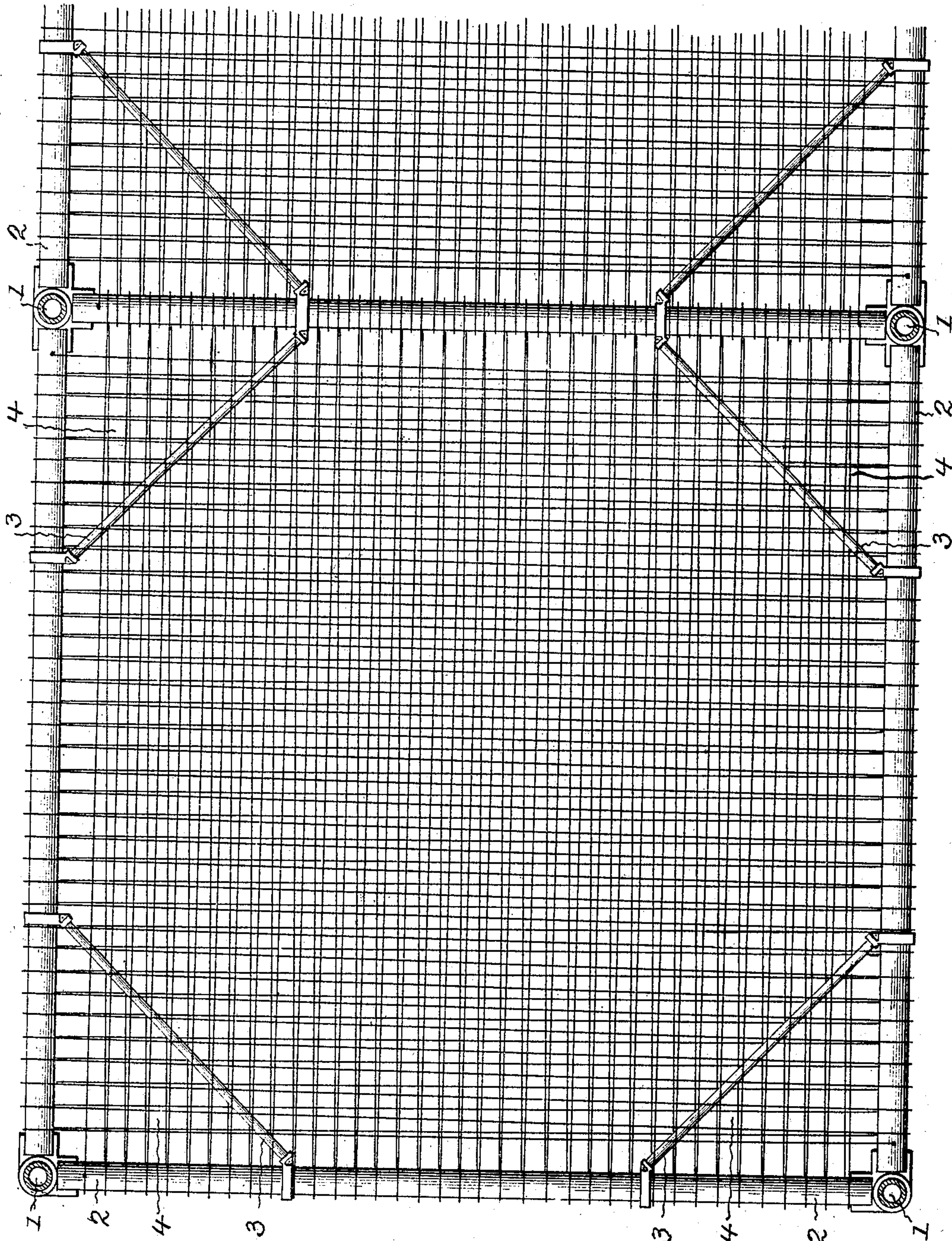


G. M. GRAHAM.
METHOD OF ERECTING REINFORCED CONCRETE STRUCTURES.
APPLICATION FILED DEC. 10, 1907.

938,660.

Patented Nov. 2, 1909.
3 SHEETS—SHEET 1.



Attest:
John Enders.
Henry Wood.

Fig. 1.

