J. M. MAHER.

CONCRETE REINFORCED PILE.

APPLICATION FILED OCT. 4, 1919.

1,356,646. **Patented Oct. 26, 1920.**

2 SHEETS—SHEET 1.

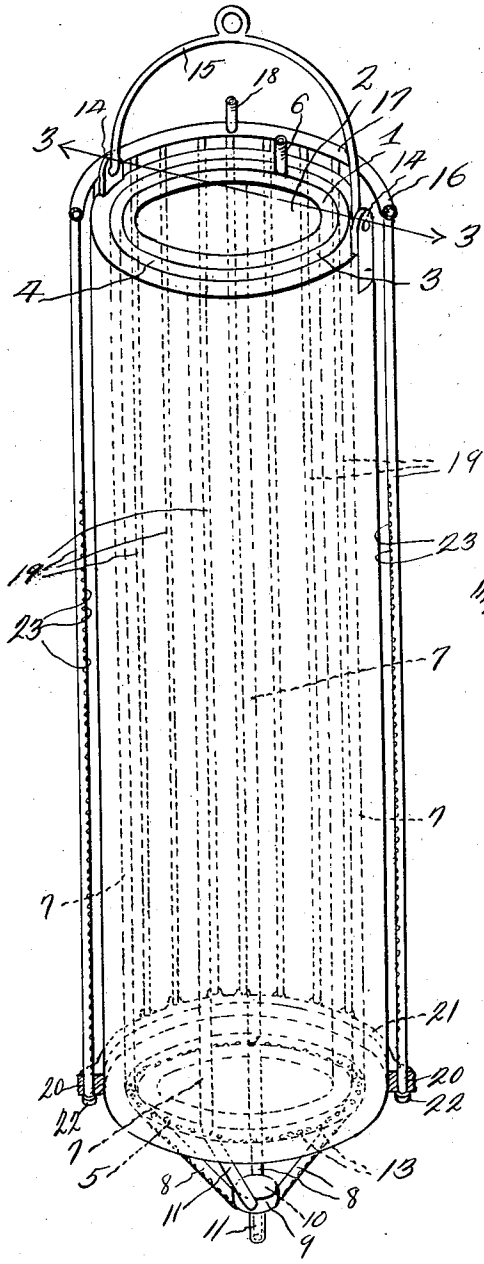


Fig. 2.

