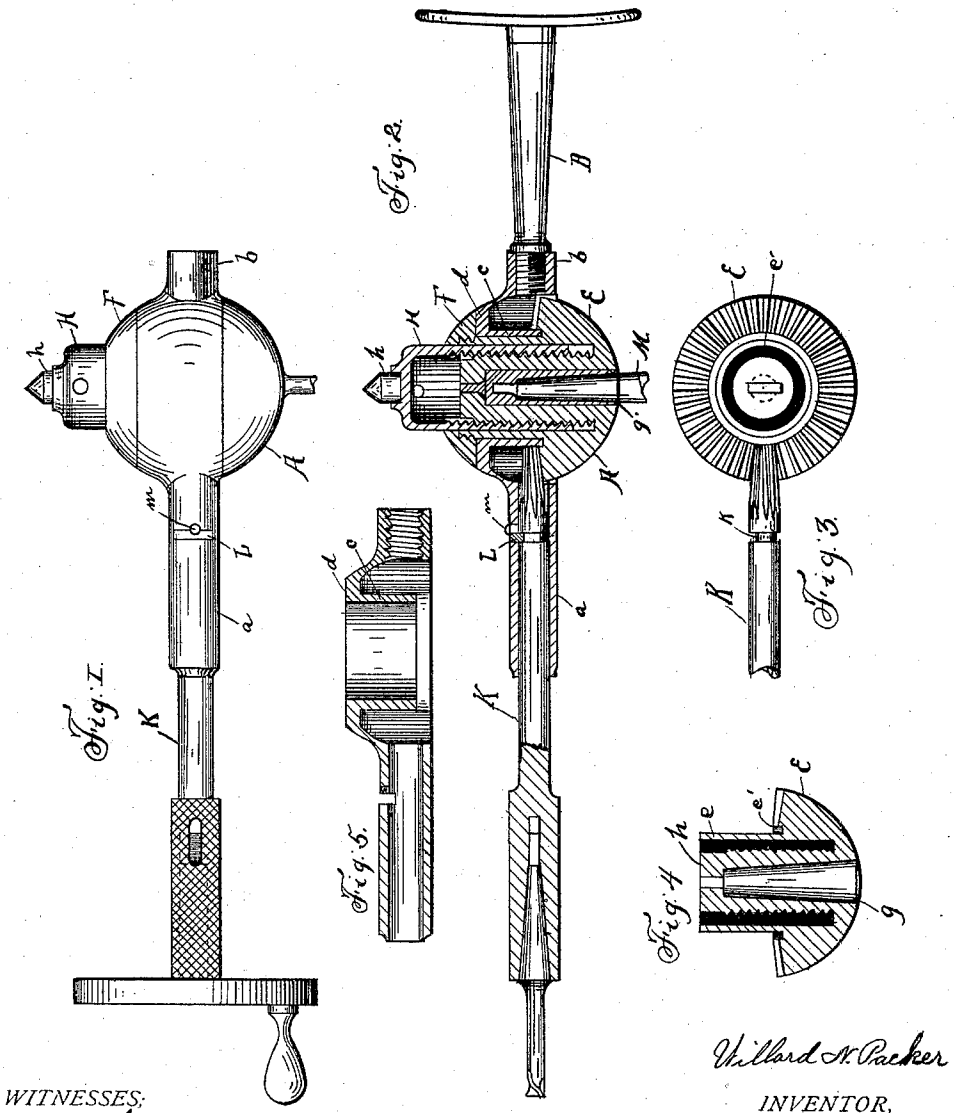
(No Model.)

W. N. PACKER.

DRILL.

No. 457,009. Patented Aug. 4, 1891.



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UNITED STATES PATENT OFFICE.

WILLARD N. PACKER, OF CLEVELAND, OHIO.

DRILL.

SPECIFICATION forming part of Letters Patent No. 457,009, dated August 4, 1891.

Application filed April 13, 1891. Serial No. 388,782. (No model.)

To all whom it may concern:

Be it known that I, WILLARD N. PACKER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Drills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to drills; and the invention consists in a drill which may be driven in light work by hand and in heavy work by power, and in which the power for one purpose is communicated in one direction and the power for the other purpose is communicated in the reverse direction. In these two opposed operations the part that serves as the driver in one direction serves as the driven part or member when the action is reversed, and the two parts being geared in the proportion of, say, one to six, or thereabout, the speed in one case will be six times faster than in the other case. The greater speed is employed when the drill is used with hand-power and a small bit, and for slower speed and heavier work power is employed.

In the accompanying drawings, Figure 1 is a side elevation of my improved drill as it appears when equipped for power work. Fig. 2 is a longitudinal section showing the drill as equipped for hand work. Fig. 3 shows a face view of the semi-spherical head and the engaging end of the spindle; and Fig. 4 is a vertical central sectional view of the said head and its central projecting parts, as hereinafter fully described. Fig. 5 is a longitudinal section of the body part of the drill.

