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Patented Aug. 27, 1901.

J. WALLACE, D. F. IRWIN & J. H. SMITH.

CUTTER FOR ROCK DRILLS.

(Application filed Nov. 12, 1900.)

(No Model.)

Fig. 1.

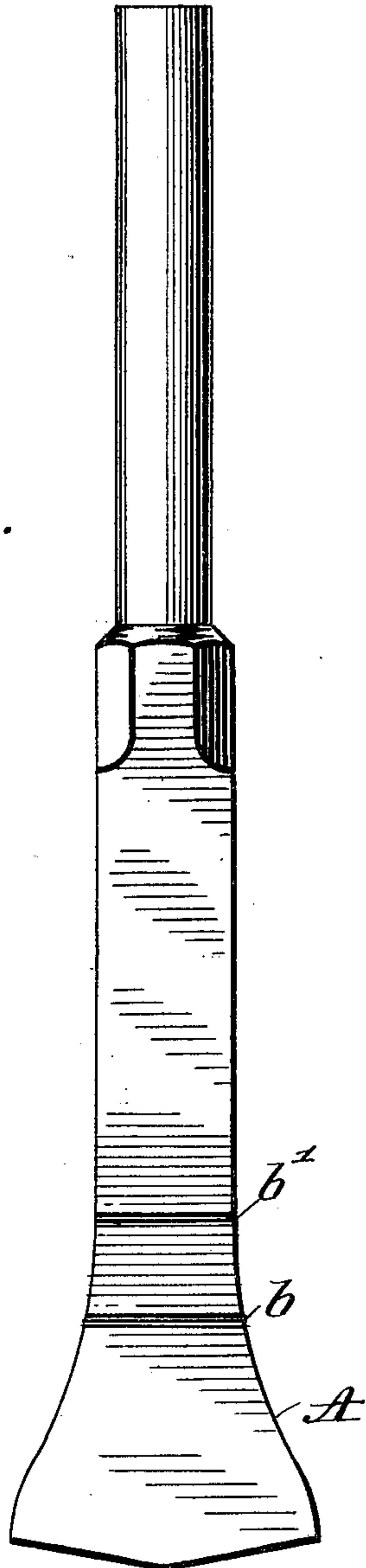


Fig. 2.

