O. K. HARRY.

BUILDING CONSTRUCTION.

APPLICATION FILED FEB. 7, 1910.

1,011,195.

Patented Dec. 12, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

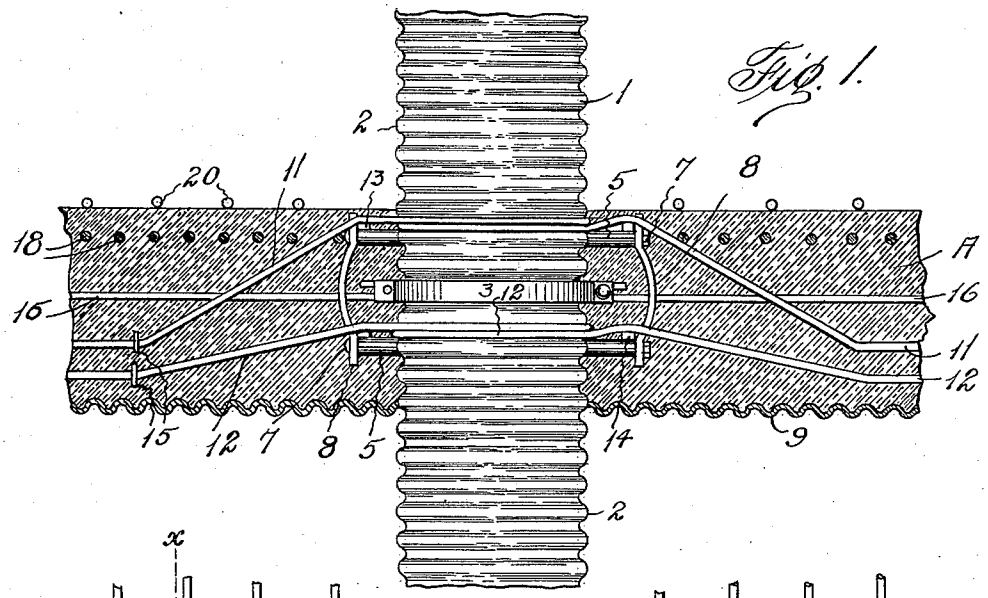

Fig. 2.

