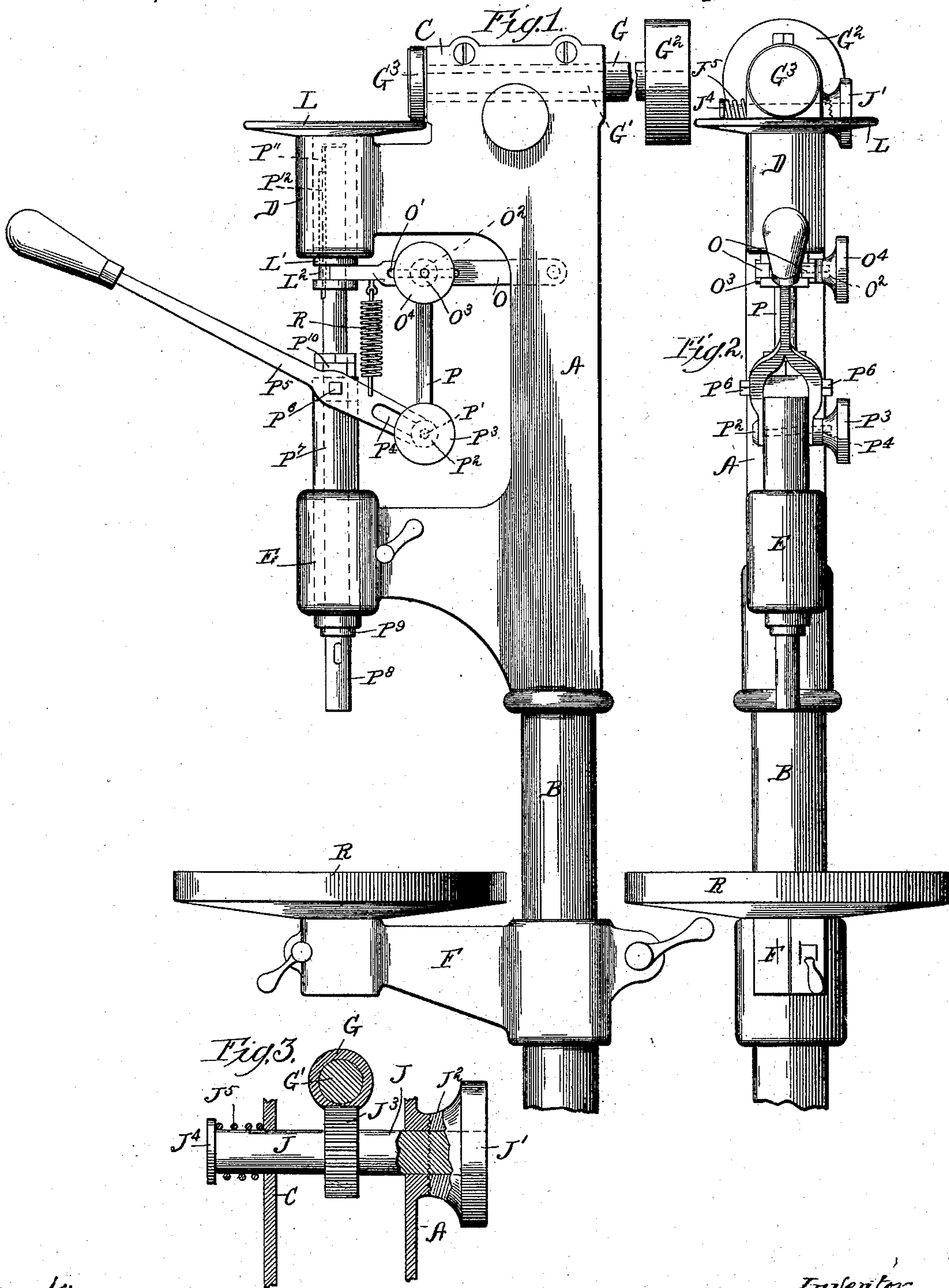


(No Model.)

