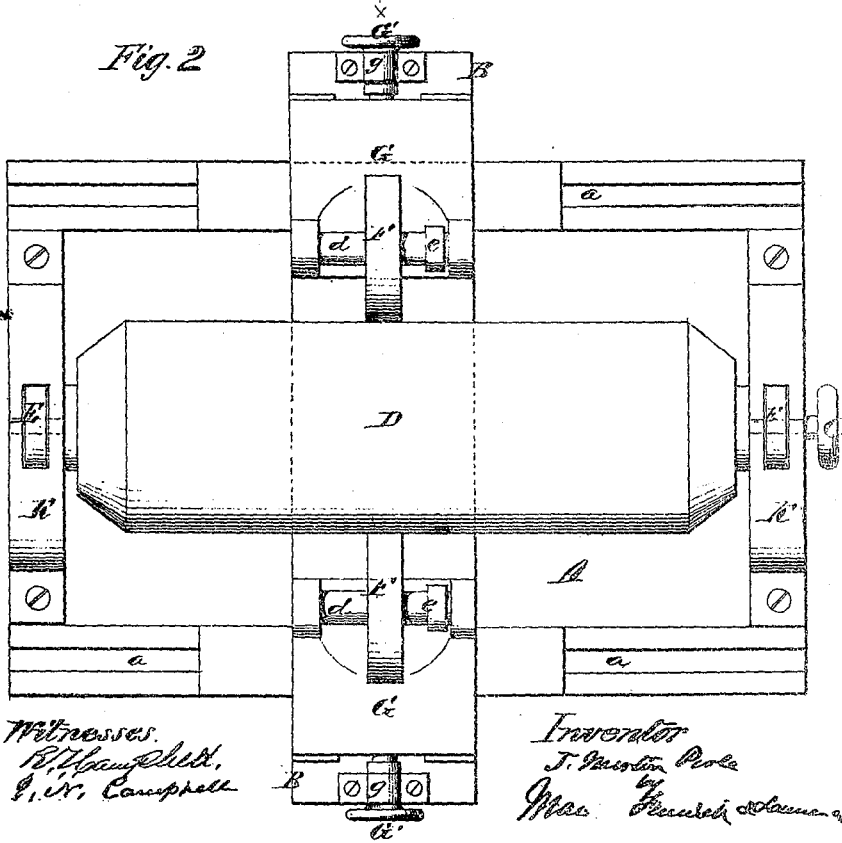
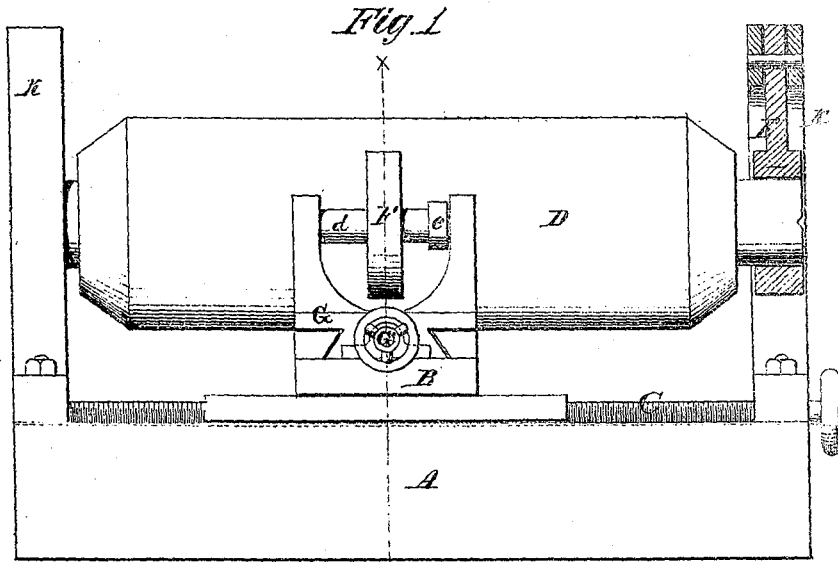


*J. M. Foote,  
Grinding Mach.*

*No. 99,000.*

*Patented Jan. 18, 1870*



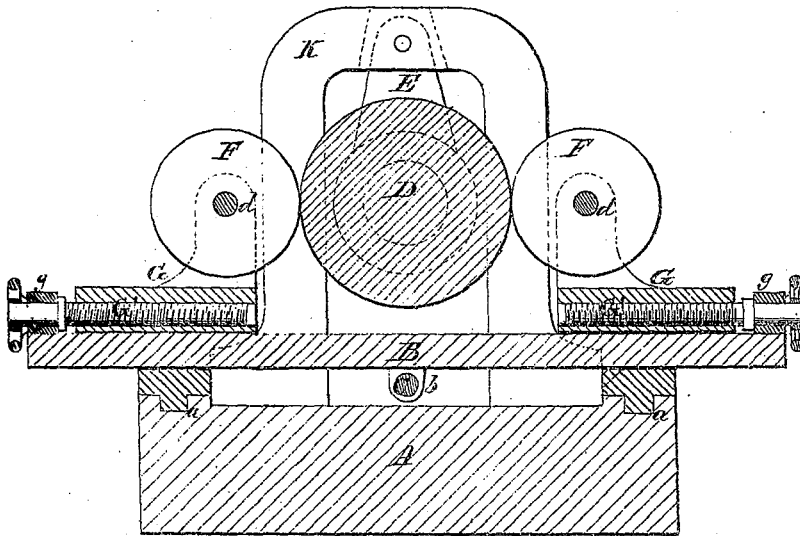
*J. M. Poole,  
Grinding Mach.*

*2 Sheets Sheet 2*

*No. 99000.*

*Patented Jan. 18. 1870.*

*Fig. 3*



*Witnesses,  
R. H. Campbell  
J. W. Campbell*

*Inventor  
J. Newton Poole  
by  
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# UNITED STATES PATENT OFFICE.