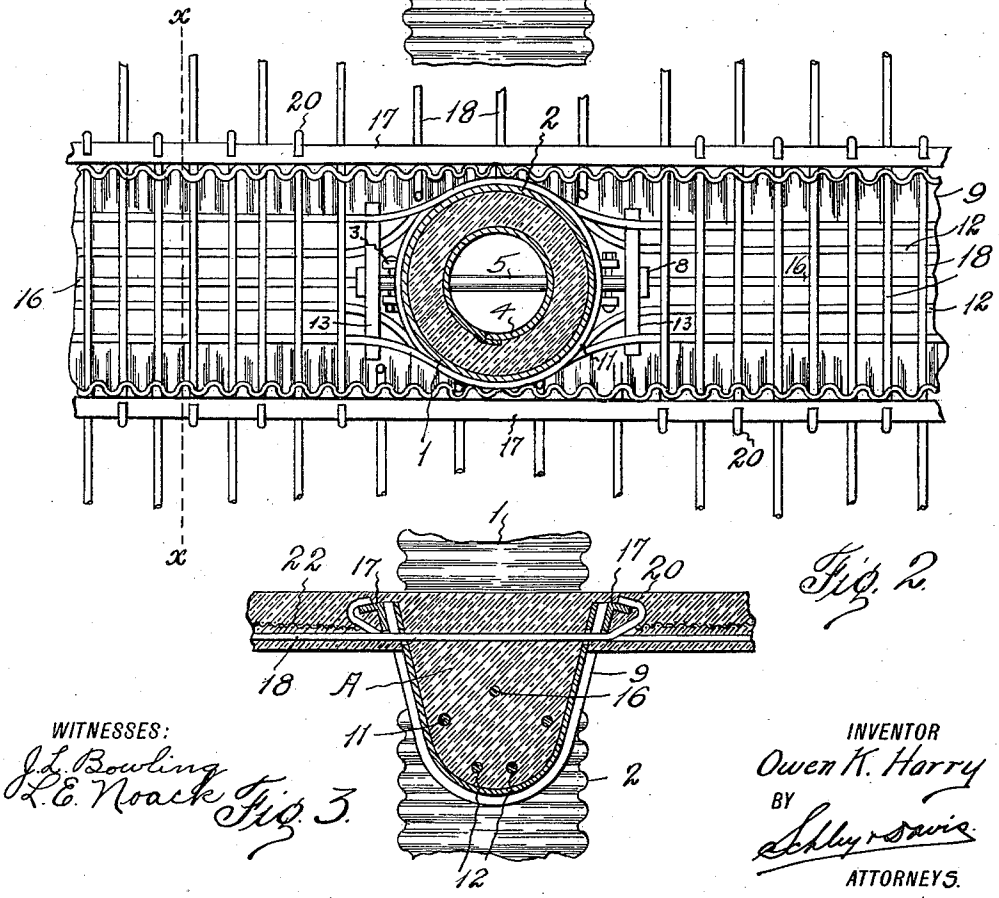

Fig. 3.

WITNESSES:

J. L. Bowling

L. E. Noack

INVENTOR

Owen K. Harry

BY

Sibley & Davis

ATTORNEYS.

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3 SHEETS—SHEET 2.

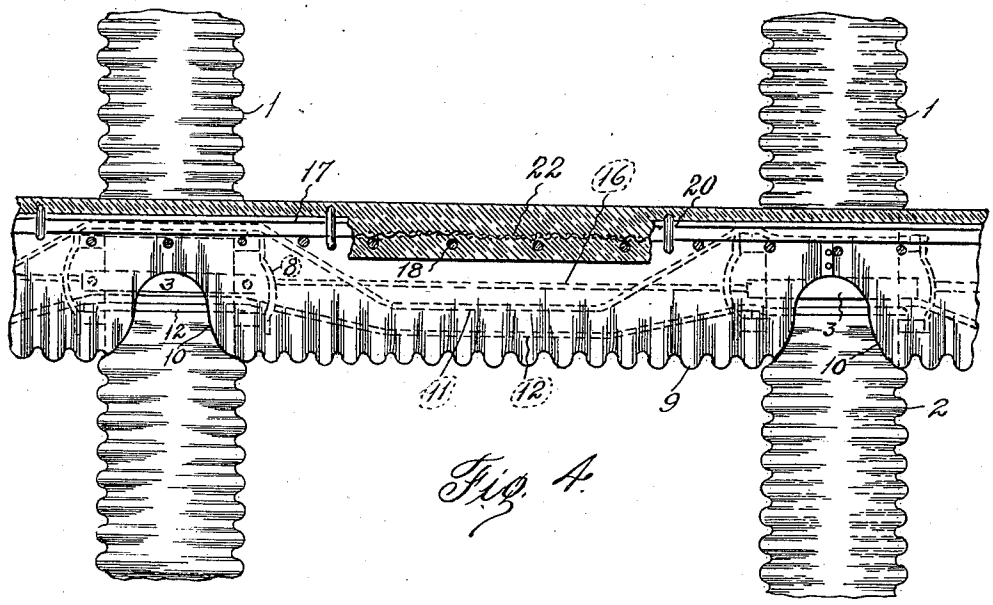

Fig. 4.

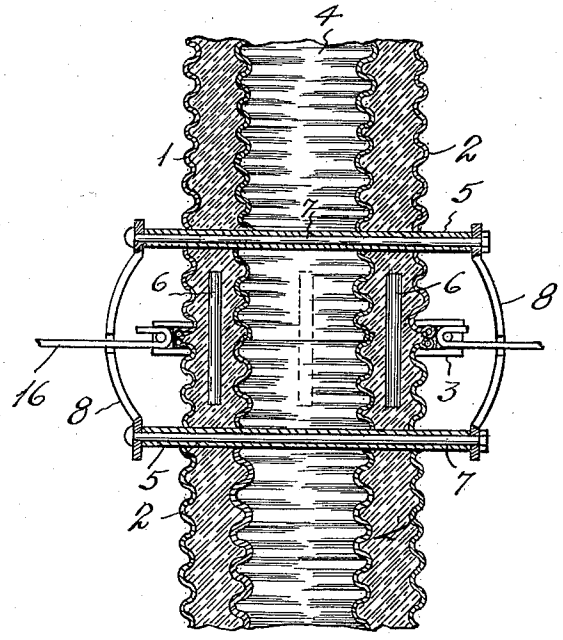

Fig. 5.

