(No Model.)

B. F. BARNES.

FEED DEVICE FOR DRILLING MACHINES.

No. 379,194. Patented Mar. 6, 1888.

Fig. 1.

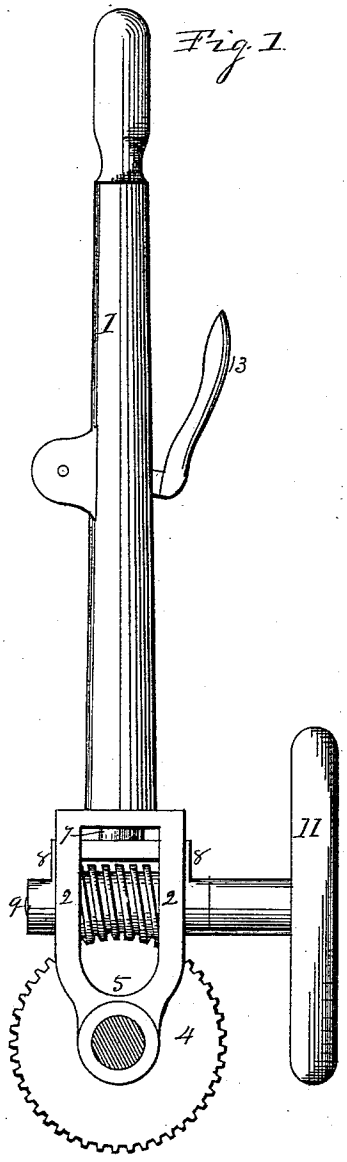


Fig. 2.

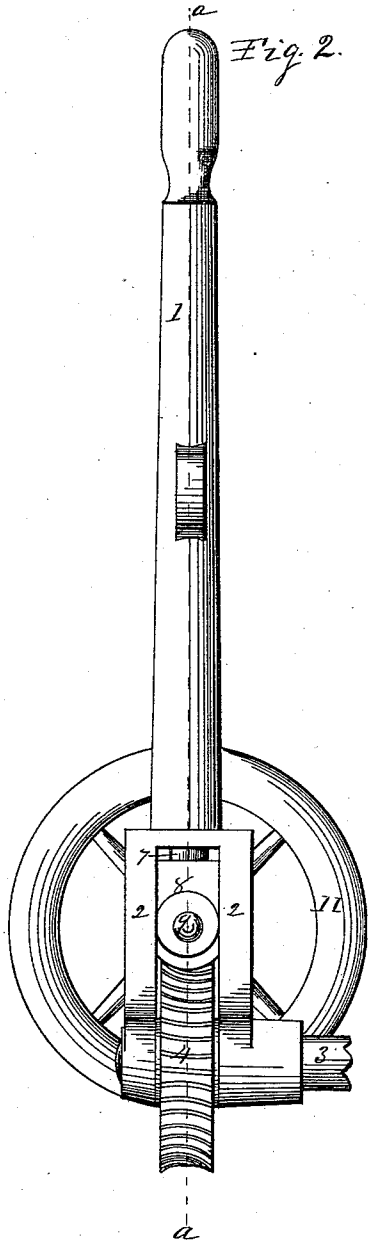
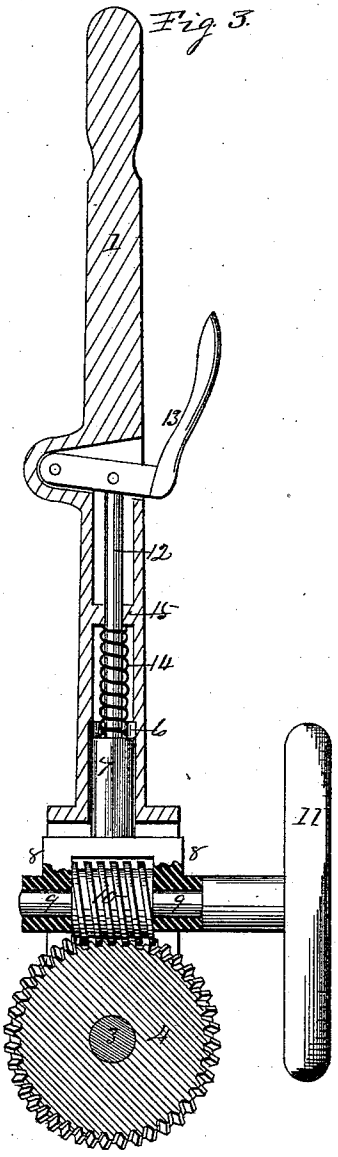


Fig. 3.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. BARNES, OF ROCKFORD, ILLINOIS, ASSIGNOR TO THE W. F. & JOHN BARNES COMPANY, OF SAME PLACE.

FEED DEVICE FOR DRILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 379,194, dated March 6, 1888.

Application filed October 4, 1887. Serial No. 251,412. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. BARNES, a citizen of the United States, residing at the city of Rockford, county of Winnebago, and State of Illinois, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification.

This invention relates to that portion of a drilling-machine known as the "feed" mechanism, in which is employed a lever, in combination with a hand-wheel, to operate the feeding mechanism of the drill.

The object of this invention is to provide an improved feed mechanism for drilling-machines; and my invention consists in a combined gear-wheel and lever-ratchet feeding mechanism capable of use as a screw-gear feed or as a lever-ratchet feed independently, which device is represented in the accompanying drawings, in which—

Figure 1 is a side elevation of an apparatus embodying my invention. Fig. 2 is a rear elevation of the same. Fig. 3 is a vertical central section on dotted line *a* on Fig. 2, showing the connections of the various parts.

