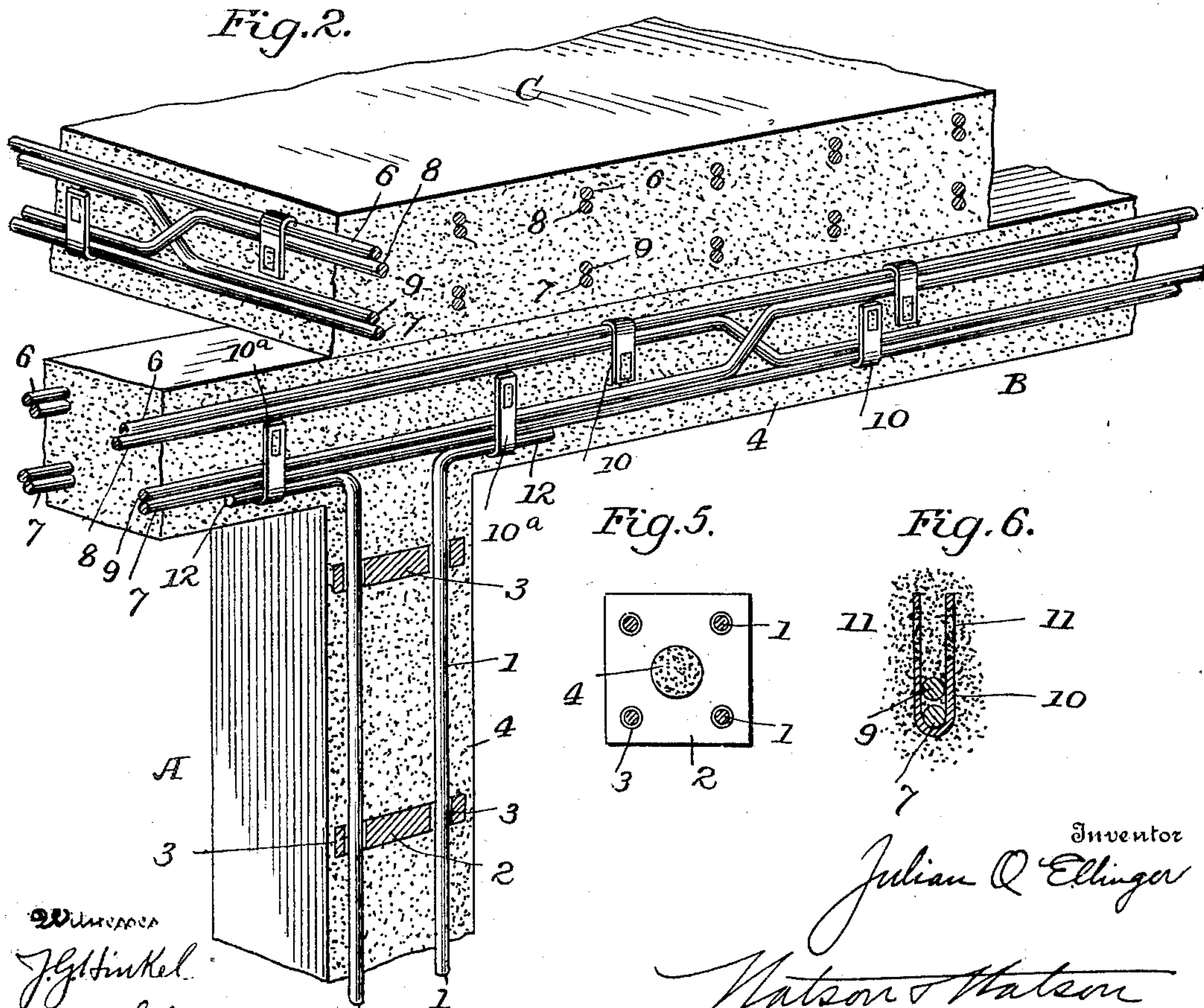
