

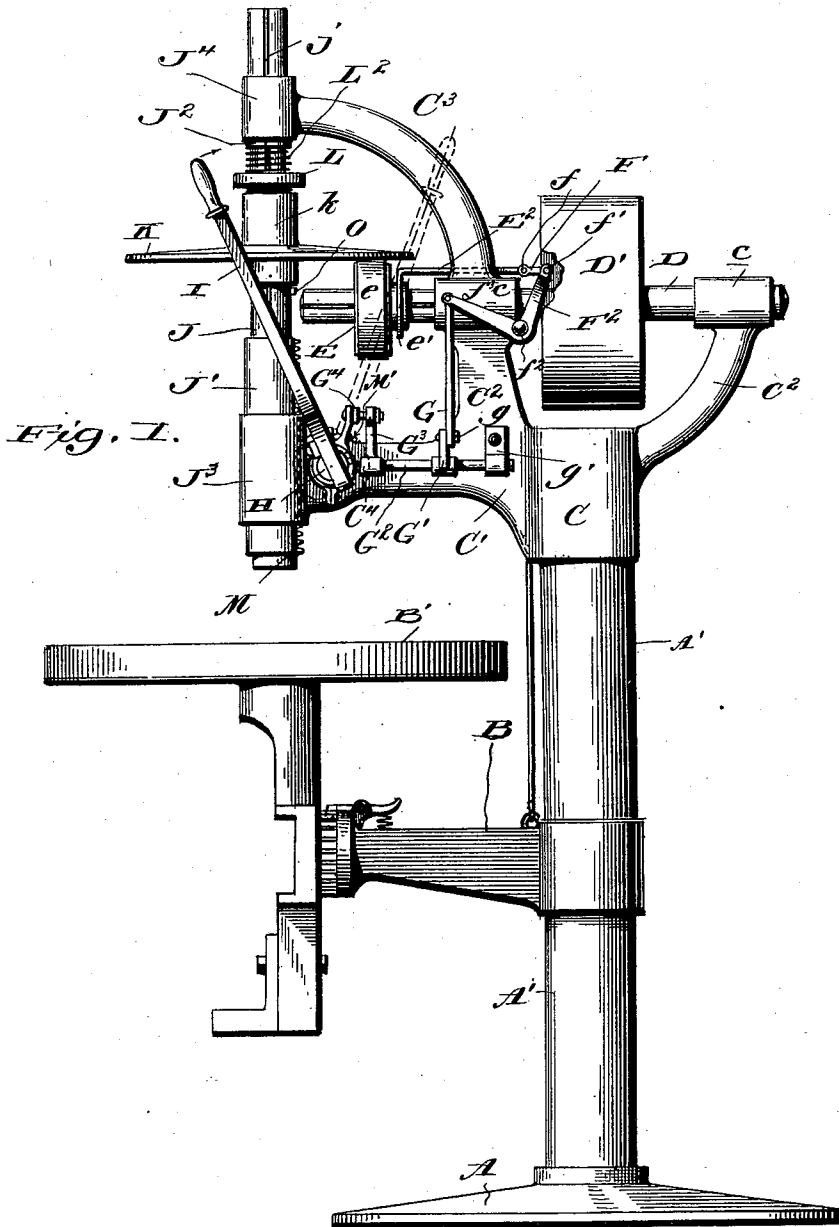
(No Model.)

2 Sheets—Sheet 1.

W. W. FLICKINGER.
DRILLING MACHINE.

No. 595,850.

Patented Dec. 21, 1897.



Witnesses:
L. C. Hills.
E. A. Bond

Inventor:
W. W. Flickinger
By E. B. Stocking
Att'y.

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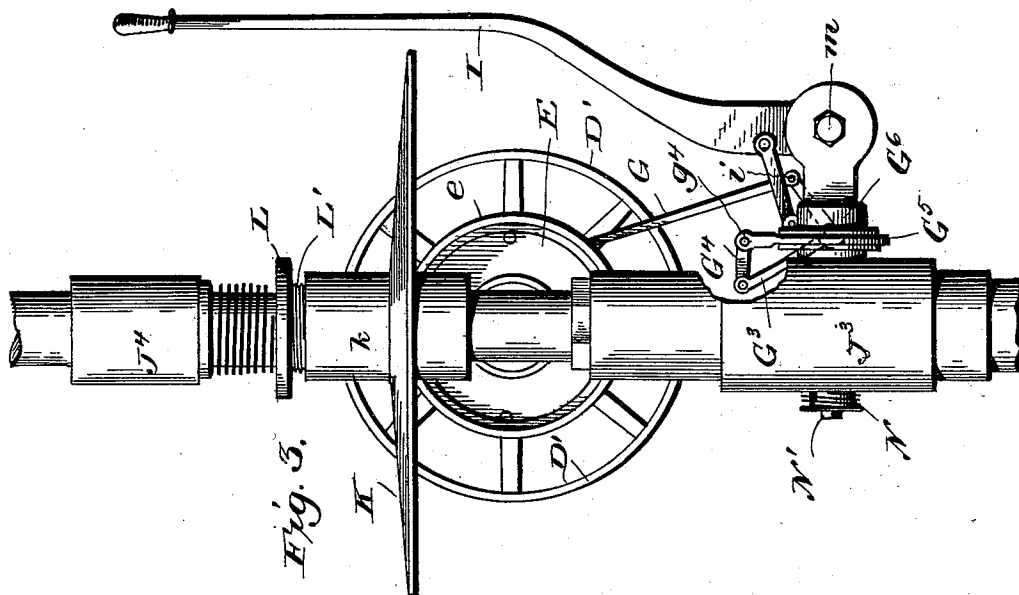


