

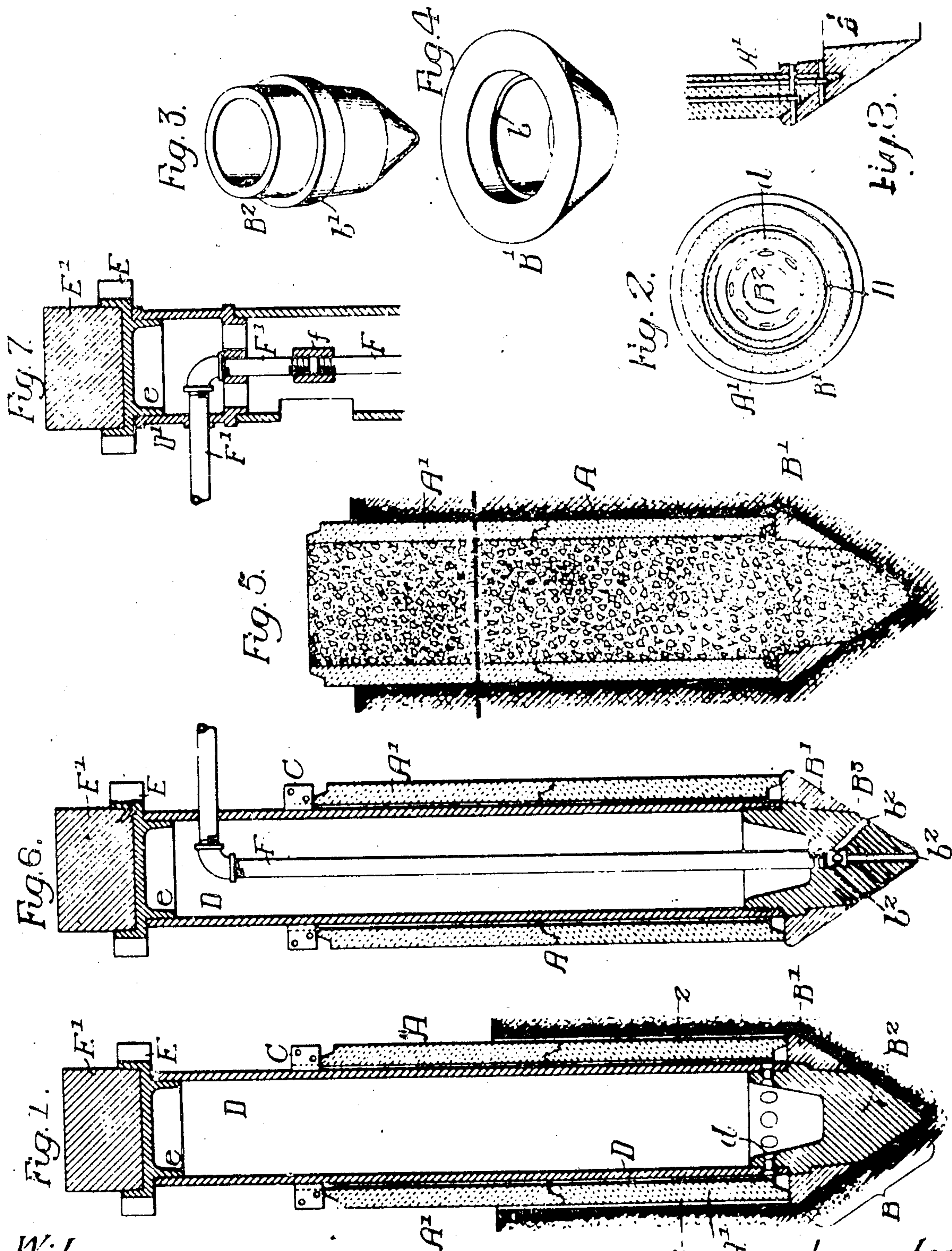
L. E. WELSH.

PILE.

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955,729.



Witnesses—
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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.

