2 Sheets--Sheet 1.

C. T. LITCHFIELD.

Machines for Cutting Off Pipe.

No. 156,581. Patented Nov. 3, 1874.

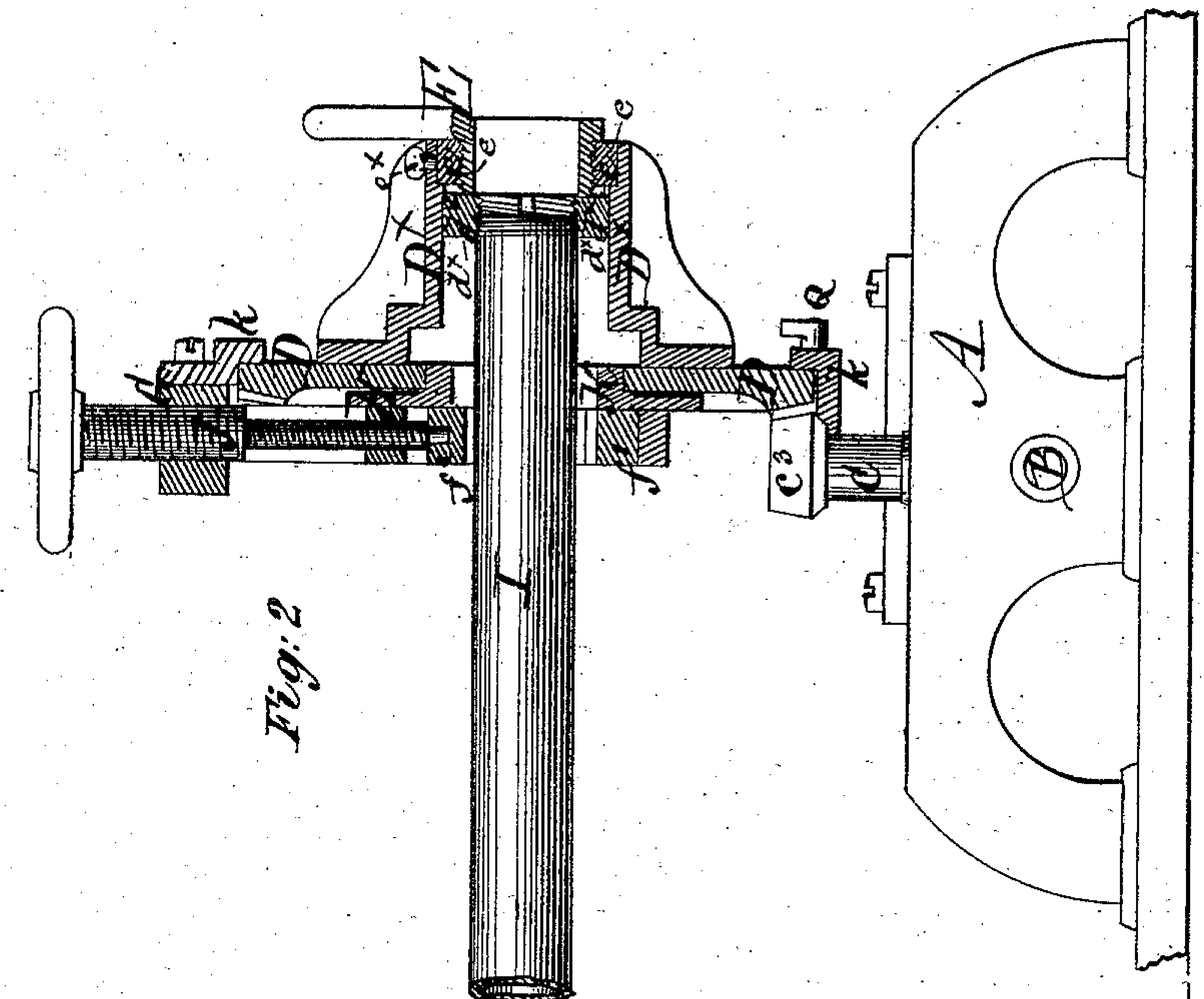

Fig: 2

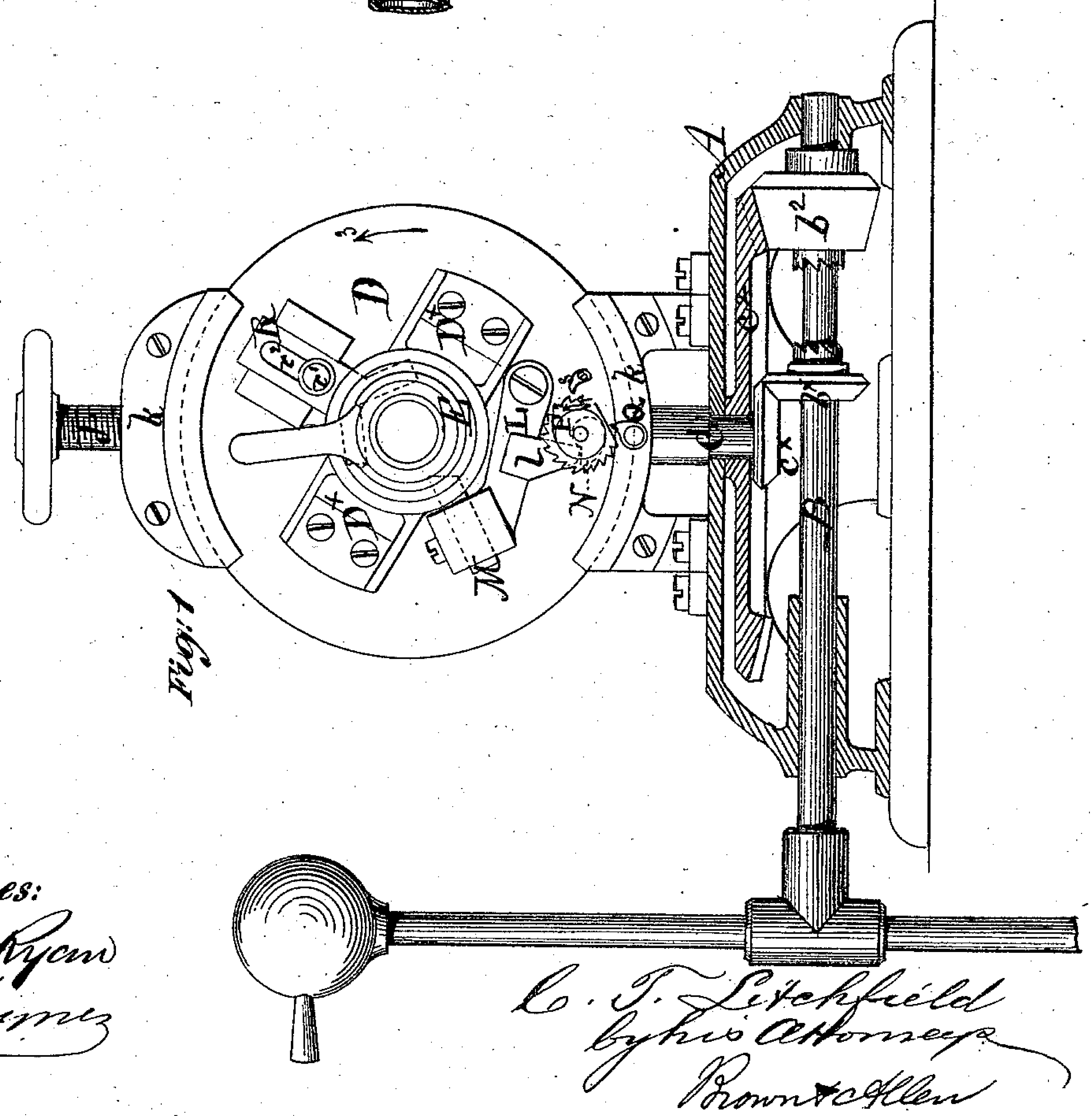

Fig: 1

Witnesses:
Michael Ryan
Jno. D. Haynes

C. T. Litchfield
by his Attorneys
Brown & Allen

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2 Sheets--Sheet 2.

