

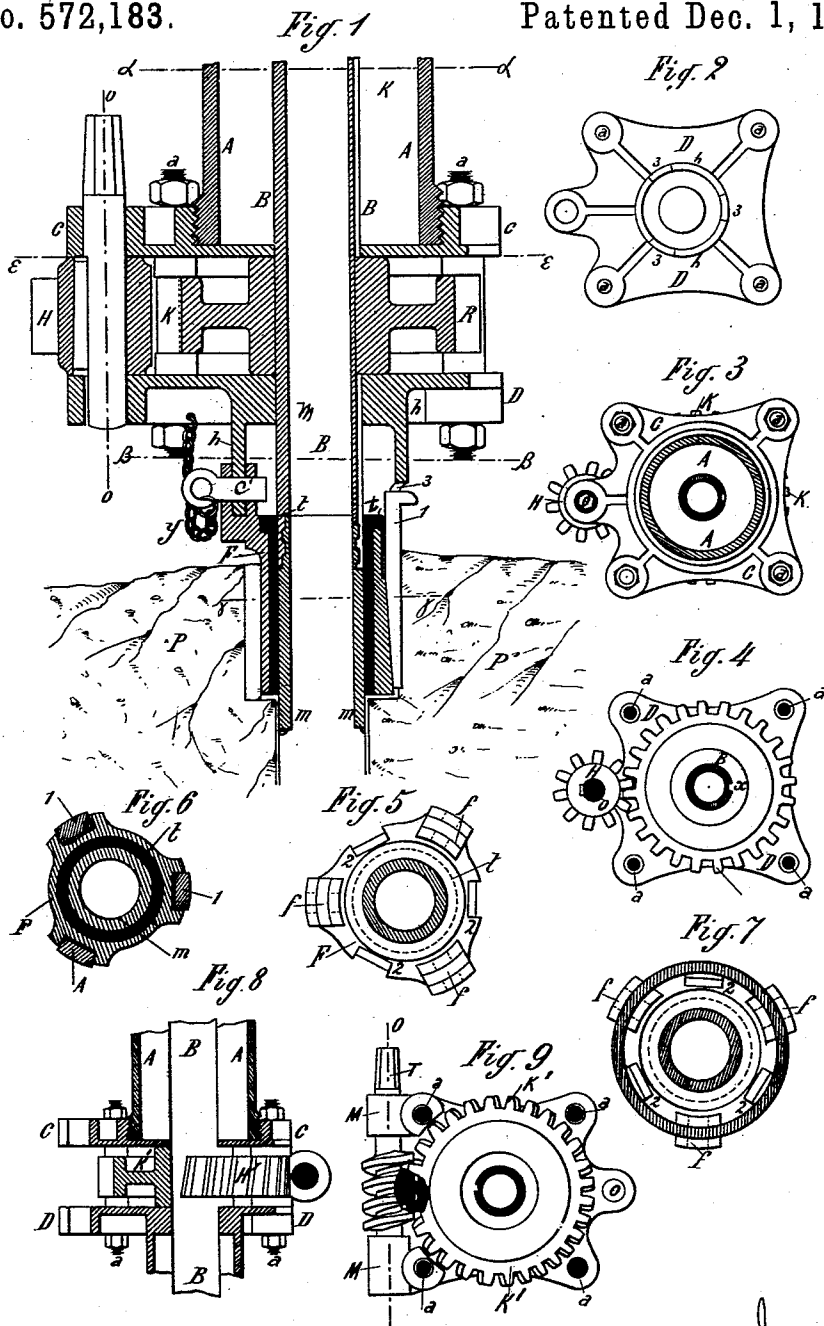
(No Model.)

U. SALVOTTI.

APPARATUS FOR FIXING AND SUPPORTING ROCK DRILLS.

No. 572,183.

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APPARATUS FOR FIXING AND SUPPORTING ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 572,183, dated December 1, 1896.

Application filed July 25, 1896. Serial No. 600,527. (No model.)

To all whom it may concern:

Be it known that I, UGO SALVOTTI, of Milan, Italy, have invented Improvements in Apparatus for Fixing and Supporting Rock-Drills, of which the following is a specification.

The present invention has for its object an apparatus designed to fix rock-drills, both those having the motion of the tool by hydraulic power and those with the motion by means of a screw.

In the annexed drawings, Figure 1 represents in section the lower portion of the drill with the mechanism which conveys rotary motion to the tool and which serves to attach it to the rock to be bored. Fig. 2 is a view from below of the plate D D. Fig. 3 is a horizontal section on the line *a a*. Fig. 4 is a section on the line *ε ε* below the upper plate *c c*. Fig. 5 is a horizontal plan of the cylindrical sleeve F, and Fig. 6 is a horizontal section of the same on the line *δ δ*. Fig. 7 represents the horizontal plan of the cylindrical sleeve with insertion of the crown H H. Figs. 8 and 9 are respectively the vertical and horizontal section of a modification of the apparatus.

