W. H. BROWN.

BOND TIE FOR WALLS AND THE LIKE.

APPLICATION FILED JULY 25, 1907.

947,194.

Patented Jan. 18, 1910.

2 SHEETS—SHEET 1.

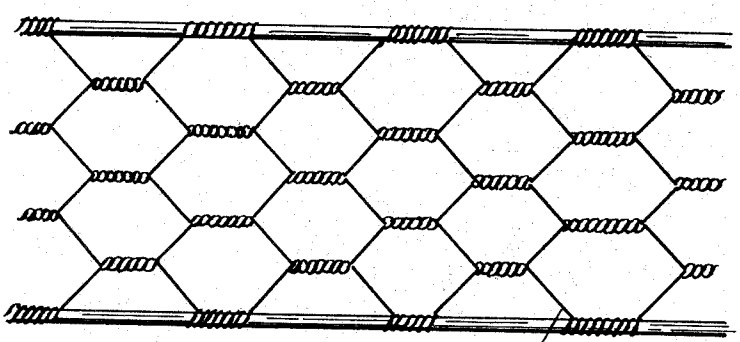

Fig.1

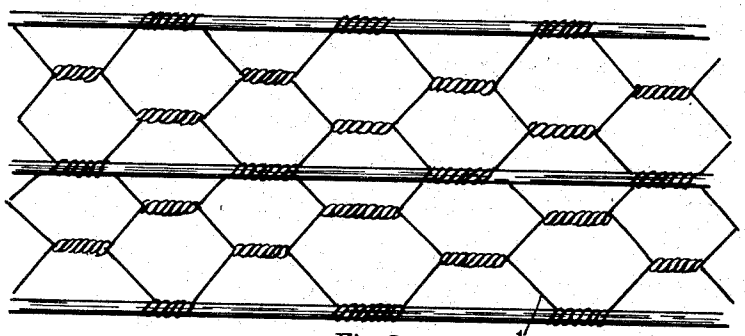

Fig.2

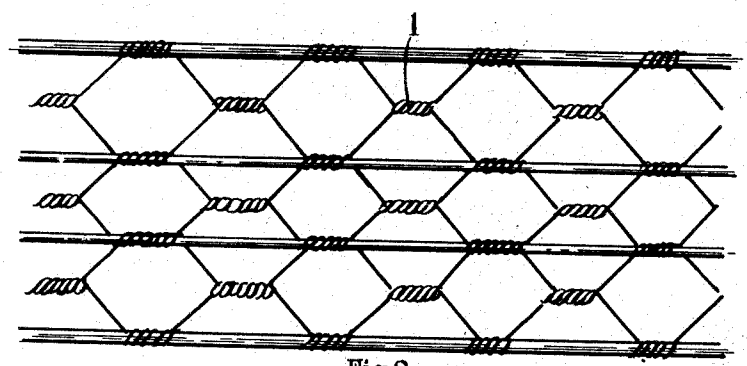

Fig.3.

Witnesses.

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2 SHEETS—SHEET 2.

Fig. 4.

Fig. 5.

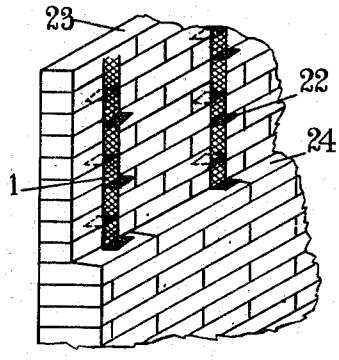


Fig. 6.

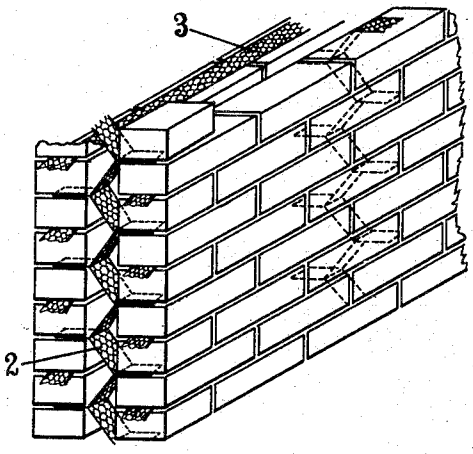
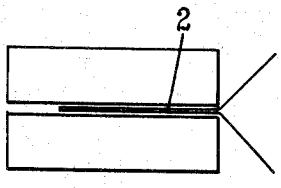


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE

WILLIAM HERVEY BROWN, OF YORK, ENGLAND.

