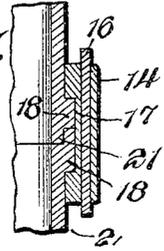
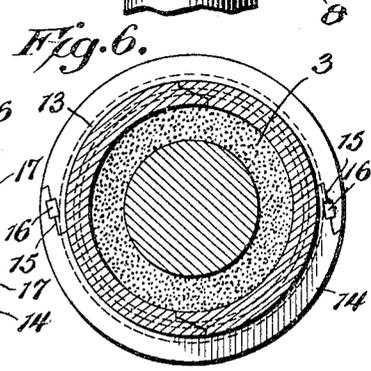
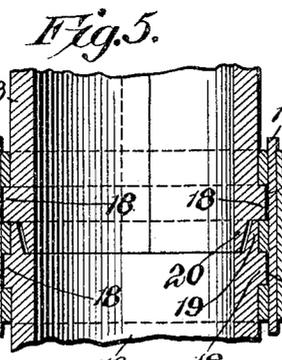
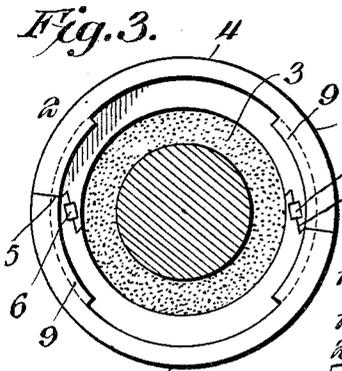
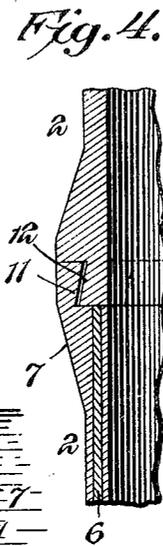
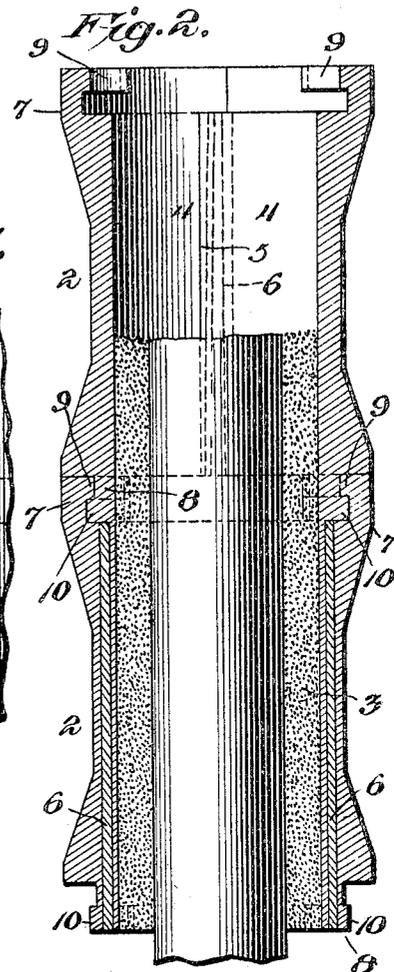
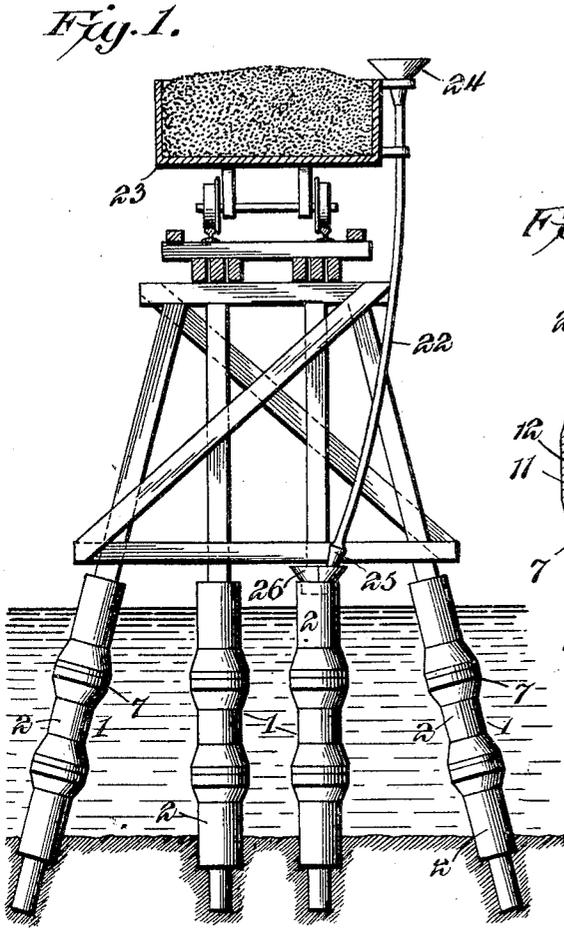


