

No. 841,281.

W. E. THORNE.
REVETMENT.

PATENTED JAN. 15, 1907.

APPLICATION FILED JUNE 9, 1906.

2 SHEETS—SHEET 1.

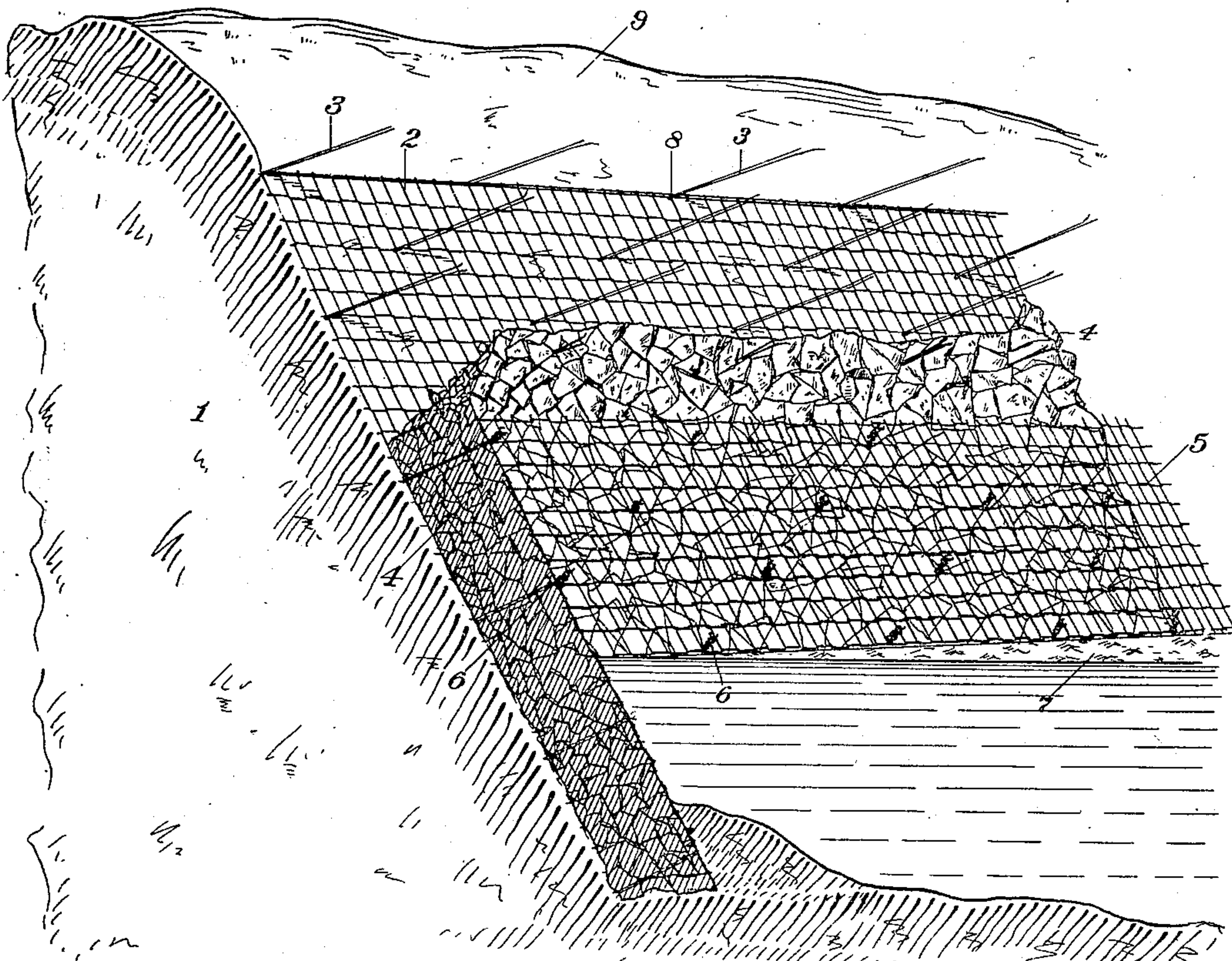


