

April 2, 1935.

J. H. PHILLIPS

1,996,121

ANCHONING DEVICE

Filed July 30, 1932

*Fig. 1*

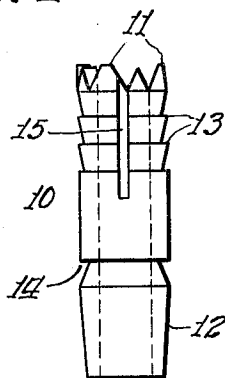


*Fig. 2*

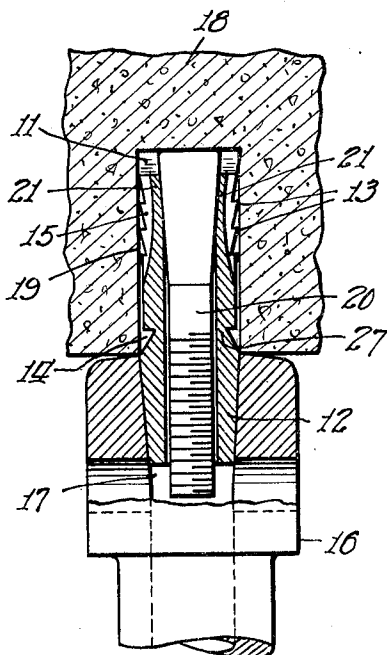


*Fig. 3*

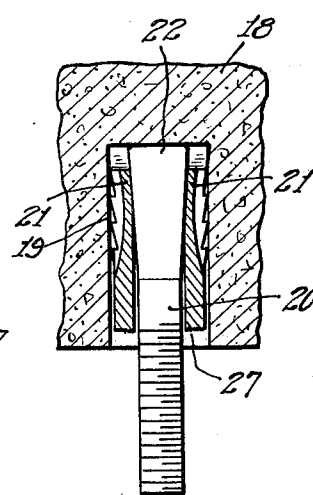
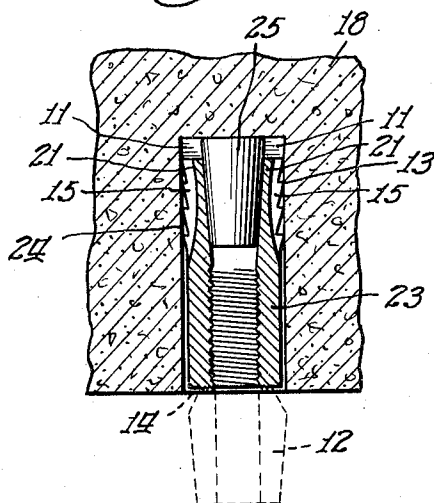


*Fig. 4*



Witness:  
V. Siljander

Inventor  
John H. Phillips  
By: Still and Hill

*Still and Hill*  
28

## UNITED STATES PATENT OFFICE

1,996,121

## ANCHORING DEVICE

John H. Phillips, Chicago, Ill.

Application July 30, 1932, Serial No. 626,492

11 Claims. (Cl. 72-105)

The invention relates broadly to anchoring apparatus utilized for fastening and holding various devices and mechanism on masonry walls, beams, ceilings, and the like. More particularly, the invention relates to improvements in anchor shells of the same general class as shown in my Patents Nos. 1,503,515 and 1,752,999 together with wedging means therefor wherein the shell is employed to drill its own hole in concrete or like material and is then wedged in position in the hole in a manner suitable for fastening apparatus thereto by means of threaded connections.

The invention embodies improvements in shells of the kind described consisting of a novel chuck engaging end which enable the shell to be mounted on the chuck of a hammer and actuated to drill its own hole by one continuous drilling operation and while mounted on the hammer, the shell is removed from its hole to permit the insertion of a wedge bolt in its cutting end following which the shell is replaced in the hole and driven by the hammer to permanent wedged position in the hole and by manipulation of the hammer the chuck engaging end of the shell may be broken off approximately flush with the masonry surface without the use of additional tools.

