

June 8, 1937.

A. M. KINNINGER ET AL
COLUMN REINFORCEMENT GIRDLE

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2 Sheets-Sheet 1

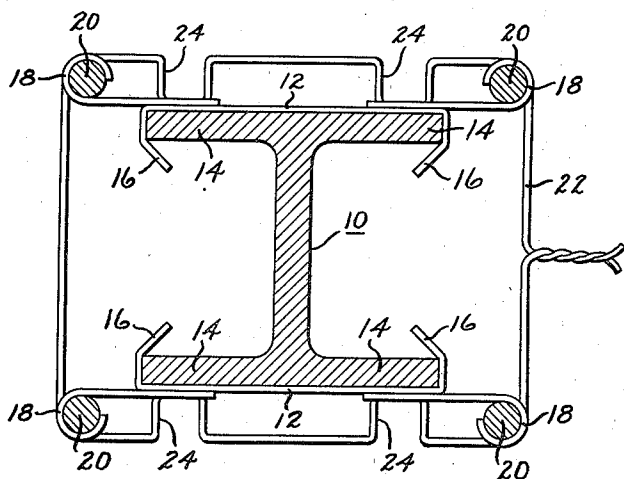


Fig. 2

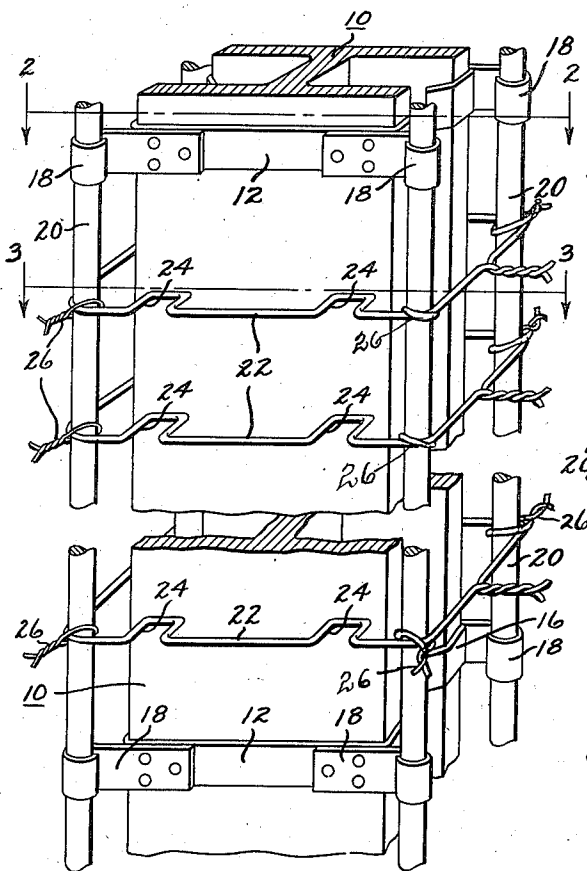


Fig. 3

Fig. 1

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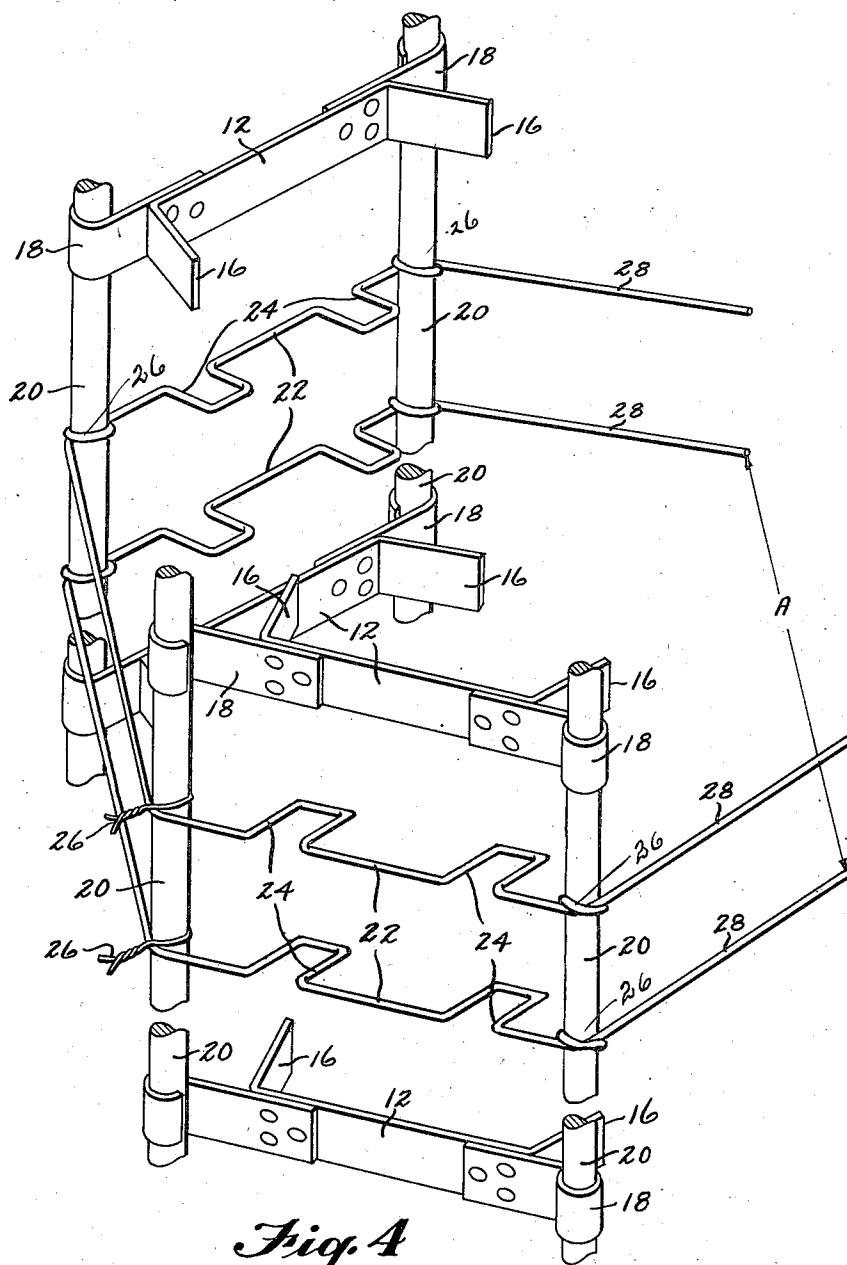


Fig. 4

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COLUMN REENFORCEMENT GIRDLE

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7 Claims. (Cl. 72—76)

This invention relates to columns and in more particular to a concrete reinforcing girdle encircling the column.

In the erection of metallic columns it has been the common practice to enclose the columns with masonry, such as concrete, that is reinforced so as to prevent the masonry from cracking and separating from the metal supporting structure. The reinforcement has usually been placed in a haphazard manner, not much thought being given to uniform distribution thereof throughout the masonry and without much attention being given to a resulting structure having the greatest amount of efficiency for the materials used and at the same time produced with the minimum cost.

An object of this invention is to provide a reinforcing girdle for columns wherein the parts are held in a relatively fixed relation to each other when assembled.

Another object of this invention is to provide the maximum amount of reinforcing material where the stresses are greatest.

Another object of this invention is to provide a reinforcing girdle that may be preassembled, so as to be readily placed in position and fixedly attached with the minimum amount of time and labor.

Another object of this invention is to provide means attached to the metallic core of the column for rigidly holding the reinforcing structure in position.

Another object of this invention is to provide a reinforcing girdle that is open along one side, so that it may be slipped around the core of the column and then secured in position.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

Fig. 1 is a fragmentary perspective view showing the metallic core encircled by the reinforcing girdle.

