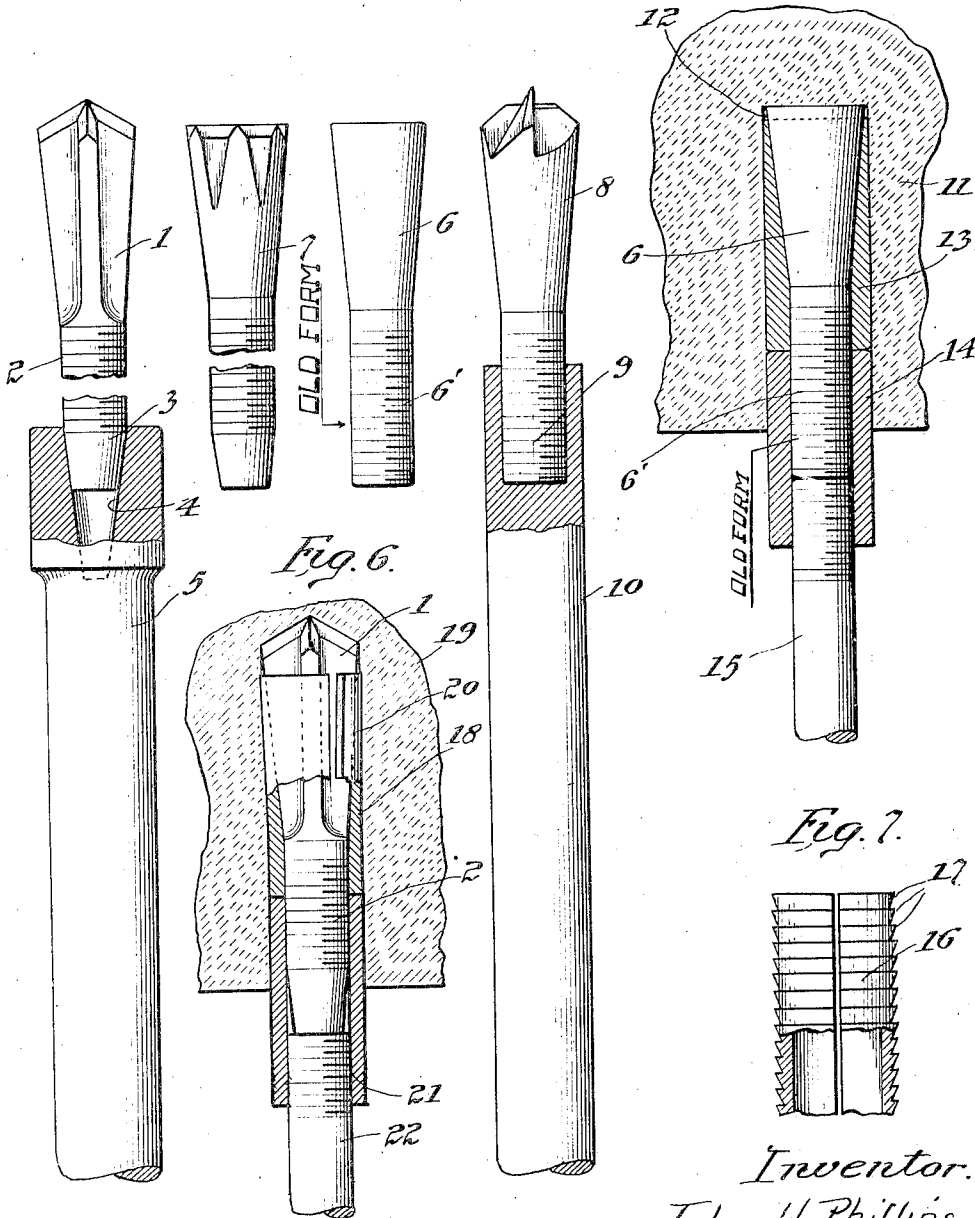


J. H. PHILLIPS.
ANCHOR DRILL BOLT.
APPLICATION FILED JUNE 21, 1919.

1,379,209.

Patented May 24, 1921.

Fig. 1. Fig. 2 Fig. 3 Fig. 4. Fig. 5.



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

UNITED STATES PATENT OFFICE.

JOHN H. PHILLIPS, OF CHICAGO, ILLINOIS.

ANCHOR-DRILL BOLT.

1,379,209.

Specification of Letters Patent.

Patented May 24, 1921.

Application filed June 21, 1919. Serial No. 305,882.

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 Anchor-Drill Bolts, 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 employed in the making of apertures in concrete, stone or brick for the reception of expansion or anchor bolts, which drill may thereafter be used in conjunction with other parts as an expansion bolt. Expansion bolts, sometimes termed "anchor bolts," are largely used in various constructions of concrete, brick, stone and other materials for the purpose of securely maintaining various devices and mechanisms in position thereon. They are largely used on ceilings and walls for the support of pipe and wire systems, as well as mechanical and other equipment and the like. Drills for making apertures in the walls or ceilings are comparatively short lived, this depending of course upon the class of material composing the wall on which the same are used. The custom is to use a drill until it becomes too dull for further practical use, when it is either discarded entirely with a consequent loss, or in some cases sent to the shop to be again sharpened, which also entails considerable expense.

