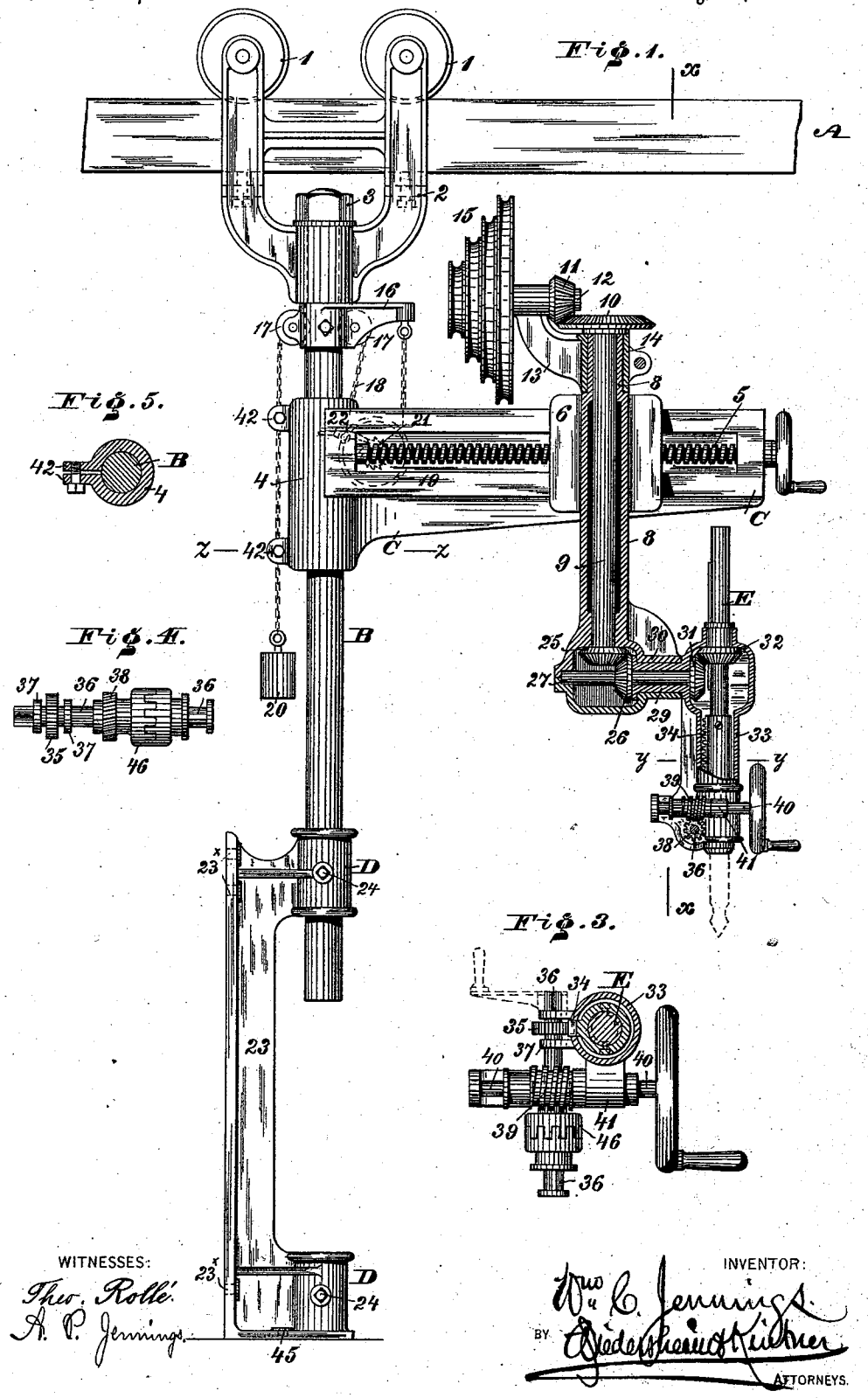
(No Model.) 2 Sheets—Sheet 1.

