Dec. 28, 1937. W. S. EDGE 2,103,897

REINFORCEMENT MESH

Filed Aug. 8, 1936 2 Sheets-Sheet 1

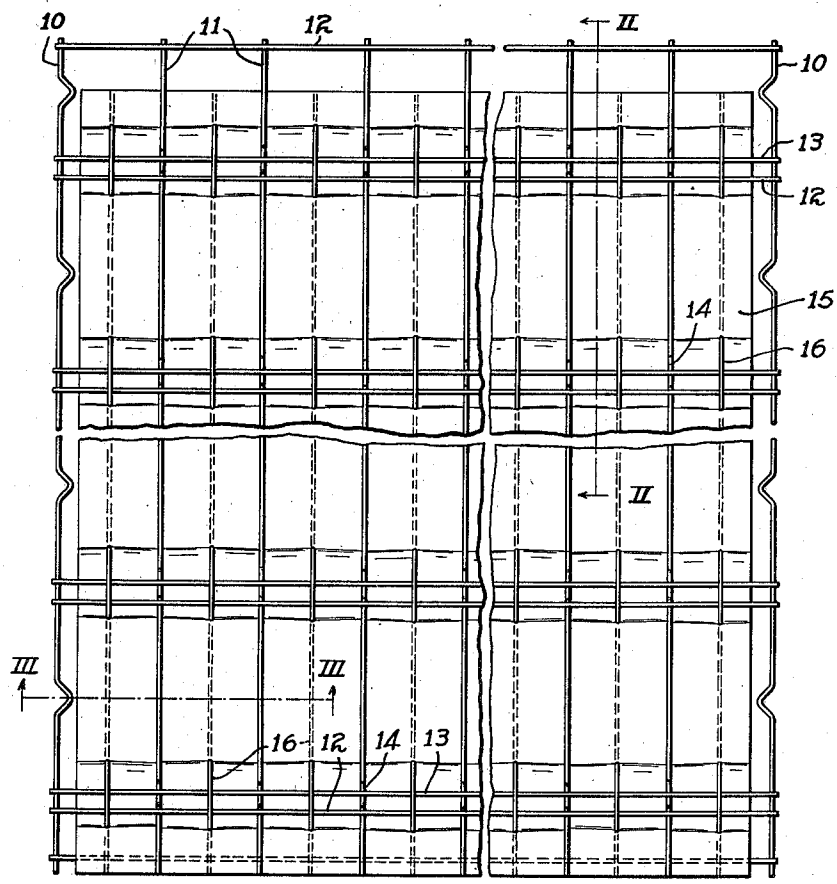


Fig. 1.

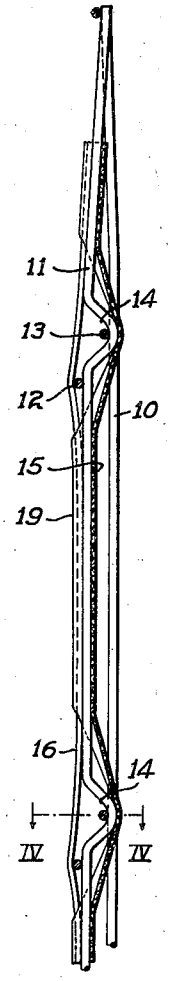


Fig. 2.

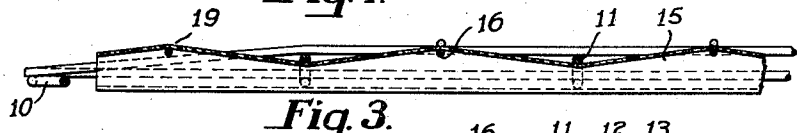


Fig. 3.

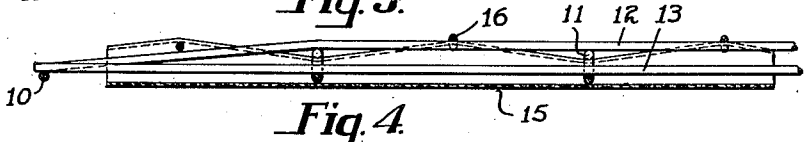


Fig. 4.

