G. E. CHISMER.

DRILL.

APPLICATION FILED JUNE 12, 1915.

1,176,273.

Patented Mar. 21, 1916.

Fig. 1

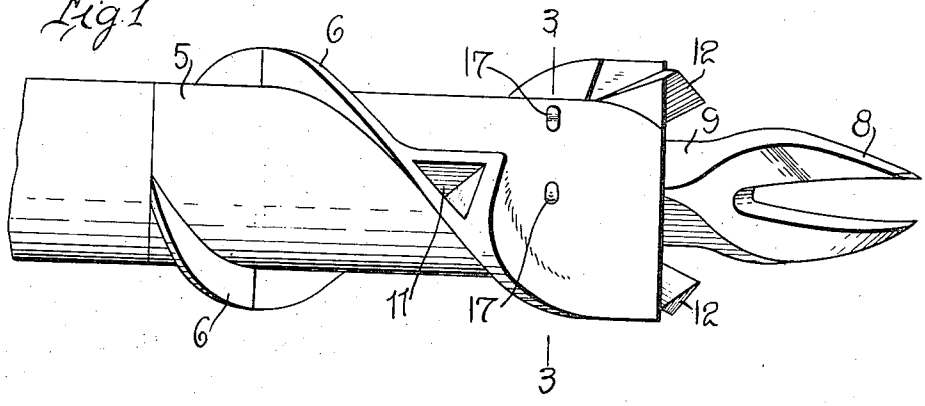


Fig. 2

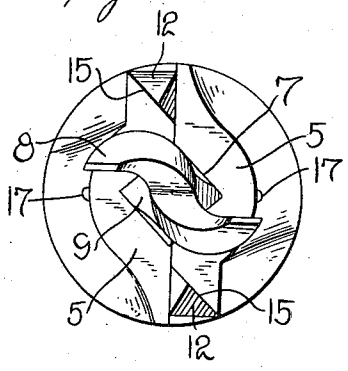


Fig. 3

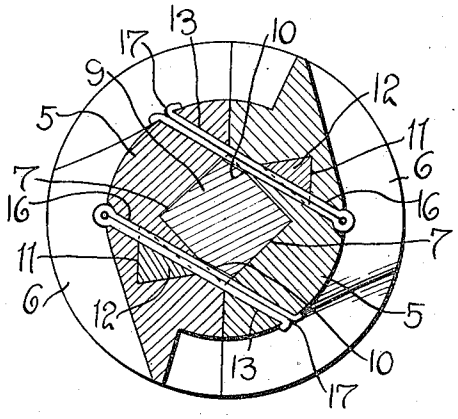


Fig. 4

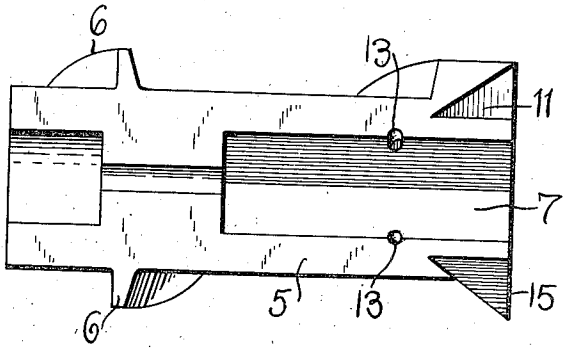
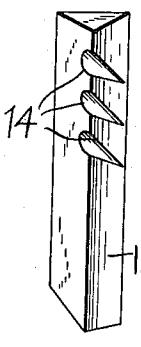


Fig. 5



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DRILL.

1,176,273. Specification of Letters Patent. Patented Mar. 21, 1916.

Application filed June 12, 1915. Serial No. 33,784.

To all whom it may concern:

Be it known that I, GEORGE E. CHISMER, a citizen of the United States, residing at Kingston, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Drills, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved drill and has for its primary object to provide a coal or rock drill which is so constructed that the hole in the wall being operated upon is automatically cleared of the cut material so that the cutting bit may have free and unrestricted action.

The invention has for another and more particular object to provide a drill including a shank adapted to receive a main axially disposed cutting bit, and angularly disposed supplementary cutting bits mounted in the shank upon opposite sides of the main cutting bit and operating to automatically draw or force the drill into the coal wall without necessitating the application of a positive pressure thereto.

The invention has for an additional object to provide a drill having a shank constructed in two sections and provided with means for receiving a main axially disposed cutting bit and angularly disposed auxiliary side bits, and simple and effective means for locking the sections of the drill shank and the main and auxiliary bits against relative movement and also securing the auxiliary bits in an adjustable position in the shank.

With the above and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts to be hereinafter more fully described, claimed, and illustrated in the accompanying drawing, in which,

Figure 1 is a side elevation illustrating the preferred embodiment of my improved drill; Fig. 2 is an end elevation thereof; Fig. 3 is an enlarged section taken on the line 3—3 of Fig. 1; Fig. 4 is a detail inner face view of one of the shank sections of the drill; and Fig. 5 is a detail perspective view of one of the auxiliary cutting bits.

