(No Model.)

M. C. HENLEY.

MACHINE FOR BORING, DRILLING, &c.

No. 383,730. Patented May 29, 1888.

Fig. 1.

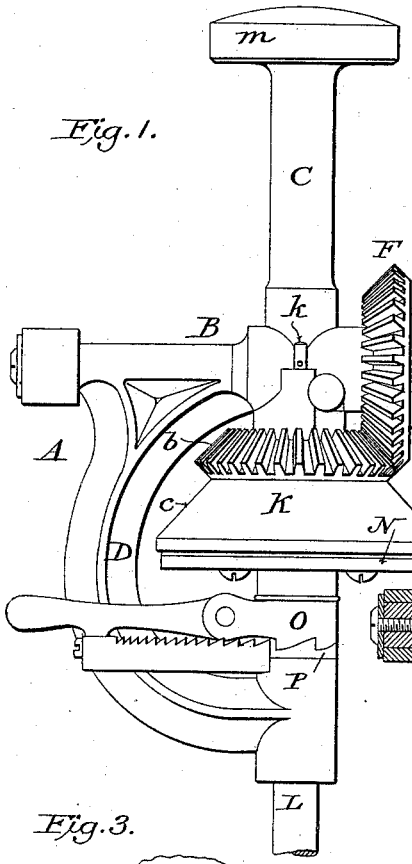


Fig. 2.

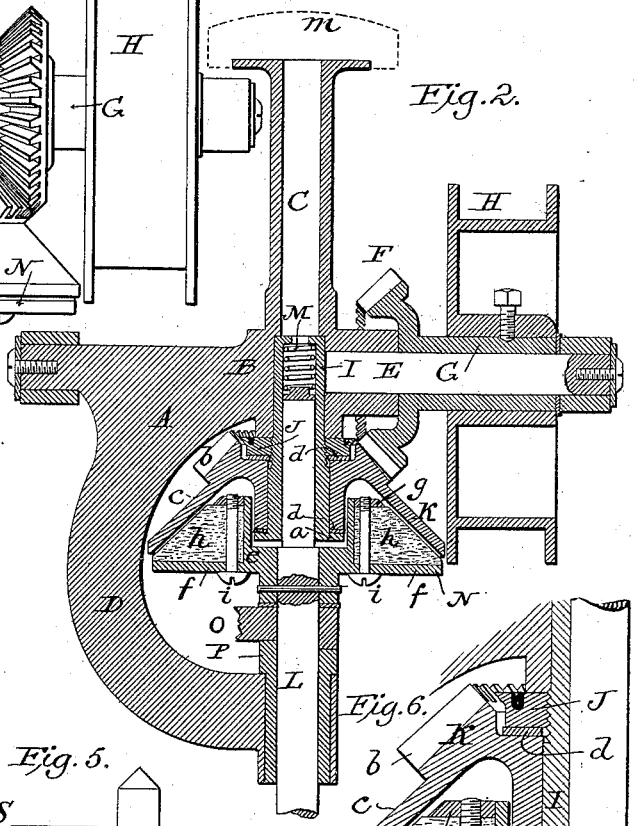


Fig. 3.

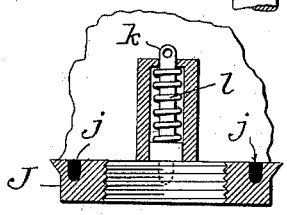


Fig. 4.

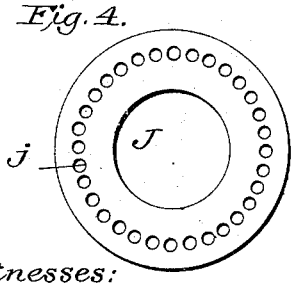


Fig. 5.