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is another sectional view taken substantially on the line 3—3 of Fig. 1.

Fig. 4 shows a perspective view of a portion of the reinforcing girdle in readiness to be applied to the metallic core of the column.

In steel structures it is a common practice to support the structure upon a steel frame including vertical columns that are enclosed by suitable masonry to protect the steel frame from the elements, to add attractiveness to the appearance and to add strength to the structure. In the erection of this type of structure the concrete surrounding the steel core is preferably provided with suitable reinforcements. Such reinforcements may also be used if the metallic core is en-

closed by other types of masonry, such as brick, tile, stone etc.

This invention relates primarily to the structure of the masonry surrounding the steel frame, which will now be more fully described.

Referring to the drawings the reference character 10 indicates the metallic core of a column. For the purpose of illustration a conventional I-bar has been shown, although any other type of a column may be used within the purview of this invention. When the structure is finished the column 10 is embedded in masonry provided with suitable reinforcements.

The masonry reinforcements include reinforcing rods 20, extending parallel to the longitudinal axis of the metallic core 10. The rods 20 at spaced intervals are held in rigid position by supporting members including pairs of metallic straps 12, extending along the opposite faces of the flanges 14 of the core 10. The straps 12 terminate in ears 16 bent inwardly, so as to be arranged in hooked relation with respect to the flanges 14. A pair of hooks 18, hooked around the rods are welded or otherwise secured to the straps 12.

The relative position of the rods 20 with respect to the column 10 is determined by the shape of the hook shaped members 18. Likewise, the number of rods 20 may be increased or decreased, depending entirely upon the contour of the finished column and its use. In some modifications the straps 12 on one side of the column may be spaced four feet apart. Although the straps 12 upon opposite sides have been shown as oppositely disposed, the straps on opposite sides may be staggered, depending entirely upon the nature of the structure. The hooks 18 should preferably fit the rods snugly, so as to prevent relative endwise movement of the rods.

It is usually desirable to provide reinforcing material in addition to the rods 20. This reinforcing material may be of any suitable design. In the modification disclosed, hoops or loops 22 formed from wire encompass the metallic core 10 and the rods 20. The hoops 22 may be quite closely spaced, in some structures only a few inches apart. In addition to providing additional reinforcement to the masonry, the loops 22 give additional protection against dislodgment of the rods 20 intermediate the hooks 18.

Where accuracy is required, the loops 22 may be provided with reentrant portions 24 arranged to abut the outer flange of the I-bar 10. The reentrant portions 24 in addition to positioning the loops 22, also tend to accurately position the rods 20 intermediate the hooks 18. The hoops or loops 22 are preferably wired to each of the rods 20 by bails 26. The ends of the hoops 22 may be twisted, welded or otherwise secured together, to hold the reinforcing girdle assembly in position.

In order to expedite the erection of the reinforcing girdle the straps 12, the hooks 18, the rods 20, the hoops 22 and the bails 26 are preferably preassembled on a bench in readiness for mounting on the metallic core. After the parts of the girdle have been assembled, the assembly is spread, as shown in Fig. 4, leaving a space indicated by the arrow A, between the ends 28 of the loops 22, sufficiently large to permit the preassembled girdle to be slipped into position around the metallic core 10.

After positioning the girdle around the metallic core the ends 28 are brought together and fastened to each other, and the ears 16, which in the preassembly are angularly disposed, may then be deflected inwardly, so as to be clinched around the edges of the flanges 14, thereby holding the girdle in a relatively fixed relation with respect to the metallic core 10.

After the girdle has been fixedly secured to the column, forms may be built around the column preparatory to the pouring of concrete, if the masonry consists of concrete. The parts of the girdle are rigidly secured in position so there is no danger of some portions being exposed to the surface of the concrete and furthermore there is no danger of the parts becoming dislodged when erecting the forms and pouring the concrete, so as to leave portions of the concrete without necessary reinforcement.

