

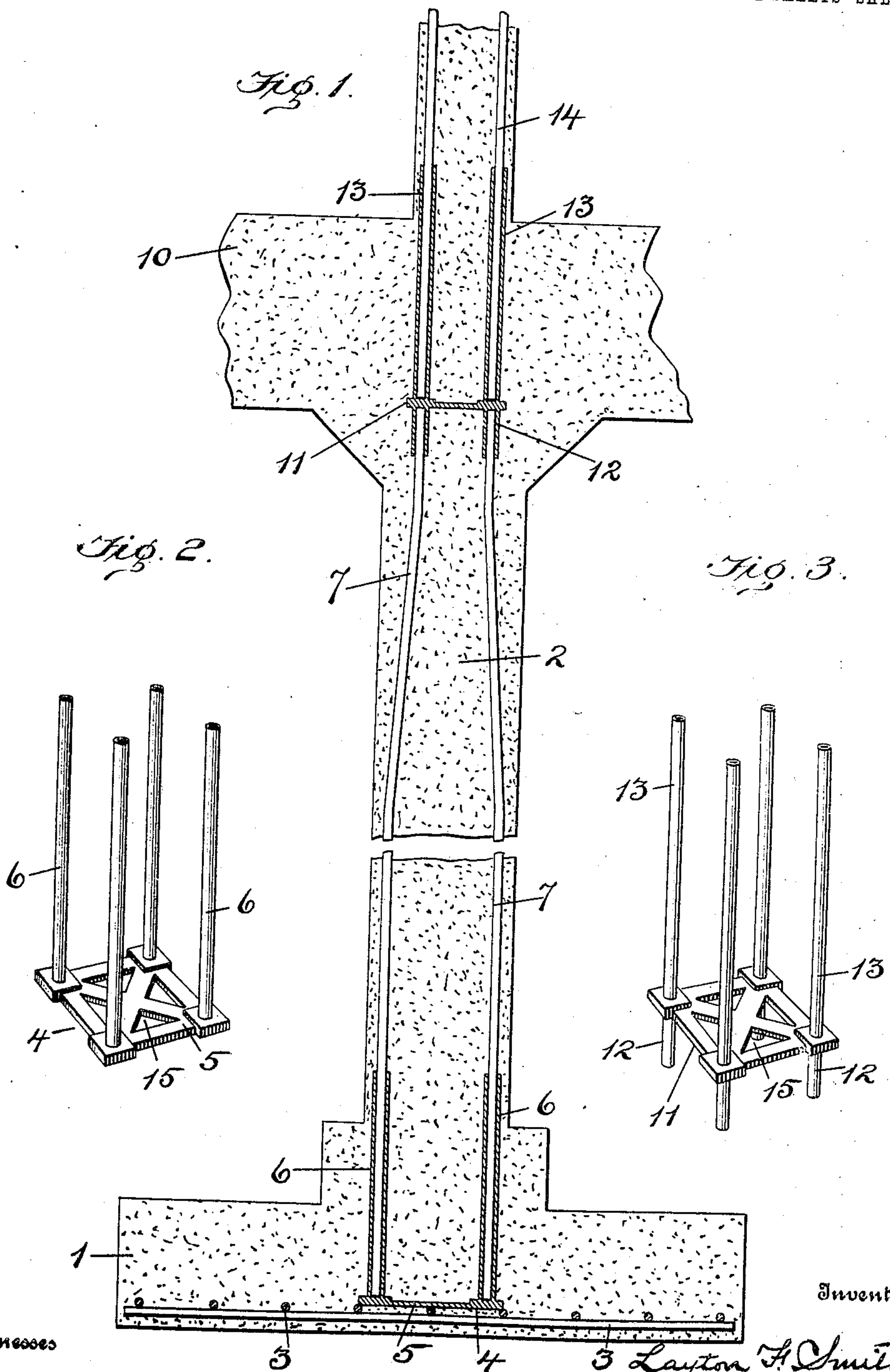
No. 841,463.

PATENTED JAN. 15, 1907.