BOND-TIE FOR WALLS AND THE LIKE.

947,194. Specification of Letters Patent. Patented Jan. 18, 1910.

Application filed July 25, 1907. Serial No. 385,540.

To all whom it may concern:

Be it known that I, WILLIAM HERVEY BROWN, a subject of the King of Great Britain, formerly residing at No. 62 Bootham, but now at No. 3 Croft's Terrace, in the city and county of York, England, have invented new and useful Improvements in Bond-Ties for Walls and the Like, of which the following is a specification.

My invention relates to and is improved means for reinforcing building work by bonding or more effectually securing together the courses or units of brick work or other building material in walls and other structures particularly where, owing to combinations of materials in the constructions, it is necessary or desirable to have the securest possible bonding or attachment of the combined materials or the separate units.

My reinforcement consists essentially of a strip, length or piece of wire netting used either with or without the addition of auxiliary strips or pieces. The main and auxiliary strips may be of any desired length or width as required by the circumstances of the case. The auxiliary strips may be either formed during the manufacture of and in one piece with the main strip of the reinforcement or may be wired or suitably fixed to the central or main strip afterward. The auxiliary strips may according to the circumstances of the case be formed on or fixed to the main strip across the breadth or along the side thereof and at any suitable or desired angle. The distances at which the said auxiliary strips shall be formed or fixed will be regulated by the requirements of each individual case.

My reinforcement is applicable to all parts of the structure and to the angles of walls equally with the walls themselves. It is also applicable to and is especially adapted for bonding together double walls or walls containing air spaces and for bonding brick work to concrete or reinforced concrete structures.

My invention is more particularly described with reference to the accompanying drawings in which:

Figure 1 shows a wire netting reinforcing strip. Fig. 2 shows a wire netting reinforcing strip strengthened by means of an additional central strand running parallel to the outer edge or selvage. Fig. 3 shows a wire netting reinforcing strip with a pair of additional strengthening strands. Fig. 4 shows a wire netting reinforcing strip provided with a series of auxiliary strips. Fig. 5 shows the application of the strip shown in Fig. 4. Fig. 6 is an isometric view showing a portion of a double brick wall containing an air space and bonded together by my reinforcement. Fig. 7 is a detail view showing one method of forming the bond by doubling the reinforcement on itself and inserting it between the courses of brick work.

Referring now to the drawings, I insert between the courses of brick work a strip of wire netting 1 which may be of the form shown in Fig. 1 or strengthened by means of central tensional strands as shown in Figs. 2 and 3 in addition to the selvage tensional strands. In each of these forms of the improved wire-netting, reinforcing or bonding strip it will be observed that said strip comprises relatively heavy longitudinal selvage tensional wires or strands and intermediate lighter wires or strands which are engaged with or coiled around the first-named wires or strands which may be termed the "warp strands", and which lighter strands, which may be termed the "weft strands", are plurally intercoiled with each other. In other words the lighter elastic or flexible strands of the netting are joined together at proper intervals by being twisted several times around each other, thereby forming longitudinally-disposed coils at these points of junction. The mesh of the wire netting strips is coarse enough so that the mortar may readily pass through the same, while the intertwisted coils of the weft strands are of sufficient size to secure a good hold on the mortar in which they are embedded, so that longitudinal strains or tensions on the reinforcing strips will be changed to lateral compressional strains or stresses on the mortar and the tensional strains will thus be absorbed by the mortar, owing to the hold in the latter which is due largely to the grip afforded by the embedded longitudinal coils formed by the plurality intertwisted or coiled weft strands of the netting strips. As shown in Figs. 4 and 5 the strip 1 is inserted between the courses of brick work either in one horizontal plane or vertical plane or side by side from one course of brick to another. By a series of such strips 1, I render the brick work monolithic and capable of resisting high tensional stresses while fracture and uneven settlements are rendered impossible.

It will be obvious that the arrangements of the bond shown in Figs. 4 and 5 are only shown by way of example and that the series of strips 1 may be arranged between the courses of brick work in a great number of ways according to the circumstances of each case.

Owing to my bond the mortar between the courses is laced and interlaced with woven wire to which the mortar grips with a tenacity which is estimated at two hundred pounds to the square inch of the surface in contact.

