(No Model.)

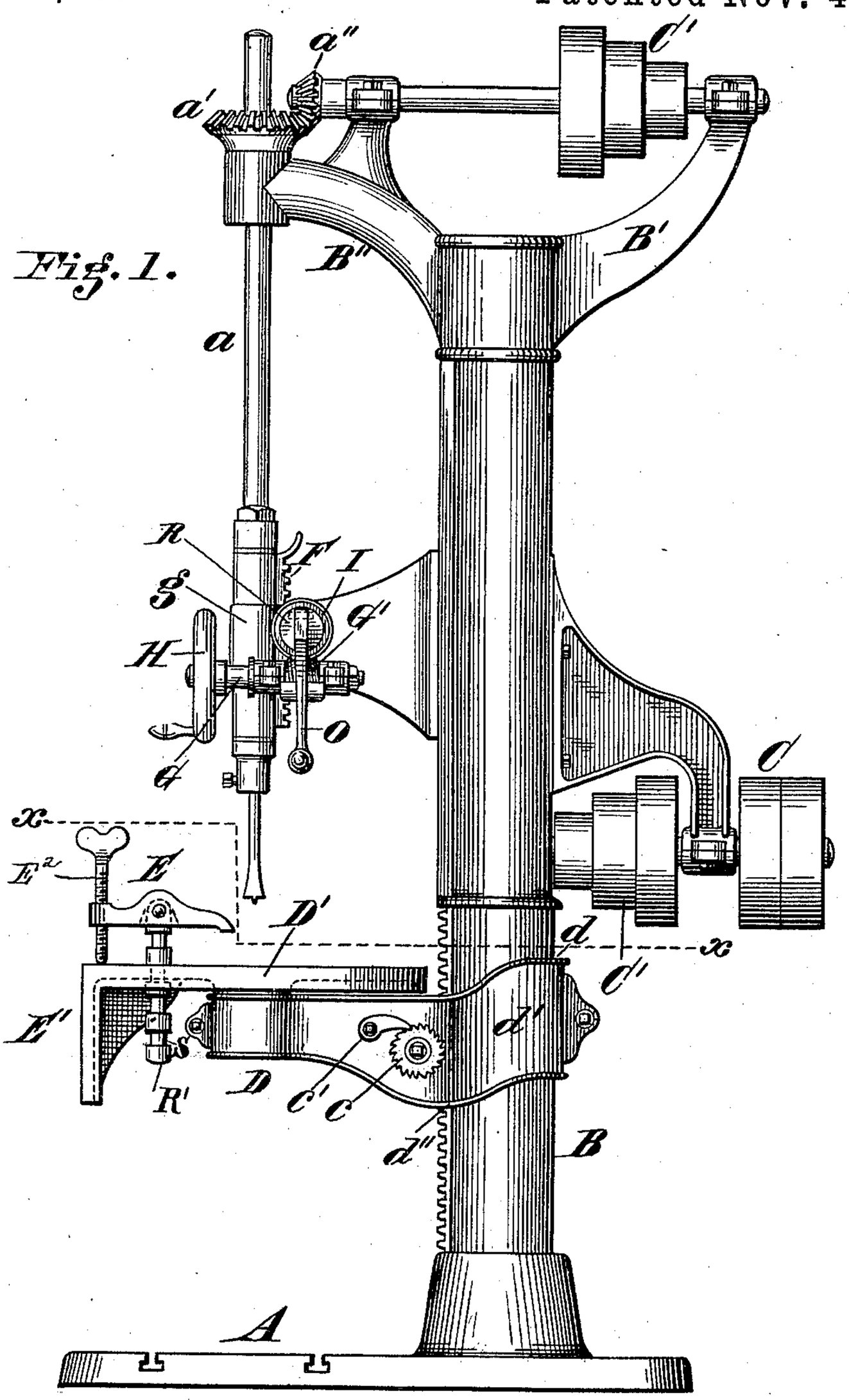
3 Sheets—Sheet 1.

# F. J. DUBRUL.

## DRILLING MACHINE.

No. 307,710. Patented Nov. 4, 1884.

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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## DRILLING MACHINE.

No. 307,710. Patented Nov. 4, 1884.

Fig. 2.