Fig 1

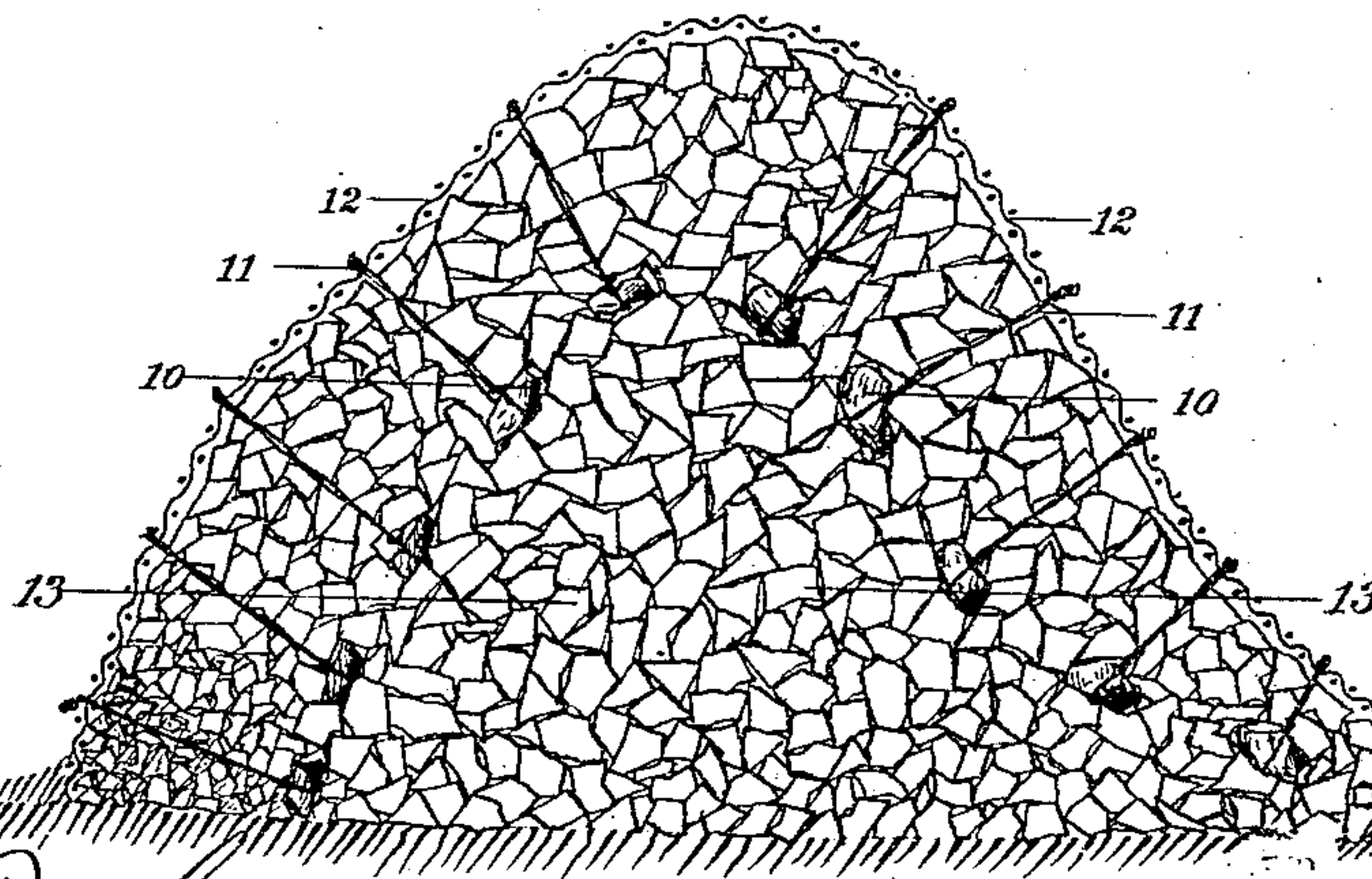


Fig 2

WITNESSES:

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INVENTOR.