G. M. FRENCH, Jr.  
METAL DRILLING MACHINE.

No. 505,516.

Patented Sept. 26, 1893.



Witnesses;  
 Wm. M. Rhems;  
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Inventor:  
George M. French Jr.  
By: Francis W. Parker,  
Att'y.



# UNITED STATES PATENT OFFICE.

GEORGE M. FRENCH, JR., OF CHICAGO, ILLINOIS.

## METAL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 505,516, dated September 26, 1893.

Application filed October 22, 1892. Serial No. 449,887. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. FRENCH, JR., a citizen of the United States, residing at Chicago, Illinois, have invented a new and useful Improvement in Metal-Drilling Machines, of which the following is a specification.

My invention relates to drills and has for its object to provide a sensitive drill, or one in which the operator will have a delicate control of the machine. It is illustrated in the accompanying drawings, wherein:

Figure 1, is a side view of the drill. Fig. 2, is a front view. Fig. 3, is a detail partly in section.

Like parts are indicated by the same letter in all the figures.

A is the body of the drill, preferably hollow, suitably supported on the standard B and having the upward projection C, the forward projections D, E, and the lower vertical adjustable arm F. The upward projection C is provided with an aperture in which slides the longitudinal adjustable sleeve G. Within this sleeve is the shaft G', having at one end the driving pulley G<sup>2</sup>, at the other the friction wheel G<sup>3</sup>. Transversely through the bottom portion of the part C is the shaft J, having at one end the thumb piece J', with an inwardly roughened or corrugated surface J<sup>2</sup>, opposed to a like surface J<sup>3</sup>, projecting laterally from the portion C of the frame A. On the other end of the shaft J is the plate J<sup>4</sup> and between this plate and the walls of the part C is the spiral spring J<sup>5</sup>. On the shaft is the pinion J<sup>6</sup> engaging a rack on the lower part of the sleeve G.

L is a plate on the upper end of the sleeve L', which has an annular groove L<sup>2</sup> at its lower end. This sleeve is placed in a vertical aperture in the portion D in which it is free to rotate. The plate L covers or completes the top of the sleeve and rests on the top of the part D.

O is an arm pivoted within the frame A and provided with the slot O', through which projects the pin O<sup>2</sup> having at one end the plate O<sup>3</sup> and at the other the thumb nut O<sup>4</sup>. The thumb nut is on one side and the plate on the other side of the arm O. The outer extremity of the arm O is bifurcated, as indicated and its outer points lie in the annulus.

P is a link pivotally connected to the pin

O<sup>2</sup> and pivotally connected at its lower end to the pin P', which is provided with a plate P<sup>2</sup> and thumb nut P<sup>3</sup>. The pin passes through the slot P<sup>4</sup> in the hand lever P<sup>5</sup>, which is pivoted at P<sup>6</sup> to the sleeve P<sup>7</sup>. The handle and the arm O are connected by the spring R. The sleeve P<sup>7</sup> is free to move in the part E and to it a handle P<sup>5</sup>, which is bifurcated so as to straddle the same is pivotally connected by the short screws P<sup>6</sup> P<sup>6</sup>.

P<sup>8</sup> is the drill rod having a collar P<sup>9</sup> near its lower end to abut against the sleeve, and a removable but normally fixed collar P<sup>10</sup> at its upper end. The drill rod is slotted at P<sup>11</sup> to receive the feather P<sup>12</sup> on the inside of the sleeve L' so that the drill rod is free to rotate in the sleeve P<sup>7</sup> and with the sleeve L'.

R is the drill bed suitably secured on the laterally projecting arm or portion F.

