To all whom it may concern:

Be it known that I, THOMAS STEEDHAM, citizen of the Dominion of Canada, residing at Victoria, in the Province of British Columbia, Canada, have invented a new and useful Reinforced-Concrete Pile, of which the following is a specification.

This invention relates to a metal reinforced concrete pile designed not only to sustain the compression of its load and resist the lateral flexure consequent thereon, but to stand the shock of driving without breaking the concrete from its metal reinforcing frame which frame is carefully inclosed within the concrete to protect it from corrosion.

The invention is particularly described in the following specification and illustrated in the drawings by which it is accompanied, in which:

Figure 1. is a vertical elevation of the metal frame of the pile, the contour of its inclosing concrete being indicated by dot and dash lines. Fig. 2. is a cross section to an enlarged scale adjacent to a spacing frame. Fig. 3. an enlarged detail of the lower end showing the tie of the structural framework to the point or shoe, and Fig. 4. a detail of the spacer. Fig. 5. is an enlarged view similar to Fig. 1. of a portion of the invention. Fig. 6. is a detail perspective view of a part of the invention.

In these drawings 2 represents the point or shoe preferably of solid cast steel in the metal of which shoe are cast or otherwise secured four members 3 of tie cross section projecting upward from the middle of the sides and bent inward slightly at the upper ends which are inwardly turned as shown in Fig. 3.

Butting into each corner of a depression in the upper surface of the shoe 2, see Fig. 1, are four rods 4 preferably of steel, polygonal in cross section as I find that cross section affords the concrete a better hold on the rods. These rods 4 extend continuously the whole length of the pile to about four inches of the top and are tied to cast iron spacing frames 5 which are in practice at intervals of about six feet, by wire ties 5 about No. 8 gage where in practice spaced about four inches apart, the ends of the ties being turned inward together that the concrete may afford a better hold around them. Between each pair of the spacing frames 6 wrought iron spacers 7 are introduced between each pair of rods to resist the pull of the wire ties 5 before the concrete is applied.

To strengthen the pile against flexure toward the middle supplementary rods 10 similar to those 4 extend throughout the midlength from about six feet from either end. These rods 10 are tied by wire to the inner corners of the spacing frames 6 and their ends should be split for a length approximately equal to twice their diameter.

At the upper end of the pile and introduced between the tie wires 5 of the columns 4 are diagonal rods 11 extending from a position about four inches laterally from the top of each corner column 4 to a position about four inches from the next column and secured by wires to the wires 5 to retain them in position during the introduction of the concrete. These are designed to receive and distribute the impact of the blow while driving. This constitutes the metal frame to reinforce the strength of the concrete which entirely encloses the frame of the pile and extends in cross section about one and one half inches beyond the corner rods 4 and a similar distance on the inside within the supplementary rods 10, leaving a cylindrical core space 8 toward the metal center 9 which in length of about three feet six inches with eighteen inches intervening extends from about six feet from the bottom to a similar distance from the top. These core spaces 8 are formed by the introduction of lengths of sheet metal pipe 9. A pile structure is thus provided which may be designed to stand any superimposed load and that is so bonded together that the concrete will not break away from its reinforcing frame with the severe blow of the pile driver, and that is reinforced to resist the tendency to lateral flexure due to its extreme length and restricted cross section. The extreme impact of the blow in driving is lessened by a special buffer cap which not being material to this application is not necessary to illustrate or describe. In their great strength a less number of these piles is required and a wharf may be built on them of metal or reinforced concrete and be thus rendered safe from fire; and they are durable in their immunity from the attack of marine growths while the metal is fully protected from corrosion.

Having now particularly described my invention and the manner of its construction, I hereby declare that what I claim as new
and desire to be protected in by Letters Patent is:

1. In a reinforced concrete pile, the combination with a pointed metal shoe, of upwardly projecting members secured thereto and having bent over ends, rods butting into a recess in the upper surface of the shoe and extending continuously throughout the length of the pile to a short distance from the top, rectangular spacer frames having crossed corner portions into which said rods engage to preserve the rods at the desired distance apart, wire ties for holding the rods to the spacer frames and a concrete body inclosing said frame, said ties and said rods.

2. In a reinforced concrete pile the combination with a pointed metal shoe, of upwardly projecting members secured therein the upper ends of which members are bent over to afford a hold in the concrete, rods butting into a recess in the upper surface of the shoe and extending continuously throughout the length of the pile to a short distance from the top, square spacer frames having crossed corners at intervals that will preserve the rods at the desired distance apart, wire ties holding the rods against the spacer frames and a body of cement inclosing the rods and spacers and having an interrupted core extending from a short distance from the bottom to a similar distance from the top of the pile.

3. In a reinforced concrete pile, the combination with a pointed metal shoe having upwardly projecting members affording a hold of the concrete, rods butting into a recess in the upper surface of the shoe and extending continuously throughout the length of the pile to a short distance from the top, spacer frames at intervals apart maintaining the several rods at the desired distance from one another, spacers between each pair of rods in the intervals between the spacer frames, wire ties for holding the rods to the frames and spacers, supplementary longitudinal rods secured to the inside of the spacer frames throughout the mid-portion of the pile length and secured by wire to the spacer frames, diagonal rods extending a short distance from the top between each pair of rods and secured to the wire ties of the same, and a body of concrete entirely inclosing the metal framework and having an interrupted core of sheet metal at the center.

4. In a reinforced concrete pile, the combination with a pointed metal shoe having upwardly projecting members affording a hold in the concrete, main rods butting into a recess in the upper surface of the shoe and extending continuously throughout the length of the pile to a short distance from the top, spacer frames at intervals apart for maintaining the several main rods at the desired distance from one another, said spacer frames having inner corners, supplemental rods held within said inner corners parallel to said main rods, wire ties at intervals between the spacer frames for holding said main rods against the frames, and a body of concrete entirely inclosing the aforesaid parts, excepting the shoe.

5. In a reinforced concrete pile the combination with a pointed metal shoe having upwardly projecting members affording a hold in the concrete, main rods butting into a recess in the upper surface of the shoe and extending continuously throughout the length of the pile to a short distance from the top, spacer frames at intervals apart for maintaining the several rods at the desired distance from one another, said spacer frames having outer corners to receive said rods and having inner corners, supplemental rods held with said inner corners parallel to said main rods, wire ties for holding said rods against said frames, a body of concrete entirely inclosing the aforesaid parts, excepting the shoe, and an interrupted tubular metallic core held within the center of the concrete.

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

THOMAS STEDHAM.

Witnesses:

D. STEVENS,
ROBERT M. NEWCOMB.