# W. C. JENNINGS.

## PORTABLE DRILL.

No. 382,472. Patented May 8, 1888.




WITNESSES:
Theo. Rollé.
A. P. Jennings.

INVENTOR:
Wm C. Jennings
BY Wedderburn & Kirkner
ATTORNEYS.

N. PETERS. Photo-Lithographer, Washington, D. C.

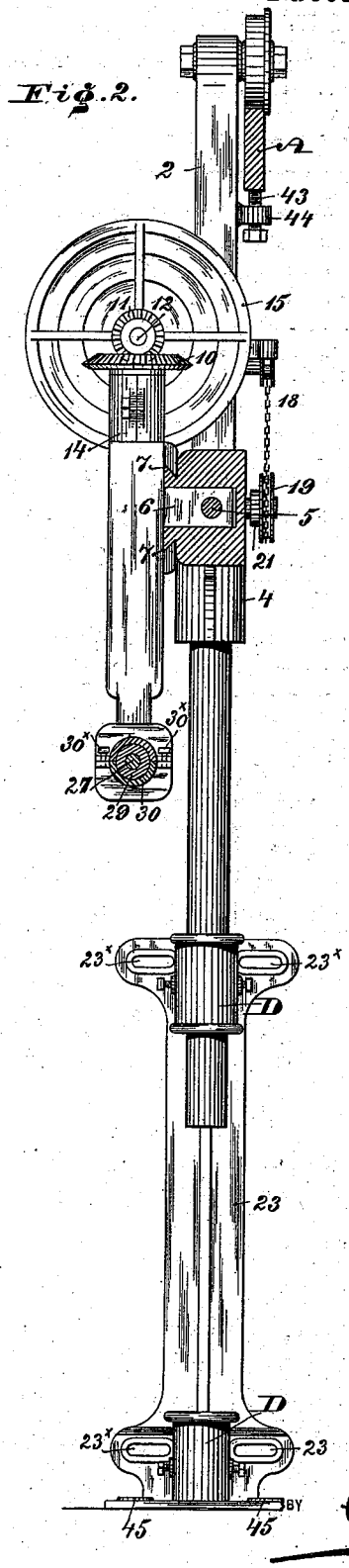
(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.




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# UNITED STATES PATENT OFFICE.

WILLIAM CYRUS JENNINGS, OF CAMDEN, NEW JERSEY.

## PORTABLE DRILL.

SPECIFICATION forming part of Letters Patent No. 382,472, dated May 8, 1888.

Application filed February 27, 1888. Serial No. 265,354. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM CYRUS JENNINGS, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Improvement in Portable Drills, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a drill possessing novel features, whereby it is readily portable and may be adjusted in various positions and adapted for operation in vertical, horizontal, and oblique directions, as will be hereinafter fully set forth.

Figure 1 represents a partial side elevation and partial vertical section of a portable drill embodying my invention. Fig. 2 represents a partial side elevation at a right angle to Fig. 1, and a partial vertical section on line *x x*, Fig. 1. Fig. 3 represents a horizontal section on line *y y*, Fig. 1, on an enlarged scale. Fig. 4 represents a view of a detached portion. Fig. 5 represents a section on line *z z*, Fig. 1.

Similar letters and figures of reference indicate corresponding parts in the several figures.

Referring to the drawings, A represents a track, which is supported in any suitable manner, and having thereon the wheels 1, from which depends a hanger or traveler, 2.

B represents a vertical rod, which is secured to the center of the hanger 2 by means of a nut, 3.

C represents a crane or arm, which is formed at one end with a boss, 4, through which the rod B passes below the hanger 2, said boss being split and provided with clamping-bolts. Swiveled on the arm C is a screw, 5, which extends horizontally and engages with a slide, 6, which latter is guided on said arm C by means of tongues and grooves, as at 7. Secured to or cast with the slide 6 is a tubular bearing, 8, for a vertical shaft, 9, the upper end of which carries a bevel-wheel, 10, with which meshes a bevel-pinion, 11, whose shaft 12 is mounted on an arm, 13, the lower end whereof is of the form of a split boss, 14, which encircles the upper end of the tube or tubular bearing 8, said shaft 12 constituting the driving-shaft of the drill and carrying the pulleys 15, by which power may be communicated from any proper source to said shaft.

