C. BROWN.

BEVEL CUTTING DIES FOR ROCK DRILLS.

APPLICATION FILED AUG. 2, 1909.

1,053,475.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.

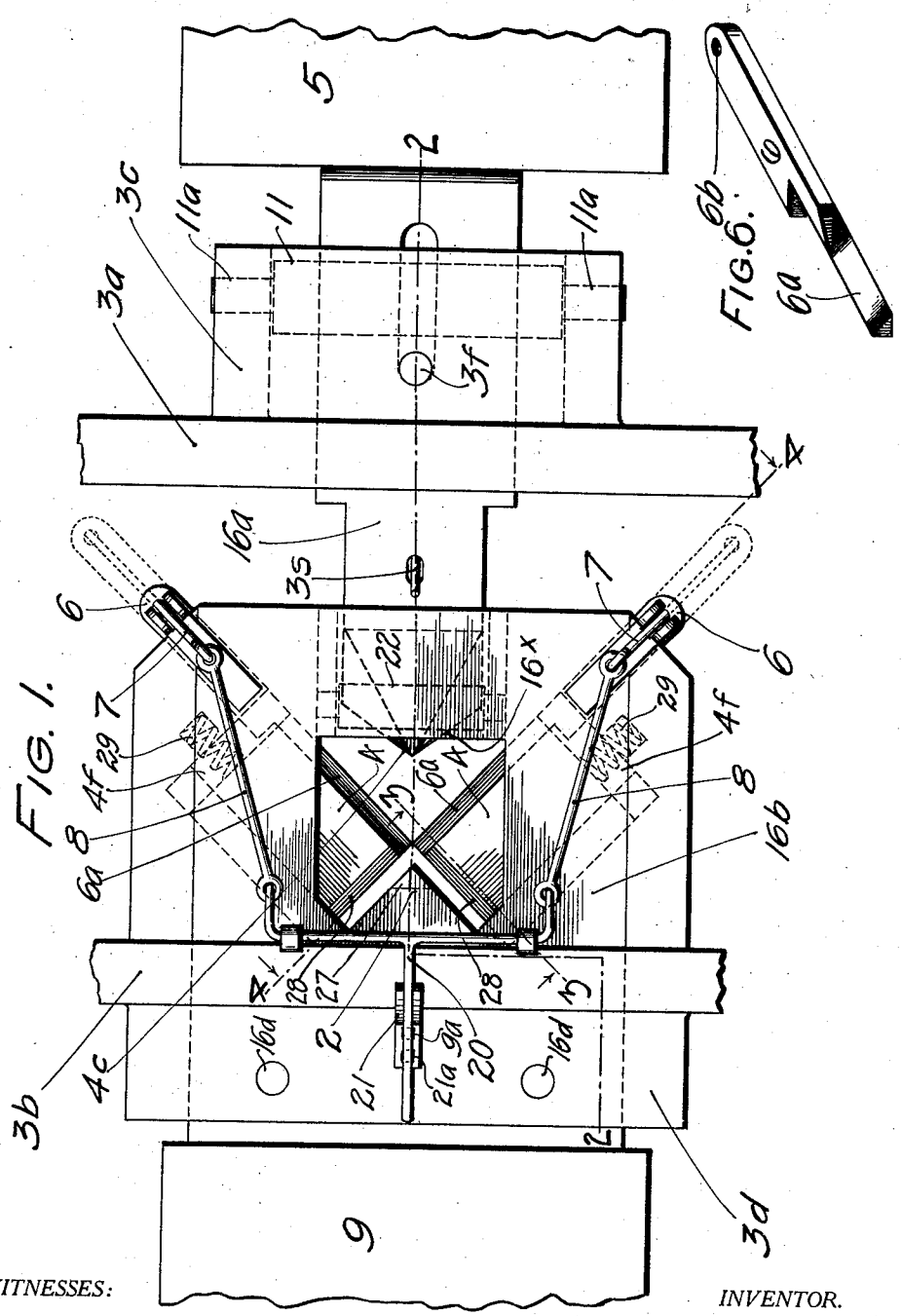

FIG. 1.

FIG. 6.