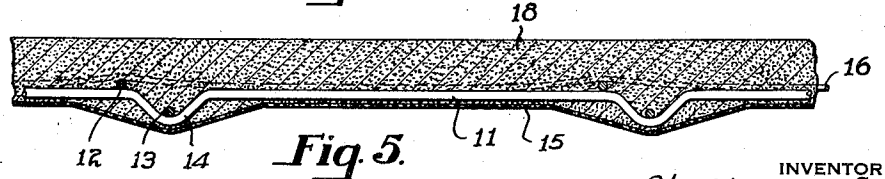


Fig. 5.

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Dec. 28, 1937. W. S. EDGE 2,103,897

REINFORCEMENT MESH

Filed Aug. 8, 1936 2 Sheets-Sheet 2

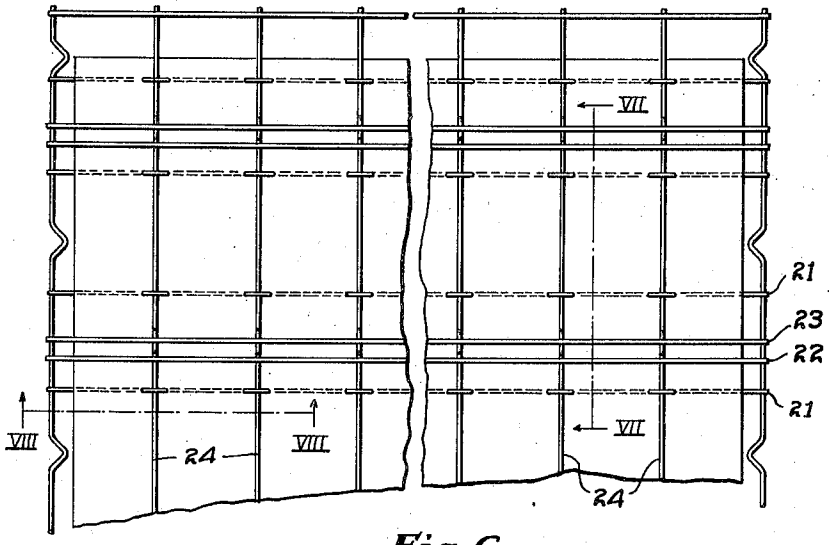


Fig. 6.

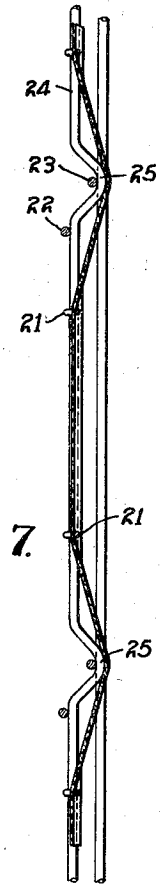


Fig. 7.

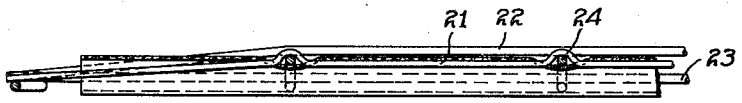


Fig. 8.

