

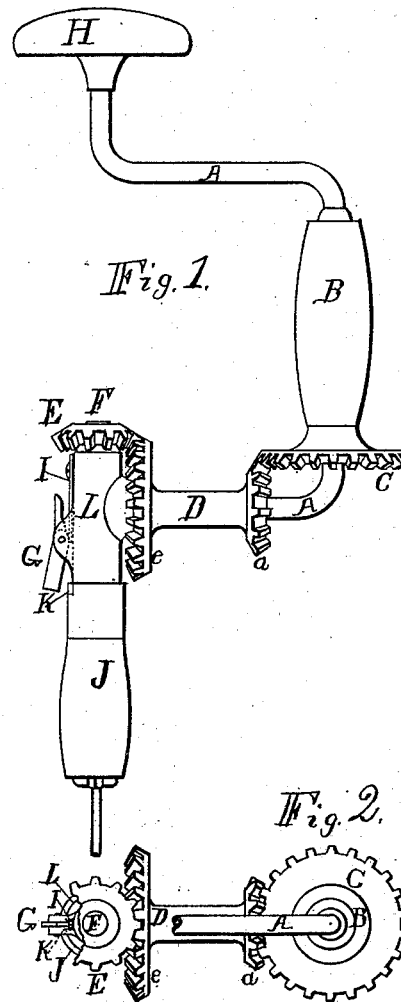
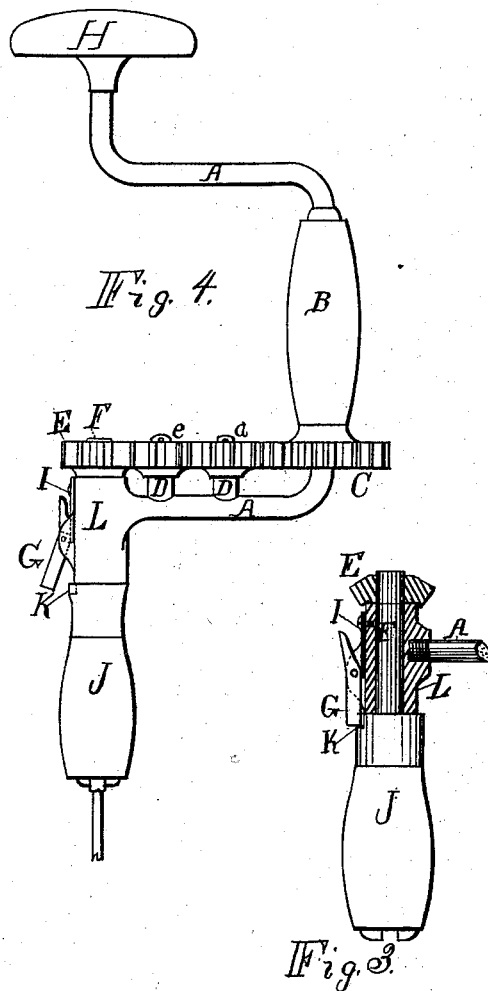
(No Model.)

W. F. & E. B. DAKE.

BIT BRACE.

No. 305,054.

Patented Sept. 16, 1884.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## BIT-BRACE.

SPECIFICATION forming part of Letters Patent No. 305,054, dated September 16, 1884.

Application filed March 28, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM F. DAKE, a citizen of the United States, residing at Grand Haven, in the county of Ottawa and State of Michigan, and EDWARD B. DAKE, a citizen of the United States, of the same place, have invented certain new and useful Improvements in Bit or Drill Braces, of which the following is a specification.

Our invention relates to improvements in that class of bit or drill braces in which the breast-piece or handle at the upper end of the brace and the chuck or clamp for holding the bit at the lower end of the brace stand in a direct line, and the body of the brace or crank, by which the bit is turned for the purpose of boring or drilling a hole, or for any other purpose for which the brace may be used, is formed by bending the body a little below the breast-plate to one side, forming a right angle, thence extending to the proper distance and turning down at right angles with the arm hereinbefore described, and, after extending downward to a convenient distance, again bending at right angles and extending, parallel with the arm hereinbefore described, to a point directly in line with the breast-plate or handle, and terminating in a chuck or clamp for holding the bit, and commonly known as a "carpenter's bit-brace." (Represented by Figure 1.)

The object of our invention is, first, to facilitate rapid boring with small bits and the procuring of rapid motion for small drills when using an ordinary brace; and, second, to provide for boring in close places—as between timbers in corners, &c.—where there is little or no chance to work the arms of the brace. We attain these objects by mechanism illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of the class of braces to which our improvement may be attached, showing a bevel-gear attachment. Fig. 2 is a top view of the same with parts cut away to show the latch G, the notch K, and the spring I. Fig. 3 is a section of a brace, showing the latch G, the notch K, and the spring I; and Fig. 4 is a side elevation of a brace with a spur-gear attachment.

Similar letters refer to similar parts throughout the several views.

The body or arms and crank A, the breast-piece or handle H, the rotary chuck J, and the journal-box L constitute the frame-work of the class of braces to which our invention may be attached, and the rotary grip-handle B, provided at its lower end with a cog-wheel, C, rigidly attached, the intermediate pinions, *a*, *e*, and E, and the latch G and notch K constitute the main features of our invention.

