

No. 616,084.

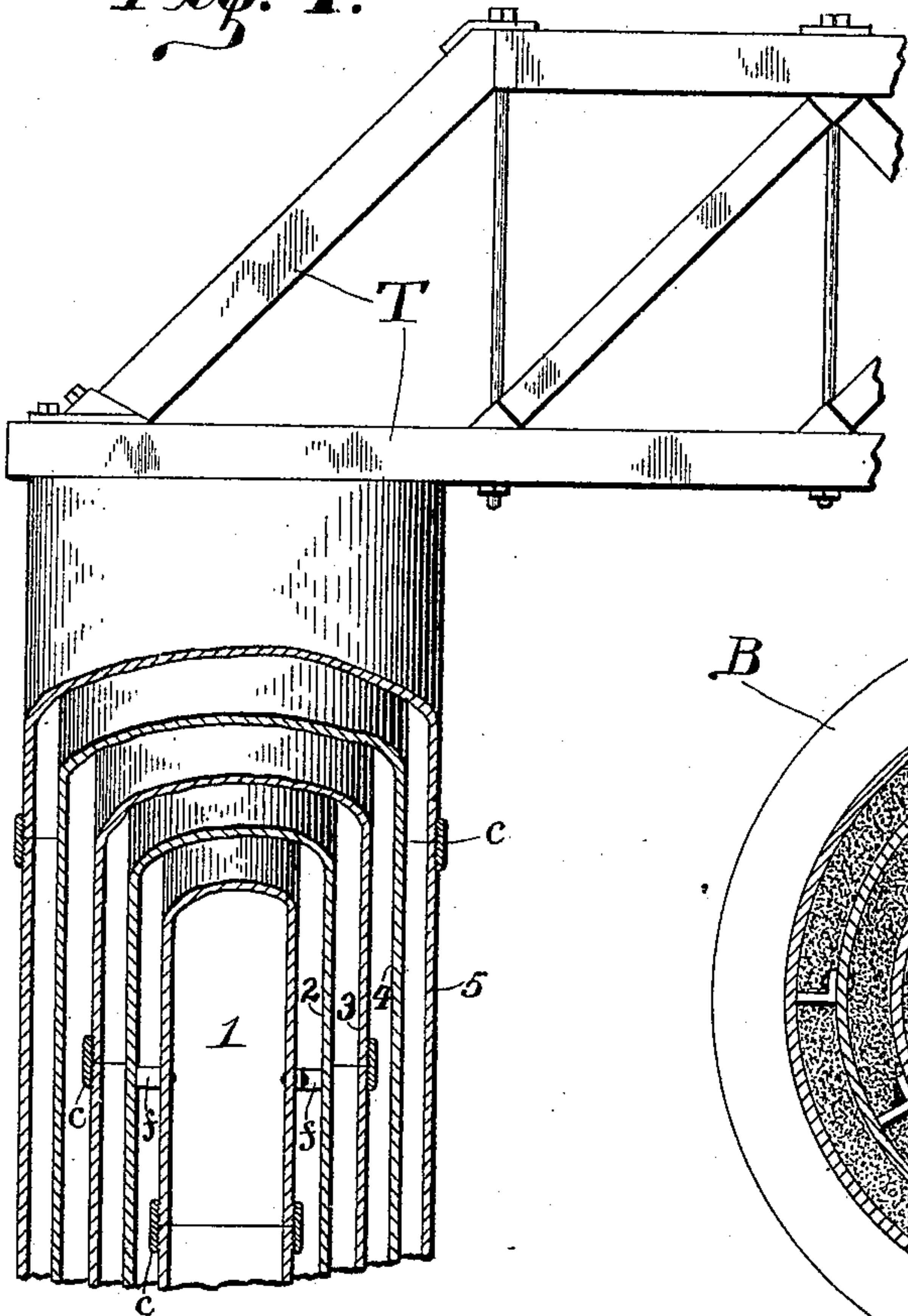
F. A. W. DAVIS.  
COLUMN.

