

No. 713,164.

Patented Nov. 11, 1902.

C. SOOYSMITH.
METHOD OF PLACING PILES.

(Application filed Jan. 21, 1902.)

(No Model.)

2 Sheets—Sheet 1.

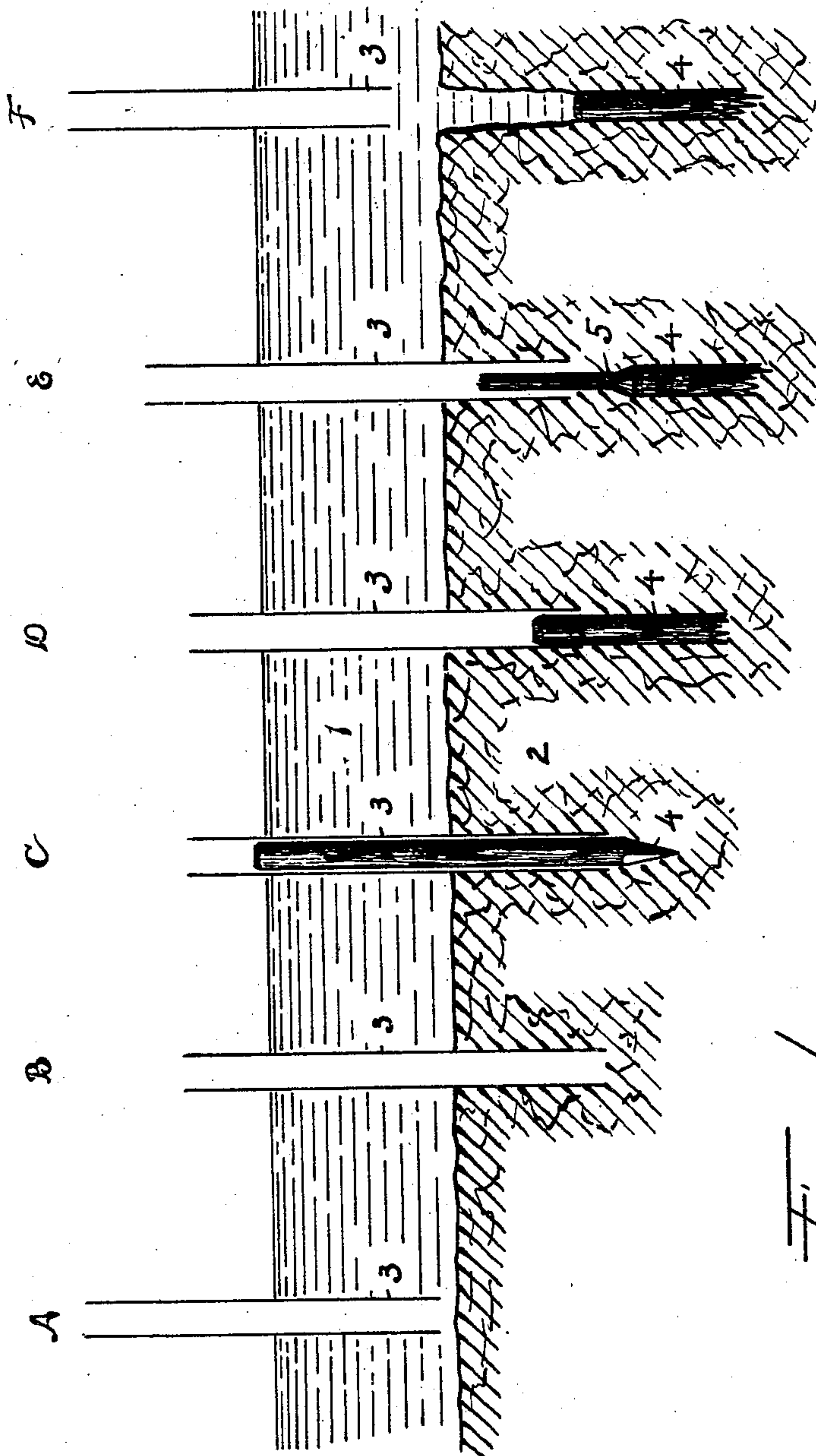


Fig. 1.

