T. H. SKINNER.

REINFORCED CONCRETE COLUMN.

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1,008,209.

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Fig. 3

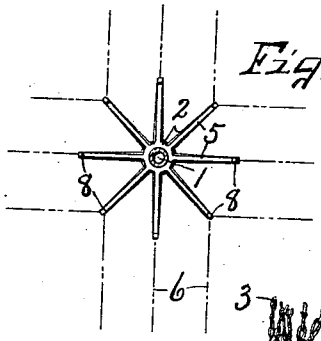
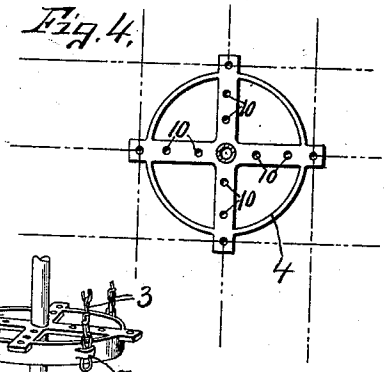


Fig. 4.



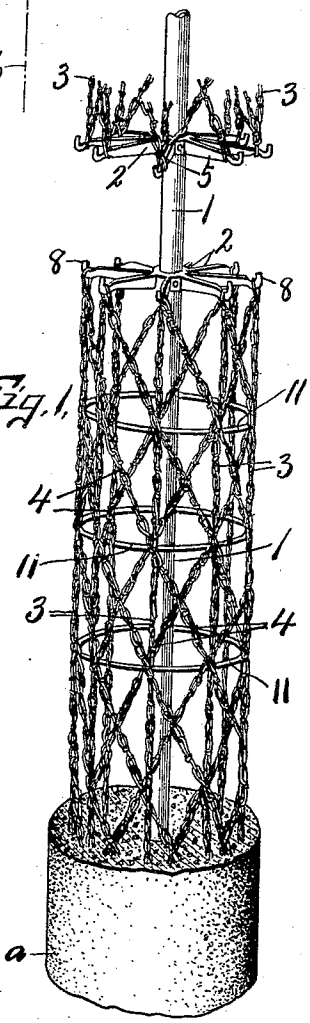


Fig. 1.

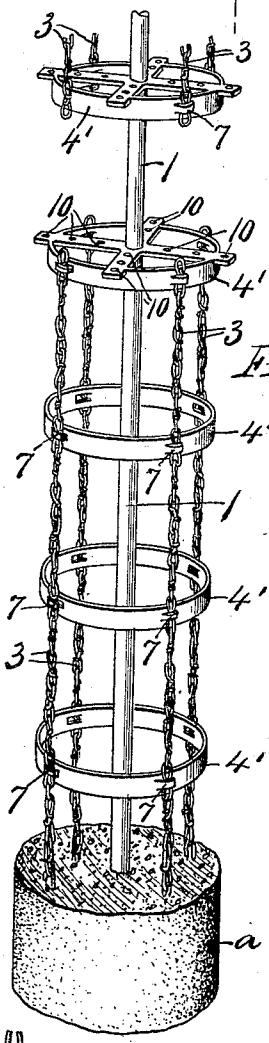
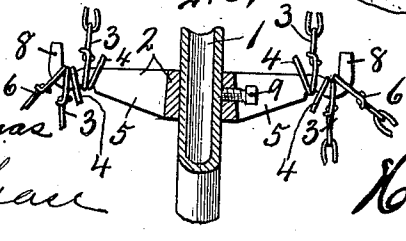


Fig. 2.

Fig. 5.



Witnesses.

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REINFORCED-CONCRETE COLUMN.

1,008,209. Specification of Letters Patent. **Patented Nov. 7, 1911.**

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To all whom it may concern:

Be it known that I, THEODORE H. SKINNER, of Oneida, in the county of Madison, in the State of New York, have invented new and useful Improvements in Reinforced-Concrete Columns, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to an improved reinforcement for concrete columns and similar upright building structures in which it is desired to establish continuity of reinforcement during progressive building throughout the entire height of the column or similar structure.

