

(No Model.)

2 Sheets—Sheet 1.


S. C. LEWIS.
MACHINE FOR MAKING ROCK DRILL BITS.

No. 442,692_N

Patented Dec. 16, 1890.



Attest
Walter Donaldson
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(No Model.)

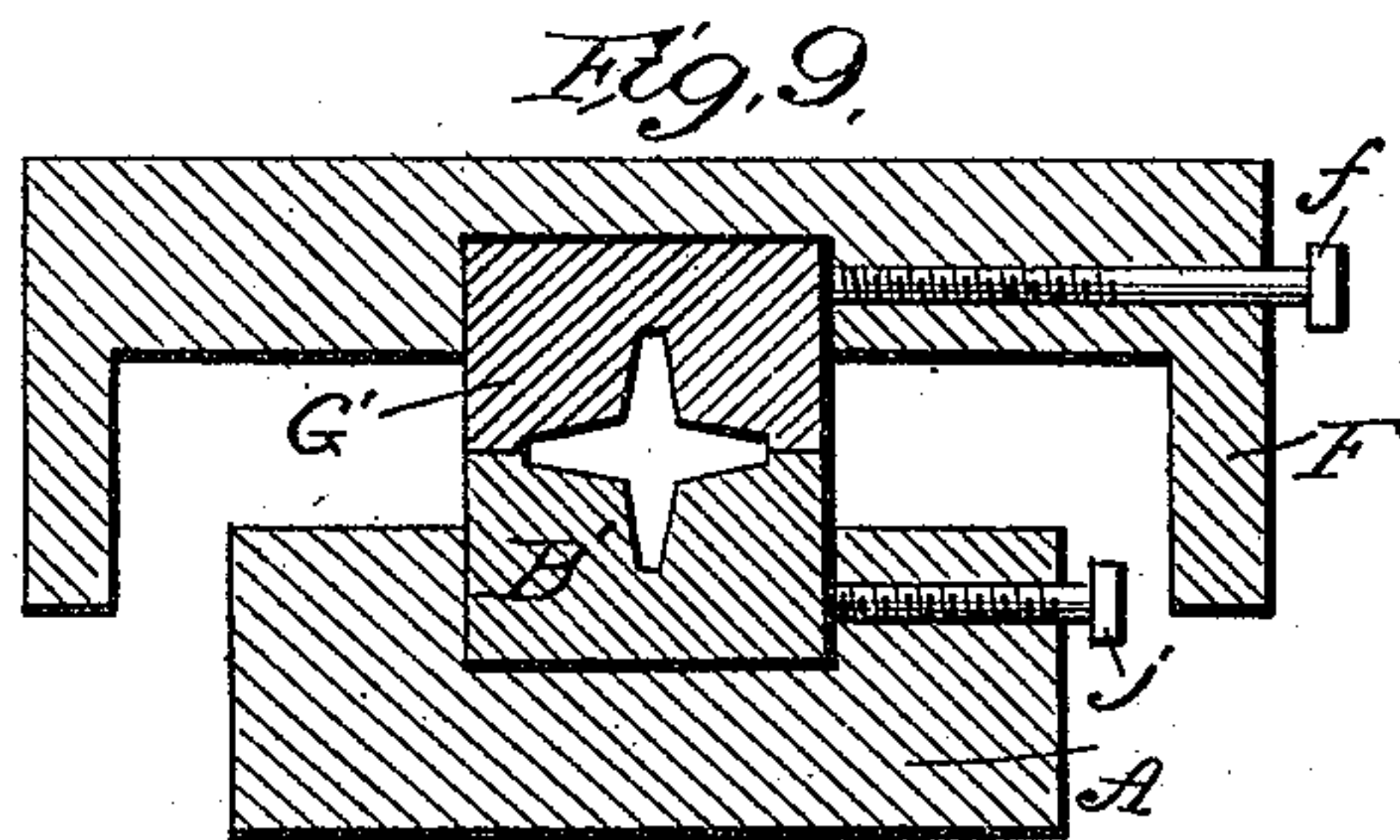