An object of the invention is the provision of an improved anchoring device of the kind described which is adapted for rapid installation in masonry. Illustrative of the speed of installation in tubular shells having a diameter and a length of approximately five-eighths of an inch and two inches respectively, it is found in practice that the entire operation of drilling the hole, wedging and breaking off the end of the shell can be performed in less than one minute due to the saving in time resulting from drilling the hole complete without removal of the shell for cleaning and that only one setting of the shell on the chuck is required.

Among the objects of the invention is the provision of an improved anchor shell of the kind described operable, by one setting of the shell in the chuck of a hammer, to perform all the steps of drilling the hole, insertion of a wedge, expanding the shell to a tight fit in the hole and which has an annular frangible portion adjacent the chuck engaging end of the shell adapting the same to be broken off flush with the surface of the masonry in which the shell is installed.

Another object of the invention is the provision of an improved shell of the kind described by means of which a hole may be drilled full depth in masonry without requiring removal of the shell for cleaning of the waste material.

A further object of the invention is the provision of an anchor shell of the kind described which is simple adapted for quick and easy manipulation to drill a hole, permanently install the shell therein and which is otherwise satisfactory for its intended purpose.

In the drawing, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a view of a combined anchor shell and drill embodying the principles of the invention;

Fig. 2 is a longitudinal sectional view of the shell illustrated in Fig. 1, showing the shell as mounted on the chuck of a hammer and positioned in a hole drilled by the shell with its cutting end expanded by being wedged about the upset end of a bolt;

Fig. 3 is a view similar to Fig. 2 showing the shell with its chuck engaging end broken off by transverse manipulation of the chuck for that purpose; and

Fig. 4 is a view of an alternative form of shell in wedged position in a hole drilled by the shell.

Referring now more particularly to the drawing wherein I have shown a preferred form of the invention, the reference character 10 generally designates a tubular shell which may be formed from any suitable material such for example as pipes, tubing or plates. The tubular shell 10 is provided at one end with a plurality of cutting teeth 11 and has its opposite end 12 tapered for mounting by wedging in a correspondingly tapered opening 17 in a chuck 16 of a hammer, not shown.

A plurality of annular teeth 13, on the outer periphery of the shell, assist in the cutting action by enlarging the hole sufficiently to avoid possibility of wedging of the shell in its hole during the drilling operation. A plurality of longitudinal grooves 15 are provided in the shell 10 adjacent the cutting teeth 11. The grooves 15 are sufficiently deep that the material underlying the grooves is relatively thin and provide corresponding longitudinal frangible portions 21.

An annular groove 14 is formed in the shell intermediate its cutting and chuck engaging ends and adjacent the latter. The groove 14 is of a depth such that the underlying material 27 provides an annular frangible section easily broken by the application of force transversely to the shell but of sufficient strength to remain intact under longitudinal force applied to the shell by the chuck 16 in actuating the shell as a drill and in wedging the shell in the hole drilled by the shell.

The anchoring device comprises in addition to the shell 10, a wedge bolt 20 having an upset end 22. The various steps in the drilling and wedging operations consist in mounting the shell 10 in the chuck 16 by wedging the shell in the outer tapering end of a socket hole 17, extending longitudinally of the chuck and having a substantial depth as shown in Fig. 2. The hammer on which the chuck 16 is mounted is then actuated to cause the shell to drill a hole 18 in the masonry wall 18. The maximum depth of the hole 18 is limited by the contact of the chuck 16 with the wall 18. The hole 18 is substantially self cleaning, the major portion of the waste matter escaping through the shell into the socket 17 and thereby enabling the hole to be drilled by one operation without removal of the shell for cleaning the hole.

