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PATENTED JAN. 26, 1904.

J. F. WILLEY.
PORTABLE DRILL.

APPLICATION FILED MAR. 5, 1903.

NO MODEL.

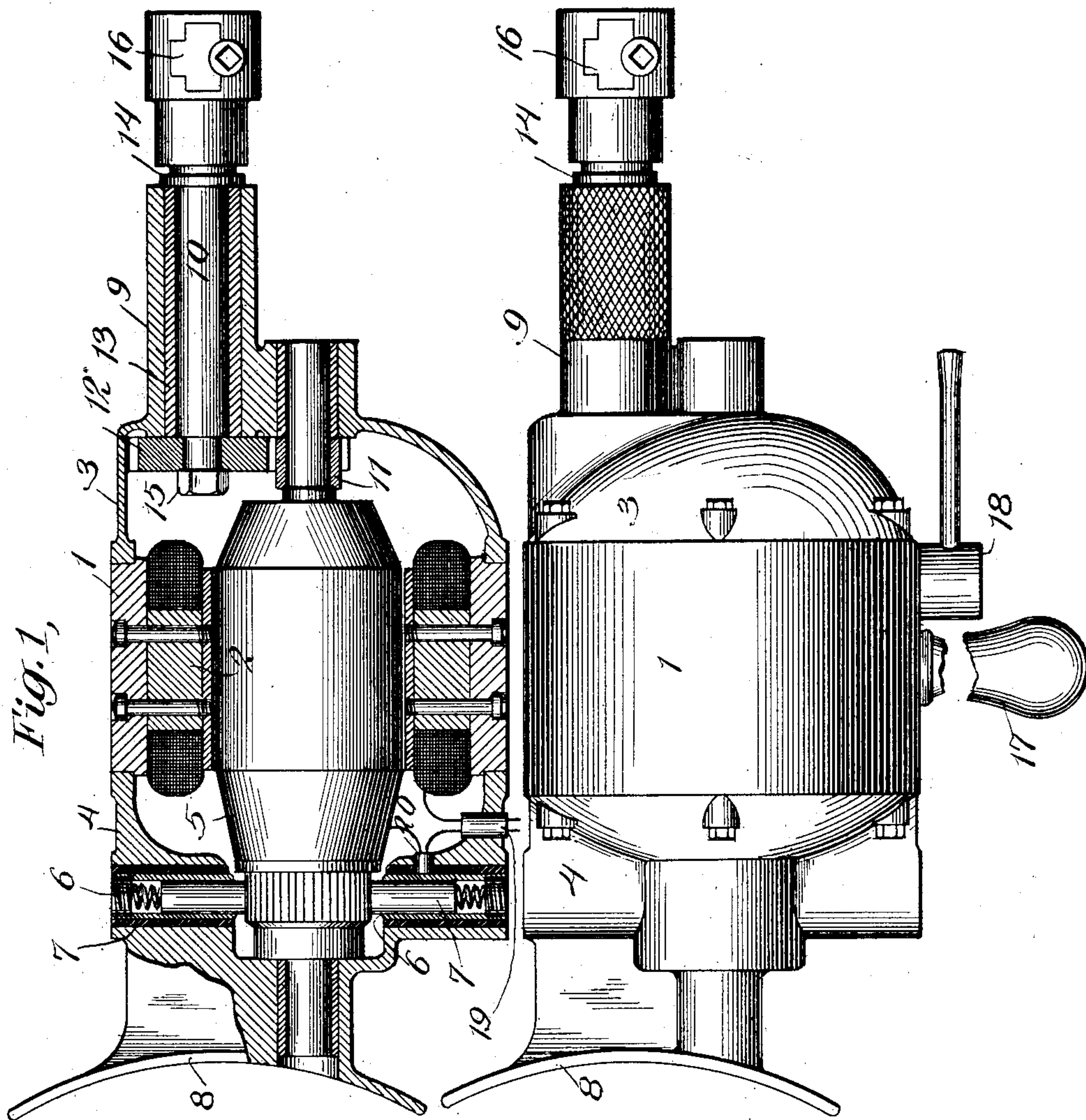


Fig. 1,

Fig. 2,

WITNESSES:

Miner Lape
A. J. Moller

INVENTOR

James F. Willey

BY

Chapin Haywood Marble
ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES F. WILLEY, OF JEFFERSONVILLE, INDIANA.

PORTABLE DRILL.

SPECIFICATION forming part of Letters Patent No. 750,744, dated January 26, 1904.

Application filed March 5, 1903. Serial No. 146,286. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. WILLEY, a citizen of the United States, residing at Jeffersonville, in the county of Clark and State of Indiana, have invented certain new and useful Improvements in Portable Drills; and I do hereby declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to motor-driven portable drills, and particularly to small portable motor-driven drills of the breast-drill type; and it consists of the novel features of construction of such drills hereinafter described, and particularly pointed out in the claims.

The objects of my invention are to facilitate the operation of small portable drills, to enable the same to be driven by electric current derived from convenient sources, to simplify the construction of such drills and render the same compact, durable, and relatively light in weight and economical in the use of power, and to protect the revolving parts of the drill from injury and prevent injury of the hands of the workmen thereby.