The grip-handle B is attached to the arms or body of the brace in the usual position in such a manner that while it cannot be slipped up and down it can be made to revolve freely upon the crank of the brace, and is provided at its lower end with a cog-wheel, C, rigidly attached to and forming a part of the grip-handle. The cog-wheel C is arranged to mesh freely with the intermediate pinion or gear *a*, which, in cases where bevel-pinions are used, is rigidly attached to the revolving sleeve D. The revolving sleeve D is attached to the lower arm of the body of the brace in such a manner that it may be made to revolve freely upon such arm, such arm passing through the center of the sleeve and forming a journal for the support of such revolving sleeve; and the revolving sleeve D is provided at one end with the bevel-pinion *a*, and at the other end with the bevel-pinion *e*, rigidly attached and arranged to mesh freely with the pinions C and E, respectively. The pinion or gear E is situated upon and rigidly attached to the upper end of the chuck shaft or spindle F, and is arranged to mesh freely with the intermediate pinion or gear *e*. The chuck shaft or spindle F passes through the journal-box L in such a manner that it may be made to revolve freely in such journal-box, and forms a bearing for the support of the chuck J, and is held in place by means of the pinion E, forming a collar at its upper end above the journal-box L, and the shoulder of the chuck forming a collar below the journal-box.

The latch G is attached to the journal-box by means of a bolt or rivet, forming a fulcrum upon which such latch may be made to work freely, in such a position that it may be thrown into a notch, K, cut into the upper

shoulder of the chuck, and is held in position, whether open or closed, by means of the spring I, which is attached to the journal-box by means of a screw or other device, and acts upon angular surfaces formed upon the inner face of the latch. The object of this latch is, first, to hold the chuck rigid in the journal-box and prevent it from turning faster than the brace is turned; and, second, to relieve the pinions C, *a*, *e*, and E of all labor when using the brace as an ordinary slow-motion brace. The chuck J is provided at its upper end with a notch, K, made to receive the latch G, when it is found necessary for any reason to hold the chuck so that it cannot be turned by the action of the pinions above described.

When it is found necessary or deemed advisable to transmit a quicker motion to the bit than can be produced by the common brace, the latch G is thrown back out of the notch K in the upper end of the chuck, and the chuck shaft or journal F allowed to turn freely in the journal-box L. The grip-handle B is grasped firmly in the hand and held in such a manner that the body of the brace, when being carried round in the process of boring a hole, &c., will turn in the grip-handle. By this means the intermediate pinion *a* is forced to travel round the cog-wheel C, thus giving a rotary motion to the said intermediate pinion *a*, which in turn transmits the motion thus obtained through the intermediate pinion or gear *e* and the pinion E upon the upper end of the chuck-shaft to the chuck, and increases the motion of the bit or drill in the ratio of the relative sizes of the above-mentioned pinions or gear.

When using our invention in places where a full sweep of the lever cannot be obtained, the lever or body of the brace A should be carried back to a convenient position, the grip-handle B grasped firmly in the hand, and the lever or body of the brace carried over and ahead as far as convenient, the grasp upon the grip-handle relinquished, the brace carried back to the position first occupied, the grasp upon the grip-handle renewed, and the lever or crank of the brace carried over and ahead, and the process continued until the desired result is attained.

In cases where the brace cannot be carried back and forth to an available distance, the desired result may be attained by turning the grip-handle B by hand, while the brace remains stationary.

When for any reason it is necessary or desirable to bore more slowly, the latch G is thrown into the notch K, and the chuck held rigidly in position on the journal-box in such a manner that only the natural motion of the brace will be transmitted to the bit, thus giving the bit a slower but stronger motion, acting simply as an ordinary brace. The same

results may be attained by the use either of bevel-gear, as above set forth, or by the use of spur-gear, as represented by Fig. 4, in which case it will be necessary to support the intermediate pinions *a* and *e* upon standards D, attached to the arm of the brace, as shown by *a*, *e*, D, and A, Fig. 4; but we greatly prefer the bevel-gear illustrated in Fig. 1, as above set forth, as being more compact, more convenient to operate, and more substantial than any other class of pinions.

We are aware that prior to our invention bit-braces have been made having the frame bent to form a lever, the revolving grip-handle or sleeve, the graduated pinions and gear-wheels, and the revolving chuck for the purpose of increasing the motion of the bit. We therefore do not claim such a combination, broadly; but,

Having thus described our invention, what we do claim as new, and desire to secure by Letters Patent, is—

1. A bit or drill brace having the body A, the revolving chuck J, the breast-piece H, the revolving grip-handle B, provided at its lower end with a gear-wheel, C, rigidly attached, the intermediate pinions or gear *a* and *e*, properly connected and arranged to mesh freely with the grip-handle gear C and the chuck-gear E, respectively, or any other suitable connection between the revolving grip-handle B and the revolving chuck J, in combination with the latch G, attached to the journal-box, the spring I, and the notch K, situated in the upper shoulder of the chuck for the reception of the latch, substantially as and for the purpose set forth.

2. A bit or drill brace having the body A, bent at proper angles to form a lever or crank, the rotary or revolving chuck, and the breast-plate, in combination with the rotary or revolving grip-handle B, provided at its lower end with the cog-wheel C, rigidly attached, and arranged to mesh freely into the pinion *a*, the revolving sleeve D, provided at one end with the pinion *a*, rigidly attached, and arranged to mesh freely with the grip-handle cog-wheel C, and at the opposite end with a cog-wheel or pinion *e*, rigidly attached, and arranged to mesh freely into the chuck-pinion E, situated upon the upper end of the chuck shaft or spindle F, and the latch G, attached to the journal-box L, and held in place by the spring I, and the notch K, cut or formed into the upper end of the chuck for the reception of the latch G, substantially as and for the purpose set forth.

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