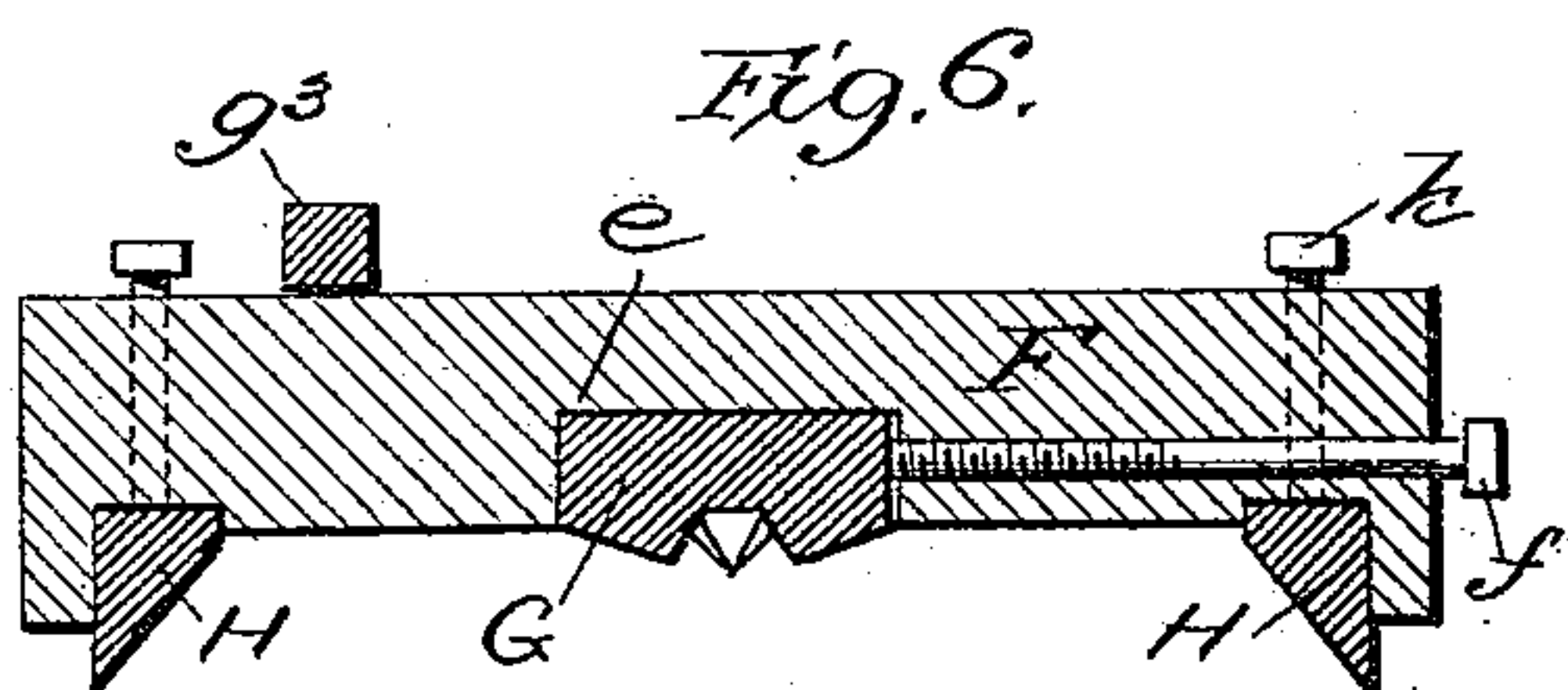
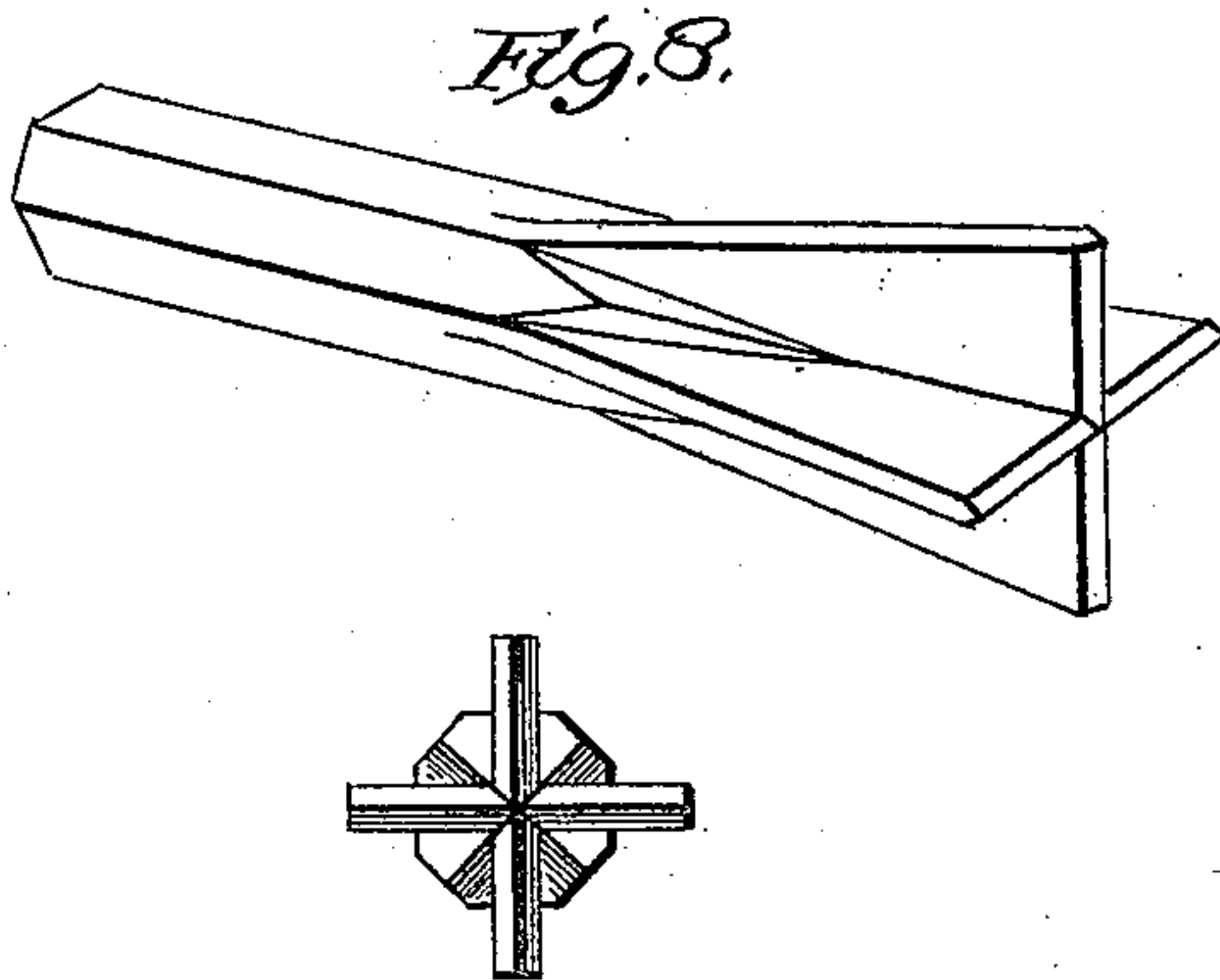