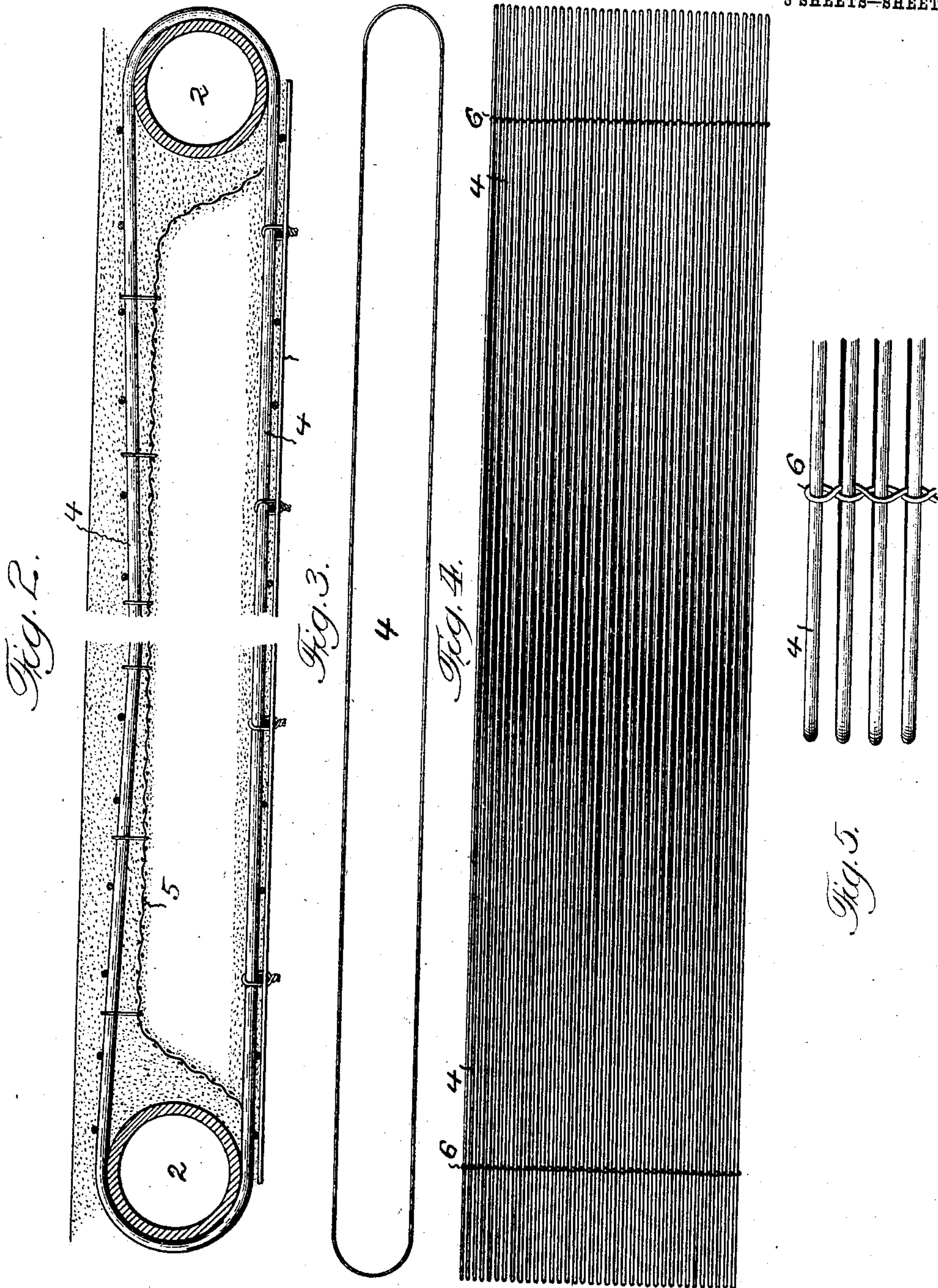
Inventor:
George M. Graham.
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