

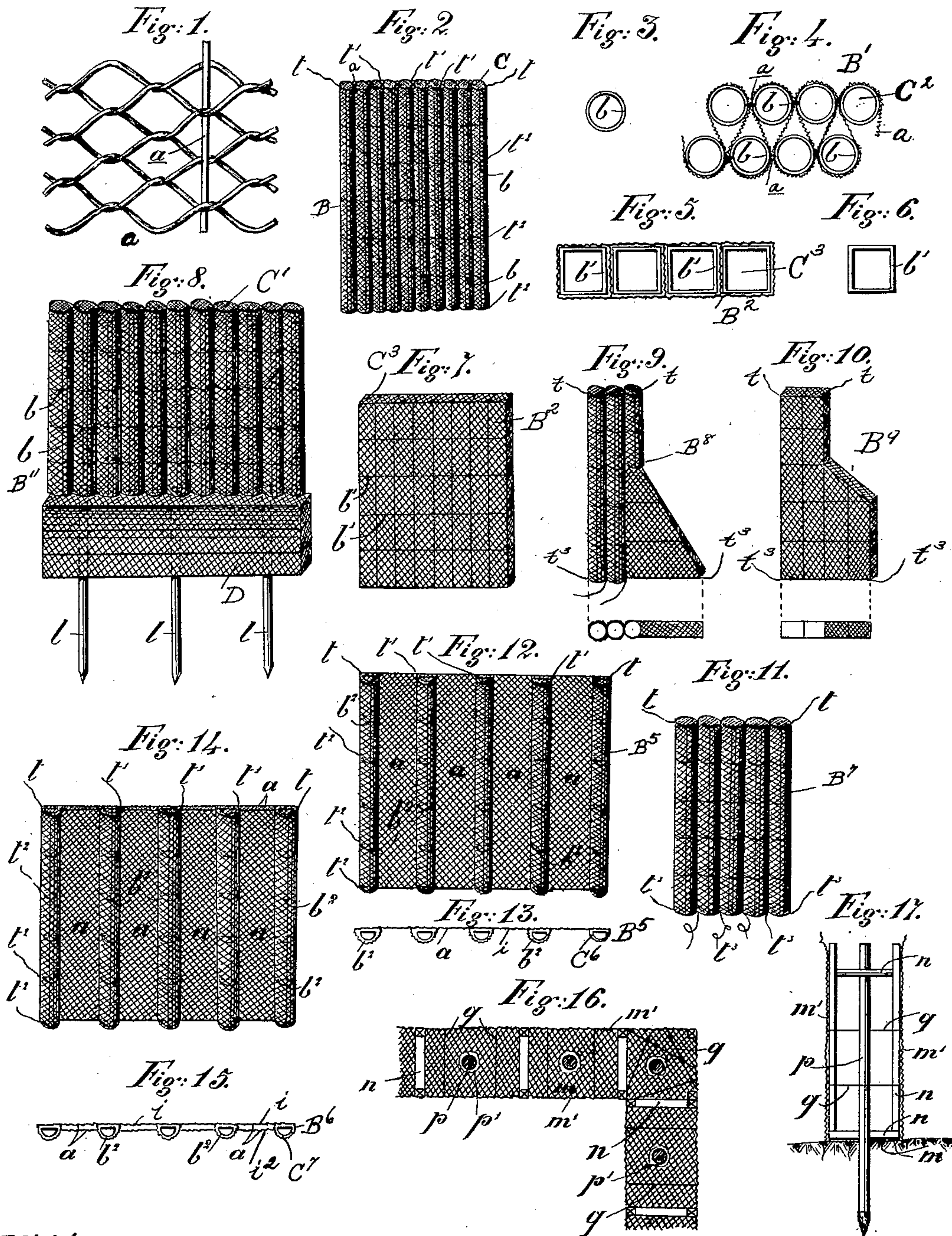
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Patented June 20, 1899.

G. S. ZANETTI.
DAM OR REVETMENT.

(Application filed Aug. 14, 1897.)

(No Model.)



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DAM OR REVETMENT.

SPECIFICATION forming part of Letters Patent No. 627,375, dated June 20, 1899.

Application filed August 14, 1897. Serial No. 648,326. (No model.)

To all whom it may concern:

Be it known that I, GIULIO SERRA ZANETTI, a subject of the King of Italy, and a resident of Bologna, Italy, have invented certain new and useful Improvements in Dams or Revetments, of which the following is a specification.