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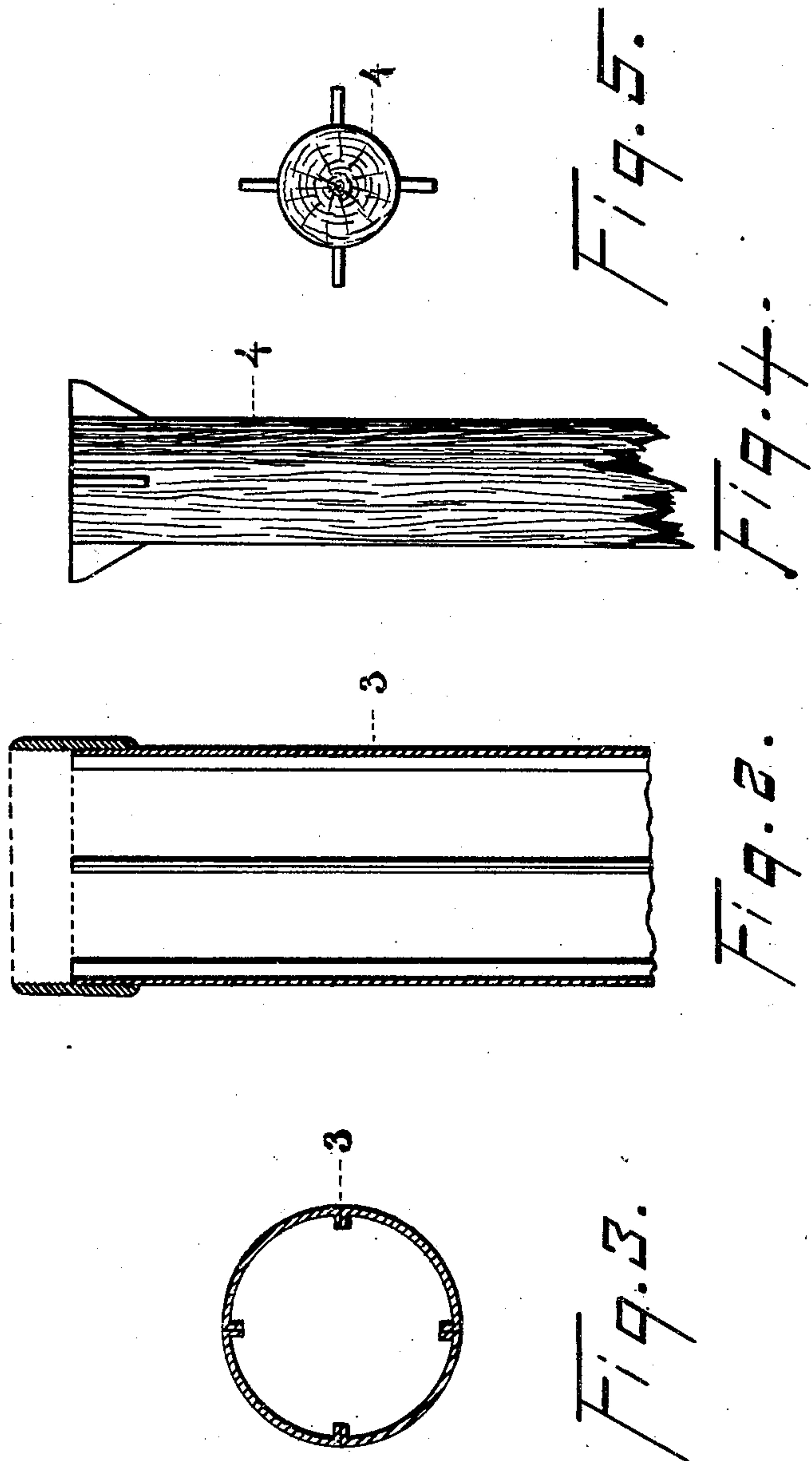
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WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES SOOYSMITH, OF NEW YORK, N. Y.

