(No Model.)

A. B. STONE.

EXPANSION BIT.

No. 560,050. Patented May 12, 1896.

Fig. 1.

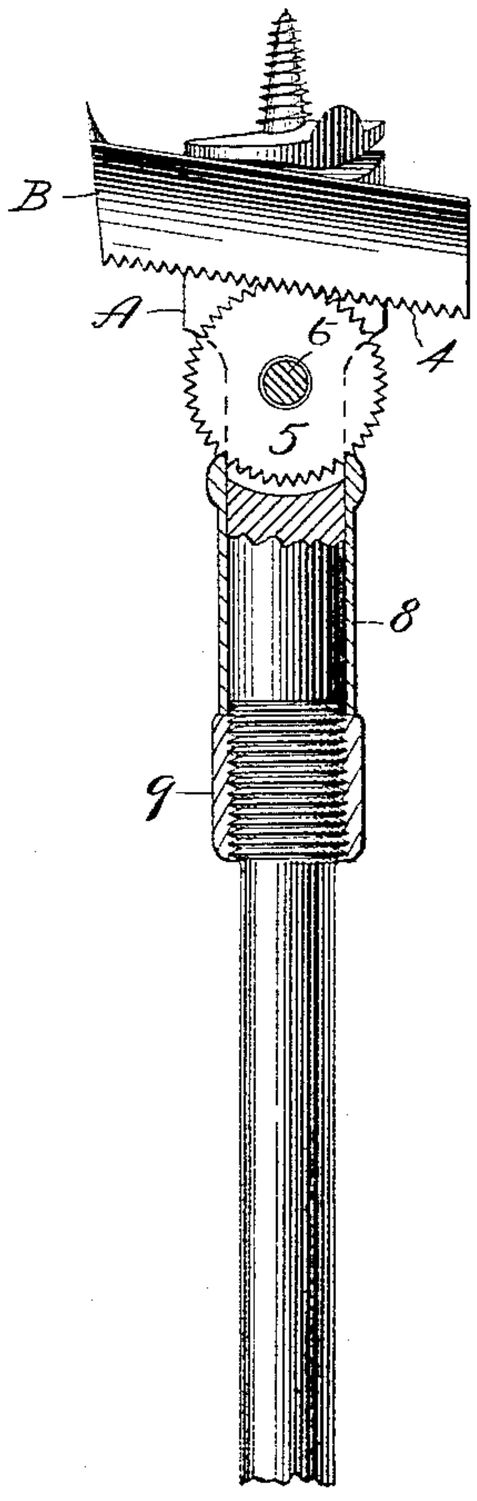


Fig 3.

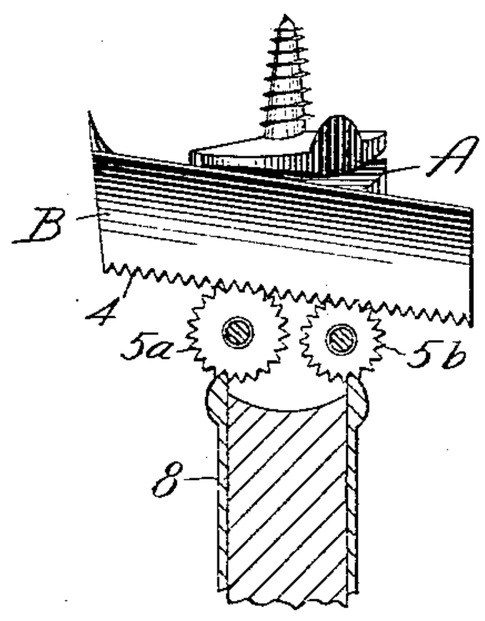
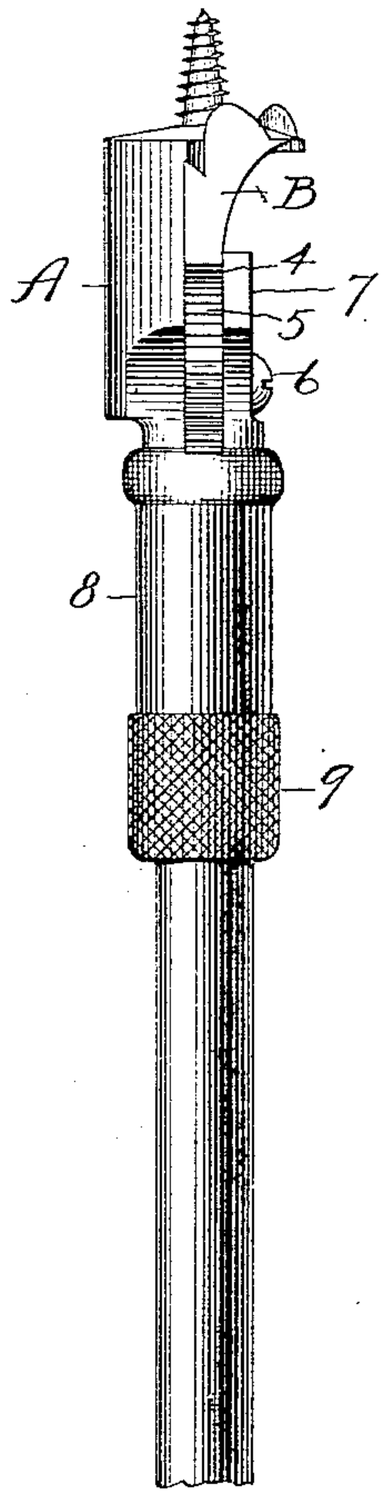


Fig 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ARTHUR B. STONE, OF WINDSOR, CONNECTICUT.

