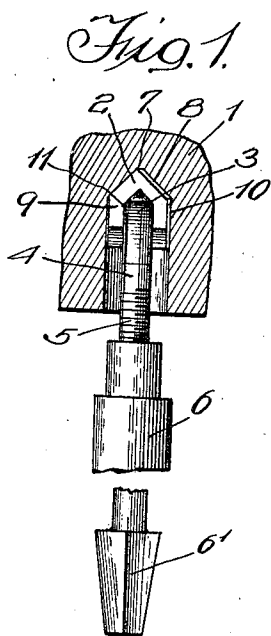
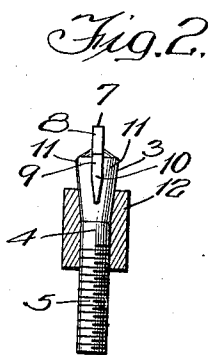
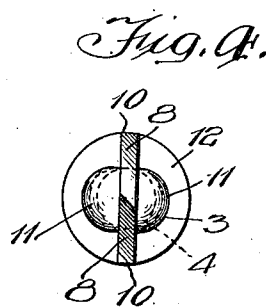
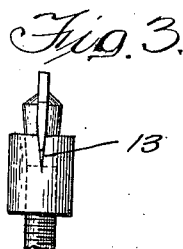
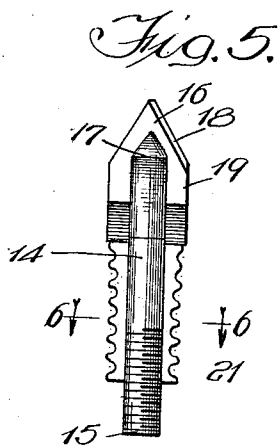
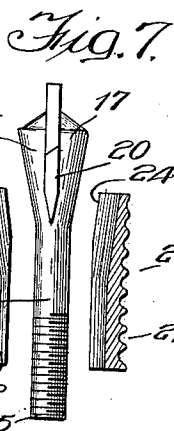
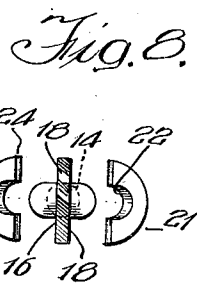
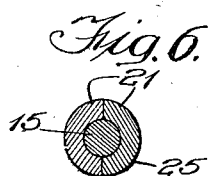


Mar. 27, 1923.

J. H. PHILLIPS.
SELF DRILLING ANCHORING DEVICE.
FILED MAY 13, 1921.

1,449,625.



Witnesses:
W. F. Kilroy
Harry R. L. White

Inventor:
John H. Phillips
By *McKee & McKee*
Attys.

Patented Mar. 27, 1923.

1,449,625

UNITED STATES PATENT OFFICE.

JOHN H. PHILLIPS, OF CHICAGO, ILLINOIS.

SELF-DRILLING ANCHORING DEVICE.

Application filed May 13, 1921. Serial No. 469,337.

To all whom it may concern:

Be it known that I, JOHN H. PHILLIPS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Self-Drilling Anchoring Devices, of which the following is a description.

My invention belongs to that general class of devices known as anchor or expansion bolts, and relates particularly to an anchor drill bolt employed in anchoring or fastening various devices to surfaces of concrete, brick and stone, etc.

The installation of mechanical, electrical and other equipment in buildings requires the drilling of holes of various sizes and depths, in walls, floors and ceilings, and the use of what are commonly called expansion bolts, expansion shells and anchor bolts for fastening such equipment thereto.