My invention has among its objects the obviating of the difficulties above mentioned and the production of a device of the kind described which is simple, convenient, durable and efficient for use wherever found applicable. More especially it relates to a drill which may be used in the usual manner until worn out, and then employed as a bolt, thereby saving the expense of a bolt.

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 embodying my improvement in position in characters indicate like or corresponding parts,

Figure 1 is a view in elevation of a drill a chuck adapted to reciprocate said drill

in operation, the chuck being partly in section to show its construction;

Fig. 2 is a view in elevation of a similar drill of slightly modified form;

Fig. 3 is a view in elevation illustrative of a plain bolt adapted to be used in an opening made by either of said drills;

Fig. 4 is a view in elevation of a rotary drill somewhat similar to the one shown in Fig. 1, and one method of engaging the same with a chuck adapted to rotate said drill;

Fig. 5 is an elevation partly in section illustrating the operation of the plain expansion or anchor bolt and the cooperating parts therewith;

Fig. 6 is an elevation partly in section illustrating the use of my improved drill as an anchor bolt, the parts being partly in section to illustrate the operation; and

Fig. 7 illustrates a modified form of expansion shell.

In the drawings, 1 represents a four point drill with the cutting edges of the usual or preferred construction. The head or cutting end of the drill is tapered at a proper angle so that the same will operate as an expansion or anchor bolt in cooperation with the shell, as will be hereafter described. The shank 2 of the drill is threaded for engagement with a cooperating coupling 21 or nut, as will also be more fully described hereafter. The end of the shank 2 is preferably tapered to engage a corresponding flared or tapered recess 4 in a suitable reciprocating or percussion chuck or member 5. This engagement permits the chuck to be driven longitudinally in the usual manner of a percussion chuck without in any way injuring the threads on the shank 2, the portions being such that the drill is firmly engaged and maintained in the chuck without engaging and injuring the threads. In Fig. 3, 6 represents a well known type of plain bolt provided with the threaded shank 6', and it will be noted by referring to Figs. 1 and 3 that the head and shank of the drill substantially corresponds in shape with the head and shank of the bolt. The drill 7 shown in Fig. 2 is a modified form of six point drill, which may be used in the percussion chuck shown in Fig. 1.

Fig. 4 illustrates a rotary drill 8 formed

with the tapered head corresponding with the anchor bolt and with a shank 9 threaded. In this case a rotary chuck part 10 is arranged to engage the thread on the shank of the drill so that the drill may be rotated.

Fig. 5 illustrates the common type of anchor bolt shown in Fig. 3 in place after the hole has been drilled, and Fig. 6 illustrates the use of one of the drills as an expansion or anchor bolt. Referring to Fig. 5, 6 represents the expansion bolt arranged in the hole 12 drilled in the material 11. The sleeve or shell 13 is shown in this case in operative position, it being understood that the shell is made in any desired number of parts or split as desired to allow expansion of the inner end. Arranged on the threaded shank 6' of the bolt is the coupling sleeve 14, which carries a rod or hanger bar 15 also threaded to engage the sleeve, and adapted for supporting whatever may be desired. In Fig. 6, 1 represents the drill used as an expansion or anchor bolt extended into a hole in the material 19. Arranged on the bolt is the expansion shell 20 and coupling 21 which carries the rod 22. In securing the plain bolt or drill bolt in place, the expansion shell and bolt are inserted in the hole as far as the same can be forced therein, after which the coupling or threaded sleeve is positioned. The coupling tends to force the expansion shell on the bolt, or what is the same thing, draw the bolt through the shell, causing the expansion shell to expand and frictionally engage the walls of the hole, so that the bolt is securely held in place. The rod 22 may then be screwed in place and the same support whatever is desired to be carried thereby. With the shell 16 shown in Fig. 7, the same is formed with what may be termed cutting teeth 17, so that the same may be driven into the hole on the bolt, and the same at the time it is being so driven engage the walls of the hole, and to a certain extent cut a flared hole. The advantages of constructing the drill so that it may be used as an anchor bolt are numerous.

In practical use drills, according to size, at the present time, cost from forty cents each and upward in quantities, and in use may drill one hole or any number up to, in some cases, as many as fifty holes, depending upon the class of material to be drilled. Some types may be resharpened a limited number of times by grinding, but as a rule it is necessary to upset, dress and retemper drills, this entails not only the expense of redressing, but also the time lost in getting drills to shop and back to the work, and in many cases the worked over drill is unsatisfactory unless resharpened by an expert tool dresser familiar with the work and equipped for doing the same. The drill bolt herein shown is designed to drill equally

as many holes as the common types of drills above referred to and now in use, and is so designed that after it has become too dull for further use, it may be used, with shell and coupling or nut, as previously described, as an expansion or anchor bolt in one of the holes it has drilled, and is also of such design that plain bolts of the same general shape, and of cheaper material and construction, may be used with like shell and nut or coupling in the other holes which is drilled. As for example, say it is necessary to use ten one-half inch expansion bolts in hanging a line of pipe to a concrete ceiling. With the bolt herein described, it would be necessary to use one one-half inch drill bolt and nine one-half inch plain bolts, drilling the ten holes with the drill bolt and then using it and the nine plain bolts with their shells and couplings in the ten holes drilled. The use of this drill bolt insures the right size drills of uniform quality at all times and obviates the expense and trouble incident to using and resharpening drills of other types.