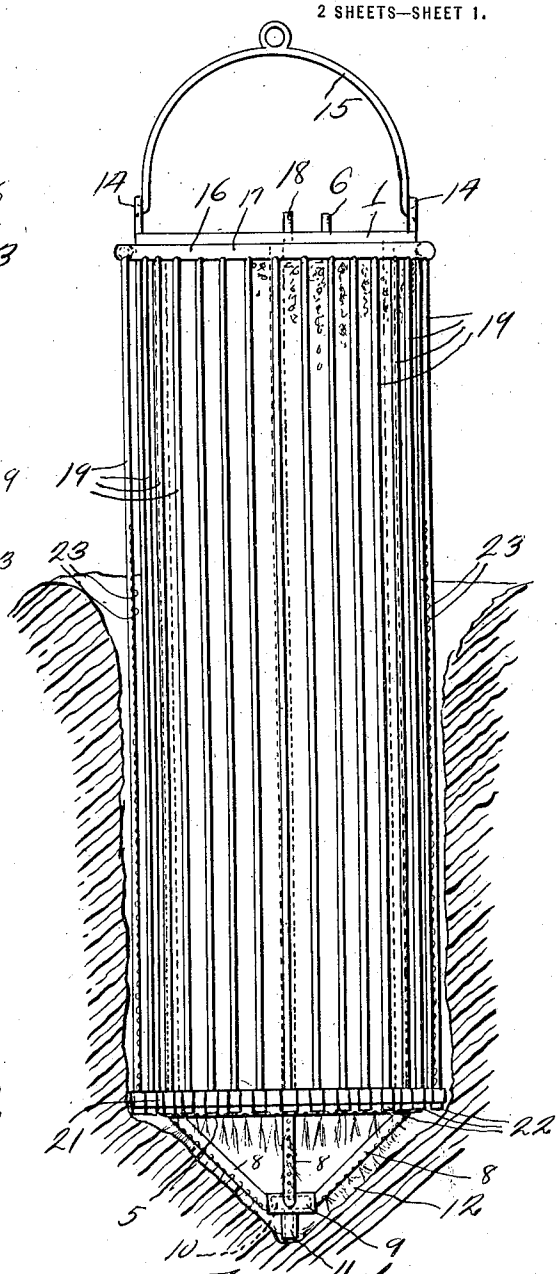


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

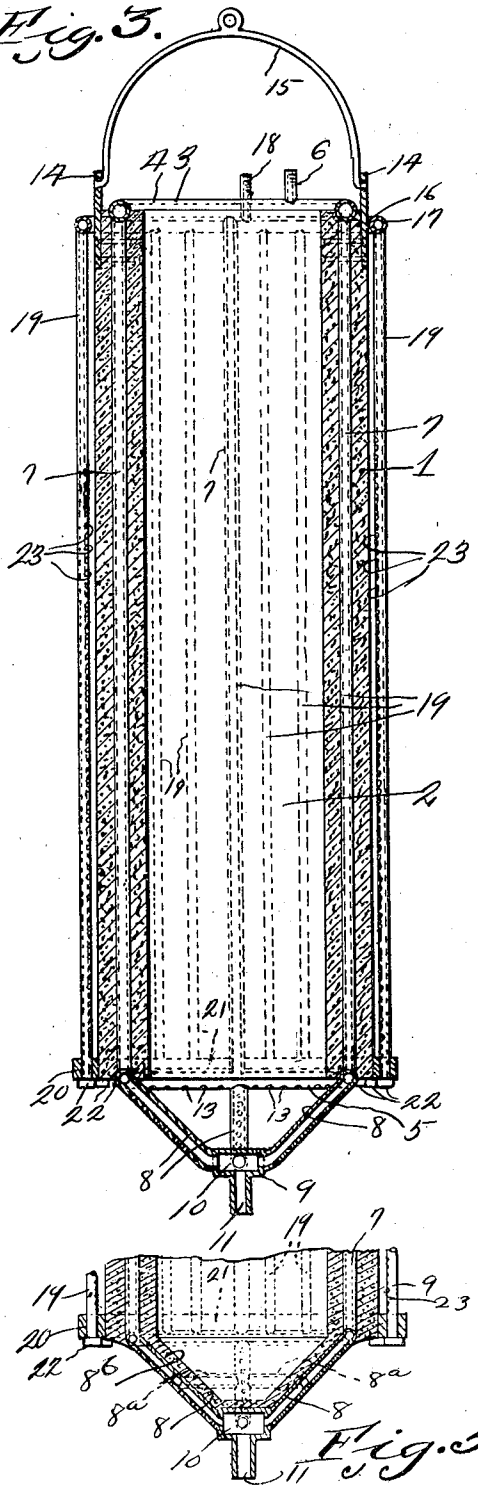


Fig. 4.