Upon completion of the drilling operation, the hammer is moved away from the work sufficiently to remove the shell 10 from the hole 18 and insert the wedge bolt 20 in the shell with its upset end 22 projecting from the cutting end of the shell and its threaded end extending beyond the annular groove 14 and into the hole 18 in the chuck 16, the amount of such projection depending upon how much the threaded end of the bolt is to project beyond the outer surface of the wall. The shell is then replaced in the masonry hole 18 and by actuation of the hammer, the chuck forces the shell to the position shown in Fig. 2. The upset end of the bolt 20 is driven into the shell thereby breaking the longitudinal frangible portions 21 with the result that the shell is expanded and wedged in position against the wall of the hole 18.

The annular groove 14 is so positioned that its deepest portion is approximately coincident with or slightly within the surface of the wall 18 when the shell is expanded in the hole 18. The anchoring or wedging of the shell 10 having been completed, the hammer is manipulated in a manner to cause the chuck 16 to break off the chuck engaging portion of the shell at the groove 14.

The groove 14 is made V shaped with its rear-most bounding surface perpendicular and its forward surface inclined, as it is found in practice that the projecting end of the anchored shell can be easily broken off at the deepest portion of the groove by tilting or moving the hammer back and forth transversely to the shell. The described manipulation of the hammer and chuck causes the shell to break in a plane coincident with the perpendicular bounding wall of the groove 14 leaving the broken end relatively smooth. It is also found in practice that if the groove 14 is bounded by two inclined surfaces instead of one, the shell is not so easily broken by transverse manipulation of the hammer as when one bounding wall of the shell is perpendicular. Neither is the resulting broken surface as smooth and uniform when both bounding surfaces are inclined as where one is perpendicular.

The amount the threaded end of the bolt 20 projects from the wall 18 is determined by its length as its upset end is positioned against the bottom of the hole 18 in the masonry as shown in Figs. 2 and 3. The threaded projecting end of the bolt provides means for fastening a variety of devices to the wall such for example, as the usual wall pictures, pipe hangers and the like.

An alternative embodiment of the device is shown in Fig. 4 as comprising a tubular shell 23 similar to the shell 10 except that its interior periphery at the chuck engaging end is threaded

for a substantial portion of its length. The shell 24 is mounted on the chuck 16 in the manner described for the shell 10 and a hole 24 is drilled in the concrete by a single operation without removal of the shell. Upon completion of the hole 24, the shell is removed from the hole without detaching it from the chuck and a short tapering wedge rod 25 is inserted in the cutting end. The shell 23 is again inserted in the hole and driven home until by the wedging action of the member 25, the frangible portions 21 are severed and the shell expanded in contact with the concrete. The chuck engaging end 12 shown in dotted lines is then snapped off at the annular groove 14 leaving the shell 23 embedded in the concrete. The V shaped annular groove 14, constructed as described, causes the shell to break along the plane of the perpendicular bounding wall of the groove and prevents an irregular breaking edge from forming tending to follow the interior threads as is found to be the case if both bounding walls of the groove 14 are inclined. The outer end of the shell being interiorly threaded, is adapted for fastening bolts thereon in a manner to suspend a variety of wall devices therefrom.

Thus, it will be seen that I have provided a novel anchor shell adapted to drill its own hole without removal for cleaning, and, without detaching the shell from a hammer chuck on which it is mounted, to insert a wedge bolt or rod in the cutting end whereby the shell is expanded and permanently mounted in the hole, the chuck engaging portion of the shell having an annular frangible portion adapting the shell to be broken off in a plane substantially coincident with the surface of the wall.

What I claim as new and desire to secure by Letters Patent is:

1. A tubular anchor shell embodying drilling teeth at one of its ends, frangible members adjacent said teeth permitting expansion of the shell, a chuck engaging portion at the other end of the shell, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, said groove being bounded by an inclined surface adjacent to said chuck engaging portion with the other edge of the groove bounded by a surface perpendicular to the longitudinal axis of the shell.

2. A tubular anchor shell embodying drilling teeth at one of its ends, frangible members adjacent said teeth permitting expansion of the shell, said shell being interiorly threaded, a chuck engaging portion at the other end of the shell, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, said groove being bounded by an inclined surface adjacent to said chuck engaging end of the shell with the other edge of the groove bounded by a surface perpendicular to the longitudinal axis of the shell.

