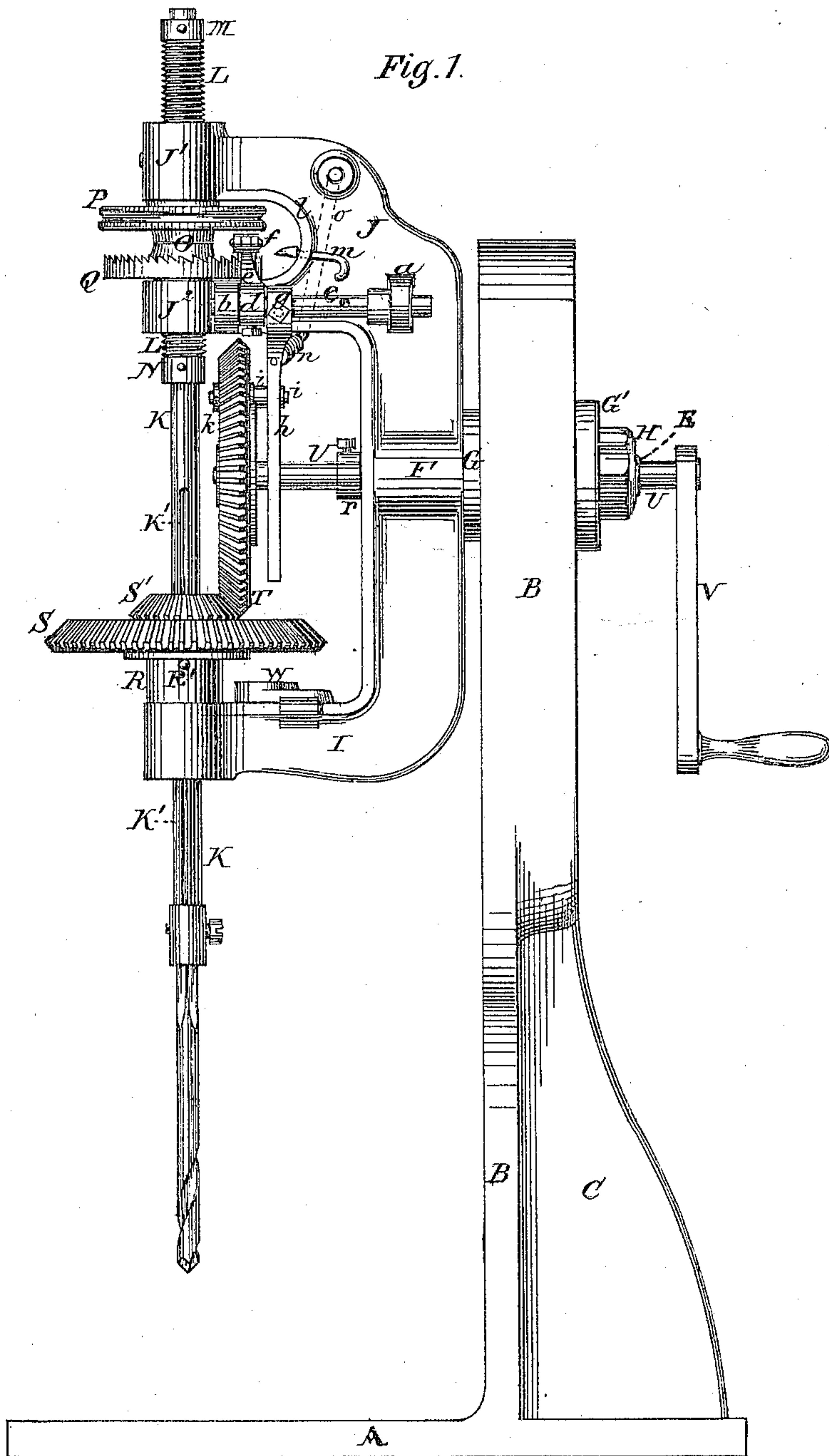


N. A. MORLAN.
Drilling-Machines.

No. 134,392.

Patented Dec. 31, 1872.