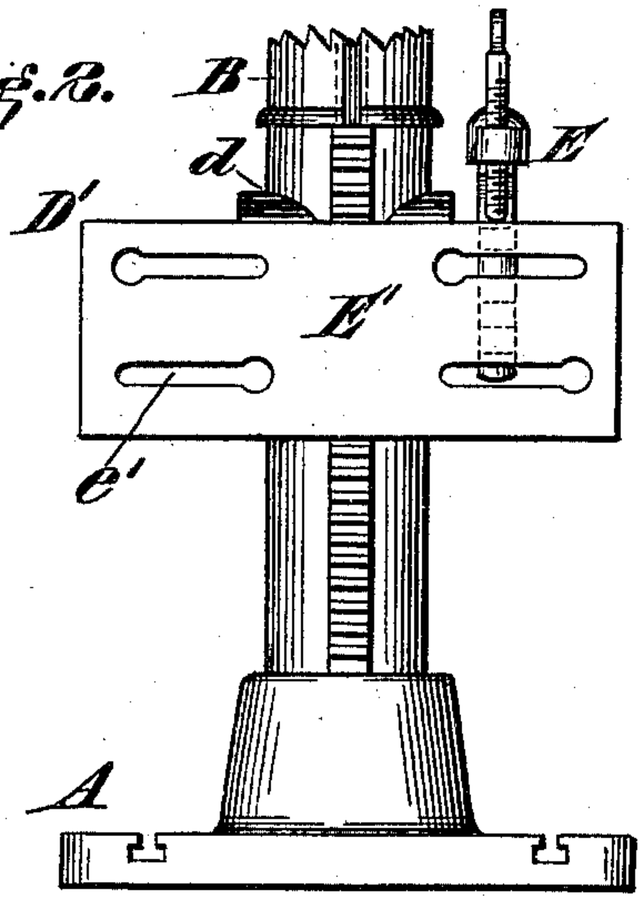
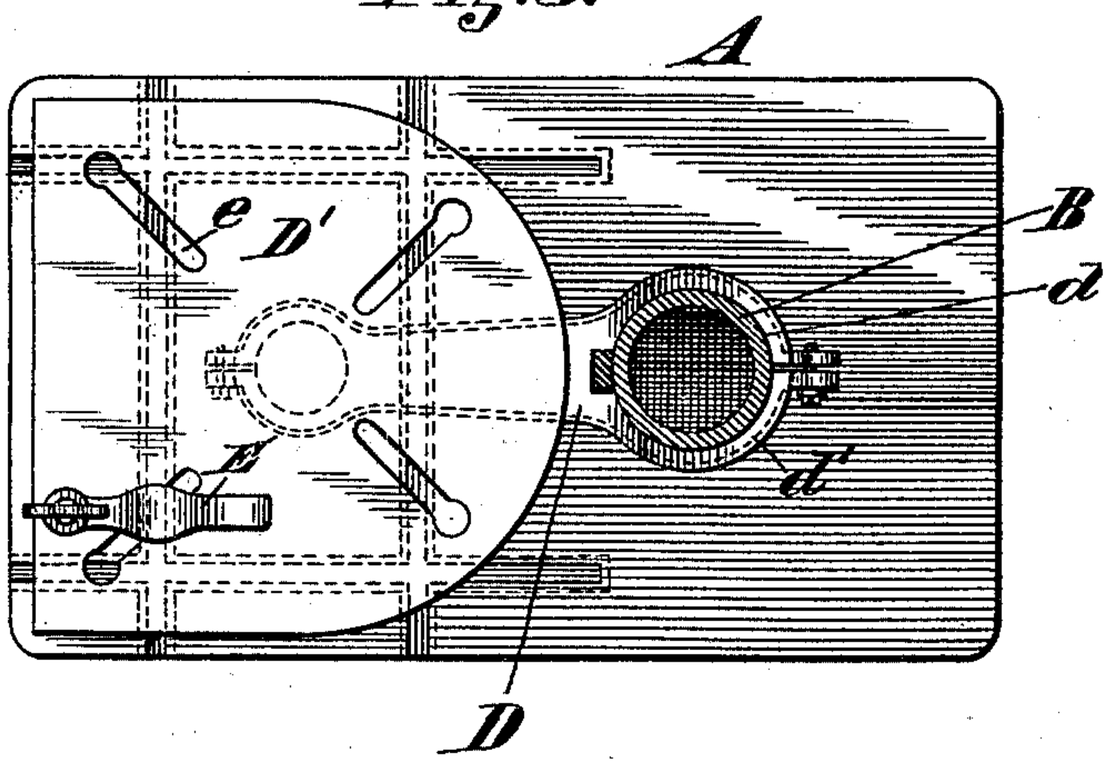



Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

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## DRILLING MACHINE.