3. An anchoring device comprising a tubular shell embodying drilling teeth at one end and a chuck engaging portion at the other end, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, the toothed end of said shell having a plurality of longitudinal grooves, a rod having one end adapted for insertion in the cutting end of said shell with the other end upset and projecting therefrom, said annular groove being bounded by an inclined surface adjacent to said chuck engaging portion of the shell with the other edge of the annular groove bounded by a surface per-

pendicular to the longitudinal axis of the shell.

4. An anchoring device comprising a tubular shell embodying drilling teeth at one end and a chuck engaging portion at the other end, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, the toothed end of said shell having a plurality of longitudinal grooves, an upset bolt having its threaded end of sufficient length to extend through said shell past said annular groove when inserted in the cutting end of said shell with its upset end within the toothed end of the shell.

5. An anchoring device comprising a tubular shell embodying drilling teeth at one end and a chuck engaging portion at the other end, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, the toothed end of said shell having a plurality of longitudinal grooves, a rod having one end adapted for insertion in the cutting end of said shell with the other end upset and projecting therefrom, the chuck engaging end of said shell being interiorly threaded beyond said annular groove.

6. An anchoring device comprising a tubular shell embodying drilling teeth at one end and a chuck engaging portion at the other end, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, the toothed end of said shell having a plurality of longitudinal grooves, a rod having one end adapted for insertion in the cutting end of said shell with the other end upset and projecting therefrom, the chuck engaging end of said shell being interiorly threaded beyond said annular groove, said annular groove being bounded by an inclined surface adjacent to said chuck engaging portion of the shell with the other edge of the annular groove bounded by a surface perpendicular to the longitudinal axis of the shell said rod having a total length less than the portion of the shell intermediate its groove and toothed end.

7. An anchoring device comprising a tubular shell embodying drilling teeth at one end and a chuck engaging portion at the other end, the intermediate portion of the shell having an annular groove adjacent said chuck engaging portion, the toothed end of said shell having a plurality of longitudinal grooves, a bolt having its threaded end portion insertable in the cutting end of said shell to project beyond said annular groove, the

other end of said bolt being upset to a diameter greater than the interior of said shell, said annular groove being bounded by an inclined surface adjacent to said chuck engaging portion of the shell with the other edge of the annular groove bounded by a surface perpendicular to the longitudinal axis of the shell.

8. A tubular shell providing drilling teeth at one end and having its other end adapted for mounting on a chuck, a portion of the shell adjacent said chuck engaging end having less thickness than the body of the shell intermediate its ends thereby adapting the shell for severance at said section by manipulation of the chuck when the shell is mounted on the chuck and positioned in the hole drilled thereby.

9. An internally threaded tubular shell providing drilling teeth at one end and having its other end adapted for wedging engagement with a chuck, an annular portion of the shell adjacent said chuck engaging end having less thickness than the body of the shell intermediate its ends thereby adapting the shell for severance at said section by manipulation of the chuck when the shell is positioned in a hole drilled by the shell by actuation of the chuck.

10. A tubular shell providing drilling teeth at one end and having its other end adapted for mounting on a chuck, the toothed end of said shell providing a longitudinal groove, an annular portion of the shell adjacent said chuck engaging end having less thickness than the body of the shell intermediate its ends, and a rod having one end adapted for insertion in the cutting end of said shell with its other end upset and projecting therefrom.

11. An internally threaded shell providing drilling teeth at one end and having its other end adapted for mounting on a chuck, the toothed end of said shell providing a plurality of longitudinal grooves, a relatively narrow annular portion of the shell adjacent said chuck engaging end having less thickness than the body of the shell intermediate its ends, and a rod having one end adapted for insertion in the cutting end of said shell with its other end of slightly larger diameter than the interior of the shell and projecting therefrom.

JOHN H. PHILLIPS.