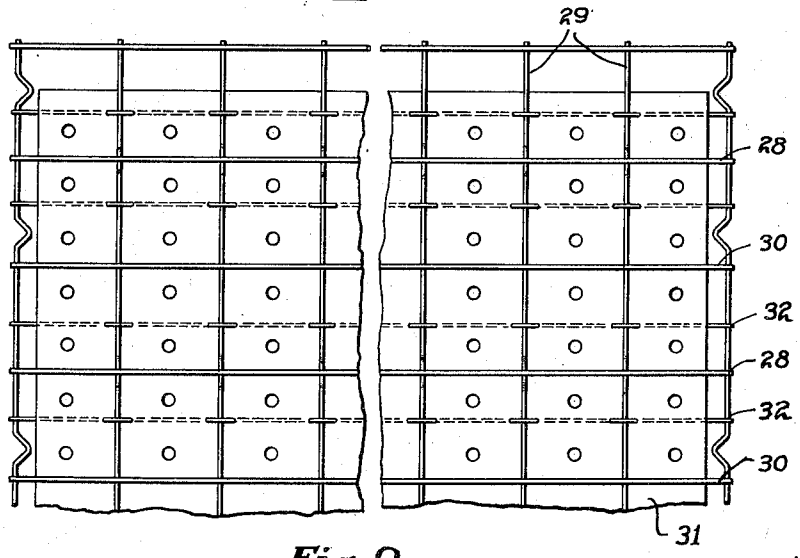


Fig. 9.

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UNITED STATES PATENT OFFICE

2,103,897

REINFORCEMENT MESH

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Application August 8, 1936, Serial No. 94,985

9 Claims. (Cl. 72—119)

My invention relates to reinforcement mesh that is particularly adapted for use in the building of walls, ceilings, floors, etc., where reinforcement is desired for a body or slab of plaster, concrete, stucco material, or the like.

This invention is especially applicable to that class of structures wherein a wire mesh reinforcement is employed for plastic material such as plaster, concrete, etc., and is backed by a form sheet of paper, or other flexible material, the composite mesh and sheet being frequently designated as "plaster ground".

One object of my invention is to provide a plaster ground structure of such form that the plaster body formed thereon will be of greater strength, relative to its thickness and weight, as compared to the forms of structures heretofore employed.

Another object of my invention is to provide a mesh of such form that it will form a truss for the plaster, of considerable depth in directions perpendicular to the plane of the structure.

Still another object of my invention is to provide a plaster ground of generally improved form.

In the accompanying drawings Figure 1 is a face view of a wire fabric and a backing sheet therefor; Fig. 2 is an enlarged view taken on the line II—II of Fig. 1; Fig. 3 is a view taken on the line III—III of Fig. 1; Fig. 4 is a view taken on the line IV—IV of Fig. 2; Fig. 5 is a view similar to Fig. 2, but showing the plaster or stucco applied thereto; Fig. 6 is a face view of another form of plaster ground; Fig. 7 is an enlarged view taken on the line VII—VII of Fig. 6; Fig. 8 is a view taken on the line VIII—VIII of Fig. 6, and Fig. 9 is a face view of still another form of plaster ground.

Referring first to Figs. 1 to 5, the structure includes a sheet of wire mesh or fabric having marginal strand wires 10 and intermediate strand wires 11, to which are welded stay wires 12 and 13, the wires 12 and 13 being arranged in pairs. The wires 10, 11, 12 and 13 are preferably of low carbon steel (.12% carbon or less), in order to secure better welds than is possible with high carbon wire. The wires 10 and 11 are preferably soft-drawn in order that permanent or set bends or crimps 14 can be more readily formed therein, and the wires 12 and 13 hard-drawn, in order to give greater stiffness to the structure.

The stay wires 13 are welded in the bends 14 of the wires 11, and the stay wires 12 welded to the wires 11 at points adjacent to the bends 14, thus producing a truss arrangement which is highly resistant to pressure or bending forces in directions perpendicular to the plane of the fabric.

A backing or form sheet 15 is supported against the rear side of the fabric, by lacing wires 16 which are preferably high carbon, hard-drawn wire of semi-spring steel, which will yield somewhat under plastering pressure, but will have sufficient stiffness to provide adequate support for the paper or other backing sheet 15.

The backing sheet may suitably be of oiled or water-proofed paper, having a multitude of minute perforations, so that it will not absorb water readily, and still will permit applied plaster to dry with sufficient rapidity to prevent "rotting" of the plaster. The perforations will be so small that no substantial amount of plaster will be forced therethrough. Since the paper will not absorb water rapidly from the plaster it will retain its strength during the troweling on of the plaster, with the result that a 60 lb. or 80 lb. paper may be employed with results equal to or better than the 200 lb. paper frequently used, thus effecting a great saving in material.

