No. 753,603. PATENTED MAR. 1, 1904.

J. S. METCALF.

STEEL CONCRETE CONSTRUCTION, &c.

APPLICATION FILED OCT. 7, 1903.

NO MODEL.

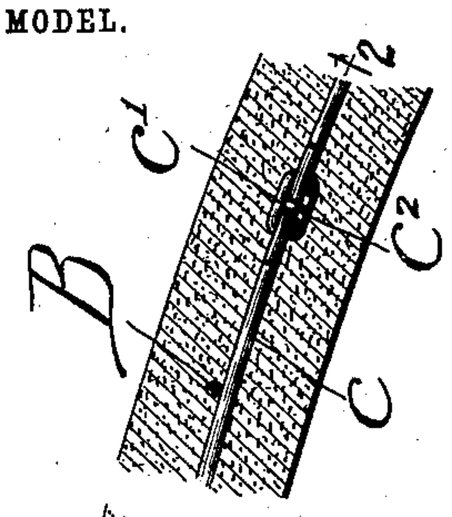

Fig. 1.

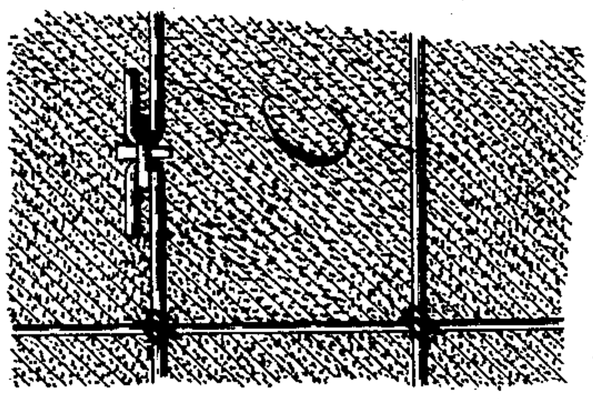

Fig. 2.

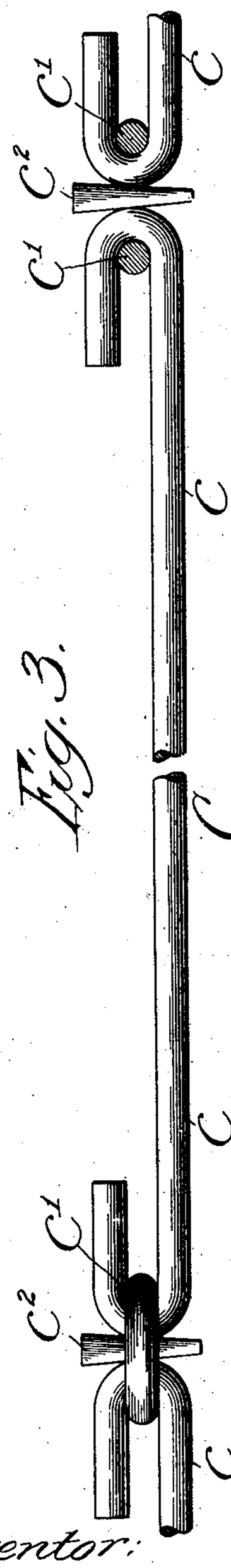

Fig. 3.

