C. L. MEYER.

MOLD FOR CONCRETE COLUMNS.

APPLICATION FILED MAR. 12, 1915.

1,154,998.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

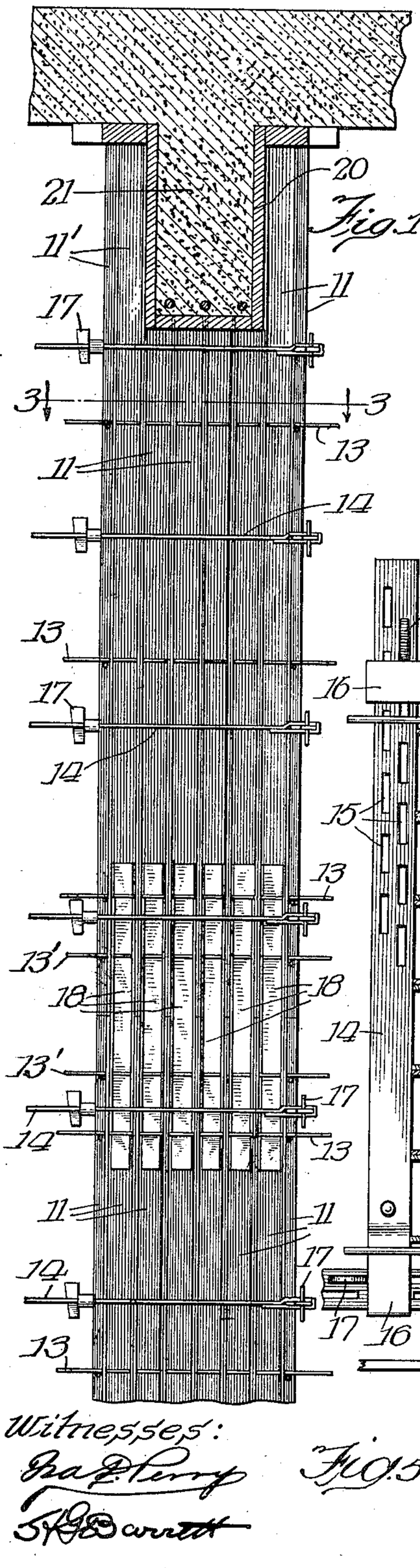

Fig. 1

