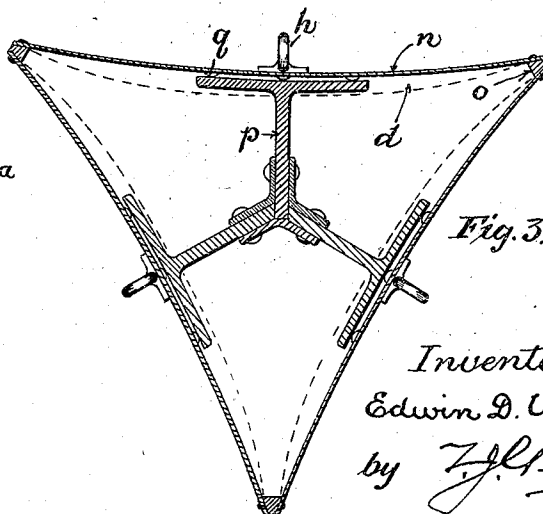
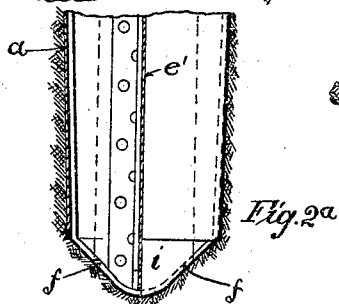
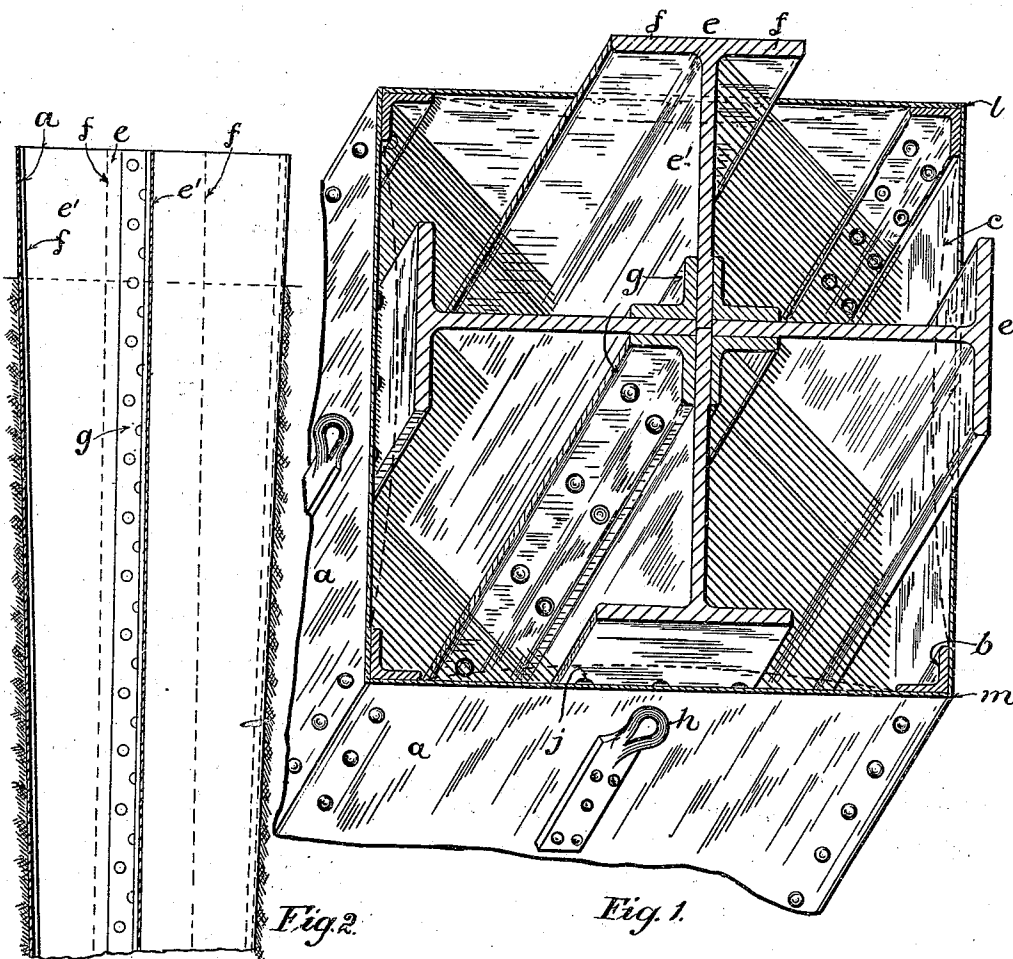


E. D. WHITNEY.
COMPRESSIBLE CONCRETE PILE FORMER.
APPLICATION FILED OCT. 21, 1908.

933,280.

