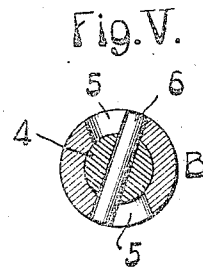
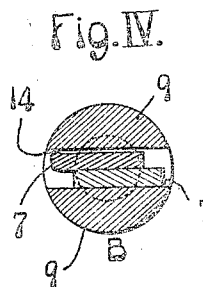
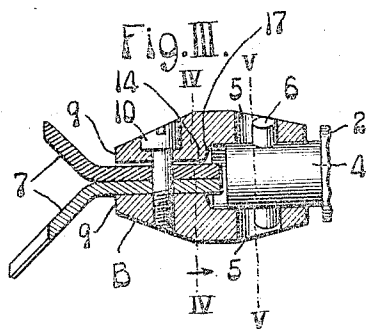
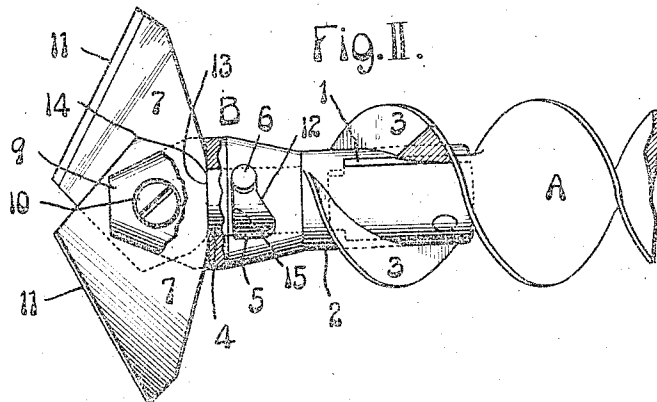
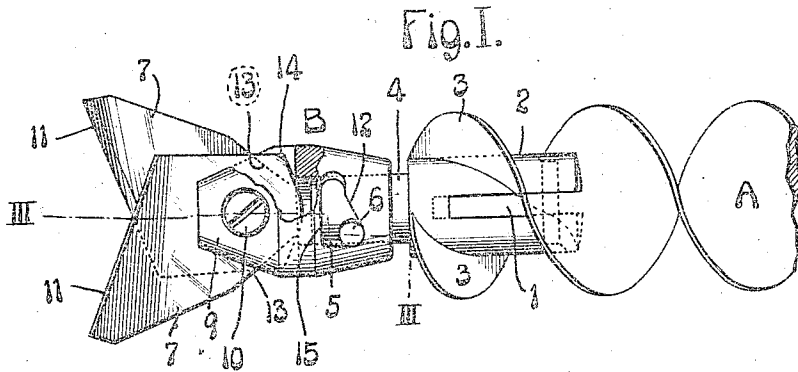


S. T. SKEEN.
MINER'S DRILL.
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1,065,005.



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MINER'S DRILL.

1,065,005.

Specification of Letters Patent. Patented June 17, 1913.

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To all whom it may concern:

Be it known that I, SAMUEL T. SKEEN, a citizen of the United States of America, residing at Sandoval, in the county of Marion and State of Illinois, have invented certain new and useful Improvements in Miners' Drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a drill particularly adapted for use in drilling into coal deposits, and has for its object the production of a drill having detachable cutter blades which may be very easily removed from or attached to the auger stem of the drill. The blades are pivoted to a cutter head at the end of the auger stem so as to swing toward each other when the drill is being withdrawn from the hole and automatically assume an extended position, and be positively locked in such position while the drill is in service. As the pivoted blades are locked in an extended position, they cannot swing toward each other in boring through "mother coal" or other soft substances.

The ordinary coal drill will very frequently become wedged in the hole being drilled by striking sulfur, or other material encountered, which causes the drill to be diverted laterally, thereby binding the drill tightly in the hole so that considerable labor is required to withdraw the drill. The pivoted blades of my improved drill will readily collapse or swing toward each other during the withdrawal of the drill, and can always be very easily withdrawn from the hole.

In drilling a hole with an ordinary drill, a tapered hole is produced by reason of the drill bit being worn down during the drilling operation. A hole so formed is very difficult to tamp, as the tamping material will wedge in the hole, and air spaces will be present back of the tamped material. My drill is so constructed as to drill a hole in which "false tamping" may be avoided, inasmuch as it permits the use of a pair of old blades having their points worn away to drill the first part of the hole, and a pair of

new blades in drilling the remainder of the hole. It will be understood that the new blades are swung toward each other so they will pass freely through the outer portion of the hole, and when the blades reach the end of the hole, the drill may be operated with the result of automatically extending the blades and locking them in their extended positions.

Figure I is a side elevation, partly in section, of a portion of a drill embodying the features of my invention. Fig. II is a view similar to Fig. I, showing the blades extended. Fig. III is a section taken approximately on the line III—III, Fig. I. Fig. IV is a section taken approximately on the line IV—IV, Fig. III. Fig. V is a section taken on the line V—V, Fig. III.

In the accompanying drawings: A designates a drill stem in the form of a spiral conveyor or worm having its end 1 flattened to fit into a slotted thrust rod 2. The stem A is interlocked with and riveted to the thrust rod 2, and the latter is preferably provided with short wings 3 forming a continuation of the spiral conveyor. The end portion 4 of the thrust rod is arranged within and slidably fitted to a cutter holder B. The cutter holder has oppositely disposed transverse slots 5 for the reception of a pin 6 on the thrust rod, whereby said parts are connected. Blades 7 are arranged between jaws 9 and pivotally and detachably connected thereto by a screw 10, which serves to hold the jaws from spreading.

