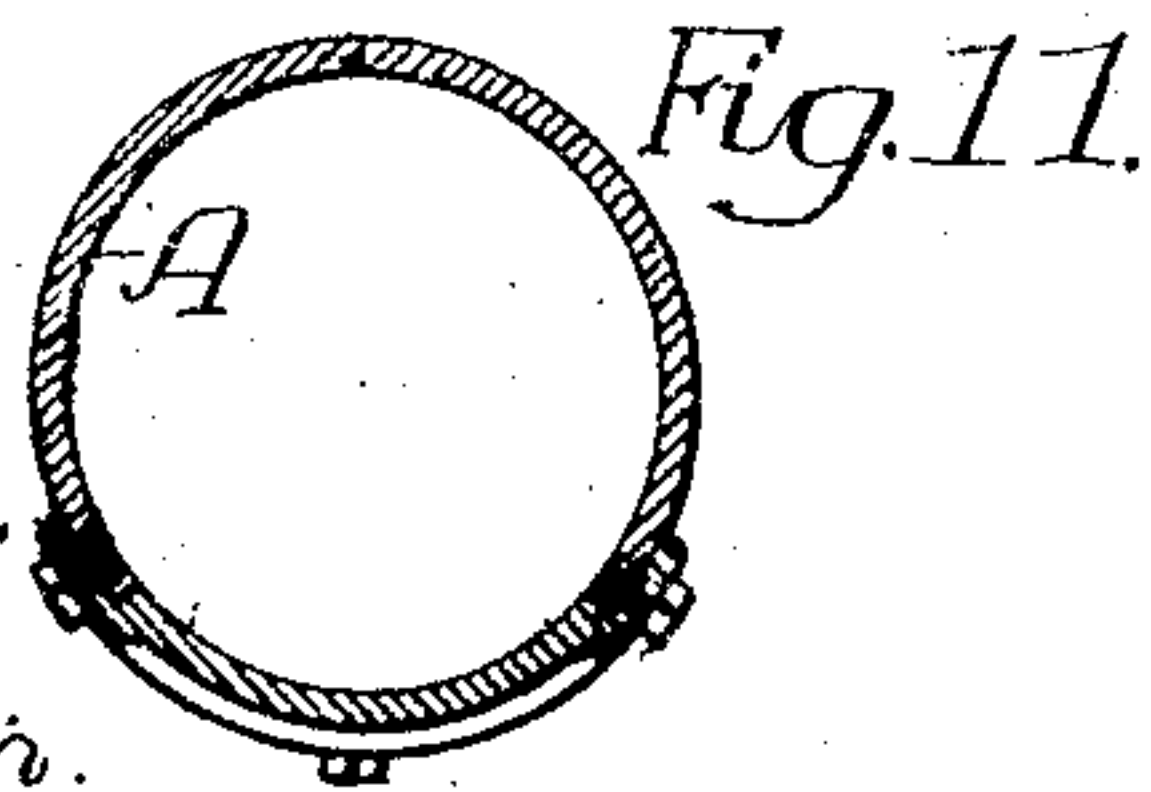