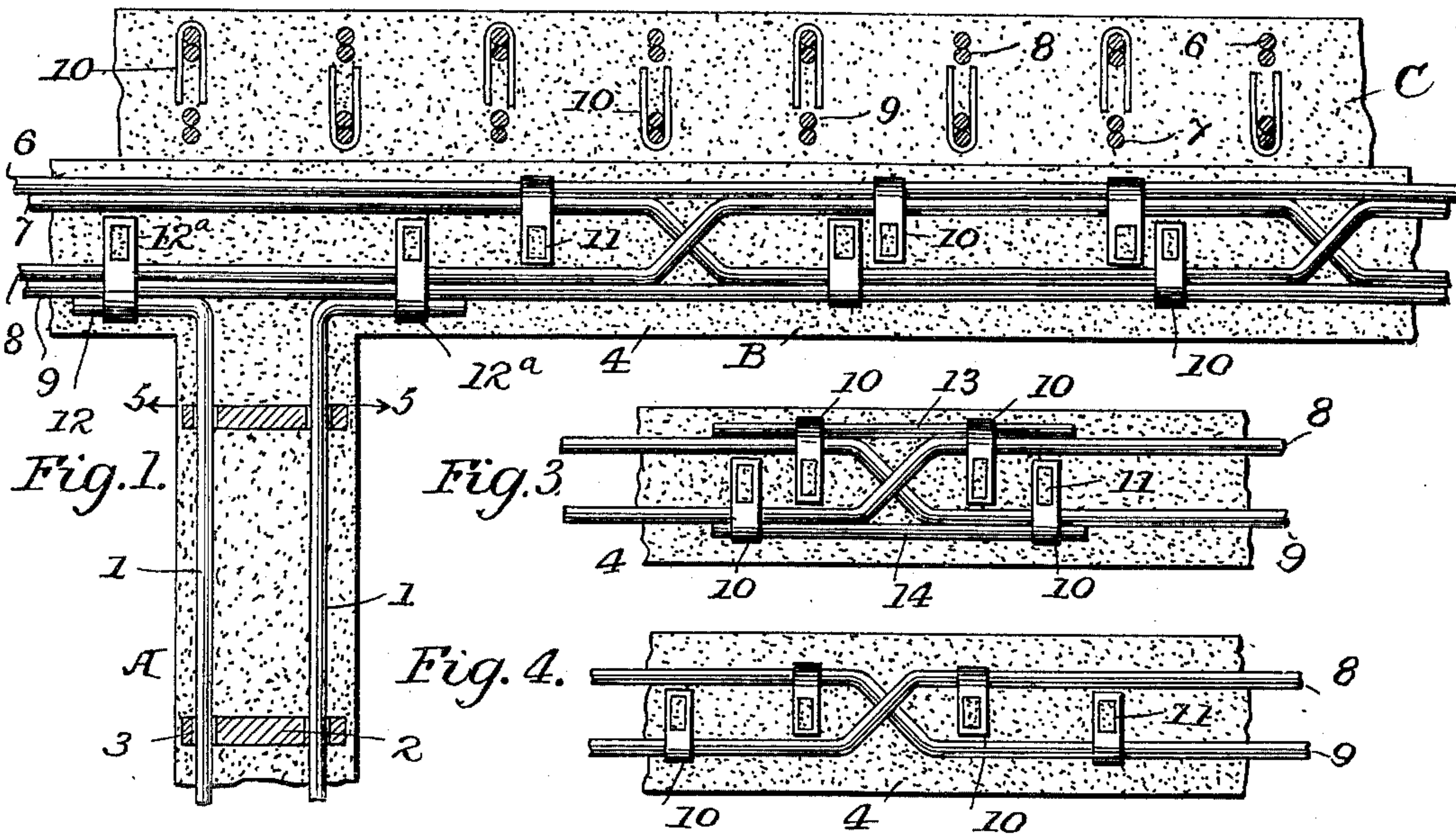