L. F. SMITH.
REINFORCED CONCRETE COLUMN.

APPLICATION FILED OCT. 3, 1906.

2 SHEETS—SHEET 1.



Witnesses

Edwin K. Bradford
G. Ferd. Vogt.

Inventor

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2 SHEETS—SHEET 2.

Fig. 4.

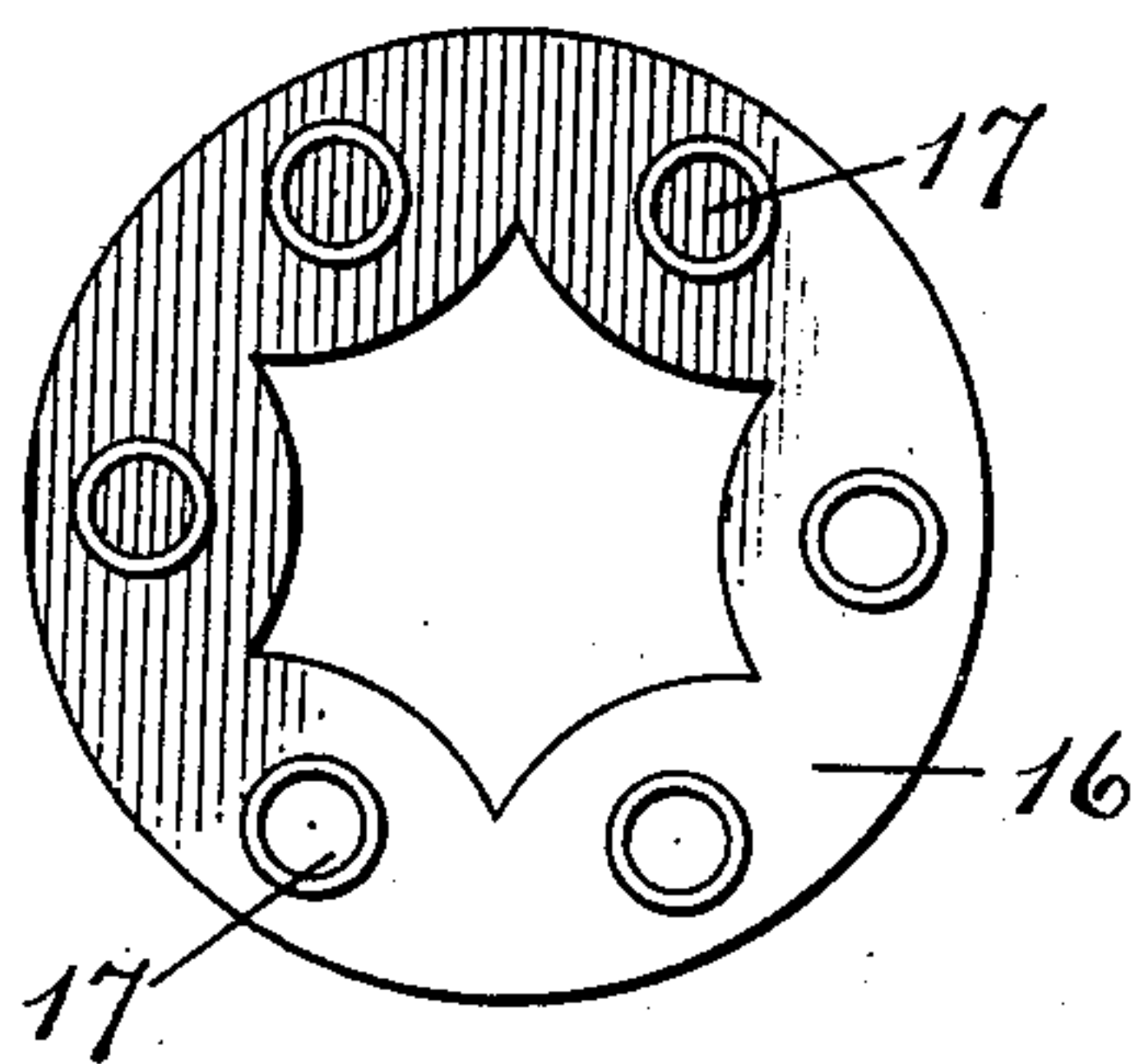


Fig. 5.