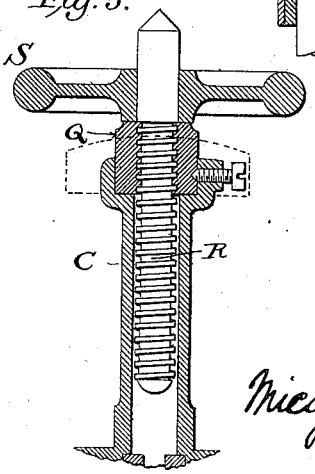
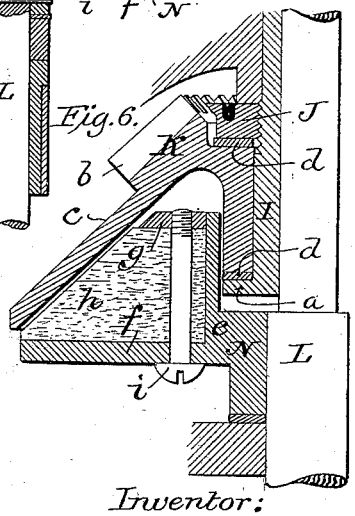


Fig. 6.



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UNITED STATES PATENT OFFICE.

MICAJAH C. HENLEY, OF RICHMOND, INDIANA.

MACHINE FOR BORING, DRILLING, &c.

SPECIFICATION forming part of Letters Patent No. 383,730, dated May 29, 1888.

Application filed February 2, 1888. Serial No. 262,763. (No model.)

To all whom it may concern:

Be it known that I, MICAJAH C. HENLEY, of Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Machines for Boring, Drilling, &c., of which the following is a specification.

My invention relates to machines for boring, drilling, and performing like work, and is designed as an improvement upon that for which Reissued Letters Patent No. 10,892 were issued to me January 3, 1888.

The invention consists in a novel construction and arrangement of the driveng-gear for imparting motion to the tool-spindle, and in other features and details hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side or face view of my improved machine. Fig. 2 is a vertical sectional view; and Figs. 3 to 6, inclusive, detail views.

A indicates the tool-stock frame, which may be supported in the manner illustrated in the patent above referred to, or in any other suitable manner; but, as the construction of the supporting devices forms no part of the present invention, I do not deem it necessary to show or describe them.

The tool-stock frame comprises a horizontal arm, B, an upright hollow post, C, and a curved arm, D, as clearly shown in Figs. 1, 2, and 3, and substantially as in my former patent. The horizontal arm B is provided with a stud-axle or short shaft, E, and mounted upon this shaft is a bevel gear-wheel, F, having an elongated tubular hub, G, which latter extends outward through, and is connected rigidly with, the hub of a band-wheel, H, to which motion is imparted from any convenient source. The band-wheel H is connected to the hub G of gear-wheel F by means of a set-screw, or in any other suitable manner, and they are adapted to rotate in unison.

I represents a hollow sleeve or tube having a broad lateral collar, *a*, at its lower end, the said sleeve being seated in a vertical recess in the frame A, as shown in Fig. 2, and reduced slightly in diameter for about half its length from its upper end. At a point between its ends the tube or sleeve is threaded externally to receive a nut, J, of the form shown in Figs. 2, 3, 4, and 6, the said nut and the flange or collar *a*, upon the lower end of the sleeve, serving to clamp or hold a combined friction and gear wheel, K, as shown in Fig. 2. The double-faced wheel or idler K is provided with teeth *b* to mesh with the wheel F, and is also provided with a downwardly-extending conical shell, *c*, the inner face of which will be turned perfectly true and smooth. A washer, *d*, will be placed between the collar or flange *a* and the lower face of the hub of the wheel K, and a similar washer will be placed between the upper face of the wheel and the under face of nut J, as shown in Fig. 2. The wheel K turns freely upon the tubular sleeve I, and it will be seen by adjusting the nut J upon the tubular sleeve compensation may be made for wear.

L indicates the tool-stock or spindle, which has its upper end reduced slightly to fit within the tubular sleeve I, and bearing upon the upper end of the said spindle L is a spring, M, which tends to keep the friction gear-wheels separated, as in my former patent.

