

F. E. REED.
Metal Drilling-Machines.

No. 151,912.

Patented June 9, 1874.

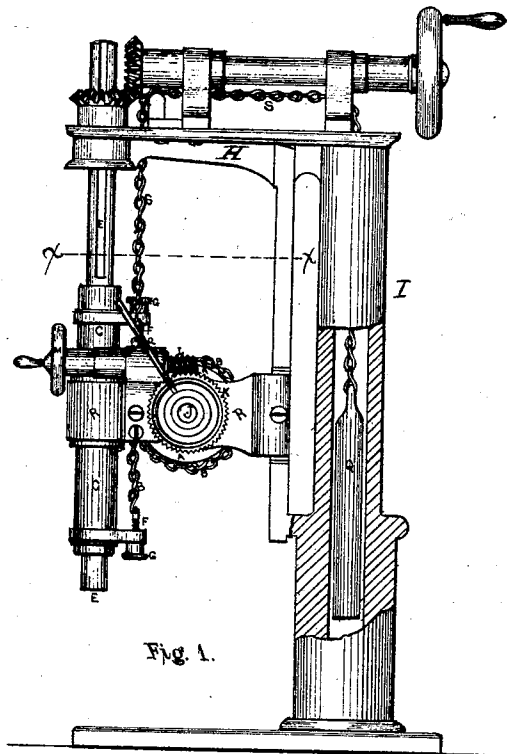


Fig. 1.

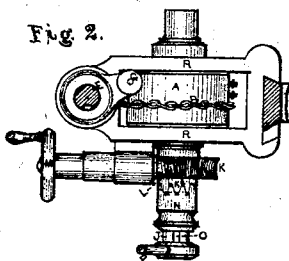


Fig. 2.

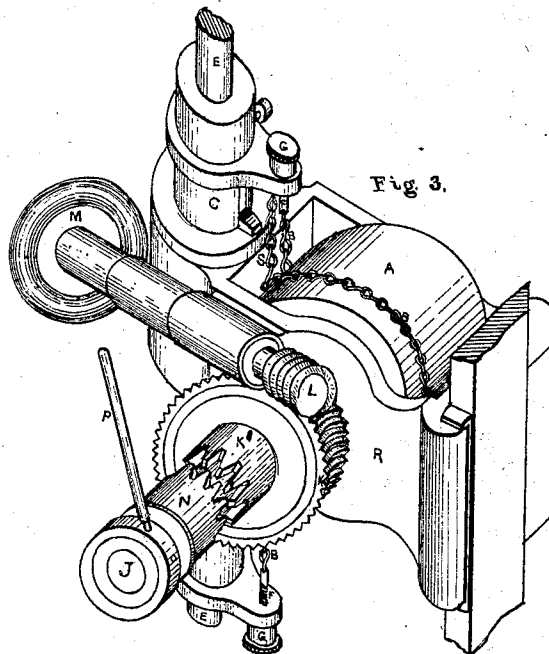


Fig. 3.

Witnesses.

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FREDERICK E. REED, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN METAL-DRILLING MACHINES.

Specification forming part of Letters Patent No. **151,912**, dated June 9, 1874; application filed February 14, 1874.

To all whom it may concern:

Be it known that I, FREDERICK E. REED, of the city and county of Worcester and State of Massachusetts, have invented a new and Improved Upright Drilling-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a cross-section on line *xx* of Fig. 1. Fig. 3 is a perspective view of the more important operative parts.

The invention is an improvement in the class of upright drilling-machines in which a weight is employed to balance the spindle and its attached drill.

My invention relates to prevention of backlash, chiefly by means of a chain, a roll or cylinder, and adjusting-screws; also, to the arrangement for enabling the drill-spindle to be quickly removed from or reinserted in the hole made by it, part of the same devices being employed for the purpose as are used for ordinary feeding of the drill.

The frame for supporting the movable parts of the machine is composed of a hollow vertical standard, I, and horizontal head or beam H. A movable weight, Q, is suspended within the standard by means of a chain, S, which passes over suitable pulleys, and connects with the roll within the head R, which latter is arranged to slide vertically on the standard. The weight counterbalances the head and its connections or attachments, and moves up or down as the head is adjusted at different altitudes. A cylindrical bearing is formed in the head R for the vertical tubular sleeve C, which forms the bearing of the drill-spindle E. The sleeve does not rotate, but is so connected with the spindle as to slide vertically with it. A roll or cylinder, A, is arranged transversely in the head R on a shaft, J, and around it, in opposite directions, are wound the chains B, which connect with the tube C

at its respective ends by means of screws F, having nuts G, so that the chains may be readily tightened to take up the slack, and thus prevent the backlash, or lost motion, which is inevitable in machines whose drill-spindle is fed by screw or rack and pinion. Thus, when the drill-point enters an air-hole or other cavity in the metal, the drill will be prevented from dropping into it, and thus broken, which is a common occurrence with other drills in general use. To feed the drill-spindle, a worm-wheel, K, having half a clutch, K', is mounted loosely on the projecting part of the roll-shaft J, and a worm, L, having hand-wheel M, meshes with it, as shown. The other half, N, of the clutch has a spline-connection, O, with the roll-shaft, so that when the halves of the clutch are engaged the shaft J may be rotated to force the tube C downward, and thus feed the drill. When the part N of the clutch is adjusted, as in Fig. 3, the roll-shaft J may be turned independently of wheel K by means of the hand-lever P, to quickly raise the drill out of the hole made by it, thus effecting an economy of time which is impossible with machines in which the same devices or apparatus used for feeding the drill are reversed to withdraw it.

The roll-shaft may be turned either way to the limit of movement of the bearing C by a single movement of said lever.

I do not claim the combination of a balance-weight with a drill-spindle or its bearing; but I claim as my invention—

1. The combination of the chains B, roll A, and adjusting screws and nuts with the tubular bearing and the drill-spindle, substantially as shown and described.

2. The combination, with the bearing C, chains B, roll A, and shaft J, of the worm-gear, clutch, and lever P, as and for the purpose specified.

FREDERICK E. REED,

Witnesses:

OTIS WARREN,

JOSEPH A. HOWLAND.