Jan. 25, 1966 M. M. ROSENFELD 3,230,679

WALL STRUCTURE HAVING PREFAB JOIST SECTIONS

Filed March 23, 1962

Fig. 1

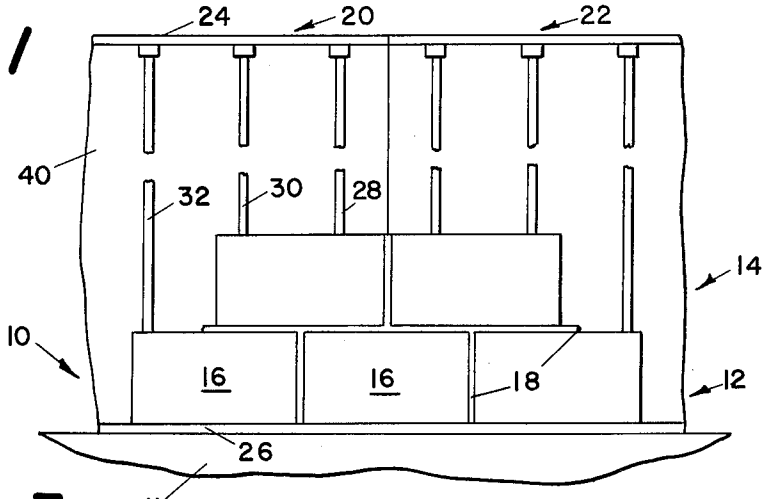


Fig. 3

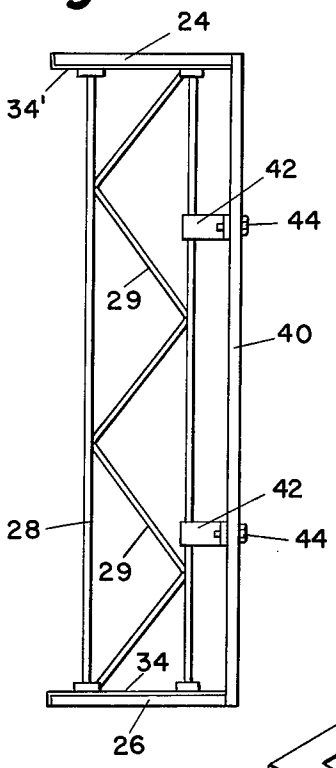


Fig. 2

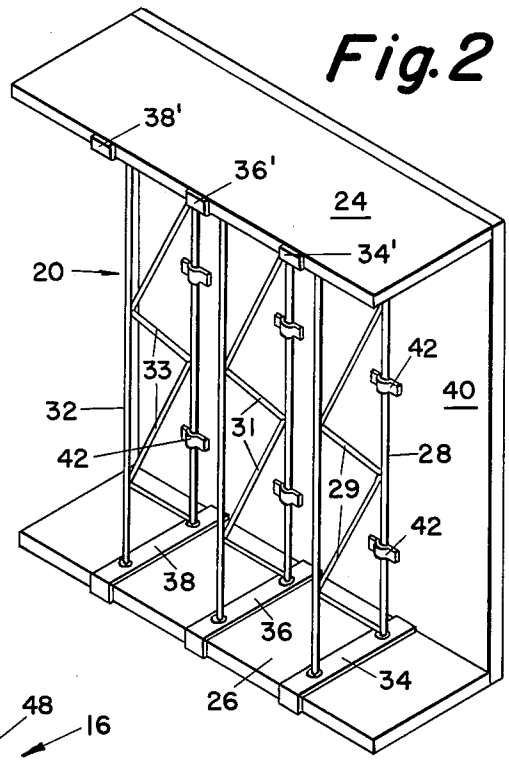
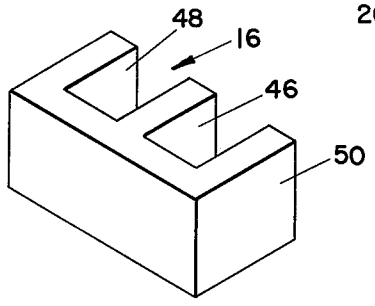


Fig. 4



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WALL STRUCTURE HAVING PREFAB JOIST SECTIONS

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This invention relates to a wall structure, and more particularly, to a wall structure having internal reinforcement in the form of prefab joist sections.