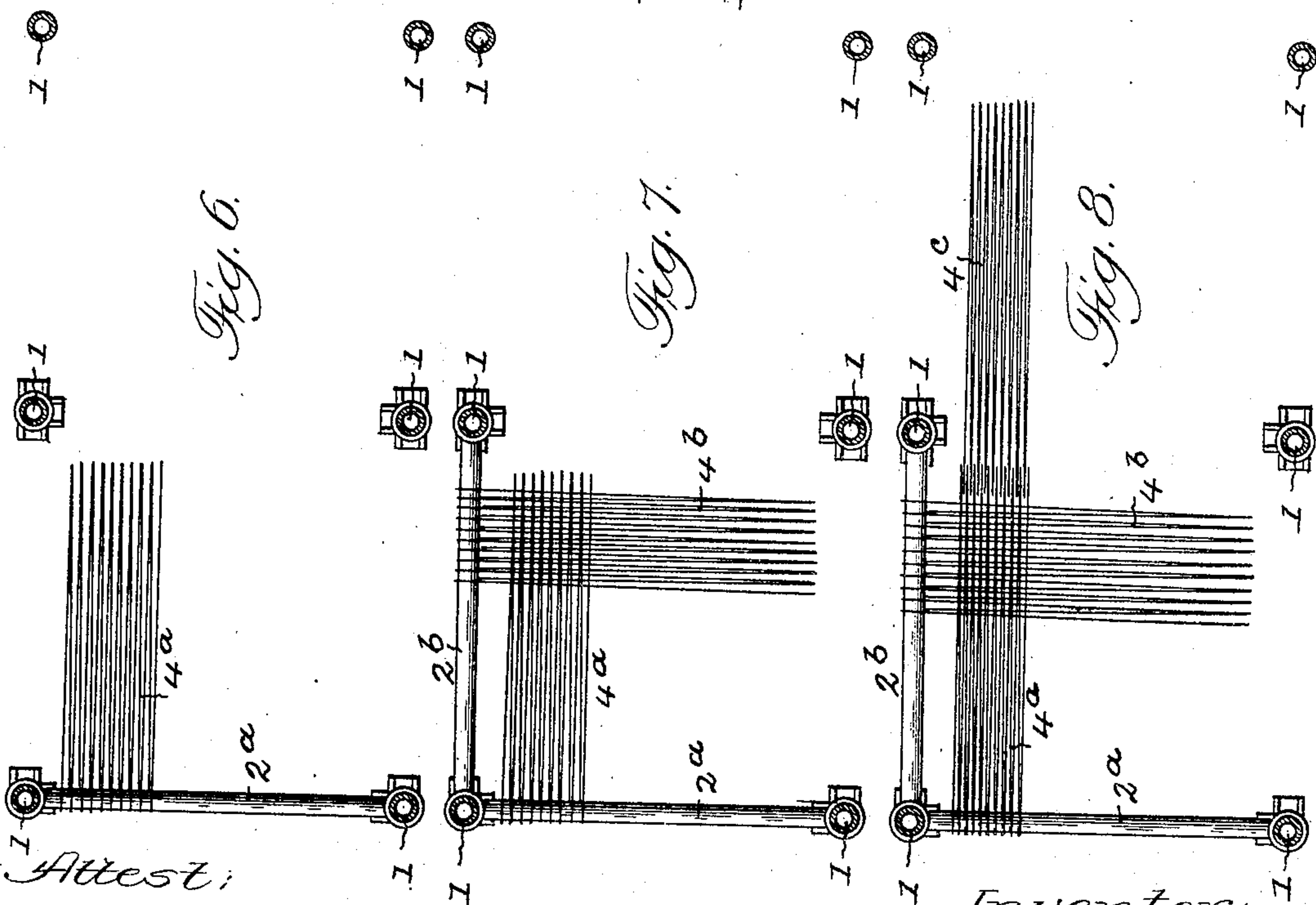
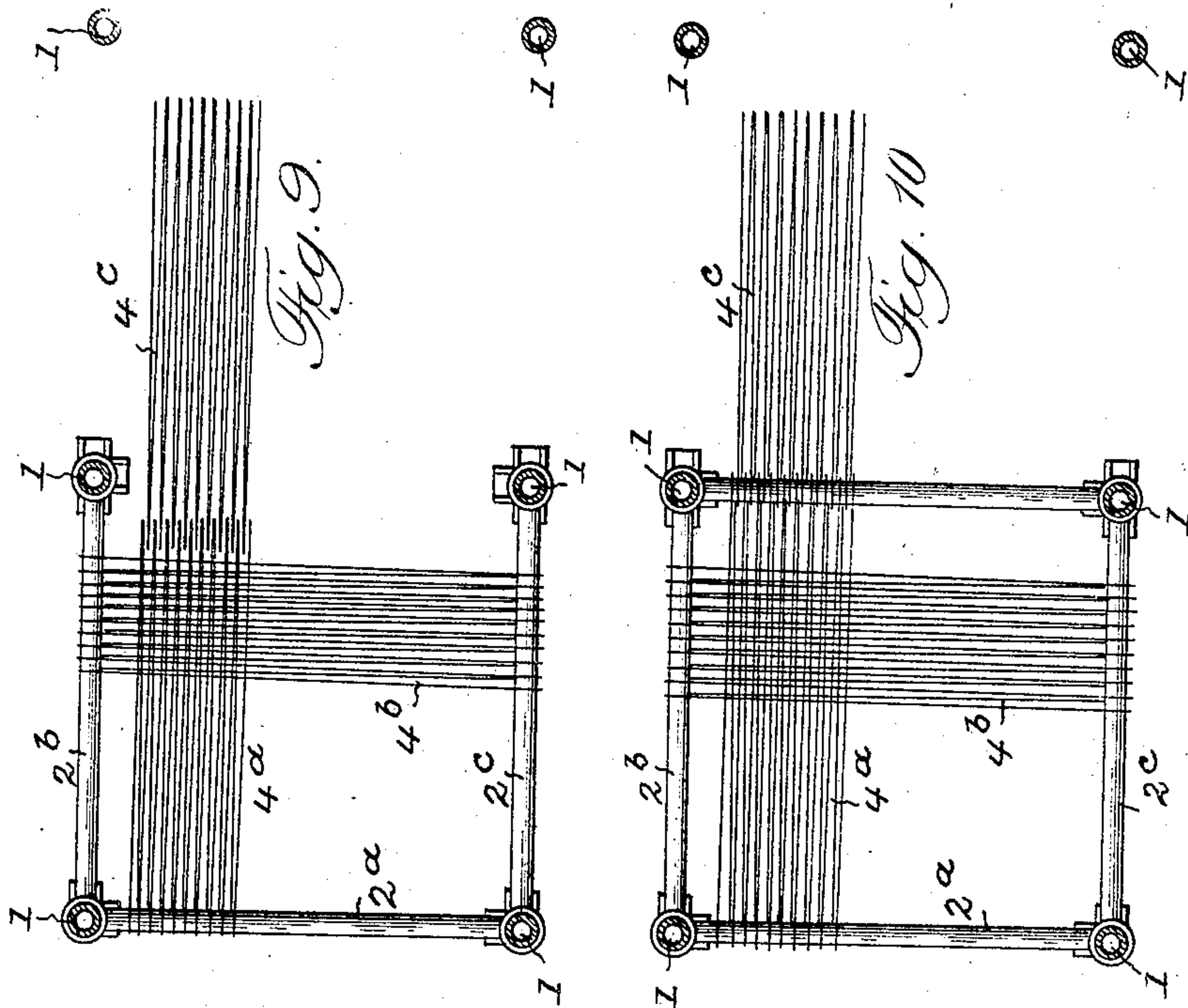
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3 SHEETS—SHEET 3.



