No. 711,013.

Patented Oct. 14, 1902.

C. SOOYSMITH.

METHOD OF DRIVING PILES.

(Application filed June 7, 1902.)

(No Model.)

2 Sheets—Sheet 1.

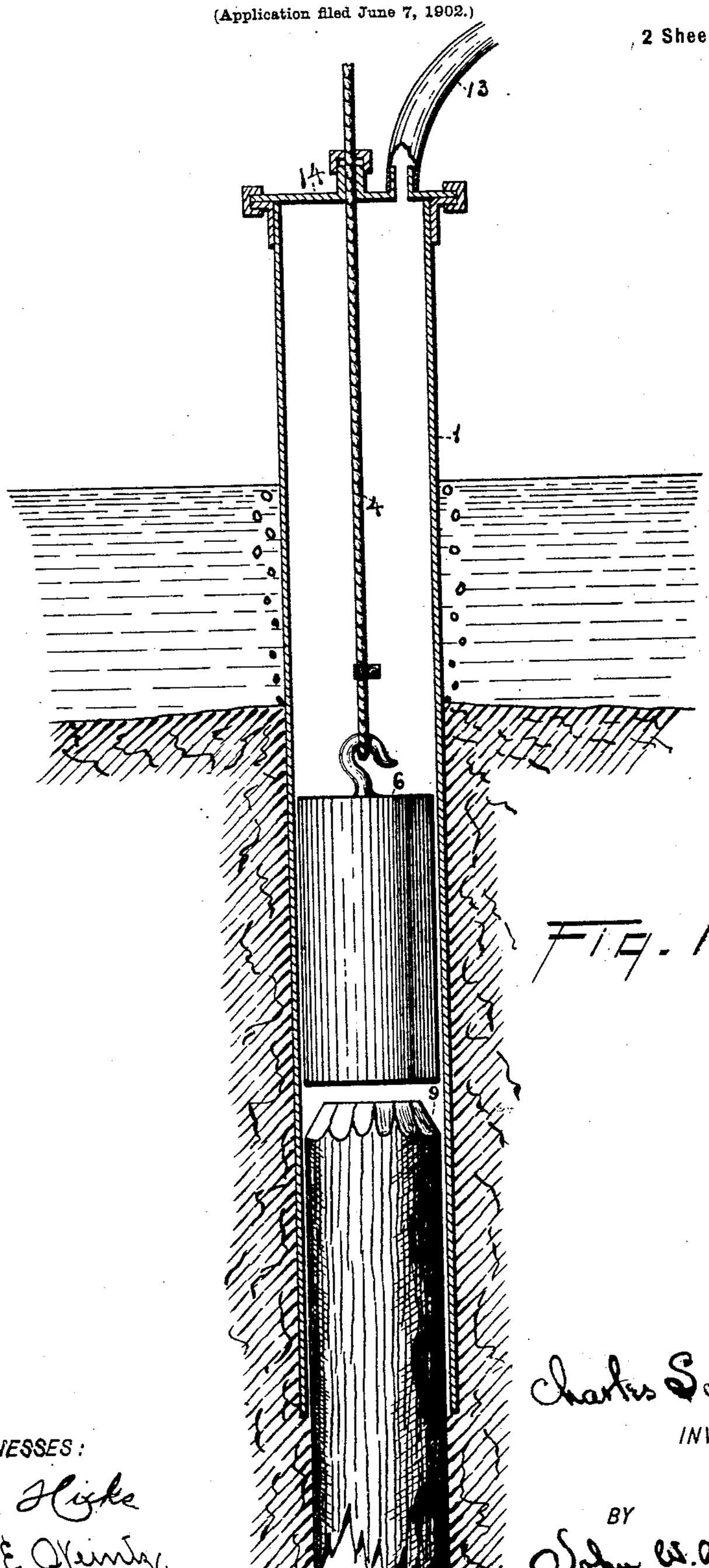

Fig. 1.