Witnesses:

A. C. N. Johnson
Alex. A. C. Klauke

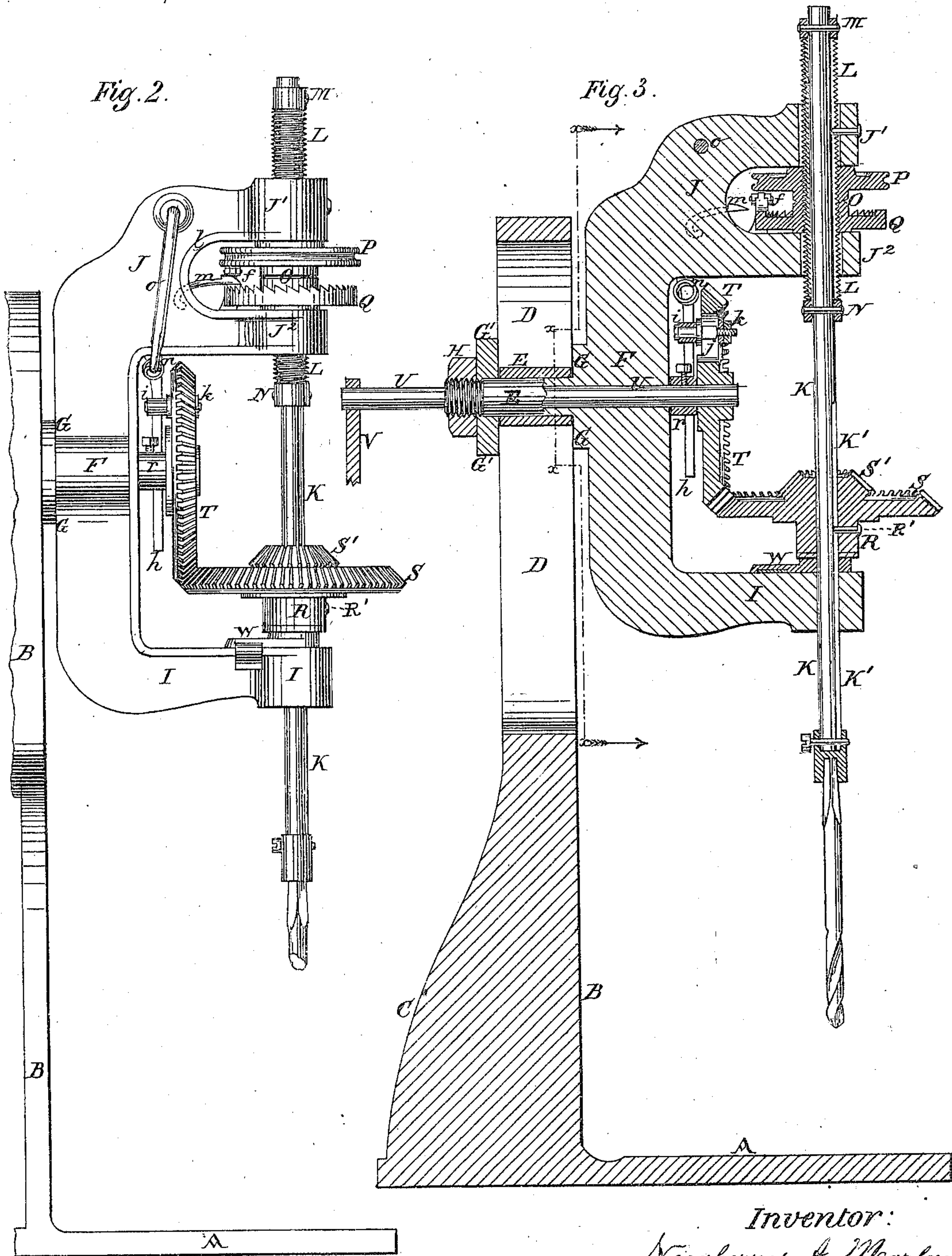
Inventor:

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Fig. 4.

