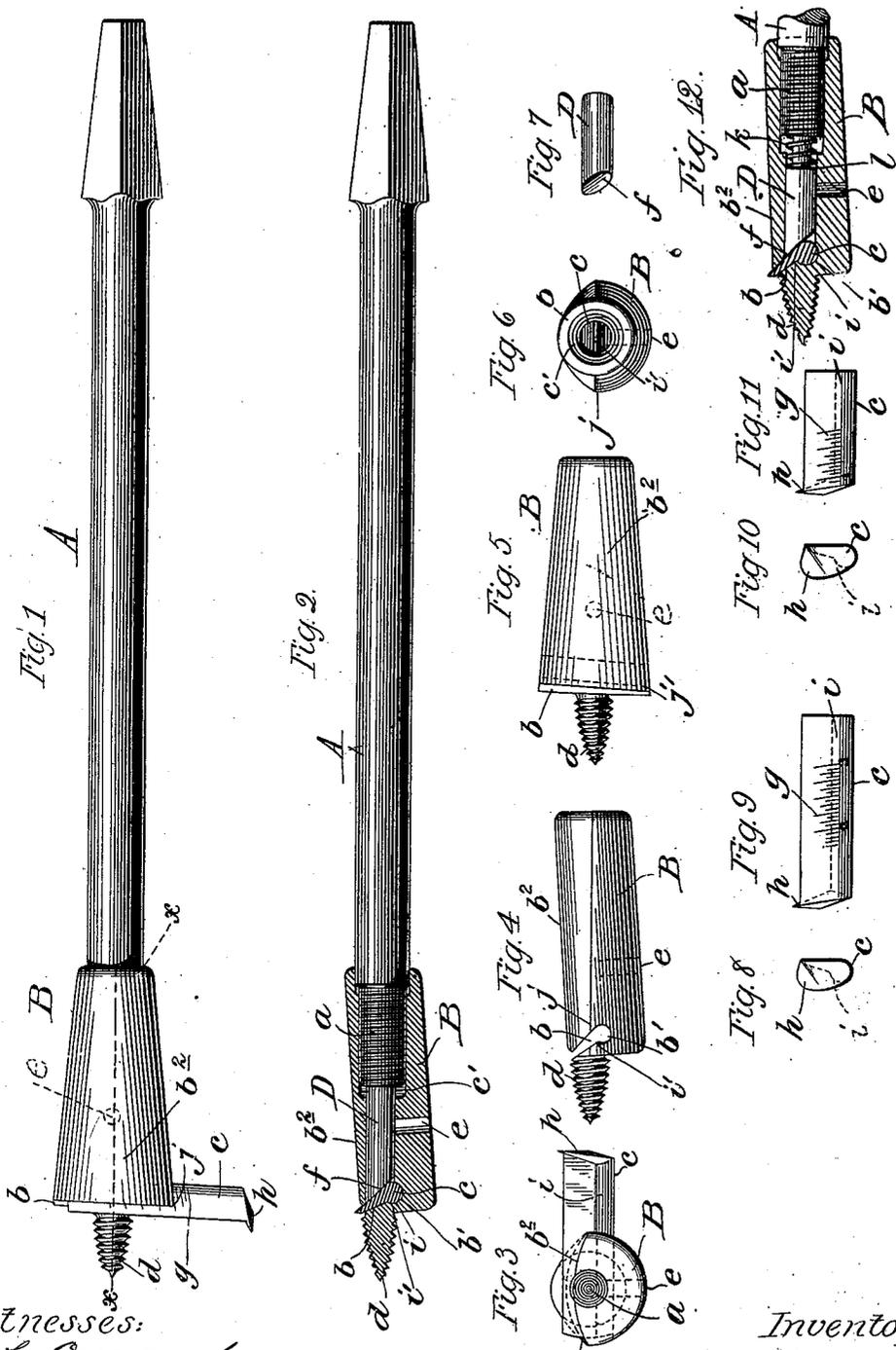


J. P. LAVIGNE.
EXPANSIBLE BIT.

(Application filed Sept. 15, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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EXPANSIBLE BIT.

SPECIFICATION forming part of Letters Patent No. 646,489, dated April 3, 1900.

Application filed September 15, 1899. Serial No. 730,532. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. LAVIGNE, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Expansible Bits; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Expansible bits of the type to which my present invention relates have been made with the head and shank integral, a radially-extensible cutter mounted in a recess transversely of said head and held in place by either a separate or integral clamp-plate, and a screw passed through the same. Still others have been made with the shank and head integral, a radially-extensible cutter mounted in a recess transversely of said head and held in place by a vertically-slidable clamp-plate, and an internally-screw-threaded sleeve operating on screw-threads chased upon a portion of the head. Several disadvantages have been encountered in these forms, among which are the weakening of the head by the necessity of cutting away much of the body thereof in order to accommodate the cutter and clamps and the difficulty of making the clamp-screws or the screw-threaded sleeves maintain their grip. These forms, moreover, are expensive of manufacture.

The objects of my present invention are to overcome these several objections and to improve such tools in several other particulars hereinafter shown.

My present invention therefore consists, mainly, in an expansible bit comprising a shank having its lower end suitably threaded to screw into a tubular removable internally-screw-threaded head, a lead-screw, a suitable recess transversely of said head for reception of a radially-extensible cutter, the bore of said head connecting said cutter-recess and said internally-screw-threaded portion thereof, and a slug or pin slidably fitted in said bore or tubular portion of the head and pro-

vided with a bevel at one end and in some cases with a shoulder and spring at the other end, all of which will hereinafter be more fully described and claimed.