Patented Dec. 20, 1898.

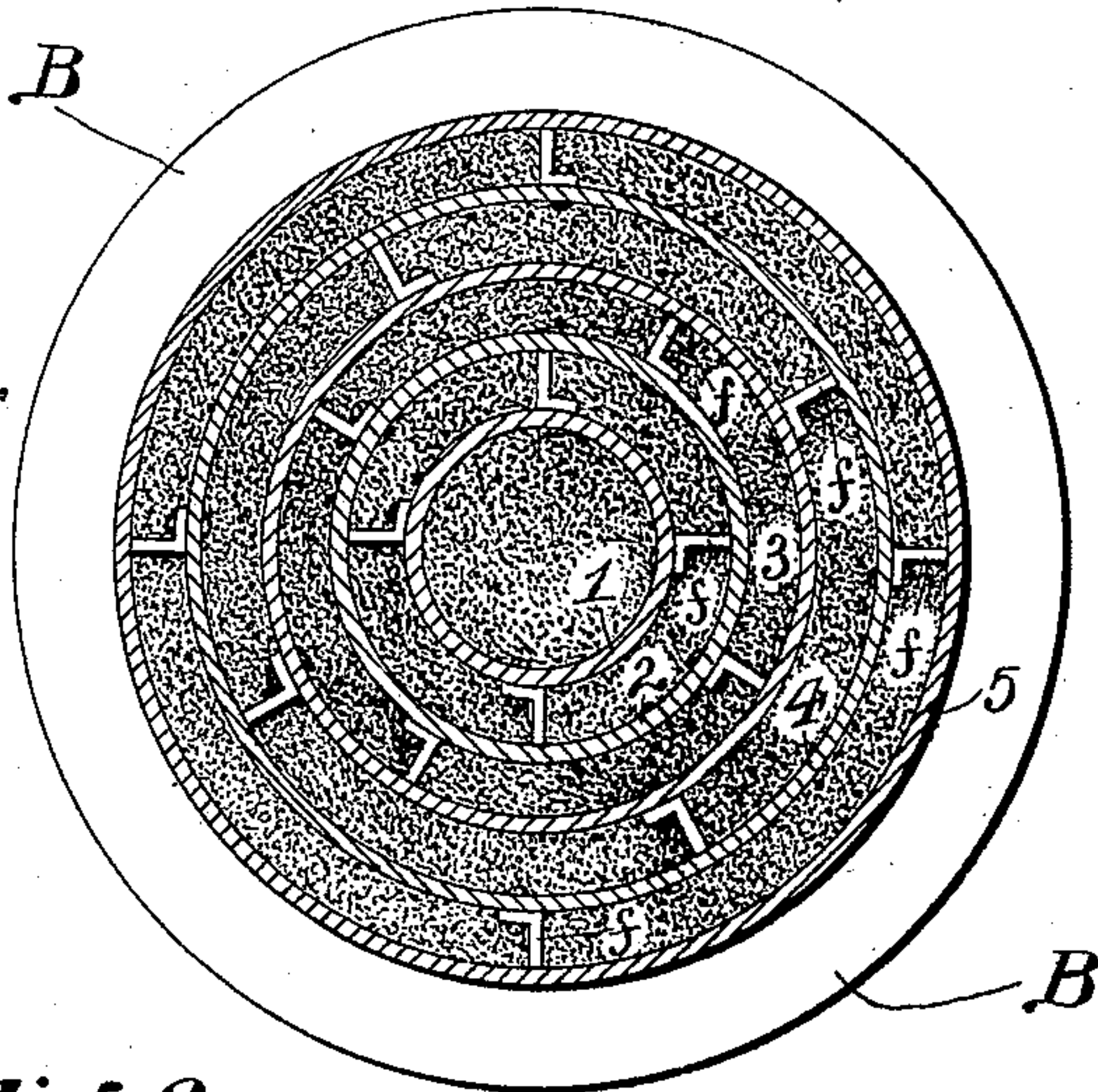
(Application filed Aug. 20, 1898.)

