May 18, 1965 W. G. SMITH 3,183,628

MASONRY WALL REINFORCING MEANS

Filed Oct. 12, 1962

FIG. 1

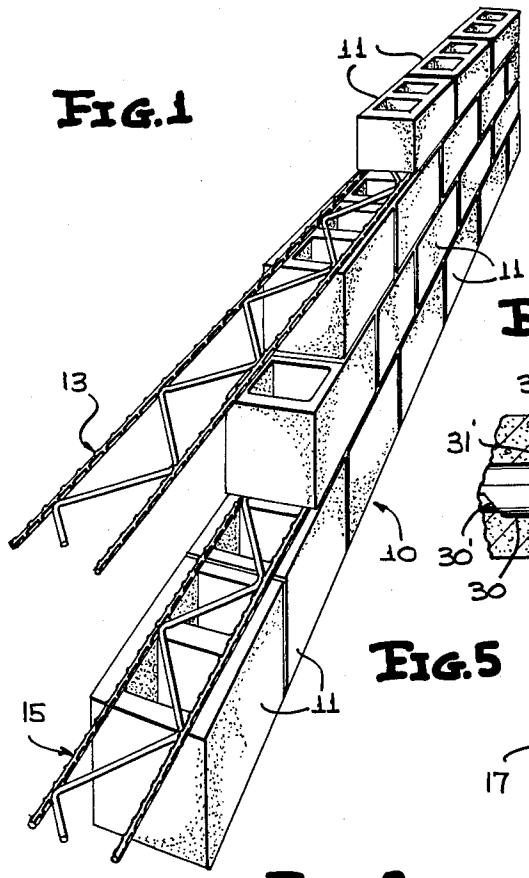


FIG. 3

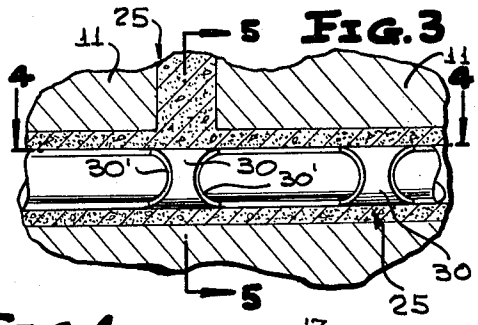


FIG. 4

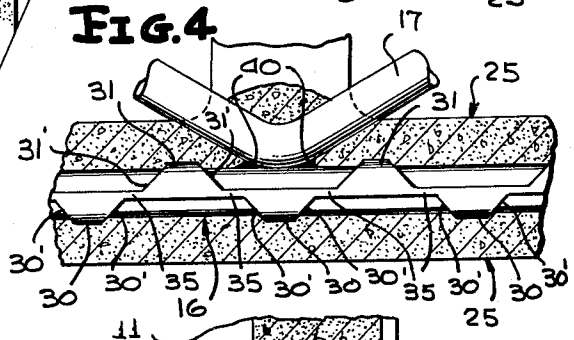


FIG. 5

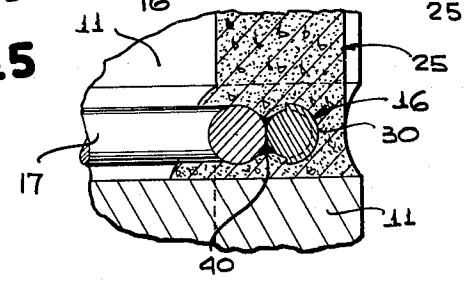
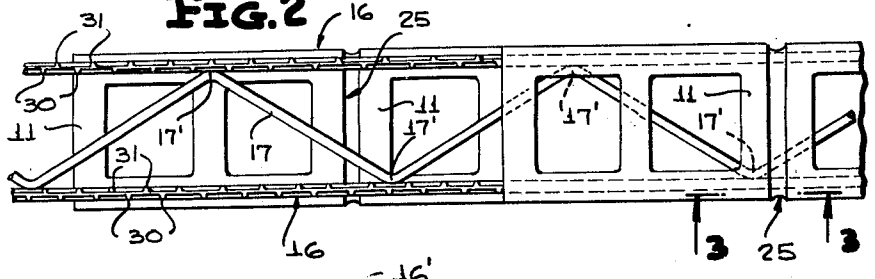


FIG. 2



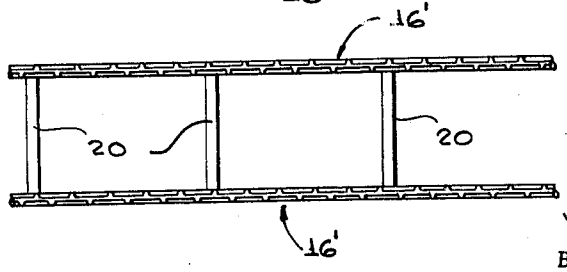


FIG. 6

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MASONRY WALL REINFORCING MEANS

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1 Claim. (Cl. 50—492)

The present invention relates to new and novel masonry wall reinforcing means, and particularly to reinforcing means to be incorporated in walls formed of concrete or concrete block faced with brick and the like.

