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W. C. LYON.

METHOD OF MAKING CONCRETE PILES.

APPLICATION FILED SEPT. 3, 1902.

NO MODEL.

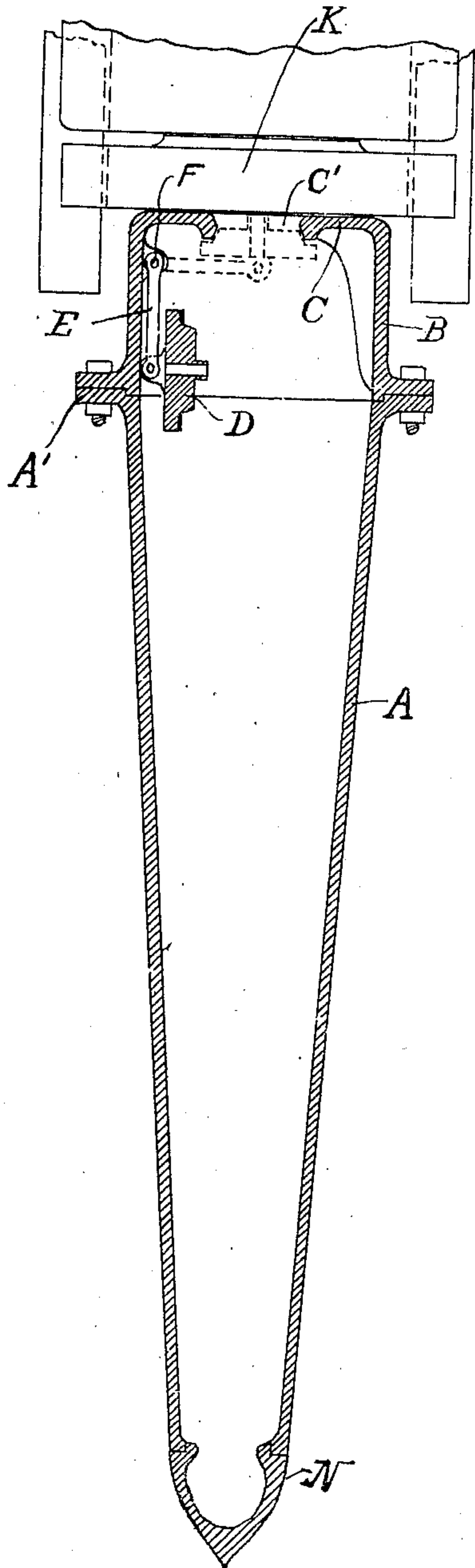


Fig. 1.