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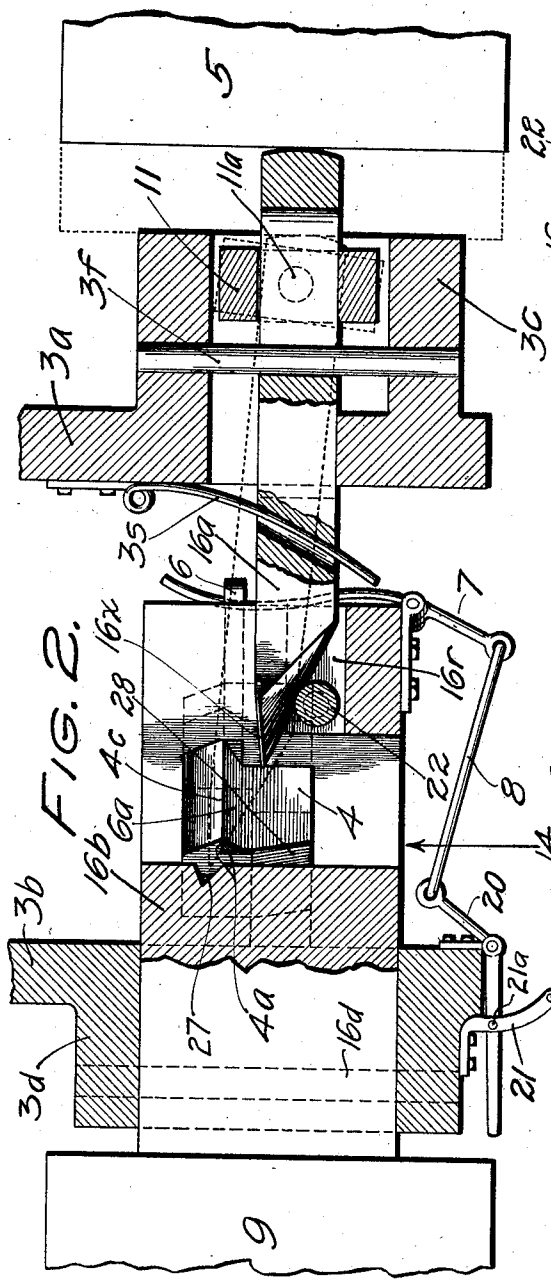

FIG. 2.

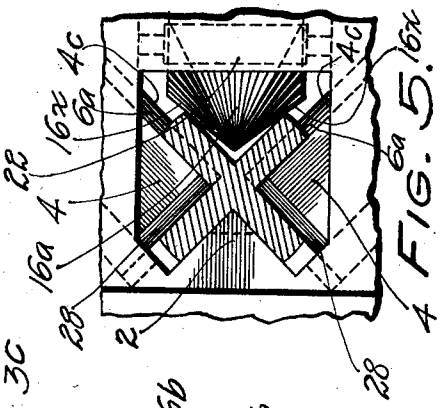

FIG. 5.

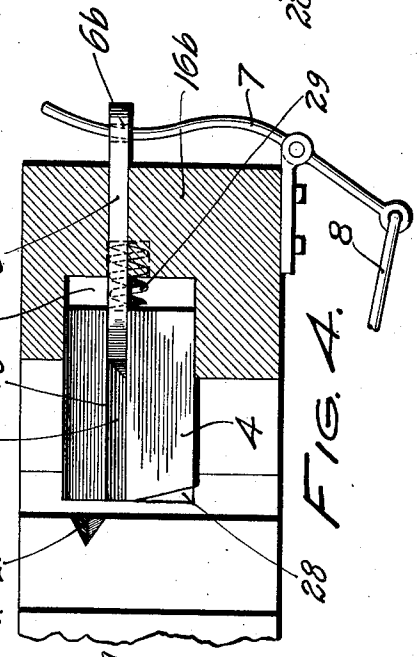

FIG. 4.

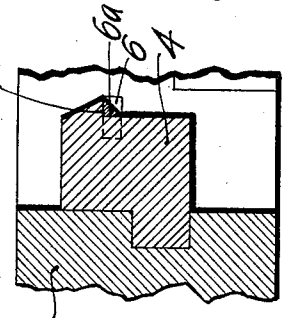

FIG. 3.

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BEVEL-CUTTING DIES FOR ROCK-DRILLS.

1,053,475. Specification of Letters Patent. **Patented Feb. 18, 1913.**

Application filed August 2, 1909. Serial No. 510,951.