Fig. 3.

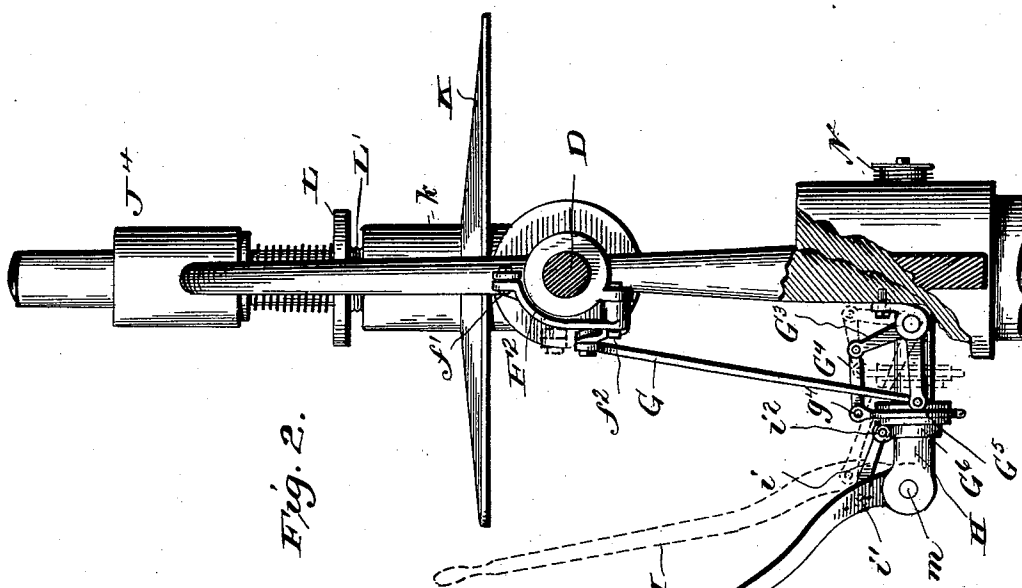


Fig. 2.

Witnesses:
L. C. Hills.
E. H. Bond

Inventor:
W. W. Flickinger,
by E. B. Stocking, Atty.

UNITED STATES PATENT OFFICE.

WILLIAM W. FLICKINGER, OF COCHRANTON, PENNSYLVANIA.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 595,850, dated December 21, 1897.

Application filed December 14, 1896. Serial No. 615,661. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. FLICKINGER, a citizen of the United States, residing at Cochranton, in the county of Crawford, State of Pennsylvania, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in drilling-machines; and it has for its objects, among others, to provide a simple and cheap construction whereby the feed-lever is so arranged and connected that it will not only start the spindle, but will feed down the drill-spindle and serve to increase or diminish the speed thereof, the latter operation being done at any time while the machine is running and feeding and with the lever in any position. The same lever may be made to stop the drill every time the spindle is raised, so that when the drill is not in use the spindle will not be running. But one hand is required to operate the machine for the desired ends and all done with the one and the same lever. The parts are few in number and those readily assembled, compactly arranged, not liable to get out of order, and in practice most efficient for the purposes for which they are intended.

Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of the machine complete, with a portion broken away. Fig. 2 is an end elevation, the parts in section and a portion broken away; and Fig. 3 is a front view showing the connection of the lever to the friction-wheel, with a portion broken away.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the base, and A' the supporting-column.

B is an arm sleeved upon the supporting-

column A', and this may be vertically adjusted thereon in any of the well-known ways, and at its outer end supports the platen B', which may be adjusted up and down in the usual way.

C is a collar secured to the upper end of the supporting-column and in turn supporting the frame C', in the vertical arms C² of which, in suitable bearings c, is supported the horizontal shaft D, upon which is fast the belt-pulley D', around which is designed to pass the belt (not shown) connected with any suitable source of power.