Attest:
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UNITED STATES PATENT OFFICE.

GEORGE M. GRAHAM, OF CHICAGO, ILLINOIS, ASSIGNOR TO G. A. EDWARD KOHLER, OF CHICAGO, ILLINOIS.

METHOD OF ERECTING REINFORCED CONCRETE STRUCTURES.

938,660.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed December 10, 1907. Serial No. 405,887.

To all whom it may concern:

Be it known that I, GEORGE M. GRAHAM, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods of Erecting Reinforced Concrete Structures, of which the following is a specification.

This invention relates to that class of reinforced concrete structures which constitutes the subject matter of my prior Letters Patent No. 865,490 of Sept. 10, 1907, and has for its object to provide a simple and efficient structural arrangement and combination of parts adapted to afford an easy and economical method of erection of the reinforcing skeleton frame of concrete structures of the type above mentioned, all as will hereinafter more fully appear.

In the accompanying drawings illustrative of the present invention:—Figure 1, is a horizontal section of a portion of the skeleton reinforcing frame of a concrete building, with the wire webs or centers in place thereon. Fig. 2 is a fragmentary detail vertical section of the same, showing a completed portion of a floor or like horizontal portion of a building. Fig. 3, is a detail side view of the wire web or center. Fig. 4, is a detail plan view of such wire center secured together for ready transportation and handling. Fig. 5, is an enlarged fragmentary plan of the same. Figs. 6, 7, 8, 9 and 10 are diagram views illustrating the series of steps in the present method of erecting a reinforcing frame.

Similar numerals of reference indicate like parts in the several views.

The general construction and arrangement of reinforcing frame parts, skeleton wire centers, and the imposed body of concrete thereon, set forth in my prior patent No. 865,490 of Sept. 10, 1907, will be employed in the present method of erecting the reinforcing frames of concrete structures, and will comprise a general arrangement of parts as follows:—

1, represents a series of vertical cylindrical posts or columns, supported on the usual foundation footings, and extending the height of the structure as a single piece, or a series of sections secured end to end by suitable fittings.

2 are a series of horizontal cylindrical girders arranged in the usual right-angle

relation, and secured together and to the adjacent vertical posts 1, by suitable fittings, preferably of the type shown in my prior patents Nos. 865,489 and 865,490 of Sept. 10, 1907. Four of such girders connected together constitute the border frame of a single unit of the skeleton reinforcing frame of a concrete structure, and as in my patented construction above referred to, additional units will utilize in their formation a girder of the next adjacent unit or units, and as illustrated in Fig. 1.