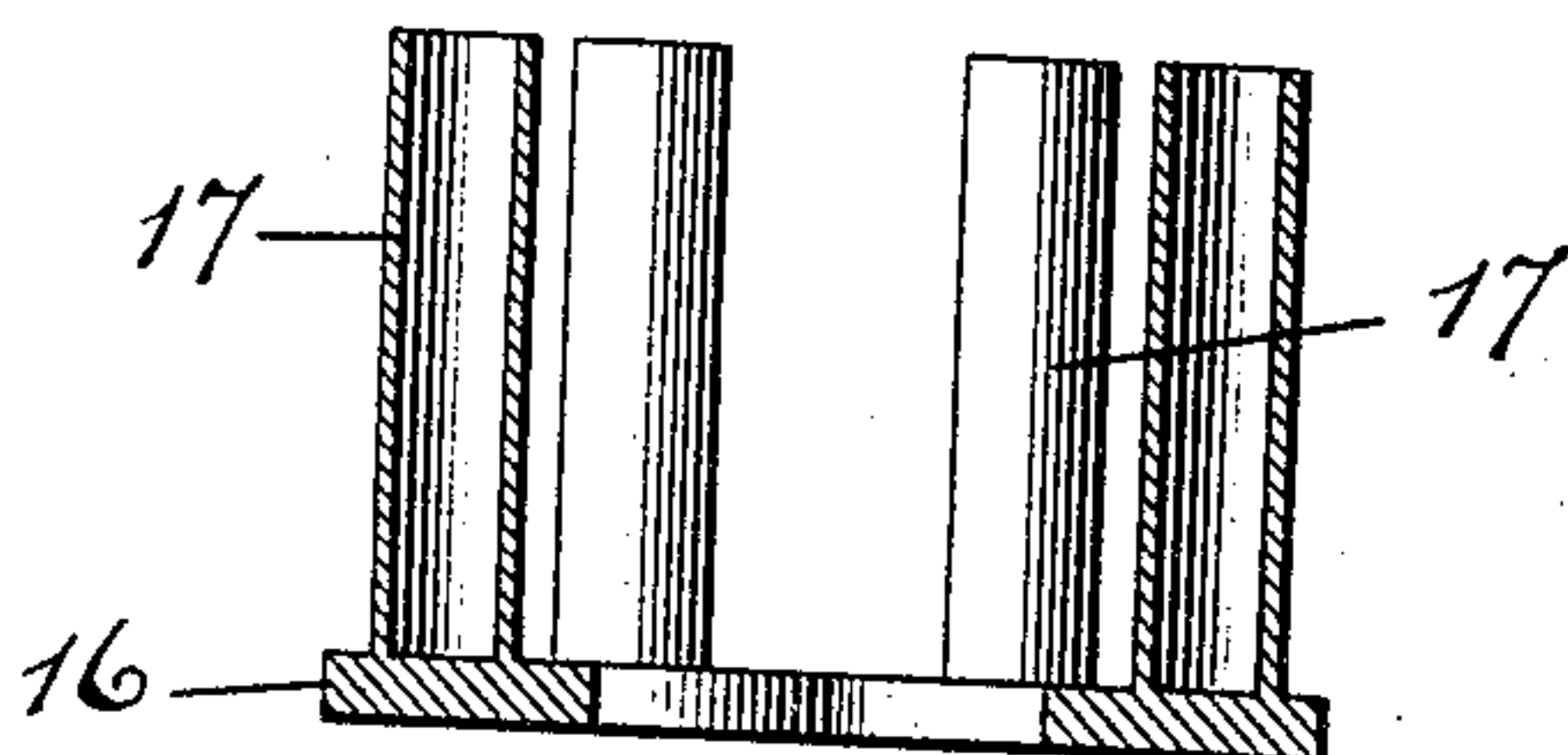


Fig. 10.