(No Model.)

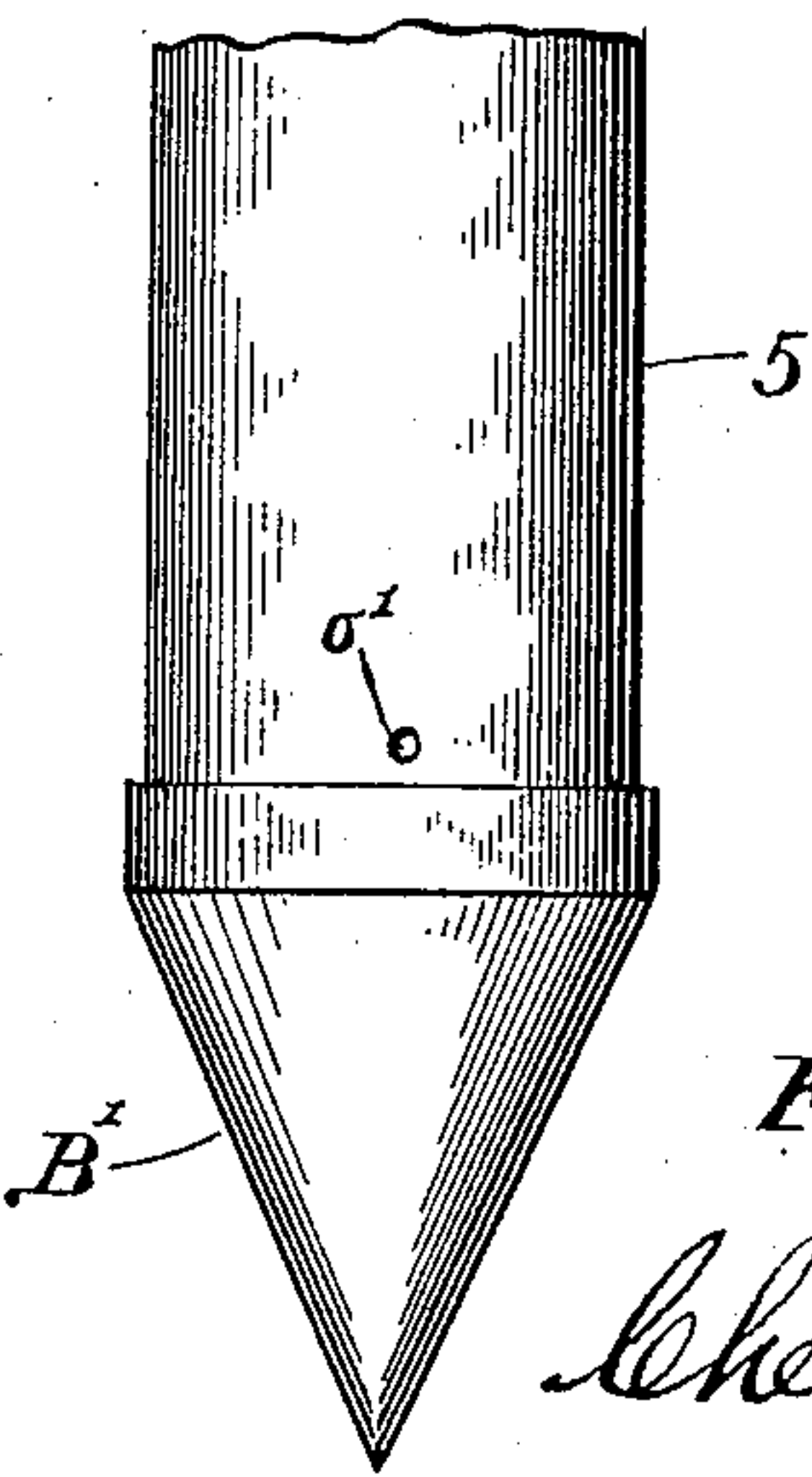
*Fig. 1.*



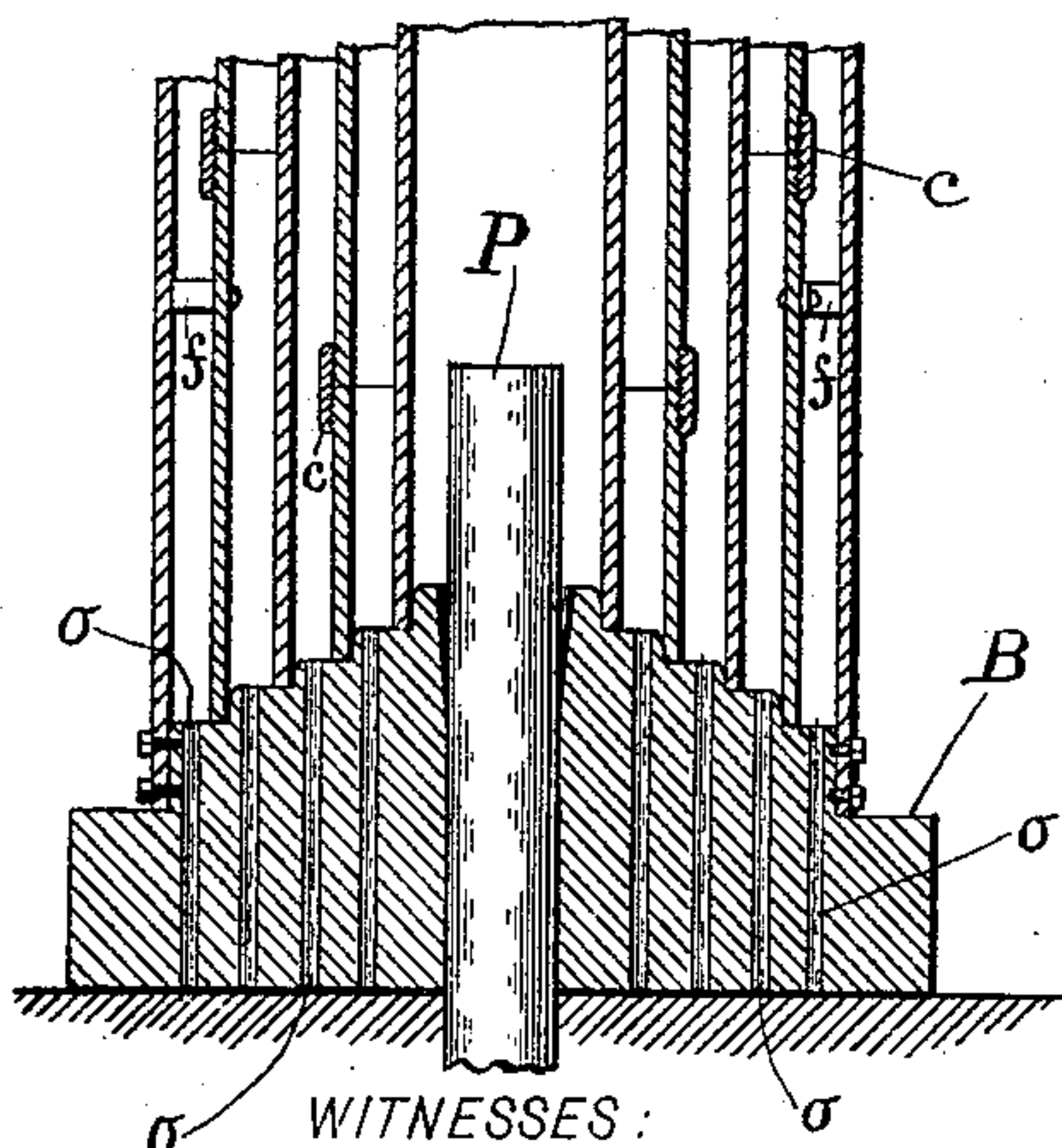
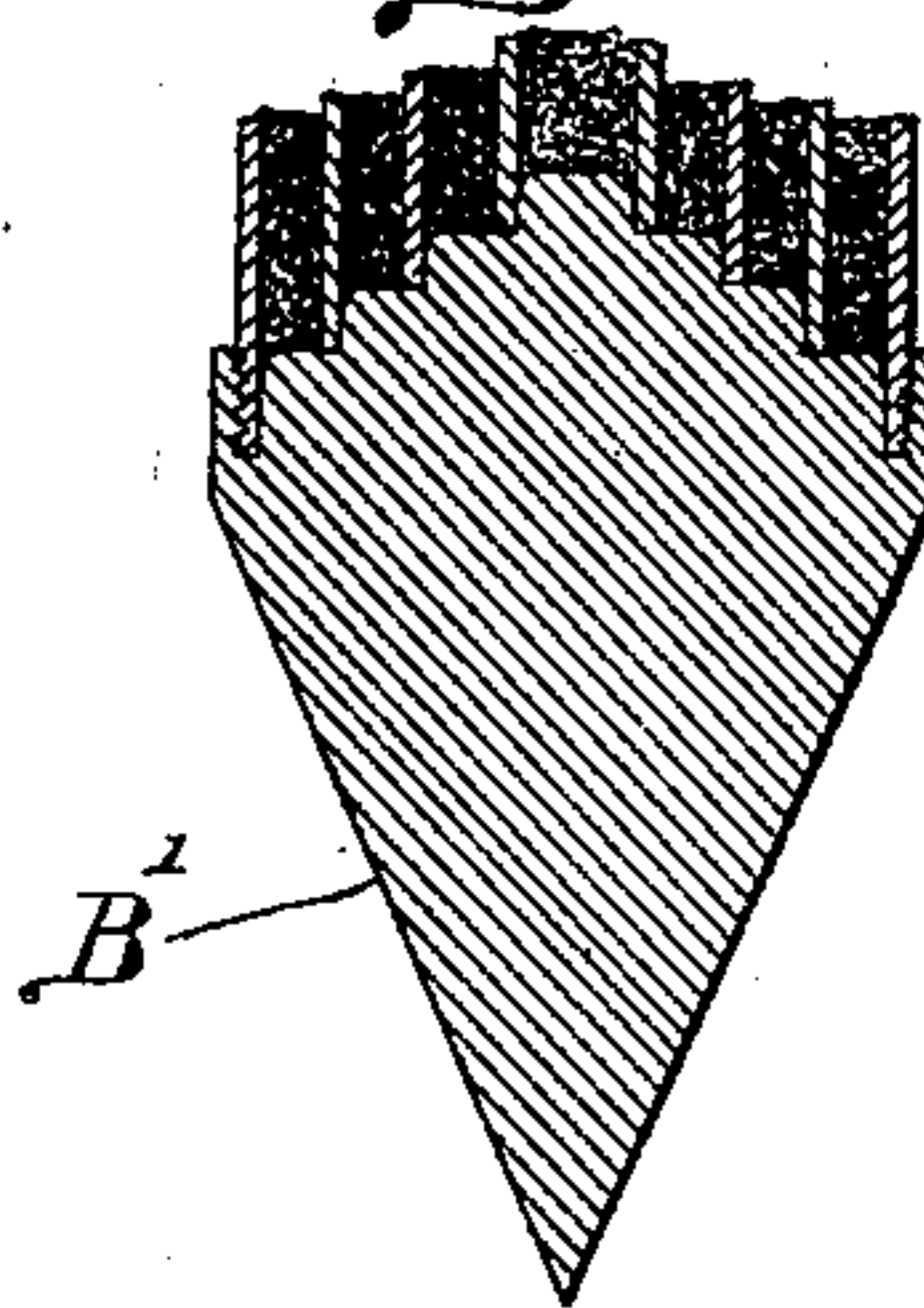
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



WITNESSES:

*C. S. Frye.*  
*J. A. Walsh.*

INVENTOR

*Frederick A. W. Davis,*

BY

*Chester P. Bradford,*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

FREDERICK A. W. DAVIS, OF INDIANAPOLIS, INDIANA.