There are many makes of these bolts and shells and in the use of all of them it is necessary to use a separate hammer or percussion drill for making the holes. These drills are of two types for hand and machine drilling, their cost of manufacture is such that economy requires the greatest possible number of holes per drill, resulting in the use of high grade costly steels and the general belief is that such is most economical and practical. While the hammer or percussion drill is generally used exclusively, any of the rotary drill bits commonly used for steel, etc., would work satisfactorily for a time, but the grinding away of the cutting edge is so rapid, and the number of holes per drill so few as to prohibit their use. Some disadvantages of this method in addition to the high cost of drills, is the unsatisfactory fit and finish of holes and often in drilling brick walls the hammering breaks the mortar bond leaving the brick loose in the wall.

Experience proves that most any quality of drill will, to some extent, drill concrete, brick and stone, such as are commonly used in building construction, and that drills can be made of cheap material and hardened to work satisfactorily for a limited amount of drilling. My invention has among its objects the obviating of the disadvantages mentioned and the production of an anchor drill bolt, as described, constructed of a grade of material and of such form as to permit of its manufacture at a cost very lit-

tle, if any, in excess of the cost of anchor bolts, not drill bolts, now in use, and of such quality and temper as to drill its own hole of required depth, and of such design that it may be held in the chuck of a rotary drilling device and used as a rotary drill bit to drill the hole in which it is used and then be securely calked, wedged or cemented therein and utilized as a permanent anchor or fastening.

A further object is the production of a self-drilling anchor bolt which on a variety of light work, such as fastening telephone, electric and other wires and fixtures to brick, stone, etc., can be used in the usual way of a rotary drill bit in a bit brace, breast or electric drill. Another good feature of this device is that it can be used under pressure feed and moderate speed to drill its own hole in concrete, which with the advantages of rotary over hammer drilling makes it especially valuable for fastening wires, conduits, seats, chairs, etc., to floors and ceilings.

My invention has among its further objects the securing of the advantages and the obviating of the difficulties above mentioned by the production of a device of the kind described which is simple, convenient, durable, economical, satisfactory, inexpensive, and efficient for use wherever found applicable. More especially it relates to an anchoring drill which is to be used in the usual manner but which may be employed as a rotary drill to drill its own hole, thereby saving the expense of drills. The type of drill herein described is a rotary type especially adapted for light work, which will permit operating the chuck and drill by a brace or breast drill, which may be in the tool kit of the mechanic. Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts;

Figure 1 is a view in elevation of a drill bolt embodying my improvement, in position in a chuck, as it is used in drilling;

Figure 2 is a side elevation of my drill

used as an anchor bolt, the chuck being removed and the sleeve thereon being shown in cross-section;

Figure 3 is an elevation of the drill bolt and sleeve shown in Figure 2;

Figure 4 is a top plan view of the bolt and shell assembled;

Figure 5 is an elevation of another form of anchor drill bolt, one of the expansible shell sections being removed;

Figure 6 is a section taken substantially on the line 6—6 of Figure 5;

Figure 7 is a vertical elevation of the anchor bolt shown in Figure 5, the shell sections being shown in section and separated from the bolt; and

Figure 8 is a top plan view of the parts shown in Figure 7.

In the drawings, 1 represents the material or body to be drilled, the drill therefor, in the case illustrated being the drill bolt, comprising a cutting blade 2 connected centrally to the head end 3 of the shank 4. The shank 4 of the drill bolt is threaded at 5 for engagement with a nut or other fastening device and when drilling with a cooperating chuck or the like 6, said chuck being provided with a suitable shank 6' adapted to fit in a brace chuck or equivalent tool, (not shown). In this case the chuck is provided with a bore threaded to engage the thread on the bolt. The bolt is screwed down into the nut in the chuck until it will go no further and then the device may be used similar to an ordinary drill or bit. The blade of the drill bolt is preferably tapered or convergent to its drill point 7, the drill blade in this instance comprising a flat plate positioned centrally of and extending diametrically of the shank, the convergent tapered edges being beveled, as at 8, so as to provide cutting edges and give proper clearance in drilling. The side edges at the rear end of the drilling top are extended rearwardly thereof, as at 9, and preferably have their outer edges 10 slightly rounded so that they may act as guides in contact with the walls of the hole to keep the drill going straight and prevent its cutting or running to one side when coming in contact with hard or soft spots common in concrete and brick.