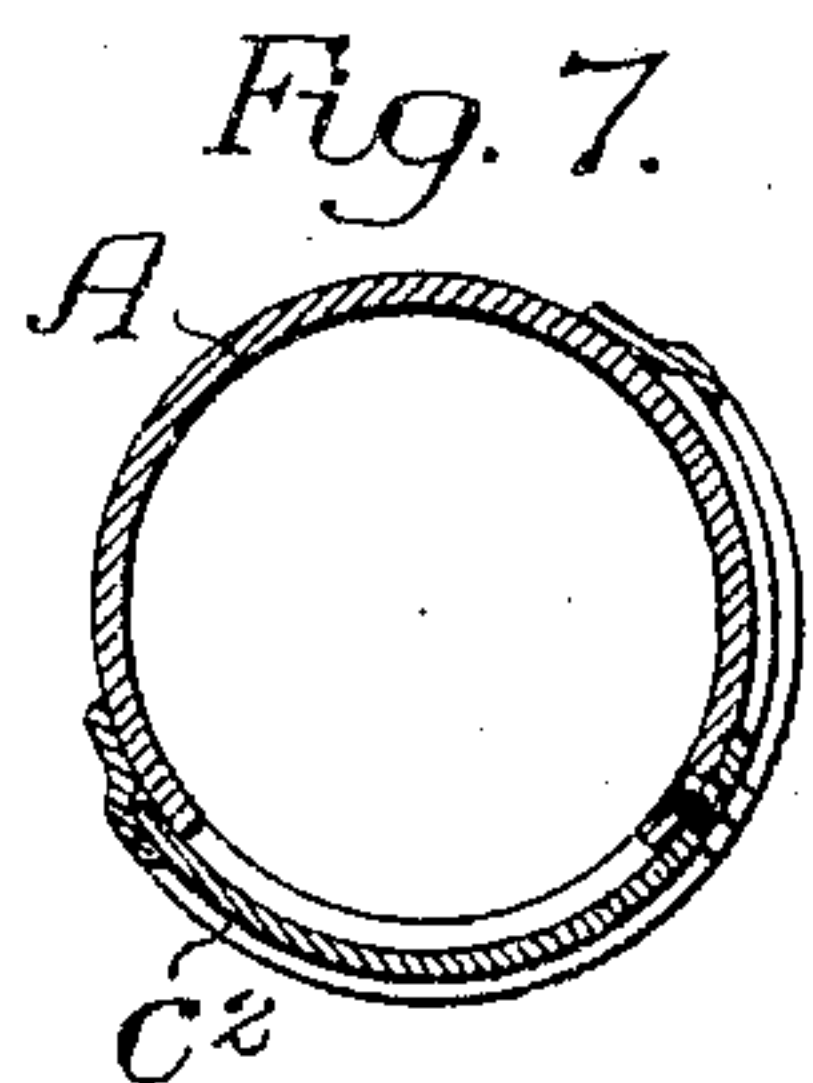
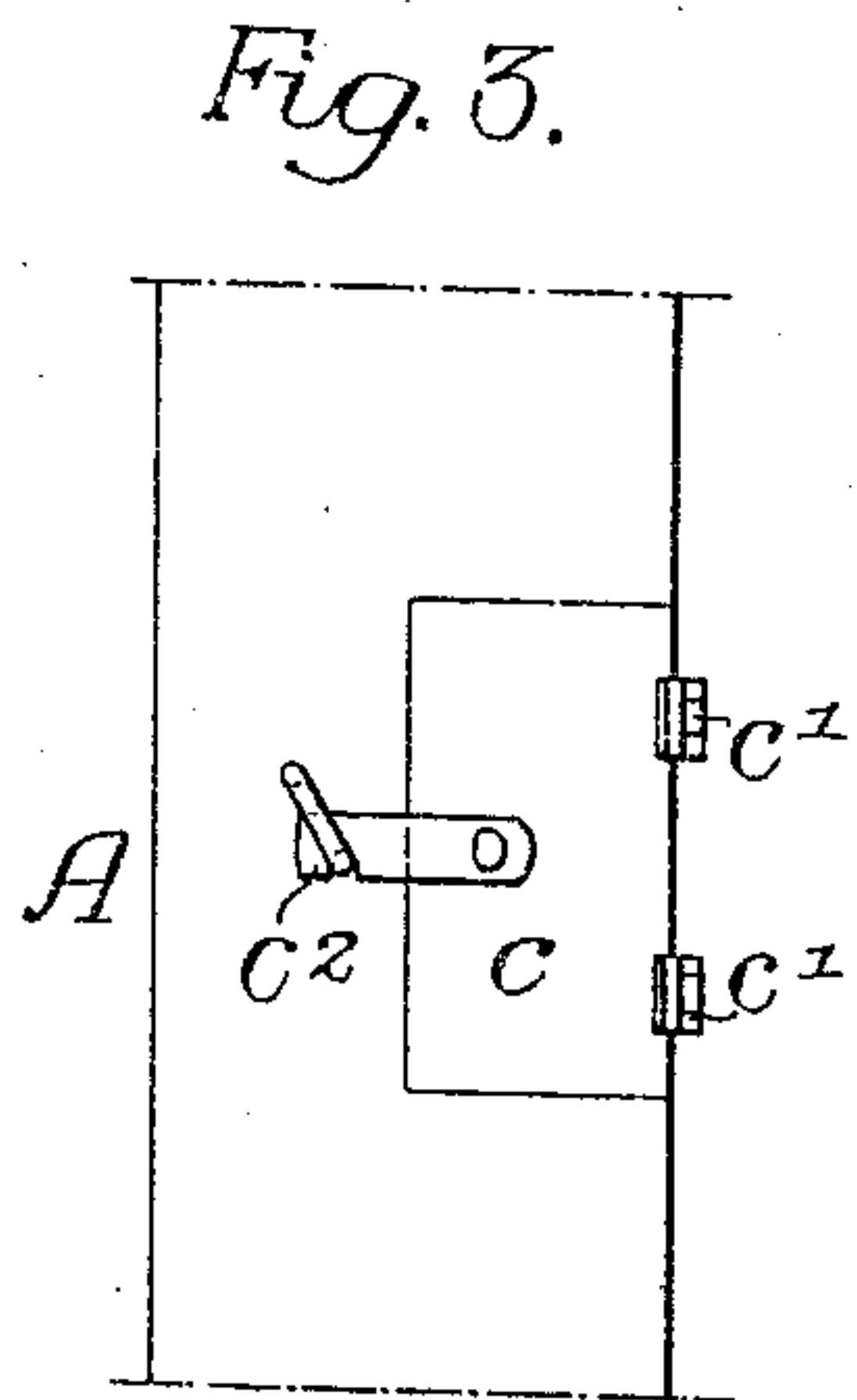