WITNESSES:

J. L. Bowling

L. E. Noack

INVENTOR

Owen K. Harry

BY

Schley & Davis

ATTORNEYS

O. K. HARRY.

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3 SHEETS—SHEET 3.

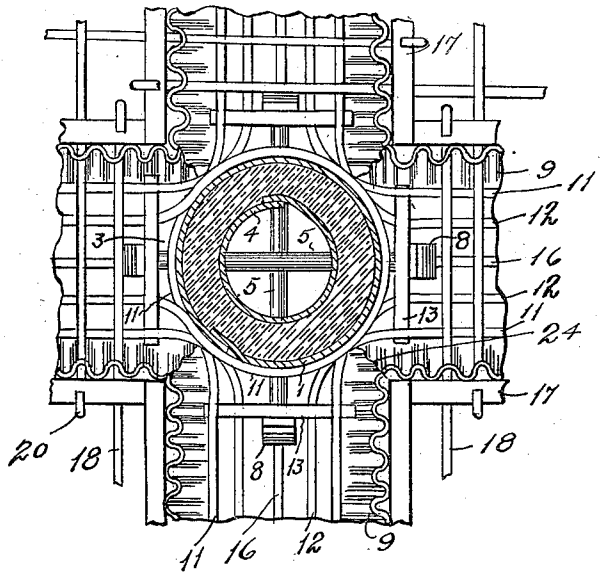

Fig. 6.

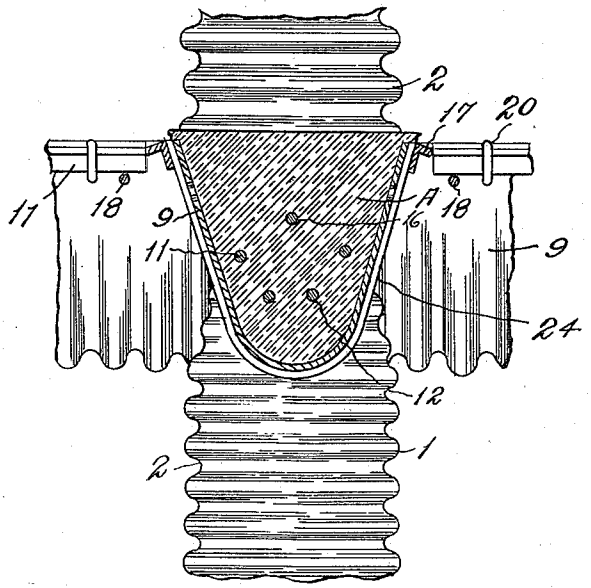

Fig. 7.

WITNESSES:
J. L. Bowling
L. E. Noack.

INVENTOR
Owen K. Harry.
BY
Sellew & Davis
ATTORNEYS.

UNITED STATES PATENT OFFICE.

OWEN K. HARRY, OF DALLAS, TEXAS.

BUILDING CONSTRUCTION.

1,011,195. Specification of Letters Patent. Patented Dec. 12, 1911.

Application filed February 7, 1910. Serial No. 542,545.

To all whom it may concern:

Be it known that I, OWEN K. HARRY, citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Building Construction, of which the following is a specification.

This invention relates to building construction and particularly to reinforced construction of the monolithic type.

The primary object of the invention is to provide a construction which will be substantial and at the same time maintain the weight of the metal used as reinforcing material, at a minimum.

A further object is to reduce the cost of construction and the weight per foot of the reinforcing metal employed in the columns and girders.