E is a pulley on the shaft D, having about its periphery a band e of any suitable material to increase the friction, this pulley being the friction-pulley adapted to revolve in engagement with the friction-disk on the drill-spindle, and this pulley is so mounted upon its shaft as to rotate therewith and yet permit of movement thereof lengthwise of the shaft, the construction in this instance being shown as the well-known key-seat and spline, so that while the pulley is movable endwise on the shaft the two must rotate together. The hub of this pulley has a boss E', provided with an annular groove, in which is seated the ring e', secured to the rod E², arranged parallel with the shaft D and working through an opening in the overhanging arm C³ of the frame, as shown. Its other end is pivotally connected, as at f, with the link F, the other end of which is pivotally connected, as at f', with one arm of the bell-crank lever F², pivotally mounted, as at f², on the frame, and its other arm pivotally connected, as at f³, with the upper end of the rod G, the lower end of which is pivotally connected, as at g, with the crank-arm G', fast on the shaft G², supported in suitable bearings g' on the horizontal portion C⁴ of the frame. G³ is an arm extending from the outer end of said shaft, and to the upper end of this arm is connected a link G⁴, the other end of which is pivotally connected, as at g⁴, with the band or ring G⁵, that works in a groove in the sleeve or collar G⁶, which is adapted to slide upon its shaft H, being connected with the operating-lever I by the link i, pivotally connected to said lever, as at i', and to said sleeve or collar, as at i², all as clearly shown in Figs. 2 and 3.

J is the drill-spindle, being disposed verti-

cally, as shown, and supported in the quill J' and the sleeve J², the former working in the tubular vertical portion J³ of the frame and the latter in the tubular vertical portion J⁴ of the frame, the spindle being provided with a key-seat or groove j, in which is engaged a feather on the sleeve J², which allows the spindle to slide up and down, while the sleeve rotates in its bearing in the tubular portion J⁴ of the frame. On the spindle is a friction-disk K, adapted to engage with the friction-wheel E, and through the medium of the same rotary movement is given to the spindle, the said disk having a hub or sleeve k, which is also connected to the spindle, so as to rotate therewith, but to have endwise movement thereon, or to allow endwise movement of the spindle within the hub portion thereof.

L is a wheel preferably having its periphery milled or roughened and having a screw-threaded portion L' screw-threaded into the hub of the disk, as shown, and by adjustment of this wheel L the friction may be regulated to give the proper friction on the disk, a spring L² being arranged between the upper end of this wheel and the lower edge of the sleeve J², this spring acting also as a cushion and pressing upon both the wheel L and the sleeve J², both of which rotate with the spindle, thus causing no friction except at the points where needed.

The quill J' carries a rack M, that is designed to be engaged by a pinion M' on the shaft II, which shaft has a slot at its outer end to admit the operating-lever I, which is fastened by one bolt m, which forms a hinge or joint and which gives to it a right or left movement. The rod or link i, which connects this lever with the sliding sleeve G⁶, above described, gives the necessary movement to said sleeve, and the sleeve or collar being grooved, as shown, to admit the strap or band G⁵ permits the shaft to turn freely without interfering with the strap.

N is a spring on the end of the pinion-shaft held between the frame and an adjustable collar or nut N' and is designed to counterbalance the spindle.

Projecting from the spindle just below the friction-disk K is a lug or pin O, as seen in Fig. 1, and which is designed to be thrown into contact with the bottom end of the hub of the disk to lift the same out of engagement with the friction-wheel E.

The turning of the shaft II by means of the lever gives to the spindle a vertical movement, which is done by pulling the said lever down or up for feeding the drill. By moving the lever to the right the sleeve G⁶ will slide out on the shaft II, and by means of the connections shown and described it will cause the shaft to turn downward. The arm G' will pull down on the rod G, connected with the bell-crank lever, and this by its connections will shift the friction-wheel E on the shaft D near to the center of the friction-

disk, thus increasing the speed of the spindle. The speed of the spindle will of course be diminished by reverse movement of the lever, which moves the friction-wheel E nearer the periphery or outer edge of the friction-disk. When the operating-lever is pushed to the position indicated by dotted line in Fig. 1, the pinion M' will be turned and by its engagement with the rack M on the quill J' the pin O will strike the under side of the collar of the disk and raise it slightly, so as to disengage it from the friction-wheel E, allowing the shaft D to revolve freely in its bearings without imparting movement to the spindle.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages. Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the drill-spindle and its rotating mechanism, of a lever, means connected therewith for starting and feeding the spindle, and means connected with said lever for increasing or diminishing the speed of said rotating mechanism, substantially as described.