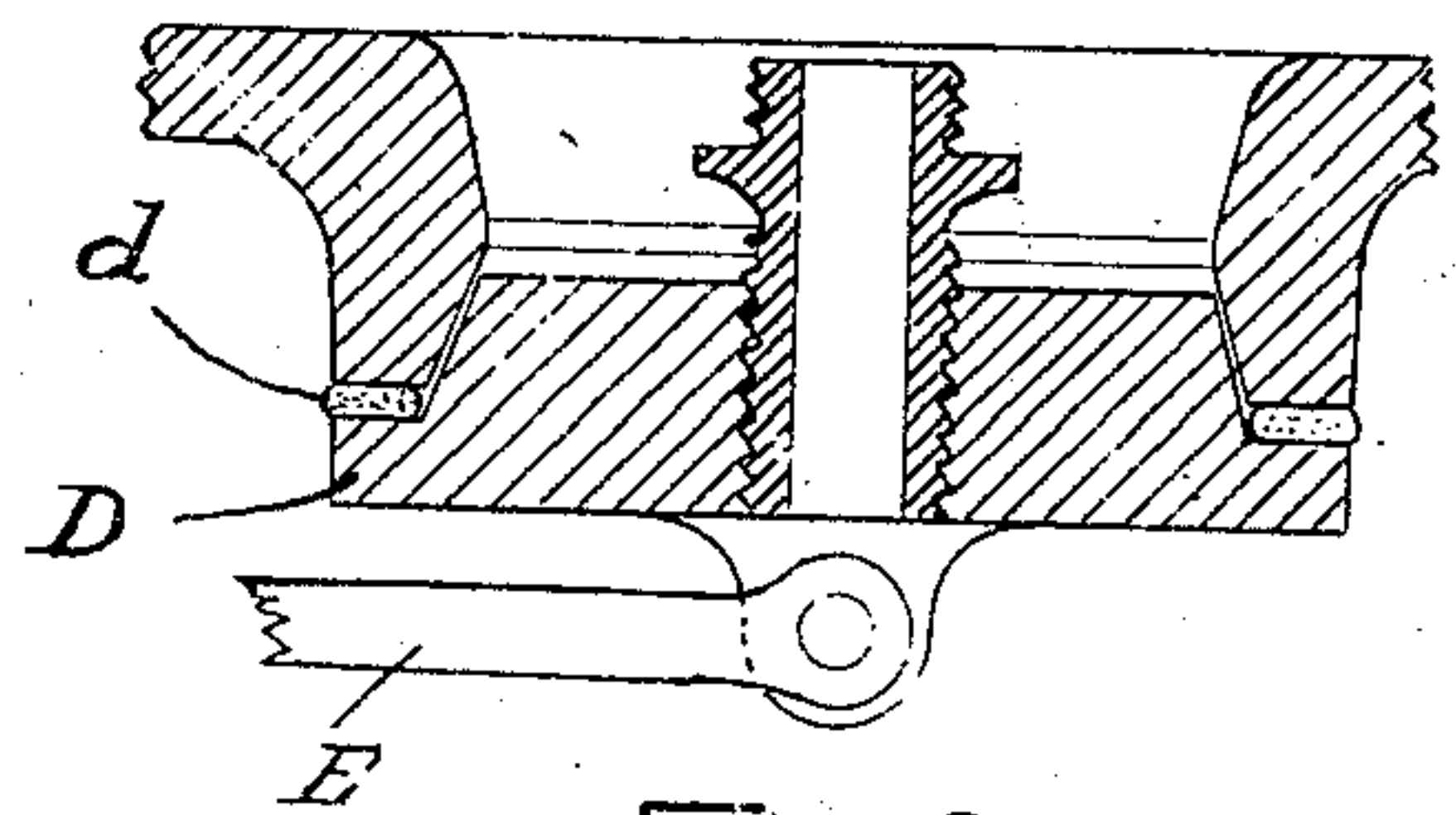


Fig. 3.

