

(No Model.)

D. NEALE.
MATTRESS FOR RIPRAP.

No. 517,879.

Patented Apr. 10, 1894.

Fig. 1.

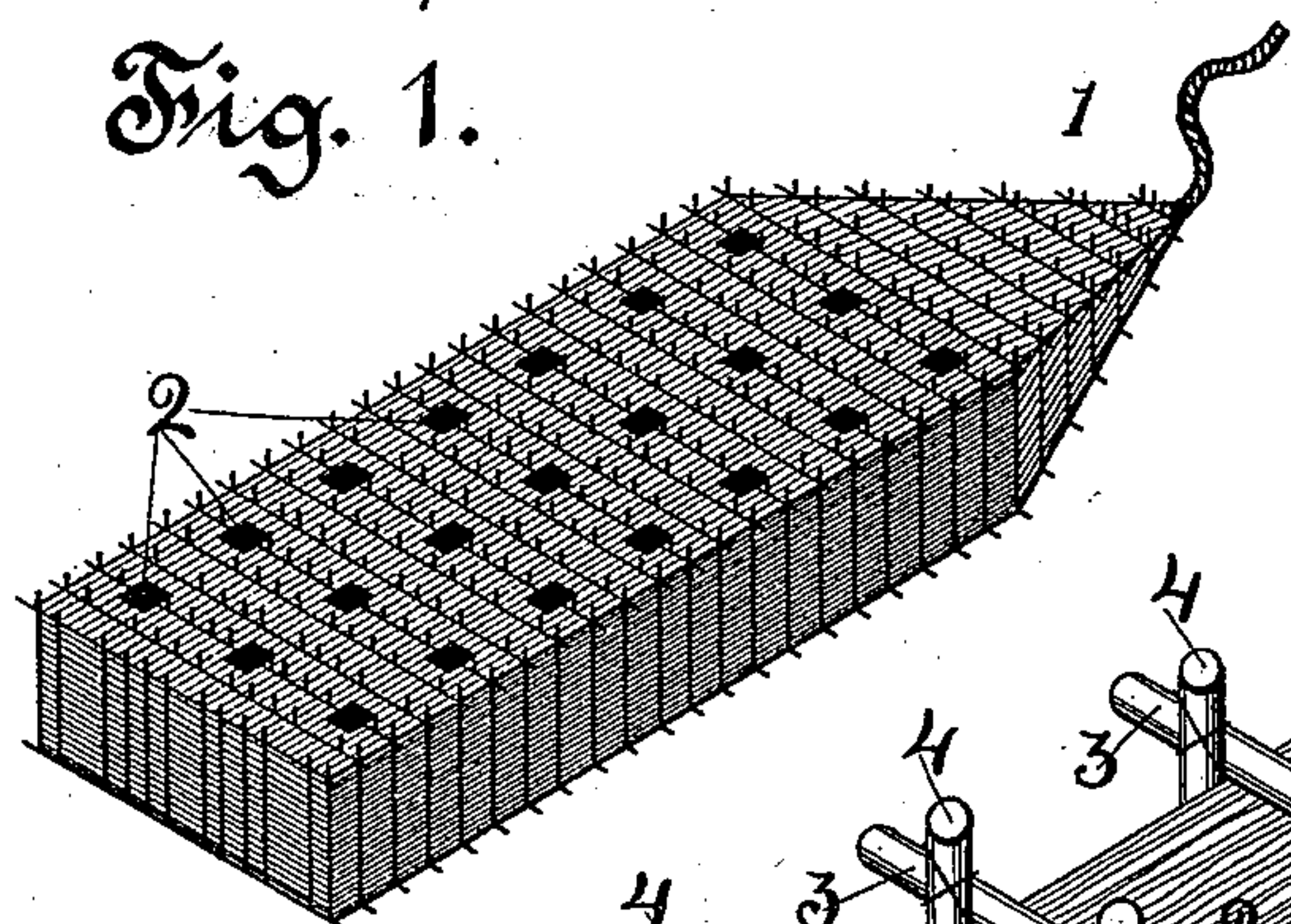


Fig. 2.