My main object is to install in the building a light skeleton net work of metal, preferably composed of coarse chains, preconstructed in the form of a basket or cage and tied together at their intersections to form a unitary article of manufacture, capable of being made in standard lengths or sizes and shipped or transported in knock down condition ready for installation, without special hand work or fitting. In other words I have sought to provide a light and efficient skeleton reinforcement, which may be easily and quickly installed in place in a building by unskilled labor during progressive building, so that when completed the entire system will be practically self-sustaining and capable of resisting any of the loads or strains to which the concrete is subjected, and at the same time the articulate form of reinforcement allows individual members to settle with the settling concrete each to an infinitesimal amount but sufficient to prevent the destruction of the bond between the concrete and reinforcement without piping the column.

A further object is to connect the reinforcing elements in such manner as to more effectually resist gyratory and shearing strains.

Other objects and uses relative to the specific parts of the reinforcement will be brought out in the following description.

In the drawings—Figure 1 is a perspective view of a preferred form of my column reinforcement showing a portion thereof as embedded in concrete. Fig. 2 is a similar perspective view of a modified form of column reinforcement showing a series of hoops or bands spaced apart and connected by flexible tie pieces or chains. Figs. 3 and 4 are top plans respectively of one of the anchor plates or frames shown in Figs. 1 and 2. Fig. 5 is an enlarged sectional view through one of the spiders seen in Fig. 1 and the adjacent portion of the supporting rod or tube.

The reinforcement shown in Fig. 1, comprises an upright supporting rod or tube —1— and one or more flexible cages or baskets, adjustably mounted or supported upon the supporting rod or tube —1— and composed, in this instance, of lower and upper heads or frames —2— and cross chains —3— and —4— intersecting each other and having their lower and upper ends secured to the outer portions of the frame —2—, preferably a uniform distance apart and an equal distance from and around the central supporting rod or tube —1—. The upright support —1— preferably consists of a comparatively small pipe or tube extending from the foundation vertically in the axis and to the top of the column, and may be made in sections secured together during progressive building from floor to floor. The spiders or anchor plates —2— are mounted upon the rod or support —1— and are adjustable vertically and rotarily and constitute the heads of the reinforcing cages of which the cross chains —3— and —4— form a part in the preferable form of my invention shown in Fig. 1.

The heads of each cage are spaced apart a distance corresponding approximately to the distance between the floors. These cages or baskets are mounted upon the central supporting rod, one above the other, with their meeting ends or heads spaced some distance apart leaving a clear opening at the floor line to permit the concrete of the floor girders to be thoroughly incorporated with that of the column, and at the same time enabling the anchor plates to be firmly embedded in such concrete. The heads are adjusted vertically to correspond to the height of the ceiling or the distance from floor to floor and are provided, in this instance, with eight radial arms of substantially equal lengths, and spaced an equal distance apart, and their outer ends are usually hook shaped for receiving the ends of the cross chains —3— and —4—, and also serve to receive the ends

of the girder reinforcing chains —6— as shown in Fig. —3—. Each head therefore constitutes a common anchorage for the girder reinforcing hammocks and also for the column reinforcing cages and enables the entire system of reinforcement to be tied together, thereby establishing continuity of the reinforcing system. The vertical chains —3— have their opposite ends detachably connected to the hooked ends of radial arms —5— of the heads —2— and are spaced an equal distance apart around and a considerable distance from the central upright support —1—. The chains —4— are also attached at their opposite ends to the arms of the head —2— and are wound spirally around and some distance from the central support —1— so as to intersect the vertical chains —3—. I preferably use two sets of spirally wound chains running in opposite directions and intersecting each other at the intersections with the vertical chains, thus forming a chain netting having diamond shaped meshes of considerable size, through which the concrete may be readily worked in and around all parts of the links of the reinforcing chains.

It will be observed that all parts of the chains reinforcement or netting are spaced a considerable or uniform distance from the central upright support and that the arms of the heads, to which the ends of the chains are attached are also spaced a considerable distance apart, which enables the concrete to be uniformly filled in, through and around all parts of the cages, the concrete being worked through the links of the chains which become individually embedded therein and serve to sustain the body of the concrete against undue settling while in a more or less plastic or green state.