FILE.

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Specification of Letters Patent.

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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 Piles, of which the following is a specification.

My invention relates to certain improvements in the pile and driving mechanism therefor, which is fully illustrated and claimed in an application for patent filed by me on March 26, 1907, Serial No. 364,623. In the application alluded to the pile point is made in a single piece and the entire point remains in the ground when the driving element is withdrawn.

The object of the present invention is to arrange a pile and driving mechanism connected therewith in such a manner that a portion of the point can be removed with the pile driving device. By this construction the entire length of the tubular pile can be examined, as well as the ground under the pile, and if necessary the ground can be further excavated so that the foundation rock can be bared to enable the concrete to rest directly upon the rock.

My invention is particularly adapted for deep pile work and piles for this work are usually of such diameter that a man can be lowered into the pile to excavate the ground, and to examine the pile if desired, before the concrete filling is placed in the tubular pile.

In the accompanying drawings:—Figure 1, is a sectional view showing my improved pile and driving form partly driven in the ground; Fig. 2, is a section on the line 2—2, Fig. 1; Fig. 3, is a perspective view of the detachable inner section of the point; Fig. 4, is a view of the permanent outer section of the point; Fig. 5, is a sectional view showing the finished pile after it is filled with concrete; Fig. 6, is a sectional view similar to Fig. 1, with the exception that the water pipe is shown so that a water jet can be used to aid in driving the pile into the ground; Fig. 7, is a view of a modification of Fig. 6, and Fig. 8, is a view showing the lower section of the hollow cylindrical pile attached to the permanent point section.

A is the tubular shell of the pile made of concrete, preferably reinforced in any ordinary manner. This shell is made in sections a' , which are preferably coupled so

that one section will align with another as mentioned in the aforesaid application.

B is the driving point or penetrating element made in two sections B' , B'' . The outer section B' is the permanent section and is in the form of a ring and it is this section which is left in the ground after the pile is driven. The inner section B'' is preferably attached to a tubular driving form D, either by rivets, as shown at d , Fig. 1, or screw thread as illustrated in Fig. 6, so that it can be removed with the driving form, and the two constitute the driving element. In the present instance the section B' has an internal shoulder b upon which rests a flange b' of the section B'' , as clearly shown in Fig. 1, and the opening in the section B' is preferably tapered to correspond with the taper of the section B'' so that as the driving form with the removable point section b'' of the point is driven into the ground it carries with it the ring section B' .

It will be noticed that the section B' is greater in diameter than the tubular concrete pile section A so as to materially decrease the skin friction on the tubular pile as it is driven and the ring section also protects the fragile concrete pile. The pile sections are held to the driving form D by a clamp ring C which is vertically adjustable on the driving form D'.

E is the driving head having a flange e , which, in the present instance, enters the driving form D and holds it central and carries a block E' which receives the blow of the hammer of the pile driver.

It will be understood that the driving form D may be of any length desired and if required may be made in sections and the sections coupled together in any suitable manner.

It will be seen by the above construction that the tubular pile sections A' are placed in position around the driving form; the lower section resting upon the ring section B' of the point B and these sections are held in position by the clamp ring C. The ring is simply to insure the carrying of the pile sections into the ground with the point and the ring is so adjusted as to relieve the pile sections from the blow of the hammer as much as possible.

After the pile is driven into the ground to the depth desired then the driving form D

is withdrawn and with it the center section B' of the point B, leaving the ring section B' in the ground as a base for the cylindrical pile A. After this, concrete is inserted in the opening, filling the interior of the tubular sections; the entire mass forming a single pile structure, as indicated in Fig. 5. After each pile is driven, if it is desired to examine the same a light can be lowered into the pile after the driving form is removed and the walls of the tubular sections of the pile examined, or, if the pile is of such a size that a man can be lowered into it then the earth can be removed from around the foundation rock so that when the concrete is inserted in the pile it will rest directly upon the foundation rock.