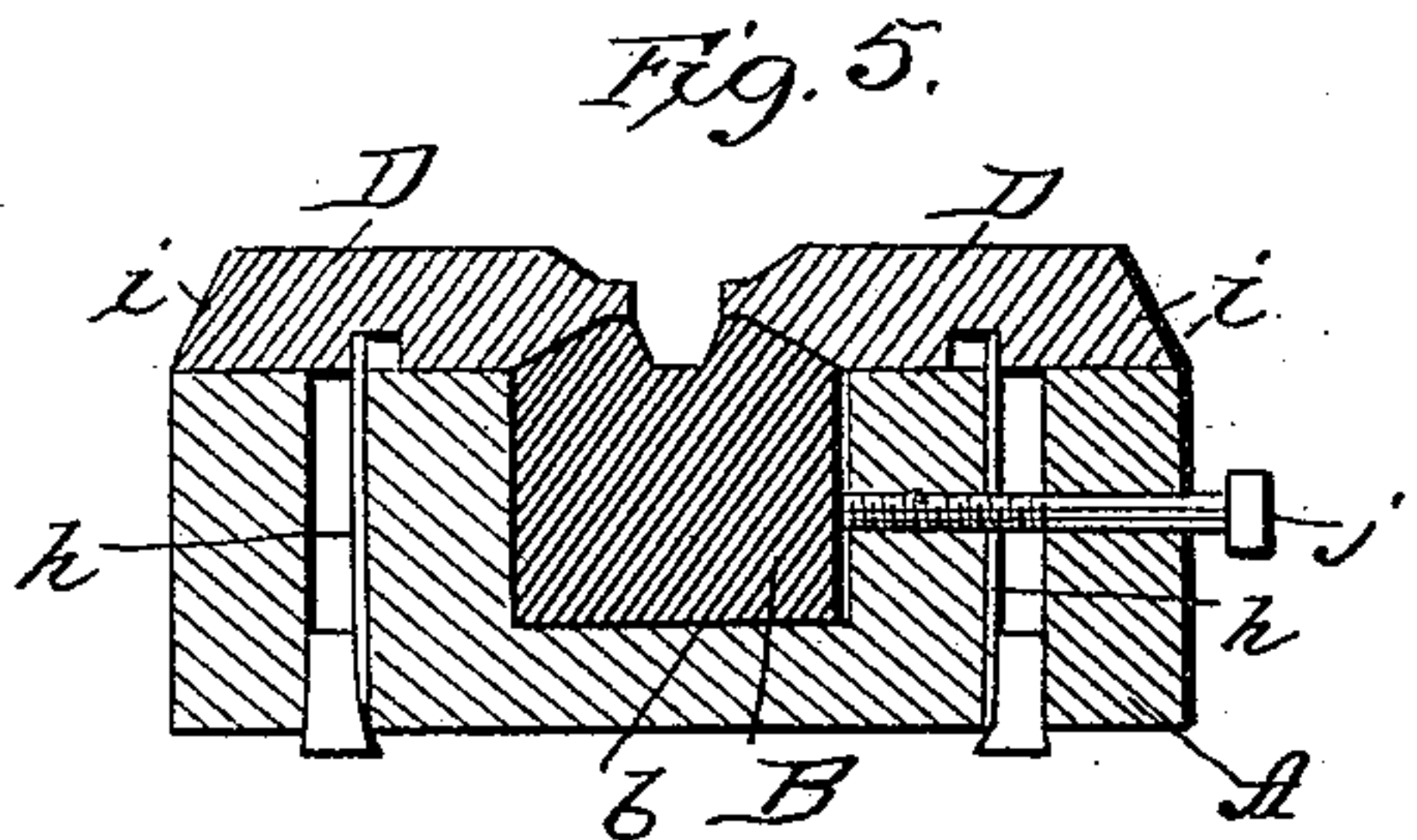
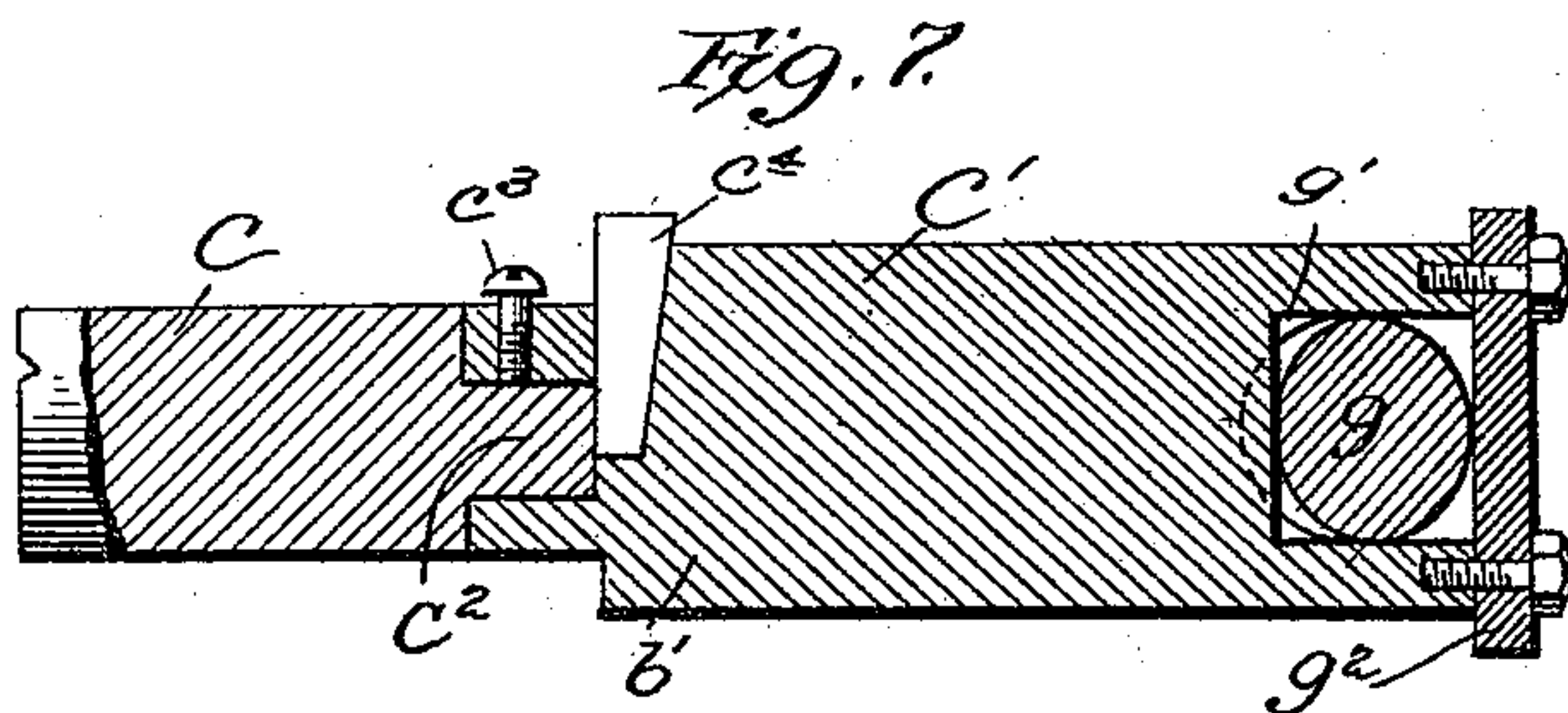