In the drawings, Figure 1 is a full-length plan view of my improved expansible bit assembled. Fig. 2 is a side elevation of the same, with sectional view of the head on line *xx* of Fig. 1. Fig. 3 is a bottom end view of the bit; Fig. 4, a full side elevation of the head with cutter and shank removed; Fig. 5, a plan view of the head with cutter and shank removed; Fig. 6, a top end view of the head with cutter and shank removed; Fig. 7, a perspective view of the slug or pin. Figs. 8 and 9 and 10 and 11 are respectively end and side elevations of cutters of different lengths, and Fig. 12 illustrates a modification of parts of my invention.

Like letters indicate corresponding parts throughout the several figures.

A is the shank; *a*, the screw-threads at its lower end.

B is the head; *b*, a transverse two-way inclined wedge-shaped recess transversely therein for reception of the radially-extensible cutter *c*; *b'*, a round hole intersected by said wedge-shaped recess tangentially on the upper side, but having its radius depressed below the base of the lower side of said recess to form a ridge or hook at *v*.

C is the bore of the tubular portion of the head, which is longitudinally central with the lead-screw *d* for reception of the slug or pin D, and *c'* is a counterbored portion of said bore C, screw-threaded for reception of the screw-threaded end *a* of said shank.

e is a lever-socket in the rear of the head B. *f* is an inclined surface or bevel on the lower end of the slug or pin.

g g are graduations on the face of the cutter, and *h* is the usual spur at the outer end thereof.

i is the extended roll-surface of the cutter-back, which forms a bead and serves to hook upon the raised ridge *l* within the recess *b*.

The functions of the several parts will hereinafter appear.

The operation of my present invention is as follows: Having been constructed and assembled as shown, the cutter *c* is placed in the

position required to bore a hole of the diameter desired, which may be accurately indicated by the outer corner *j* of the head registering with the appropriate graduation *g*. The head B is now held from turning while the shank A is screwed down into it, which operation forces the bevel *f* of the slug or pin D firmly against the inclined face of the cutter *c*, which latter, being hooked at *i i'* against sliding downward or outward, is thereby instantly and firmly bound in place and securely held against radial displacement. It will now clearly appear to those skilled in the art that when the bit is applied the act of boring serves to further tighten the cutter, because if there be any rotation whatever of the head B on the screw-threaded end *a* of the shank A it must of course force the slug or pin D against the cutter *c* and more firmly impinge the latter on its seat and at *i i'*.

As a provision for holding the head B when tightening the cutter in place or when unscrewing the shank A to release the same a socket *e* is made, preferably on the rear side of the head, so that a lever, a nail, or a bit of wire may be inserted therein.

I prefer to make the head in the form shown, with its front *b*² reduced by a circle of greater radius than that of the circle of the rear side, (see Fig. 3,) but do not wish to limit myself to this.

Fig. 12 shows a modified construction of the slug or pin D to permit of the application of a coiled spring *k* upon the reduced end, one end of said spring to bear against the shoulder *l* of the pin and the other against the threaded end *a* of the shank A. It will be understood that the object of this is to keep the beveled end *f* of the pin in frictional contact with the cutter *c*, so that when being loosened for adjustment the latter may not fall out of the recess *b*. This feature of my invention may or may not be employed.

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

1. In an expansible bit, in combination, a shank screw-threaded at its lower end, a revoluble, tubular head internally screw-threaded at its upper end, a slug or pin to act in said tubular head, and a radially-extensible cutter carried in a suitable recess in said head, substantially as set forth.

2. In an expansible bit, in combination, a shank screw-threaded at its lower end, a rev-

oluble, tubular head internally screw-threaded at its upper end, a slug or pin to act in said tubular head shouldered at one end, a coiled spring bearing against said shoulder, and a radially-extensible cutter carried in a suitable recess in said head, substantially as set forth.

3. In an expansible bit, in combination, a shank screw-threaded at its lower end, a revoluble, tubular head internally screw-threaded at its upper end, and provided with a lever-socket in one side thereof, a slug or pin to act in said tubular head, and a radially-extensible cutter carried in a suitable recess in such head, substantially as set forth.

4. In an expansible bit, in combination, a shank screw-threaded at its lower end, a revoluble, tubular head internally screw-threaded at its upper end, a slug or pin to act in said tubular head, and a radially-extensible cutter, having a roll-bead *i* along its back, carried in a recess in said head, wherein is provided a ridge or hook *i'* on its lower wall, substantially as described.

5. The herein-described improved expansible bit, comprising a shank screw-threaded at its lower end, a revoluble, tubular head, internally screw-threaded at its upper end, a slug or pin to act in said tubular head provided with a bevel at one end, a lead-screw, a radially-extensible, graduated cutter, having a spur at its outer end and a roll-bead *i* along its back, carried in a recess in said head, wherein is provided a ridge or hook *i'* on its lower wall, substantially as described.

6. The herein-described improved expansible bit comprising a shank, screw-threaded at its lower end, a revoluble, tubular head, internally screw-threaded at its upper end, a slug or pin to act in said tubular head, having a bevel at one end and a shoulder at its other end, a coiled spring bearing on said shoulder, a lead-screw, a radially-extensible, graduated cutter, having a spur at its outer end and a roll-bead *i* along its back, carried in a recess in said head, wherein is provided a ridge or hook *i'* on its lower wall, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH P. LAVIGNE.

Witnesses:

JOHN J. TOWER,
WILLIAM H. COLE.