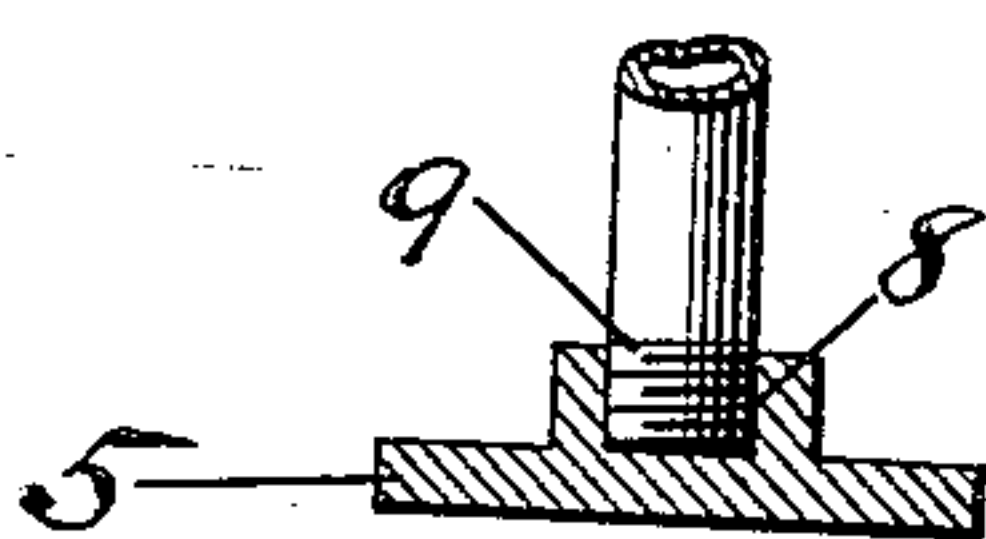
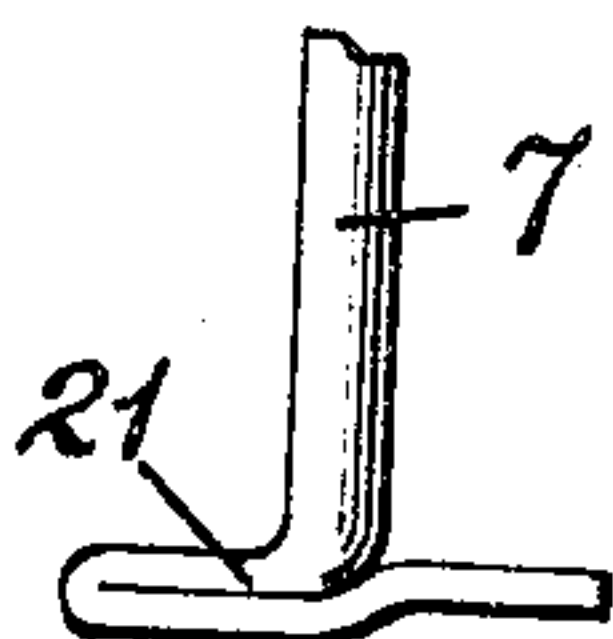


Fig. 11.



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Fig. 6.

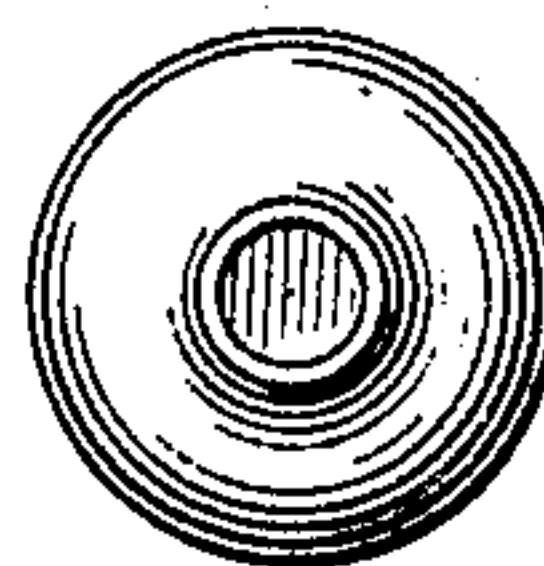


Fig. 7.