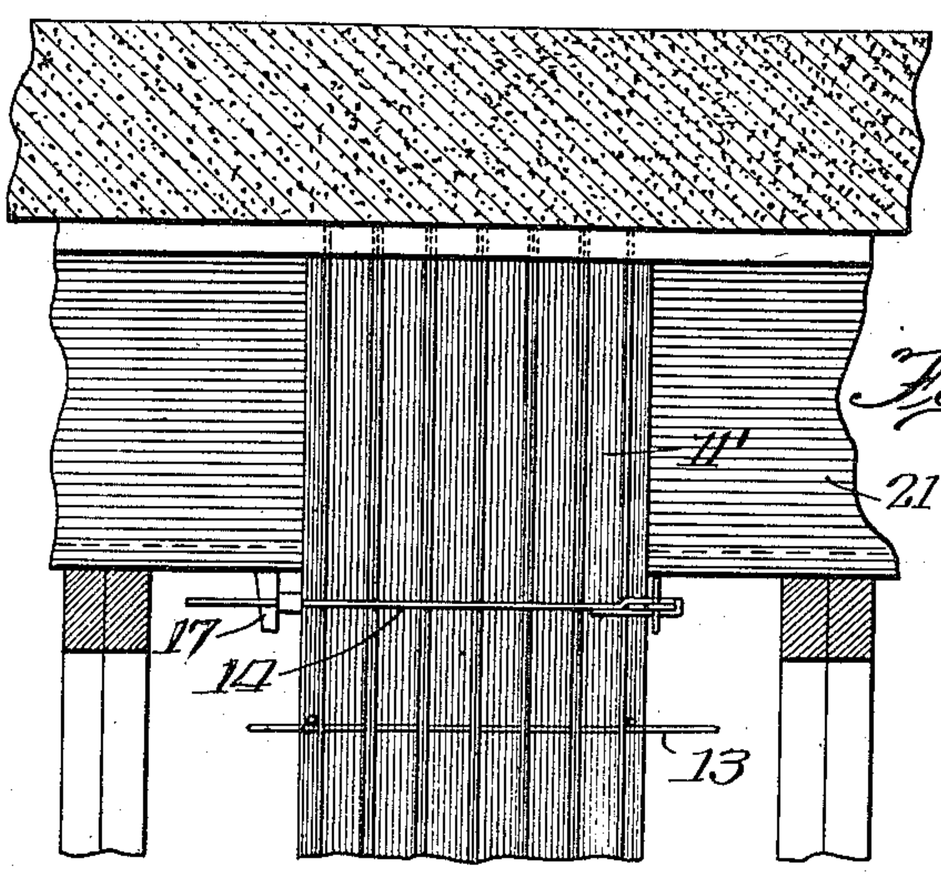

Fig. 2

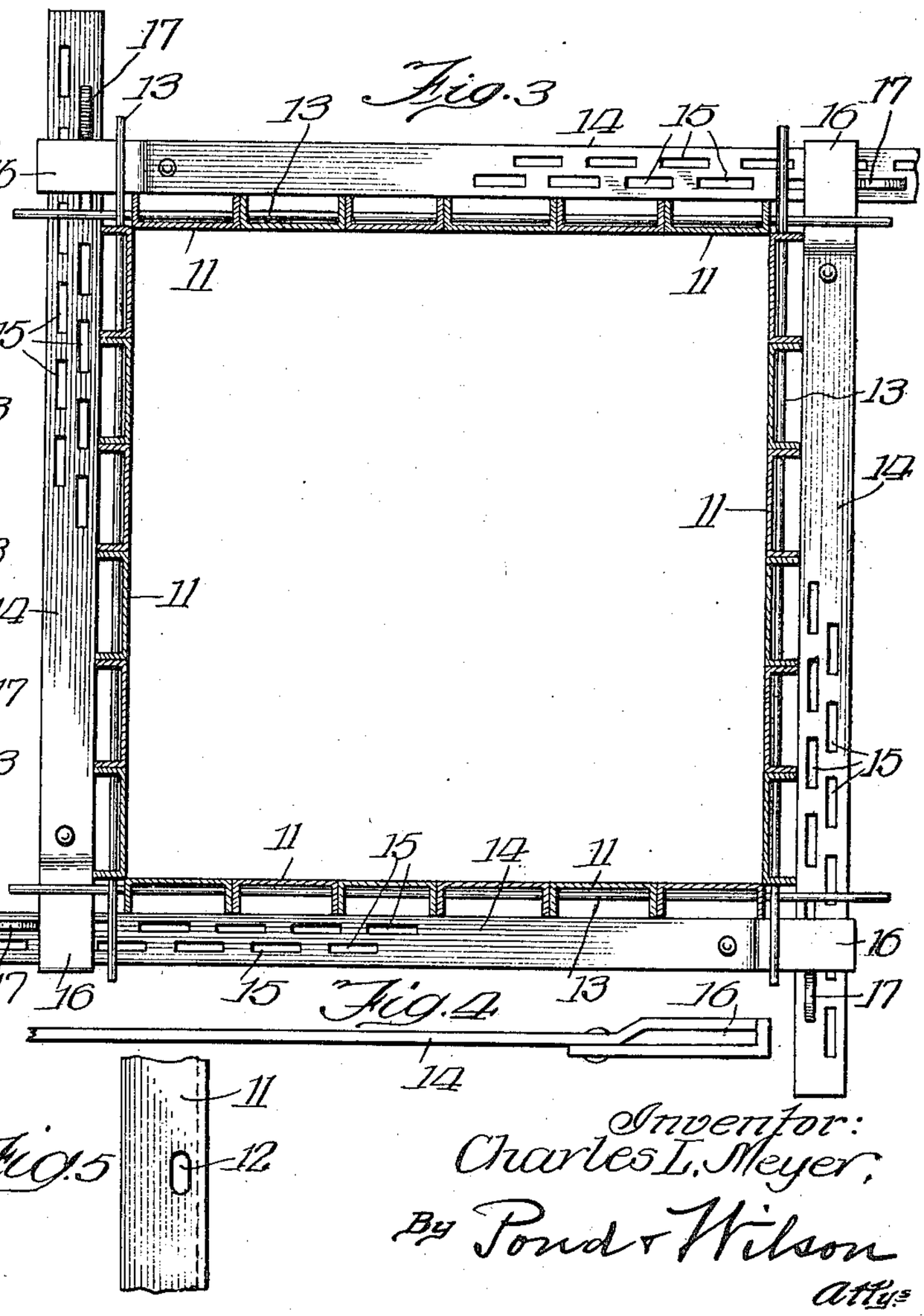

Fig. 3

Fig. 4

Fig. 5

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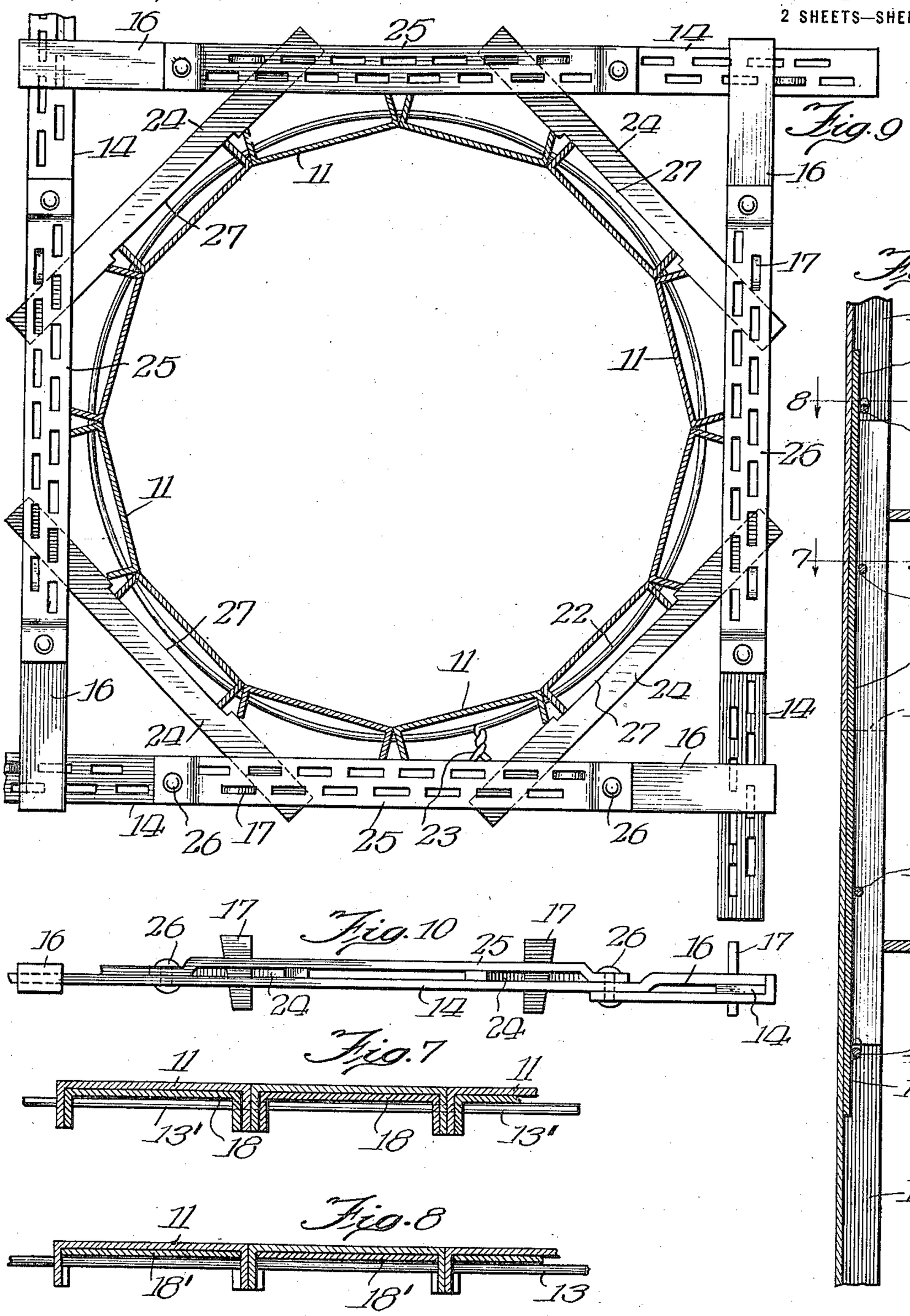