Bolted or otherwise secured to the shaft B, between the hanger 2 and crane C, is an arm, 16, which carries pulleys 17, and connected with it a chain, 18, which passes around a pulley, 19, on the crane C, and also around the pulleys 17, the lower end of the chain having secured to it a counterpoise or weight, 20. To the shaft of the pulley 19 is secured a ratchet, 21, with which engages a pawl, 22, the latter (shown in dotted lines, Fig. 1,) being hung on the crane C and serving to prevent rotation of the pulley 19.

D represents vertical bosses at the upper and lower ends of a sustaining and securing stand, 23, which latter is provided with slots or ears $23^{\times}$, whereby said stand may be sustained on a wall, column, floor, &c., it being noticed that the lower end of the rod B passes through the upper boss D, and may be passed through the lower boss, each boss having a screw or bolt, 24, for tightening the rod in either boss or bolt, or both bosses.

The lower end of the shaft 9 carries a bevel-pinion, 25, which meshes with a bevel-pinion, 26, secured to a horizontal shaft, 27, the latter being mounted in a sleeve, 29, which is fitted within a tubular bearing, 30, formed in sections, the upper section being cast with or otherwise secured to the lower end of the tube or tubular bearing 8, the two sections being connected by screws or bolts $30^{\times}$. To the shaft 27 is also secured a bevel-pinion, 31, which meshes with a bevel-pinion, 32, the latter being connected by a feather with the drill or tool carrier E, said pinion 32 and the lower end of the carrier E being fitted in a shell or tubular bearing, 33, which is cast or otherwise connected with the sleeve 29.

Secured to the carrier E is a rack, 34, with which meshes a pinion, 35, the latter having its shaft 36 mounted on ears 37 on the shell or bearing 33. To the shaft 36 is secured a worm-wheel, 38, which engages with a worm, 39, on a horizontal shaft, 40, the latter being mounted in a boss, 41, at the bottom of the shell 33.

The boss 4 of the crane C is provided with ears 42, to receive screws or bolts, whereby said crane may be fixed in position when adjusted.

On the hanger 2 are bolts or screws 43, which are fitted to ears 44 on said hanger and adapted to tighten against the under side of the track A for preventing shifting of the hanger when adjusted. It will be seen that the hanger may be moved on the track to the required position, carrying the connected parts with it, the bosses D being also moved to accord with the hanger, after which the hanger is locked by means of the bolts 43 and the bosses are secured to the floor of the apartment or a bed thereon by the screws or bolts passed through openings 45 in the base of the stand 23, the rod thus being firmly sustained at both ends.

Should it be desired to lower the drill, the nut 3 is unscrewed, the rod B fitted in both bosses D, and the stand secured either to a wall, column, or floor. The crane may also be raised or lowered, as desired, its connected parts moving with it. When said crane is raised, the weight 20 assists the operation thereof and takes up the slack of the chain 18.

When the crane is to be lowered, the pawl 22 is raised clear of the ratchet 21, the weight 20 then preventing rapid descent of the crane. When the position of the crane is attained, the ratchet is let go and locks the pulley 19, and bolts or screws are passed through the eyes 42, said bolts clamping the boss 4 on the shaft B, whereby the crane is firmly held in adjusted position. The slide 6 may be moved in opposite directions by operating the screw 5, the bearing 8 and connected parts following the motion of said slide. The pulleys 15 may be set in desired position by loosening the split boss 14 and swinging around the arm 13 on the bearing 8 to the desired place, after which the tightening-bolt of said boss is properly rotated so as to clamp the boss on the bearing 8. The drill-carrier E may be raised or lowered by operating the crank-wheel of the shaft 40. By loosening the sectional bearing 30 the vertical shell 33, with the parts supported by the same, may be rotated with the sleeve 29 in said bearing, so as to assume either a horizontal or oblique position, and thus present the tool to the work in corresponding position, after which the sections are tightened by means of the bolts $30^{\times}$, so that the sleeve 29 is firmly clamped in said bearing 30.