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Fig. 4.

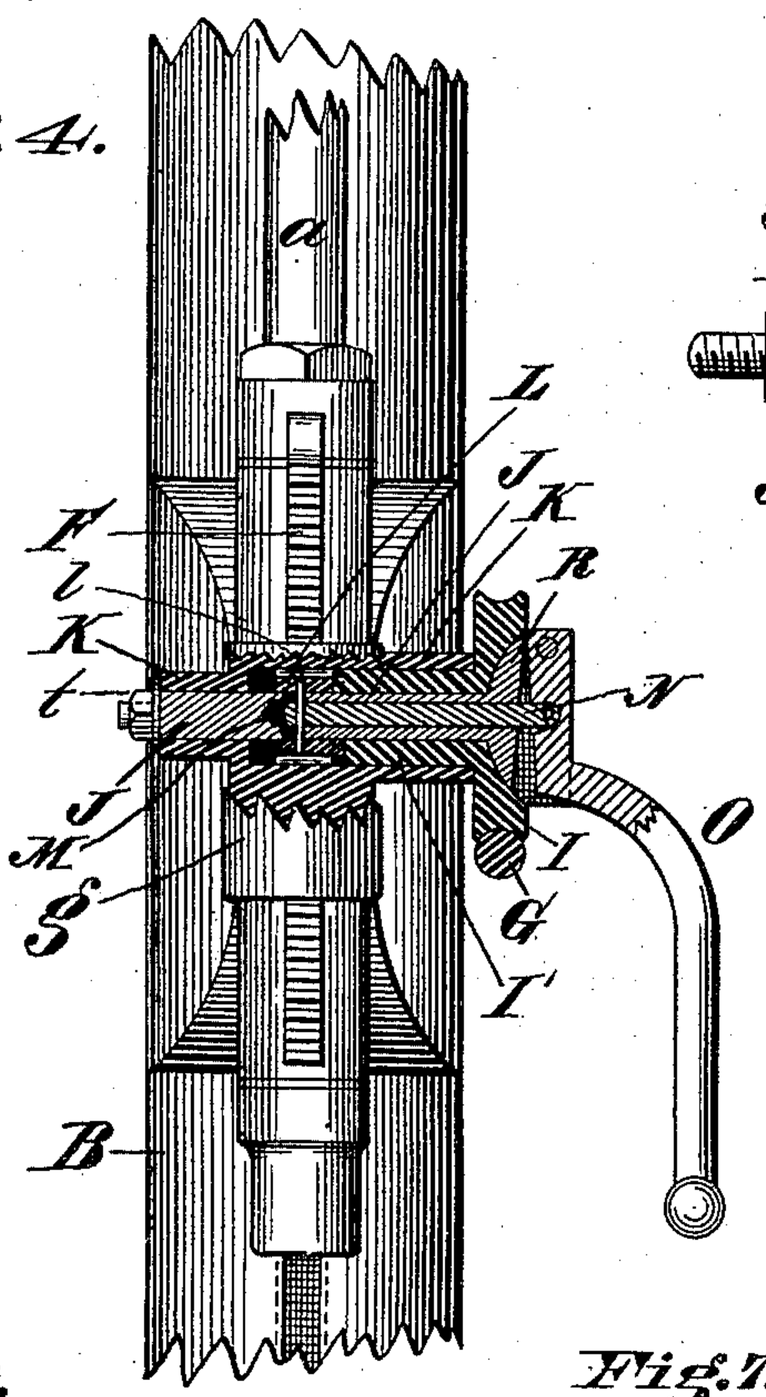



Fig. 5.

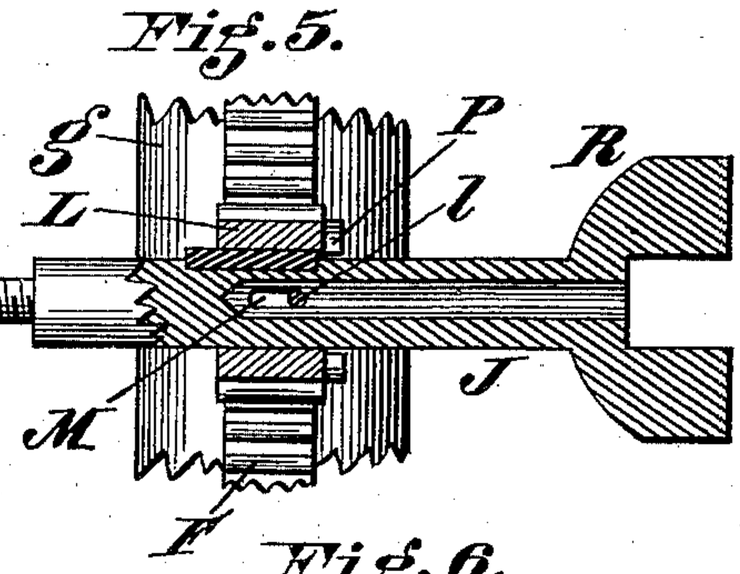



Fig. 6.