METHOD OF PLACING PILES.

SPECIFICATION forming part of Letters Patent No. 713,164, dated November 11, 1902.

Application filed January 21, 1902. Serial No. 90,634. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SOOYSMITH, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in the Method of Driving or Placing Piles or Similar Foundations, of which the following is a specification.

My invention relates to the method of driving piles or other similar foundations and to improvements in the means by which this process can be accomplished, and it is especially adapted to those cases where the tops of the piles or foundations are to be emplaced in and below the top of the bed of a river or other body of water or the surface of the ground.

Heretofore in driving piles where it has been desired to drive the tops below the surface of the water or other material a piece of timber or short pile, commonly called a "follower" or "set," has been placed upon the pile after it has been driven down to or near the surface of the water or material, and the driving force has then been applied to the said follower. This method is open to the objection that it does not afford a sufficient guide to the pile and follower to preserve the same in position or line, and the unavoidable friction of the material on or against the follower and pile is objectionable, and the friction and difficulties mentioned have very much limited the depth to which piles can be driven.

The objects of my invention are to overcome these difficulties and to provide a method of and means for driving or placing piles or other foundations which shall be at once more economical of time, labor, and expense than the method applied heretofore, and which shall permit a more accurate and satisfactory location of the pile itself both as to alinement and depth. I accomplish these objects by the use of the process and devices illustrated in the accompanying drawings, described in the following specification, and claimed hereinafter.

In the drawings like characters of reference refer to like parts throughout the respective views.

Figure 1 is a cross-section of a bed of a river or other place, showing various features of my invention, and particularly the different stages of the process and forms of the devices employed therein. Fig. 2 is an interior view of my pilot-tube, showing one form of guides for the pile. Fig. 3 is a plan view of this pilot-tube, showing one method of its construction. Fig. 4 is an elevation of the pile, showing another method of guiding or alining the same in the tube. Fig. 5 is a plan view of the latter, showing a form of guide which may consist of steel wedges or other device adapted to keep the pile in position within the tube.

In Fig. 1, A represents the pilot-tube being lowered into position. B represents same sunk to required depth in soil. C shows excavation made to base thereof and pile therein; D, pile being driven; E, pile being driven below base of pilot-tube by means of follower or set; F, pilot-tube being removed, leaving pile in place. 1 represents the water; 2, the bed or mud; 3, the pilot-tube; 4, the pile; 5, the follower or set.

The method I employ is as follows: A tube of steel or other material having an internal diameter larger than the pile to be employed is sustained in a vertical, inclined, or other position by means of a derrick, frame, leads, or other suitable means of support. The tube may be lowered until its lower end rests on the surface of the ground at the proper location of the pile to be driven, the tube itself meanwhile being maintained in this position by the hereinbefore-mentioned device. The tube is then sunk into the earth, it may be by means of a water-jet combined with its own weight, or any other suitable method or methods. The sinking of this tube may be by a method which excavates the material through which it passes during the process of sinking, or the tube may be first sunk to the required position and the fixed material subsequently excavated in whole or in part. As the principal object of this tube is to relieve the pile which is to be driven through or below it from injury or displacement and the pile-driving device from the necessity of forcing the pile through a certain part of this