Although the preferred modification of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts which generally stated consist in a device capable of carrying out the object set forth, in the novel parts, combination of parts and mode of operation, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. A completely preassembled concrete reinforcing girdle for columns and the like having a metallic core, said girdle including members interlocking portions of the core, a plurality of rods supported by said members, each of said rods being arranged in parallel relation with respect to the longitudinal axis of the column, and a plurality of loops originally open along one side and extending in parallel relation with respect to said members, said loops extending around the metallic core and the rods, and having portions thereof engaging the side of the metallic core so as to support the loops and enclosed rods in fixed relation with respect to the core, said loops being united along the open sides after assembly.

2. A completely preassembled concrete reinforcing girdle for use in concrete columns having an I-bar, said girdle including a plurality of spaced bars of oppositely disposed straps extending across opposite faces of the I-bar and having the ends of said straps arranged in hooked relation with the edges of the flanges of the I-bar, reinforcing rods offset with respect to the edges of the flanges, said rods extending parallel to the longitudinal axis of the I-bar, a pair of hooked members fixedly attached to each of said straps, the hooks of which support the rods in fixed relation with respect to the I-bar and reinforcing loops originally open along one side and encompassing the I-bar and the reinforcing rods to which the loops are fixedly attached, said loops being arranged in closer spaced relation than

adjacent straps so as to cooperate with the reinforcing rods to reinforce the concrete of the column, the loops being united along the open sides after assembly.

3. A completely preassembled concrete reinforcing girdle for use in concrete columns provided with a metallic core, said girdle including a plurality of rods extending parallel to the longitudinal axis of the column and radially disposed with respect thereto, means interlocking the rods at spaced intervals having ears interengaging portions of the metallic core so as to hold the rods in fixed spaced relation with respect thereto and reinforcing loops originally open along one side and surrounding the rods to reinforce the concrete of the column, said loops being closed along the open side after assembly.

4. In a completely preassembled concrete reinforcing girdle for use in concrete columns having metallic cores, said girdle including a plurality of rods arranged in parallel relation, means fixedly attached to pairs of rods for holding the rods in fixed spaced relation and loops fixedly attached to the rods having all the ends before assembly arranged to extend across the space between two adjacent rods so as to permit the spreading of the assembly along one side while being passed over the core, the ends of the loops being fixedly attached after the girdle is passed around the core to rigidly hold the girdle in fixed relation with respect thereto.

5. A completely preassembled concrete reinforcing girdle for use in concrete pillars provided with metallic cores, said girdle including a plurality of reinforcing rods arranged when assembled to extend parallel to the longitudinal axis of the core, means for rigidly holding the rods in fixed spaced relation and wire loops extending around the rods and attached thereto, each of said loops having the ends open along one side of the girdle so as to permit the separation thereof while being put in position around the core of the column, the ends of the loops being fixedly secured to hold the girdle in position after assembly on the metallic core to firmly hold the girdle in fixed relation with respect thereto.

6. A completely preassembled concrete reinforcing girdle for use in concrete columns provided with metallic cores, said girdle including a plurality of rods extending parallel to the longitudinal axis of the core, means fixedly attached to the core for holding the rods in fixed spaced relation, and reinforcing means associated with the rods to cooperate therewith to reinforce the concrete surrounding the metallic core, said reinforcing means being open along one side before assembly to permit separation of the sides while positioned around the core and fixedly united along said open side when positioned to hold the assembly in position.

7. A completely preassembled reinforcing girdle for use with a metallic column having masonry surrounding the same, said girdle including spacing means fixedly attached to the metallic column, reinforcing mesh work supported by said spacing means for reinforcing the masonry surrounding the column, said reinforcing mesh work being open along one side to permit the assembly to be inserted into position, said mesh work being united along the open side after assembly.

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