

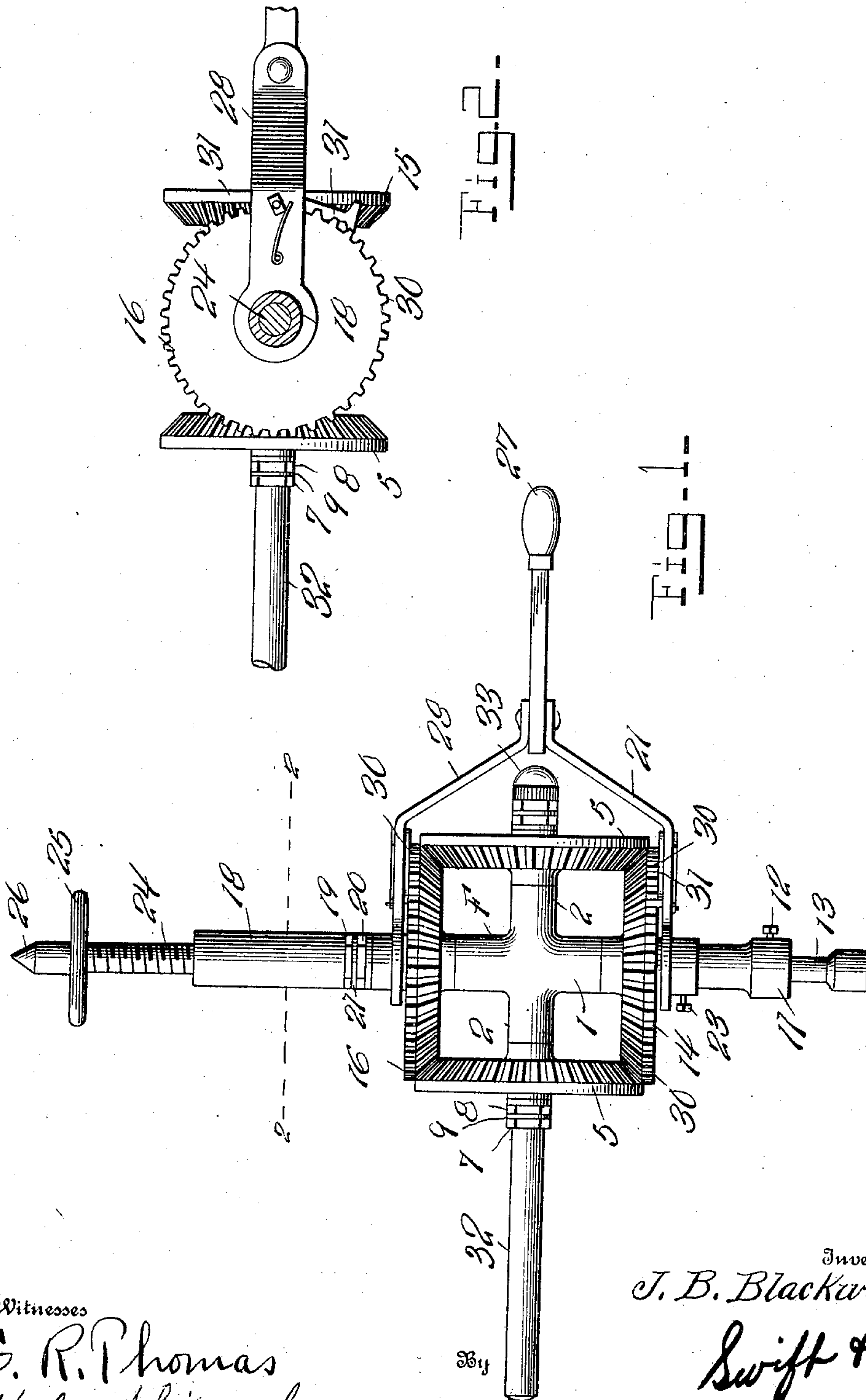
No. 877,288.

PATENTED JAN. 21, 1908.

J. B. BLACKWELL.
RATCHET DRILL.

APPLICATION FILED JULY 6, 1906.