The lacing wires 16 lie mainly behind the paper, as shown more clearly in Fig. 1, but are threaded therethrough at intervals where they overlie and are supported by the stay wires 12. They need not be welded to the wires 12, because they will remain in place because of their deflection to sinuous form and their inherent springy character. The bends 14 may suitably be of $\frac{5}{16}$'' depth and the mesh wires 16 gage, while the lacing wires are 18 gage, for most general use.

The wires composing the mesh can be welded in any well-known manner, and thereafter the crimps or bends are formed in the strands 10 and 11, by suitable crimping dies. Crimps are formed in the marginal strands 10 along with the crimping of the wires 11, in order to avoid distortion of the mesh, but the crimps of wires 10 are then bent sidewise, to the plane of the mesh, so that the marginal edges of adjacent mesh bodies can be overlapped, without making the structure too thick at those points. The overlapping referred to will ordinarily be directly in front of the studding to which the plaster ground is attached.

The lacing wires 16 are inserted by first deflecting outwardly those portions of the paper between the stay wires 12 and then inserting the lacing wires as the paper and the mesh are advanced by suitable feeding means.

When the plaster ground has been secured to studding or other supporting members, the plaster 18 is applied in the usual manner, the paper sheet

being held by the lacing wires 16, against the rear sides of the bends 14 and intermediate portions of the wires 11, with sufficient force to prevent excessive deflection of the paper under plastering pressure. The resistance to rearward deflection is further increased because of the approximate dome shapes given to the paper at points 19 through the tensional force of the lacing wires 16 which pull the paper outwardly at points between adjacent strand wires 11 and adjacent stay wires 13.

In applying the plaster, the paper will be pushed slightly away from 11 and 13, but it will be sprung back by the lacing wires 16 so that there can be a complete imbedment of the wires 11 and 13, without excessive thickness of plaster and with consequent saving in plaster and reduction in weight of the structure. The truss arrangement at 14 and the dome or arch effect above referred to give a completed structure of strength which is comparable to the strength of other forms wherein the plaster body is much thicker, and there is more complete imbedment of the reinforcing mesh. Not only do the bends 14, together with the wires 12 and 13 form a truss substantially all of which is imbedded in the plaster, but they in effect cause a series of stiffening ribs to be formed on the rear side of the plaster body.

Referring now to Figs. 6, 7 and 8, I show a structure comprising a wire mesh and backing sheet of substantially the same form as in Figs. 1 to 5, but wherein lacing wires 21 extend parallel to stay wires 22 and 23, instead of transversely thereof, and cross the strand wires 24 at points intermediate their bends 25, thus holding the paper against the wires 23 and 24 and the bends 25.

In Fig. 9, I show a wire mesh of somewhat different form in that stay wires 28 are welded to the bottom of bends in strand wires 29 in the same manner that the wires 13 are welded to the bends 14 in the strand wires 11, but stay wires 30 which correspond to the stay wires 12 are set farther from the wires 28, with the result that while the truss strength is not so great as in Figs. 1 to 8, there is more uniform spacing of the stay wires, and hence better distribution of the wires in the plaster. In this structure the paper sheet 31 is held in place by lacing wires 32 which are disposed mainly behind the paper and are threaded therethrough where they pass over the strand wires 29.

It will be understood that sheet material other than paper will sometimes be employed. For example, very fine woven wire screening or loosely woven textile materials, such as burlap, could be employed.

With further reference to the backing sheet or form sheet, I have found that 60 lb. or 80 lb. paper will be satisfactory when impregnated with lubricating oil, or the like, and that the plaster will adhere well to such paper, particularly if the paper is not too highly calendered. I have found that this paper will not lose strength through absorption of water, as rapidly as untreated paper, but that its ability to pass water by evaporation is not impaired. The theory underlying this result is not entirely clear, but I attribute it to the fact that there is a sufficient porosity in the paper to allow evaporation from the rear side thereof, but that the light impregnation of oil renders the individual fibers resistant to absorption of the water, and therefore enables them to preserve their bond in a manner superior to untreated paper of the same weight.

