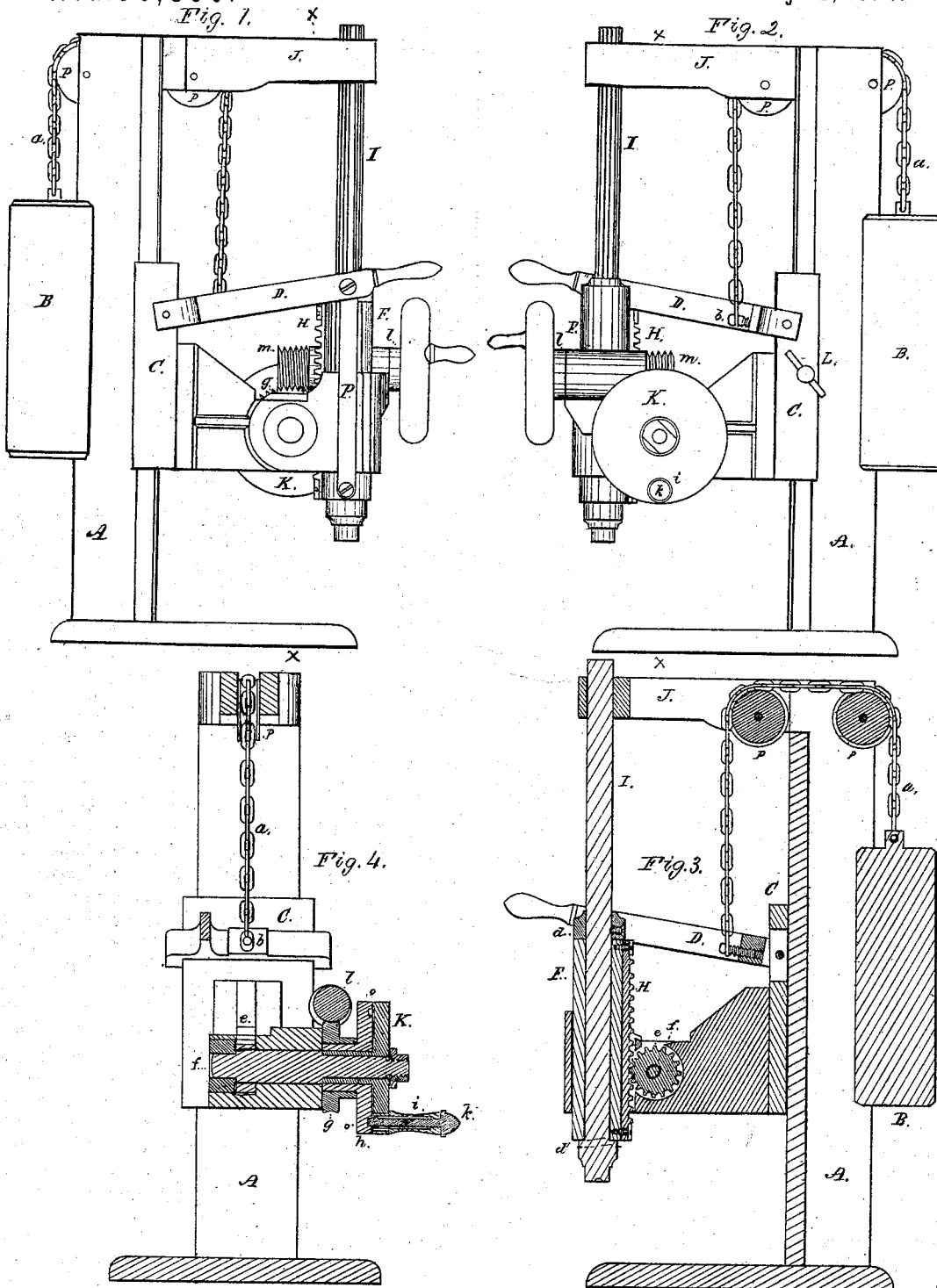


A. B. PROUTY.
Metal-Drilling Machines.

No. 150,890.

Patented May 12, 1874.



Witnesses.
Geo Gray.
L. C. Hale.

Augustus B. Prouty
by his attorney
J. P. Hale.

UNITED STATES PATENT OFFICE.

AUGUSTUS B. PROUTY, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN METAL-DRILLING MACHINES.

Specification forming part of Letters Patent No. **150,890**, dated May 12, 1874; application filed February 5, 1874.

To all whom it may concern:

Be it known that I, AUGUSTUS B. PROUTY, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Upright Drills; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, in which—

Figures 1 and 2 denote opposite side elevations of an upright drill embodying my improvements. Fig. 3 is a central, vertical, and longitudinal section; and Fig. 4, a transverse and vertical section on line *xx* of Figs. 1 and 2.

The object of my invention is to remedy sundry defects incident to upright drills, as ordinarily constructed, and enable the same to be operated with greater facility and ease; and my invention consists in combining with the drill-head, the drill-spindle, and its movable bearing, a balancing device, whereby both the drill-head and the spindle and its movable bearing are balanced while being either raised or lowered; also, in combining with the above and with the worm and its shaft and the cogged shaft, by which the spindle and its movable bearing may be moved upward and downward, a loose worm-gear, disposed upon the latter shaft, which is provided with mechanism, as hereinafter described, whereby the worm-gear is readily thrown into or out of action, as circumstances may require.