Patented Sept. 7, 1909.



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UNITED STATES PATENT OFFICE.

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COMPRESSIBLE CONCRETE-PILE FORMER.

933,280.

Specification of Letters Patent.

Patented Sept. 7, 1909.

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To all whom it may concern:

Be it known that I, EDWIN D. WHITNEY, a citizen of the United States, and a resident of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Compressible Concrete-Pile Formers, of which the following is a specification, reference being had to the accompanying drawings as constituting a part thereof.

My invention relates to the art of making concrete piles, and has for its primary object to obtain a pile-former which may be readily removed from the cavity made in the soil, is easily manufactured, and consists only of a few pieces. In the construction of a concrete pile-former, it is essential that the same be adapted to be readily withdrawn from the cavity made in the soil. To this end I make my pile-former compressible in cross-section, the same consisting of a shell of angular form, in cross-section, and preferably made of resilient material, so that the walls of the shell are adapted to be sprung inward, in cross-section, between their angular junctures, in order to relieve the pressure of the surfaces of the shell upon the walls of the cavity, and thus facilitate the withdrawal of the shell.

My invention is further based upon the principle that since a pile supports its load partly by the friction of the soil on the sides of the pile, greater friction-area of the sides affords a relative increase of carrying capacity; and the theory of my invention is to make use of this principle, either to obtain greater carrying capacity for a column produced by a given quantity of concrete material, or to obtain a standard of carrying capacity with a smaller quantity of material. For example, since there is no appreciable flexure in a pile, viewed as a column, when driven into compact soil, if the arc of exterior curvature of the segments of a circular area be inverted so as to give the same degree of concavity as its former convexity, the friction areas of the sides of the pile will remain the same, but a smaller quantity of material will be used in making the pile.

The details of construction of my invention are illustrated in the drawings, in which:

Figure 1 represents, perspective, a cross-section of the resilient shell of my former and its bracing core in place; Figs. 2, 2^a,

taken together, represent a vertical section showing my pile-former as contained in the cavity made by it in the soil; and Fig. 3 is a plan section illustrating a modification of the construction of my pile-former, the shell being made triangular in cross-section, and the surfaces between the angular junctures thereof concaved to obtain greater frictional area.

Referring now to the letters designating the parts in the several views: the outer shell or case, *a*, of my former is made of thin sheets of metal, united at their edges by any convenient means, such for example, as angle-irons or bars *b*, said uniting means being so arranged as not to interfere to any extent with the spring of the sides of the shell inward; and the shell-sides and their uniting means may be further arranged and adapted so as to normally impart to the surfaces of the shell-sides an inward spring, or deflection from a straight line, (as indicated by dotted lines *c*, *d*, in Figs. 1 and 3) between the angular junctures *l*, *m*, etc. of the sides.

In cross-section, my shell may be made quadrilateral, as shown in Fig. 1, or triangular, as shown in Fig. 3. To brace the sides of the shell while driving my pile-former into the soil, I use a removable core. The latter may be of any convenient construction, the bearing faces of which are so arranged as to brace the sides of the shell, substantially as illustrated in Figs. 1 and 3. I find it convenient to make my core of T-beams *e*, arranged to bear with their flanges *f*, *f*, against the inner faces of the sides of the shell; and the webs *e'* of the T-beams are united by suitable means, as for example, by riveting to angle-irons or bars *g*, as shown. In order to further facilitate the removal of the shell, the pressure of the surfaces of the same against the walls of the cavity may be relieved by attaching a short hoisting tackle to the ears, *h*, of the shell, whereby, in lifting, the latter will draw in the sides thereof between their angular junctures *l*, *m*, etc., and consequently reduce the cross-section area of the shell.