In order to increase the rapidity of evaporation at the rear side of the sheet, I provide in some instances a multitude of small perforations in the sheet, not more than ¼ inch in diameter and preferably less, which will not permit any substantial quantities of plaster to be forced through the sheet.

I claim as my invention:

1. Fabric structure comprising a mesh composed of strand wires and stay wires secured together at their points of intersection, the strand wires having furring bends formed therein and extending rearwardly of the mesh, a backing sheet disposed against the rear sides of said bends and having portions deflected forwardly through the mesh openings, and lacing members overlying the outer side of the mesh and extending through the said deflected portions of the sheet.

2. Fabric structure comprising a mesh composed of strand wires and stay wires secured together at their points of intersection, the strand wires having furring bends formed therein and extending rearwardly of the fabric mesh, a backing sheet disposed against the rear sides of said bends and having portions deflected forwardly through the mesh openings, and lacing members overlying the outer side of the mesh and extending through the said deflected portions of the sheet, the said lacing members being of resilient material.

3. Fabric structure comprising a mesh composed of strand wires and stay wires secured together at their points of intersection, the strand wires having furring bends formed therein and extending rearwardly of the fabric mesh, a backing sheet disposed against the rear sides of said bends and having portions deflected forwardly through the mesh openings, and lacing members overlying the outerside of the mesh and extending through the said deflected portions of the sheet, the lacing members extending in directions parallel to the strand wires.

4. A plaster ground structure comprising reinforcing mesh, and a backing sheet therefor, the said sheet being resistant to the absorption of water and having perforations in closely spaced relation and of sufficiently small size to prevent substantial quantities of wet plaster being pushed therethrough, but permitting the passage of water.

5. Fabric structure comprising a mesh formed of a series of wires having furring bends formed therein, and a second series of wires extending transversely of the first-named series, certain wires of the said second series being welded in the apices of said bends, other wires of said series being welded to the first-named series at points intermediate the bends thereof, a backing sheet, and means for holding the said sheet against the rear sides of the bends.

6. Fabric structure comprising laterally-spaced wires having bends formed therein that project rearwardly from the plane of the said wires, means for maintaining the wires in their proper relative positions, a backing sheet disposed against the rear sides of said bends, and means for holding the sheet against the rear sides of the bends and with portions of the sheet deflected forwardly toward the plane of the wires.

7. Fabric structure comprising laterally-spaced wires having bends formed therein that project rearwardly from the plane of the said wires, means for maintaining the wires in their proper

relative positions, a backing sheet disposed against the rear sides of said bends, means for holding the sheet against the rear sides of the bends and with portions of the sheet deflected forwardly toward the plane of the wires, and a reinforcing wire extending transversely of the first-named wires and connected thereto at points adjacent to the said bends.

8. Fabric structure comprising laterally-spaced wires having bends formed therein that project rearwardly from the plane of the said wires, means for maintaining the wires in their proper relative positions, a backing sheet disposed aginst the rear sides of said bends, means for holding the sheet against the rear sides of the bends and with portions of the sheet deflected forwardly toward the plane of the wires, and a reinforcing wire extending transversely of the first-named wires, connected thereto at points adjacent to the said bends and in forwardly spaced relation with respect to said sheet.

9. Fabric structure comprising laterally-spaced wires each having bends formed therein that project rearwardly from the plane of the said wires, the bends in each wire being located in transverse alignment with said bends in the other wires, means for maintaining said wires in their proper relative positions, a backing sheet disposed against the rear sides of said bends, and means for holding the sheet against the wires with portions of the sheet deflected forwardly toward the plane of the wires between each series of transversely-aligned bends.

WALTER S. EDGE.