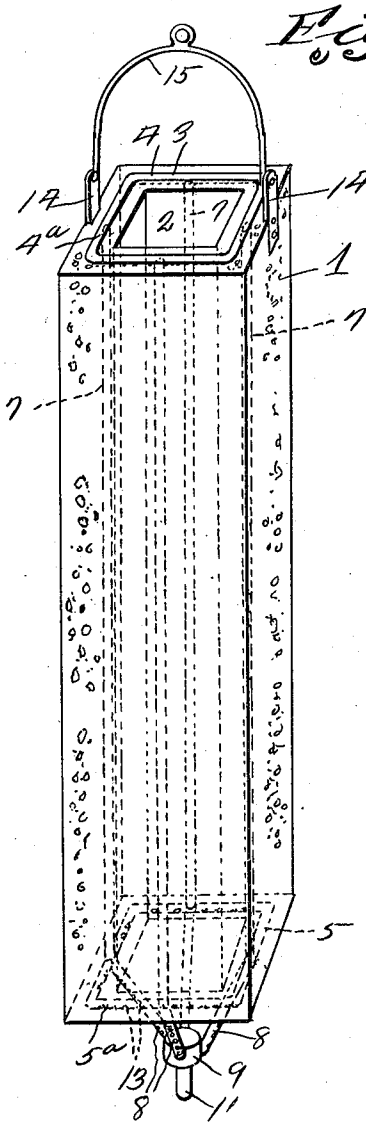


Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES M. MAHER, OF FREMONT, NEBRASKA.

CONCRETE REINFORCED PILE.

1,356,646. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed October 4, 1919. Serial No. 328,509.

To all whom it may concern:

Be it known that I, JAMES M. MAHER, a citizen of the United States of America, residing at Fremont, in the county of Dodge and State of Nebraska, have invented certain new and useful Improvements in Concrete-Reinforced Piles, of which the following is a specification, reference being had therein to the accompanying drawing.

The invention relates to piles for bridge abutments and the like and has for its object to provide a reinforced concrete pile wherein the reinforcing material is piping, thereby forming means whereby water may be conveyed to the bottom of the pile under pressure and ejected adjacent the bottom of the pile in jets, which jets dislodge and soften the earth and sand on the bottom of the stream thereby forming a cavity into which the pile as a whole will settle under its own weight. Also to provide means at the upper end of the pile whereby the same may be easily and quickly lowered into position during the cavity forming operation by the jets.

A further object is to provide a caging telescopically fitting over the pile and formed of piping, the vertical members of said piping being provided with apertures through which water jets will be directed against the periphery of the pile thereby preventing the collection of dirt on the same which will retard its downward progress and also assisting in forming the cavity in the stream bed. The telescopically engaging member being removably mounted on the pile.

With the above and other objects in view, the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:—

Figure 1 is an elevation of the pile showing the same in position in a cavity that it has formed in the bottom of a river or the like.

Fig. 2 is a perspective view of the pile showing part of the outer cage member broken away to better illustrate the parts.

Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a perspective view of another form of pile which is rectangular in horizontal cross section.

Fig. 5 is a detail sectional view of the lower end of the pile showing the same closed and the pipes that incline to an apex connected by horizontally disposed pipes.

Referring to the drawings, the numeral 1 designates a cylindrical concrete body member having a chamber 2 extending therethrough. The concrete cylinder 1 is reinforced by a reinforcing metallic structure 3 comprising an upper ring 4 and a lower ring 5, which rings 4 and 5 are formed of piping thereby forming means through which water may be conducted. Ring 4 has an upstanding nipple 6 to which a hose may be connected whereby water may be forced into the ring 4 and thence downwardly through pipes 7 which connect the ring 4 and the ring 5, thereby allowing water to be conducted to the bottom of the cylindrical pile 1, and also forming means for reinforcing said pile. Ring 5 has extending downwardly and inwardly a series of pipes 8 which pipes have their lower ends connected in any suitable manner to a fourway fitting 9 having a chamber 10 therein and extending downwardly from said chamber is a nipple 11, whereby water will be ejected into the apexed end of the hole 12 which is being formed by the pile. Ring 5 has on its under face a series of apertures 13 through which water is ejected downwardly for loosening the sand and dirt and causing the same to flow upwardly through the hole 12 that is being formed by the pile thereby allowing the pile to settle into the hole by its own weight. Pipes 8 are also provided with apertures on their outer faces whereby jets of water will be ejected against the wall of the apexed end of the hole 12, thereby cutting away the dirt, sand or the like and forming and deepening the hole so that the pile may settle in the same. The upper end of the cylindrical member 1 is provided with ears 14 to which is connected a bail 15 said bail being adapted to be suspended from a derrick, by means of which derrick the pile may be lowered and raised as desired.