Fig. 9

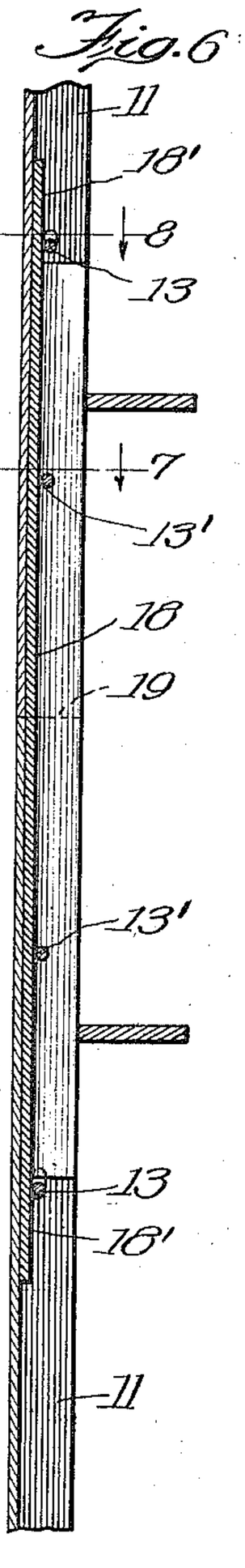

Fig. 6

Fig. 10

Fig. 7

Fig. 8

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UNITED STATES PATENT OFFICE.