Referring to Fig. 1, it is obvious that A A is the cylinder of the drill. B B is the shaft of the borer, which can be lengthened by means of the pieces *m m*, screwing one upon the other, and the lower of which is the piercing-tool of steel provided with diamonds according to the character of the rock. The shaft B B has a longitudinal advancing movement, (which can be communicated to it by means of a hydraulic press or by means of a screw,) and has at the same time a rotary motion, which is imparted to it by means of the pairs of cylindrical wheels H K. The gearing is inclosed in a frame formed of two plates C C D D, united by means of four bolts *a a a a*, which serve to fix their distance apart. The spur-wheel H is keyed by means of a slot and key upon the axis *o o*. To the upper part of this axis a handle is affixed, or a pulley may be secured to it for the transmission of motion of a motor of any kind, preferably working by steam or electricity. The tooth-wheel K bears upon its hub a fixed key, which engages in a longitudinal slot in drill B in such a manner that the wheel K carries drill B around in its rotary motion without interfer-

ing with the motion of advancement. The same motion, by means of cylindrical gear-wheels, is employed for the slow rotation by hand and for rapid rotation of the diamond drill. If it be desired to impart a slow movement to the tool by aid of a motor of rapid rotation, the wheels H K are replaced by a helicoidal wheel coupled with a worm. Such an arrangement is represented in its details by Figs. 8 and 9.

K' is the helicoidal wheel; II, the worm which engages therein. The axis of the worm is supported in supports M M by means of screws *a a*.

T is the point of attachment of the turning-handle, which can be actuated by a motor of any kind.

The apparatus which serves to fix the boring-machine to the rock is composed of the cylindrical sleeve F, in which is arranged the bronze collar *t*, which in its turn receives in its interior the tool-bearer *n n*, that is to say, the shaft of the drill. As shown in the drawings, this sleeve has at the top three lugs *fff*, into which is inserted the annular crown *h* of the plate D D, which is fixed to the said lugs by means of three pins *c'*, attached to the plate by means of chains *y*. Upon its exterior surface the sleeve F, Figs. 5 and 7, has three grooves in the form of inclined planes 2 2 2, into which are inserted the keys 1 1 1, Fig. 6, which fix the sleeve and the whole perforating apparatus to the rock P P. For this purpose the workman commences by making by any usual means the hole in the rock of suitable dimensions and of limited depth, Fig. 1.

In Fig. 3 is shown a horizontal plan of the annular crown. This crown is provided with openings corresponding to the lugs *fff*. These openings are indicated in Fig. 2 by the numbers 3 3 3. This method of attachment is characteristic for its simplicity and for the easy placing and mounting, as also for the firmness of attachment which is obtained. This firm attachment is based, essentially, on the difference between the amount of friction between the rock and the metal and that between metal and metal. The solidity of the attachment is proportional to the pressure exercised by the drill-tool. The perforating

mechanism can by this means be fixed in any direction, and the props or other supports now in use can be done away with.

5 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. An apparatus for supporting and fixing rotary drills or boring-machines consisting of
10 two plates C C D D fixed by means of bolts *a a a a*, the said plates serving to support the shaft *o o*, and having between them a spur-wheel K and a pinion H the former splined upon the shaft of the drill B and the latter
15 upon the shaft *o o*; the upper plate *c c* being connected to the cylinder A A of the borer and the lower plate D D bearing an annular crown *h h* which is adapted to enter the slots of the lugs *f f f*, all substantially as described
20 and illustrated in the drawings.

2. In combination, the drill-shaft, a socket or sleeve F through which the same passes, means for turning the drill-shaft, the support for the said means arranged above the socket

and extending across the same, the stud-and- 25 groove connection between the sleeve and the said support and the pins C' for completing the said connection, said connection extending parallel with the drill-shaft, substantially as described. 30

3. In combination, the socket having the lugs at different points about it with inclined grooves extending longitudinally of the socket and intermediate of the lugs, the drill-shaft, the gearing for driving the same and 35 the plate D extending over the socket and having the crown *h* detachably secured to the lugs of the socket, the said grooves being adapted to receive wedges, substantially as described. 40

In witness whereof I have hereunto set my hand, in presence of two witnesses, this 23d day of May, 1896.

UGO SALVOTTI.

Witnesses:

EGIDIS GARNFFAE,
SANTO FINNI.