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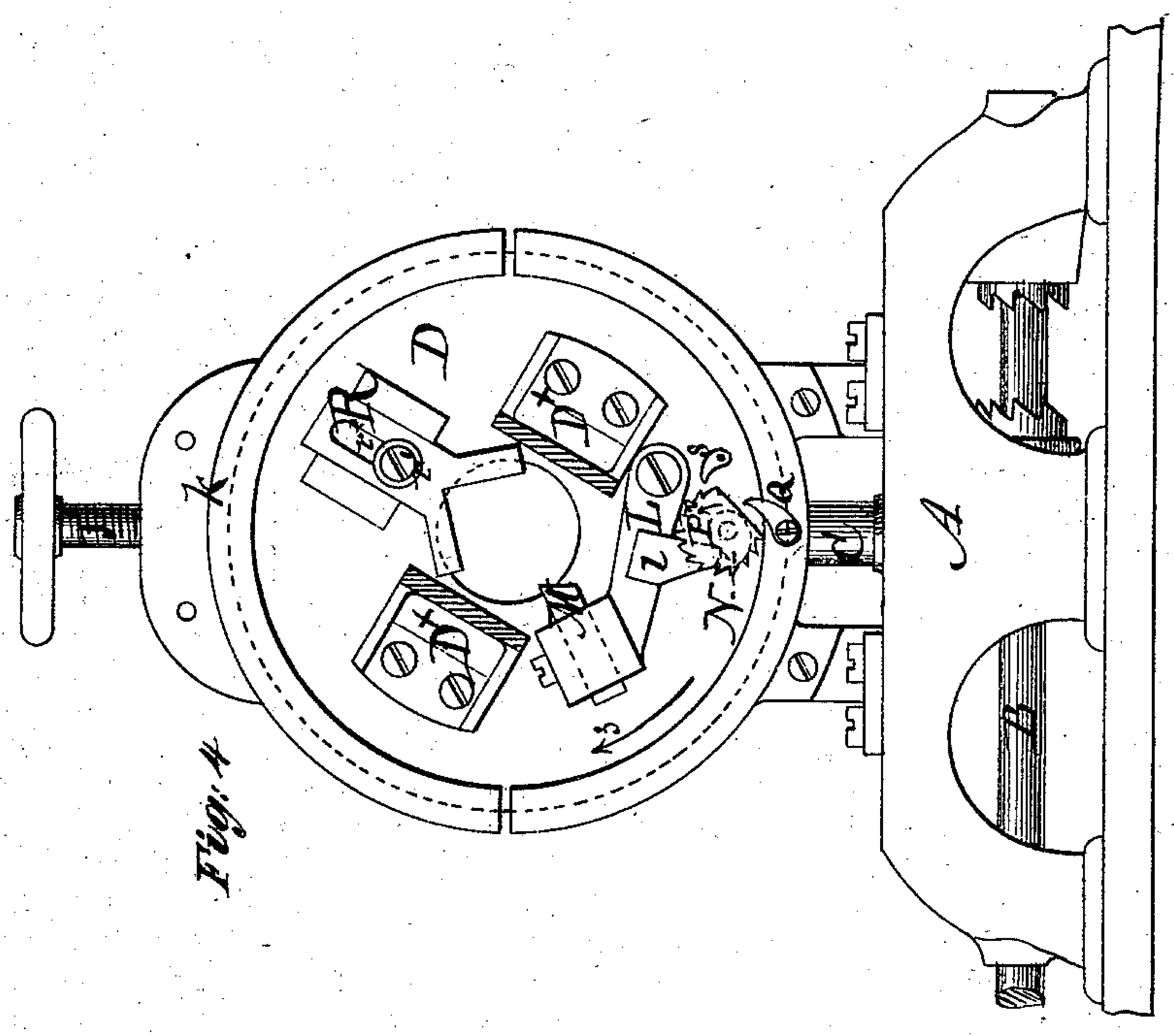