EXPANSION-BIT.

SPECIFICATION forming part of Letters Patent No. 560,050, dated May 12, 1896.

Application filed January 30, 1896. Serial No. 577,394. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR B. STONE, a citizen of the United States, residing at Windsor, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Expansion-Bits, of which the following is a specification.

My invention relates to improvements in expansion-bits; and the chief objects of my improvements are to dispense with the use of a screw-driver in adjusting the bit and to positively secure the extension arm or cutter against slipping.

In the accompanying drawings, Figure 1 is a sectional front elevation of the main portion of my bit, the shank portion being broken off. Fig. 2 is a side elevation of the same, and Fig. 3 is a section elevation showing a modification thereof.

The bit-head A is or may be of any ordinary form for this class of bits and is provided with a transverse groove or recess, in which the extension arm or cutter B is guided and held. I prefer to make part of the front edge of the extension-arm of a beveled form and to form an overhanging wall at the corresponding side of the recess, so as to fit said bevel, as in ordinary bits of this class. What I call the "front" edge of the extension-arm is that edge which is nearest the cutting end of the bit. The rear edge of the extension-arm is toothed, as shown, to form a rack 4. The head B in addition to being grooved transversely to receive the extension-arm is slotted through longitudinally in rear of said arm to receive the pinion 5, which is held in place by the walls on each side of the slot and by a pin or screw 6, extended through the lip 7, the pinion 5, and into the body of the head opposite said lip 7. This lip preferably should extend forward partially over the broad side of the extension-arm, as shown in Fig. 2. I prefer that the edge of the pinion shall project slightly at each side of the head for convenience of manipulation.

Upon the head, in the rear of the pinion, is a sleeve 8, and in rear of said sleeve there is a nut 9, screwed upon a threaded portion of the head or body of the bit. The exterior of the nut should be knurled, as in other nuts for analogous uses, and the pinion should be somewhat loosely pivoted.

By loosening the nut and withdrawing the front end of the sleeve from its engagement with the teeth of the pinion the said pinion may be turned by one's fingers and thereby move the extension-arm either way through the engagement of the teeth of said pinion with the rack. Although the pinion is loosely pivoted, it is still confined closely enough to hold the teeth of the pinion and rack in engagement for moving the extension-arm. When said extension-arm has been adjusted to the desired position, the nut 9 is turned to force the sleeve forwardly against the pinion and into engagement with the teeth thereof at the opposite sides of said pinion, as shown in Fig. 1. The same act will also force the pinion firmly against the rack at the rear edge of the extension-arm and press the front edge of said arm firmly to its bearing in the head, whereby the said pinion is firmly clamped between the extension-arm and the sleeve. The engagement of the sleeve with the teeth of the pinion and the pinion with the rack, in addition to said clamping function, will form a positive lock for preventing the extension-arm from moving endwise, so that the boring of a hole of uniform diameter from end to end is always insured. The pinion is somewhat loosely pivoted, so as to permit the pressure of the nut and sleeve being thrown upon the edge of the extension-arm.

The modification shown in Fig. 3 differs from that shown in Figs. 1 and 2 by the substitution of the two pinions 5^a and 5^b for the single pinion 5, and they are the equivalent therefor to a large extent and are the full equivalent thereof, excepting as they are more expensive to build and not quite so convenient to manipulate. The locking devices herein shown—viz., the nut and sleeve for engaging the teeth of the pinion and forming a positive lock for the extension-arm—are considered the best devices for that purpose now known to me; but I do not wish to limit myself to the details of construction shown and described, as I claim the right to make such mechanical changes and variations as may fairly fall within the spirit and scope of my invention. As in other extension-bits, arms of different lengths may be employed, and a scale and index may also be used to indicate the size that the bit will bore; but I

consider it unnecessary to show and describe these well-known features.

I claim as my invention—

1. The combination of the bit-head, the extension-arm properly guided therein and having a rearwardly-facing rack, a pinion with its teeth in engagement with said rack, and locking devices for acting directly upon the teeth of said pinion and positively locking it in place and through said pinion positively locking said arm in its position in said head, substantially as described.

2. The combination of the bit-head, the extension-arm properly guided therein and having a rearwardly-facing rack, a pinion pivoted in the head opposite the rack of the said extension-arm and projecting on opposite sides of said head, and devices for pressing said pinion firmly against the rack of said extension-arm, substantially as described.

3. The combination of the bit-head, the extension-arm properly guided therein and provided with the rack, the pinion pivoted in the head for engaging said rack, the sleeve 8 and the nut 9 for holding said pinion and extension-arm, substantially as described and for the purpose specified.

ARTHUR B. STONE.

Witnesses:
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