3 are diagonal brace members for each unit aforesaid, and arranged at the respective corners thereof as shown.

4 is the skeleton webbing or centering for each unit aforesaid, and which as in my former patented construction aforesaid consists of continuous wrappings of a single wire around the cylindrical border members 2 of the unit, in spaced relation, and in crossed or opposite directions, to afford an open weblike center to the unit and to which is attached the concrete mass forming the main body of the floor or other portion of the structure. Such windings 4 are initially formed as a coil or bundle having the elongated link form shown in Fig. 3, in which each individual winding a uniform size and form, and are secured together side by side in the form of a compact bundle by twisted tie wires 6 near the respective ends of the bundle as shown in Figs. 4 and 5. As so arranged the individual windings of the bundle will have a spaced relation to permit of an interleaving of the adjacent ends of two bundles together in the erection of the skeleton reinforcing structure. Such construction and arrangement of the windings forms the subject matter of Letters Patent No. 910,469, dated January 19, 1909.

5 are sheets of perforated lathing attached to the aforesaid web or center 4 of a unit, and adapted to afford a support for the concrete mass in the application and setting thereof.

The present invention comprises a method of erecting the skeleton reinforcing frame set forth in my prior patent aforesaid, with the coils or windings above set forth as the skeleton web or center of the units comprising the structure.

In the present method, and as graphically illustrated in Figs. 6, 7, 8, 9 and 10, the series of vertical posts 1 are first erected. The

initial coil of windings 4^a is slipped upon the initial girder 2^a, after which said girder is coupled to its supporting posts or columns as illustrated in Fig. 6: The second coil of winding 4^b is then slipped inside or over the initial coil 4^a, as found most convenient, and in right angle relation, after which a second girder 2^b, is passed through one end of the last mentioned coil of windings 4^b and then coupled in place on and to its supporting posts or columns as illustrated in Figs. 7 and 8. At this stage in erecting a building structure of two or more units in adjacent relation, the coil of windings 4^c of the next adjacent unit will be interleaved with the coil of windings 4^a as illustrated in Figs. 8, 9, and 10 previous to the succeeding operations. The third girder 2^c is then slipped into the coil of windings 4^b, and the fourth girder 2^d through the interleaved coils of windings 4^a and 4^c, after which said girders 2^c and 2^d are moved to place and coupled to their posts or columns, thus effecting the preliminary erection of the first unit. The succeeding units are erected by a series of similar steps or operations. With the completion of such preliminary erection of one or more units, the coils of windings aforesaid, after having their respective wire ends or terminals attached to the girders, are spread apart into the required spaced relation as shown in Fig. 1. With such spreading or spacing of the individual windings of a coil, each individual strand thereof is readily and effectively brought to a common and uniform tension, to in a like manner receive the normal stress or load imposed upon the unit as a whole, and accordingly afford a very strong and substantial structure with a minimum amount of material.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:—

1. The herein described method of erecting reinforcing frames for concrete structures which consists, in initially assembling as a compact bundle having an elongated flat form the wire strands constituting the skeleton center of a building unit, successively inserting cylindrical frame members

through said coil, coupling said members together as a border frame, and finally separating the coil windings to a uniform spaced relation to impose uniform tension thereon.

2. The herein described method of erecting reinforcing frames for concrete structures which consists, in initially assembling as compact bundles having an elongated flat form the wire strands constituting the skeleton center of a building unit, arranging pairs of said bundles in crossed relation, successively inserting cylindrical frame members through said coils, coupling said members together as a border frame, and finally separating the coil windings to a uniform spaced relation to impose uniform tension thereon.

3. The herein described method of erecting reinforcing frames for concrete structures which consists, in initially assembling as a compact bundle having an elongated flat form the wire strands constituting the skeleton center of a building unit, successively inserting cylindrical frame members through said coil, coupling said members together and to a series of vertical columns to constitute a border frame, and finally separating the coil windings to a uniform spaced relation to impose uniform tension thereon.

4. The herein described method of erecting reinforcing frames for concrete structures which consists, in initially assembling as compact bundles having an elongated flat form the wire strands constituting the skeleton center of a building unit, arranging pairs of said bundles in crossed relation, successively inserting cylindrical frame members through said coils, coupling said members together and to a series of vertical columns to constitute a border frame, and finally separating the coil windings to a uniform spaced relation to impose uniform tension thereon.

Signed at Chicago, Illinois, this 29th day of November 1907.

GEORGE M. GRAHAM.

Witnesses:

ROBERT BURNS,
HENRY MOE.