream.

This mattress can be used on a jetty or wing dam connected with the shore line for the purpose of diverting the current from said shore line and causing still water alongside, or an isolated jetty placed in mid-stream for the purpose of affecting the condition of the channel.

The mattress can be used for bank revetment by sloping off the bank and weighting the lower edge of the mattress with concrete blocks into which wires have been anchored, with said wires extending over the mattress and attached to a cable or other anchorage at the top of the bank.

The main result of the use of my flexible revetment is that in placing the blocks along the outer fringe of the mattress, the latter is permitted to sink automatically with the erosion of the river bed.

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

1. A revetment for the protection of

banks of streams and jetties, comprising a mattress formed of green brush laid upon the face of the bank or jetty, means for retaining the brush in position against the action of the current of the stream, and means whereby said retaining means are constantly pressed upon the mattress to retain the latter during the erosion of the bed of the stream.

2. A revetment for the protection of banks of streams and jetties, comprising a mattress formed of green brush laid upon the face of the bank or jetty, means for retaining the brush in position against the action of the current of the stream, and means whereby said retaining means are constantly pressed upon the mattress to retain the latter during the erosion of the bed of the stream, said brush retaining means including a metallic fabrication permanently secured to anchors along the upper edge of the revetment and having its outer edge secured in individual blocks.

3. A mattress for the protection of river improvement work, jetties and embankments, said mattress comprising a fabrication of wires, a layer of green brush disposed upon the face of the embankment or jetty and over which the metallic fabrication is laid, anchoring means at the upper portion of the embankment to which one edge of the fabrication may be secured, and individual blocks or weights secured to parallel strands of the fabrication.

4. A mattress for the protection of river banks and jetties, comprising green brush placed upon the inclined face of the bank or jetty, an anchor placed upon the upper portion of the bank or jetty, strands of wires secured to said anchor, projecting outwardly from the upper portion of the bank and downwardly toward the bed of the stream, independent blocks of concrete in which the terminals of a plurality of said outwardly extending strands are secured, and transverse barbed strands secured to said outwardly projecting strands whereby the brush portion of the mattress is retained in position upon the earth or embankment.

5. A mattress for the protection of river banks and jetties, comprising green brush placed upon the inclined face of the bank or jetty, an anchor placed upon the upper portion of the bank or jetty, strands of wires secured to said anchor, projecting outwardly from the upper portion of the bank and downwardly toward the bed of the stream, independent blocks of concrete in which the terminals of a plurality of said outwardly extending strands are secured, and transverse barbed strands secured to said outwardly projecting strands whereby the brush portion of the mattress is retained in position upon the earth or embankment, said independent blocks attached to the outer

ends of the first named strands, allowing the free edge of the brush retaining strands to settle in conformity with the bed of the stream as the latter is worn away by the
5 current of water.

6. A mattress for the protection of river banks and for reducing the permeability of jetties and wing dams, comprising brush placed upon the face of the soil forming the
10 bank, flexible means for retaining said brush in place, a shore anchor to which said means

are connected at one side, and means connected to the river edge of said flexible means whereby the same is placed under tension and pressed upon the brush.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LOU G. HARE.

Witnesses:

A. G. WINCKLER,
P. W. SOTO.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