I may make the ring section B' of the point hollow and provided with ribs and may mold the hollow concrete pile forms on to this point section, locking the two firmly together by means of the reinforcing rods, as shown in Fig. 8.

In some instances it may be desirable to jet the pile into the ground in order to aid in driving the pile. Fig. 6 shows an arrangement of pipes which may be used. F is a pipe leading from any source of water supply. This pipe in the present instance is screwed into an opening in the center section B' of the point b' and in this section is a series of passages b' communicating with the pipe so that when water under pressure is forced through the pipe F it is projected through the passages b' directly under the point of the pile.

When it is desired to make the driving form in detachable sections then I use a head section D' carrying a portion F' of the pipe which is coupled to the pipe F by a union / so that on detaching the pipes F, F', the head section D' can be removed and another section or driving form inserted with any section of pipe and coupled, thus increasing the length of the driving form and pipe.

I claim:

1. The combination in a pile, of a driving element consisting of a central penetrating point and a driving form, with an annular point section, both the driving element and the annular point section being shouldered, whereby the driving element may positively engage the annular point section and force the latter into the ground when driven, said central penetrating point forming the initial part of the penetrating element and being removable from the annular point section, the latter forming part of a permanent base of a pile.

2. The combination in a pile, of a driving element consisting of a central penetrating point and a driving form secured together, with an annular point section, both the driving element and the annular point section

being shouldered, whereby the driving element may positively engage the annular point section and force the latter into the ground when driven, said central penetrating point forming the initial part of the penetrating element and being removable with the driving form from the annular point section, the latter forming part of the permanent base of a pile.

3. A sectional point for a pile, comprising a central section and a ring section having a continuously tapered outer surface, the central section extending through the ring section and shouldered to engage the same, said central section being removable from the ring section, and the latter forming part of the permanent base of the pile.

4. The combination with a pile point having an inner and an outer portion, the inner portion passing through the outer portion, of a driving form bearing upon the inner portion, said inner portion having its outer wall shouldered to engage the outer portion so that the latter is forced into the ground by and simultaneously with the inner portion, the driving form and inner portion being removable after the pile point has been driven.

5. The combination of a pile point made in two sections, comprising a ring section and a central section, said central section extending through the ring section and forming with it an enlarged conical head, and a driving form attached to and removable with said inner section, said inner section having an annular enlargement forming a flange and the outer section being recessed to form a shoulder to receive said flange so that the outer section may be driven simultaneously with the inner section, the latter being removable from the outer section which is left in the ground.

6. The combination of a driving form, a sectional point therefor, comprising a central portion connected to the driving form and a ring portion, each of said parts having a shoulder for mutual engagement and the central portion extending through the ring portion, the latter serving as part of a permanent base for a pile while the central portion forms the penetrating element and is removable with the driving form, said central portion being apertured for jetting purposes, and a jetting tube communicating with said central portion.

7. The combination in a pile, of a penetrating element consisting of a central penetrating point and an annular point section, said annular point section having an internal shoulder and the central penetrating point having a flange extending over the shoulder, with a driving form engaging the central penetrating section to force it into the ground with the annular point section, the central penetrating point being capable

of removal independently of the annular point section to expose the ground under the pile.

8. The combination of a sectional driving form, a sectional point therefor, comprising a central portion connected to the driving form and a ring portion, each of said parts having a shoulder for mutual engagement and the central portion forming the penetrating element and being removable with the driving form, said central portion being apertured and extending beyond said ring portion, independent sections of pipe carried by the sections of the driving form and attached to the central portion of the point for the passage of fluid to and through the apertures of said central portion, and couplings for said pipe sections.

9. A sectional point for a pile comprising a central impact portion and a ring portion, the central portion extending through and beyond the ring portion and both parts being shouldered, whereby the central portion may positively engage the ring portion and force the latter into the ground when driven, said central portion forming the initial part of the penetrating element and removable from the ring portion, the latter forming part of a permanent base for a pile.

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.