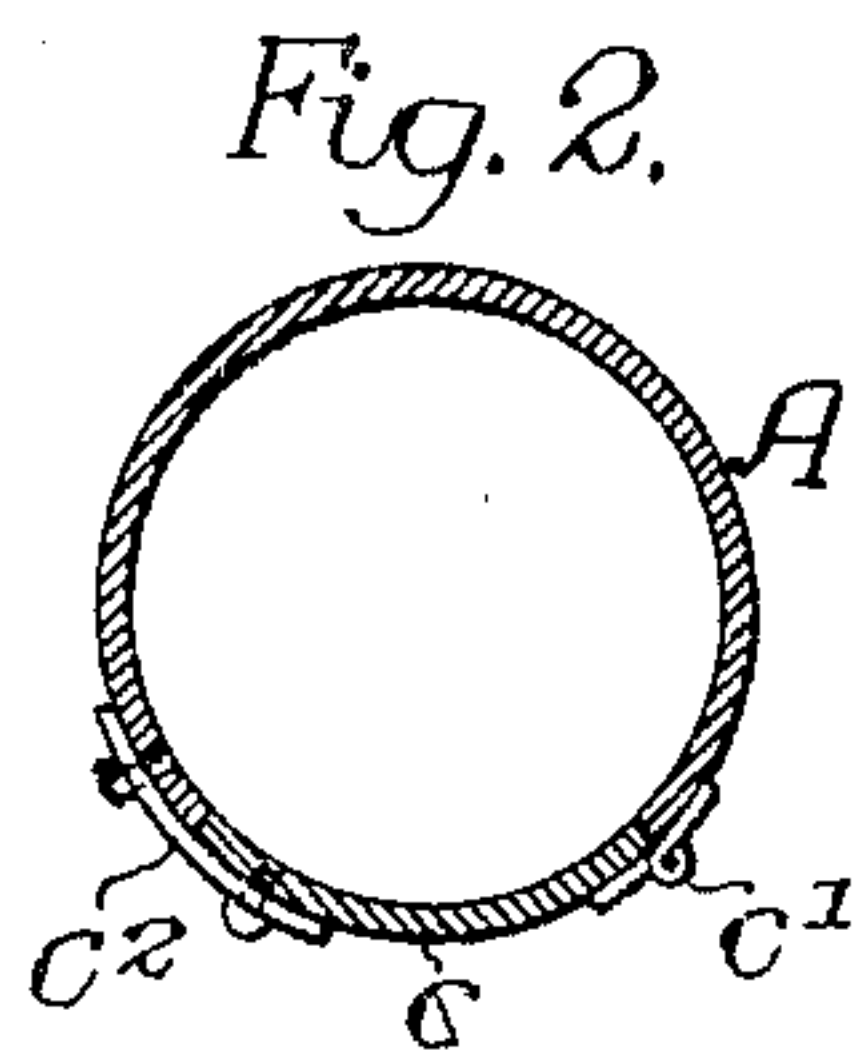