The reinforcing means of the present invention is adapted to be embedded within the mortar between adjacent courses of the constructional units whatever their nature may be. Since the reinforcing means is to be surrounded by mortar, an essential feature of the reinforcing means is to provide in some manner the best possible adherence between the mortar and the reinforcing means. Efforts have been made in the prior art to provide this type of reinforcing means with some means for obtaining good mortar adherence. This has, for example, taken form of scored notches and the like in the body of the side rods of the reinforcing means in an effort to obtain the desired mortar adherence.

The measures referred to above as taken in the prior art have not proved satisfactory for a number of reasons. Firstly, the desired mortar adherence has not been obtained, and further the deformation or scoring required to form the notches and the like in the side rods weakens the side rods and lowers the tensile strength thereof. The mortar adherence and the shear strength of the mortar when utilizing this type of prior art construction is not adequate.

The present invention incorporates a unique construction wherein the side rods of the reinforcing means are embossed so as to provide a plurality of spaced bosses on opposite sides of each of the side rods, the bosses on one side of each rod being in staggered relationship to the bosses on the other side thereof. The opposite ends of these bosses are joined by longitudinally extending ribs which extend between the adjacent ends of bosses on opposite sides of the side rods. Firstly, it will be apparent that by so embossing the substantially cylindrical side rods, the rods retain their full strength and are not weakened by deformation or scoring. It has also been found that this construction according to the present invention provides higher tensile strength and a better mortar bond than the deformed or scored type referred to above.

Furthermore with the construction of the present invention the shear stress is on the steel while the compression forces act on the mortar which is the desirable situation.

The connecting means between the spaced side rods may take the form of relatively smooth rods which can be suitably secured to the side rods in any desired manner. In a first form of the invention, the connecting means is of the truss type which extends obliquely to the rod, while in a second modification a ladder-like configuration is provided wherein the connecting means extends substantially normally to the side rods. In either case, the masonry wall reinforcing means can be readily cut and bent to form corners where required so that continuous corner reinforcing can be provided. It is evident that the reinforcing means of the present invention will be utilized in various wall areas, generally being employed between certain selected spaced courses of the constructional units, and between courses adjacent all wall openings.

An object of the invention is to provide new and novel masonry wall reinforcing means which is especially designed to be embedded in the mortar between adjacent

courses of constructional units such as concrete blocks, bricks and the like.

Another object of the invention is to provide masonry wall reinforcing means including a plurality of side rods including means for providing a good mortar bond and at the same time providing a construction wherein the side rods are not weakened by deformation or scoring.

A further object of the invention is to provide masonry wall reinforcing means which has a higher tensile strength and better mortar bond than prior art deformed or scored types.

A still further object of the invention is the provision of masonry wall reinforcing means which places the shear stress on the steel components of the reinforcing means while the compression forces are acting on the mortar surrounding the reinforcing means in the assembled relationship.

Other objects and many attendant advantages of the invention will become more apparent when considered in connection with the specification and accompanying drawing, wherein:

FIG. 1 is a top perspective view of a portion of a semi-completed wall incorporating the reinforcing means of the present invention;

FIG. 2 is a top view of a part of the wall structure shown in FIG. 1;

FIG. 3 is a broken away sectional view taken along line 3—3 of FIG. 2 looking in the direction of the arrows;

FIG. 4 is a sectional view partially broken away taken along line 4—4 of FIG. 3 looking in the direction of the arrows;

FIG. 5 is a broken away sectional view taken substantially along line 5—5 of FIG. 3 looking in the direction of the arrows; and

FIG. 6 illustrates a modified form of the invention.

Referring now to the drawings wherein like reference characters designate corresponding parts throughout the several views, there is shown in FIG. 1 a typical wall construction made of concrete blocks indicated by reference numerals **11** of conventional construction, which wall is reinforced with the reinforcing means of the present invention as indicated generally by reference numerals **15**.

As illustrated, the masonry wall reinforcing means of the present invention is shown as being disposed such that the wall area is reinforced every second course.

As seen in FIG. 2, each reinforcing means of the present invention may include a pair of spaced substantially parallel side rods or members **16** of similar construction which will be hereinafter described. These side rods are interconnected with one another by suitable connecting means which as seen in FIG. 2 takes the form of a relatively smooth round rod-like member **17** which may be bent into a zig-zag form, the apexes of member **17** being suitably secured to the inwardly facing surfaces of the rod **16** as by butt welding and the like.

A modified form of the invention is illustrated in FIG. 6, wherein the side rods **16'** may be identical with the side rods **16** discussed in connection with FIG. 2, the side rods being interconnected by a plurality of cross members **20** which serve the same purpose as member **17** of the construction shown in FIG. 2. It is apparent that members **20** may be suitably secured to members **16'** along the inner surfaces thereof by any suitable means as by butt welding.

In comparing the two modifications shown in FIGS. 2 and 6, it will be evident that the configuration as shown in FIG. 2 may well be identified as a truss type whereas the construction as shown in FIG. 6 may be referred to as a ladder type construction. In each case, the connecting means serves to maintain the side rods in the proper spaced relationship to one another, the connecting means being of relatively smooth rod-like construction, and further-

more in each case the two side rods and the connecting means interposed therebetween lie substantially in a plane.