2 SHEETS—SHEET 1.



Witnesses
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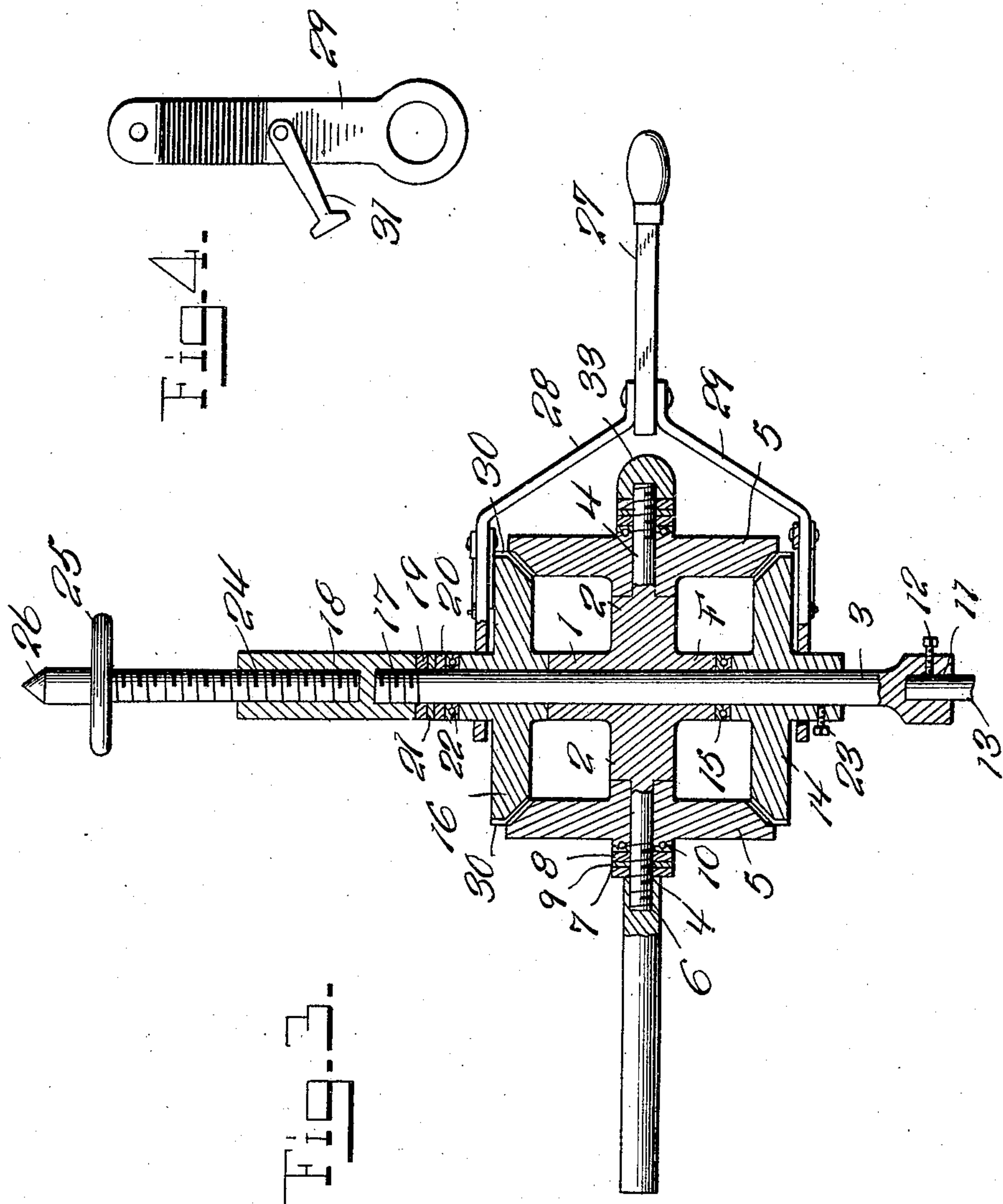
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UNITED STATES PATENT OFFICE.

JOHN B. BLACKWELL, OF DARLINGTON, SOUTH CAROLINA.

RATCHET-DRILL.

No. 877,288.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed July 6, 1906. Serial No. 324,929.

To all whom it may concern:

Be it known that I, JOHN B. BLACKWELL, a citizen of the United States, residing at Darlington, in the county of Darlington and State of South Carolina, have invented a new and useful Ratchet-Drill; and I do hereby 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.

This invention relates to ratchet drills; and it has for its objects to simplify and improve the construction and operation of this class of devices.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to, when desired.

