F. A. KOETITZ.

FITTING FOR PILE CASINGS.

APPLICATION FILED JUNE 29, 1909.

954,973. Patented Apr. 12, 1910.

Fig. 1.

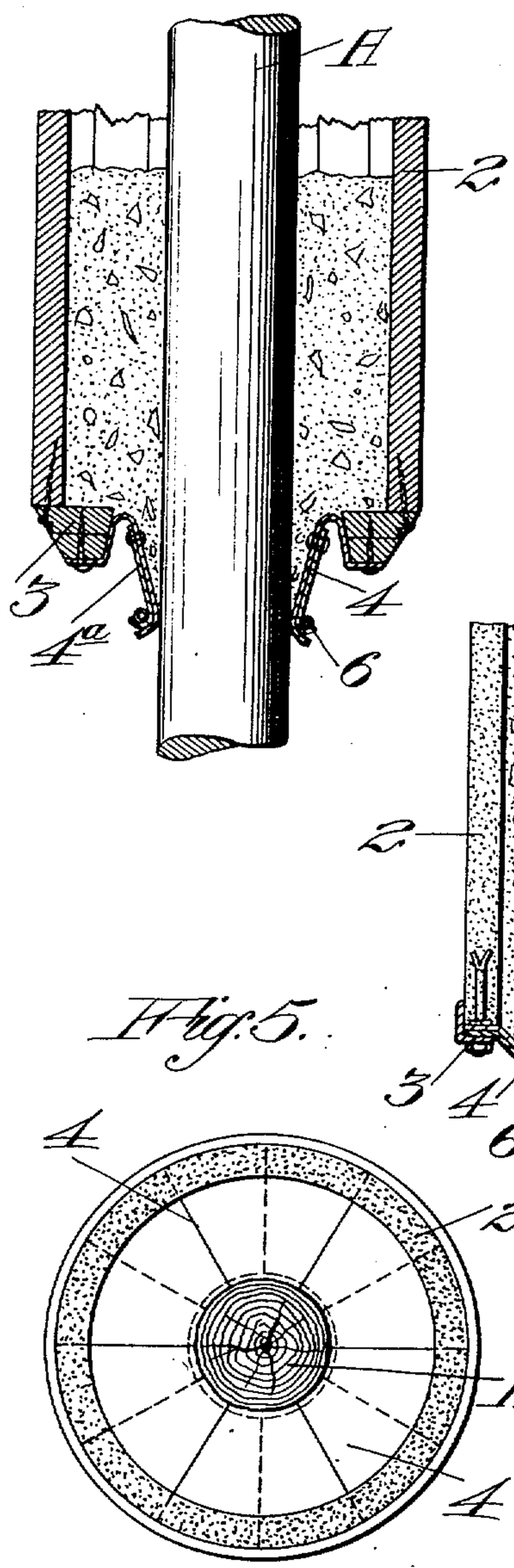

Fig. 2.