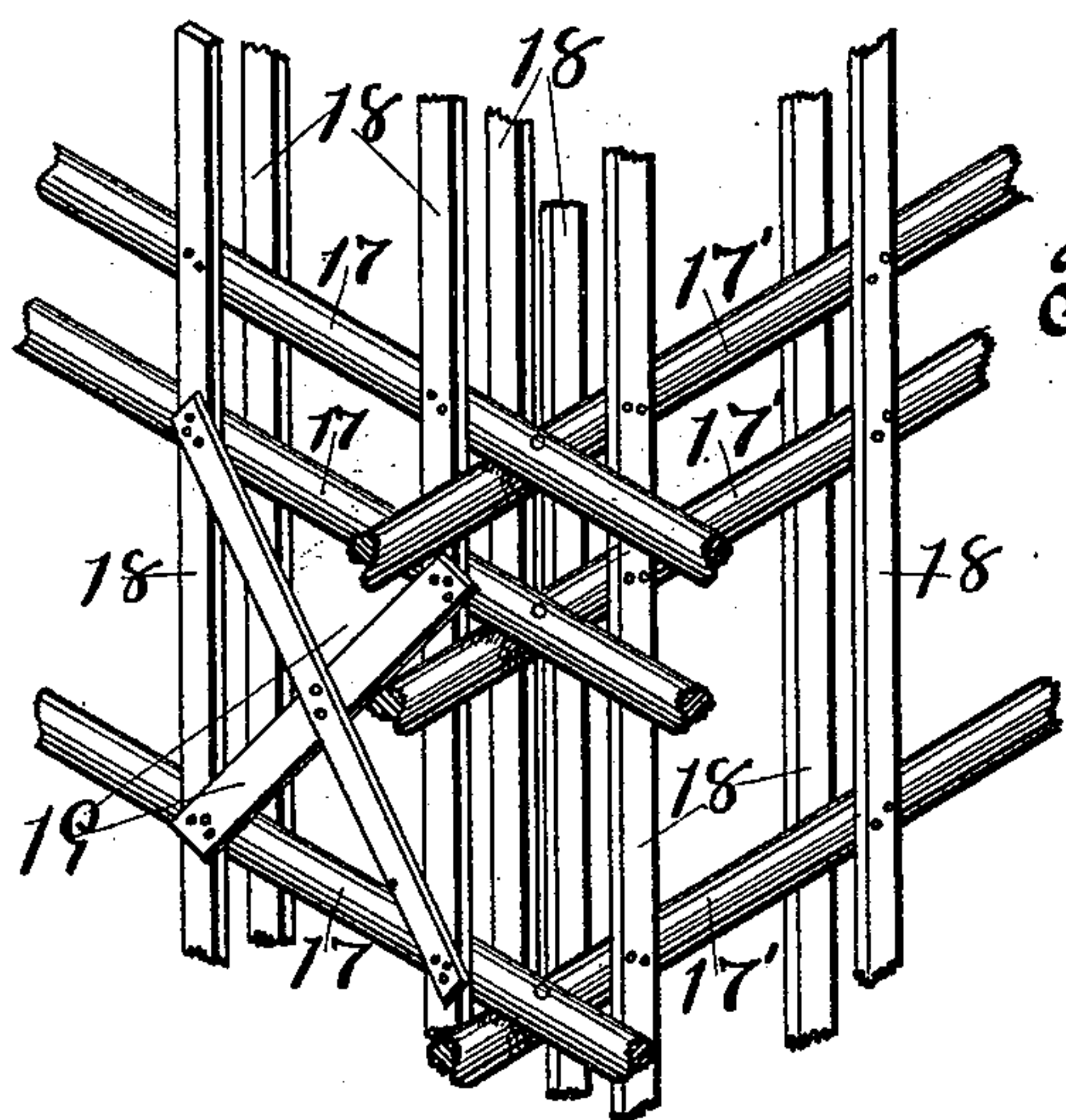
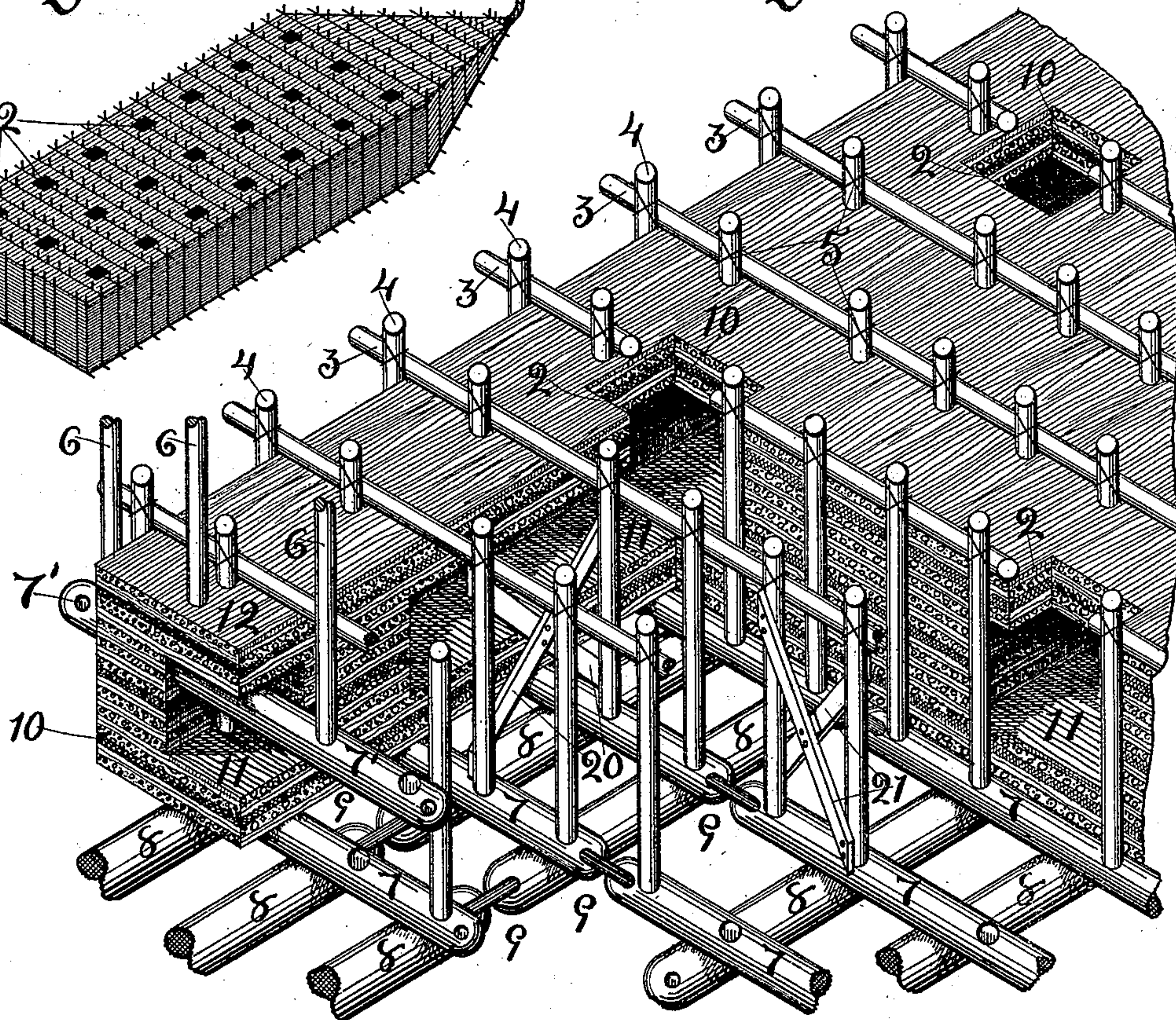