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MOLD FOR CONCRETE COLUMNS.

1,154,998. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed March 12, 1915. Serial No. 13,906.

To all whom it may concern:

Be it known that I, CHARLES L. MEYER, a citizen of the United States, residing at Omaha, in the county of Douglas, State of Nebraska, have invented certain new and useful Improvements in Molds for Concrete Columns, of which the following is a specification.

This invention relates to improvements in molds or forms for concrete pillars and columns, and the general purpose or object of the invention is to cheapen and facilitate the work of erecting concrete pillars, columns, and like structures, through an improvement in the molds or forms in which the concrete is poured and held until set. To this end the invention comprises, the novel combined structural features hereinafter described and more particularly pointed out in the claims.

The principle of my invention, its manner of use, and the advantages and benefits resulting therefrom will all be readily understood when considered in connection with the accompanying drawings, wherein I have illustrated my invention as embodied in forms or molds for the erection of square columns and generally-round columns, and referring thereto,—

Figure 1 is an elevational view of a mold or form for a square column, showing the same as adapted to support a concrete floor girder or beam; Fig. 2 is an elevational view of the upper portion of Fig. 1, in a plane at right angles to that of the latter figure; Fig. 3 is an enlarged cross-sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is an edge elevational view of one of the clamp bars; Fig. 5 is a detail fragmentary view of one of the channel beams in side elevation, illustrating the form of the apertures in the side walls or flanges thereof; Fig. 6 is a vertical longitudinal section taken through the abutting ends of two channel beams and the cleat or splice uniting the same; Figs. 7 and 8 are cross-sectional views through a pluarlity of channel beams arranged side by side, with the cleats which connect vertically alined beams, taken in the planes indicated by the lines 7—7 and 8—8 of Fig. 6; Fig. 9 is an enlarged cross-sectional view, similar to Fig. 3, showing a mold or form for a column of generally-round formation in cross section; and Fig. 10 is an edge view of one of the main clamp bars employed in the structure of Fig. 9,

In the embodiments of the invention herein illustrated, the unit of construction is a channel-beam section such as is shown at 11. In the erection of a mold or form of rectangular cross-section, such, for instance, as the square mold illustrated in Figs. 1, 2 and 3, I employ a plurality of these channel beams 11, disposed vertically side by side, to make up each wall or face of the mold. These channel beams, which are of uniform sizes throughout (except in cases where two opposite sides of the column are carried higher than the two intermediate sides to facilitate the formation of a concrete girder or beam of less width than the column at the upper end of the latter, as shown in Figs. 1 and 2), are formed with oblong apertures 12 through the side walls or flanges thereof at intervals throughout their length, said apertures preferably lying close to the inner surface of the web of the beam. In assembling, the requisite number of beams to form each side of the mold are laid side by side, and rods 13 are strung through the registering apertures 12, thereby bringing the several beams into correct lateral registration with each other, after which the entire assembly forming each side is raised to vertical position, and the several sides are brought together into correct relative positions, the rods 13 maintaining the alinement of the individual units during this operation. By giving the apertures 12 the elongated form illustrated, the supporting rods of two opposite sides are adapted to overlie or underlie the ends of the supporting rods of the two intermediate sides, without necessitating any special selection of beams for any particular side. The sides of the mold having been thus erected, they are securely bonded together by a series of duplicate clamp bars, each of which comprises a straight, flat body-portion 14 that is provided with a group of relatively offset or staggered, elongated apertures 15, and a loop 16 at one end. These bars lie edgewise against the outer edges of the flanges of the channels, as clearly shown in Fig. 3, with the apertured body portion of each bar extending through the loop 16 of a bar on an adjacent side. Wedge blocks 17 are then driven through that one of the apertures 15 of each bar which lies just outside the loop 16 of the coöperating bar, this obviously tending to draw and clamp the bars tightly around the shell of the mold, thus bonding

the units of the latter securely together and preventing outward yielding or spreading of the walls from the internal pressure of the fresh concrete.