Referring in detail to the drawing, 5 designates the two drill shank sections which are identical in form and construction. Each of these shank sections is of semi-circular form in cross-section and each provided with an exterior spiral rib or pin, indicated at 6. These pins, when the shank sections are connected, are disposed in mating relation so that they form a continuous worm or screw.

Each of the shank sections 5 is provided in its outer end with one-half of a rectangular socket, indicated at 7, and these sockets receive a square shank 9 of the cutting bit 8. This main cutting bit may be of any desired type and provided with two or more angularly disposed cutting teeth. The oppositely related corners or longitudinal edges of the square shank 9 of the cutting bit are provided with notches or recesses, indicated at 10, for a purpose which will be hereinafter explained. Each shank section 5 also has formed therein, on its outer end at one side of the socket 7, an obliquely disposed or inclined opening 11 which is of triangular cross-sectional form and is adapted to receive one of the triangular shaped auxiliary cutting bits 12. The opening 11 extends entirely through the shank section and such shank section, intermediate of the ends of said opening, is provided with a transverse orifice 13 which intersects the opening 11. In one longitudinal edge of the bit 12, a series of spaced notches 14 are formed, any one of which is adapted to be disposed in registering relation to the orifice 13. The shank section 5 is provided on the opposite side of the socket 7 with respect to the opening 11, with a shoulder or seat 15 upon which the bit 12, carried by the other shank section, is adapted to engage. An additional opening or orifice 16 is also provided in the shank section 5 and is adapted to register or coincide with the orifice 13 of the other shank section.

For the purpose of securely holding the several parts of the device in assembled relation, I provide the split keys 17. In assembling the bits in the sectional shank of the drill, it will be understood that the two auxiliary bits 12 are first adjusted in the respective shank sections so as to dispose one of the recesses 14 in each bit in registering relation with the orifice 13 in the shank section. The two sections of the shank 5 are then arranged upon each other and the main cutting bit 8 engaged in the socket of the shank. The recesses 10 in the shank of the bit are disposed in registering relation with the openings 13 and 16 in the shank

sections. The keys 17 are then inserted through said mating openings in the sections of the shank and engaged in the notches 14 of the side bits 12 and also in the recesses 10 in the shank of the main cutting bit. Thus, it will be apparent that, by means of the two keys, the shank sections 5 are securely held together and the main and auxiliary bits are also fixed against relative movement in the drill shank.

From the above description, the construction, as well as the several advantages of the invention in practical use will be apparent to those skilled in the art.

The drill may be used in connection with any approved type of mining machine and is driven into the coal or rock wall and then turned in the opening thus provided, so that the teeth of the main bit 8 will cut into the coal or rock at the base of the opening, and the side bits 12 also perform a positive cutting action upon the side walls of the opening at the inner end of the main bit. As these auxiliary bits are disposed at reverse angles upon opposite sides of the main cutting bit, they will act, in the rotation of the drill, to draw the same inwardly and thus create a constant pressure of the teeth of the main cutting bit upon the material. At the same time, the spiral worm or screw upon the periphery of the drill shank will remove the cut material from the opening in the wall and keep the same clean so that the several cutting bits may freely act upon the walls of the opening and not be clogged or retarded in their action by the accumulations of the cut material. The side bits 12 are disposed at an angle of approximately 45°, and in view of the inclination of the cutting edges of these bits, they will not simply scrape the walls of the opening, but will positively cut into the material and break the same away in particles. These auxiliary cutters, when they become dull, may be readily sharpened, and by the provision of the series of notches 14, they can be readily mounted and secured in the drill shank as they are gradually shortened by such sharpening thereof.

The several parts of my invention as above described, are of exceedingly simple form, and it is apparent that the invention, as a whole, may be inexpensively manufactured.

It will be seen that I have provided a very simple and effective means for easily, quickly and securely locking the several parts of the drill together which will permit of their ready assemblage or disassemblage.

The drill shank may be of any desired length and any approved means may be employed for connecting the same to the operating bar or rod of a mining machine.

While I have shown and described the preferred construction and arrangement of the several elements employed, it is to be understood that the invention is susceptible of considerable modification therein and I, therefore, reserve the privilege of resorting to all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

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

A drill of the character described including a shank formed in two mating sections of identical formation, said shank having a socket in its outer end, a main cutting bit adapted to be engaged in said socket, each of the shank sections being formed upon one side with an obliquely disposed opening, an auxiliary cutting bit adapted to be engaged in said opening, a shoulder formed on each section upon the opposite side of the socket with respect to the obliquely disposed opening adapted to be engaged by the auxiliary bit, each of said bits and the shank of the main bit having recesses therein, said shank sections being provided with mating transverse openings, and removable locking keys adapted to be engaged through said openings and also in the notches of the auxiliary bits and the main bit to hold said bits against relative movement in the drill shank.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

GEORGE E. CHISMER.

Witnesses:
CHAS. F. MILLER,
D. S. CLARK.