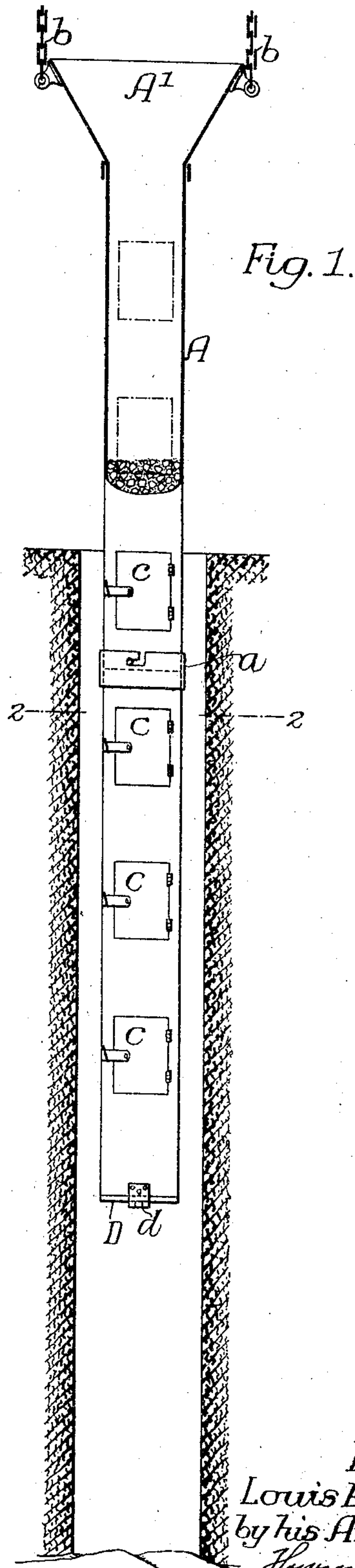
940,100.

