O. PLUMMER.
Upright Metal-Drills.

No. 207,206. Patented Aug. 20, 1878.

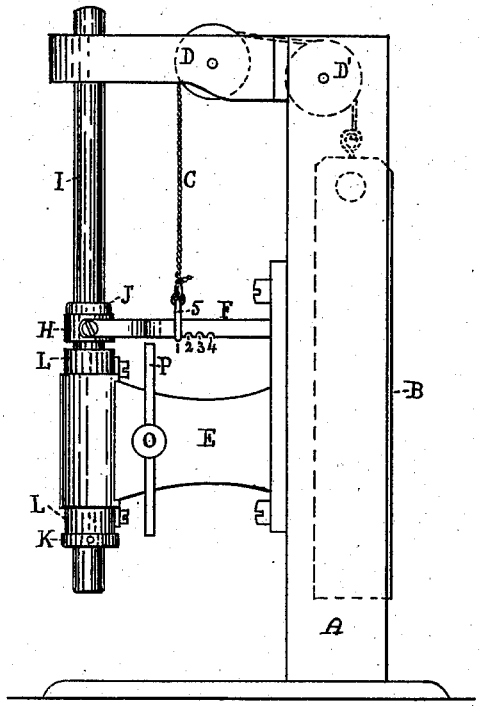


FIG. 1.

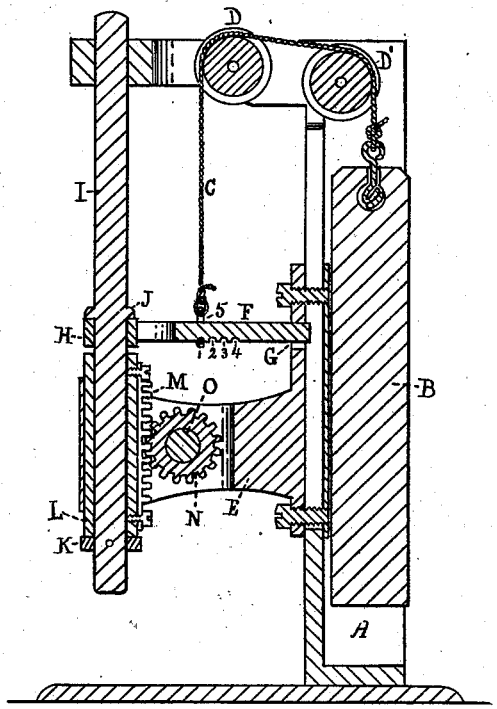
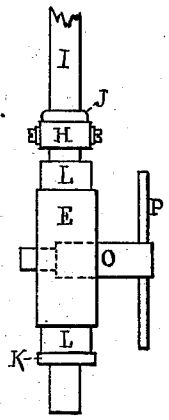


FIG. 2.

FIG. 3.



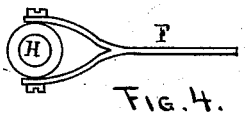


FIG. 4.

WITNESSES.

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UNITED STATES PATENT OFFICE.

OSGOOD PLUMMER, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN UPRIGHT METAL-DRILLS.

Specification forming part of Letters Patent No. **207,206**, dated August 20, 1878; application filed June 21, 1878.

To all whom it may concern:

Be it known that I, OSGOOD PLUMMER, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Metal-Drilling Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of an upright drill embodying my invention. Fig. 2 is a central vertical longitudinal section. Figs. 3 and 4 are detached parts, Fig. 3 being a front elevation, and Fig. 4 a plan.

The object of my invention is to provide an upright drill having the movable head and spindle balanced with a single weight, in such a manner that the drop or backlash in the spindle is prevented, when caused from wear or disarrangement of the parts.

My invention is an improvement upon the metal-drilling machine patented by Augustus B. Prouty, May 12, 1874, No. 150,890, and a detailed description of the several parts common to both drills is therefore unnecessary.

On the drawing, A denotes the upright column, and B the counterbalance-weight inside of column A. The weight B is connected by a chain or cord, C, (which passes over pulleys D and D′,) to the sliding drill-head E by means of forked lever F, one end of said lever moving freely through slot G in drill-head E, and the other end being pivoted to loose collar H, through which drill-spindle I revolves, the said spindle being driven in any well-known manner. Spindle I is provided with a collar, J, the lower surface of which rests upon loose collar H. The lower end of spindle I is also provided with a collar, K, that has a bearing upon its upper surface, which comes in contact with the lower surface of movable spindle-bearing L, which is provided with rack M, meshing into pinion N on shaft O, having lever P, by which, or in any well-known manner, the spindle-bearing may be moved upward or downward.

The lever F has notched bearings 1 2 3 4 on its under surface, into either of which the hook or link 5 on the end of cord C may be adjusted. The head E is so constructed that it may be slid up and down and fixed in any required position on the face of column A. The weight B is of about the same heft as the drill-head, spindle, and their attachments combined. Therefore, when the drill-head is moved up or down, the weight counterbalances the moving parts. When the head is fixed and stationary, and the spindle and its movable bearing are worked up and down in the usual manner, the spindle is also balanced by the weight B, the counterpoise being adjusted by the proper attachment of cord or chain to lever F, allowing the spindle to move down only so far as forced into position by the movable bearing L coming in contact with the collar K. Therefore the spindle will not have a drop or downward thrust when the drill is passing through work, as would be the case with the machine of the Prouty patent, when the pressure in forcing the drill into the work is greater than the weight of the spindle and there is looseness or end motion of the movable bearing between the collars on the spindle.

I am aware that a weight, cord, and collar have been used to prevent backlash in spindles of upright drills, they having been specially introduced for that purpose, and in no wise intended or designed to balance the drill-head when being raised or lowered, as set forth in the S. W. Putnam patent, issued November 30, 1875, which I do not claim as my invention. With my improvement the weight is so arranged and combined with the movable head and spindle that it balances their combined weight when being raised and lowered; also, when the head is stationary and the spindle is at work, the same weight, through its attachments, balances and prevents backlash of the spindle.

The drill can be used with or without a work-supporting table, in the usual manner.

From the foregoing it will be seen that my improvement prevents drop, backlash, or end-thrust of the spindle, when both the drill-head and spindle are balanced by one and the same weight, which is an important feature, as it reduces the risk of breaking drills and damage to work.

I do not claim that my invention is confined to this exact arrangement of the parts, as any arrangement of the mechanism actuated by a

single weight to accomplish the within-described results would be substantially the same.

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

1. The combination, with a sliding drill head and spindle, of a balancing device or mechanism, which, in addition to balancing the drill head and spindle when being raised and lowered, is so arranged as to prevent backlash of spindle when the drill is passing through work.

2. The combination, with a sliding drill head and spindle, of the balance-weight B, cord or chain C, lever F, and collar H, substantially as above described, and for the purpose set forth.

OSGOOD PLUMMER.

Witnesses:

E. BOYDEN,

A. B. PROUTY.