Another object is to reduce to a minimum the usual false work, commonly called "forms," and to employ corrugated sheet metal as a reinforcing material.

Finally the object of the invention is to provide a construction of the character described that will be strong, durable and efficient, and comparatively simple to build.

With the above and other objects in view, the invention has relation to certain novel features of construction and operation, an example of which is described in this specification and illustrated in the accompanying drawings, wherein:

Figure 1, is a vertical section at the intersection of adjacent girders, the column being shown in elevation, Fig. 2, is a plan view, the plastic material being omitted, except in the column, Fig. 3, is a vertical section on the line *x*—*x* of Fig. 2, the plastic material being shown, Fig. 4, is a view showing a portion of the floor construction in section and the girders and columns in elevation, the truss rods of the girders being indicated in dotted lines, Fig. 5, is a vertical section of one of the columns, Fig. 6, is a plan view showing the girders at right angles, the plastic material being omitted, and Fig. 7, is an elevation of the same, one of the girders being filled with plastic material and the floor rod omitted.

It is to be understood that the invention herein shown and described relates particularly to a column, but in order to better show the invention a girder construction has also been included which sets forth the manner of connecting the column with ordinary tie rods and brings out certain advantages possessed by the column.

In the drawings, the numeral 1 designates a vertical column comprising an outer shell formed of a plurality of cylindrical and corrugated sheet metal sections 2 superposed. These sections are secured together by horizontal channel members 3 having their flanged ends connected by a bolt or rivets as best shown in Figs. 1, 2 and 5. Within the outer shell and in concentric relation thereto, an inner shell is disposed. The inner shell is considerably less in diameter than the outer shell so as to provide an annular space therebetween. This inner shell is also constructed of superposed cylindrical sections 4 formed of corrugated sheet metal. The sections 4 are positioned in the outer shell by transverse tubular members 5 which project beyond the outer shell for the purpose hereinafter set forth.

In assembling the column the first section 2 of the outer shell is set in position on a suitable footing (not shown) and the first section 4 of the inner shell adjusted to position therein. Plastic material is then deposited in the annular space between the shells and the space thus filled to the top of the first section. After this step has been completed short bars 6 are embedded in the plastic material about half their length. The second section is now placed on the first section and the channel members 3 placed about the meeting edges of the sections and secured together, the projecting ends of the vertical bars 6 extending up into the annular space of the second section. The second section then has its annular space filled with plastic material. This operation is repeated as sections are added and the column carried to the desired height. It is apparent that the bars 6 will be embedded in the plastic material and acting with the members 3, reinforce the joint between first and second sections of the column.

Attention is called to the fact that no plastic material is deposited in the inner shell and a hollow reinforced plastic column is thereby produced, which will have great strength. Of course the inner shell could be filled with plastic material if desired, but unless an extremely heavy load is to be carried the hollow column is not only more desirable, but less expensive.

The sections of the column may be of different lengths, but I have found it con-

venient to join the sections at the intersection of the girder spans thus providing each column with an unbroken surface between floors.

The tubular members 5 are positioned so as to extend one over the other in the center of the girder spans and longitudinally thereof. Bolts 7 are passed through the members 5 for securing flat vertical bars 8 to the ends thereof. These bars project above and below the members.

A girder casing 9 of corrugated sheet metal is fitted about the column. This casing, as shown in Fig. 3, has a round bottom in cross section, and outwardly flared sides, the width of the bottom being less than the diameter of the column and the width across the top of the casing being greater than the diameter of the column. This necessitates cutting an opening 10 in the casing to receive the column or forming the casing in sections, fitting the ends and fastening them together, both forms being shown in Fig. 4. Where an opening 10 is formed in the casing, the latter is placed on the lower section of the column before the upper section is placed in position.