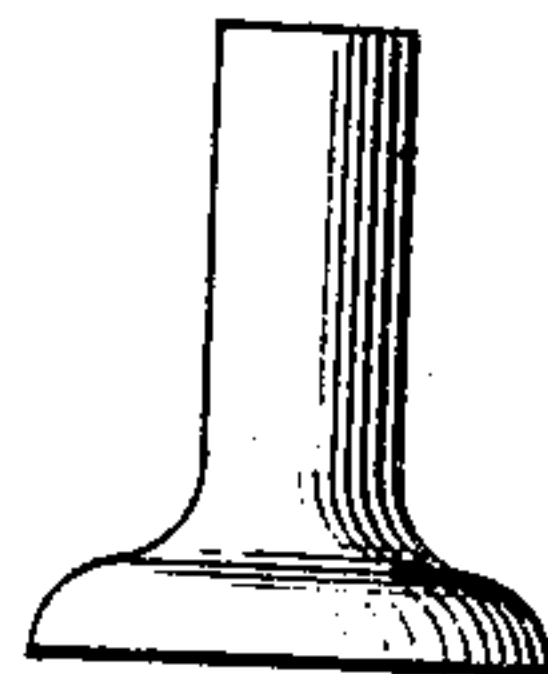


Fig. 8.

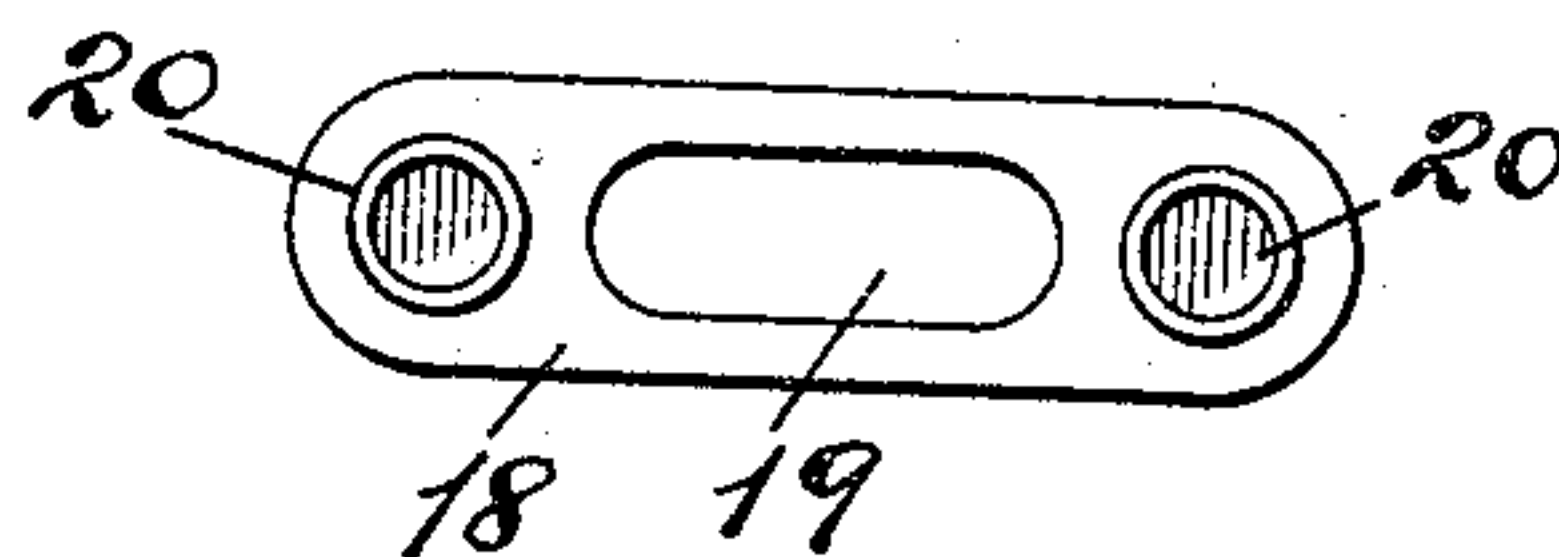


Fig. 9.