William E. Thorne

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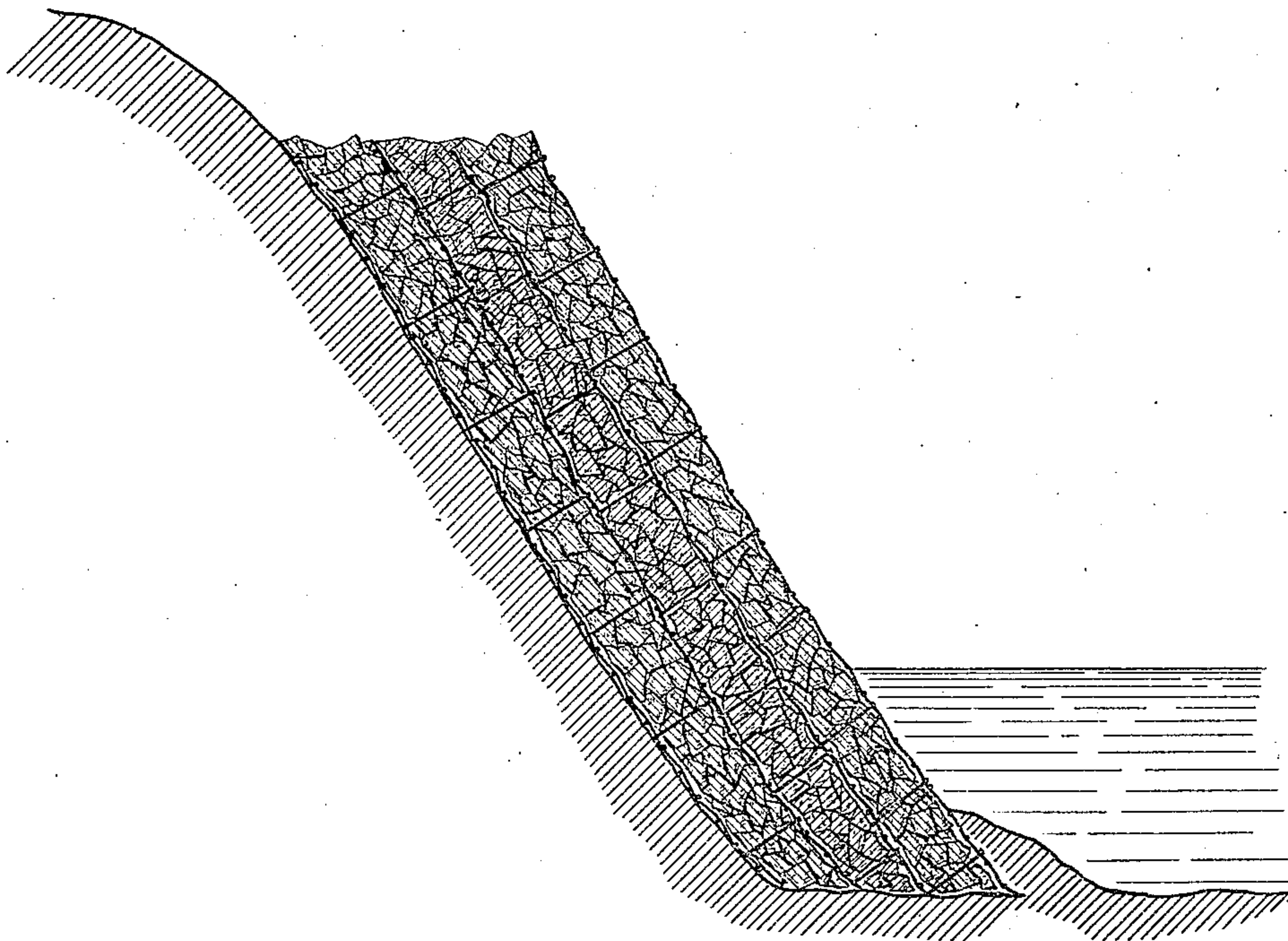


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM E. THORNE, OF DENVER, COLORADO.

REVETMENT.

No. 841,281.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed June 9, 1906. Serial No. 320,962.

To all whom it may concern:

Be it known that I, WILLIAM E. THORNE, a citizen of the United States, residing at 1115 Detroit street, in the city of Denver, county of Denver, and State of Colorado, have invented certain new and useful Improvements in Revetments, of which the following is a specification.

My invention relates to improvements in the construction of revetments or riprap-work of any sort. It consists, essentially, of the use of a woven-wire base and cover appropriately secured, the stone or material used being laid between.

It has been found that it is difficult to lay up loose stone to form a revetment without supporting or binding the stone into place in some manner; but the methods heretofore in use have not resulted satisfactorily. This is especially true where the revetment is made upon a sloping embankment. The advantages of my improvement will hereinafter be specifically pointed out.

In the accompanying drawings, Figure 1 is a perspective view showing a transverse section of a revetment constructed upon a slope for the purpose of retaining the water and of preventing the same from wearing away the embankment. Fig. 2 shows a vertical cross-section of a dam constructed in my improved manner. Fig. 3 shows a wall made up of successive layers of stone, a sheet of woven wire being placed between each two layers thereof, the binding-wires passing outwardly from one sheet to another.

In the drawings, 1 is the embankment in transverse section.

9 indicates the surface of the embankment above the revetment.

