D. W. POND.
Metal-Drilling Machine

No. 204,248. Patented May 28, 1878.

Fig. 1

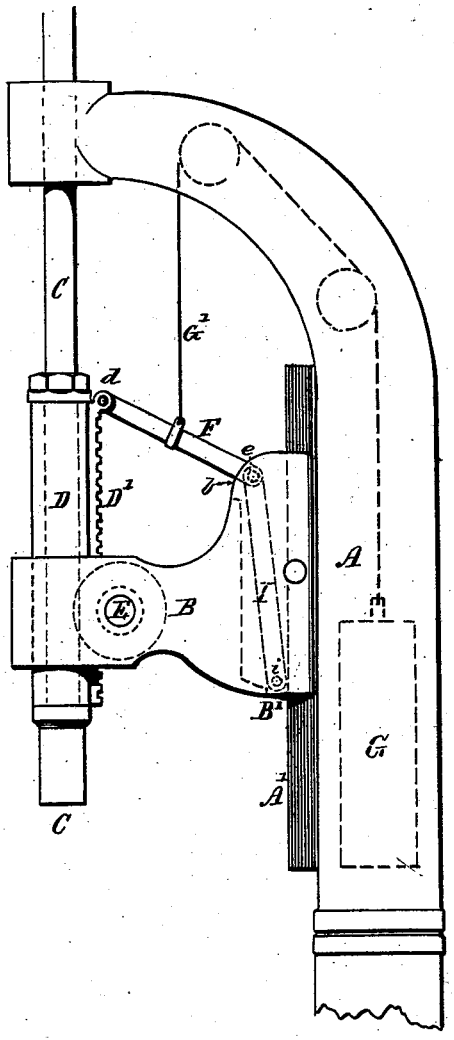
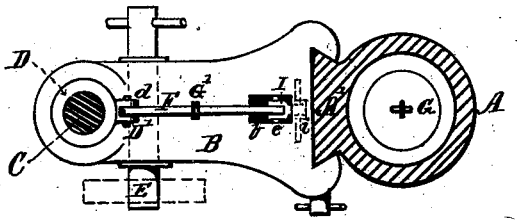


Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID W. POND, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN METAL-DRILLING MACHINES.

Specification forming part of Letters Patent No. **204,248**, dated May 28, 1878; application filed May 10, 1878.

To all whom it may concern:

Be it known that I, DAVID W. POND, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Upright Drilling-Machines; and I declare the following to be a description of my said invention, sufficiently full, clear, and exact to enable others, skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a side view of such parts of an upright drilling-machine as are necessary to illustrate the nature of my invention; and Fig. 2 represents a plan view of the same.

This invention relates to the construction of the devices for counterbalancing the drill-spindle and sliding head in upright drilling-machines, the same being an improvement in the mechanism described in Letters Patent No. 150,890; and my invention consists in the peculiar arrangement of the balancing-lever and manner of combining the same with the sliding head and drill-spindle quill, as hereinafter described.

In the drawings, A denotes the main supporting-frame, with guideways A′. B is the sliding head-block, movable on the ways A′. C is the drill-spindle; D, the feed-quill, with rack D′, and E the feed pinion and its shaft, all of which parts may be constructed and arranged in the ordinary manner, as may also the operating-gears, driving-pulleys, and other portions of the machine not shown in the drawings.

F indicates the counter-balance attachment lever, to which the cord or chain G′ of the counter-weight G is connected adjustably or otherwise, as preferred. Said lever F I arrange in a central position in rear of the drill-spindle C, and attach its forward end directly to the upper end of the feed-quill D, in the present instance by pivoting the end of the lever between ears *d*, formed on the top end of the rack D′, which is rigidly attached to or forms a part of said quill, as shown.

The rear end of lever F, which extends through a suitable opening, *b*, at the upper part of the head-casting B, is connected by the link I to the lower central rear part B′ of the sliding head B by a pivot-joint, *i*, as indicated, the lever F, link I, and their connecting-joints *d e i*, all being arranged centrally of the machine, or so as to operate in a plane coincident with the vertical axis of the drill-spindle, sliding head, and supporting-frame.

The link I is inclosed within the casting or interior of the head B, the opening *b* being made of a size sufficient for the free working of the parts, as required.

By constructing and arranging the parts as herein shown and described, the force of the counter-balance weight is caused to act centrally on the mechanism. The strain at the forward end of the lever F being brought into direct line from the joint *d* to the feed-pinion E produces no side strain or twisting action on the quill D, while the link I, being attached at the lower rear part of the head B, causes the strain of the counter-weight to act in opposition to the leverage of the head, since its tendency is to draw the heel or lower corner B′ away from the guides A′, thus overcoming the tendency of the head to cramp on the guides by its own weight, and greatly reducing the friction of the parts by avoidance of side strains or cramping action.

It will be understood that I do not make claim herein, broadly, to a lever device for connecting the balanced parts with the chain of the counter-weight in such manner that both spindle and head can be counterbalanced by a single weight; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the drilling-spindle and sliding head in an upright drilling-machine, of a counter-balance-weight mechanism, substantially such as described, arranged centrally in rear of the drill-spindle, and connected by pivot or hinge attachment directly to the upper end of the feed-rack or quill and linked to the lower rear part of the head-block, for the purposes set forth.

2. In combination, substantially as herein

shown and described, the feed-quill and rack D D′, provided with ears *d*, the sliding head B, the lever F, having its front end pivoted between the ears *d*, and its rear end connected by link I to the central lower part or heel B′ of the head-block, the weight G, and connecting chain or cord G′, all arranged and operating as and for the purposes set forth.

Witness my hand this 8th day of May, A. D. 1878.

DAVID W. POND.

Witnesses:
CHAS. H. BURLEIGH,
AUG. BUEHLER.