When the drill is set up where required and the desired adjustments are obtained, power is applied to either of the pulleys 15, whereby the tool is rotated and the drilling accomplished, the tool-carrier being presented to or removed from the work by the operations of the shaft 40, as occasion requires.

When it is desired to raise or lower the drill-carrier in a rapid manner, it may be accomplished by the operation of the shaft 36. For this purpose the worm-wheel 38 is cast with or secured to the one part of a clutch, 46, said wheel and clutch being loose on the shaft 36, the other part of said clutch being connected with the shaft 36 by a feather, so as to rotate with the same. (See Figs. 3 and 4.) When the clutch is separated, the worm-wheel 38 rests loosely on the shaft 36, and the latter may be rotated by a crank-handle on the shaft 36, (see dotted lines, Fig. 3,) so as to operate the pinion 35, the effect of which is evident.

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

1. A drill having the tool-carrier vertically adjustable by means of a worm, a worm-wheel, a rack, and a pinion, said worm, worm-wheel, and pinion being mounted on the bearing of the carrier and said rack being secured to the carrier, the latter having a gear-wheel which is connected with the same by a feather, substantially as described.

2. A drill having the bearing of the tool-carrier connected with a sleeve which is rotatably mounted in a bearing, whereby said carrier may be placed in vertical, horizontal, and oblique positions, as stated.

3. In a drill, the rotatable sleeve 29, connected with the bearings of the tool-carrier and mounted in a sectional bearing which may be clamped on said sleeve, substantially as described.

4. In a drill, a tool-carrier, in combination with gearing 32 31, sleeve 29, clamping-bearings 30, shaft 27, gearing 25 26, and shaft 9, substantially as described.

5. In a drill, a tool-carrier adjustably mounted in its bearings, in combination with an operating-shaft and intermediate gearing, a slide carrying the bearing of said shaft, a crane supporting said slide, and an operating-screw connected with the crane and fitted to said slide, substantially as described.

6. In a drill, a tool-carrier, in combination with the driving-shaft and intermediate gearing, said shaft being mounted on an arm which is rotatable on one of the shafts of said gearing, substantially as described.

7. In a drill, a tool-carrier, in combination with the shaft 9, the bearing 8 for said shaft, the driving-shaft 12, gearing 11 10 of said shaft, and an arm, 13, the latter supporting the shaft 12 and having a clamping sleeve or boss which is rotatably fitted on said bearing 8, substantially as described.

8. In a drill, a tool-carrying crane such as C, vertically adjustable on a rod, in combination with a chain and counterpoise and an arm secured to said rod, said chain passing around pulleys on said arm and crane, the pulley on the crane carrying a ratchet which is engaged by a pawl on said crane, substantially as described.

9. In a drill, a tool-carrier and an operating-shaft and support therefor, in combination with a traveler or movable hanger, a track, and a bolt for clamping said hanger to said track, substantially as described.

10. In a drill, a tool-carrying crane having a split boss for securing the same in vertically-adjusted position, in combination with a chain and counter-balance, substantially as described.

11. In a drill, a tool-carrying crane connected with a supporting-rod, in combination with a stand having bowls for sustaining said rod, substantially as described.

12. In a drill, a tool-carrying crane and a rod supporting the same, in combination with a traveler or hanger and a movable stand adjustably sustaining opposite ends of said rod, substantially as described.

13. A tool-carrier and an operation rack and pinion, in combination with shaft 36, clutch 46, worm-wheel 38, worm 39, and shaft 40, as stated.

WILLIAM CYRUS JENNINGS.

Witnesses:
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A. P. JENNINGS.