## COLUMN.

SPECIFICATION forming part of Letters Patent No. 616,084, dated December 20, 1898.

Application filed August 20, 1898. Serial No. 689,086. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK A. W. DAVIS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Columns, of which the following is a specification.

The object of my present invention is to provide a means whereby strong and rigid columns can be constructed, especially in deep water; and such a column consists, generally speaking, in a series of metal tubes, one arranged within the other, with the spaces within the tubes preferably filled with suitable stiffening material. A modified form consists in a series of tubes, as before, with flanges extending from tube to tube in the intervening spaces, through which the strain may be transmitted from one to another and the entire strength of all thus utilized. Flanges are also preferably employed when the filling is used in order to accurately secure evenly-spaced distances between the several tubes. Columns of this kind are designed to start from suitable bases and may be prolonged by coupling sections of pipe together until any required height is attained.

Said invention will be first fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a view, partially in side elevation and partially in section, illustrating the construction of a column embodying my said invention, the same being provided with a flat base and a fragment of a truss being shown as resting on the top of the column, the spaces between the tubes forming this column being shown as empty, except for the intervening flanges; Fig. 2, a horizontal sectional view of such a column, on a somewhat enlarged scale, showing the spaces between the tubes of which the column is composed filled with concrete or some such material; Fig. 3, a view similar to the lower end of Fig. 1, except that the same is shown in elevation and with a pointed base adapted to be driven into the earth where the bottom is soft; and Fig. 4, a sectional view of the form shown in Fig. 3.

Referring now especially to Fig. 2, the column is shown as composed of a series of tubes 1, 2, 3, 4, and 5 of varying sizes, the smallest one being the center and the larger ones surrounding it in regular gradations until any desired size is attained. Flanges *f* are shown as placed upon each of these tubes, except the outer one, said flanges being as wide as the space between the tube bearing the same and the one immediately outside of it and preferably extending the whole length of the tubes, although they may be in sections. These flanges serve both to insure that the tubes shall occupy the proper relation to each other—that is, shall be as far from each other at one point as at another—and also to stiffen the tubes and assist in transmitting the strain from one to another, so that the entire structure when properly erected and loaded shall carry substantially an equal strain throughout. In the interstices between the several tubes and the flanges I prefer to insert a filling material, such as concrete or in some cases metal filings or turnings, which will rapidly become a substantially solid mass under the action of the water, so that the column becomes practically solid. In the erection of such a column a section of the largest-sized pipe which is to be used is first secured to the base (two forms of base B and B' are shown) and the same is lowered, the operatives coupling on additional sections by means of the coupling-rings *c* until the base rests securely upon the bottom of the body of the water where the column is being erected. Tubes of the next size having the flanges secured thereto are then inserted within the larger tube in the same manner, and so on until the desired number of tubes have been put in place, and the column (unless it is to have the fine filling material) is thus completed. If the filling material is to be used which I prefer, all the interstices are filled therewith, which, as will be readily understood, makes a more rigid and durable column.

The form of base B shown in Fig. 1 is designed to be used where the bottom upon which it is to rest is comparatively hard and a good surface foundation can be obtained. The form of base B' shown in Fig. 3 is designed to be used where the bottom is soft



and the column needs to be driven into the same to a greater or less extent. As shown in Figs. 1 and 4, the upper portion of the base where the tubing comes in contact therewith is formed with a "step" to enter the lower end of each tube separately, thus bringing said tubes to exact position at the bottom and holding them firmly in place. I prefer that the portions of the base which enter the tubes shall be large enough so as to cause a "driving fit," the upper edges of each such entering portion being tapered or rounding, so as to start into the tubes easily.