My reinforcement is possessed of a certain elasticity and resistance to shear which is not possessed by a plate or strip of stiff metal reinforcement. It has the advantage of being well distributed throughout the mortar joints, and the wires are at one and the same time at right angles parallel and tangential to the direction of every possible stress that can affect the brick work, giving both elasticity and a perfect resistance to shear. The action of wire netting when embedded in a mortar joint, with a weight of brick work above it, is such that, when resisting a tensional stress in the direction of its length, the natural tendency of the wire mesh to elongate and reduce its sectional area is resisted by the mortar which has become locked in the meshes; the direct tensional stresses, are, as a result, to a great extent arrested. This action also comes into force when resisting forces that are acting at right angles to its length. On the contrary hoop iron or sheet metal has no resistance to shear and its effect can only be compared to a steel joint embedded in concrete for the purpose of reinforcement; it acts as an independent body, and not in unison with the brick work, or the like, which it is reinforcing. The reinforcement can be supplied in rolls and can be moved forward by the bricklayer as the work proceeds. It is found that instead of being a hindrance to the workman it gives his work an almost perfect alinement.

In Figs. 4 and 5 I show the arrangement of a series of auxiliary strips 22 added to the width of the main strip 1. These auxiliary strips may also be added along the edge of the main strip if desired and in any case at any desired angle. This form of bond is especially applicable for bonding an old wall, such as 23, to a new wall, such as 24, or it may be used to bond a glazed or facing brick wall to a plain brick wall.

In Fig. 6 I show the sides of a double wall of brick (with air space between the sections) bonded together by step to step reinforcement 2, passing alternately from one wall to the other. In this manner I am enabled, for instance, to build a nine inch double wall with a facing brick outside and with a common brick inside as effective in resisting dampness and of greater strength than a fourteen inch double wall which has not been reinforced.

It will be readily understood from Figs. 6 and 7 that the reinforcement 2 is formed of a strip of wire netting similar in all respects to the reinforcement 1 shown in Figs. 1 to 3. In order to build such a wall the strip is first doubled and then placed between the two courses of brick work in one wall, as shown in Fig. 7 and then passed to the other wall and again doubled between the two courses of brick in the latter wall and from thence back to the first wall where it is again doubled between two courses of brick and so on throughout the height of the walls. It will be seen that, as shown in Fig. 6, I may arrange a series of such strips 2 bonding together the two walls at any desired distance from each other.

It will be readily understood that these methods of reinforcement have the effect of adding to and strengthening the power of resistance of the structure to which it is applied, to and against pressure in or from any direction while it provides a satisfactory and cheap method of bonding together different materials such as facing brick with common brick or concrete with brick work or other building materials.

What I claim is:

1. A flexible or elastic reinforcing bond for masonry structures, consisting of a coarse wire netting strip adapted to be embedded in the mortar and which strip is provided with a series of side extensions or auxiliary strips, as 22, of wire netting extending outward transversely from the body of the main strip.

2. A flexible or elastic reinforcing bond for masonry structures, consisting of a coarse wire netting strip comprising relatively heavy selvage warp strands and relatively light and flexible interposed weft strands engaged with said warp strands and intertwisted together at intervals to form plural coils disposed lengthwise of the said netting strip, said strip being provided with said extensions or auxiliary strips, as 22 of wire netting extending outward transversely from the body of the main strip.

3. A flexible or elastic reinforcing bond for masonry structures, consisting of a coarse wire netting strip comprising heavy selvage warp strands and one or more heavy intermediate warp strands, and relatively light and flexible weft strands engaged with said warp strands and intertwisted with each other, independently of their point of connection with said warp strands, to form plural coils which are disposed lengthwise of the said netting strip, said strip being provided with side extensions or auxiliary strips, as 22, of wire netting extending outward transversely from the body of the main strip.

4. A reinforced bonded double wall comprising walls spaced apart and each formed of units of brick, stone, concrete or other building materials, a series of main wire netting strips arranged between the inner and outer parts of the double walls, and a series of auxiliary wire netting strips connected to and extending outward from the main strips and passed between the courses of the building materials forming said walls.

5. A reinforced or bonded double wall comprising walls spaced apart and each formed of units of building material and a series of wire netting strips arranged between the inner and outer parts of the double walls as a vertical step by step reinforcement, and passing alternately between the courses of the building materials forming said walls.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HERVEY BROWN.

Witnesses:

W. BOYCE,

L. E. HAYNES.