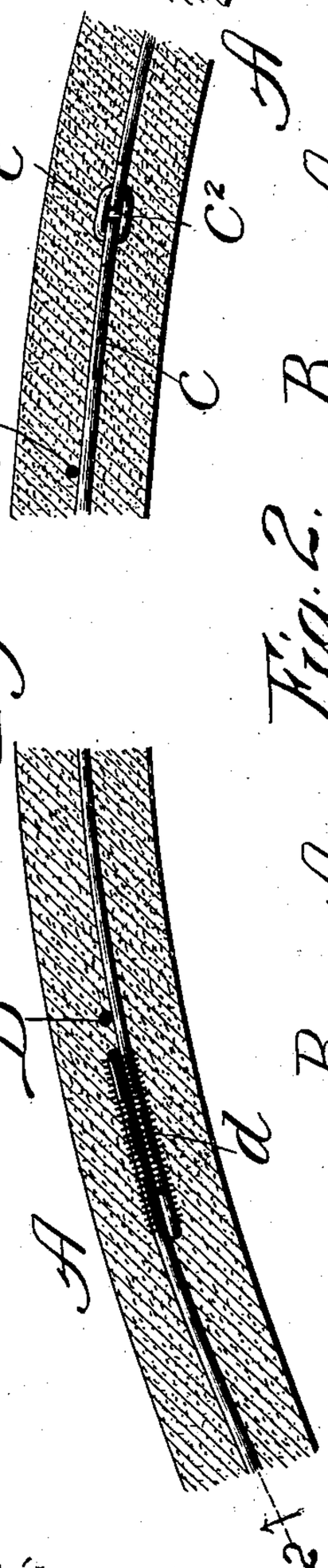

Fig. 4.

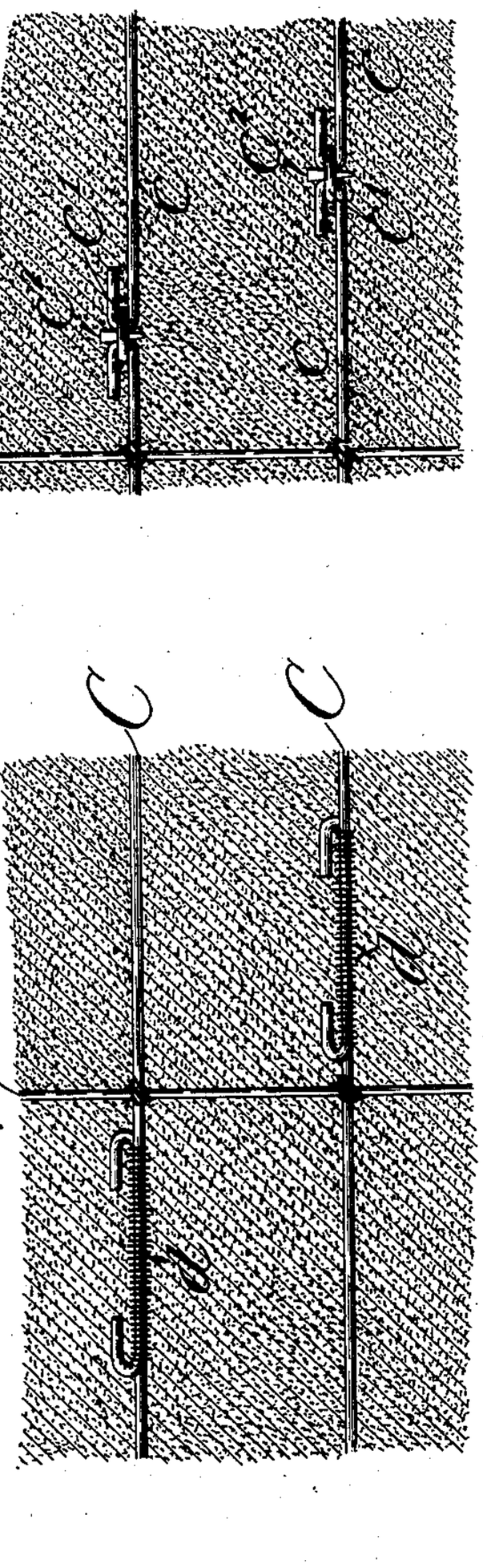

Fig. 5.

Fig. 6.

Witnesses:
Chas. E. Gaylord.
John Enders.

Inventor:
John S. Metcalf.
By Dyrenforth, Dyrenforth & Lee
Att'ys.

No. 753,603. Patented March 1, 1904.

UNITED STATES PATENT OFFICE.

JOHN S. METCALF, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN S. METCALF CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

STEEL-CONCRETE CONSTRUCTION, &c.

SPECIFICATION forming part of Letters Patent No. 753,603, dated March 1, 1904.

Application filed October 7, 1903. Serial No. 176,045. (No model.)