P. AYLETT.
DEVICE FOR PROTECTING PILES, &c.
APPLICATION FILED SEPT. 7, 1904.



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UNITED STATES PATENT OFFICE.

PHILIP AYLETT, OF PORTSMOUTH, VIRGINIA.

DEVICE FOR PROTECTING PILES, &c.

No. 798,384.

Specification of Letters Patent.

Patented Aug. 29, 1905.

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To all whom it may concern:

Be it known that I, PHILIP AYLETT, a citizen of the United States, residing at Portsmouth, in the county of Norfolk and State of Virginia, have invented a new and useful Device for Protecting Piles and Similar Submerged Woodwork, of which the following is a specification.

The invention relates to improvements in devices for protecting piles and similar submerged woodwork.

The object of the present invention is to improve the construction of devices for protecting piles and similar submerged woodwork employed in the construction of wharves, bridges, abutments, and analogous structures and to provide a simple, inexpensive, and efficient device adapted to be applied to and removed from a pile or the like without affecting the structure.

A further object of the invention is to provide a pile-protector which may be either applied while a wharf, bridge, or other structure is being constructed or after the same has been completed and which will be capable of effectually protecting such submerged woodwork from the ravages of the ship-worm and other marine insects.

Another object of the invention is to provide a pile-protector which will always rest upon the bottom of a stream or other body of water to protect a pile from the mud-line to a point above the surface of the water and which will be automatically adjustable and gradually descend as the bottom of such stream or other body of water changes through scour or other cause.

The invention also has for its object to provide a pile-protector which may be manipulated from the top when it is desired to place it in position or remove it or increase its length.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is an elevation,

partly in section, of a structure provided at the submerged portions of its woodwork with pile-protectors constructed in accordance with this invention. Fig. 2 is an enlarged sectional view of two of the pipes of the adjustable tubular pile-casing. Fig. 3 is a plan view of the same, the pile being in section. Fig. 4 is a detail sectional view illustrating a slight modification of the means for interlocking the pipes together. Fig. 5 is a longitudinal sectional view illustrating another modification of the invention and showing two pipes connected by and interlocked with a sectional collar or coupling. Fig. 6 is a horizontal sectional view of the same. Fig. 7 is a detail vertical sectional view showing another form of collar or coupling.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a tubular pile-casing composed of one or more pipes 2, of terra-cotta or any other suitable material which will be unaffected by sea-water. The pipes of the tubular casing are interlocked at their ends, as hereinafter described, and a casing may thereby be constructed of any desired length to suit the depth of water and to allow for any desired change in the bottom of a stream or other body of water. The length of the tubular pile-casing may be increased from time to time, as hereinafter explained, to protect a pile from the mud-line to a point above the surface of the water, and the internal diameter of the casing is in excess of the diameter of the pile to provide an intervening space, which receives a packing 3 of loose material, such as sand, cinders, gravel, or any other suitable material. A mixture of sand and gravel will be found exceedingly effective, and this packing will permit the pile-casing to descend as the mud-line is lowered by the washing away of the bottom. Also the packing or filling of loose material will not interfere with the removal of the tubular pile-casing, which may be readily lifted from the top, thereby obviating the necessity of introducing a hook beneath the lower end of the pile-casing, which operation is necessary when the pipes are not connected, as hereinafter explained. When removing the pile-casing, the packing or filling can be conveniently washed away by the use of a small hand-pump, if desired.