The head end of the shank 4 is formed wedge-shaped or enlarged, that is, the head end is offset so as to form the enlarged portion 11 longitudinally of the shank and merging thereinto, said portion being oppositely directed and lying at each side of the cutting blade 2, as shown most clearly in Figure 4.

Adapted to cooperate with the drill bolt is an expansible sleeve 12 or shell, being slit or split if desired and preferably of a ductile material, such as lead or the like, but which may be of wood, or the equivalent, if desired, and having a bore therethrough of a

size to encircle the shank 4. In the walls of the shell at one end I have shown diametrically aligned recesses 13, which may be provided if desired, said recesses being adapted to receive the laterally extending blade extension 9, whereby relative rotational movement between the bolt and shell is prevented.

In operation the hole is first drilled, then the chuck 6 is removed and the shell slid over the bolt, the recesses 13 when provided engaging with the parts 9 thereof. The sleeve is moved into the hole axially of the bolt by any suitable means, (not shown), the sleeve being expanded outwardly by the wedge head of the bolt so as to frictionally engage the walls of the hole and thus securely hold the bolt in place therein.

In the modification shown in Figures 5 to 8 inclusive, the bolt has a threaded shank 15 and a diametrically positioned cutting blade 16 at the head end 17 of the bolt, the head end 17 being decreasingly tapered rearwardly to the straight shank, and the tapered portions 14 lying at each side of the cutting blade 16. The tapered, end-cutting edges 18 of the blade are beveled so as to provide a proper clearance for cutting, similar to the bevels 8 of the blade 2, the sides 19 being extended rearwardly of the cutting edges 18 to act as guides etc., and if desired tapered as at 20 for a purpose to be hereinafter described.

The sleeve or shell comprises a pair of mating sections or segments 21 having a central bore 22 therethrough, this bore being wedge-shaped in radial cross-section, as at 23, towards one end thereof so as to receive the radial wedges or arms 14 of the bolt head. The meeting edges of the shell sections in the construction illustrated are beveled outwardly at the internally enlarged end as at 24, so that when the shell sections 21—21 are assembled there will be tapered recesses formed by the cutaway bevels 24—24 at the line of juncture of the sections, these recesses being adapted to receive the rearwardly extending, radial, rearwardly tapered wings 19 of the cutting blade. This feature, however, is optional. If desired the shell may have a corrugated or other suitably roughened peripheral surface 25, as shown, in order to provide a better gripping surface in the wall of the drilled hole. The shell 21—21 is applied in place and expanded substantially similar to the shell 12, except that the shell 21 showing the expansion, is aided by the tapered wings 19 of the cutting blade. The shell and bolts may be of such design, material and construction as may be found necessary, this being dependent upon the nature of the work being done.

The device herein shown and described is particularly intended and designed for light work. While the same may be used in a machine, such as electric-driven, hand-drill,

or the like, the same is particularly suitable for use in a brace in which with the chuck described is used similar to an ordinary bit. The same is particularly suitable, convenient and desirable to electricians, telephone repair and installing men, and in fact is a handy article in the tool kit of any mechanic installing equipment. When necessary to anchor a device, whatever it may be, in a wall or ceiling, or in any other place, the mechanic inserts the bolt in his brace chuck, drills the hole, inserts the expansion shell member, preferably driving it into place whereupon it is expanded, locking the bolt in the hole. The device to be secured may then be secured on the bolt by means of the usual nut or the equivalent. While I have shown a chuck provided with a bit stock shank, it is obvious that the same may be constructed to fit the particular tool which the mechanic carries.

Having thus described my invention it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction and combination of parts herein shown and described, or uses mentioned.