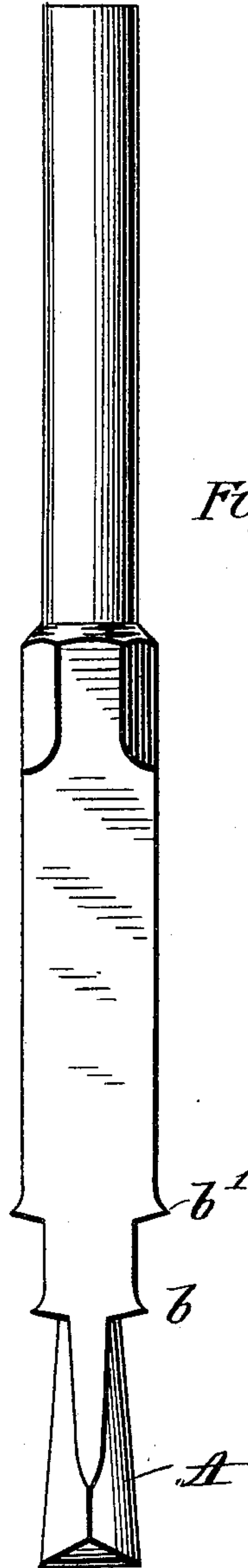
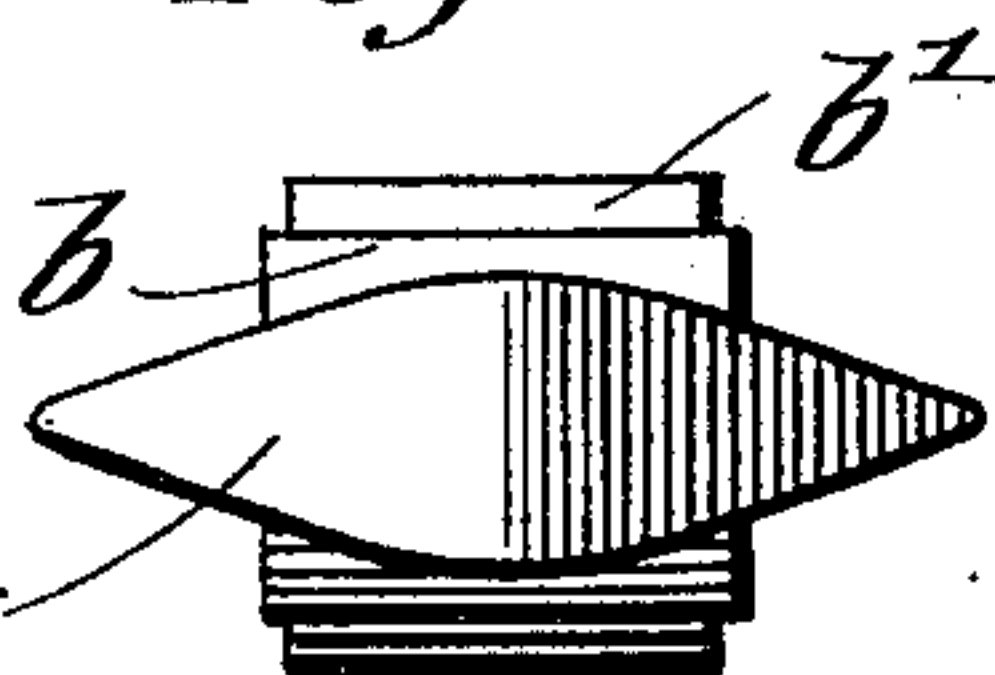


Fig. 3.



WITNESSES:

Frank S. Oby,
E. S. Brumley

INVENTORS

Jack Wallace
D. Frank Irwin &
Joseph Henry Smith

BY

Robert E. Moore

ATTORNEY

UNITED STATES PATENT OFFICE.

JACOB WALLACE, D. FRANK IRWIN, AND JOSEPH HENRY SMITH, OF
PLYMOUTH, OHIO, ASSIGNORS TO THE WALLWINITH MANUFACTURING CO., OF OHIO.

CUTTER FOR ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 681,381, dated August 27, 1901.

Application filed November 12, 1900. Serial No. 36,194. (No model.)

To all whom it may concern:

Be it known that we, JACOB WALLACE, D. FRANK IRWIN, and JOSEPH HENRY SMITH, citizens of the United States, residing in Plymouth, county of Richland, State of Ohio, have invented certain new and useful Improvements in Bits or Cutters for Rock-Drills, of which the following is such a full, clear, and concise description as will enable others skilled in the art to which our invention appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

In quarrying dimension-stone it is important that the rock be broken from the ledge in true blocks of square or oblong form, so that the stone may be produced in marketable shape with the least possible expenditure of additional labor. The faces of such blocks should also be more or less smooth and not corrugated and irregular in outline. The fracture made by exploding a charge of powder in a hole is ordinarily an irregular one and not always along a predetermined and desired line, and the stone requires subsequent scabbling or dressing to true smooth surfaces.

In the practice of quarrying stone by machinery a series of round shallow holes are usually formed in the surface of the rock at intervals along a straight line. A rock-drill fitted with an ordinary bit or cutter-bar can drill such holes; but in splitting stones so drilled steel feathers, thicker at their bottom end and half-round in cross-section, are used to give the effect of a tapering opening for receiving the wedges, and after the latter are driven down and the stone is split or broken round holes show in half their diameter, which deteriorates from the appearance of the stone for masonry-work in general, and blocks so produced are often rejected by engineers. This objection holds to such an extent that handwork is still resorted to in many cases notwithstanding its slowness and corresponding increase in cost, and a tapering or V-shaped trench or a series of V-shaped holes are formed along the lines of intended cleavage by means of a pick or other instrument operated by hand, as such openings do not

leave an abrupt outline and are not so unsightly after the rock is broken.