2. The combination with the drill-spindle and its rotating mechanism, of a single lever and connections substantially as described constructed and arranged to start, feed and stop said spindle and increase or diminish its speed; substantially as described.

3. The combination with the drill-spindle and friction devices for rotating the same, of a single lever and interposed pivotal connections substantially as described between said lever and one of the elements of the friction driving mechanism, whereby the single lever serves to stop, start and feed the spindle, and connections between said lever and the friction driving mechanism to regulate the speed thereof; substantially as described.

4. The combination with the drill-spindle and the friction-disk mounted thereon for rotary movement therewith and for movement lengthwise of the spindle, of the friction-wheel mounted for rotation with and endwise movement upon its shaft, a pivotally-mounted bell-crank lever, an operating-lever connected therewith, and a connection between the bell-crank lever and the hub of the friction-pulley; substantially as described.

5. The combination with the drill-spindle and the friction-disk mounted thereon for rotary movement therewith and for movement lengthwise of the spindle, of the friction-wheel mounted for rotation with and endwise movement upon its shaft, a pivotally-mounted bell-crank lever, an operating-lever connected therewith, a connection between the bell-crank lever and the hub of the friction-pulley, and a pinion on the shaft of said operating-lever, and a quill around the drill-spindle having a rack portion engaging said pinion; substantially as described.

6. The combination with the drill-spindle and the friction-disk having a hub mounted on the spindle for rotary movement therewith and for endwise movement thereupon, 5 and a cooperating friction-wheel, adapted to move radially to the axis of said disk, of a projection on the spindle adapted to engage the hub of the friction-disk to move the same away from the friction-wheel; substantially 10 as described.

7. The combination with the drill-spindle and the friction-disk having a hub mounted on the spindle for rotary movement therewith and for endwise movement thereupon, 15 and a cooperating friction-wheel, adapted to move radially to the axis of said disk, of a projection on the spindle adapted to engage the hub of the friction-disk to move the same away from the friction-wheel, and means for 20 increasing the friction between said disk and wheel; substantially as described.

8. The combination with the drill-spindle and the friction-disk and its hub, and a cooperating friction-wheel adapted to move radially to the axis of said disk, of a collar having a threaded portion engaged by said hub, 25 a sleeve supported in the frame and through which the drill-spindle passes, and a spring around the spindle between said collar and sleeve; substantially as described. 30

9. The combination with the drill-spindle and the friction-disk and its hub, of a collar having a threaded portion engaged by said hub, a sleeve supported in the frame and 35 through which the drill-spindle passes, a spring around the spindle between said collar and sleeve, and a projection on the drill-spindle adapted to engage the under side of the hub of the friction-disk; substantially as described. 40

10. The combination with the sliding collar G^6 and the strap disposed in an annular groove thereof, of the operating-lever connected with said collar, the friction-wheel mounted for 45 endwise movement on its shaft, the bell-crank lever and connections between the said sliding collar and the bell-crank lever and between the bell-crank lever and the hub of the friction-wheel; substantially as described.

11. The combination with the sliding collar 50 G^6 and the strap disposed in an annular groove thereof, of the operating-lever connected with said collar, the friction-wheel mounted for endwise movement on its shaft, the bell-crank-lever connections between the said sliding 55 collar and the bell-crank lever and between the bell-crank lever and the hub of the friction-wheel, and a pinion on the shaft of the sliding collar, and a sleeve having a rack portion to engage said pinion; substantially as 60 described.

12. The combination with the friction-wheel mounted for endwise movement on its shaft, of the sliding collar G^6 , its shaft, the operating-lever connected with the collar, the bell- 65 crank lever connected with the sliding collar by an interposed pivotal and rocking connection, and a connection between the bell-crank lever and the hub of the friction-wheel; substantially as described. 70

13. The combination with the friction-wheel mounted for endwise movement on its shaft, of the sliding collar G^6 , its shaft, the operating-lever connected with the collar, the bell- 75 crank lever connected with the sliding collar, a connection between the bell-crank lever and the hub of the friction-wheel, and a spring on the shaft of the sliding collar to counterbalance the drill-spindle; substantially as described. 80

14. The combination with the friction-wheel mounted for endwise movement on its shaft, of the sliding collar, its shaft, the operating-lever connected with the collar, the bell-crank 85 lever connected with the sliding collar, a connection between the bell-crank lever and the hub of the friction-wheel, and a spring on the shaft of the sliding collar to counterbalance the drill-spindle the said shaft having a slot, in which the end of the operating-lever 90 is received and pivoted; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM W. FLICKINGER.

Witnesses:

FRANK M. FLEMING,
FRANK FLOWER.