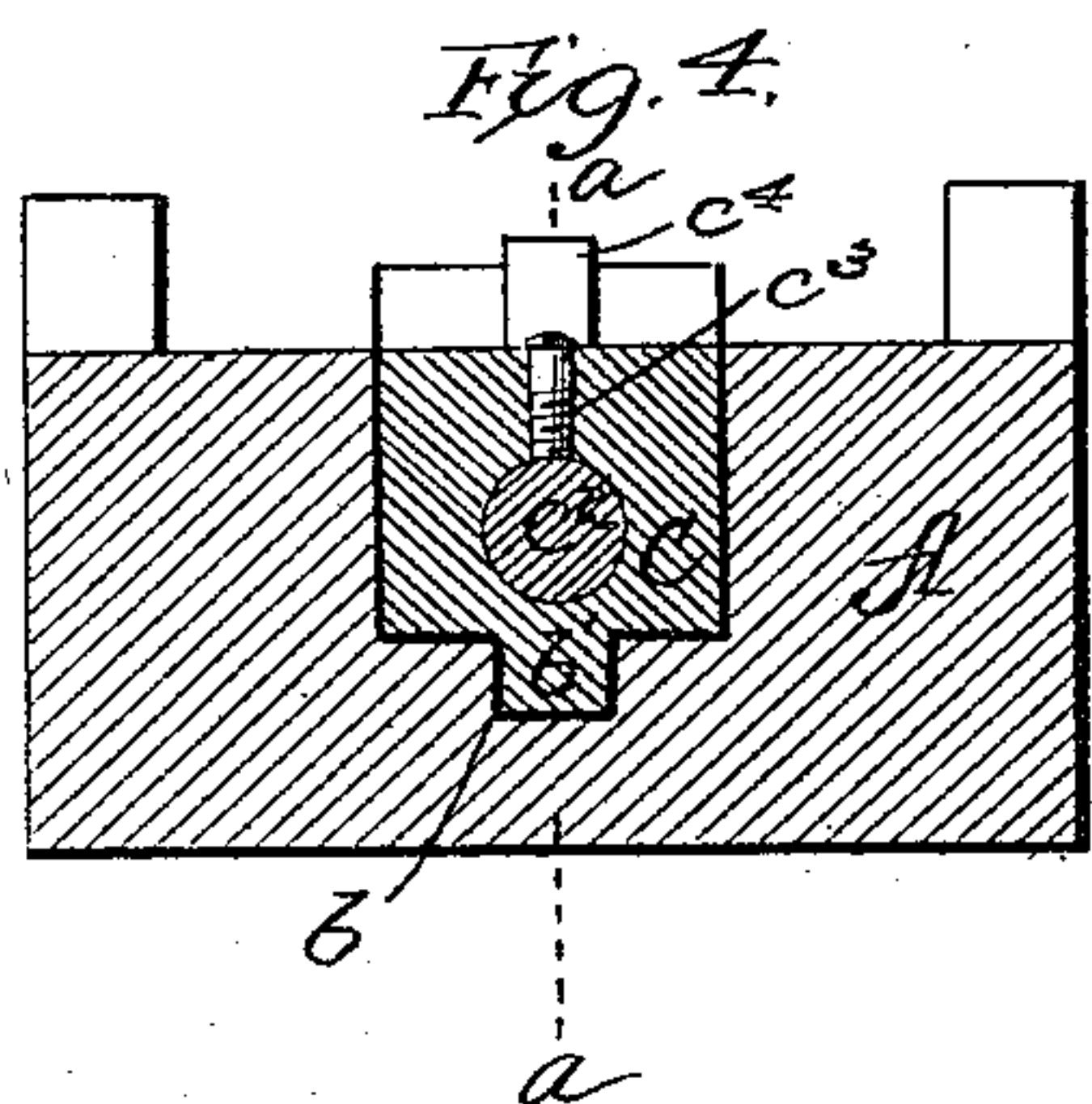
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