The object of our invention is to provide a bit or cutter for rock-drills by which approximately V-shaped wedge-holes or tapering openings may be rapidly formed to the desired depth as a means to the splitting of the stone with the ordinary wedges without the use of feathers into blocks that will not bear disfiguring marks; and our invention consists in the device hereinafter described, and more fully set out in the claims.

Figure 1 is a side elevation of our improved cutter, showing the expanded lead or striking end, while Fig. 2 is a similar view with the cutter-bar turned at right angles to illustrate the projecting shoulders or offsets which give a widening effect or wedge-shaped outline to the opening. Fig. 3 is a plan view looking up from below.

At the bottom or lower end of the bit or cutter is an extended lead A, which is shown as fan-shaped in outline and provided with edges expanding in a double-wedge form, the bottom faces of which are slightly inclined from the center, where the diameter is preferably increased, so that the bit is thicker there than just below the lower offsets or shoulders; but these bottom faces may for use on certain kinds of rock be beveled off to a sharp chisel-edge. On the sides of the cutter-bar above the lead A and parallel with its greatest width are formed the projecting shoulders or offsets *b b*, with under surfaces preferably upwardly inclined, and above the offsets *b b* and extending beyond the same are similar shoulders or offsets *b' b'*. Additional offsets extending farther and farther out may be formed above the offsets *b' b'*; but for ordinary purposes the two sets of offsets illustrated in the drawings are sufficient.

In practical use our improved bit may be operated by a percussion rock-drill of ordinary construction fitted with any suitable device to prevent rotation. Such a drill mounted upon a varrier is moved along a predetermined line either at a uniform rate for the purpose of cutting a groove or channel or with rests, so that separate openings may be drilled at required intervals. As the bit penetrates

the stone the increased thickness at the bottom of the lead or striking end gives clearance, while the flaring edges cut and weaken the stone in the direction of the proposed
5 cleavage. Then as the offsets or shoulders $b\ b$ and $b'\ b'$ are brought to bear upon the rock the opening is by degrees widened. As previously noted, the under surfaces of the shoulders or offsets are preferably upwardly
10 inclined, so that the stone may be crushed or crumbled and not chipped or broken off in pieces of such size which in falling down might jam or bind the bit. The hole or opening thus formed is of sufficient width at the
15 top to receive the expanded portion of the splitting-wedge, giving it a bearing when driven, not against the very top, where its pressure would result in flaking out the rock, but some distance below the surface where
20 there is sufficient body or strength to the stone to result in a clean break or split. Moreover, the lower part of the hole being of practical uniform diameter there is sufficient depth to give driving distance or draft for
25 the wedge as well as allow any small amount of dirt or dust to drop far enough below the end of the wedge not to interfere with its action, and the wedge has thus sufficient space to be driven to the spitting-point without
30 having anything in its way that would cause it to rebound or bounce out.

Having thus fully described our invention,

what we claim as new, and desire to secure by Letters Patent, is—

1. A bit or cutter for rock-drills provided 35 at its lower end with a lead of greater width than thickness and provided above the wider sides of the lead with graduated shoulders to bevel the wider sides of the hole, formed by the lead, downwardly and inwardly for a
40 splitting-wedge; substantially as described.

2. An improved bit or cutter for rock-drills formed with an expanding striking end or lead and further provided with graduated shoulders or offsets upon its sides above said 45 lead and parallel to the greater diameter of the same, substantially as and for the purposes set forth.

3. An improved bit or cutter for rock-drills formed with an expanding lead or striking 50 end centrally thickened at its base, said cutter being further provided upon its sides above said lead and parallel to the greater diameter of the same, with graduated shoulders or offsets, the under surfaces of which 55 are upwardly inclined, substantially as and for the purposes set forth.

JACOB WALLACE.
D. FRANK IRWIN.
JOSEPH HENRY SMITH.

Witnesses:

HARRY H. HARTZOG,
ARTHUR ELWOOD SMITH.