My pile-former is preferably tapered downward, so as to facilitate the penetration of the soil, and, likewise, the removal of the shell; and the point *i* of my former is conveniently made by pointing the lower ends of the core, as illustrated in Fig. 2.

In order to reduce the friction area of the

flanges, f , against the inner faces of the sides of the shell, I provide the latter with a series of longitudinally arranged protrusions j .

5 In using my pile-former, the core is, as usual, inserted in the shell, the bearing faces of the core pressing against and bracing the sides of the shell.

10 In the use of a pile-former having concaved faces, as illustrated in Fig. 3, the cavity made in the soil will be of greater cross-section than the shell itself will have upon the withdrawal of the core; and thus as soon as the core has been removed, the inward spring of the sides of the shell will, to some degree, of itself remove the pressure of the shell-sides against the faces of the cavity, and the distances between the angular junctures or corners l, m will also be diminished to some degree, thereby facilitating the convenient withdrawal of the shell.

15 In the triangular construction of my pile-former (shown in Fig. 3) is illustrated the additional feature that the sides n may be curved inward, or concaved from a straight line cross-section, to relatively increase the friction-area of the surfaces of the pile. In other respects the type shown in Fig. 3 is substantially the same in construction and operation as that shown in Fig. 1. The angular corners of the sides n are united by being riveted to strips o ; the core p is substantially of the same construction as that used in connection with my quadrilateral form of shell, except the flange-beams are adapted to the triangular construction shown in Fig. 3, and the protrusions q on the inner faces of the triangular walls n are the equivalents of the protrusions j .

20 In making my pile-former of triangular cross-section, as shown in Fig. 3, I also preferably taper the same downward and form the point thereof substantially as illustrated in Figs. 2, 2^a.

I claim:

1. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material.

50 2. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, and a core adapted to be removably inserted in the shell to brace the sides thereof.

55 3. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, a core removably inserted in the shell and consisting of T-beams arranged to bear with their flanges against the inner faces of the sides of the shell, and means uniting the T-beams at their webs.

60 4. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, a core re-

movably inserted in the shell and consisting of T-beams arranged to bear with their flanges against the inner faces of the sides of the shell, means uniting the T-beams at their webs, and protrusions on the inner faces of the sides of the shell and positioned relatively to the bearing faces of the core.

5. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, the walls of the shell being adapted to normally spring inward in cross section between their angular junctures, and a core adapted to be removably inserted in the shell to brace the sides thereof.

6. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, reinforcement at the angular junctures of the shell-sides, and a core adapted to be removably inserted in the shell to brace the sides thereof.

7. A compressible pile former consisting of a shell of angular form in cross section and made of resilient material, a core adapted to be removably inserted in the shell to brace the sides thereof, and protrusions on the inner faces of the sides of the shell positioned relatively to the bearing faces of the core.

8. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, a core removably inserted in the shell and consisting of T-beams arranged to bear with their flanges against the inner faces of the sides of the shell, and angle-irons uniting the T-beams at their webs.

9. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, a core removably inserted in the shell and consisting of T-beams arranged to bear with their flanges against the inner faces of the sides of the shell, angle-irons uniting the T-beams at their webs, and protrusions on the inner faces of the sides of the shell and positioned relatively to the bearing faces of the core.

10. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, a reinforcement at the angular junctures of the shell-sides, a core removably inserted in the shell and consisting of T-beams arranged to bear with their flanges against the inner faces of the sides of the shell, and means uniting the T-beams at their webs.

11. A compressible pile former consisting of a shell of angular form in cross section and made of resilient material, the walls of the shell being adapted to normally spring inward in cross section between their angular junctures, a core adapted to be removably inserted in the shell to brace the sides thereof, and protrusions on the inner faces

of the sides of the shell positioned relatively to the bearing faces of the core.

12. A compressible pile-former consisting of a shell of angular form in cross-section and made of resilient material, the walls of the shell being adapted to normally spring inward in cross-section between their angular junctures, a reinforcement at the angular junctures of the shell-sides, a core re-

movably inserted in the shell and consisting of T-beams arranged to bear with their flanges against the inner faces of the sides of the shell, and means uniting the T-beams at their webs. 10

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Witnesses:

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