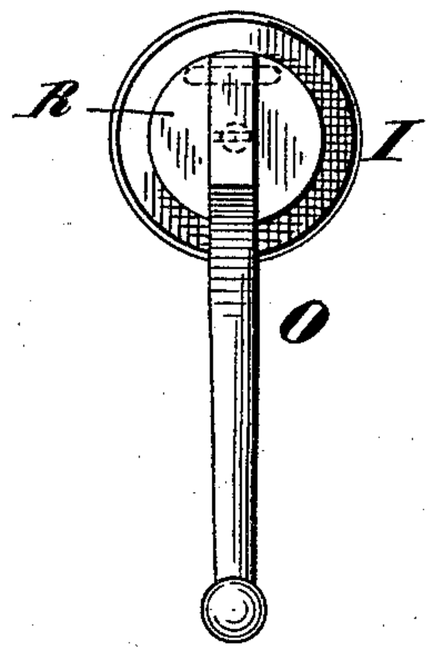



Fig. 8.

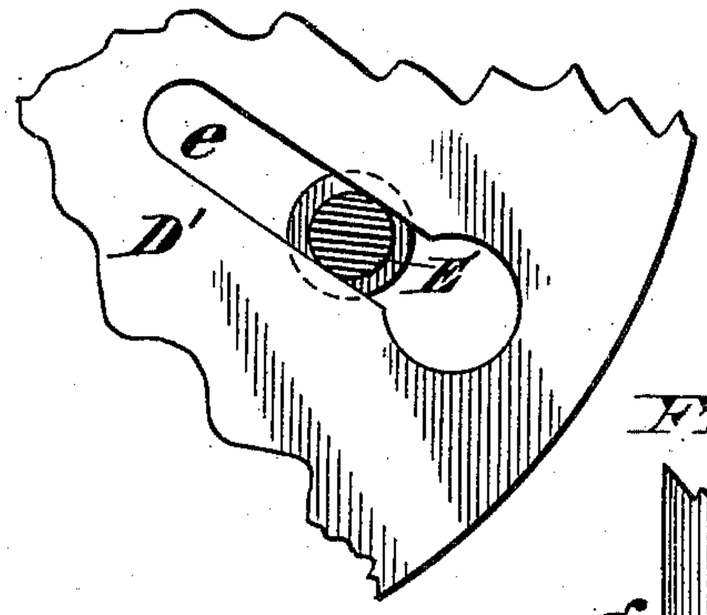



Fig. 7.