L. E. WELSH.
MEANS FOR FILLING HOLES WITH CONCRETE.
APPLICATION FILED DEC. 29, 1908.

Patented Nov. 16, 1909.
3 SHEETS—SHEET 1.



Witnesses
V. H. Burrone
William A. Burrone

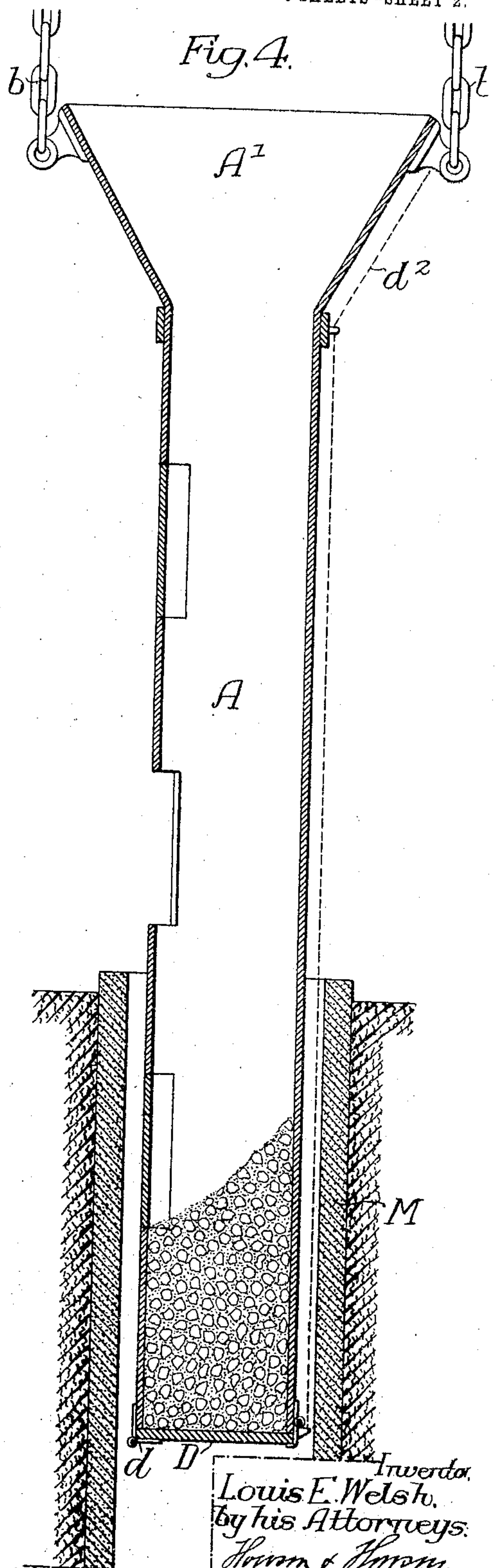
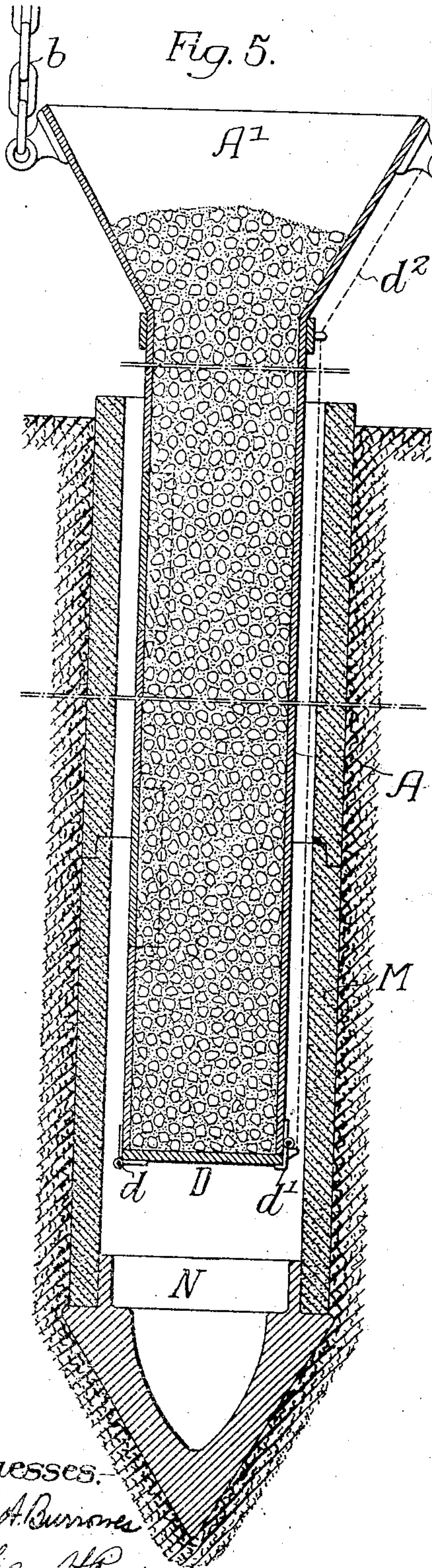


Inventor
Louis E. Welsh.
by his Attorneys
Howan & Howan

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Witnesses.
 Willard Burrone
 William A. Burrone