J. O. ELLINGER.
FIREPROOF BUILDING STRUCTURE.

(Application filed Oct. 17, 1900.)

(No Model.)



Witnesses
J. G. Hinkel.
L. W. Clement.

Inventor
Julian Q. Ellinger
Watson & Watson
Attorneys

UNITED STATES PATENT OFFICE.

JULIAN O. ELLINGER, OF BALTIMORE, MARYLAND.

FIREPROOF BUILDING STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 667,871, dated February 12, 1901.

Application filed October 17, 1900. Serial No. 33,386. (No model.)

To all whom it may concern:

Be it known that I, JULIAN O. ELLINGER, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Fireproof Building Structures, of which following is a specification.

My invention relates to improvements in fireproof structures of the class in which the body of the structure is composed of a cemented fireproof composition within which is arranged a framework of metal rods adapted to brace the structure and distribute the strains.

In the accompanying drawings, which illustrate my invention, Figure 1 is a sectional view through a floor, beam, and column made in accordance with my improvements. Fig. 2 is a similar view in perspective. Figs. 3 and 4 show modified forms of the metal framework. Fig. 5 is a section through the column on the line 5 5 of Fig. 1, and Fig. 6 is a sectional view through one of the stirrups.

Referring to Figs. 1 and 2 of the drawings, A indicates a column, B a beam, and C a section of flooring arranged upon said beam. The column comprises a number of parallel metal rods 1, which are braced at suitable intervals by plates 2, having openings 3 therein, so that they may be passed onto the rods, and a body of cemented fireproof composition 4, suitably shaped to form the column. The central portions of the plates are cut out, as shown in Fig. 5, for the double purpose of lightening the structure and permitting the cemented material to extend through the openings and form a continuous solid column. As shown in Figs. 1 and 2, the column and beam are in one continuous structure, the upper ends of the rods 1 on the opposite sides of the column being turned outwardly at right angles and embedded in the cemented material of the beam. The column may, however, be made separately from the beam, or it may be formed integral with a section of the floor or other structure which it is to support. The beam, as shown in said figures, comprises the body of cemented material 4 and a framework embedded therein, said framework consisting of a suitable number of upper and lower parallel tension-rods 6 and 7, extending throughout the length of the beam, and a correspond-

ing number of pairs of brace-rods 8 and 9, extending parallel with the tension-rods throughout the greater portion of their length, said brace-rods being arranged between and against the tension-rods and crossing each other at suitable intervals, so that the adjoining sections of the brace-rods between the crossing-points are alternately ranged along side the opposing tension-rods. At frequent intervals throughout the length of the beam the rods are stayed by means of stirrups 10, (see Fig. 6,) consisting of pieces of flat metal in a U shape and having openings 11 near their ends. These stirrups pass around the rods on each side of the beam and extend inwardly into the mass of cement. As the cement extends through the openings 11, the stirrups are held firmly in place and strengthen the structure by holding the parallel rods together and binding the rods and the mass of cement together at a number of points in each section. The right-angled portions 12 of the rods 1 are also preferably bound to the beam by means of stirrups 10^a, as shown. This construction gives a very rigid, light, and comparatively inexpensive beam with a uniform resistance to bending strains. The flooring C is constructed in the same manner as the beam, pairs of tension and brace rods being placed at suitable distances apart laterally throughout the entire floor, as shown in Figs. 1 and 2.

Instead of extending the tension-rods the entire length of the structure I may, as shown in Fig. 3, connect adjoining portions of the rods 8 and 9 at their crossing-points by short rods 13 and 14, which are bound in the mass by stirrups 10, passing around said short rods and the rods 8 and 9. These short rods brace the structure against flexure at the crossing-points of the brace-rods and form, with the parallel portions of the latter, continuous metal rods in the line of tension. As the main portions of the brace-rods are in the line of tension, I may in some instances dispense with the tension-rods entirely, using only the brace-rods and stirrups, as illustrated in Fig. 4, or I may, if desired, use only one tension-rod instead of two in connection with each pair of brace-rods.

It will be apparent that the number and size of the rods employed will depend upon

the required strength of the structure and that any suitable fireproof cemented material may be used.

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

1. A building structure comprising a framework made of metal brace-rods arranged in parallel pairs, extending longitudinally of the structure, the rods of each pair crossing one another at suitable intervals, and the intermediate parallel portions being opposite one another, and a mass of cemented material between and surrounding said framework.
2. A building structure comprising a framework made of metal brace-rods arranged in parallel pairs, extending longitudinally of the structure, the rods of each pair crossing one another at suitable intervals, and the intermediate parallel portions being opposite one another, a mass of cemented material between and surrounding said framework, and stirrups extending around said rods and inwardly into said mass.
3. A building structure comprising a framework made of metal brace-rods arranged in parallel pairs, the rods of each pair crossing one another at suitable intervals, a mass of cemented material between and surrounding said framework, and stirrups extending around said rods and inwardly into said mass, said stirrups having openings near their inner ends.
4. A building structure comprising a framework made of metal brace-rods arranged in parallel pairs, the rods of each pair crossing one another at suitable intervals, a corresponding number of parallel tension-rods, a mass of cemented material between and surrounding said framework, and stirrups extending around said rods and inwardly into said mass.

5. A building structure comprising a frame-

work made of metal brace-rods arranged in parallel pairs, the rods of each pair crossing one another at suitable intervals, one or more tension-rods extending parallel with said brace-rods, a mass of cemented material between and surrounding said framework, and stirrups extending around said rods and inwardly into said mass.

6. A building structure comprising a framework made of metal brace-rods arranged in parallel pairs, the rods of each pair crossing one another at suitable intervals, a mass of cemented material between and surrounding said framework, stirrups extending around said rods and inwardly into said mass, and a column formed integral with said structure, said column comprising a body of cemented material and a frame consisting of a series of parallel rods secured by brace-plates, the ends of said rods being embedded in the body of said structure.

7. The combination with a building structure, as a floor-beam, comprising a framework of metal rods and a mass of cemented material between and surrounding said rods, of a column formed integral with said beam, said column comprising a body of cemented material and a frame consisting of a series of parallel rods secured by brace-plates, the ends of said rods being embedded in said beam.

8. In a building structure, a framework constructed of metal rods, a mass of cemented material between and surrounding said framework, and stirrups extending around said rods and inwardly into the mass, said stirrups having openings near their inner ends.

In testimony whereof I affix my signature in presence of two witnesses.

JULIAN O. ELLINGER.

Witnesses:

ROBERT WATSON,
WM. V. HEAPHY.