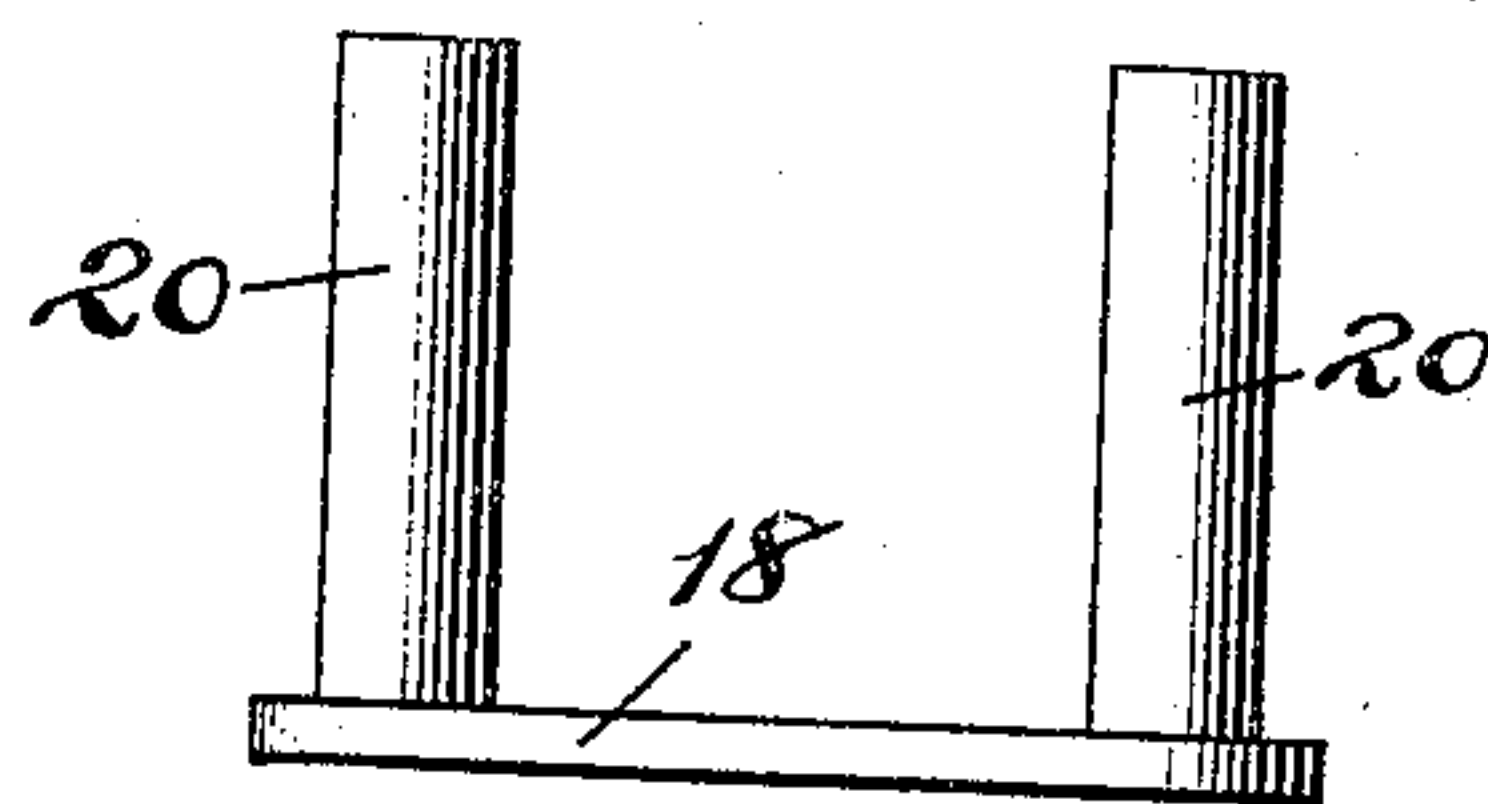
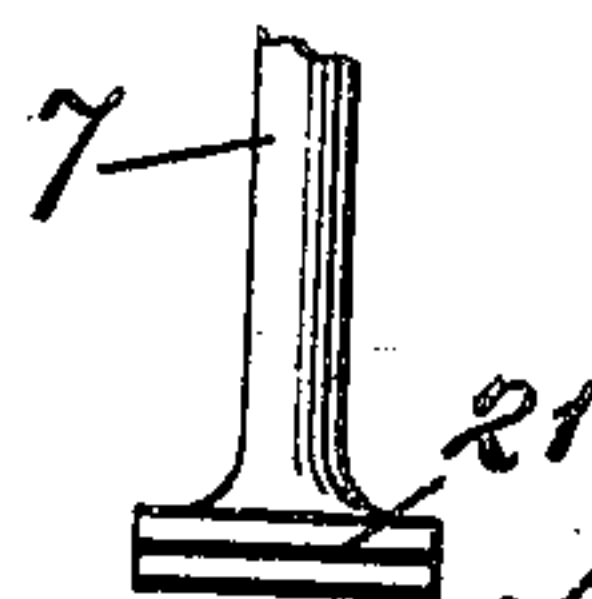