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

1. In a device of the kind described and in combination an expansible shell, and a drill bolt projecting thereinto at one end and having tapered means thereon for simultaneously engaging the wall of the drilled hole and said shell and expanding said shell.

2. In a device of the kind described and in combination, an expansible shell, and a threaded drill bolt projecting thereinto at one end and having a plurality of spaced tapered means thereon for engaging said shell and expanding it.

3. An anchor drill bolt of the kind described a head having a pair of cutting blades at one end thereof lying in a common plane, said head being tapered rearwardly of said end and having a straight shank, and threaded adjacent the end.

4. In a device of the kind described and in combination, a bar having a radial wedge thereon at one end thereof, and a cutting blade at said end transversely of the plane of said wedge, and a shell adapted to encircle said bar and be expanded by said wedge.

5. In a device of the kind described and in combination, a bar having a longitudinally extending radial wedge thereon at one end thereof, and a cutting blade at one end lying in a plane transversely of the plane of said wedge, and an expansible shell constructed to encircle said bore and be expanded by said wedge.

6. In a device of the kind described and

in combination, a bar having a pair of longitudinally extending, oppositely directed radial wedges thereon at one end thereof, and a cutting blade at said end transversely of the plane of said wedges, and an expansible shell adapted to encircle said bar and be expanded by said wedge.

7. In a device of the kind described and in combination, a bar having a pair of longitudinally tapered radial wedges thereon at one end thereof, and a cutting blade at said end and lying in a plane perpendicular to said radial wedge and an expansible shell adapted to encircle said bar and be expanded by said wedge.

8. In a device of the kind described and in combination, a bar having a pair of longitudinally extending, tapered, radial wedges thereon at one end thereof, a cutting blade at said end transversely of the plane of said wedges, and an expansible shell adapted to encircle said bar, said shell having a recess therein tapering outwardly toward its end to receive said wedge and to be expanded thereby.

9. In a device of the kind described and in combination, a bar having a pair of longitudinally extending, tapered, radial wedges thereon at one end thereof, a cutting blade at said end transversely of the plane of said wedges, and an expansible shell adapted to encircle said bar, the bore of said shell being increasingly tapered in cross-section outwardly toward its end to receive said wedge and to be expanded thereby.

10. In a device of the kind described and in combination, a bar having a pair of longitudinally extending, tapered, radial wedges thereon at one end thereof, a cutting blade at said end transversely of the plane of said wedge, and an expansible shell adapted to encircle said bar, said shell having a recess therein tapering outwardly toward its end to receive said wedge and to be expanded thereby, said means preventing relative rotational movement between said bar and shell.

11. In a device of the kind described and in combination, a bar having a longitudinally extending, tapered, radial wedge thereon at one end thereof, a cutting blade at said end being in a plane transversely of the plane of said wedge, and an expansible shell adapted to encircle said bar and to be expanded by said wedge, said blade being extended rearwardly of its cutting point, and said shell having a longitudinal recess therein adapted to receive said rearwardly extending blade to prevent relative rotational movement between said bar and shell.

12. A drill bolt comprising a head having a longitudinally extending radial wedge thereon at one end thereof, a cutting blade at said end lying in a plane transverse to the plane of said wedge, and a shank por-

tion extending rearwardly of said end, the radial length of said blade being greater than the maximum radial length of said wedge.

5 13. A drill bolt comprising a head having a pair of longitudinally extending cutting edges lying in a plane at one end thereof and having guides of the same diameter as said cutting edges extending rearwardly
10 from said end-cutting edges and provided with a threaded shank engageable with a cooperating part.

14. In a device of the class described and

in combination an expansible shell, a drill bolt projecting therethrough, and tapered 15 means engageable between said bolt and shell for preventing relative rotation therebetween and expanding said shell.

In testimony whereof, I have hereunto signed my name in the presence of two sub- 20 scribing witnesses.

JOHN H. PHILLIPS.

Witnesses:

ROY W. HILL,
BERTHA HARTMANN.