In the drawing, A denotes the main upright frame; B, the counter-balance weight, which is formed with longitudinal grooves to fit and slide upon the vertical edges of the frame A. The weight B is connected by a cord or chain, *a*, (passing over two pulleys, *p p*), to the drill-head C, by means of a furcated lever, D, whose forked arms are pivoted thereto, as shown in Figs. 1 and 2, the said lever being also connected, at its opposite end by means of a pitman, F, with the spindle or spindle-bearing F. The chain *a* may be connected with the lever D by a fixed arm or hook projecting therefrom; but I prefer, in order to attain a ready and accurate balance of the drill-spindle I and its movable bearing, to connect it with such lever by means of an adjustable arm or hook, *b*, which, by being moved either toward or away from the fulcrum of the lever, as circumstances may require, the equipoise of the spindle and

its movable bearing can be effected with great ease and dispatch. The spindle-bearing F is held in position on the drill-spindle by collars *d* and *d'*. The bearing F is provided with a rack, H, by which it can be raised and lowered by the fixed cog-gear *e* on the shaft *f*, which is supported in suitable bearings on the drill-head C, the latter being so fitted to the frame A as to be capable of being slid up and down on the front of the same. The top of the drill-spindle I is supported in an arm or bearing, J, projecting from the top of the frame A, the spindle being rotated by means of gears and other mechanism applied thereto in the ordinary manner. Upon the shaft *f* is disposed a loose worm-gear, *g*, which is formed with a disk, *h*, upon its outer end, such disk having a circular series of holes, *o*, made in its outer vertical face and near the periphery thereof. K is a disk or wheel, which is affixed upon the outer end of the shaft *f* and abuts against the outer face of the disk *h*. The wheel K is provided with a tubular box, which extends through the axis of the loose gear. It also has a hollow handle, *i*, having a cylindrical sliding bolt, *k*, of such length that when forced inward it will extend into the holes formed in its fellow disk *h*, and thus clutch the loose worm-gear to the shaft *f*, and when drawn outward it will unclutch the worm-gear, so that the shaft *f* can be rotated without moving the said gear. When thus unclutched, by taking hold of the handle of the wheel K and turning the latter the drill-spindle and its movable bearing can be either raised or lowered with great rapidity and ease. I would remark that, by extending the front end of the lever D beyond the outer face of the pitman P, as shown in the drawing, another means is afforded, by which the spindle and its movable bearing can be readily moved upward and downward. Above the worm-gear *g* and arranged upon a shaft, *l*, supported in suitable bearings affixed to the drill-head, is a worm, *m*, which engages with the gear *g*. L is a clamp-screw, by which the drill-head may be firmly secured to the frame A. Against the lower end of this screw, and so as to bear against the angular face of frame, I arrange a cylindrical washer, whose outer face is flat, while its inner end is diagonal to conform to

the angular face of the ways on which the drill-head slides, the object of such washer being to prevent injury to the ways by the working of the screw.

It will be understood that a work-supporting table is to be attached to the frame A in the ordinary manner, and so arranged that it can be raised and lowered as may be desirable, and then securely fastened to the frame A.

I would remark that another method of throwing the worm-gear *g* into and out of action would be to so affix the gear *e* to the shaft *f* as to enable the latter to be moved endwise without moving the gear, which could readily be effected by forming a stud on the internal surface of the gear, and a longitudinal groove on the shaft, or the same could be effected by giving the shaft and groove a little endwise play.

From the above it will be seen that by my improvements the drill-head, as well as the spindle with its movable bearing, are both balanced by the single weight B, while heretofore each have been supported or balanced by separate mechanisms. This is objectionable, not only on account of the extra expense involved in their construction, but on account of the time required in adapting the various parts of the machine to the work. It will also be seen that, by my construction and arrangement of parts, the throwing of the worm-gear into and out of action, so as to enable the drill-spindle to be raised or lowered, can be instantaneously ef-

fectured, and the raising and lowering of the spindle, as circumstances may require, be accomplished with great ease and dispatch.

Having described my invention, what I claim is—

1. The combination, in an upright drill with the spindle, its movable bearing, and the drill-head, of a balancing device or mechanism, whereby both the drill-head and the spindle with its movable bearing are balanced while being either raised or lowered.

2. The combination, with the drill-head, the spindle, and its movable bearing, of the balance-weight B, cord or chain *a*, lever D, and pitman P, as and for the purpose set forth.

3. The combination, with the weight B, chain *a*, and lever D, of the adjustable hook *b* or its equivalent, as and for the purpose set forth.

4. An improved drilling-machine, consisting of the frame A, drill-head C, drill-spindle I, and its movable bearing F, balance-weight B, and chain *a*, worm *m*, and its shaft *l*, shaft *f*, its fixed gear *e*, and loose gear *g*, provided with a perforated disk, *h*, and the disk K, having a hollow handle, *i*, carrying a sliding bolt, *k*, the whole being connected, arranged, and combined together in manner and for the purpose set forth.

AUGUSTUS B. PROUTY.

Witnesses:

H. L. PARKER,
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