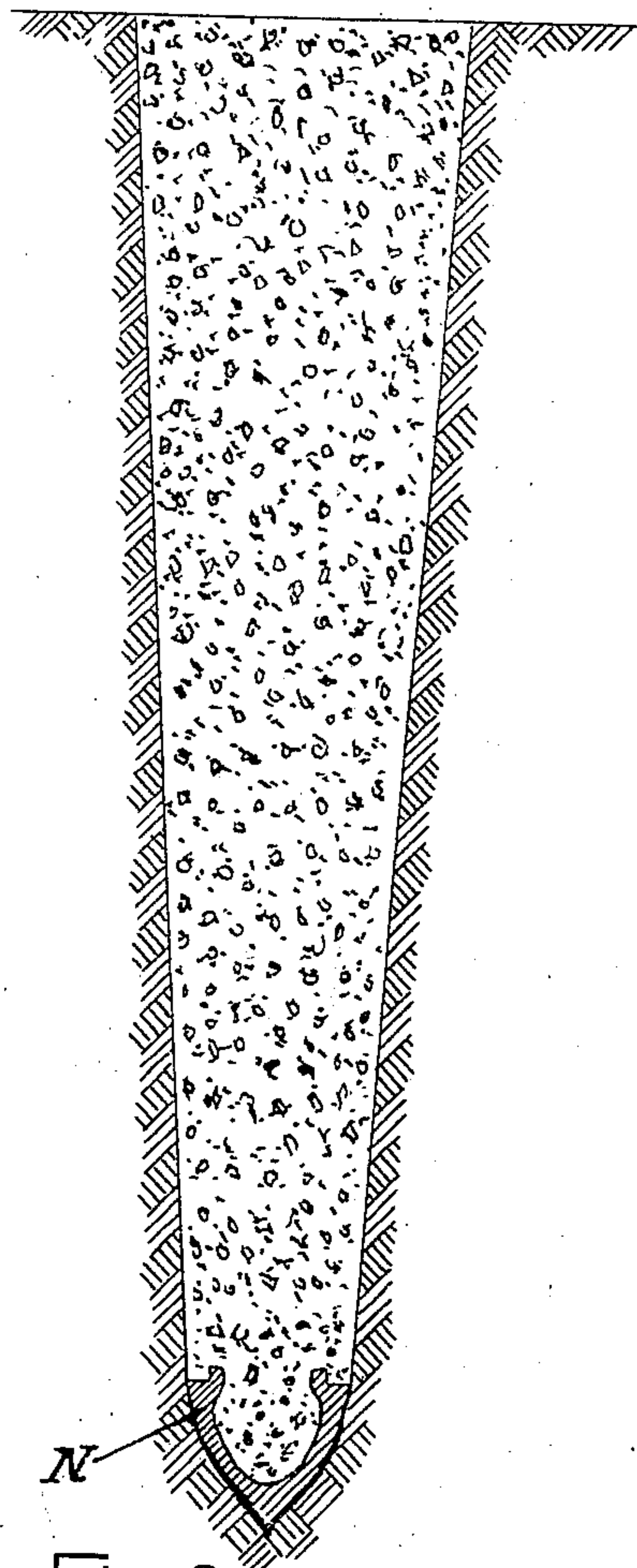


Fig. 2.

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METHOD OF MAKING CONCRETE PILES.

SPECIFICATION forming part of Letters Patent No. 754,375, dated March 8, 1904.

Application filed September 3, 1902. Serial No. 121,988. (No specimens.)

To all whom it may concern:

Be it known that I, WALLACE C. LYON, a citizen of the United States, residing at Hyattsville, in the county of Prince George and State of Maryland, have invented certain new and useful Improvements in Methods of Making Concrete Piles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

15 This invention relates to a novel method of making concrete piles; and it consists, first, in the formation of a hole in the earth having the dimensions of the pile to be constructed and of forming the pile by forcing in the concrete material simultaneously with the withdrawal of the former, which has been previously driven into the ground to make the hole for the pile, by which method the pile may be built up, following the former as it is being withdrawn, the concrete being forced out of the bottom of the former and against the wall of the hole in the ground, thereby preventing the caving in of the hole.

25 In the production of piles in accordance with my method it will be readily understood that the pressure exerted upon the mass of concrete, which is placed within the former which is driven into the ground, will be sufficient after overcoming the frictional contact between the outer circumference of the former and the wall of the hole to cause the concrete to rise up about the circumference of the lower portion of said former and to quickly fill up the hole as the former is withdrawn.

30 In the accompanying drawings I have illustrated an apparatus whereby the various steps of my method may be carried out, and in which—

45 Figure 1 is a vertical central longitudinal sectional view through a tapering hollow former which is utilized to make a hole in the ground of a size desired to mold the pile. Fig. 2 is a sectional view through the ground, showing the formation of the pile. Fig. 3 is a sectional

view in detail through the upper portion of the former.

Reference now being had to the details of the drawings by letter, A designates a former of tapering form having its lower end open and a flange A' at its upper end, to which a flanged top B is bolted or otherwise secured. Said top has a flattened portion C, which is centrally apertured, as at C', the wall of which aperture is adapted to form a seat for the valve D, pivotally mounted on an arm E, that is in turn pivotally mounted on a pin F, carried by a lug on the inner wall of said top. In order to make an air-tight joint between said valve and its seat, a gasket *d*, Fig. 3, is interposed between the valve and its seat, as shown. Passing through an aperture in said valve is a pipe having threaded circumference fitting threads formed in the wall of said aperture, and to the upper end of said pipe, which has threads about its circumference above a flanged portion thereof, a hose-pipe is adapted to be attached, through which any fluid may be forced to produce a pressure upon the concrete which has been previously placed within the former. Said concrete should be of such a consistency as to readily pass out of the lower end of the former as the latter is raised out of the hole in the ground and as pressure is applied to the surface of said concrete.