Secured rigidly upon the tool stock or spindle L is a friction-wheel, N, which comprises a metallic hub, *e*, base-plate *f*, top plate, *g*, interposed paper body *h*, and bolts or screws *i*, as clearly shown in Figs. 2 and 6. This wheel N, which is conical, fits within the conical shell *c* of idler K, and is adapted to be brought into contact therewith by means of a collar, O, which encircles the shaft or spindle L, substantially in the manner illustrated in my former patent. The collar O upon being turned or rotated in one direction rides upon inclines on the collar P, and thereby raises the shaft or spindle L with its wheel N, so that the latter will come in contact with the conical shell *c* of the wheel K, the spring M being compressed to allow the vertical movement of the spindle relatively to frame A. The moment the collar O is turned in the opposite direction the spring M forces the spindle L downward and the wheel N out of engagement with the wheel K. As the wear or pressure upon idler K is on the upper face of its hub, by turning the nut J this wear may be taken up; and in order to hold the nut in its adjusted positions it is provided on its upper face with a series of sockets, *j*, Figs. 2, 3, and 4, with which a spring-pressed pin, *k*, engages.

As shown in Figs. 1 and 3, the frame A, or more properly its arm B, is provided with a housing or socket on its outer face, which is adapted to receive the vertically-sliding pin *k*, which latter is held down upon the nut J by means of a coiled spring, *l*. The pin *k* is perforated at its upper end to receive a wire, by which it may be lifted out of the socket *j*, so as to permit the nut J to be turned.

The spindle L will be provided with a tool-holder of any suitable construction. The pressure of the spring M, urging the spindle L downward, tends to keep the friction-wheels K and N out of contact with each other, and thus to cause the tool stock or spindle to remain at rest except when pressure is applied to the head or knob *m* sufficient to overcome the force of the spring and to bring the surfaces *h* and *c* of the wheels into contact with each other. The tool-stock or spindle will therefore remain at rest except when manipulated by the operator, unless the gears K and N be held in contact with each other by means of the collars O P, as in my former patent.

In inserting screws, boring wood, and such other light work the pressure or force exerted by the operator on the handle or by turning the collar O is sufficient; but in drilling iron it is not possible to thus secure the desired pressure or force. In order to accomplish this result I adopt the construction shown in Fig. 5, in which it will be seen that the upright hollow arm C is provided at its upper end with a nut, Q, through which passes a screw-stem, R, having near its upper end a hand-wheel, S. Now, by having a rigid support for the upper end of the screw-stem and turning the hand-wheel and its screw the frame A, with its drill or other tool, will be forced against the material being operated upon with the desired pressure. The gearing F K will advisably be covered by a guard, but, being a common expedient, is not shown.

The angle or inclination of the friction-surfaces *c* and *h* may be varied as desired; but I believe that the form shown in the drawings will give the best results.

Instead of making the gear-wheel F and the band-wheel H separate and fastening them together by means of a set-screw or otherwise, they may be made of a single casting; or, if desired, the band-wheel H may be omitted altogether, the invention relating particularly to the gearing F K N regardless of the means employed for imparting motion thereto.

It will be noticed that at its upper end the wheel K is recessed, this construction forming a convenient oil-receptacle.

Having thus described my invention, what I claim is—

1. In a machine for boring, drilling, &c., the combination of the frame A, provided with a band-wheel, H, and a gear-wheel, F, adapted to rotate in unison, a tool-stock or spindle mounted in the frame and provided with a friction-wheel, N, and an idler encircling the spindle and adapted to engage with the wheels F and N.

2. In a machine for boring, drilling, &c., the combination, with a frame, of a band-wheel and a gear-wheel carried thereby and adapted to rotate in unison, a spindle or tool-stock mounted in the frame and provided with a wheel, and an intermediate wheel or idler journaled upon the spindle, substantially as shown, and adapted to impart motion from the gear-wheel to the wheel upon the tool-stock.

3. In combination with a frame, a band-wheel and a gear-wheel mounted thereon and adapted to rotate in unison, a tool-stock or spindle journaled in the frame, a gear or wheel carried by said tool-stock, and an idler loosely encircling the stock.