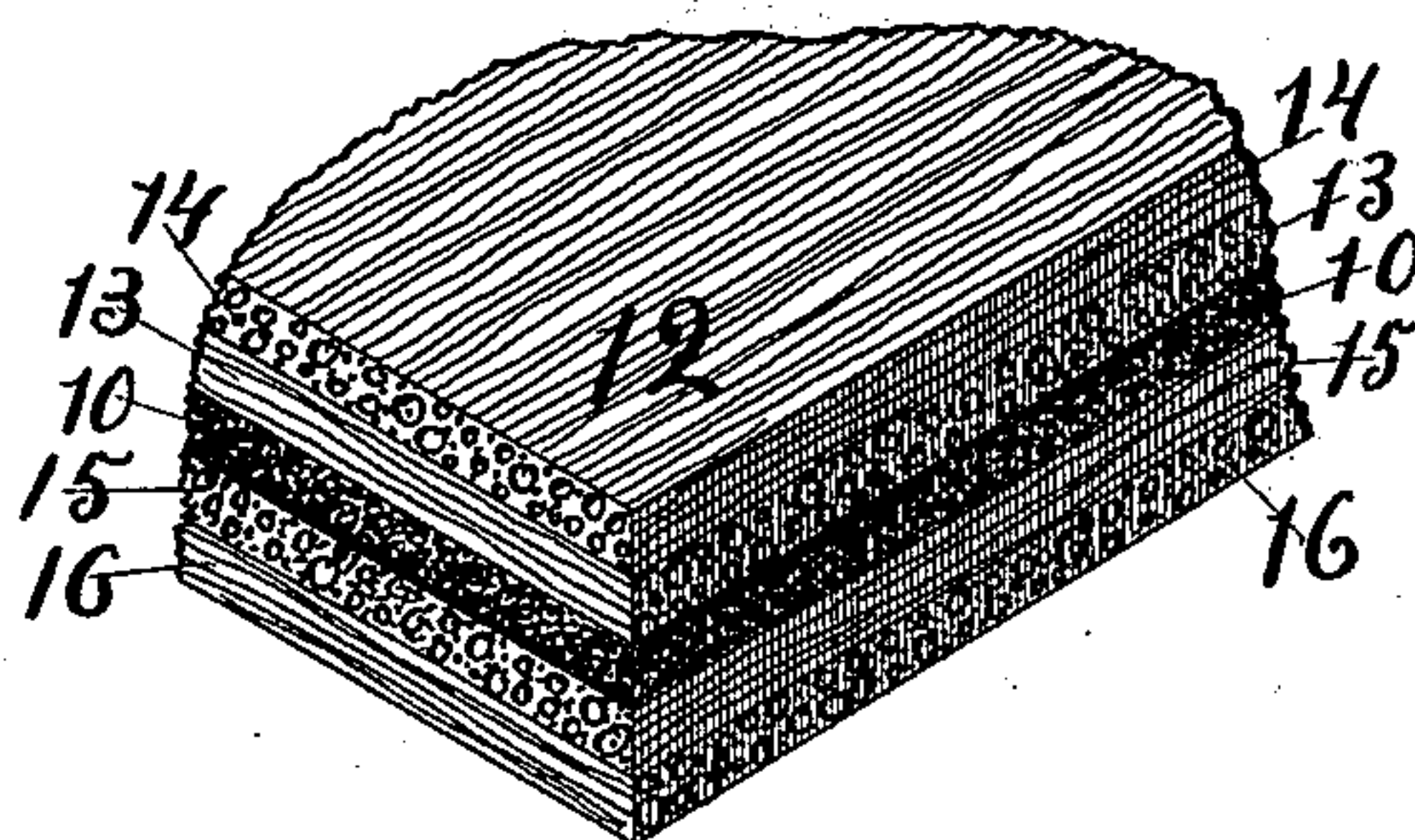