In order to assist the pile and prevent the same from binding in its downward movement a cage 16 is provided which is removably and telescopically disposed over the cylindrical body 1. Cage 16 is formed of

piping and comprises an upper ring 17 into which water is conducted through a nipple 18, to which a hose may be secured. Depending downwardly from the ring 16 is a series of vertically disposed pipes 19, the lower ends of which pass through apertures 20 in a ring 21, which ring maintains the lower ends of the vertical pipes 19 and prevents bending and jamming of the same. The lower ends of the pipes 19 are closed by caps 22, thereby preventing the water from passing out of the ends of the pipes. The inner faces of the pipes 19 are provided with a series of apertures 23 through which the jets of water under pressure are forced against the surface of the cylindrical member 1, thereby preventing the jamming and collection of dirt or mud on the same and also allowing the pile as a whole to be easily lowered into the hole formed by the various jets of water.

The operation is as follows. When it is desired to place the pile in the bed of a stream the same is suspended from a derrick and lowered into position then water is forced into the embedded hollow reinforcing and into the cage 16, therefore the jets on the apex end of the embedded reinforcing will form the hole 12 and as the hole is deepened, the jets will force the water upwardly through said hole and out of the same. However, during this upward movement of the mud and dirt, the jets ejected through the apertures 23 will prevent the same from becoming lodged in the hole and therefore retarding the advancement of the pile under its own weight. After the pile has been sunken to its desired position the caging 16 is removed if so desired and used on other piles, said caging being removed by any form of block and tackle or other means. If so desired the chamber 2 of the piling may be filled with concrete. Referring to Fig. 4, the structure is practically the same with the exception that instead of rings 4 and 5, rectangular members 4^a and 5^a are employed.

Referring to Fig. 5 it will be seen that the structure is practically the same as that shown in Fig. 3 except that the pipes 8 are connected by horizontally disposed pipes 8^a and the apexed end of the pipe being closed by cement as at 8^b. Pipes 8 and 8^a may be perforated if so desired. It has been found in some cases that a closed end is desirable. However, it is to be understood that the pile may be constructed with a closed end, an open end or if so desired the water conducting means may be embedded in a solid pile.

The invention having been set forth what is claimed as new and useful is:—

1. A pile comprising a concrete body, said body having embedded therein a metallic reinforcing formed from piping, said reinforcing comprising a horizontal endless pipe at its upper end, vertically disposed connecting pipes, the lower ends of said vertically disposed connecting pipes being connected to a horizontally disposed endless pipe, said last named endless pipe being provided with apertures through which water may be ejected vertically downwardly under pressure, the lower horizontally disposed endless pipe having downwardly and inwardly inclined pipes, the lower ends of which are connected in a common outlet, apertures in the downwardly and inwardly extending pipes through which jets of water may be ejected, and means whereby water under pressure will be conveyed through the piping forming the reinforcing and ejected through the jet apertures.

2. A pile comprising a concrete body, said body having embedded therein a metallic reinforcing formed from piping, said reinforcing comprising a horizontal ring at its upper end, vertically disposed connecting pipes, said connecting pipes having their lower ends connected to a horizontally disposed ring, said last named horizontally disposed ring being provided with downwardly and inwardly extending pipes, the lower ends of said pipes terminating in a chamber, a downwardly extending jet aperture carried by said chamber, apertures in the lower horizontally disposed ring and the downwardly and inwardly inclined pipes whereby jets of water will be ejected vertically downwardly and downwardly and outwardly for forming a hole into which the pile will settle under its own weight, means for conducting water to said jets under pressure, a telescopically disposed caging formed from piping telescopically fitting over the pile, said caging comprising a horizontally disposed ring having downwardly extending pipes, apertures in said pipes through which jets of water are adapted to be ejected against the surface of the pile and means whereby water will be conducted through the horizontally disposed ring to said jet apertures.

In testimony whereof I hereunto affix my signature.

JAMES M. MAHER.