Fig: 4

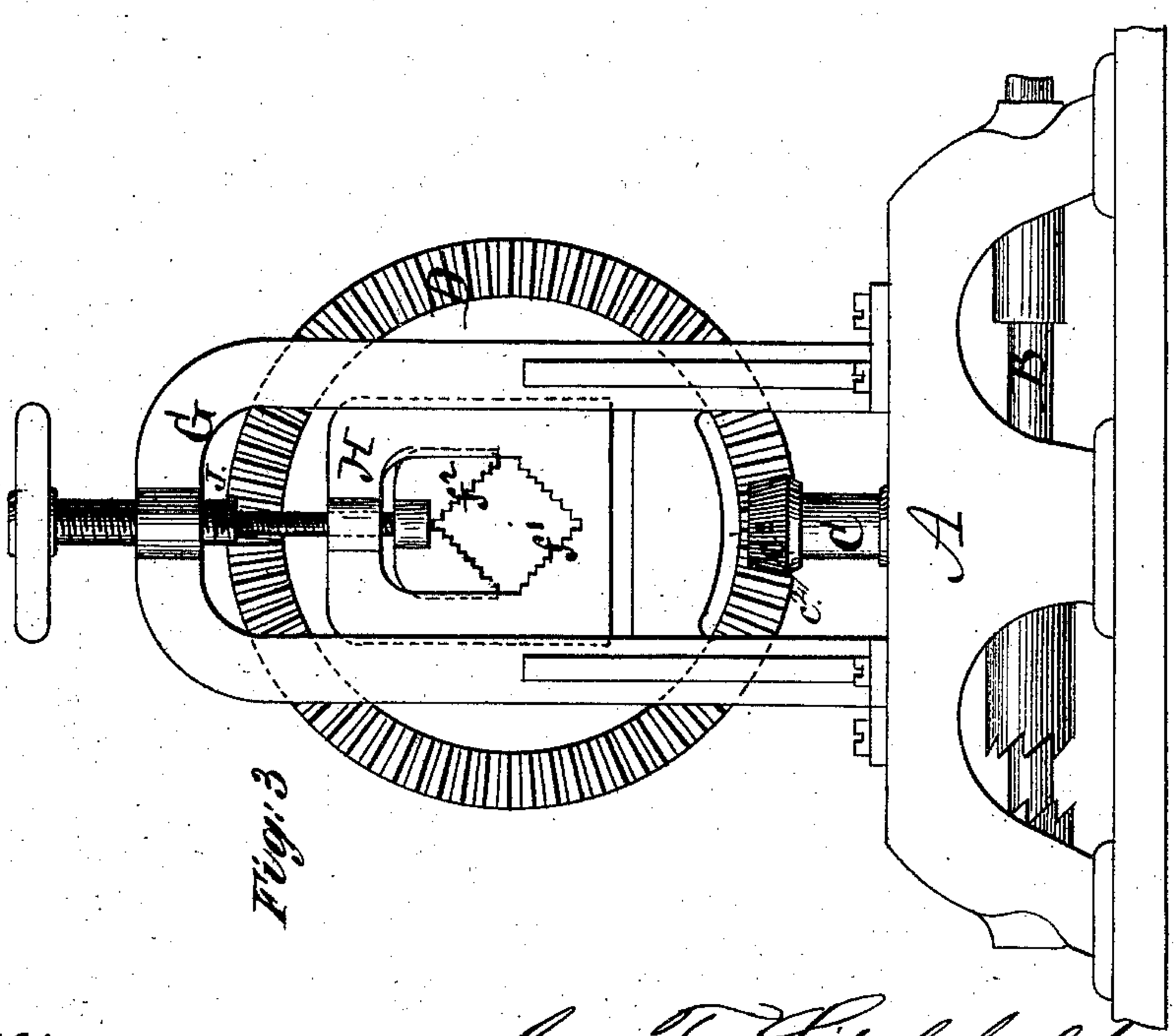

Fig: 3

Witnesses:
Michael Ryan
Fred Haynes

C. T. Litchfield
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

CHARLES T. LITCHFIELD, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MACHINES FOR CUTTING OFF PIPE.

Specification forming part of Letters Patent No. **156,581**, dated November 3, 1874; application filed July 6, 1874.

To all whom it may concern:

Be it known that I, CHARLES T. LITCHFIELD, of Brooklyn, in the county of Kings and State of New York, have invented an Improved Machine for Cutting and Threading Pipes and Rods, of which the following is a specification:

My invention consists in, first, the combination of a longitudinally-adjustable shaft and pinions, a vertical shaft and pinions, and a wheel carrying the working parts, whereby the speed of the machine may be changed by shifting the horizonal shaft; second, the combination of a rotary die-carrying wheel, a stationary standard sustaining the bearing for said wheel, a differential screw, a yoke, and a pair of centering-jaws for centering the work in the machine; third, the combination of a cutting-tool, a pivoted tool-holder, a cam, a ratchet, and a pawl, for cutting pipes and rods.

In the accompanying drawing, Figure 1 is a side view, partly in section, of my improved cutting and threading machine. Fig. 2 is a sectional view at right angles to Fig. 1. Fig. 3 is a view of the side opposite to that shown in Fig. 1. Fig. 4 is a view, partly in section, at right angles to Fig. 2.