Fig. 12.



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UNITED STATES PATENT OFFICE.

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REINFORCED CONCRETE COLUMN.

No. 841,463.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed October 3, 1906. Serial No. 337,188.

To all whom it may concern:

Be it known that I, LAYTON F. SMITH, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Reinforced Concrete Columns, of which the following is a specification.

This invention relates to improvements in reinforced concrete construction, and has particular reference to the construction of columns, the distribution of load of column-rods to concrete, and the connection between the column and beam.

The object of the invention is to provide a construction whereby the column-rods may be sustained in a socket or shoe whose base has an area equivalent to ratio of stress in the steel and concrete, so as to distribute the load in the rods over the concrete base.

In practicing the invention it is immaterial just where these socket or shoe members are situated, as it may be located in the footing of the column or at the column-and-beam connection or it may be at any point where two column-rods join.

Examples of the application of the invention are illustrated in the accompanying drawings, in which—

Figure 1 shows a sectional elevation of a column, the footing or foundation-base of the column, and the connection between the column and girder or beam, all of which are provided with my improved constructions. Fig. 2 is a perspective view of one form of lower socket member. Fig. 3 shows a detail of one of the upper socket members. Figs. 4 and 5 illustrate plan and cross-sectional views of a socket member circular in form. Figs. 6 and 7 show similar views of a single socket. Figs. 8 and 9 show two views of a double-socket member. Fig. 10 illustrates a socket base-plate and a tubular socket attached thereto by means of screw-threads; and Figs. 11 and 12 show the lower ends of a column-rod flattened out and bent to increase the base area whereby to form a flat support for the rod.

In a reinforced concrete column if it is considered that the steel rods carry a definite amount of load that load should be distributed over the concrete in the footing or foundation by increasing either the area or the rod at the resting-point or by providing a socket or shoe which must have an area equivalent to the ratio of compression allowed in the two materials—to wit, steel and concrete. If the ratio of fifteen is allowed,

then the resting-point of the rod or the socket in which the rod rests should have an area fifteen times as great as the area of the steel rod.

By my invention I have provided a convenient construction whereby the distribution of the load of the column-rods to the concrete is effected.

Referring to the drawings, the numeral 1 designates the footing, and 2 the column rising therefrom. This footing may be reinforced in numerous ways, but in the present instance the reinforcement consists of a series of steel bars 3, forming what is termed a "grillage."

During the formation of the footing I embed therein one or more socket members 4, which latter may be formed in various ways, several examples of which are shown in the accompanying drawings.