A represents the body of the drill, provided at one end with a tubular projection *a* and at the other end with a screw-socket *b* to attach the breast-piece B. The central part of the body is a shell with rounded and finished exterior and provided with an annular hub *c*, open through its center and extending inward from its flat upper portion *d*. This hub forms a bearing on its inside for tubular spindle *e* of the gear-head E, set into the hub from the bottom. A slight groove *e'* is formed around the base of the spindle *e*, into which the hub *d* projects, and the said spindle extends above the said hub a slight distance and is threaded on its exterior to accommodate the ring-shaped nut F, which engages said spindle above the said hub and rests on the flat surface *d*. The head E and the nut F are thus connected and rotate together. The head E is provided centrally from its bottom with a socket *g* for either a drill, as in Fig. 1, or a handle to turn the drill, as in Fig. 2, and in Fig. 2 I show a removable collet *g'*, which may or may not be used as a larger or smaller drill is employed.

Centrally within the gear-head E is a threaded hub *h*, which extends into the head some distance below its spindle and is separated therefrom by an annular space, and an adjusting feed-cap H, entering through the nut F, extends down into this space and engages the thread of the said hub. This cap is used as a force-feed device when the drill is used with power, as in Fig. 1, and has a pointed bearing *h'* on its top adapted to bear against the arm or other object, through which mechanical pressure may be applied, but not shown here. If such arm were stationary, the sleeve would be turned outward, and thus carry the drill down.

Through the tubular extension *a* of the body A extends the spindle K, tapered at its inner extremity and provided with longitudinal teeth on its tapered portion meshing with the teeth on the hub E. The teeth on the head E incline sufficiently from their inner to their outer portion to accommodate themselves to the taper of the spindle and are arranged radially on said head around the hub *e*. The spindle K has an annular groove *k*, engaged by a segmental locking-piece *l*, let into the tube *a* over said groove and held by a short screw *m* at its side. The outer extremity of the spindle K is adapted to receive a drill, as in Fig. 2, or to have power applied, as in Fig. 1. When power is employed, the breast-piece B may be removed.

In operation for light work a crank-handle M is used, and this use gives speed to the drill by reason of the gear employed with only ordinary speed in the handle, and when power is used a slow speed with greater force is obtained by the reverse movement of the parts

and inserting the drill in the socket *g*, as in Fig. 1.

The body A, head E, and nut F are formed to match at their meeting edges and together produce a spherical figure which is exceedingly neat and convenient to handle. If the drill were wanted only for light work, the hub *h* and the adjustable feed cap or sleeve H would be omitted and the nut F would be closed and rounded at its center instead of open, as now.

The construction here shown can be converted into a very effective ratchet-drill by using the spindle K as a handle. Thus supposing that a drill be inserted in the socket in the head, as in Fig. 1, and the spindle rotated quarter-way round horizontally and then clutched and drawn back, the spindle will roll in the hand on the outward idle movement and be rigid in the hand on the return movement, and this grip on the spindle makes the parts rigid with one another and gives the desired effect to the drill. Each backward movement is a rolling one and each forward movement a rigid one.

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

1. The shell-shaped body, a head having gear and a socket for a drill or a handle rotating in said body, and a spindle with teeth meshing with the gear on the said head, substantially as described.

2. The body provided with a tubular hub and a rotating thread with a spindle in said hub and having gear and a socket for a drill or a handle, and a spindle having teeth meshing with said gear, substantially as described.

3. The body having a tubular projection at one side and a spindle in said projection with teeth on its inner end, and a rotating head provided with gear meshing with the said spindle, and a spindle having a bearing in said body and free to turn therein, substantially as described.

4. The body having a tubular bearing, a rotating head having a spindle fitting said bearing, and a series of radial teeth outside of the spindle and a threaded hub inside of the spindle, a nut to lock the said body and rotating head together, and an adjusting-sleeve engaging the hub on said head, substantially as described.

5. The body with a tubular bearing and the head with a spindle extending through said bearing and above the same, and a nut engaging said spindle and holding the body and head together, said head having radial teeth at the base of its spindle, and a toothed spindle engaging said teeth, substantially as described.

6. The body of the drill having a tube for the spindle at one side, a socket for a breast-piece on the opposite side, and a tubular bearing at right angles to these features forming a bearing for a rotating head, in combination with said head having a spindle extending through said bearing and secured by a nut, said head having radial teeth, and a socket for a drill or a handle, and a spindle meshing with the head, substantially as described.

7. The body having a tubular hub, a breast-piece at one side, and a drill-supporting spindle with teeth on its inner end supported on the opposite side of the body, in combination with a rotating head having a spindle secured in said hub by a nut outside of the hub and having teeth to engage the teeth on the drill-supporting spindle, and a socket for a handle, substantially as described.

Witness my hand to the foregoing specification this 21st day of March, 1891.

WILLARD N. PACKER.

Witnesses:
H. T. FISHER,
N. L. MCLANE.