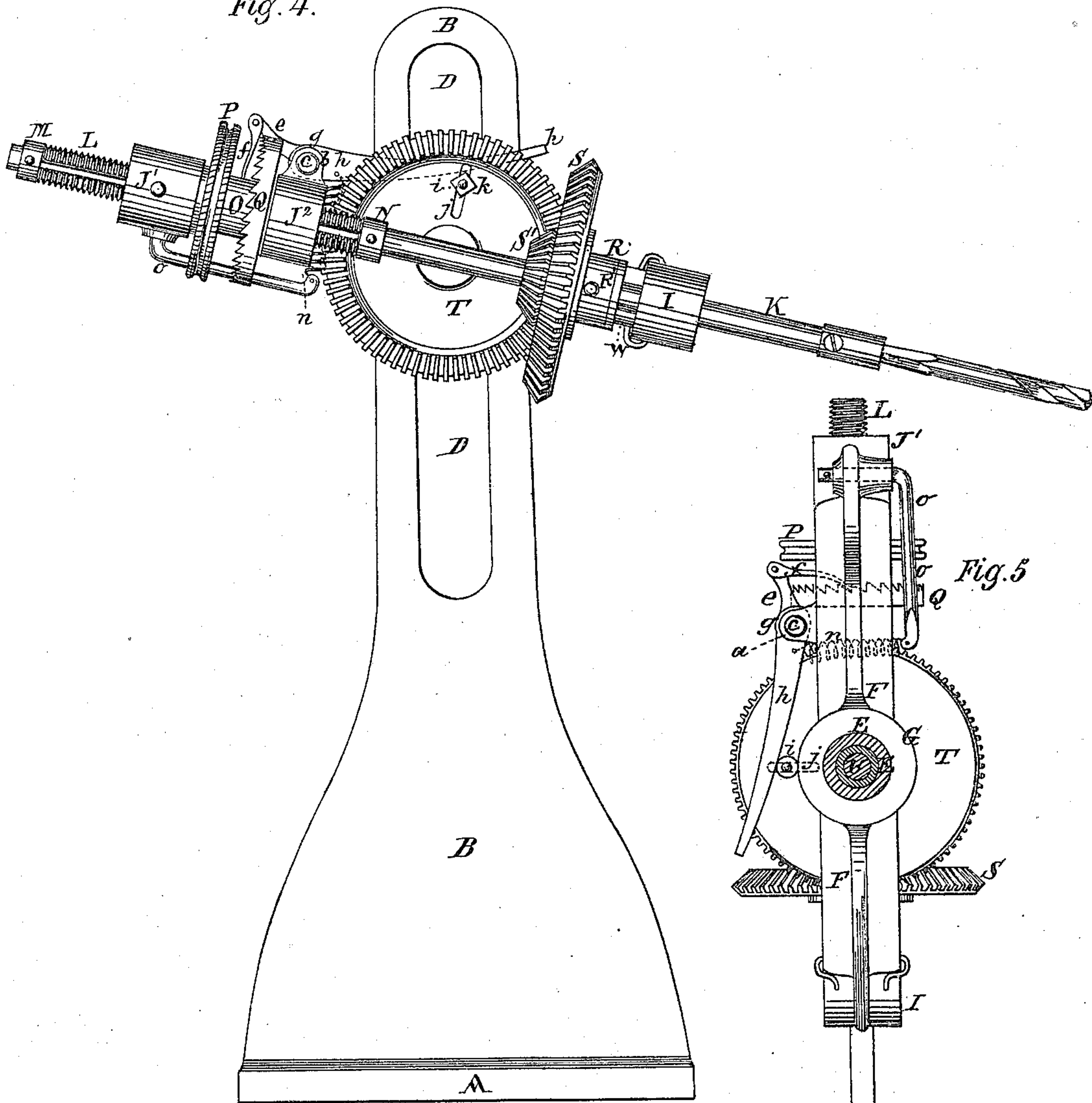


Fig. 5.

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UNITED STATES PATENT OFFICE.

NEWBERRY A. MORLAN, OF SALEM, OHIO.

IMPROVEMENT IN DRILLING-MACHINES.

Specification forming part of Letters Patent No. 134,392, dated December 31, 1872.

To all whom it may concern:

Be it known that I, NEWBERRY A. MORLAN, of Salem, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in Machines for Drilling Metals, of which the following is a specification:

My invention relates to machines for drilling metals, operated by hand; and my said invention consists, first, in the arrangement and combination of a short hollow clamping-mandrel of the drill-head with the slotted standard and adjustable drive-wheel shaft, to obtain a vertical adjustment of the drill-head and a horizontal adjustment of the drive-wheel shaft by one and the same mandrel; second, in the combination of the double gear-wheels and their adjustable bearing with the drive-wheel, having a horizontal movement with its shaft, whereby the drive-wheel is made to connect with one or the other of the double wheels, when the same shall have been adjusted in line with either of said wheels; third, in the arrangement and combination of an adjustable bearing on the drill-head with the double gear-wheels of the drill-stock and the drive-wheel of the drill-head, the said double gear and drive wheels having, respectively, free vertical and horizontal movements, whereby the change of the drive-wheel from a fast to a slow gear is readily and easily effected by shifting the bearing-support for the double gear-wheels; fourth, in the combination of the adjustable collar with the adjustable shaft, the drive and double gear wheels and the drill-head, whereby the said drive-wheel is locked in position when adjusted to connect it with one or the other of the double gear-wheels; fifth, in the arrangement of the feed-ratchet and hand-adjusting wheels upon a single screw-sleeve and between the branches of the upper drill-head arm, whereby both upper and lower seats are formed for the feeding and adjusting devices so that they can have no axial movement, and require no fastenings while operating the drill-stock; sixth, in the arrangement of the rock-shaft with the operating arm and pin, and the pawl with the ratchet-wheel and the screw-sleeve of the bit-stock, to effect the feed of the latter, as hereinafter described; lastly, in the arrangement and combination of the several