The wall structure of the present invention is particularly suitable for erection within enclosed structures such as basements of buildings, mines, vaults, etc., where the erection of walls capable of withstanding heavy loads is desirable. The wall structure of the present invention is readily adaptable for erection within confined quarters and is economically attractive as compared with wall structures proposed heretofore. The wall structure of the present invention will provide a stronger wall having the ability to withstand pressures of approximately 2,000 pounds per square foot or more. In comparison, the wall structures proposed heretofore such as the reinforcement structures in buildings having heavy machinery or the like, the design load for such structures is only approximately 250 pounds per square foot.

In order to provide an internally reinforced wall structure capable of being erected in confined quarters, the present invention contemplates utilization of prefab vertical joist sections. Each joist section includes a header and a base fixedly interconnected by upright reinforcement members. The reinforcement members may be pairs of spaced rods interconnected with bracing or the like. When constructing a wall in accordance with the present invention, the prefab sections will be positioned in the plane of the wall to be constructed. Thereafter, the wall is constructed in accordance with any one of a variety of conventional manners with or without the use of overlapping blocks. The blocks are provided with hollow cores adapted to accommodate the upright reinforcement members.

In constructing a wall as per the present invention, it is preferable to use a form against which the blocks will be positioned thereby assuring that all blocks will lie in the same plane. Since the prefab upright joist sections will be in the nature of a skeleton, a novice may readily construct a properly orientated wall within a minimum amount of time. The prefab sections are capable of being made in a variety of sizes and weights. I have found that the preferred size is approximately 32 inches square and has a weight of approximately 85 pounds. The weight of the sections may be varied by varying the materials from which the sections are constructed.

It is an object of the present invention to provide a novel wall structure internally reinforced by prefab upright joist sections.

It is another of the present invention to provide a novel method for rapidly constructing an internally reinforced wall structure.

It is another object of the present invention to provide a novel wall structure utilizing prefab sections and blocks having mortar between juxtaposed faces.

It is another object of the present invention to provide a novel wall structure which may be readily erected by a novice while at the same time incorporating internal reinforcement which facilitates proper orientation of blocks with respect to each other.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings forms which are presently

preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a front elevation view of a partially constructed wall in accordance with the present invention.

FIGURE 2 is a perspective view of a prefab joist section and form.

FIGURE 3 is an end elevation view of the prefab section and form illustrated in FIGURE 2.

FIGURE 4 is a perspective view of a building block capable of being utilized in constructing the wall illustrated in FIGURE 1.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 a wall structure designated generally as **10**.

The wall structure **10** is erected on a support surface **11** which may be a floor of a building, a foundation, etc. The wall structure as indicated in FIGURE 1 is partially constructed and includes a first course **12** and a second course **14**. The courses **12** and **14** are preferably constructed from overlapping building blocks **16** with mortar **18** between juxtaposed faces of the blocks in the same and adjacent courses.

A plurality of prefab upright joist sections are provided within the plane of the wall to be constructed. As illustrated in FIGURE 1, sections **20** and **22** are disposed adjacent one another in the plane of the wall **10**. Other sections will be disposed alongside and on top of the sections **20** and **22**. All of the prefab joist sections are identical. Accordingly, only section **20** will be described in detail.

As shown more clearly in FIGURES 2 and 3, the prefab joist section **20** includes a header **24** and a base **26** interconnected by upright pairs of reinforcement members **28**, **30** and **32**. A larger or smaller number of pairs of reinforcement members may be provided as desired. The pair of reinforcement members **28** are interconnected by bracing **29**. Likewise, the pair of reinforcement members **30** are interconnected by bracing **31** and the pair of reinforcement members **32** are interconnected by bracing **33**.

The pair of reinforcement members **28** are provided with flanged ends connected to straps **34** and **34'**. The strap **34** is secured to the base **26** and the strap **34'** is secured to the header **24**. The pair of reinforcement members **30** are likewise interconnected with straps **36** and **36'**. Also, the pair of reinforcement members **32** are interconnected with straps **38** and **38'**. The reinforcement members are preferably made from a reinforcing material having sufficient strength characteristics. I prefer to use steel for the reinforcing members. The header and base may be made from any one of a variety of materials including wood, concrete, metal, etc. The width of the header **24** and base **26** may be slightly less than the width of the wall **10**. The thickness of the header **24** and base **26** may approximate the thickness of the mortar between adjacent courses. Hence, the side faces of the header and base of each section may be pointed in a conventional manner so as to conceal the sections, thereby providing a wall structure which is reinforced in a manner which is not readily ascertainable.