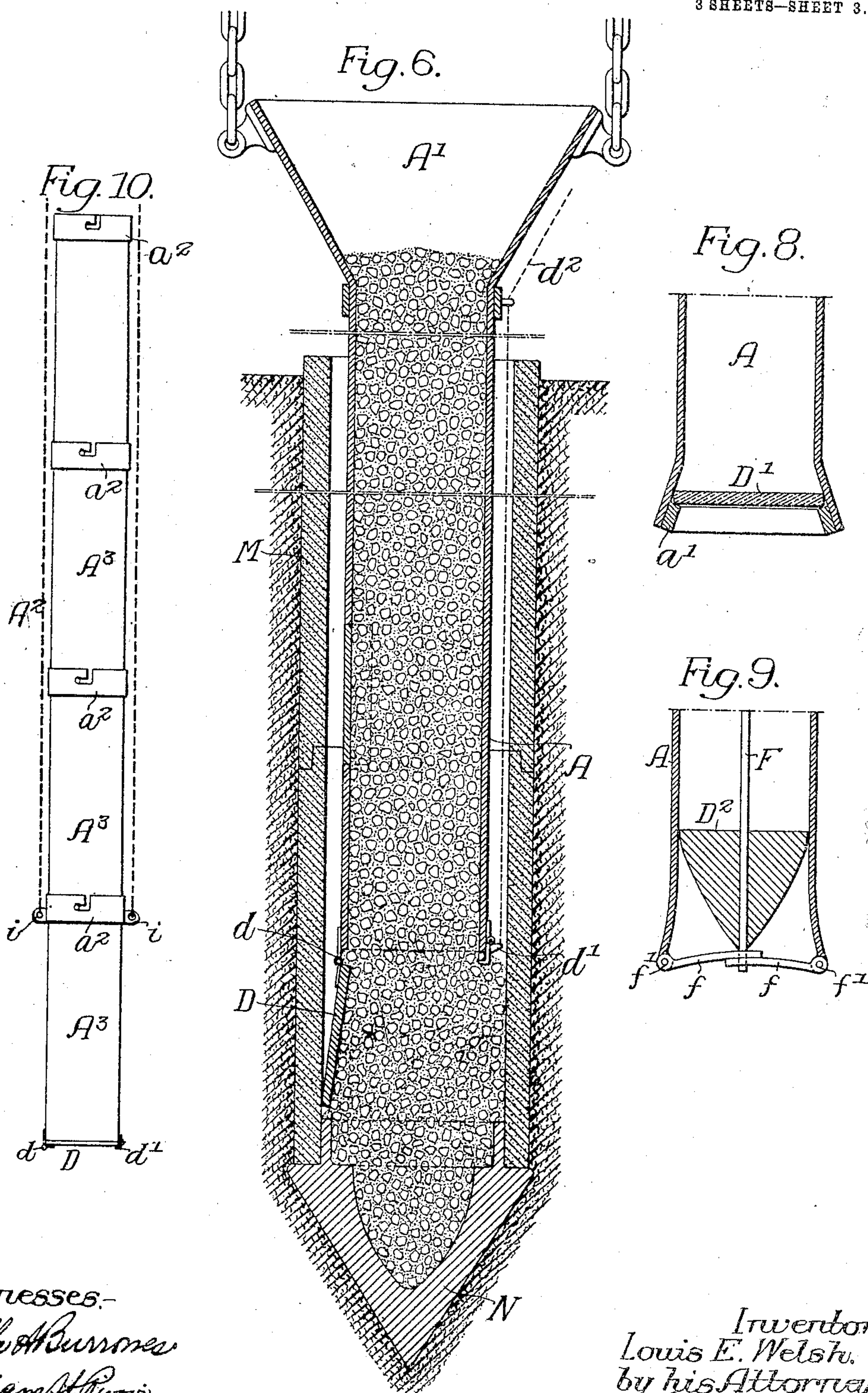
Inwitness
 Louis E. Welsh,
 by his Attorneys,
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3 SHEETS—SHEET 3.



Witnesses:
H. A. Burrows
William H. Burrows

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UNITED STATES PATENT OFFICE.

LOUIS E. WELSH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO AMERICAN CONCRETE PILING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

MEANS FOR FILLING HOLES WITH CONCRETE.

940,100.

Specification of Letters Patent.

Patented Nov. 16, 1909

Application filed December 29, 1908. Serial No. 469,833.

To all whom it may concern:

Be it known that I, LOUIS E. WELSH, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Means for Filling Holes with Concrete, of which the following is a specification.

My invention relates particularly to means for forming concrete piles, especially of the type in which a shell of concrete is first inserted in the ground, which is afterward filled with a concrete mixture, and when this concrete is set the pile is a homogenous mass.

My invention can be used for filling any deep hole with concrete no matter by what process the hole is made, or whether it is lined or not, and also may be used in discharging a concrete mixture under water.

The object of my invention is to place the concrete in the hole in such a manner that the stone, sand, and cement will not separate, thus insuring the proper cementation of the mixture.

It is well known that if concrete is dropped from any height the particles of cement, sand and stone separate so that the mixture is destroyed and the bond weakened. The method now in use for filling deep holes is to use a trip bucket in which the concrete is placed and the bucket lowered in the hole and so discharged that there will be very little fall to the mixture, but this is tedious and uncertain, whereas by my invention the concrete can be measured so as to insure the proper amount of concrete being inserted in the hole and separation of the ingredients is rendered impossible; furthermore the apparatus acts as a gage, insuring the hole being of a proper diameter throughout.