To all whom it may concern.

Be it known that I, JOHN S. METCALF, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Steel-Concrete Construction, &c., of which the following is a specification.

My invention relates particularly to the steel-concrete construction of buildings, storage-bins, tanks, &c., of circular cross-section, such as are now being employed for grain-elevators and the like.

My primary object is to provide improved means embedded in the wall for staying the same and bearing the tensile stresses.

My improvement is illustrated in its preferred embodiment in the accompanying drawings, in which—

Figure 1 represents a broken horizontal sectional view of a tank, vat, or the like constructed in accordance with my invention; Fig. 2, a curved vertical section taken as indicated at line 2 of Fig. 1; and Fig. 3, a broken side elevational view of a tension-rod, showing joints thereof.

In the preferred construction, A represents a fragment of a concrete wall, B vertical rods embedded therein in the usual manner; and C horizontally-disposed stays or rods comprising sections connected by improved joints and disposed in an improved manner. Each rod C comprises sections *c*, curved to conform to the curvature of the wall and each having extremities curved upwardly and back toward each other, thereby forming open hooks with extremities directed toward each other and extending parallel with the adjacent portions of the section; short chain-links *c'*, disposed in a horizontal plane and connecting the several sections of each stay together; vertical wedges c^3, extending through the links and serving to force the stay-sections apart; and wire windings *d*, binding together the last joint of each circlet, the free extremities of the last two sections of each stay being overlapped any convenient distance for receiving said windings.

The sections of the circular stays may be of any desired standard length, and the joints of the stays should be successively staggered with relation to each other, the purpose of which expedient is to distribute the wrapped joints or arrange them in a spiral in the wall, these joints being inherently weaker than the other joints.

It will be observed that in my improved construction the great majority of the joints may be made with ease by workmen at elevated positions, it being necessary only to pass the hooks through the links and then insert the wedges and drive them home. Moreover, exceedingly strong joints are provided, it being noteworthy that the hooks lie in vertical planes, so that there is no possibility of them straightening out or bulging or cracking the cement. Furthermore, the hooks being forced into intimate contact with the links by the wedges there is no possibility of slippage, with consequent cracking of the cement after the latter has set. Finally, the amount of steel necessary for making joints is reduced to a minimum, it being observed, also, that the number of wrapped joints being so reduced renders it of small importance that the final sections of each stay may overlap little or much at the last joint formed.

It may be stated that the improved joint is applicable to construction work of the general character specified, regardless of whether the wall is entirely of concrete or partially of tiles providing interstices filled with cement, the improved stays being capable of use wherever tension members are necessary in such construction. Certain of the advantages of my construction may be secured regardless of the means employed for securing closeness of connections between the hooks and links. It is of considerable consequence that the improved joint affords interstices for receiving cement.

From the premises it will be understood that the details of construction may be varied somewhat without departure from my invention. Hence no undue limitation should be understood from the foregoing detailed description.

What I regard as new, and desire to secure by Letters Patent, is—

1. In construction of the general character

set forth, a stay comprising sections formed with adjacent hook-equipped extremities, a link engaged by said hooks, and means at each link forming a part of the stay for forcing the hooks into close engagement with the link, for the purpose set forth.

2. In construction of the general character set forth, a stay comprising sections formed with adjacent hook-equipped extremities, a link engaged by said hooks, and a wedge forcing the hooks apart and into close engagement with the link.

3. A wall of curved cross-section comprising in whole or in part cement, and curved stays embedded in the wall, each stay comprising sections provided with hook-shaped extremities, links disposed in horizontal planes and joining adjacent hooks of adjacent sections, and vertical wedges extending through said links between said hooks, for the purpose set forth.

4. An annular wall, comprising in whole or in part cement, and annular stays embedded therein, each comprising curved sections having upturned hooks, links joining adjacent hooks of adjacent sections, except at the last joint, and wedges forcing the sections apart, the last joints of the several stays being staggered, for the purpose set forth.

JOHN S. METCALF.

In presence of—
WALTER N. WINBERG,
M. S. MACKENZIE.