The masonry wall is of a conventional construction being composed of a plurality of constructional units such as concrete blocks as mentioned previously, the various blocks being held together by mortar as is conventional in the art. The reinforcing means of the present invention is embedded and surrounded by the mortar between adjacent courses of the constructional units, and for the sake of simplicity, the body of mortar between the courses as well as between adjacent blocks in any particular course has been indicated by **25** such as the mortar throughout is indicated by this particular reference numeral.

Considering now the specific construction of each of the side rods, the side rods are substantially cylindrical in configuration and are embossed so as to provide a plurality of outwardly projecting bosses and rib portions thereon. The construction of each of rods **16** is identical, and accordingly a description of the specific construction of one of these rods will be sufficient. As seen for example in FIG. 4, each side rod is embossed so as to comprise a first plurality of bosses **30** on one side thereof and a second plurality of bosses **31** on the opposite side thereof. These bosses are substantially diametrically opposite to one another and extend outwardly from opposite sides of the rods so that when in operative position they extend laterally with respect to the associated wall portion.

As seen in FIG. 4, the bosses each include oppositely sloping side surfaces so that the bosses have a generally tapered configuration as viewed from above. In other words, the side surfaces **30'** of bosses **30** and the side surfaces **31'** of bosses **31** slope toward one another in moving from the outer cylindrical surface of the rod toward the outer portion of the bosses. This sloping configuration may also be readily seen in FIG. 3 wherein it may be further noted that the side surfaces of each of the bosses is curved as indicated such that the bosses have their maximum dimension at the upper and lower portions of the associated rod as seen in FIG. 3 with a minimum dimension at the medial point thereof as seen in this figure.

Referring now to FIG. 4, it will be noted that a plurality of longitudinally extending rib portions **35** are disposed between the adjacent upper ends of bosses **30** and **31** on opposite sides of the rod. It will be understood that similar ribs are disposed between the lower end portions of each of the bosses, the rods being symmetrical in configuration as regards the positioning of the bosses and ribs thereon.

As illustrated in FIGS. 4 and 5, reference numeral **40** indicates the butt weld which secures connecting means **17** to the rod **16**.

It is apparent from the foregoing discussion that the reinforcing means is embedded in the mortar between adjacent courses in such a manner that the rods **16** are completely surrounded by mortar, it being apparent that the bosses **30** and **31** as well as the ribs **35** provide a very good bond with the mortar and which further insures that this bond will be such that forces can be readily transmitted from the mortar to the reinforcing means in many varied directions.

As a result, the shear stress in the wall is on the material of the reinforcing means which may be formed of high tensile, cold drawn, bright basic steel which may conform to ASTM standard specification A82–58T. At the same time the compression is on the mortar as it should be in this type of construction. The reinforcing means of the

present invention has higher tensile strength than the deformed or scored type as employed in the prior art, and the side rods retain their full strength and are not weakened by any deformation or scoring.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, and since the scope of the invention is defined by the appended claim, all changes that fall within the metes and bounds of the claim or that form their functional as well as conjointly cooperative equivalents are therefore intended to be embraced by this claim.

I claim:

Masonary wall reinforcing means comprising a pair of side rods disposed in spaced substantially parallel relationship with one another and being of similar construction connecting means connected between said rods for retaining the rods in operative relationship relative to one another, said connecting means and rods lying substantially in a plane and being rigidly attached to one another so as to provide a rigid structure, each of said rods being embossed to define a plurality of bosses and ribs thereon, each rod having a first plurality of spaced bosses disposed on one side thereof with a second plurality of spaced bosses on the opposite side thereof, said rods being substantially cylindrical in configuration with the embossed portions thereof extending radially outwardly thereof, each of said bosses extending through an arc of less than 180 degrees, each of said ribs extending in a longitudinal direction relative to the length of the respective rod, the outer surfaces of said embossed portions and said ribs defining a portion of a cylindrical surface which is concentric with the cylindrical surface of said rods, each of said ribs extending between adjacent end portions of a pair of bosses, said bosses having a maximum dimension at the end portions thereof and a minimum dimension at an intermediate portion thereof, said ribs extending longitudinally of the associated rods a distance substantially less than the associated end portion of the bosses, and adjacent bosses being disposed on opposite sides of the rod and in staggered relationship with one another such that adjacent bosses are spaced longitudinally along the rod from one another with a rib interposed therebetween so that no portion of any boss is disposed at a diametrically opposite portion of the rod from another boss, said connecting means being rigidly secured to the inner surface of each of said rods at a point substantially midway between two adjacent inwardly extending bosses formed on each rod.

References Cited by the Examiner

UNITED STATES PATENTS

815,618	3/06	Mueser	50—528
931,185	8/09	Dudley	50—529
2,929,238	3/60	Kaye	50—492

FOREIGN PATENTS

184,711	2/56	Austria.
10,703,	6/95	Switzerland.

OTHER REFERENCES

Concrete (a publication), September 1957, page 3.

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JACOB L. NACKENOFF, *Examiner.*