In the accompanying drawings:—Figure 1, is a view of my improved apparatus for filling holes with concrete, showing it partly inserted in a hole in which a pile is to be formed; Fig. 2, is an enlarged transverse sectional view on the line 2—2, Fig. 1; Fig. 3, is an enlarged view showing the door and latch; Fig. 4, is an enlarged view showing the first step in the method of charging the apparatus; the apparatus being partially inserted in a tubular pile casing in the present instance; Fig. 5, is a view showing the apparatus inserted in the pile casing to the full

depth of the pile and ready to be discharged; Fig. 6, is a view similar to Fig. 5, showing the concrete being discharged into the tubular pile and the apparatus in position to be withdrawn leaving the concrete in the pile; Fig. 7, is a view showing a sliding door substituted for the pivoted door shown in Fig. 2; Fig. 8, is a view showing a fragile bottom plate which can be broken when the apparatus is lowered to a certain point; Fig. 9, is a view showing a detachable block forming the bottom of the apparatus, said block being left in the ground when the apparatus is withdrawn; Fig. 10, is a view of a modification illustrating a sectional apparatus in which the doors are dispensed with; and Fig. 11, is a view showing a detachable door.

A is a tube made in any length desired, either in a single piece or in sections, as shown in Fig. 1; the sections being jointed together at *a* in any suitable manner. In the present instance I have shown a sleeve on one section and pins on the other adapted to slots in the sleeve, forming a bayonet joint connection, and one section is turned with respect to the other when it is desired to couple or uncouple the sections.

At the upper end of the tube A is a funnel A' and attached to the tube are the hoisting chains *b*, *b* connected to any suitable mechanism for raising or lowering the tube. As shown in Figs. 1, 2 and 3, doors *c* are arranged at intervals throughout the length of the tube and these doors in the present instance are pivoted at *c'*, each one being provided with a latch *c''* so that they can be locked when closed. Each door is preferably arranged that its inner surface will be on a line with the inner surface of the tube, so that no obstructions are formed to interfere with the discharge of the material. In some instances, however, the door may be of a sliding type, as illustrated at *c''*, Fig. 7, instead of a pivoted door, *c* made detachable as in Fig. 11, or arranged in any other manner found desirable.

At the bottom of the apparatus is a pivoted door D hinged to the body portion at *d* in the present instance, and held closed by a latch *d'* of any suitable construction. A rope *d''* is attached to the latch and extends alongside the tube, as shown in dotted lines,

Fig. 4, from any convenient point so that it can be operated from the surface of the ground when it is desired to trip the door and allow the contents of the tube to be discharged.

In place of the trip door a plate D' of glass, pottery, or other fragile material may be mounted in the bottom of the tube A , as shown in Fig. 8, held by a flange a' , and a projection may be formed in the bottom of the hole for breaking this fragile bottom piece D' to allow the contents of the tube to be discharged as soon as the tube is raised.

In Fig. 9, I have shown a block D^2 held at the lower end of the tube A by two pivoted arms f, f held in place by a rod F ; the rod extending from the upper end of the tube through the section D^2 and through openings in the arms f , which are pivoted at f' so that on withdrawing the rod F the arms will be released and the section D^2 , which may be made of concrete or other material, is allowed to drop into the bottom of the hole and the concrete mixture will be discharged on top of it.

It will be seen by the above description that any means may be used to temporarily retain the concrete in the tube while the tube is being filled and lowered into the hole.

In Fig. 10, I have shown a sectional tube A^2 ; the sections A^3 being short and coupled together by bayonet joints a^2 . As one section is filled with concrete it is lowered into the ground and another section added to it and filled, and so on until the tube reaches the desired depth. Ears i may be provided on each section to which may be attached the hoisting chains. The hoisting chains may be permanently attached to the lowermost section as shown and the other sections may be built upon this section, if desired.

In Figs. 4, 5 and 6, I have shown my improved apparatus used in filling an improved form of pile, for which I have filed an application for patent, Serial No. 364,623, on March 26, 1907. This form of pile consists of a point section N and a tubular casing M , which is driven in the ground with the point section and after this casing is driven in the ground it is filled with concrete so as to make a solid concrete pile.