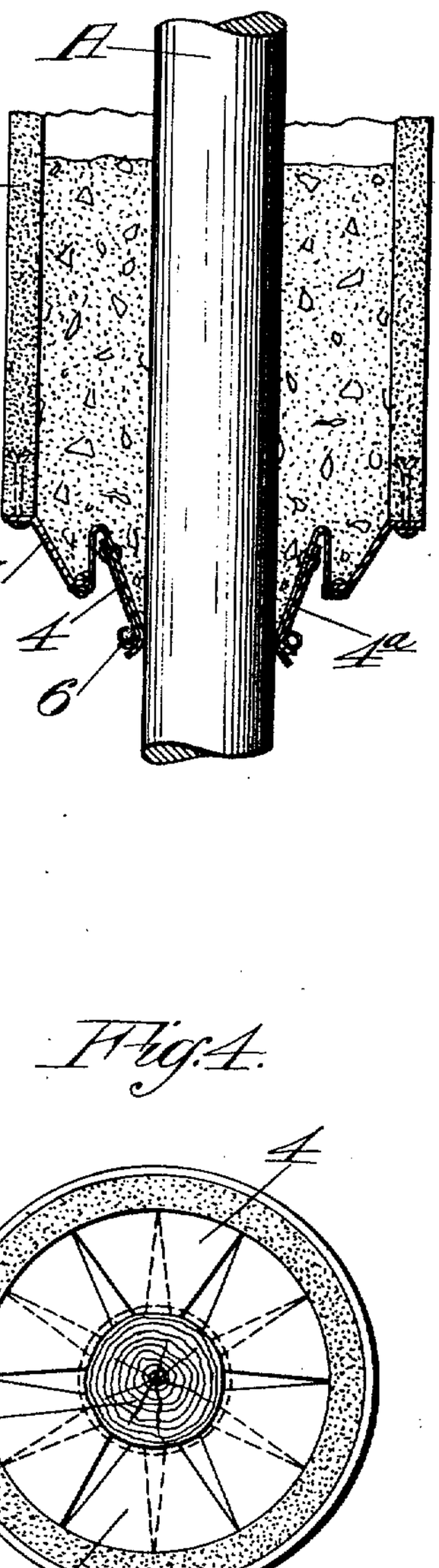

Fig. 3.

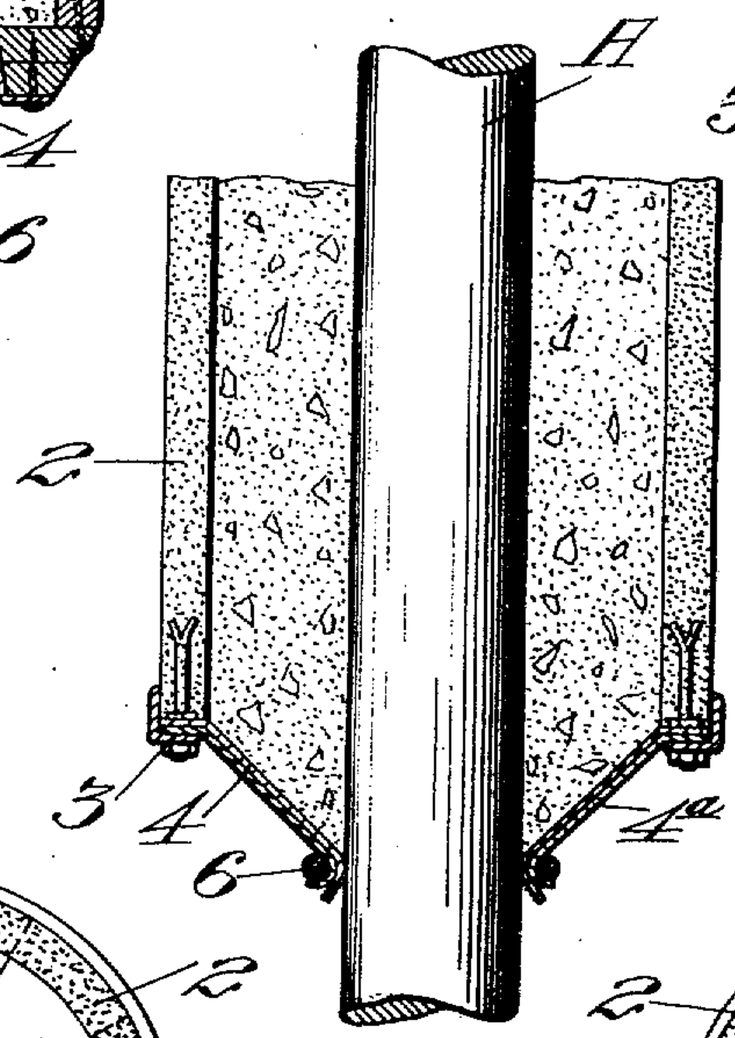

Fig. 5.

Fig. 4.

Witnesses.
T. Kasberg.
F. E. Maynard.

Inventor.
Frederick A. Koetitz.
by Geo. H. Strong
Atty.

UNITED STATES PATENT OFFICE.

FREDERICK A. KOETITZ, OF SAN FRANCISCO, CALIFORNIA.

FITTING FOR PILE-CASINGS.

954,973. Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed June 29, 1909. Serial No. 505,074.

To all whom it may concern:

Be it known that I, FREDERICK A. KOETITZ, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Fittings for Pile-Casings, of which the following is a specification.

My invention relates to improvements in the fitting of concrete casings to driven piles, and for like purposes, where the structure to be protected is submerged.

The invention consists especially in means for preventing the entrance of mud and water into the space within the casing and around the pile, and in the combination of parts and details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figures 1 and 2 are sectional views of my preferred forms of construction. Fig. 3 is a section showing a modification. Fig. 4 is a cross-section showing the metal shoe in the expanded position. Fig. 5 is a similar view showing the shoe in closed position.

For the purpose of protecting driven piles it is customary to drive an inclosing casing, which may be made of concrete or other material, and which casing is subsequently filled with concrete which embeds and protects the inclosed pile.