The blades 7 may be swung to the position seen in Fig. I to allow the drill to be inserted into a hole, and when the blades reach the end of the hole, the drill may be operated, with the result of moving the blades to the position seen in Fig. II. When the drill is rotated with the inclined cutting edges engaging the material to be drilled, the blades will automatically move to the position seen in Fig. II, and at this time, the pin 6 will ride along cam walls 12, at the rear of the slots 5, and finally lie in the ends of said slots beyond the cam faces on the walls 12. The rotation of the drill causes the pin 6 to be retained in the ends of slots

5, as seen in Fig. II, and the end of the thrust rod will therefore bear against the flat rear faces 13 of the cutter blades, so as to positively hold the latter in their extended positions.

To prevent the blades 7 from swinging to their extended positions while the drill is being inserted into a hole, at least one of the blades is preferably offset, as shown at 14, to frictionally engage one of the jaws 9, (Fig. IV), thereby forcing both blades into frictional engagement with the jaws 9.

To prevent the pin 6 from being strained by a reverse rotation of the spiral stem A while the drill is under pressure, the slot 5 has a straight forward wall 15 opposite the rear cam wall 12. This straight wall 15 preferably lies at a right angle to the axis of the drill, hence the drill may be reversely rotated while under pressure, without imparting a longitudinal thrust to any of the parts, and without in any way injuring the pin 6.

The inclined cutting edges of the blades 7 extend from points in front of the cutter holder to points some distance rearwardly of the front end of said holder, and it will therefore be understood that the cut material is deflected by the blades to a point some distance back of the front end of the cutter holder. It will be noted that the blades are also offset to provide inclines for deflecting the cut material away from their cutting edges. This arrangement of the blades prevents the cutter holder from becoming clogged with cut material lying in front of it.

The jaws 9 of the cutter holder have rear beveled faces 17, (Fig. III), located within the thrust rod bore at its forward end. The object in forming this beveled face is to enable the thrust rod 4 to force out between the blades 7 and the jaws 9 any material tending to prevent said rod from moving to its seat against the flattened rear edges of the blades.

The flattened end 1 of the stem of my drill is connected to the thrust rod 2 by a rivet, as shown, and to hold the thrust rod from pivotal movement, said flattened end is provided with a tongue, (see dotted lines Figs. I and II), that seats in a suitable recess in the rear end of the thrust rod.

An important advantage in my drill is that the drill blades being detachable from the drill stem, they may be removed and replaced by other blades whenever necessary, without the necessity of taking the drill stems from a mine to sharpen their bits, as is ordinarily done, and a single drill stem may be used for years, owing to there being practically no wear thereon, the wear being received by the detachable blades.

I claim:

1. A miner's drill comprising a stem, a thrust member at the end of said stem, a blade holder rotatable on said thrust member, the said holder having inclined cams extending diagonally thereof relative to the axis of the holder, and said thrust member being provided with elements operable in contact with said cams to impart longitudinal movement to said blade holder, and blades pivoted to said holder, said blades being positioned to be engaged by said thrust member during the operation of the drill.

2. A miner's drill comprising a stem, a thrust member at the end of said stem, a blade holder rotatable on said thrust member, the said holder having inclined slots extending diagonally thereof relative to the axis of the holder, and said thrust member being provided with elements operable in said slots, and blades pivoted to said holder, said blades having flat faces adapted to be engaged by the end of said thrust member.

3. A miner's drill comprising a stem, a thrust rod at the end of said stem, a blade holder slidably fitted to said thrust rod, said blade holder having a slot provided with a cam wall, a pin on said thrust rod extending into said slot, and blades pivoted to said blade holder, each of said blades having a flat face adapted to be engaged by said thrust rod.

4. A miner's drill comprising a stem, a thrust rod at the end of said stem, a blade holder slidably fitted to said thrust rod, said blade holder having a slot provided with a cam wall, a pin on said thrust rod extending into said slot and adapted to ride along said cam wall to a point beyond the end of its cam face, and blades pivoted to said blade holder, each of said blades having a face adapted to be firmly engaged by the end of said thrust rod when said pin is located beyond said cam face.

5. A miner's drill comprising a stem, a thrust member at the end of said stem, a blade holder having a slot and pin connection with said thrust member, and blades pivoted to said holder, said blades being positioned to be engaged by said thrust member during the operation of the drill; one of said pivoted blades having an offset portion adapted to frictionally engage said blade holder for the purpose described.

6. A drill comprising a stem, a thrust rod at the end of said stem, a blade holder having a bore in which said thrust rod is slidably mounted and having a pair of jaws at its forward end, blades pivotally mounted between said jaws and adapted to be engaged by said thrust rod, said jaws having beveled faces at their rear ends within said bore to facilitate discharge of substance

from said bore between said jaws and blades.

7. A miner's drill comprising a stem, a blade holder at the end of said stem, and blades pivoted to said blade holder, each of said blades having an inclined cutting edge extending from a point in front of the blade holder to a point some distance rearwardly

of the end of said holder and each of said blades being offset to provide inclines for deflecting the cut material away from the cutting edges of the blades. 10

SAMUEL T. SKEEN.

In the presence of—

DAVE ROGERS,
AND SHERMAN.