Each of the pipes 2 of the tubular casing

is divided longitudinally and is composed of a plurality of sections 4, which are connected at their contiguous longitudinal edges by scarf lock-joints 5, having longitudinal keys 6, of wood or other suitable material. These keys, which extend from the top to the bottom of the body portions of the sections 4, are wedge-shaped, being tapered upwardly to enable them when removing the pile-casing to be readily loosened or driven out by blows upon their upper ends. By dividing the pipes longitudinally they may be readily placed around a pile without affecting the structure of which the pile forms a part, and the piles may be protected after such structure has been erected. The sections may be cast or molded in any desired manner, as will be readily understood, and although only two sections are illustrated in the accompanying drawings, yet it will be readily understood that the pipes may be constructed of any desired number of sections. The upper ends 7 of the pipes are enlarged to form sockets for the reception of the lower or spigot ends 8 of the contiguous sections. The socket ends are provided with inwardly-extending curved flanges 9, which form grooves and which are spaced apart, as clearly shown in Fig. 3. The spigot ends 8 are provided with outwardly-extending curved flanges 10, which are adapted to fit in the grooves and interlock with the inwardly-extending flanges 9. The space between the ends of the inwardly-extending flanges 9 are of a size to permit the outwardly-extending flanges to be introduced into the enlarged ends or sockets, and by rotating the pipes a quarter of a revolution the flanges are interlocked by carrying the outwardly-extending flanges 10 beneath the inwardly-extending flanges 9. This partial rotation of the pipes also causes them to break joints, as indicated in Fig. 2 of the drawings. The pipes are also preferably enlarged adjacent to their spigot ends, as shown in Fig. 2, to increase the strength of the device. The flanges or projecting portions of the ends 7 and 8 are provided with horizontal engaging faces, as illustrated in Fig. 2; but the pipes may be detachably interlocked by bevel or wedge shaped engaging portions 11 and 12, as illustrated in Fig. 4 of the drawings.

In Figs. 5 and 6 of the drawings is illustrated another modification of the invention, in which the pipes 13 are detachably connected by means of a sectional collar or coupling 14. The sections of the collar or coupling are connected by scarf lock-joints 15, having removably-tapered or wedge-shaped keys 16, of wood or other suitable material. In the form illustrated in Figs. 1 to 4, inclusive, of the drawings the ends of the keys abut against the ends of the adjacent pipes, and the said keys are wholly concealed within the tubular casing and are thereby

protected; but in the form shown in Figs. 5 and 6 the keys may be coated or otherwise treated to protect them. The sectional collar or coupling 14 is provided with opposite grooves 17 for the reception of annular flanges 18 of the pipes 13. The upper and lower ends 19 and 20 of the pipes may be beveled, as shown in Fig. 5, or square shoulders or seats may be employed, as shown at 21 in Fig. 7 of the drawings.

The packing which excludes the water from the casing may be conveniently introduced into the same by means of a flexible tube or pipe 22, designed to be carried by a car 23, as shown in Fig. 1. The flexible pipe is provided at its upper end with a hopper or funnel 24, and it has a tapering discharge nozzle or end 25, which is adapted to extend into a sectional funnel 26. The sectional funnel 26 is adapted to be placed around a pile and fitted within the upper end of the pile-casing, as shown in Fig. 1.