2 is the foundation or base, of woven wire, which is laid upon the ground in beginning the construction of a revetment in my improved manner. The meshes of the wire may be of any desired size or weight, and the wire is firmly bound and strengthened along its edges. After this foundation-wire is laid wires (indicated at 3) are secured to the foundation-wire. These wires 3 are intended to act as tie or binding wires in the manner hereinafter shown. The binding-wires 3 are arranged in staggered series at intervals, which will be determined by the size of the stone used. A section of the stone wall, as indicated at 4, is then laid up. When the desired height is reached, a cover or top section

of wire 5 is laid upon the wall, and the binding-wires 3 being firmly secured to the bottom or foundation-wire 2 at 8 are carried through the meshes of the top section 5 and twisted together, as indicated at 6. In this manner is formed a basket or binding-support for the loose stonework composed of a foundation-section, tie-wires secured thereto and extended at a right angle outwardly therefrom in a staggered series at intervals determined by the size of the stone used, these tie-wires extending upward through the layers of stone and having their upper ends free above the top of the wall. A cover-sheet of wire is then laid on and the tie-wires are passed through the same and twisted tightly to secure their upper ends in the cover-section of wire. It is apparent that the wall laid up in this manner is very solid and substantial and bound together in such manner that the stone cannot fall apart. If in time the wire rusts and breaks, it will be found that the wall has settled and the parts have become so closely united that the wall will still remain intact. Further, a wall constructed in this manner is bound together throughout and forms a continuous structure, one part depending upon another, a result which would not be possible if only loose stone were used without the binding sheets and ties of wire to consolidate the whole into one structure.

It is seen that this construction is of use in building dams also, and I have shown a dam in section in Fig. 2. 10 designates anchor boulders or stones, to which are secured the binding-wires 11. As the successive upper layers of stone are placed the wires 11 are brought out until the dam has the height desired, whereupon a cover-sheet of woven wire 12 is laid over the whole and firmly secured in place by the binding-wires 11. In the construction of dams loose stones 13 are dropped into the stream until the stone reaches a height slightly above the surface of the water. The anchor boulders or stones are then placed, and the construction proceeds as above stated. In this construction the base or lower sheet of woven wire is not employed. It is apparent, however, that it may be utilized in the place of the anchor-boulders, if desired.

The construction herein shown is believed to be new and has been demonstrated to be a very substantial improvement in the con-

struction of riprap or a revetment of any kind and has the advantage of being not only durable, but renders it possible to use loose stone for revetment purposes where it would be impossible to do so if the methods now in use would have to be resorted to. Where the water covers the stone, loose material, such as hay or straw, may be used for packing, and thereby the silt will be retained, which will make the wall more compact. However, it is to be understood that I do not use wire as a temporary expedient, for it is shown that the wire has wearing qualities, and it serves to bind together the stone structure for a long period of time.

The wall may be laid up in successive layers of stone with the foundation-sheet of woven wire at the bottom, and a cover-sheet may be used with each layer. The binding-wires may be brought through from the bottom sheet and secured in each of the upper sheets as they are laid on. In this manner the wall may be formed more compactly and securely.

The binding-wires are preferably formed with double or treble strands, and in securing the same to the successive sheets of woven wire they may be straddled through the meshes, and thus furnish a firmer engagement.

My improved construction of revetments is simple and can be readily utilized by land-owners and others interested in the preservation of the banks of streams or the formation of dams. It is seen also that the invention can be practiced by one person alone and is durable and admits of quick repair when needed.

What I claim as new, and desire to secure by Letters Patent, is—

1. A revetment, dam, or the like, comprising a mass of material composed of loosely-disposed parts, a flexible covering for said mass, and means for securing said covering to points below the surface of said mass, whereby said loosely-disposed parts are bound together.

2. A revetment, dam, or the like, comprising a mass of material composed of loosely-disposed parts, a flexible covering for said mass, binding-wires secured to said covering and penetrating said mass and secured at points below the surface of said mass.

3. A revetment, dam, or the like, comprising a mass of material composed of loosely-disposed parts, an upper stratum of flexible material constituting a covering for said mass, a substratum of flexible material, and binding means secured to said substratum and brought outwardly through said mass and secured to said upper stratum.

4. A revetment composed of a foundation of wire mesh, loose stone laid thereon, a cover of wire mesh upon said stone, and tie-wires secured to said foundation wire mesh and passed upwardly through said stone and firmly secured to said cover of wire mesh, whereby the stones are firmly bound and secured in place.

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

WILLIAM E. THORNE.

Witnesses:

EDWIN J. MOORE,
W. W. WHITE.