material to its final position, it is evident that the depth to which this tube is sunk will be dependent upon the ultimate position of the pile, the character of the soil, and the position into which the pile is to be driven. For example, while in general the base of the tube would be sunk to the level at which it is desired to have the head of the pile, it may be desirable to drive the tube much farther, as in the case of a long pile in very hard material, where it might be impossible to drive the pile through that material without first employing the pilot-tube. The tube may be made in one piece of sufficient length or may be made of sections to be fastened together or adapted to telescope one within the other. The pile may be placed in the tube before or after it has been sunk, and the tube may be of such size as to be a substantially accurate guide for the pile, or it may be substantially larger than the pile, in which case means may be employed for holding the pile in any desired position relative to it, as when the pile itself is provided with guiding means or otherwise adapted to guide itself in the tube. The pile now being in a position to drive, any means for driving it may be applied to its head, such as a weight working in guides or by means of a hammer driven by compressed air, steam, or electricity, or it may be sunk by the aid of water-jets. Whatever means are employed for driving are in general preferably controlled in this direction by means of guides. These guides may be external to the tube or internal to the tube, or both, and the external guides and internal guides may be continuous, so that the hammer can be capable of striking the head of the pile whether the head of the pile is above or below the tube or is within the tube, and, furthermore, the hammer may be arranged to follow the head of the pile during the process of driving it to the lower extremity of the tube or by special means to continue below the cylinder. The hammer itself may be used in connection with a follower or set, as heretofore described, and also it is evident that the guides may be omitted and the hammer or set be guided by the head of the pile and the inner walls of the cylinder alone. During the process of driving the pile the tube will in general act as a support, protection, and guide for the pile and the means for driving it. If desired, a capping of concrete or cement may be applied to the head of the pile by placing same inside the tube about the head of the pile, and in order to prevent this capping coming away from the pile when the tube is withdrawn the head of the pile may have been previously notched or provided with such projections or other devices as will attain this end. The pile having been put in position and the subsequent processes completed through the medium of the tube, the tube is withdrawn. The means applied for withdrawing the tube may be the derrick,

frame, or leads heretofore mentioned, together with a water-jet or water-pressure suitably applied.

Referring to means for sinking the tube, it is evident that the pile may be placed in the tube before the tube is sunk through the soil, and the pile itself may be made hollow or may have a water-pipe and a jet-pipe attached to and connected with the pump or other appliances of the tending-barge. In this case the pile itself may be the jetting device applied in sinking the tube, and this jet attached to the pile may be used in sinking the pile after the tube is in position or the hollow-pile water-jet attached may be used in combination with other means for the sinking of the tube and pile, or either of them.

In some cases a stone, brick, metal, or other foundation may be substituted for the piles, in which case the operation is similar, except that the foundation would not be driven in many respects like the wooden pile, but the stone or other material would be inserted in the tube, the latter being sunk to its proper depth and the foundation either sinking or being carefully forced inside the tube to its proper position. The tube is then removed, as previously explained.

I do not confine myself to the use of any particular material, shape, size, or proportions of any of the parts or devices employed in my invention nor their exact indicated arrangement or positions, nor do I confine myself in the use of this process to any particular class of work or to any particular direction as the perpendicular, as it is evident that variations from the exact features here shown may not depart from the essential features of my invention. For instance, I may desire to emplace stone or other foundations; but

What I do claim, and desire to protect by Letters Patent, is—

1. The method of placing piles which consists in first sinking a tube into the ground, second forcing a pile through the tube into the ground, third withdrawing the tube substantially as described.

2. The method of placing piles which consists in sinking a tube into the ground, second sinking a pile through the tube into the ground and beyond the tube, third withdrawing the tube substantially as described.

3. The method of placing piles which consists in first, sinking a tube to the required depth, second sinking a pile through said tube so that its head shall rest beyond the end of the tube, third withdrawing the tube, substantially as described.

4. The method of placing foundations which consists in first forcing a pile through a tube into the ground, second, surrounding a portion of the pile with concrete or similar material, third, removing the tube, substantially as described.

5 The method of placing foundations which consists in adjusting a tube at the desired place of location of the foundation, second, sinking the same to the required depth into the ground, third, emplacing the foundation inside the tube, fourth, removing the tube, substantially as described.

Signed at New York, in the county of New York and State of New York, this 15th day of January, A. D. 1902.

CHARLES SOOYSMITH.

Witnesses:

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A. KENT.