The spiral or diagonal chains —4— constitute bands which serve to tie the vertical chains and to hold them a uniform distance apart at intervals throughout their length. In some instances I may prefer to tie the vertical chains together by horizontal hoops or bands —4'—, said bands being concentric with the central upright support —1— and are spaced some distance apart vertically, one above the other, each ring being provided with suitable fastening means as hooks —7— for tying the chains to the hoops or bands. The hoops serve to hold the chains a fixed distance apart, while the chains serve to suspend the hoops a uniform distance apart, the hoops and chains forming a cage or basket around the central support. The upper and lower rings of each of these cages —1— are adjustably secured thereto by set screws or other suitable fastening means. These latter cages are also mounted upon the central support —1—, one above the other during progressive building, with their meeting ends spaced some distance apart for the reception of the concrete at the junction of the girders with each other and with the column.

The spokes or arms of the adjacent heads —2— of the cages are provided with a series of apertures —10— for the reception of the ends of the girder chains constituting the reinforcing hammocks or baskets for the floor girders or beams as indicated in Fig. 4.

In the installation of this reinforcement the upright central supporting tube is properly positioned centrally of the column and extended upwardly any desired height during progressive building by attaching one pipe section to another. One or more heads —2— are then placed upon the upright pipe section, one of them being secured to the bottom of the tube at the foundation of the column, after which the upper head of the cage is adjusted to the proper height and the opposite ends of the chains constituting the flexible portion of the cage are then attached respectively to the lower and upper heads and drawn tightly until the chains —3— assume a vertical position, it being understood that the forms for shaping the exterior of the column are properly positioned for the reception of the concrete, after which the concrete is filled in and thoroughly tamped in and around all parts of the chains and central supporting tube —1—, thereby completely embedding the chains and end heads of each cage or basket during progressive building.

Referring again to Fig. 1, it will be seen that the sets of spiral chains are joined together at their intersections at intervals by rings or hoops —11— which prevent inward compression of the intermediate portions of the cage between the spiders —2— thereby maintaining the general cylindrical form of the cage more perfectly than would be the case without the use of such rings.

What I claim is:

1. A reinforcement for concrete columns comprising an upright support, and a flexible cage mounted upon and surrounding the support and provided with end heads adjustable on said support.

2. A reinforcement for concrete columns comprising an upright support, and a cage coaxial with the column and composed of chains and end heads adjustably attached to the chains and secured to the support.

3. In a reinforcement for concrete columns, an upright support, heads adjustably mounted on the support and provided with radial arms, and reinforcing members attached to the said arms.

4. In a reinforcement for concrete columns, an upright support coaxial with the column, heads adjustable vertically along said support, and articulate members connecting said heads.

5. In a reinforcement for concrete col-

umns, an upright support, heads adjustable vertically along and upon the support and sets of chains running spirally around the axis of the support in opposite directions and attached to the heads.

6. In a reinforcement for concrete columns, an upright support heads adjustable vertically and rotarily upon the support and separate sets of chains running spirally around the axis of the support in opposite directions and tied together at their intersections.

7. A reinforcement for concrete columns, comprising an upright support, a cage adjustable vertically on the support and composed of end heads and separate sets of chains connecting said heads and intersecting each other and tied at their intersections and spacing members for the chains.

8. A reinforcement for concrete columns comprising an upright support, and a cage composed of end heads secured to the support separate sets of spirally extending chains arranged about the axis of the column and having their ends attached to the heads, and connections between the intermediate portions of the chains.

9. A reinforcement for concrete columns comprising an upright support, a plurality of chains arranged about the support, and means on the support for tensioning the chains.

10. A reinforcement for concrete columns comprising an upright support, a plurality of chains arranged about the support, means on the support for tensioning the chains, and separate means for holding the intermediate portions of the chains in fixed relation with each other.

In witness whereof I have hereunto set my hand this 8th day of January 1909.

THEODORE H. SKINNER.

Witnesses:
H. E. CHASE,
C. M. MCCORMACK.