A is the base or platform of the machine, in which is arranged a horizontal shaft, B, which carries a bevel-pinion, $b^\times$, fast on the shaft, and another pinion, b^2, loose on the shaft. The rear side of the pinion $b^\times$ and the front side of the pinion b^2 are provided with teeth or notches, forming a clutch. The pinion $b^\times$ is for engagement with a pinion, $c^\times$, on the lower end of a vertical shaft, C, and the pinion b^2 for engagement with a wheel, c^2, on said shaft C. The power is applied to the shaft B. When the machine is at work the pinion b^2 is usually engaged with the wheel c^2, but when it is desired to increase the speed, as may be the case when the machine is to be reversed, the shaft B is shifted longitudinally, so as to cause the pinion $b^\times$ to engage with the pinion $c^\times$ to drive the shaft C, thus disengaging the clutch and allowing the pinion b^2 to revolve independently of the shaft B. On the upper end of the shaft C is a bevel-pinion, c^3, (see Figs. 2 and 3,) which imparts motion to a bevel-wheel, D. This wheel revolves around a fixed annular bearing, K, and is prevented from lateral displacement by means of plates k k, attached to a standard, G, which extends upward from the base or platform A. In some cases the fixed annular bearing K may be dispensed with, and the plates k k may extend entirely around, as shown in Fig. 4, so as not only to prevent lateral displacement, but also to serve as a bearing for the wheel D. When the fixed annular bearing is used, it is formed on or attached to the standard G and is of sufficient diameter to admit pipes and rods of different sizes. On the rear side of the bevel-wheel D is bolted a box, $D^\times$, for carrying the screw-threading dies $d^\times$, which may be removed for the purpose of replacing them with others of different sizes. These dies are fed up to their work by means of a feeding device, E, working in a bushing, e, which may be held in place in the box $D^\times$ by a set-screw, $e^\times$. When the machine is used for cutting, and not threading, the dies and feeding device are removed from the box $D^\times$. In the standard G, on the side opposite the box $D^\times$, slides a yoke, H, provided with two centering-jaws, f^1 f^2. The lower jaw, f^1, is formed on the yoke H, and the upper jaw, f^2, slides in the yoke. (See Fig. 3.) A differential screw, J, engages with a thread in the upper part of the standard G and another thread in the upper part of the yoke H, the lower end of the screw working loosely in the sliding jaw f^2. As the differential screw J is turned, the jaw f^1 is raised and the jaw f^2 is depressed, and the two jaws are simultaneously drawn toward each other and toward the center of revolution of the wheel D, by which means the rod or pipe I may be properly centered. The cutting-tool M is attached to one end of the tool-holder L, the other end of which is pivoted to the wheel D, and is provided with a tail-piece l, for engagement with a snail-cam, N, which is made fast to a ratchet-wheel, P, attached to the wheel D. A pawl, Q, is attached to the lower one of the plates k, so as to engage with the ratchet P at each revolution of the wheel D and partially revolve the ratchet in the direction of the arrow 2, a pawl, s, preventing it from turning backward. The wheel D revolves in the direction of the arrow 3, and when it reaches the position shown in Figs. 1 and 3, the ratchet strikes the pawl Q and is moved in the direction of the arrow a distance equal to the length of one of its teeth, moving the cam N a corresponding distance and causing it to press upon the end of the tail-piece *l* and feed the tool M to its work. Thus the tool is fed up at each revolution and caused to cut with a precision and regularity which would be unattainable if fed up gradually and continuously. The pawl Q may be arranged so that it may be moved out of engagement with the ratchet, or the ratchet may have a piece cut from its edge, so that it may pass clear of the pawl Q when the cutting-tool is not in use. On the wheel D, at a point opposite the edge of the cutting-tool, is an adjustable sliding-rest for holding the work while being cut. This rest consists of a bar, R, one end of which is divided and spread out so as form a bearing for the pipe or rod to be cut. The remaining portion of the bar works between two blocks or plates and is held in place by a screw, r^1, passing through a slot, r^2, by which means the bar may be adjusted to correspond with pipes or rods of different sizes and form a bearing therefor while being operated upon by the cutting-tool.

This machine may be used for cutting internal threads by using the proper threading-dies.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the longitudinally-adjustable shaft B and pinions $b^\times$ b^2, the shaft C, and pinions $c^\times$ c^3, and the wheel D, as shown and described, for the purpose specified.

2. The combination of the rotary die-carrying wheel D, the stationary standard G, sustaining the bearing for the said wheel D, the differential screw J, yoke H, and centering-jaws f^1 f^2, as shown and described, for the purpose specified.

3. The combination of the cutting-tool M, pivoted tool-holder L, cam N, ratchet P, and pawl Q, as shown and described, for the purpose specified.

4. The combination of the standard G, plates *k k*, and wheel D, substantially as and for the purpose shown and described.

CHAS. T. LITCHFIELD.

Witnesses:
MICHAEL RYAN,
FRED. HAYNES.