My invention relates to dams for closing crevasses in levees or river-banks and also to revetments, means for protecting and reinforcing banks of rivers and other bodies of water, breakwaters, and the like; and it will be fully understood from the following description and claims when taken in conjunction with the annexed drawings, in which—

Figure 1 is a detail view illustrative of the woven-wire fabric which enters into all of the several embodiments of my invention. Fig. 2 is a perspective view of a plurality of receptacles of circular form in cross-section, formed by a single strip of woven-wire fabric and designed to be filled with broken stone or other suitable material. Fig. 3 is an enlarged plan view of one of the rings used to preserve the shape of the circular receptacles. Fig. 4 is an end view of two parallel series of receptacles formed by a single continuous strip of woven-wire fabric. Fig. 5 is an end view of a series of connected receptacles of rectangular form in cross-section. Fig. 6 is a view of one of the squares used to preserve the shape of the rectangular receptacles. Fig. 7 is a perspective view of a plurality of receptacles of rectangular form in cross-section, connected together so as to form a wall of the shape of a parallelepipedon. Fig. 8 is a perspective view of a wall constructed in accordance with my invention. Figs. 9 and 10 comprise perspective views of two forms of walls for protecting banks of a body of water, together with protracted views of the same. Fig. 11 is a perspective view of a series of connected receptacles forming a wall. Fig. 12 is a perspective view of a modified form of wall. Fig. 13 is an end view of the same. Fig. 14 is a perspective view of another form of wall. Fig. 15 is an end view of the same.

Referring by letter to the said drawings, A (see Fig. 1) indicates the woven-wire fabric of galvanized iron wire which enters into all the embodiments of my invention, the said

wire fabric having a mesh of suitable size in proportion to the material to be used for filling and being woven by the simple twisting of one wire upon the other, thus giving the fabric a great suppleness, which will enable the several devices (hereinafter described) formed of it to readily adapt themselves to all the irregular forms of river banks or beds. The wire fabric is in preference usually strengthened by means of ribs *a*, formed of wire rods arranged at suitable intervals and secured in the fabric by the woven wire thereof. These rods *a*, in addition to strengthening the fabric, serve another purpose, which will be readily understood by reference to Figs. 2 and 3. In the former figure is shown a wall B, which comprises a number of upright receptacles C, of circular form in cross-section, arranged side by side and adapted to contain pebbles, broken stone, or other suitable filling. In forming this wall B the fabric A is bent upon is middle rod *a*, and each corresponding pair of intermediate rods *a*, as well as the end pair, are connected by means of galvanized iron wire. The separate receptacles C thus formed are each provided with a plurality of rings *b*, which are placed within them and are secured to the wire fabric A by galvanized iron wire or other suitable means, said rings *b* having for their function to preserve the circular form of the receptacles in cross-section. In the wall B (shown in Fig. 2) the lower ends of the receptacles or stacks C are sewed together and closed by wire, so as to retain their filling of pebbles or broken stone within them. When, however, the wall is arranged on and connected to a base-cage D of woven wire, (see Fig. 8,) the lower ends of the upright receptacles or stacks C' are left open and in communication with the base-cage, so that the filling of pebbles or broken stone shoveled into the upper ends of the receptacles C' will pass through said receptacles C' into the base-cage until said cage is fully occupied and will then occupy the said receptacles C', the feeding of the filling being continued until the receptacles C', as well as the base-cage D, are filled.

In Fig. 4 is shown a double wall B', formed of a single strip of fabric A, said wall comprising two parallel series of receptacles C²

for the reception of broken stone or other filling, as shown. In forming this wall B' a strip of fabric A of greater length than that employed in forming the wall B is bent upon
 5 itself in opposite directions, and each corresponding pair of intermediate rods are connected together by means of galvanized wire to form the receptacles C², the circular form of said receptacles in cross-section being pre-
 10 served by the rings b in the same manner as in Fig. 2. The ends of the piece of fabric A in the embodiment shown in Fig. 4 may be secured in any suitable manner.

In Figs. 5 and 7 is shown a modified wall
 15 B², which is in the form of a parallelepipedon and comprises a plurality of receptacles C³, of rectangular shape in cross-section, designed to receive a filling of broken stone or the like, the said receptacles being connected by wire or
 20 other suitable means and being preserved in their original shape by squares b' of iron or other suitable metal. (See Fig. 6.)

When broken stone, pebbles, or other suitable filling is not plentiful, a wall B⁵ (see Figs.
 25 12 and 13) may be employed, the said wall comprising connected sections, which are respectively formed of one piece of wire fabric and respectively comprise the receptacles C⁶, with the portion of fabric i interposed between
 30 them. Where a stronger wall, entailing the employment of a small amount of filling, is desired, the wall B⁶ (shown in Figs. 14 and 15) may be employed. This wall comprises re-
 35 ceptacles C⁷ and parallel portions of fabric i i², interposed between the same, as shown.