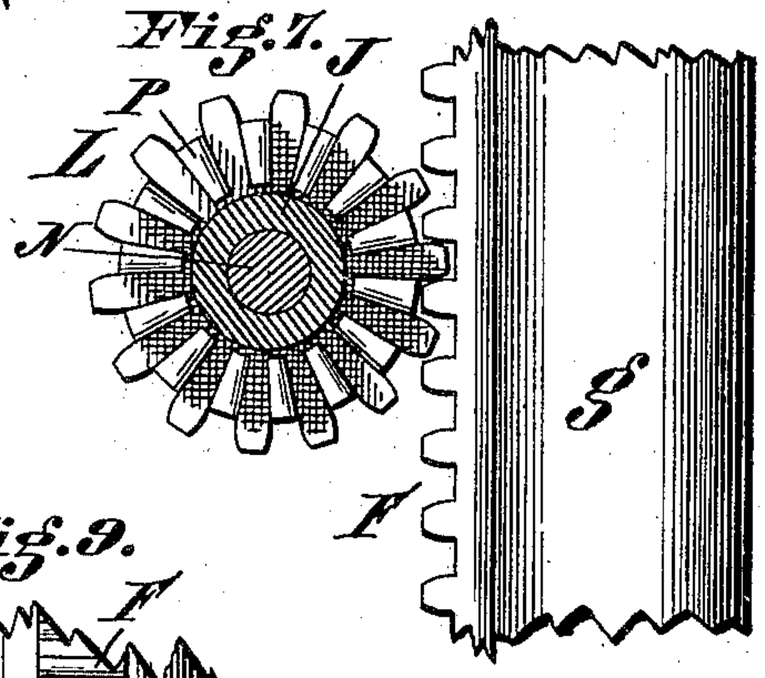
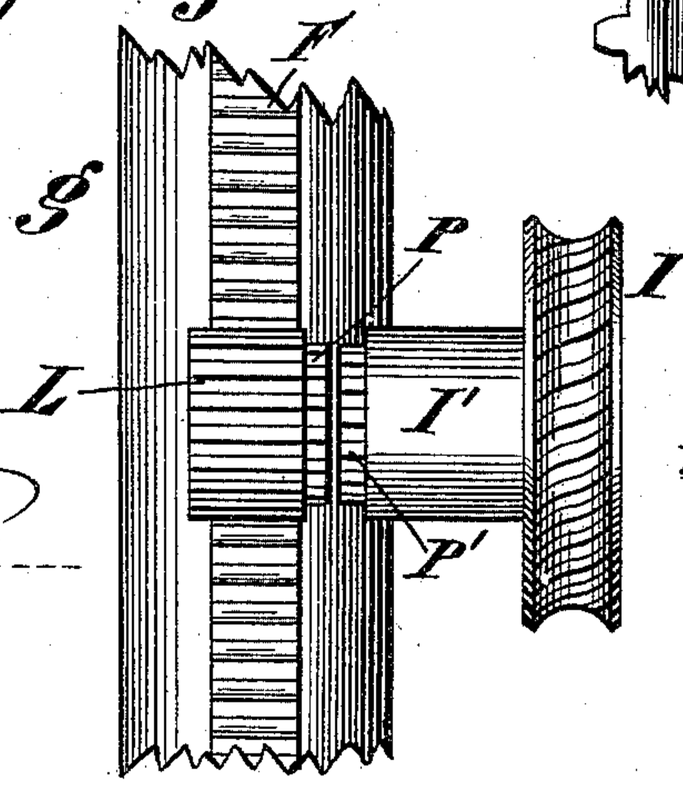



Fig. 9.

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# UNITED STATES PATENT OFFICE.

FERDINAND J. DUBRUL, OF COLUMBUS, OHIO.

## DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 307,710, dated November 4, 1884.

Application filed March 7, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FERDINAND J. DUBRUL, a citizen of the United States, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Drill-Presses, of which the following is a specification.

My invention relates to an improvement in drill-presses, the object of which is to provide a cheap, strong, and durable machine.

In the accompanying drawings, Figure 1 is a side elevation of my improvement; Fig. 2, a broken front elevation of the lower part of the drill-press; Fig. 3, a plan view on line *x x*, Fig. 1. Fig. 4 is a longitudinal sectional elevation showing the clutch and feeding devices. Fig. 5 is a similar view representing the worm gear-wheel and sleeve removed. Fig. 6 is a front elevation of the clutch-lever. Fig. 7 is a detail view of the clutch-gear. Fig. 8 is a broken plan view of the table. Fig. 9 is a detail view of the clutch-gear, worm-wheel, and sleeve.

A B B′ B″ represent the frame of the drill-press.

C C′ represent the driving-pulleys; *a*, the drill-spindle; *a′ a″*, the bevel-gears for driving the same. These parts are constructed in the ordinary manner.

D represents an arm supporting the table D′. It is made of the form shown in Fig. 1. The rear end, *d*, of the sleeve is made to project upward, so as to be terminated on a line at or near the top of the table, while the opposite side of the sleeve *d′* is made to project down a considerable distance, as shown at *d″*, Fig. 1. The object of making these portions of the sleeve is to form an extended brace or long vertical bearing for supporting arm D upon the column B, the portion *d″* extending a considerable distance below the table, and the upper shoulder, *d*, extending upward, as shown. This form of sleeve furnishes the maximum amount of support for the weight of metal employed.

*c c′* represent a ratchet and pawl placed upon a shaft which carries a pinion meshing with the rack-teeth on the column B for raising, lowering, and holding the table-arm in any desired vertical adjustment. Table D′ is provided with two or more radial slots, *e*, for receiving a clamp, E, which is inserted through the larger portion of said slot, and is capable of being adjusted to and from the center of the table for clamping the material to be drilled down on said table. The pivoted clamping-tool E is provided with an adjusting or set screw, $E^2$, at one end adapted to bear on the table for adjusting the clamping end of the tool to and from the table. Similar slots, *e′*, are provided in the vertical side E′ of the table for receiving the clamping-tool E.