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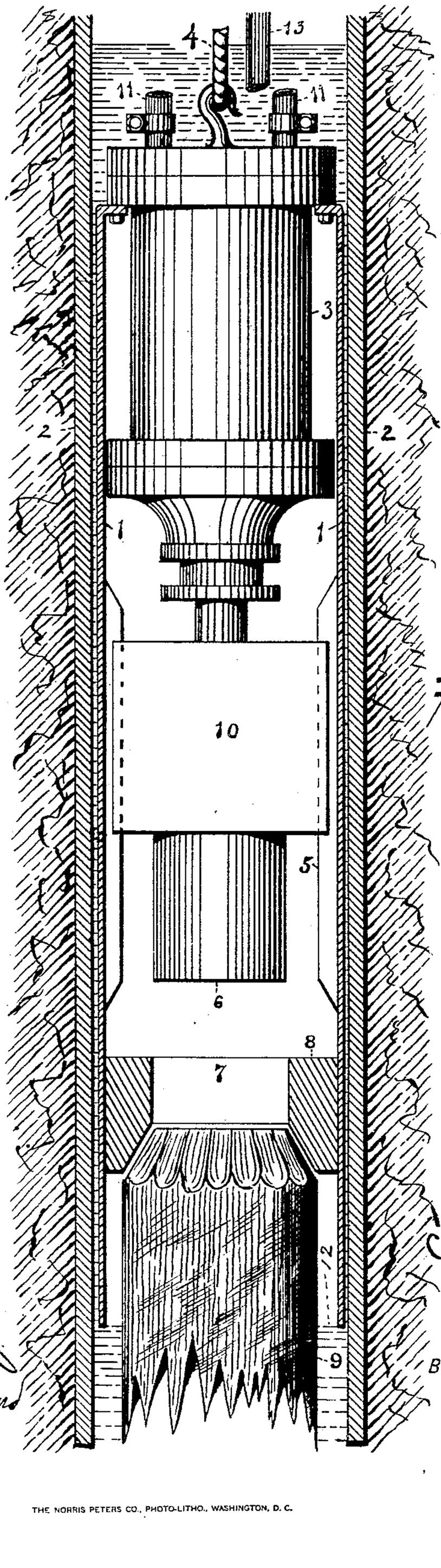

Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES SOOYSMITH, OF NEW YORK, N. Y.

METHOD OF DRIVING PILES.

SPECIFICATION forming part of Letters Patent No. 711,013, dated October 14, 1902.

Application filed June 7, 1902. Serial No. 110,589. (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 New York, in the county of New York and State of New York, have invented certain new and useful Improvements in the Methods of Driving Piles, of which the following is a specification.

My invention relates to pile-drivers, and especially to pile-drivers where the head of the pile driven is required to be below the surface of the earth or water, and has especial reference to instances where the pile is placed and the driving carried on within a tube.

The objects of my invention are to provide a method of and means for permitting the blow of the hammer or weight to fall directly upon the head of the pile, and thus render the operation more easy, economical, and rapid than has heretofore been possible. I attain these objects by the methods and devices illustrated in the accompanying drawings, described, and claimed hereinafter.

In the figures like numerals of reference refer to like parts throughout the respective views.

Figure 1 is a sectional view of my device, showing the pile-hammer in elevation. Fig. 2 is a similar view, but showing a steam, compressed-air, or other power hammer operating therein and the whole inclosed within a tube similar to the device illustrated and described in my application, serially numbered 90,634, filed January 21, 1902.

In Fig. 1, 1 is a cylinder or tube open at bottom and provided with a removable cover 14, adapted to permit the passage of a rope or cable 4, holding the weight or hammer 6. Preferably in this cover is a pipe or inlet 13 for compressed air or other vehicle of pressure. 9 is the pile, over the head of which the cylinder or tube 1 is placed.