SAMUEL C. LEWIS, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR MAKING ROCK-DRILL BITS.

SPECIFICATION forming part of Letters Patent No. 442,692, dated December 16, 1890.

Application filed February 12, 1890. Serial No. 340,102. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL C. LEWIS, a citizen of the United States, residing at the city and county of San Francisco, State of California, have invented certain new and useful Improvements in a Machine for Making Rock-Drill Bits; and I do hereby declare that the following is a full, clear, and exact description of the said invention.

My invention relates to a machine for forming and sharpening rock-drill bits.

The object of the invention is to make these drills, which have been heretofore produced by hand-forging, cheaply, quickly, and more perfectly at a single operation.

The machine may be generally described as consisting of a press formed in two parts and hinged together and containing dies for forming the sides and point of the drill.

The invention is illustrated in drawings, in which—

Figure 1 is a perspective view of the machine in position for operation. Fig. 2 is a like view of the bed-frame containing the pointing-die, the bottom die, and one side die, the other side die being removed. Fig. 3 is a like view of the hinged upper section and its die. Fig. 4 is a cross-section on line *xx*, Fig. 2. Fig. 5 is a cross-section on line *yy*, Fig. 2. Fig. 6 is a cross-section on line *zz*, Fig. 3. Fig. 7 is a longitudinal vertical section on line *aa*, Fig. 4. Fig. 8 is a view of the drill produced by the machine. Fig. 9 represents a modified arrangement of dies.

A represents the bed of the machine, which is cast or formed from a single piece of iron, and has feet *a* at the bottom and at one end, by which it may be secured to any suitable support either horizontally or vertically or at any angle preferred. A central longitudinal recess *b* is formed in this bed extending entirely through it. This recess forms a seat for what I shall term the "bottom" die B and for the movable pointing-die C. Seats *c* and guides *c'* *c'* are also formed in the bed to receive the movable side dies D D. Bearings *d* *d* for the shaft E are bored in each side of the bed, extending through its walls, and the shaft E extends through these bearings a sufficient distance to receive the movable sec-

tion or part F of the press, which turns upon said shaft as a hinge, and is adapted to be closed down upon and partly around the bed and there secured by a fastening device, such as the spring-latch *d* or equivalent means. The hinged part F is, like the bed, formed in one piece and is provided with a central recess *e*, having planed walls to receive and hold the upper forming-die G, which is forced against one of these walls and held in place by a pair of set-screws *f* and an end set-screw *f'*.

The die C, which forms and points the end of the drill, is held within the recess *b* of the bed by a guide *b'*. The head of this die is of hardened steel, shaped to give the proper form to the drill, and this head is removable from the sliding stock C', but is secured within it by a stub end *c*², Fig. 7, on which bears a set-screw *c*³. The head of the die has a slight longitudinal adjustment independently of the stock by means of a wedge *c*⁴ forced down through a slot in the stock C' so as to bear against the end of the stub *c*², and by moving the latter slightly forward to compensate for wear. The entire die C is moved and retracted by an eccentric *g* on the shaft E, formed by cutting away a portion of the shaft, as shown in Fig. 7. The die is provided with a slot *g'*, closed at the rear end by a plate *g*², bolted to the die, and the eccentric, when the shaft is turned by the lever *g*³ keyed thereon, bears upon the forward or rear end of said slot, and thus moves the die forward or retracts it. The hardened-steel face of the die is shown of a shape for forming a drill with four radial cutting-edges; but of course a great variety of shapes can be produced by the substitution of dies of other forms.

The sides of the drill are formed by the movable dies D D. As before stated, these dies are held in seats *c* *c* of the bed, in which they have a limited transverse motion. The shape of their forming-faces is sufficiently indicated in Fig. 1. Springs *h* *h*, which pass through the bed and enter slots in the lower surface of the dies, tend to force them apart or outward; but when in operation they are brought together by the closing of the press, when a pair of adjustable cams or inclines H, 100

held in recesses in the movable sections by screws kk' , bear upon the inclined outer faces d of the dies, Fig. 5.

The lower die B and upper die G are substantially similar. The former rests in the recess b of the bed, where it is held in place by set-screws j , which force it against the wall of such recess, Fig. 5, and the latter is placed within the recess e in the hinged section of the press and is held by similar screws f , Fig. 6. The approximating edges of the upper, lower, and two side dies are of the same shape, necessarily, to produce the cross-section of the drill illustrated in Fig. 8.

In the operation of the machine as so far described the two sections are closed and secured, the pointing-die forced forward by the lever g^3 , and the steel rod from which the drill is to be formed, or the drill to be sharpened, properly heated, is forced into the front opening b^2 between the forming-dies. This is ordinarily done with blows from a sledge and results in spreading the metal into the interstices between the dies, producing the proper cross-section, which Fig. 8 sufficiently illustrates. At the same time the end of the steel rod is driven up against the face of the pointing-die C, giving the angular cutting-edges shown in Fig. 8. The die 6 is then retracted and the hinged section F raised, when the side dies D, no longer held by the cams H, are moved sufficiently by their springs to permit the removal of the finished drill-bit.