The use and operation of my invention are as follows: Assuming that the parts are in substantially the position indicated in the figures and that a drill has been inserted in or connected with the drill rod, the work will be placed upon the table R. By operating the handle P<sup>5</sup>, pushing the handle downwardly, the sleeve P<sup>7</sup> in which the drill rod is free to rotate will be carried downwardly toward the work, thus carrying with it the drill rod and the drill until they are applied to the work. But as pressure is applied to the handle P<sup>5</sup>, the same being a lever, its inner end will rise, thus pushing upwardly upon the link P and raising the outer end of the arm O. This will move the sleeve L' upwardly so as to bring the plate L operatively against the friction wheel G<sup>3</sup>. It is assumed, of course that this friction wheel is in motion, being driven from the pulley G<sup>2</sup> and it will communicate its motion to the plate L, thence to the sleeve L', thence to the rod and drill. The operation of the handle thus simultaneously applies the drill to the work and connects the driving mechanism and that too with an equality of action, for the harder the drill is pressed against the work, the more powerfully is the plate L placed against the friction wheel and thus the greater power obtained. The device is sensitive to the touch, and the hand of the operator will give him instant and constant notice of the variations in the work. The spring R will automatically restore all the



parts to normal position out of engagement for operation. There is, of course, very little vertical motion of the sleeve L', and very little is required. The device can be adjusted by moving the pins O<sup>2</sup> and P' in their respective slots to any desired positions and when so adjusted they are easily locked in position. By drawing the thumb nut J' outwardly against the spring J<sup>5</sup> the two interlocking corrugated surfaces will be disengaged, and by turning the thumb nut the shaft J will be turned and the pinion J<sup>3</sup> will move the sleeve G longitudinally and thus bring the friction wheel G<sup>3</sup> to a different position on the plate L thus varying the point of application of power. When the drill rod is to be removed by unloosening the screws P<sup>6</sup> P<sup>6</sup> the rod will be free to drop out, and by then unloosening the collar P<sup>10</sup> the rod may be removed from the sleeve P<sup>7</sup>.

I do not of course desire to be limited to the specific devices and forms of construction here shown, and especially as some of these features could be utilized independent of the others.

I claim—

1. In a drill the combination of a drill rod with a driving plate, a shaft parallel with such plate and having a friction wheel at one end and a shaft driving pulley or the like at the other end, and means for adjusting such shaft along its length, said means consisting of a sleeve in which such shaft is journaled, and a rack and pinion associated with such sleeve, and a spring clutch piece associated with such pinion so that the pinion may be driven or locked into position thereby.

2. In a drill the combination of a friction driving device with a drill rod, a handle, a suitable connecting device whereby the drill and the friction devices are operatively moved simultaneously by the action of the handle.

3. The combination of a drill rod with a handle to depress the same, friction devices to drive the rod, connecting parts from such handle to such friction devices whereby the

latter are put into operation by the motion of the former.

4. In a drill the combination of a drill rod with a handle for depressing the same against the work, friction devices for driving the drill rod, a lever connected with such friction devices at one end and fixedly connected at the other, and a link from the handle to the lever whereby the motion of the handle operatively applies the friction devices.

5. In a drill the combination of a drill rod with a handle for depressing the same against the work, friction devices for driving the drill rod, a lever connected with such friction devices at one end and fixedly connected at the other, and a link from the handle to the lever whereby the motion of the handle operatively applies the friction devices and a spring connecting the handle and the lever so as to automatically restore the parts to their position of disengagement when the handle is free.

6. In a drill the combination of a drill rod with a handle for depressing the same against the work, friction devices for driving the drill rod, a lever connected with such friction devices at one end and fixedly connected at the other, and a link from the handle to the lever whereby the motion of the handle operatively applies the friction devices, said link longitudinally adjustable at each end respectively along the handle and the lever.

7. In a drill the combination of a drill rod with a handle for depressing the same against the work, friction devices for driving the drill rod, a lever connected with such friction devices at one end and fixedly connected at the other, and a link from the handle to the lever whereby the motion of the handle operatively applies the friction devices, said link longitudinally adjustable at each end respectively along the handle and the lever, and a spring connecting the handle and the lever.

GEORGE M. FRENCH, JR.

Witnesses:

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