Extending between each column in the casing, are truss rods 11 and 12. These rods are in the form of loops passing around one column, extending to and around the next column, and returning to the first column. The corrugations of the columns form seats for the ends of the rod loops and retain the same in position. The rods 11 extend from the column over a cross bar 13 resting on the upper member 5 in rear of the bar 8, thence straight along each side of casing, and thence up at an angle and over the cross bar 13 of the next column and around the same. The rods 12 are looped about the column from opposite sides and extend therefrom, passing outward over bars 14 similar to the bars 13. These rods 12 extend from the bars 14 down at an angle and then straight along each side of the casing below the rods 11. At the intersection of the straight and angular portions of the rods, the latter are drawn toward each other and held by ties 15 so that the straight or horizontal portions will be confined in the bottom portion of the casing. A horizontal tie rod 16 extends from one column to the other and has its ends fastened to the centers of the bars 8.

Along the outside at the top edges of the casing, angle members 17 are secured to the casing with the projecting legs uppermost. Floor rods 18 at right angles to the longitudinal center of the casing, are passed through the sides of the casing and have their ends hooked over the angle members at 20. These floor rods are disposed in alternate relation, one passing through the casing and hooking over the angle member on one side and the next passing through the casing and hooking over the angle member on the other side, the floor rods extending from both sides of the casing.

It is easy to see that no false work or forms will be required in erecting the columns and while no forms will be required in constructing the girders, suitable supports (not shown) for the casing and false work (not shown) for the floors will be required, these supports and false work of course being removed when the plastic material has "set".

After the casing and rods have been placed in position, plastic material indicated at A is deposited in the casing and the rods 11, 12 and 15 embedded. It is to be observed that the bars 8 being supported away from the columns by the projecting ends of the tubular members 5, sufficient space between each of said bars and its column is provided, to permit the plastic material to lodge therein and form a lock between each end of the girder spans of the columns and tie the structure together. The plastic material is deposited about the floor rods 18 with which wire fabric 22 may be employed.

It will be seen that by obviating much of the false work and many of the forms commonly employed considerable time, labor and expense are saved. In the type of column wherein vertical rods are used to reinforce said rods and their ties will weigh more per foot than the column herein described. By use of the corrugated sheet metal casing for the girders, the number of truss and tie members now commonly used can be reduced.

While the outer shell of the column and the casing may be plastered or otherwise concealed, in structures such as factories, storage houses, stores or wherever desired, the said outer shell and casing need only to be painted to provide a neat and pleasing appearance at a minimum expense.

In Figs. 6 and 7 I have illustrated the construction used where girders intersect at right angles with a column. It will be seen that very little change in the construction of the parts is necessary. Two pairs of tubular members 5 are employed and the truss rods, tie rods and bars duplicated. The casings 5 are cut at 24 so as to fit about the column and join together. Of course in this construction, a casing for each girder span, that is a casing for each span of the girders between columns, is used. The floor rods 18 may be run parallel from two of the alined casings or at right angles to all of the casings so as to cross at right angles.

What I claim is:

1. A column for building construction, comprising, a metallic outer shell of two or more superposed sections, a plastic material confined in the column, a member passing transversely through each section near the

meeting edges thereof and projecting on opposite sides, and vertical bars connecting the ends of one member with those of the other member, the joint between the sections of the column being located between the transverse members.

2. A column for building construction, comprising, a corrugated outer shell composed of a plurality of sections, an inner corrugated shell of smaller diameter composed of sections, a filling of plastic material between the shells, short vertical reinforcing bars embedded in the plastic material at the joints between the sections, transverse fastening members extending through the shells above and below the reinforcing bars, and connections between the fastening members.

3. A column for building construction, comprising, a corrugated outer shell composed of superposed sections, the adjacent edges of the sections being beaded, a channel band engaging the adjacent beaded edges at each joint between the sections, an inner shell of corrugated metal smaller in diameter than the outer shell, a filling of plastic material between the shells, and reinforcing bars embedded in the plastic material at the joints between the sections.

4. A column for building construction, comprising, an outer metallic shell composed of superposed sections, circumferential members uniting the sections, a filling of plastic material within the shell, vertical reinforcing bars embedded in the plastic material at the joints between the sections, members passing transversely through the sections above and below the bars, and vertical exterior fastening bars connecting the adjacent ends of the members at the joints of the sections.

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

OWEN K. HARRY.

Witnesses:
JACK A. SCHLEY,
L. E. NOACK.