I have illustrated in Fig. 9 a modified arrangement of dies for producing drills having tapering radial flanges. In forming this bit I dispense with dies D D and use only three dies—the pointing-die, heretofore described, and an upper and lower die, which form the four sides of the bit. These dies B' and G', Fig. 10, are held, respectively, in the recesses b and e of the bed and hinged section F in the same manner as before described. They are, however, thicker than the dies B and G, and are so formed that when brought together they will produce the four-flanged drill of the cross-section illustrated in Fig. 9. The tapering shape of the flanges makes it feasible to release the bit by simply raising the upper section, whereas the straight-flanged drill, Fig. 8, if made by two dies would bind, and thus be difficult of removal. Ordinary chisel-pointed hand-drills can also be made with two dies of the proper shape. I have described a machine for making a single bit; but it is evident that by an extension of the frames of the machine and a duplication of the same or other dies two or more drills may be made at the same time of the same or different shapes. I do not illustrate the proposed construction in the drawings, because it is practically only an enlargement of the bed and hinged section sufficiently to give room for one or more additional sets of dies. It will also be evident that the lever g^3 may under some circumstances be dispensed with. By keying the upper section F on the shaft

E the closing of the sections will operate the eccentric and force the pointing-die forward. I prefer, however, to have the pointing-die under independent control of the lever g^3 , as it is often of advantage to leave it in position while the upper section is being raised, as it holds the end of the bit down, and thus facilitates the removal of the upper die.

By the use of this machine I am enabled to make rock-drill bits much more rapidly and cheaply and of a quality superior to those produced by skilled labor in hand-forging.

The simplicity of the machine and of the method of using it obviates the necessity of employing skilled labor to operate it, as the closing of the press, the introduction of the rod or blank for the bit, and its removal are all that is required of the operator.

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

1. In a machine for making rock-drill bits, the combination of two frames movable toward and from each other, said frames being constructed to form an opening at one end when they are together, and the shaping and pointing dies carried by the frames in rear of the mouth of said opening.

2. In a machine for making rock-drill bits, the combination of two frames, hinged together and movable toward and from each other, said frames being constructed to form an opening at one end when they are together, and the shaping and pointing dies carried by the frames in rear of the mouth of said opening.

3. In combination, the dies forming the sides of the bit, the bed A, with section F hinged thereto and carrying the said dies, a pointing-die movable in the bed, and means for operating the same, substantially as described.

4. The combination of the bed A, having a longitudinal recess, the bottom die B, side dies D D, and movable pointing-die C, with the hinged section F, having the upper die G, substantially as described.

5. The combination, with the bed A, having the bottom die B and transversely-movable side dies, of the hinged section F, carrying the die G and having the cams for operating said side dies, substantially as set forth.

6. The combination, with the bed carrying the sliding pointing-die C, of a transverse shaft passing through the die, having an eccentric, and a lever on said shaft for operating the die, substantially as described.

7. In a machine for forming rock-drill bits, the combination, with the bed-frame, of transversely-movable side dies, having springs for forcing them apart, and the hinged section F, having cams H H for forcing said dies inward against the pressure of the springs, substantially as described.

8. In a machine for forming rock-drill bits, the combination, with the bed-frame having a longitudinal recess, of the slotted pointing-

die C, the transverse shaft E, having the eccentric g , and the lever g^2 , substantially as described.

9. In a machine for making rock-drills, consisting of two sections adapted to be closed together and separated, dies carried thereby and abutting when said sections are closed, so as to form a passage for the drill-blank, and a pointing-die closing the said passage, all substantially as described.

10. In a machine for making rock-drills,

the pointing-die C, having a removable and adjustable head, substantially as described.

11. Dies for making rock-drill bits, having forming-faces coincident with the sides of the finished bit and adapted to be so placed as to form a passage for the bit-blank, substantially as set forth.

SAMUEL C. LEWIS.

Witnesses:

LEE D. CRAIG,
L. W. SEELY.