In the usual method of driving the exterior casing it is desirable to keep the mud and material from entering the casing from below as the latter is sunk to the proper distance into the mud in which the pile is driven, as otherwise it would be necessary to excavate or pump out any such substances entering, before filling the space with concrete. This is usually attempted by the employment of a shoe of either wood or metal to seal the space between the casing and the pile, but in the use of tapered piles, the variation in the size of the pile from the top downward causes the opening around the pile to be continually enlarged, and unless some efficient, automatically adjustable protecting device be employed, so much mud and water will enter the casing that it will prevent the proper filling of the same with concrete.

It is the object of my invention to overcome this difficulty.

As shown in the drawings, A is a pile, which may represent any structure which is to be embedded in the bottom underneath the water.

2 is a casing of sufficiently larger diameter than the pile, which is to be sunk around the latter and into the mud so far as to prevent the entrance of destructive marine insects, and this casing is subsequently filled with concrete, thus forming a solid inclosure for the pile. The exterior casing itself may be made of concrete, wood, or other suitable material, and it has at the lower end a closure 3 which may be of any suitable or desired form for the purpose.

By reason of the tapering of the pile it is necessary to so construct the shoe that it will continually contract as the casing is lowered or driven, and thus inclose the pile, and at the same time present such an angle to the mud in which the casing is being sunk, that it will force the latter outwardly and prevent its entering the casing.

The shoe 3 is a fixed shoe suitably attached to the casing or cylinder, and in connection with this I employ the automatically adjustable shoe 4 which is fixed to the shoe 3. The inner periphery of the shoe 4 is so constructed that it will contract with the constantly reduced size of the pile, as the casing is lowered, and thus maintain the closure around the pile which will prevent the soil from entering. This adjustable shoe may be made of rubber or metal, to suit the form of the fixed shoe. It is preferably made up of several pieces, and in two layers, the outer layer overlapping the joints of the inner layer, so that while the parts are allowed to contract or expand, the joints are constantly kept closed. I have here shown the shoe 4 with the overlapping layers 4^a disposed as above described; and these shoes are preferably so constructed that they converge downwardly from the bottom of the fixed shoe, thus presenting an inclined or conical surface, the tendency of which is to force the mud away from the pile, while the pressure of the mud itself continually closes the shoe against the pile as it moves downward. I have here shown the lower edges of these shoes as curved outwardly, or so formed as to receive a spring or springs 6 which may be made either of metal or rubber, and which will hold the extreme ends of the adjustable shoe in close contact with the pile, in case the resisting force of the soil is not sufficient for the purpose; but

in any event, these springs will greatly assist to keep the shoe in contact with the pile. The details and material of this shoe are such as to suit the special requirements of the soil to be penetrated, the form of the casing or cylinder, and the shape of the pile to which it is fitted.

In order to more completely seal the junction between the pile, shoe, casing or cylinder, especially against the ingress of water, I fill part of the space between the casing and the pile with fresh concrete after the cylinder has been placed around the pile and before it is lowered into the water. Sufficient concrete is used for this purpose to overcome the upward pressure of the water while the casing is being lowered into position, and when this position has been reached the remainder of the space may be filled with concrete, which will afterward harden and set, thus making a solid protection about the pile to prevent its deterioration or destruction.

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

1. The combination with a driven pile and a casing therefor, of a shoe substantially closing the lower end of the casing, said shoe converging downwardly from the bottom of the casing, and means by which the shoe is caused to clasp the exterior of the pile.

2. The combination with a driven pile and a casing therefor, of a shoe converging downwardly and outwardly from the bottom of the casing and automatically adjustable to maintain contact with the body of the pile as the latter decreases.

3. The combination with a driven pile and a casing therefor, of a shoe fitting the bottom of the casing, a supplemental sectional shoe converging downwardly from the fixed shoe, and elastic clamping means for maintaining the lower end of the shoe in contact with the body of the pile.

4. The combination with a driven pile and a casing therefor adapted to be filled with concrete, of a downwardly convergent, automatically adjustable shoe to force the mud outwardly and prevent its entering the casing.

5. The combination with a driven pile and a casing therefor, of a shoe made in overlapping layers converging downwardly from the lower end of the casing, and means whereby said shoe is caused to automatically fit around the pile.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FREDERICK A. KOETITZ.

Witnesses:

CHARLES EDELMAN,

HENRY PURDY.