(No Model.)

W. S. ROGERS.

FEED MECHANISM FOR DRILLING MACHINES.

No. 373,755. Patented Nov. 22, 1887.

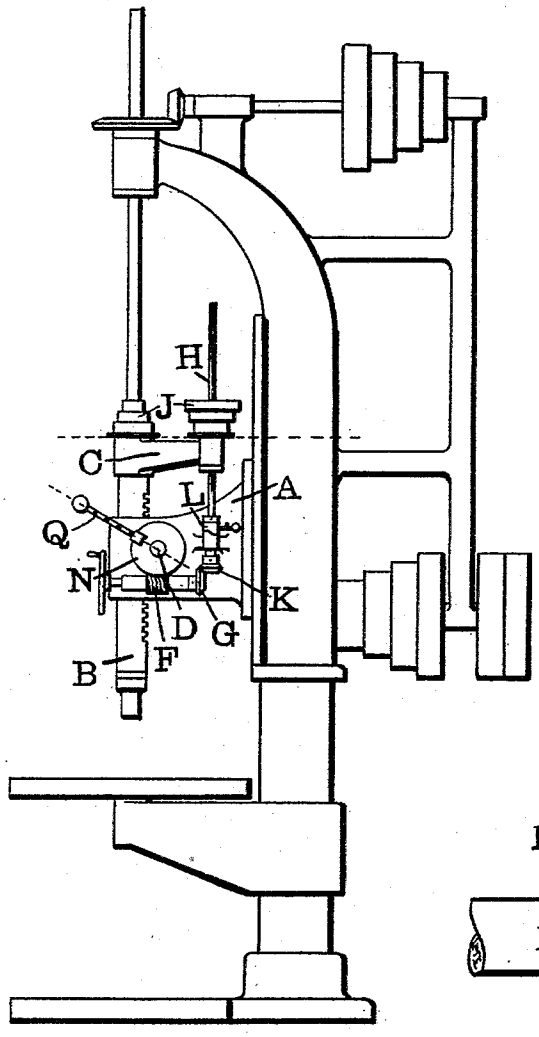


Fig. 1.

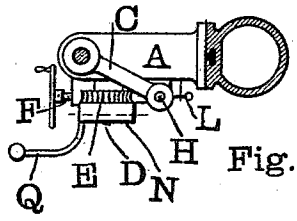


Fig. 2.

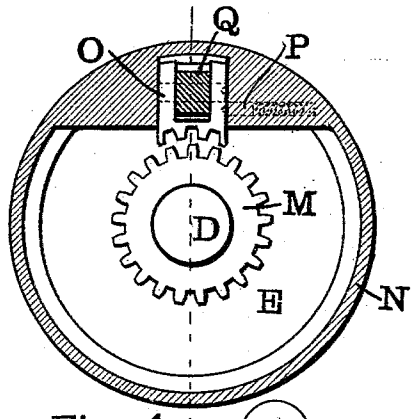


Fig. 4.

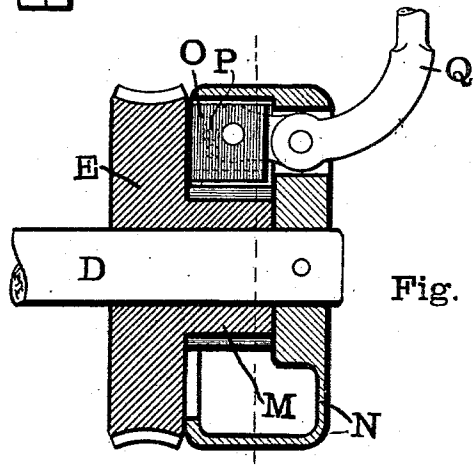


Fig. 5.

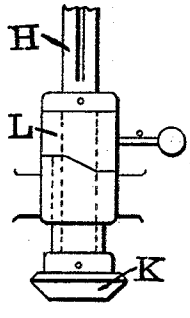


Fig. 3.

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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR DRILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 373,755, dated November 22, 1887.

Application filed August 3, 1887. Serial No. 246,004. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD S. ROGERS, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Feed Mechanism for Drilling-Machines, of which the following is a specification.

This invention relates to the feeding mechanism of upright drilling-machines; and the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a well-known type of upright drilling-machines embodying my improvements; Fig. 2, a plan of the usual vertically-adjustable bracket which supports the lower end of the drill-spindle, the drill-spindle and the frame-column of the machine being shown in connection therewith and appearing in horizontal section, the plane of the section of this view, however, corresponding with the top level of arm C; Fig. 3, an enlarged side elevation of the lower end of vertical feed shaft H with its immediate appurtenances, the direction of view being the same as in Fig. 1; Fig. 4, a vertical section of the jaw-case N, which is secured to the outer end of the usual pinion-shaft, D, the plane of the section being at right angles to the axis of said shaft; and Fig. 5, a diametrical section of this jaw-case, and also of the usual feeding worm-wheel, E.