The walls shown in Figs. 2, 12, and 14 are designed to be placed vertically or on an incline against the bank of a river or other body of water, and they are therefore provided with
 40 cords t, connected to and extended along their upper edges with free end portions, as shown, intermediate vertical cords t', which have extended ends, as shown, and intermediate horizontal cords t², also with extended ends. The
 45 cords t t' and sometimes the cords t² are of use in lowering the walls to their proper position and properly adjusting the same, and the cords t t' are also designed to be fastened to trees or other natural or artificial objects fixed
 50 in the ground to secure them in position, while the cords t² are designed to connect one wall to the ends of the walls contiguous thereto, thus insuring the stability of the walls and enabling them to protect a river-bank against
 55 the action of the stream.

The walls shown in Figs. 4 and 7 may also be provided with cords t t' t² when necessary, although they are not shown as provided with the same.

60 When it is desired to provide a bank or levee with a protecting-wall of high resisting power, subwalls B⁷, such as shown in Fig. 11, are arranged side by side, so that the direction of their length is at right angles to the
 65 face of the bank or levee. In order to connect the subwalls together, each is provided with wire or metallic cords t³, and in order to

fasten them to a bank or levee they are provided with cords t similar to those before described.

Another wall of great defensive power may be formed by arranging subwalls B⁸, such as shown in Fig. 9, or subwalls B⁹, such as shown in Fig. 10, side by side and connecting them together and to the bank or levee. The sub-
 75 wall B⁸ preferably comprises two upright receptacles of circular form in cross-section and a third receptacle which is of a less length than the other two and merges at its lower end in a sloping base-cage, as shown. The subwall
 80 B⁹ comprises one receptacle of rectangular form in cross-section and a second shorter receptacle, of rectangular form in cross-section, which merges at its lower end in a sloping base-cage. The said subwalls B⁸ B⁹ may be
 85 provided with cables t t³ similar to those on the subwalls of the wall B⁷.

All of the walls of wire-netting and stone or other filling described are designed for use in a vertical or in an inclined position to pro-
 90 tect the banks of rivers and other bodies of water.

In addition to reinforcing and protecting levees or banks of streams or other bodies of water the walls may be used in repairing
 95 breaks, different types of walls being used, according to the seriousness of the crevasse or threatened crevasse. I would also have it understood that, when necessary, walls em-
 100 bodying but a single layer each may be arranged one in front of the other to form a thick wall of great strength.

In Fig. 8 is shown a wall B¹¹, which has piles l driven through its base-cage D to secure it in position. This wall B¹¹ is designed for use
 105 at the foot of a bank or levee at times when the waters have subsided and when it is necessary to securely repair a break or weakened spot in the bank or levee. After the base-cage of the wall has sunk sufficiently in
 110 the bed of the river to maintain the wall in position the piles l may be withdrawn, so as to permit of a further sinking of the base-cage if the river-bed be of such a nature as to permit of the same.

Having thus described my invention, what I claim is—

1. A wall for use in reinforcing and protecting river banks or levees and repairing breaks or crevasses therein comprising a plu-
 120 rality of receptacles formed of woven-wire fabric and connected together, rigid frames arranged in said receptacles and connected to the woven-wire fabric so as to preserve the shape of the receptacles, and a filling of
 125 broken stone or other suitable material arranged in said receptacles, substantially as specified.

2. A wall for use in reinforcing and protecting river banks or levees and repairing
 130 breaks or crevasses therein comprising a piece of woven-wire fabric; said piece of fabric being bent upon itself and having its bent portions connected so as to form receptacles, and

a suitable filling arranged in said receptacles, substantially as specified.

3. A wall for use in reinforcing and protecting river banks or levees and repairing
5 breaks or crevasses therein, comprising a piece of woven-wire fabric having stiffening-rods at intervals in its length; said piece of fabric being bent upon itself and having the said rods connected together so as to form recep-
10 tacles, and a suitable filling arranged in said receptacles, substantially as specified.

4. A wall for use in reinforcing and protecting river banks or levees and repairing
15 breaks or crevasses therein, comprising a plurality of receptacles formed of woven-wire fabric and connected together, a base-cage of woven-wire fabric connected to the lower ends of the said receptacles and communi-
20 cating with the same, and a suitable filling occupying said receptacles and base-cage, substantially as specified.

5. A wall for use in reinforcing and protecting river banks and levees and repairing
25 breaks or crevasses therein, comprising a plurality of receptacles formed of woven-wire

fabric and connected together, a base-cage of woven wire connected to the lower ends of the said receptacles and communicating with the same, piles for securing the said base-cage to the bed of a river, and a suitable fill-
30 ing occupying the said receptacles and base-cage, substantially as specified.

6. An appliance for use in reinforcing and protecting river levees or banks and repairing
35 breaks or crevasses therein, comprising a plurality of receptacles formed of woven-wire fabric and connected together, a suitable filling arranged in the said receptacles, and metallic cables connected to said wall and de-
40 signed for use in connecting it with other walls and with the bank or levee, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 12th day of July, 45
1897.

GIULIO SERRA ZANETTI.

Witnesses:

F. I. WENEDITTY,

AUGUST EGGENSCHWILER.