Among the many uses to which my improved drill bolt is particularly adapted, may be mentioned their use in connection with the drilling of holes for the installation of automatic sprinkler systems in concrete buildings, such sprinkler systems require a number of sizes of pipe which may vary from ten or twelve inches diameter for mains, to three-quarter inch for laterals or branches, according to the number of sprinkler heads and the distance from supply. For hanging or suspending these various sizes, correspondingly varying size expansion bolts and hangers are required. The size of expansion bolts and hangers commonly used are three-eighths, one-half, five-eighths and three-quarter inch, these sizes referring to the diameter of the rod or hanger used for suspending the pipe. In present practice a one thousand bolt installation would require, assuming twenty to be the average number of holes a drill will make before it becomes too dull for further practical use, one thousand expansion bolts and fifty-one drills, consisting of four sizes to accommodate the four sizes of expansion bolts. With my improved drill bolt the same installation would require nine hundred and forty-nine expansion bolts, of the plain bolt type previously described, and fifty-one drill bolts which would also be used as expansion bolts after the holes are drilled, and by making the outside diameter of the three-eighths inch shells the same as the one-half inch, and the five-eighths inch the same diameter as the three-quarter inch size, only two sizes of drill bolts would be used in drilling the holes for the four sizes. This would be a saving of fifty-one bolts and would simplify

the work in requiring only two sizes of drills, leaving no dull or broken drills to be resharpened or lost, or hauled from job to job.

5 The shells for use with the drill bolts and plain bolts may be of such design, material and construction as may be required or found necessary, or drill bolts and plain bolts may be used with lead or other calking rings. While I have particularly mentioned and pointed out the advantages of the device when used on automatic sprinkler work, the same may be used equally well for other kinds of work, and the drill bolt may be used as an expansion bolt in its own hole, or by varying the size of the shell, may be used in holes drilled with the next larger size drill bolt. This is immaterial in so far as the use of the drill bolt is concerned, and depends upon the particular work in hand.

The drill may be manufactured of material suitable for the purpose and tempered or case hardened to the extent desired or found necessary. It is found by experience that in some cases, the drill can be made of the same material as the ordinary bolt and in a suitable bolt machine, and then be case hardened. Of course when so constructed it does not ordinarily have the life of the steel drill, but does have sufficient for some purposes. The cost in the case of this type of drill is but little more than the cost of an ordinary bolt.

35 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, arrangement and combination of parts herein shown and described, or uses mentioned.

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

45 1. A drill bolt comprising a drill head provided with a shank, the drill tapering from adjacent the end of the head thereof to the shank, said shank provided with a thread thereabout.

50 2. A drill bolt comprising a head having cutting edges at the end thereof and tapered from the head and provided with a straight shank, said shank threaded to engage a cooperating part.

55 3. A drill bolt comprising a head having cutting edges at the end thereof and tapered from the head to provide a straight

shank, said shank threaded to engage a cooperating part, the extreme free end of the shank tapered to engage a suitable chuck. 60

4. A drill bolt of the kind described, comprising a head end and a shank, the head end being tapered from a point adjacent the free end of the same to the shank and formed with cutting faces at the free end, 65 the opposite end of the shank being tapered, said shank being threaded between said tapered end and the head, in combination with an expansible shell arranged on said head end, and a coupling arranged to engage the thread on said shank and the end of said shell.

5. In a device of the kind described and in combination, a drill bolt formed with a cutting edge at one end and tapered at the 75 opposite end, with a threaded straight shank intermediate the ends, the cutting end of said bolt tapered to the straight shank portion, a shell arranged about said bolt adjacent the cutting end, and a coupling arranged to engage the threaded end of said shank and of a length to engage a threaded rod projecting thereinto from the opposite end.

6. An anchor drill bolt comprising a drill 85 provided with a tapered head adapted to cooperate with an expansion shell, and having its opposite end formed to be engaged with a chuck, the shank of the bolt being screw threaded to engage a cooperating part adapted to force the drill longitudinally in the expansion shell.

7. An anchor drill bolt comprising a drill provided with an enlarged head and a screw threaded shank, the shank near the end 95 thereof being tapered to seat within a cooperating chuck.

8. An anchor drill bolt comprising a drill provided with an enlarged head and a screw threaded shank, said shank constructed to 100 seat within a cooperating chuck.

9. An expansion shell expanding bolt comprising a bolt provided with an enlarged head and having cutting means thereat, and provided with means for engaging a cooperating 105 chuck.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN H. PHILLIPS.

Witnesses:

ROY W. HILL,
CHARLES I. COBB.