In Fig. 2 the tube 1 is bolted direct to the cylinder 3 instead of having a cover, as in Fig. 1. 2 represents an external tube sunk in the earth and in which the pile 9, the tube 1, the hammer 3 6 10, and all other parts are lowered. 3 is the cylinder of a steam-hammer, bolted to the top of the tube 1 in such a way that the joint is air-tight. 4 is a rope or cable sustaining the whole device in the tube 2 and by which it may be raised or lowered relative to the head of the pile. 5 represents guides to preserve the alinement of the striking-weight 10, provided with the cylindrical striking-head 6. 7 is an opening in the guiding-cap 8 of sufficient size to admit the hammer 6. 9 is the pile; 10, the cross-head or guide-weight; 11 11′, the inlet and exhaust air, steam, or other orifices; 12, the water being held back from the inside of tube 1 by the air-pressure; 13, the compressed-air or other pressure pipe; 14, the pipe or cylinder head.

The operation of my device is as follows: Where I am about to drive a pile below the surface of soft material, water, &c., I place over its head the tube or cylinder 1, which may preferably be long enough to extend below the pile-head 9, while yet leaving room for the sufficient rise and fall of the weight or hammer 6. Compressed air, steam, or other gaseous vehicle of pressure is then admitted through the pipe 13, which is regulated so as to force the water or material down and out at the bottom of the tube 1, thus leaving the head of the pile 9 clear. Where the steam-hammer in Fig. 2 is used, the operation is the same; but, if desired, the third pipe 13 may be dispensed with, and the cylinder 3 may exhaust into the tube or cylinder 1, and thus establish the required pressure, which may then be allowed to escape at the bottom of the tube through the surrounding material or be carried off by a pipe 11 under regulation as to pressure and in such a way as to secure the adequate pressure in the cylinder to keep the water-line at the proper point.

Heretofore in driving piles so that their heads shall be beneath the surface of water or other material it has been necessary to use a follower or set, which resting upon the pile's head after it passes beneath the surface transmits the force of the blow to the pile. This is objectionable, because it is difficult to preserve accurate alinement and adjustment of set, and thus the pile is liable to be displaced or misdirected. Moreover, this method is slow, cumbersome, and inaccurate and in other ways is unsatisfactory. By my method, however, I am enabled to apply the blow of the

hammer always directly to the head of the pile itself, no matter at whatever depth it may be.

This invention may be used in connection with my improvement in the methods of driving piles indicated and referred to above.

I wish it to be understood that I do not limit myself to the exact shape or construction or arrangement of parts of the elements of the device as illustrated herein, nor do I limit myself to its use in any particular material; but

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

1. The method of driving piles, which consists in, expelling the surrounding material from about the hammer and the space through which it falls, and driving the pile, substantially as described.

2. The method of driving piles which consists in surrounding the hammer and filling the space through which it falls with a gaseous medium under pressure and driving the pile, substantially as described.

3. The method of driving piles beneath the surface which consists in expelling the material from the space above the pile by a gaseous medium under pressure and driving the pile, substantially as described.

4. The method of driving piles which consists in, placing a hollow inverted cylinder above the head of the pile, forcing a gaseous medium into the same, and applying a driving force to the head of the pile in said cylinder, substantially as described.

5. The method of driving piles beneath the surface which consists in, placing a hollow inverted cylinder containing a hammer, above the head of the pile, forcing a gaseous medium into said cylinder under sufficient pressure to prevent the surrounding material from obstructing the blow of the hammer, and driving the pile from within said cylinder, substantially as described.

6. The method of driving piles beneath the surface which consists in inclosing the head of the pile, in a cylinder containing the driving-hammer, forcing a gaseous medium into said cylinder under sufficient pressure to prevent the surrounding material from covering the head of the pile, and driving the pile, substantially as described.

Signed at New York, in the county of New York and State of New York, this 6th day of June, A. D. 1902.

CHARLES SOOYSMITH.

Witnesses:
Z. ROSENFIELD,
E. L. ABBOTT.