F represents a rack-bar attached to the spindle *a* for raising and lowering it, these parts being constructed in the usual manner.

In order to feed the drill-spindle slowly, and to raise and lower it rapidly for adjustment, I have provided the following devices:

G represents a shaft suitably journaled upon a sleeve, *g*, and carrying a worm, G′.

H represents a hand-wheel for driving the shaft G and the worm G′.

I represents a worm-wheel which is provided with a sleeve, I′, that journals on the hollow shaft J.

K represents a journal-box, in one end of which the shaft J journals, and in the opposite end the sleeve I′ journals.

L represents a pinion secured to shaft J by means of the pin *l*, which works in the slot M pierced through the shaft J.

N represents a connecting-rod, one end of which is pivoted to lever O, and at the other end pin *l* is inserted to connect it to the sliding clutch-pinion L. The connecting-rod N works longitudinally in the hollow shaft J to move the gear L backward or forward in the recess formed between the sleeve I′ and the journal-box K.

*k* represents clutch-teeth formed on the face of pinion L.

P′ represents similar clutch-teeth on the face of sleeve I′. When the pinion L is in the position shown in Fig. 4, the teeth P P′ are in engagement and form a clutch, and cause sleeve I′ to revolve with the pinion L. When the lever O is moved inward toward the column B, pinion L is slid laterally upon the shaft J, so as to release the engagement of the clutch-teeth P P′, and permit the pinion L, which is still in engagement with the rack-teeth F, to revolve independently without moving the sleeve I′, and without disturbing the worm-gearing I G. The revolution of pinion L is

effected by the handle or crank O, and by the means described the drill-spindle may be quickly raised or lowered into any desired position, and when properly adjusted the pinion L may be thrown by a single movement of the lever O into a clutch engagement with the sleeve I′, after which the rotation of the pinion will be controlled by the movement of the worm-gearing.

*t* represents a nut for securing shaft J in position.

R represents a concave disk formed on the outer end of shaft J, which journals in a similarly-shaped recess formed in the disk of worm-wheel I, thus preventing any lateral motion of the shaft J, and allowing it to journal in sleeve I′, so as to be revolved independently of the sleeve I′ for rapid adjustment of the drill-spindle *a*. When lever O is withdrawn or swung outward in the position shown in Fig. 4, the clutch-teeth P P′ are in engagement, and the sleeve I′ and pinion L are revolved through the medium of the hand-wheel H, shaft G, worm G′, and worm-wheel I for feeding the tool to its work. The clamp E is pivoted to the rod R′, which is provided with annular grooves *s*, so as to be adjusted at different heights above the table within the slot *e*.

I am aware that heretofore and prior to my invention a feeding device for drilling-machines has been invented in which the drill-spindle was thrown up and down by means of a pinion engaging with a rack, the pinion-shaft being rotated by worm-gearing, and having a toothed disk upon its outer end with which a crank-lever may be engaged, whereby the actuating-pinion may be operated without disturbing the worm-gearing. I make no claim, broadly, to such an invention.

I claim—

1. The combination of the arm D, the table D′, journaled on the arm, and constructed with a series of radial slots, *e*, each having its outer end enlarged laterally beyond the width of the slot, and the adjustable clamping-tool adapted to be inserted through the enlarged end of the slot and adjusted along the latter, substantially as described.

2. In a drill-adjusting mechanism, the combination of the pivoted crank O, connecting-rod N, shaft J, pinion L, to slide thereon, and provided with clutch-teeth P, and sleeve I′, provided with clutch-teeth P′, substantially as described.

3. The combination of the pinion L, having the clutch-teeth P, sleeve I′, having the clutch-teeth P′, worm-wheel I, connected to said sleeve, shaft G, provided with worm-gear G′, and wheel H and shaft J, journaled within sleeve I′ and adapted to have the pinion L slide thereon, substantially as described.

4. The combination of the worm-wheel I, having clutch-sleeve I′, connected thereto, clutch-pinion L, to engage with the latter, and shaft J, provided with a convex disk journaled within wheel I, substantially as described.

5. In combination with the table D′, having slots *e*, the clamp E, pivoted to the rod R′, having the grooves *s* for adjusting the tool at different heights to the table, and an adjusting-screw, E², substantially as specified.

In testimony whereof I have hereunto set my hand.

FERDINAND J. DUBRUL.

Witnesses:

PETER HERMANN,

HENRY OLNHAUSEN.