A form **40** is preferably juxtaposed to a side face of the various prefab joist sections. The form **40** may be maintained in an upright disposition by means of brackets **42** which releasably secure the form **40** to the joist sections. A bolt **44** may extend through the form **40** and be threadedly secured to the brackets **42**.

The wall **10** is preferably constructed from blocks **16** as illustrated in FIGURE 4. The blocks **16** are generally E-shaped and have a center leg **46** and end legs **48** and **50**. The blocks **16** may be constructed from a wide va-

riety of materials including cinders, concrete, etc. Preferably the blocks **16** are provided with dimensions which are multiples of the size of the prefab joist sections. For example, if blocks eight inches high are utilized, the distance between the base **26** and header **24** may be thirty-four inches thereby accommodating four courses of blocks and four one-half inch layers of mortar **18**. Depending upon the circumstances and environment in which the wall **10** is to be constructed, the size of the blocks and prefab joist sections may be varied as desired.

The wall **10** may be constructed as follows:

A supporting surface **11** which may be floor, a foundation, or the like is provided in the area in which the wall **10** is to be constructed. A plurality of prefab joist sections are positioned in the plane of the wall which is to be constructed. Preferably, the base on the lowermost row of prefab joist sections is anchored to the supporting surface **11**. The header on each section in the uppermost row of prefab joist sections may be fixedly secured to an upper limiting surface such as a ceiling or the like. If desired, the intermediate rows of prefab joist sections may be interconnected with one another by conventional fastening means. Thereafter, the forms **40** are releasably secured along one side of the various prefab joist sections.

At this point, it will be noted that a skeleton of the wall has been constructed. A layer or mortar **18** may be provided on the base **26** of each section, thereafter the first course **12** of the blocks **16** will be positioned with mortar **18** between juxtaposed faces of the blocks **16**. The blocks **16** will be positioned so that each of its legs **46–50** will be disposed between adjacent ones of the pairs of reinforcement members. The second course **14** will be provided in a manner so that the blocks overlap the blocks in course **12** while at the same time each of the legs **46–50** on the blocks will be disposed between one of the pairs of upright reinforcing members. As the blocks **16** are placed in position, they are pushed to the rear against the form **40**. Hence, the form **40** acts as a limit stop thereby assuring that all of the blocks in the various courses of wall **10** will lie in the same plane.

When the desired height of the wall **10** has been attained, the bolt **44** will be loosened and the form **40** removed. Thereafter, the wall **10** is completed. The simplicity with which the wall **10** may be constructed enables walls to be rapidly constructed by a novice while heretofore the services of a skilled mason or bricklayer were required. The space between the legs of the blocks **16** may be filled with concrete by means of a shovel, trowel, small chutes, etc. The form **40** facilitates the retention of concrete within the hollow cores between the legs of the blocks **16** and preferably should remain in its upright disposition until the filler material has hardened.

The wall **10** may be a foundation for a building, a wall of a bomb shelter, or a reinforcement structure for buildings adapted to contain heavy machinery. The wall **10** is preferably constructed in a manner so that the surface thereof illustrated in FIGURE 1 is the exposed surface. This exposed surface offers little or no indication that the wall is internally reinforced or that prefab joist sections were utilized in the construction of the same. Where desired, apertures or windows of a limited size may be provided in the wall **10** by utilizing a prefab joist section which lacks a middle pair of reinforcement

members. In this manner, it will be noted that the prefab joist sections of the present invention will eliminate the necessity for providing a window opening header in the wall to support the weight of the blocks above the window opening.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. A wall construction comprising a plurality of prefabricated joist sections, said joist sections comprising a horizontal base member and a horizontal header member, said base and header members interconnected in spaced relationship by a plurality of vertical rods, said rods being arranged in longitudinally spaced pairs, the bars of each pair being disposed in a plane normal to the longitudinal axis of the joist section with said pair of bars being interconnected by a plurality of bracing rods, and a plurality of building blocks connected to the pre-fabricated joist sections, said building blocks comprising a substantially planar facing wall and a plurality of legs extending from one side of said facing wall and normal thereto, forming channels on one side of said building block, each of said channels receiving one of said pairs of vertical rods therein and a cementitious material filling the channels and embedding the vertical rods therein.

2. A wall construction in accordance with claim **1** wherein the distance between said header and base of each joist section is related to the height of said building blocks so that an integral number of courses of said building blocks may be provided between said base and header at each section.

3. A wall construction in accordance with claim **2** wherein said base and header members each have a horizontal width less than said building blocks and a vertical thickness corresponding to mortared joints between said courses of blocks, wherein said members may be hidden within said wall by a mortared joist.

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