K designates a buffer, which is adapted to rest upon the flattened portion of the top of the casing and provided for the purpose of receiving the blow from the driving-hammer.

Previous to the commencement of the formation of the hole in the ground a pointed shoe N, having a shouldered portion, is placed in the lower end of the casing in the manner illustrated in Fig. 1 of the drawings, the outer circumference of said former being flush with the outer circumference of said tip in order that there will be no uneven surfaces on the former to offer resistance to the driving of the former. When the former is driven into the ground a sufficient depth and after the concrete has been placed within the former, the valve is closed, and any suitable pressure is applied between the surface of the concrete

and the top of the former sufficient to overcome the friction existing between the outer circumference of the former and the wall of the hole formed in the ground, and when further pressure is thus applied the former will be forced up simultaneously with the forcing out of the concrete material at the lower end of the former. It will be understood that as said former is forced up the shoe will remain at the bottom of the hole, it being securely anchored therein by the concrete which fills the hollow portion thereof and also which sets firmly about the shouldered portion of the shoe.

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

1. A method of making concrete piles, consisting in forming a hole in the ground by means of a former, of filling the former with concrete, hermetically sealing the same and applying a pressure between the surface of the concrete and the top of the former; whereby the latter will be raised out of the ground and the concrete forced through the lower end of the former to replace the space occupied by the former, as set forth.

2. A method of making concrete piles, consisting in making a hole in the ground by a suitable former and filling the latter with a semiliquid concrete and hermetically sealing the former and applying pressure between the surface of the concrete and the top of the former, whereby the concrete will be forced through the lower end of the former simultaneously with the raising of the latter, whereby the space occupied by the former may be replaced by the concrete and preventing the caving in of the wall of the hole, as set forth.

3. The method of making concrete piles which consists in preparing a permanent base or foundation for the pile, introducing the same into the ground to the proper depth, and forming an opening above said base by the act of introducing the same, then filling said opening with concrete or other plastic material and permitting the concrete to set, substantially as described.

4. A method of making concrete piles which consists in preparing a permanent base or foundation for the pile, driving the same into the ground to the proper depth by means of a pile or former and thereby making an opening in the ground above said base, then filling said opening with concrete or other plastic material and permitting the concrete to set, substantially as specified.

5. A method of making concrete piles which consists in preparing a permanent base or foundation for the pile, driving the same into

the ground to the proper depth by means of a hollow pile, or former and thereby making an opening in the ground above said base, then filling said opening with concrete or other plastic material introduced therein through the hollow pile, and permitting said concrete to set, substantially as specified.

6. A method of making concrete piles, the same consisting in providing a hollow pile or former with a detachable point or shoe, driving said pile to displace the earth, withdrawing the pile without the shoe and filling the opening above said shoe with concrete or other plastic material and permitting the same to set, substantially as specified.

7. A method of making concrete piles which consists in providing a hollow pile or former with a detachable point or shoe, driving said pile to displace the earth, withdrawing the pile, without the shoe, and, as said pile is withdrawn, delivering the concrete or other plastic material from its lower end into the opening formed by such withdrawal of the pile, substantially as specified.

8. A method of making concrete piles which consists in providing a hollow pile or former with a detachable point or shoe, driving said pile to displace the earth, introducing concrete into the hollow pile, withdrawing the pile without the shoe, and, as said pile is withdrawn, applying pressure to the mass of concrete therein so as to force said concrete from the lower end of the pile into the opening formed by the withdrawal of the pile, substantially as specified.

9. A method of making concrete piles which consists in providing a hollow pile or former with a detachable shoe or point, driving said pile to displace the earth, introducing concrete into the hollow pile, closing the top of the pile and then introducing fluid-pressure into the space between the top of the mass of concrete and the closed top of the pile, whereby the latter is forced out of the opening, leaving the shoe therein, and the concrete is forced from the lower end of the pile into the opening above said shoe, substantially as specified.

10. A method of making concrete piles consisting in introducing a tube into the ground, introducing concrete into the tube, hermetically sealing the tube and applying fluid-pressure between the surface of the concrete and the closure of the tube.

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

WALLACE C. LYON.

Witnesses:

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N. A. MAYHEW.