To all whom it may concern:

Be it known that I, CARL BROWN, a citizen of the United States, residing in the city and county of Denver and the State of Colorado, have invented new and useful Improvements in Bevel-Cutting Dies for Rock-Drills, of which the following, together with the accompanying drawings, constitutes a full, clear, and an exact specification.

This invention relates to dies, for cutting the bevels, which form the chisel edges, on the working face of a cruciform drill bit used in rock drills and the said dies are intended to be used with the machine for making and sharpening rock drills and for general forging, upon which I have filed an application for U. S. Patent Serial No. 510,950 bearing even date herewith.

The object of the present invention is to provide a tool for cutting the chisel edges on rock drills quickly and efficiently without skilled hand labor. While the primary purpose is to use this invention in connection with the machine referred to, yet these dies may be mounted in an individual framework and used separately in cases where this may seem desirable. The present drawings show these dies as forming a part of the machine above referred to, but any skilled designer of machinery can readily see how to construct a simple individual framework containing the necessary elements for a separate machine.

In the accompanying drawings, Figure 1 is a front elevation of the dies in the working position. Figs. 2, 3 and 4 are sectional views taken respectively on the lines 2—2, 3—3 and 4—4, (Fig. 1). Fig. 5 is a minor detail view, showing a part of the dies with a section of the drill steel ready to be operated upon and Fig. 6 is a perspective view of one of the mechanical elements not clearly shown in the other views.

The steel of which the drill is being made, comes to these dies after having been operated upon by the gaging dies as explained in the application for U. S. patent already named.

Referring to the drawings, (3^a) and (3^b) are parts of the tool wheel disks of my machine, the sleeves (3^c) and (3^d), extending outward, respectively, from (3^a) and (3^b). The recessed block (16^b), is the relatively stationary part of the dies, and (16^a) is the relatively movable part. In the recess of (16^b) is a V-shaped projection (2), to fit into the angles of the cruciform. Movable jaws (4), with right-angled abutments (4^a), are adapted to form a bearing for the steel as it is put into the dies. Slidably disposed in the abutment (4^a), are the pieces (6), one of which is shown in perspective in Fig. 6, each having the triangular projection (6^a) at one end and the eyelet (6^b) at the other end. The pieces (6) are movable back and forth by means of the levers (7) passing through eyelets (6^b) and at their other ends engaging the links (8), which in turn engage the forked operating lever (20). (20) moves along the quadrant (21), to which it may be adjustably secured by pin (21^a) for two extreme positions of (6), the object of which will be presently explained. (16^a) is in the form of a pointed cutter adapted to be driven forward by a suitable hammer (5). The bolt (3^f) in sleeve (3^c) forms a stop for the cutter when the latter is retracted by the spring (3^s) after the hammer recedes.

(22) is a small roller located in the recess (16^r) and is journaled at its opposite ends in (16^b).

When the cutter is forced forward by the hammer, the downward component of the pressure, exerted by the spring (3^s) causes the cutter to bear against the roller and as it travels forward will be forced in the direction toward the position of the cutter shown in dotted lines. The cutting edges (16^x) of (16^a), pass corresponding edges (4^c) on the movable jaws (4) in close contact, producing a correct shearing action upon the steel. When the hammer recedes, the cutter is returned to its normal position and the dies are ready for another insertion of the steel. The cutter travels through the movable guide (11), pivoted at (11^a), allowing it to adjust itself to any movement of the cutter.

In constructing an individual machine, the parts (3^a) and (3^b) would form a portion of the framework of the machine and the two parts would, of course, be rigidly connected to each other, so as to allow the proper working of the cutter against the jaws (4).

Fig. 5 is a view similar to Fig. 1, and shows a section of the cruciform steel in place in the dies with the cutter just ready to begin the shearing. It will be noticed

that the point of the cutter forms an obtuse angle so that the flanks of the cutter will come in contact with two adjacent wings of the cruciform, before any other part of the shearing edges thereof. Thus as the cutter is driven forward to the position shown in dotted lines, Fig. 2, it exerts a constant but gradual shearing effect across the face of the drill steel.

Referring to Fig. 2, the back surface of the point of the cutter is shown to make a slight angle with the back surface of the body of the cutter for the purpose of having the shearing edges of the cutter, touch exactly and consecutively every point along the shearing edges of jaws (4), the cutter moving across the jaws in a more or less diagonal path.