Fig. 4.

Fig. 3.



Witnesses
Sherry Moore
Will Wilkinson

David Neale Inventor
By his Attorney, J. S. Vaughan

UNITED STATES PATENT OFFICE.

DAVID NEALE, OF FORT CALHOUN, NEBRASKA.

MATTRESS FOR RIPRAP.

SPECIFICATION forming part of Letters Patent No. 517,879, dated April 10, 1894.

Application filed August 28, 1893. Serial No. 484,231. (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 Mattress for Riprap, of which the following is a specification.

My invention relates to improvements in mattresses used to straighten and retain the banks of silt and sand bearing streams, and the objects of my improvement are, first,—to provide mattresses that may be loaded and sunk after being placed in the stream, leaving them light to handle until deposited; second,—to provide a mattress that will be self loading in a silt or sand bearing stream; and third to construct mattresses of the minimum amount of material, by making them hollow or cellular. I attain these objects through the medium of construction illustrated by the accompanying drawings, in which—

Figure 1. is a perspective view of a large cellular mattress. Fig. 2. is a detail in perspective showing the construction. Fig. 3. is an enlarged detail of the portion of Fig. 2 at 12; and Fig. 4. is a perspective view of a modification of the frame-work.

Similar numerals refer to similar parts throughout the several views.

In Fig. 2, the longitudinal jointed logs 8 of any convenient length have their ends loosely jointed together by as many ply of wire as necessary, inserted through perforations in their adjacent ends, as shown at 9, or in any suitable manner, and in numbers to suit the required length of mattresses, generally lying parallel with the stream; superposed thereon there are cross-logs 7, usually about ten feet in length and the required distance apart, being also loosely jointed together endwise to give the required width of mattress, and where these cross-logs come in contact or rest on the logs 8 they may be drift-bolted, or lashed together with wires or ropes, the two sets of logs forming a pliant frame-work or bottom to build upon; uprights or stakes 4, 4. &c., are set in the cross-logs as shown, four to each log, a pair nearer each end of the log leaving the central space the largest in order to span the required width of cell; it will be observed that there is a single long cell or row of cells above each longitudinal

tier of cross-logs, running lengthwise of the mattress bringing the longitudinal partitions between the cells over the joints in the cross-logs and the cross partitions over the joints in the longitudinal logs.

The cross-partitions may if desired be left out as the cells are spanned in width by a single length of brush, the cross-logs being of length to suit the length of brush at hand; so also in streams where the accretions are rapid, and in localities where brush are scarce the longitudinal partitions may be made without the filling of brush, hay, straw or bagasse, and a system of lateral bracing as 19, 20 and 21 is applied to the frame to prevent collapse of the mattress until it has filled with mud, silt and sand.