While my invention is particularly adapted to filling a hollow pile, it will be understood that it can be used for filling any hole, whether to form a pile foundation or any structure requiring the discharge of material at any depth.

The operation of the apparatus is as follows:—As illustrated in Figs. 4, 5 and 6, the apparatus is suspended above the hole, as illustrated in Fig. 4, and the door at the bottom closed and the apparatus lowered until the first door from the bottom is about on a line with the surface of the ground

when it is opened and the concrete mixture is inserted through the doorway until the concrete reaches the point indicated in Fig. 4, when the door is closed and the apparatus lowered. The second door is then opened and more concrete is inserted until it reaches the edge of the said doorway, when the second door is closed and the next door opened, and so on until the tube is filled with the mass of concrete and extends a proper distance into the hole, as illustrated in Fig. 5.

By providing a funnel at the upper end of the tube the structure can be loaded with an additional amount of concrete to fill the space occupied by the tube. Instead of the funnel-shaped hopper, the tube can be extended a considerable distance above the ground, giving the same result, but I prefer the construction shown in Figs. 4 and 5.

When the tube is in the position shown in Fig. 5, the lower end of the tube is in close proximity to the bottom of the hole, then the door D at the bottom of the tube can be tripped by pulling upon the cords a^2 and the door will fly open, as illustrated in Fig. 6, discharging the concrete into the bottom of the hole. Then the tube is raised by any suitable hoisting mechanism and the concrete will be discharged from the tube into the hole with practically no fall, and consequently the particles will not become separated and a much stronger concrete pile structure will be made than where the material is to be intermittently discharged or dropped from any considerable height.

One great advantage in discharging material into a hole by my improved device is that the device itself acts as a gage when inserted in the hole, insuring the hole being of the proper diameter throughout when the concrete is placed therein. Furthermore when tubular pile sections are used, as shown in the drawings, it will detect any misalignment of these sections should one break away from another by the pressure of the earth, thus the operator is assured, when the tube is inserted to a certain depth, that the hole is in proper condition to receive the concrete to make a perfect pile.

I claim:—

1. In a means for filling holes with concrete, of a tubular structure, means for normally closing the bottom of said structure, said tubular structure being provided with successive means whereby it can be charged with concrete at progressing levels as it is lowered into the hole in the ground, and means for opening the bottom of the tube so as to allow the entire mass to be discharged into the hole without disintegrating the mass.

2. The combination in means for filling holes with concrete, of a tubular structure having successive openings through which short sections of the tube may be filled with

concrete, a device for closing the end of the tube, and means for releasing the device to discharge the contents of the tube.

3. The combination in means for filling a hole with concrete, of a tubular structure having a series of openings arranged at intervals, doors for closing said openings, a device at the bottom of the tube for retaining the concrete in the tube until it is lowered in the hole to the distance desired, and means for releasing the device so as to allow the concrete to escape from the tube into the hole.

4. The combination in means for filling holes with concrete, of a tubular structure having a series of openings at different levels through which the concrete can be deposited in the tube, movable means for opening and closing the bottom of the tube, and a hopper at the upper end of the tube.

5. The combination in means for filling holes with concrete, of a tubular structure having a detachable bottom so as to allow the contents of the tube to be discharged into the hole, said tube having a series of openings throughout its length, pivoted doors for closing the openings, and means for locking said doors in a closed position.

6. The combination in means for filling a hole with concrete, of a tubular structure made in sections, one section being detachably secured to another, each section having

one or more openings through which concrete can be inserted in the tube, means for closing said opening, and a detachable bottom to allow the contents to be discharged from the tube into the hole.

7. The process herein described of carrying a concrete mixture to a great depth, said process consisting in filling a tube with concrete at progressing levels so as to prevent the disintegration of the mixture and lowering the tube to the depth desired, then discharging the concrete mixture from the lower end of the tube and raising the tube as the contents are discharged.

8. The process herein described of filling a deep hole with concrete, said process consisting in inserting a tube having a normally closed bottom in the hole, charging the tube with concrete at progressing levels and lowering the tube into the hole as the depth of concrete in the tube increases until the tube reaches the depth desired, then discharging the entire mass of concrete from the tube into the hole without disintegrating the mass, and withdrawing the tube.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

LOUIS E. WELSH.

Witnesses:

JOS. H. KLEIN,
WM. A. BARR.