In using these dies the lever (20) is first moved to the position where it can be secured by the pin at (9^a), which causes the pieces (6) to be moved to the positions indicated by dotted lines in Fig. 1. This leaves the right-angled abutments (4^a) clear of the triangular projections (6^a). The cruciform steel with its flat, straight-across face, as it comes from the gaging dies, is now inserted from the front of the dies as indicated by the arrow at (14), Fig. 2, and rests with its face against the abutments (4^a). The cutter is then driven forward, and traveling in its diagonal path, shears the bevels on the two adjoining edges, (which form a right angle) on the face of the cruciform steel. This operation is repeated upon the opposite two adjoining edges of the cruciform, the steel having meanwhile been withdrawn from its first position in the dies, and again inserted after having been turned through an angle of 180 degrees. This leaves the four wings of the cruciform with one half of the chisel edge cut on each wing. The triangular projections (6^a) are then returned to the positions as shown by full lines in the drawings and thus form beveled abutments. The steel is inserted into the dies twice again, in a manner similar to that explained above, these latter two times, however, the steel rests (with the bevels previously cut) on the beveled abutments formed as above described.

The jaws (4) have their faces (28) inclined, in order to allow the drill wings to be easily insinuated between the faces of V-shaped projection (2) and the jaws (4). Acting upon the jaws (4) is a yielding pressure, exerted preferably by springs (29), keeping the said jaws normally closed, in the positions as shown in Fig. 1.

When a drill is forced into the dies it pushes the jaws (4) back a distance corresponding to the thickness of the drill wings (as shown in Fig. 5.) and the reaction of springs (29) causes the drill to be tightly held against (2), thus forming a bearing to resist the thrust of the cutter.

(27) is a notch to clear the point of the cutter when it reaches its final position as indicated by dotted lines in Fig. 2.

The anvil block (9) is provided to take up the shock produced by the striking of the hammer (5).

Having fully described my invention, what I claim as new is:—

1. In bevel-cutting dies for rock drills, the combination with a suitable framework, of a die block and a reciprocating cutter, the said die block being suitably recessed, with a centrally located V-shaped projection; movable abutment jaws, under a yielding pressure for holding an inserted rock drill against the V-shaped projection; a pivoted guide yoke for the said cutter; a guide roller for deflecting the said cutter; means for driving the said cutter forward, and means for retracting the said cutter, substantially as described.

2. In bevel-cutting dies for rock drills, the combination with a suitable framework, of a die block containing a suitable recess, with a V-shaped drill bearing, spring pressed abutment jaws forming a stop for drills inserted into the said recess, guides for the said cutter, and means for driving the said cutter forward, so that its cutting edges will coöperate with cutting edges on the said abutment jaws and means for automatically retracting said cutter, substantially as described.

3. In bevel cutting dies, the combination with a suitable frame, of a recessed die block, spring-pressed jaws suitably guided, beveled abutment slides, disposed in the said jaws, means for moving the said beveled abutment slides back and forth along the said abutment jaws, and a suitable coöperating cutter, as, and for the purpose specified.

4. In bevel cutting dies, the combination with a suitably supported die, properly recessed, with abutment jaws having suitable shearing edges, the said abutment jaws arranged along converging lines, of a cutter with shearing edges, formed along a suitably shaped nose, means for impelling the said cutter forward, means for guiding the said cutter in such a way, that its shearing nose shall be caused to pass across the shearing edges of the abutment jaws in a more or less diagonal path, and means for retracting the said cutter, all as, and for the purpose specified.

5. In bevel-cutting dies the combination of a suitably recessed die block, with a reciprocating cutter having two shearing edges forming a V-shaped nose; suitable abutment jaws, with shearing edges complementary to the shearing edges of the said cutter, the said abutment jaws properly disposed in

the said die block; a pivoted guide-yoke for the said cutter, means for driving the said cutter forward, means for deflecting the path of the nose of the cutter from a right line in its travel forward, and means for automatically retracting the cutter, substantially as described.

6. In bevel cutting dies, the combination with a suitable cutter, of a die, the said cutter being provided with cutting edges adapted to operate in conjunction with corresponding cutting edges in the said die, means for suitably deflecting the said cutter when it is forced toward the said die from an initially separated position, and means for automatically returning the said cutter to its initial position, as, and for the purpose specified.

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

CARL BROWN.

Witnesses:
P. H. MALLINCKRODT,
IDA B. HAWLEY.