parts of the machine relatively to and with each other, as hereinafter more fully described.

In the accompanying drawing, Figure 1 represents a side elevation of my improved metal-drilling machine, showing the driving-wheel in gear with the fast gear-wheel. Fig. 2 represents a similar elevation of the opposite side of the machine, the driving-wheel being shown in gear with the slow gear-wheel. Fig. 3 represents a vertical central section of Fig. 2. Fig. 4 represents a front elevation of the machine, the drill-head being shown as arranged at an angle to a horizontal plane; and Fig. 5 represents a sectional view in line *x x* of Fig. 3.

From a suitable support, A, a standard, B, rises, which may be suitably braced, as shown at C, and which, in its upper narrower part, is provided with a vertical slot, D, of suitable extent, in which slot the hollow mandrel E of a drill-head, F, has its bearing, a shoulder, G, bearing against the inner face of the standard B, while the nut H, provided with a shoulder, G', and moving on the outer screw end of the mandrel, securely clamps the mandrel in the slot against the standard. The drill-head F is formed with two projecting arms, I J, the mandrel E being formed on the drill-head centrally between these arms. The lower arm I is provided with a vertical opening near its outer end, in which the drill-stock K moves freely up and down. The upper branched arm J of the drill-head is likewise provided with vertical openings, in which a vertical screw-sleeve, L, has free vertical play, the drill-stock K passing upwardly through the said screw-sleeve L, which is held between shoulders M and N on the drill-stock K. The screw-sleeve L and the drill-stock K are held by means of a sleeve, O, surrounding the screw-sleeve L, between the divided portions J¹ J² of the upper branched arm J, and provided at its upper end with a hand-wheel, P, and at its lower end with a horizontal ratchet-wheel, Q. On the drill-stock K a sleeve, R, has a free vertical movement, which sleeve at its upper end carries a gear-wheel, S, and a small bevel-gear, S', surrounding the drill-stock K in such manner that the level of the smaller inner bevel-gear S' is just above the level of the larger outer bevel-gear S. The sleeve R and

gear-wheels SS' have a free vertical movement on the drill-stock K ; but the latter is compelled to rotate with the sleeve and gear-wheel by reason of a key or rib R' on the inside of the sleeve, which fits into longitudinal groove K' formed in the drill-stock. Through the center of the drill-head F and through the central opening of the hollow mandrel E passes a shaft, U , carrying on its outer end a crank-handle, V , and on its inner end, between the arms I J of the drill-head, a beveled driving-wheel, T , which, when the sleeve R of the gear-wheels SS' has its bearing on the surface of the lower arm I , and when the shaft U has been pushed inwardly as far as it will go, gears with the inner smaller fast gear S' , but gears with the outer larger slow gear S when the shaft U is drawn outwardly as far as it will go, and the sleeve R and gear-wheels are raised on the auxiliary bearing W , which slides on the lower arm I of the drill-head and may be made to embrace the drill-stock K and support the sleeve R . In suitable projections a b on the drill-head F and arm J , respectively, a rock-shaft, c , has its bearing. On this rock-shaft, just inside of the projection b , a shoulder, d , is held by a set-screw, from which extends outwardly an arm, e , to the end of which a pawl, f , is pivoted so as to operate the teeth of the ratchet-wheel Q , and thus revolve the latter as the pawl is operated from the rock-shaft. On the rock-shaft c a sleeve, g , is free to be moved from end to end, being held in position by a pin passing through the sleeve and into the shaft, or by a set-screw, from which sleeve an arm, h , extends downwardly between the inner face of the drill-head and the back of the drive-wheel T , and is operated from a pin, i , passing through a radial slot, j , in the body of the drive-wheel and held on its front side by a nut, k . The rearwardly-projecting end of the pin i operates the rock-shaft c through its arm h once at every revolution of the drive-wheel, and through the rock-shaft the pawl f , which revolves the ratchet-wheel Q a certain distance at every revolution of the drive-wheel, and this distance may be regulated by setting the pin i nearer to or further away from the center in its slot j , thereby moving the arm h a less or greater distance at each revolution, and consequently operating the rock-shaft and pawl to a proportionate degree. When the drive-wheel T is in gear with the slow outer gear S the arm h on its sleeve g is secured to the rock-shaft c near its rear end; and when the drive-wheel is in gear with the inner fast gear S' the arm h and sleeve g are moved to the opposite end of the rock-shaft, so as to allow the pin i to operate it in that position. In the bend of the branch of the arm J an opening is formed through the lip l , through which opening a pin, m , passes. This pin is so arranged relatively to the hand-wheel P and ratchet-wheel Q and the pawl f that when it is desired to elevate the drill-stock K rapidly by means of the hand-wheel, the pin m may be pushed under the ele-