Where the column is of such height as to require the erection of the mold or form in two or more superposed sections, the said sections are united at their meeting joint by cleats, herein shown as consisting of short channel-beam sections 18, of slightly less width and thickness than the main channel-beam sections, nesting within and overlapping the joint 19 between the latter. Preferably, and as herein shown, the side walls or flanges of the cleats are cut away inwardly of the ends of the latter to enable the end portions 18′ of the cleats to be overlaid and tied to the webs of the main channels by the assembling rods 13, and the side walls or flanges of the cleats are also apertured for the passage of additional or extra assembling rods 13′, which additionally tie the cleats in place and prevent any relative endwise movement between the cleats and the main channels. Fig. 1 of the drawings illustrates two superposed mold-sections united by cleats in the manner described; and Figs. 1 and 2 also show channel units 11′ of increased length relatively to the channels used throughout the principal height of the column to facilitate the formation of a mold 20 at the top of the column for a cross beam or girder 21.

In the erection of the mold of a generally-round column of polygonal external form, such as is shown in Fig. 9, the same structural units 11 are employed, all the units being connected up laterally by running rods or stiff wires 22 therethrough before erection, then flexing the assembled group of beams into the generally-round form shown, and twisting the ends of the rods or wires together as shown at 23, thereby creating a temporary bond sufficient to maintain the form of the mold while the bonding clamps are applied. A column of this cross-sectional form, of course, requires a somewhat larger number of clamp bars, the arrangement shown in Fig. 9 being practicable, wherein the four main clamp bars 14 are connected up as in the square form shown in Fig. 3, and additional diagonal or oblique, plain bars 24 are interposed crosswise of the corners of the frame formed by the main bars 14, the auxiliary bars 24 being forced against the sides of the mold by wedges 17. If desired, the main clamp bars 14 may, in this instance, be provided with apertured keepers 25, as shown in Fig. 10 secured thereto by rivets 26, for the reception of the ends of the diagonal bars 24, to prevent any edgewise canting of the latter, and the channel-engaging edge of each diagonal clamp bar 24 may be cut away, as illustrated at 27, to adapt said diagonal bars to a bearing upon the flanges intermediate the flanges engaged by the main bars.

From the foregoing it will be evident that by constructing the shell of the mold or form out of units identical in shape, size and structure, which units are capable of being assembled to produce any desired cross-sectional form of column, and are capable of being superposed upon each other to produce columns of differing heights, I have provided a practically universal structure of mold which may be assembled and disassembled with a minimum of expense both for material and labor, especially where the unit of structure selected is a standard structural beam. The described means for laterally bonding the shell is obviously adapted to a wide variety of sizes and shapes of molds, and can be very easily applied and removed. The alternating or staggered arrangement of apertures in the clamp bars to receive the wedges renders these clamp bars practically universal for any sizes within the longitudinal limits of the bars themselves.

While I have herein illustrated my invention as embodied in a mold for a concrete column, and contemplate that such will be its principal application, it will be evident that the same is applicable to and useful in molds for other concrete structures, such as girders or floors. Hence the invention is not to be understood as limited in its application to column molds exclusively.

I claim:

1. A mold for concrete structures, adjustable as to cross sectional form and comprising a plurality of channel beams of uniform size disposed in edge-to-edge contact around a longitudinal axis, the flanges of said beams having laterally registering apertures, stringer rods or wires slidably mounted in registering groups of said apertures and serving to bring and hold said units in correct lateral registration, and means for bonding said channel beams together laterally.

2. A mold for concrete structures, adjustable as to cross sectional form and comprising a plurality of channel beams of uniform size disposed with their channel sides outward and in edge-to-edge contact around a longitudinal axis, the outwardly extending flanges of said channel beams having laterally registering apertures spaced at intervals throughout the length of the structure, stringer rods or wires slidably mounted in registering groups of said apertures and serving to bring and hold said units in correct lateral registration, and tie-bars embracing the edges of said flanges and bonding said channel beams together.

3. In an adjustable mold for concrete structures, the combination of a group of channel beams of uniform size disposed in edge-to edge contact around a longitudinal

axis, the flanges of said channel beams having laterally registering apertures, a second like group of channel beams disposed in longitudinal alinement with said first named group and abutting the latter endwise, the flanges of said second group likewise having laterally registering apertures, channel-shaped cleats nested within and lapping the abutting ends of the beams of said groups, the flanges of said cleats having apertures registering with the apertures in the flanges of said beams, stringer rods or wires slidably mounted in the registering apertures of said beams and cleats, and means for bonding the beams of said groups together laterally.

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