The socket member shown in the footing of the column in Fig. 1 and also in detail in Fig. 2 comprises a base-plate 5, having tubular sockets 6, projecting vertically from the upper side thereof. In this form the base-plate is provided with four tubular sockets, one at each corner thereof; but it is obvious that the plate may be of any desirable shape in outline and also be provided with as many sockets as desired to conform to the character of the column needed. The tubular sockets 6 may project from the base-plate for any desired distance in order that the lower ends of the column-rods 7 may be properly inclosed. The length of these tubes therefore may be varied to suit the requirements in any special case, but the chief object in all cases being to provide a broad flat base for the end of each column-rod to rest upon when embedded in the concrete, so as to distribute or transfer the load from the rod to the concrete.

The tubular sockets may be formed integrally with the base-plate 5, or the base-plate may be provided with a screw-threaded recess 8, into which a threaded end 9 of the socket may screw, as seen in Fig. 10.

It will be understood that the socket members may be employed either at the footing or base of the column or at any point where two column-rods join. For example, by reference to Fig. 1 it will be noted that the lowermost column-rods 7 extend vertically from the footing 1 up to the first beam or girder 10. This beam or girder may be reinforced in any desired manner; but where the upper ends of the column-rods 7 terminate I

provide a socket member 11, comprising a base-plate with tubular sockets 12, projecting from the bottom of the base-plate, so as to receive the upper ends of said lower column-rods 7. This socket member 11 is also provided with tubular sockets 13, which project from the upper side of the base-plate and which receive the lower ends of the column-rods 14, which project from the beam or girder upwardly. It will thus be seen that this socket member 11 forms a connection between the lower and upper column-rods 7 and 14.

Where a plurality of tubular sockets are provided on a single base-plate, I preferably provide openings 15 in said plate in order that the concrete above and below the plate may be united through said openings and not be separated.

In Figs. 4 and 5 I show a base member 16 of a circular form and in which the sockets 17 project vertically from said circular plate.

Figs. 6 and 7 show a base from which a single socket projects, while Figs. 8 and 9 illustrate a rectangular base 18 with a central opening 19 and a socket 20 at each end thereof.

In Figs. 11 and 12 I show a form in which the base 21 is formed integrally with the column-rod 7. In the formation of this base the lower end of the column is increased in size or area by being upset, so as to form a broad flat base on which the rod may rest in the concrete.

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

1. A concrete column having a rod embedded and extending vertically therein, a flat base also embedded in said concrete column beneath said rod, and means engaging the base and said rod whereby the load of the rod may be distributed over the concrete through the base.

2. A concrete column having a rod embedded and extending vertically therein, a

base also embedded in said concrete, said base having a socket to receive said rod whereby the load of the rod may be distributed over the concrete.

3. A concrete column having a vertical rod embedded therein, and a base of greater area than the area of the rod and having a tubular socket projecting therefrom, said socket serving to receive the end of the rod.

4. A concrete column having a plurality of vertical rods embedded therein, a single base having a plurality of sockets projecting vertically therefrom, said sockets being of greater diameter than the rods and serving to receive the latter.

5. A concrete column having a plurality of vertical rods embedded therein, a single base-plate having a greater area than the cross-sectional area of all the rods combined and also having an opening extending therethrough and a plurality of sockets projecting from said base-plate and serving to receive the ends of the rods.

6. A concrete column having a plurality of vertical rods, one above the other and said rods being embedded in said concrete and a plate resting on top of the lower rod and receiving the load of the upper rod and serving to concentrate the load from the concrete to the lower rod.

7. A concrete column having vertical rods arranged one above the other and said rods being embedded in said concrete and a plate interposed between the adjacent ends of said rods and having sockets projecting at opposite sides thereof whereby the upper end of the lower rod and the lower end of the upper rod may enter said sockets and the load of the concrete be concentrated on the rods.

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

LAYTON F. SMITH.

Witnesses:

G. FERDINAND VOGHT,
CHARLES B. MANN, Jr.