The pile-protector, which may be applied to the piles of a structure after the same has been completed, as well as while the structure is being erected, is manipulated from the top by placing the pipe-sections around a pile and interlocking or connecting the pipes, which are successively lowered until a pile-casing is constructed of a length to extend from the mud-line to a point above the surface of the water. The bottom pipe is partially embedded in the mud through the weight of the casing, and the latter is adapted to drop or descend automatically as the bottom is washed away. By this operation the pile-casing is adapted to automatically maintain its position upon the bottom of a stream or other body of water, and the submerged woodwork is effectually protected from the mud-line to a point above the surface. The pile-casing may be removed without affecting the structure, as it is lifted from the top, the sections being successively removed. When the pile-casing is removed, it may be used again, as it is not affected by sea-water or by ship-worms or other marine insects.

The sections may be made of any desired length, and when a pile-casing is applied to a crooked pile the sections by being made in short lengths and by being constructed to allow a limited play at the joints may be readily arranged to fit such crooked pile. Also by protecting the pile only from the mud-line to a point above the surface of the water a pile-protector of a minimum length is provided, and the cost is also reduced to a minimum and is much less than where an entire pile is protected.

In the above specification I have described in illustration of my invention a form of pipe or casing which in itself is a new and useful invention applicable to many other uses. I do not claim herein this pipe or conduit as an article of manufacture nor the method of

building it, as I have made other applications—to wit, Serial Nos. 258,771 and 258,772, filed May 4, 1905—for these improvements.

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

1. A pile-protector, comprising a tubular casing extending upward from the mud-line or bottom and movable independently of a pile to maintain itself automatically upon such bottom..

2. A pile-protector, comprising a tubular casing adapted to be arranged around a pile and extending upward from the mud-line or bottom, said casing being movable independently of the pile and adapted to maintain itself automatically on the bottom, and a filling or packing interposed between the casing and the pile.

3. A pile-protector, comprising a tubular casing adapted to be arranged around a pile and extending upward from the mud-line or bottom, said casing being movable independently of the pile and adapted to maintain itself automatically on the bottom, and a filling or packing interposed between the casing and the pile, said filling or packing consisting of loose material.

4. A pile-protector, comprising a tubular casing adapted to receive a pile and movable independently thereof and arranged to rest upon the bottom of a stream or other body of water, said casing being composed of a plurality of pipes detachably connected.

5. A pile-protector, comprising a tubular casing movable independently of a pile and composed of separable sections adapted to be placed around the pile, and means for detachably connecting the sections.

6. A pile-protector, comprising a tubular casing movable independently of a pile and divided longitudinally to form separate sections, and means for detachably connecting the sections.

7. A pile-protector, comprising a tubular casing movable independently of a pile and composed of a plurality of pipes detachably

connected at their adjacent ends, each pipe being divided longitudinally to provide separable sections.

8. A pile-protector, comprising a tubular casing composed of a plurality of longitudinally-divided pipes detachably connected at their adjacent ends, and a packing or filling of loose material interposed between the casing and the pile.

9. A pile-protector, comprising a plurality of longitudinally-divided pipes having overlapped longitudinal joints, and longitudinal keys extending through the pipes and concealed within the same.

10. A pile-protector, comprising a tubular casing composed of longitudinally-divided pipes, and upwardly-tapered keys locking the sections of the pipes together and extending substantially the entire length of the pipes.

11. A pile-protector, comprising a tubular casing movable independently of a pile and composed of a plurality of longitudinally-divided pipes, the longitudinal joints of one pipe being located at the intervals between the corresponding joints of the adjacent pipes, and means for detachably connecting the pipes.

12. A pile-protector, comprising a tubular casing adapted to receive a pile and movable independently thereof and arranged to rest upon the bottom of a stream or other body of water, said casing being composed of a plurality of pipes.

13. A pile-protector, comprising a tubular casing composed of separable sections, and means for detachably securing the sections together, said means embodying an overlapped joint, and a removable key extending through the joint.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

PHILIP AYLETT.

Witnesses:

S. R. MOORE,

W. C. WATSON.