In the drawings, A indicates the usual bracket projecting outwardly from the frame-column and serving as the support for the lower portion of the drill-spindle; B, the usual sleeve fitted to slide, but not to rotate, in this bracket, and provided with the usual rack-teeth, the interior of this sleeve forming, as usual, the lower journal of the drill-spindle; C, an arm formed with or rigidly attached to the upper end of the sleeve B, this arm projecting angularly rearward and terminating at its outer end in a vertical bearing for the support of the feed-cone; D, the usual pinion-shaft journaled in the bracket and projecting outwardly from the side thereof, this shaft being provided within the bracket with the usual feed-pinion engaging the rack-teeth of the sleeve B, this pinion not appearing in the drawings, as the arrangement is to be as usual in this class of drilling-machines; E, the usual worm-gear fitted to revolve loosely upon the outer projection of this pinion-shaft; F, the usual feed-worm mechanism, consisting of a horizontal shaft carried in journals supported by the bracket A and provided with a worm engaging the worm-wheel and with a frontal hand-wheel by which the shaft may be turned; G, a bevel-gear on the rear end of the shaft just referred to.

H is a vertical shaft having its lower end journaled in a bearing projecting from the sides of the bracket A, and having its upper end projecting axially through the bearing upon the free end of arm C; J, a pair of cone-pulleys, one fast upon the drill-spindle over the arm C, the other journaled in a bearing at the end of this arm, the vertical shaft H being splined to the latter pulley, so as to be driven thereby and be capable of vertical movement therethrough; K, a bevel-gear fast on the lower end of shaft H, this gear engaging gear G and being disposed far enough below the bearing which supports the lower end of shaft H to permit of the shaft and gear rising and falling in that bearing sufficiently to permit the gear K to be engaged with and disengaged from the gear G; L, a collar surrounding the shaft H above its lower bearing and below the collar fast upon the shaft, this collar being provided with a handle, by which it may be partially rotated, and being also provided with a cam fast upon its lower surface, whereby, when the collar is partially rotated by means of a handle, it will be caused to rise, and thus elevate the shaft H and lift gear K out of engagement with gear G; M, a spur-pinion projecting outwardly from the face of worm-gear E, this pinion being formed with and otherwise made integral with the worm-gear; N, a disk-like hollow jaw-case rigidly secured to the outer end of pinion-shaft D, this jaw-case lying against the outer face of the worm-gear and inclosing its attached spur-pinion M; O, a jaw-block fitted to slide radially in the jaw-case, and having its inner end provided with teeth adapted to intermember with the teeth of spur-pinion M; P, a spring detent-pin housed in the jaw-case and engaging alternative detent countersinks in the side of the jaw-block O, these countersinks being so disposed that when one of them is engaged by the detent-pin the jaw-

block will be held out of engagement with the spur-pinion, and when the other one is engaged by the detent-pin the jaw-block will be held in engagement with the spur-pinion, the detent-pin yielding when the proper shifting force is applied to the jaw-block; and Q a hand-lever projecting outwardly from the jaw-case, and attached thereto by a pivot at right angles to the pinion-shaft D, the inner shorter end of this lever engaging the jaw-block, so that as the hand-lever is oscillated the jaw-block will be shifted radially, either into or out of engagement with the spur-pinion M.

Normally the worm-wheel E is loose upon pinion-shaft D. Under such circumstances the pinion-shaft may be rapidly rotated by means of the hand-lever Q, the jaw-case being fast upon the pinion-shaft. The drill-spindle may thus be quickly raised and lowered by means of this hand-lever, and light feeding may also be done by this means. When the worm-gear is thus loose upon pinion-shaft D, the worm mechanism F may be revolved by its hand or power mechanism without having any effect upon the pinion-shaft. If, however, the outer end of the hand-lever be thrown inwardly, the jaw-block O will engage the spur-pinion M, and the worm-gear will become thereby locked to the pinion-shaft E. Under such circumstances the pinion-shaft can be no longer revolved by the hand-lever; but it may be revolved by the worm mechanism F, by the hand-wheel if the bevel-gearing be disengaged, or by the power mechanism if that gear be in engagement.

The power-feed is transmitted to the worm mechanism F, through the bevel-gearing, by means of a belt on the cones J. Partially turning the collar L lifts gear K and stops the operation of the feed.

The upper portion of the shaft H and the cone-pulley upon it is supported by arm C, which projects from the sleeve B. The arm and both cones therefore rise and fall with the drill-spindle, whether the rising and falling of the drill-spindle be caused by the movement of the sleeve through the bracket or by the bodily raising and lowering of the bracket upon the frame-column.

I claim as my invention—

1. In feed mechanism for drilling-machines, the combination, substantially as set forth, with the usual bracket, sleeve, pinion-shaft for reciprocating the sleeve in the bracket, and worm mechanism for revolving the pinion-shaft, of vertical shaft H, arranged to transmit rotary motion to said worm mechanism and to be engaged and disengaged therefrom, arm C, projecting rigidly from the upper end of said sleeve and provided with a vertical bearing at its outer end, and belted cones J, one secured to the drill-spindle above said arm, the other journaled in the outer bearing of said arm and splined to said shaft H.

2. In feeding mechanism for drilling-machines, the combination, substantially as set forth, with the usual bracket, sleeve, pinion-shaft for reciprocating the sleeve in the bracket, worm-wheel E, loose upon said shaft, and worm mechanism F for revolving said worm-wheel, of spur-pinion M, fast to said worm-wheel, jaw-case N, fixed to said pinion-shaft, jaw-block O, fitted to slide radially in such jaw-case and provided with teeth to engage the teeth of said spur-pinion, a spring-detent, to hold said block in its position of engagement and disengagement, and hand-lever Q, pivoted to said jaw-case and having its inner end in pivotal engagement with said jaw-block.

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