vated pawl f , and will thus keep the pawl out of contact with the teeth of the ratchet-wheel Q , while the hand-wheel is operated to elevate the drill-stock by the mere withdrawal of the pin m from under the pawl f . When the elevation of the drill-stock has been completed the pawl is allowed to fall and again come in contact with the ratchet-wheel. The arm h is held inwardly toward the shaft of the drive-wheel by means of a spring, n , attached one end to the arm h and the other to a rod, o , suitably pivoted in the arm J , or to any other suitable portion of the drill-head, thus always insuring the full operation of the rock-shaft c from the arm h by means of the pin i , whether the drive-wheel T be moved in or out.

My improved drilling-machine may be arranged at any desired angle and at different angles successively without changing the point where the power is applied. The gearing may be made fast or slow at pleasure and in whatever position the drill-head may be, and the drill-head may be raised or lowered within its slotted standard, and the drill set to its work in the most perfect manner, by merely loosening and tightening the screw-nut H , which same screw-nut also allows of revolving the drill-head and its mandrel and thus arranging the operation of the drill at any angle lying within a vertical plane.

When the drive-wheel is in gear with the inner fast gear the drive-wheel is prevented from moving away with its shaft from the gear by means of a collar, r , on the shaft U , which collar, being held against the inner side of the drill-head F , prevents any such movement.

All the operative parts of my improved machine are placed between the arms I J of the drill-head, and combine simplicity and compactness, and consequent cheapness, with perfect control of the parts and their superior operation. My improved drilling-machine may be carried from place to place with ease, being emphatically a hand-machine, and, with an elongated drill-stock, holes may be drilled in stationary machinery which would be hard to get at, and yet harder to drill with the hand-drills now in use.

Having described my invention, I claim—

1. The combination of the short hollow clamping-mandrel E of the drill-head with the slotted standard B D and adjustable drive-wheel shaft U , substantially in the manner and for the purpose herein described.

2. The combination of the gear-wheels SS' and devices for adjusting them to different heights on the drill-stock with the drive-wheel T and means to adjust said wheel laterally so as to connect with one or the other of the wheels SS' , when the same shall have been adjusted in line with it, substantially as described.

3. In combination with the double gear-wheel SS' having a free vertical movement on the bit-stock K and the drive-wheel T having a free lateral movement with its shaft U , the sliding

bearing W on the arm I of the drill head, as and for the purpose described.

4. The adjustable collar *r*, in combination with adjustable shaft U, drive-wheel T, the double gear-wheels S S', and drill-head F, in the manner and for the purpose set forth.

5. The arrangement of the feed ratchet-wheel Q and the hand adjusting-wheel P upon the screw-sleeve O and between the branches J¹ J² which form both stops and seats, to hold the adjusting devices from axial movement, as described.

6. The arrangement of the rock-shaft *c* with its operating arm *h*, the arm *i*, the pawl *f*, ratchet-wheel Q, and the screw-sleeve L of the drill-stock, as and for the purpose described.

7. The adjustable arm *h* of the rock-shaft *c*, in combination with the adjustable drive-wheel T and its pin *i*, whereby the said arm *h* and the feeding mechanism are adapted for joint operation with the drive-wheel, whether the latter be engaged with the fast or slow gear, substantially as described.

8. The improved drilling-machine, constructed and operating in the manner essentially as herein described.

NEWBERRY A. MORLAN.

Witnesses:

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A. R. SILVER.