The apparatus represented in the drawings is an improvement on Patent No. 270,537, dated January 9, 1883, issued to John and Benjamin F. Barnes, and is capable of use on the drill represented in said patent, and in this application I deem it only necessary to describe and show the construction of my improved feed mechanism.

In the construction shown in the patent above referred to the support for the shaft which carried the screw-pinion was pivoted to the hand-lever, so that when it was desired to free the screw-pinion from the gear-wheel it was necessary to lift it in a curved path, whereby when it was again lowered into engagement with the gear-wheel the several threads were not simultaneously lowered into engagement, but first the one nearer the pivot and then the others in succession, which was liable by the catching or failure to register of the first one to cause delay in getting the new and firm grip desired, while the pivoting of the said screw-pinion supporting-frame required an unnecessary number of parts and undue frictional wear of the device as a lever-ratchet mechanism. My present construction does away with said pivoting of the screw-support, reduces the number of parts to a minimum, and enables me to slide the screw-pinion directly toward or away from the periphery of the gear-wheel, insuring the engagement of the several screw-threads with the gear-teeth simultaneously, thereby affording a firm grip between the two, and they are not liable to slip or cause delay.

A hand-lever, 1, is made in handle form at one end and its opposite end is made in yoke form, composed of yoke-arms 2, bored transversely at their free ends to serve as bearings to the end portion of a shaft, 3, on which the lever is mounted to oscillate and which is designed to connect with the operating mechanism of the drill. A gear-wheel, 4, is secured to the shaft 3 within the arms 2 of the lever to rotate therewith. Side openings, 5, are formed in the yoke-arms of the lever, for a purpose to appear hereinafter. The yoke-end portion of the lever is tubular, the end portion 6 of which is of enlarged diameter, bored, for a purpose to appear hereinafter.

A yoke-bearing, consisting of a shank, 7, to enter the enlarged bore 6 of the lever, and yoke-arms 8, to enter within the yoke-arms 2 of the lever, is put in place therein, and is capable of an endwise sliding movement within the arms 2 of the lever, which, in connection with the enlarged bore 6, serve as guides to the endwise movements of the yoke-bearing.

The free ends of the yoke-arms 8 are bored transversely and form the bearings to the end portion of a screw-supporting shaft, 9, supported to revolve therein. A screw, 10, to engage the teeth of the gear-wheel 4, is fixed to the shaft 9 within the arms 8 of the yoke-bearing and within the side openings, 5, of the yoke-arms 2 of the lever.

A hand-wheel, 11, is fixed on the projecting outer end of the screw-supporting shaft 9, for the purpose of rotating its shaft and the screw fixed thereon to impart a rotary movement to the gear-wheel 4, with which it engages.

A connecting-rod, 12, extending from its connection with the yoke-bearing in the axial center of the lever, has a pivotal connection of its end with a thumb-lever, 13, pivoted at

one end to the lever in such a manner that a movement of its free handle end will impart a sliding movement to the yoke-bearing.

A spring, 14, surrounds the rod 12 within the tubular portion of the lever between the shank 7 of the yoke-bearing and a guide, 15, to the rod 12 within the tubular portion of the lever, and operates to hold the screw in working contact with the gear-wheel, from which it can be disengaged by the inward movement of the free arms of the thumb-lever.

It will be seen that the action of the spring pressing on the yoke-bearing tends to hold the screw in working contact with the gear-wheel, and when the screw is rotated in either direction by means of the hand-wheel a rotary motion will be imparted to the gear-wheel and through its shaft to operate the feed mechanism of the drill with which it is connected; or the gear-wheel may be rotated in either direction to operate the feed mechanism by an oscillatory movement of the lever, in which movement the screw engages the teeth of the gear-wheel to serve the purpose of a pawl, and by means of the thumb-lever the screw can be disengaged from the gear-wheel to permit the return movement of the lever to again engage the gear-wheel, or to employ a quick return movement.

I claim as my invention—

1. In a feed-operating mechanism, the combination of a gear-wheel, a screw mounted in a bearing slidable in a right line toward and away from the gear-wheel, and a spring for holding the screw in engagement with the gear-wheel, substantially as set forth.

2. In a feed-operating mechanism, the combination of a hand-lever, a gear-wheel mounted in said lever, a bearing slidable in longitudinal parallel ways, a screw supported in said bearings, and means for sliding the bearings, and hence the screw, away from and toward the gear-wheel, substantially as set forth.

3. In a feed-operating mechanism, the combination of the hand-lever, a gear-wheel mounted in said lever, a bearing slidable in longitudinal parallel ways, a screw supported in said bearing, and a thumb-lever connected with the bearing for disengaging the screw from the gear-wheel, substantially as set forth.

4. In a feed-operating mechanism, the combination of a hand-lever, a gear-wheel mounted in said lever, a bearing slidable in longitudinal parallel ways, a screw supported in said bearings, a spring for holding said screw in engagement with said gear-wheel, and a rod connecting the slidable bearing with the thumb-lever for disengaging the screw from the gear-wheel, substantially as set forth.

5. In a feed-operating mechanism, the combination of a pivotal hand-lever, a gear-wheel mounted in said lever, a screw-bearing slidable in longitudinal parallel ways, a screw mounted in the said bearing, means for sliding the bearing, and hence the screw, toward and away from the gear-wheel, and a hand-wheel to rotate the screw, substantially as set forth.

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