In the drawings:—Figure 1—is a side elevation, of a ratchet drill constructed in accordance with the principles of the invention. Fig. 2—is a horizontal sectional view, taken on the plane indicated by the line 2—2 in Fig. 1. Fig. 3 is a vertical sectional view; Fig. 4 is a detail plan view of the operating handle and pawl.

Corresponding parts in the several figures are designated by like characters of reference.

The frame, F, of the improved drill is cruciform, consisting of a vertical portion or stem, 1, having laterally extending arms, 2, 2. The stem is cored and drilled longitudinally to afford a bearing for the bit shaft, 3; the lateral arms 2, 2 have reduced extensions, 4, forming bearings upon which bevel gears, 5, are mounted for rotation; the extremities of the extensions 4 being externally screw-threaded, as shown at 6, for the reception of jam-nuts, 7, 8, and washers, 9, that serve to retain the bevel gears upon the bearings. The proximate faces of the bevel gears and of the inner jam nuts 7 are formed with ball races, for the reception of anti-friction balls, 10.

The bit shaft 3, which extends through the bearing formed for its reception in the verti-

cal portion or stem of the frame, is provided at its lower end with a recess or socket, 11, in which the shank or tang of a bit may be secured by means of a set-screw, 12; or, if preferred, a bit socket, as 13, of ordinary chuck construction may be mounted in the recess 11. The bit shaft carries near its lower end a bevel gear, 14, meshing with the bevel gears 5, 5, and between the hub of the bevel gear 14 and the lower extremity of the stem 1 of the frame there are placed anti friction balls, 15. The bit shaft carries near its upper end a bevel gear, 16, which meshes with the bevel gears 5, 5; the upper extremity of the bit shaft is threaded, as shown at 17, for the reception of the screw case, 18, between the lower extremity of which and the hub of the bevel gear 16 jam nuts, 19, 20, a washer, 21, and anti friction balls, 22, are interposed, the bevel gear 16 being thus supported upon the bit shaft in such a manner as to rotate freely thereupon. The bevel gear 14 is firmly secured upon the bit shaft, as by means of a set screw, 23.

The feed screw, 24, which operates in the screw case 18, is provided with a hand wheel, 25, whereby it may be conveniently operated; and the upper extremity of said feed screw has a conical bearing point, 26, enabling the device to be operated in connection with a drill support of ordinary construction.

A handle, 27, is provided; said handle being provided with terminal divergent straps, 28, 29, having eyes or apertures journaled either direct upon the bit shaft, adjacent to the bevel gears 14 and 16, or upon the hubs of said wheels, as shown in the drawings. The bevel gears are provided with peripheral cogs or teeth, 30, and upon the handle straps 28, 29 there are pivoted reversible, spring actuated pawls, 31, adapted to engage the peripheral teeth of the bevel gears to effect the rotation of the bit shaft in opposite directions; it being readily understood that when the operating handle is reciprocated, said pawls will exercise a pushing action in opposite directions. It will also be seen that by reversing the position of the pawls, the direction of rotation of the bit shaft will be reversed.

For the purpose of assisting in holding the device steady during operation, a handle, 32, is provided, said handle being screwed onto the threaded extremity of the extension 4 of one of the frame arms 2; a cap, 33, is threaded onto the extremity of the opposite frame

arm, as shown. Said handle and cap also assist in securely assembling the parts, and impart a neat and finished appearance to the device.

5 From the foregoing description taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it pertains. The
10 general construction is simple and inexpensive; the parts may be readily assembled for use, and the arrangement of ball bearings is such that the working parts will be largely relieved from friction, and, hence, the device
15 may be used with ease and efficiency.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States:—

20 In a device as specified, the combination of a cruciform frame consisting of integral lateral and vertically extending arms and pro-

vided with a vertically disposed bore, of a bit shaft journaled therein, a gear having ratchet teeth loosely mounted upon the upper portion of said shaft, another gear fixed to the
25 lower portion of said shaft and also provided with ratchet teeth disposed opposite to the ratchet teeth of the upper gear, a horizontally operating forked lever provided with oppositely operating spring actuated pawls
30 to co-act with the ratchet teeth, a gear journaled upon one of the lateral arms and a handle extending from the other laterally disposed arm as specified.

In testimony whereof I have signed my
35 name to this specification in the presence of two subscribing witnesses.

JOHN B. BLACKWELL.

Witnesses:

J. MONROE SPEARS,
GILES SMITH.