4. In combination with a frame, a band-wheel, H, and a gear-wheel, F, both mounted therein and adapted to rotate in unison, a tool-stock or spindle, a double-faced gear or wheel mounted loosely upon the spindle and adapted to remain in engagement with the gear-wheel F, a gear or wheel rigidly secured to the spindle, and a spring adapted to hold the spindle-wheel normally out of contact with the wheel F.

5. In combination with a frame, a band-wheel, H, and a gear, F, both mounted therein, a tool-stock or spindle, L, journaled in the frame and provided with a friction-wheel, N, a combined gear and friction wheel, K, loosely encircling the spindle, and a spring, M, serving to keep the wheels K N normally separated.

6. In combination with a frame, a band-wheel, H, and a gear, F, both mounted thereon, a tool-stock or spindle, L, journaled in the frame and provided with a friction-wheel, N, a combined gear and friction wheel, K, encircling the spindle, a spring, M, tending to keep the wheels K and N separated, and the collars O P, adapted and arranged to hold these wheels in engagement.

7. In combination with a frame, A, band-wheel H, and gear-wheel F, carried thereby, a tool-stock or spindle mounted in the frame and adapted to rotate and also to move longitudinally therein, a wheel secured rigidly to said spindle, and an idler loosely encircling the spindle and adapted to engage the wheel thereon as said spindle is moved relatively to the frame.

8. In combination with a frame, a band-wheel, H, and gear-wheel F, carried thereby, a tool-stock or spindle mounted in said frame, a wheel secured rigidly to the spindle, an idler encircling the spindle and adapted to engage the wheel thereon as the said spindle is moved longitudinally, a spring tending to keep the wheels upon the spindle separated, and a cam adapted and arranged, substantially as shown, to overcome the force of the spring and to hold the wheels in engagement.

9. In a machine constructed substantially as shown and described, the combination, with the frame, of a spindle, L, mounted therein

and provided with a wheel, a sleeve, I, encircling the spindle and provided at its lower end with a collar, *a*, a nut, J, screwing upon the spindle, and a wheel mounted upon the sleeve and clamped between the nut and the collar.

10. In combination with frame A, provided with arms B and D, a spindle, L, mounted in said frame, a sleeve, I, encircling the spindle and provided with a collar, *a*, a wheel mounted upon the sleeve, a nut screwing upon the sleeve and provided with a series of sockets, *j*, a pin, *k*, mounted in frame A and adapted to engage the sockets, and a spring, *l*, bearing upon said pin, all substantially as shown.

11. In combination with frame A, a spindle, L, mounted therein, an idler encircling said spindle, and a wheel, N, secured rigidly upon the spindle and comprising hub *e*, plates *f g*, paper body *h*, and bolts *i*.

12. In combination with frame A, provided with a gear-wheel, F, a spindle mounted in the frame and provided with a conical friction-wheel, N, and a wheel, K, encircling the spindle and provided on its upper face with teeth *b* and with a conical shell, *c*, as and for the purpose set forth.

13. In combination with a frame, a spindle mounted and adapted to slide longitudinally therein, a conical friction-wheel, N, secured to said spindle and provided with a countersunk hub, and a conical friction-wheel, K, loosely encircling the spindle and provided with a hub to fit within the hub of the wheel N.

14. In a machine of the class described, the combination, with the frame A, having the upright arm C and tool-operating mechanism, of a fixed nut secured to the arm C, and a threaded stem passing through said nut and provided with a hand-wheel.

15. In combination with a shaft, I, threaded externally and provided at its lower end with a collar or flange, *a*, a wheel, K, mounted loosely upon the spindle and recessed at its upper end, and a nut encircling the spindle and serving to hold the wheel in place thereon.

In witness whereof I hereunto set my hand in the presence of two witnesses.

MICAJAH C. HENLEY.

Witnesses:
C. V. PATTERSON,
WILLIAM E. BELL.