When that form of base B shown in Fig. 1 is employed which is adapted to rest upon a rock bottom or foundation, it is desirable to provide a means by which it may be certainly held in place at all times after it has been located. In order to do this, I provide a central perforation through the base (of considerable size) and after the structure is properly seated in place drill down through said perforation a suitable distance into the solid bottom or foundation below and then drop a heavy pin P down through said perforation and into the perforation in the rock, which of course results in holding the structure to its position.

In sinking these columns it is of course desirable that the water should flow in as the structure descends. It is therefore desirable to provide one or more orifices through the base, such as the orifice o. (Shown at the bottom in Fig. 1.) The same results may be secured by making orifices o' in the outer pipe just above the base, as shown in Fig. 3.

At the top of Fig. 1 I have illustrated a fragment of a truss T or strong frame. It is obvious that where heavy lifting is to be done in the water, as in the case of raising vessels, a number of columns of this character can be readily placed around the object to be raised and a heavy truss or framework placed on the upper ends thereof, from which the raising-tackle may be suspended. This structure is adapted for many uses and heavy work. Where, for example, a ship has sunk in deep water, it serves as a means by which it can be raised and saved, and the columns themselves may be raised in sections and taken away for other use after the work has been completed, as the tubes are screwed together in convenient lengths, which admit of an easy assembling and disassembling, except where the filling is used. The latter form, including the filling, is designed especially for the more permanent structures, although, of course, where the utmost strength and rigidity for the size are required and the object to be attained is sufficiently important to warrant the abandonment of a structure after a single use the filling may be used for merely temporary structures.

Columns of this character also form a highly efficient piling and are especially desirable in localities where ordinary wooden piles are subject to be destroyed by insects, which, as

is well known, is a serious difficulty in many places. My column being, in its preferred form, composed of alternately-arranged metal and cement or concrete tubes will resist deteriorating causes more effectually. Even in situations where the outer metal shell becomes destroyed or impaired by oxidation or otherwise the cement or concrete tube immediately within it will resist such destroying agency in a highly efficacious manner, while the inner metal tubes, being completely surrounded and covered by the concrete, are protected and their strength remains unimpaired.

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

1. A column composed of a suitable base and a series of tubes mounted thereon one within another and braced and supported by connecting devices in the spaces between them, substantially as set forth.

2. A column, composed of a suitable base, a series of tubes of different sizes arranged one within another, and flanges on said tubes which extend between the tubes bearing them and the adjacent tubes, whereby equal distances between the several tubes are maintained.

3. A metal column comprising a suitable base, several tubes of varying sizes mounted thereon one within another and braced one to another, and filling material of a hard and solidifying character packed in the spaces between said tubes, substantially as set forth.

4. A column, composed of several tubes of different sizes arranged one within another, each tube being composed of several sections coupled together the couplings being arranged at different intervals thus breaking joints, and flanges on said tubes whereby the distances between the several tubes are maintained, substantially as set forth.

5. A column, composed of a base, and several tubes of different sizes arranged one within another, the outermost and largest tube being strongly connected to the base, while the inner tubes rest upon said base, the positions of the several tubes in relation to one another being determined by distance-flanges secured at suitable intervals, substantially as shown and described.

6. A column, composed of several tubes of different sizes arranged one within another, and a base upon which said tubes are mounted having a separate receiving-step or base portion for each tube over which the lower ends of the tubes respectively pass and whereby they are held in place thereon.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 16th day of August, A. D. 1898.

FREDERICK A. W. DAVIS. [L. S.]

Witnesses:

CHESTER BRADFORD,  
JAMES A. WALSH.