The floors, walls, partitions and ceilings or roofs of these cells, are built up of alternate layers of brush, hay, straw, bagasse or any similar material, laid transversely to each other beginning with a layer of brush lengthwise of the mattress and across the cross-logs 7, always using an even number of layers in the floor in order that the finishing layer of the floor 11 shall extend across the cells as shown; then any number of transversely arranged layers may be placed in order to give the walls and partitions the required height, forming the roof with an even number of layers, the first laid on spanning the cell, and the last laid lengthwise of the mattress to receive the binders 3, 3, 3, &c., which are firmly fastened by the wiring 5, to the upper ends of the uprights 4, 4, 4, &c., after the mattress has been compressed perpendicularly, by machinery made especially for this purpose.

When it is expedient to weight the mattress with sand or earth, such cells as are to receive weighting have a central layer 10, in floors and roofs of finer material such as fine leafy brush, hay, straw or bagasse, as shown in detail in Fig. 3, beginning with the layer 16 spanning the cell, across this the layer 15, then the layer 10 of fine material, finishing with layers 13 and 14 in their regular order and manner; in such cases fine material is also incorporated into the adjacent walls and partitions sufficient only to prevent the weighting material from escaping; when stones or sacks of sand are used for weighting, the fine stuff may be omitted, but in most cases the walls

and roofs are to be made sufficiently permeable to receive the mud, silt or sand, accretion of the same forming in the quiet water in the cells; the use of finer or coarse material being varied to meet requirements of the work at hand. Ports 2, 2, &c., are formed in the ceilings of cells for convenience while constructing, through which to deposit the weighting and through which mud, silt and sand will settle into the cells beneath.

To make the frame-work more secure, and, in work where great strength is required wires are attached to the cross-logs and accompany the uprights up through and the upper ends are used to make the tie 5, by which the binders 3 are secured; also wire stitching or quilting, using a large steel needle to pass the wire up and down through the mattress is used where necessary.

When more height, or superimposed stories are required, and sawed timber cannot be obtained to build the frame as shown in Fig. 4, I insert another tier of cross-logs 7' just below the ceiling of cells, with another set of uprights 6, 6, &c., and compress and bind each story separately, the ceiling of one story being the floor of the story above and so on indefinitely until the required depth or height is obtained.

Where floating objects as ice or drift-wood are liable to accumulate against and break the mattress from its moorings before it has become fixed by accretion or weighting, the up-stream end may be pointed and anchored with a single large cable as shown in Fig. 1.

The modified frame-work shown in Fig. 4, is used where sawed timber is available for the uprights 18, 18, 18, &c., logs 17 17' being placed above and below all floors and ceilings, and the spaces between the uprights and above and beneath the logs filled with brush, hay, straw or bagasse to form the walls and partitions; if partitions are desired to be omitted the frame will be reinforced with the lateral bracing 19; the logs to be jointed together at their ends same as in other frame.

In some work an advantage is gained by building on land single or multiple cell mattresses in size according to length of logs at hand, the ends of logs prepared before launch-

ing so they may be attached to those previously placed, and the space at joints in logs filled or not as desired afterward.

Where mattresses are built on the land they are supported up from the ground on inclined trestles or skids, to facilitate working the needle when quilting, as well as completing the other bottom work, and making them easier to launch.

In weighting and sinking a large cellular mattress I propose, where conditions will allow it, to use a heavy power pump taking the mud, silt and sand from the bed of the stream and deposit it through the ports into the cells. Where the mattresses are made very large it is often desirable to weight and sink one end at a time; especially is this practice employed when it is built to protect a shore or bank, the water edge being weighted down, the shore edge securely anchored.

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

1. A mattress for riprap having a cell formed with permeable walls, adapted to receive and retain accretions of mud, silt or sand substantially as described.

2. A mattress for riprap consisting of one or more cells formed with permeable walls and partitions sustained by a frame-work substantially as described.

3. A mattress for riprap built up of brush, hay, straw or bagasse and a sustaining frame-work, and having a system of internal cells with port holes substantially as described.

4. A cellular pliant mattress for riprap having a frame-work consisting of loosely jointed logs, connected by uprights with binders parallel with the logs, and having walls and partitions of brush, hay, straw or bagasse sustained by the frame-work to form a system of cells substantially as described.

Signed at Blair, in the county of Washington and State of Nebraska, this 24th day of August, A. D. 1893.

DAVID NEALE.

Witnesses:

CHAS. MULHAR,

M. H. B. ROSENBALM.