I will now proceed to describe my invention with reference to the accompanying drawings, illustrating certain forms of my invention, and will then point out the novel features in claims.

In the drawings, Figure 1 shows a central longitudinal section of one form of my improved breast-drill in which speed-reducing gears are interposed between the armature-shaft and the drill-spindle. Fig. 2 is an external view of the same drill.

The drawings show a breast-drill, the main portion of which is a hollow casing inclosing the armature of the motor. Said casing is formed in three sections—viz., an intermediate section 1, carrying the field-magnets 2 of the motor, and end sections 3 and 4, in which the armature 5 has bearings. The sections of the casing are held together by screws. Section 3 is provided with an extension-boss 9 eccentric with respect to the center of gravity of the drill and to the armature, and in said boss is a bearing in which is mounted the drill-spindle 10. Said boss forms a convenient means for grasping the drill by hand for the

purpose of guiding it. Section 4 carries the holders 6 for the commutator-brushes 7 and is provided with an operator's body-piece or steadying-piece 8, which is in line with the drill-spindle, and therefore is also eccentric to the center of gravity of the drill and to the armature. In the particular instance shown this body-piece is a breast-piece; but other forms of body-piece or steadying-piece may be used. The drill-spindle is driven from the armature-shaft by means of reducing-gears 11 and 12, inclosed within the casing, the section 3 being suitably formed to contain these gears. Since the gears are thus inclosed, they are protected from injury, it is impossible for the workman's finger or clothing to be caught in them, and the drill may be handled as readily as if no gears were used. The drill is also more simple and compact in appearance than could be the case if the gears were external. Between the drill-spindle and the said boss 9 there is a bearing-bushing 13. The spindle is provided with a thrust-collar 14. The gear 12 prevents the spindle from being withdrawn from the bearing normally, said gear being held in place on the spindle by a nut 15. The spindle may carry any suitable chuck 16 for grasping drills or may be provided with anything else for the same purpose.

Upon the side of the casing opposite the drill-spindle 10 and operator's body-piece 8 there is a handle 17. By so locating the handle a single handle may be used in place of the two handles ordinarily employed, so that the drill is more compact and may be used in places where a drill having handles on two opposite sides cannot be used. Near this handle there may be a controller-handle 18, by which the motor may be stopped or started or its speed regulated. I have not shown any particular controller to be operated by this handle, as the same forms no portion of my invention; but any suitable controller may be used.

Wires for supplying current may enter the casing through a thimble 19 and from thence may reach the brushes through thimbles 20, of which only one is shown.

The particular motor shown is of the direct-current type and is adapted to take current

from any ordinary incandescent lighting-circuit by means of a plug fitting into any ordinary lamp-socket. Obviously any other type of direct-current motor may be substituted
5 or any convenient type of alternating-current motor.

The drill is used in the same manner as an ordinary breast-drill except that the workman has simply to hold it in the desired position and by pressing against its breast-piece
10 supply the pressure necessary for drilling. Because of the wide distribution of electric-lighting circuits current to operate the drill may be obtained in most places where such
15 drills are used.

It is obvious that my invention is capable of various modifications in construction and arrangement of the parts, and I do not confine myself to the particular construction above
20 described.

By the term "operator's body-piece" used hereinbefore and in the following claims I mean any piece or member by which the operator may steady the drill, hold it in position, and press it up to its work either by
25 grasping such piece with his hand or by pressing any other portion of his body against it.

It is obvious that this drill may be used with suitable tools for other purposes than
30 metal-boring. It may be used, for example, in wood-boring, reaming, tapping, and flue-rolling.

What I claim is—

1. In a motor hand-drill, the combination
35 with a motor of the rotary type comprising a rotary driving member and a casing inclosing the same, said casing having at one end a bearing for a drill-spindle eccentric to the center of gravity of the drill and of the axis
40 of rotation of the driving member, and at the other end an operator's body-piece in line with

said bearing; and having also a handle projecting from the side of the casing opposite the bearing end of the said body-piece; of a spindle within said bearing, and intermesh-
45 ing gears within the motor-casing mounted on said spindle and on the rotary member of the motor, the drill having also provision for hand-support at a point adjacent the drill-spindle, whereby the drill is provided with
50 a three-point support, its center of gravity lying within a triangle formed by lines connecting the said points of support.

2. A motor hand-drill comprising the armature and field-magnet of an electric motor, a casing, a drill-spindle, and gearing connecting the same with the said armature, the said casing comprising three members arranged in line with each other and longitudinally bolted together, each of the end members having a
60 bearing for the said armature, one of the said members carrying the drill-spindle, the bearing therefor in the said member being arranged to one side of the armature-bearing, the other of said end members provided with
65 an operator's body-piece arranged in line with the said drill-spindle, and the middle member supporting the field-magnet of the electric motor, whereby upon disconnection of the three casing members the drill-spindle and
70 gear thereupon will be removed with one of the said end members, and the body breast-piece with the other of said members, permitting free removal of the armature and free access to the field-magnet supported by the
75 middle member.

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

JAMES F. WILLEY.

Witnesses:

JAS. CLARK, Jr.,

W. S. GOULD.