J. MORTON POOLE, OF WILMINGTON, DELAWARE, ASSIGNOR TO HIMSELF,  
WILLIAM T. PORTER AND THOMAS S. POOLE, OF SAME PLACE.

## MACHINE FOR GRINDING OBJECTS CYLINDRICALLY.

Specification forming part of Letters Patent No. 99,000, dated January 18, 1870.

*To all whom it may concern:*

Be it known that I, J. MORTON POOLE, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and Improved Machine for Grinding Objects Cylindrical; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, Plate 1, is an elevation of one side of those parts of the improved machine which are necessary to illustrate my invention. Fig. 2, Plate 1, is a plan view of Fig. 1. Fig. 3, Plate 2, is a section taken transversely through the machine, in the vertical plane indicated by dotted line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a new and useful improvement which is designed to overcome certain difficulties hitherto experienced in machines for turning or grinding objects cylindrically true. The greatest difficulty in this operation has arisen from the fact that it is impracticable to make a machine which will always admit of work being adjusted in it so as to be perfectly true with respect to other parts of such machine, for, if the several parts composing the machine could be made to work perfectly true at first, it is obvious that they would soon lose their truism in consequence of the natural wear of one part moving upon another.

To overcome this difficulty, the nature of my invention consists in applying one or more grinding-wheels, which are arranged upon a saddle or support, upon opposite sides of the axis of the object to be rendered cylindrical, the supports or bearings of such objects being constructed in such manner that the object is, when properly adjusted, free to move transversely to its axis, while the saddle carrying the grinding wheel or wheels is moved by suitable mechanism from one end of the said object to the other, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

The horizontal bed A of the machine may

be constructed of any required length and width, and should be substantially supported upon a frame or stand somewhat after the manner of constructing the frame and bed of a turning-lathe.

Upon this horizontal bed A, a slide-rest or saddle, B, is supported, and guided by the tenons on said rest fitting into grooves *a a*, formed in side elevations of the bed, as shown in Fig. 3.

This rest B lies transversely across the bed, and may be moved in a direction with the length thereof by means of a screw, C, turned by hand, or otherwise, which screw is tapped through an eye, *b*, upon the bottom of the rest, and supported at its ends by suitable bearings upon the bed A.

At or near the extremities of the bed A are bearings E E, which are designed for supporting the ends of the object D, which it is required to grind cylindrical. These bearings should be so constructed that the work can be readily introduced into the machine, and removed therefrom.

The bearings should be so constructed that the object D, instead of being rigidly held, shall be free to move transversely when impelled by a very slight force.

F F represent grinding-wheels, which are placed on opposite sides of the axis of the object D, and upon horizontal shafts *d d*, which have their bearings in the standards of laterally-adjustable tool-rests G G, and which carry wheels or drums *e e*, around which belts pass, for communicating rotary motion to the grinding-wheels. Instead of employing two opposite grinding-wheels, one grinding-wheel, with a suitable stop opposite to it, may be substituted.

I propose to use, at the same time, more than one pair of grinding-wheels, operating with respect to the cylinder to be ground, in the same manner as the single pair operates, but one pair operating upon one portion of the cylinder, while another pair is operating upon another portion. The pairs of wheels will be actuated in harmony with one another. In a word, the device of the grinding-wheels may be duplicated in the one machine, if desired, as many times as utility will demand. The same plan of duplicating may be adopted

in cases where only one grinding-wheel and an opposite stop are used. These modifications, I regard as but the equivalents of the plan of construction represented in the drawings.

The screws G' G', with their hand-wheels, are designed for adjusting and fixing the grinding-wheels at any desired distance apart, according to the required diameter of the object to be operated upon. These screws are supported by means of bearings g g, which are fast upon the upper surface of a horizontal transverse saddle, B.

If the bed A were made perfectly straight, the axis of the object to be ground, rigidly fixed in unyielding bearings, and parallel to the line of movement of the rest, the machine set in motion, and the grinding-wheels caused to traverse over the object D, it is evident that a perfectly cylindrical object could be attained. But in practice it is found impossible to make a bed perfectly straight, and even if this could be done, the varying travel of the rest, with objects of different length, would soon wear the parts out of their truism.

By my invention it will be seen, that while the rest or saddle B, moving in the tenon-grooves a, in the bed, is forced to follow the irregularities of this bed, the swinging bearings E E, suspended from the standards K K, are free to move transversely, without altering the distance apart at which the grinding-wheels may be set. This transverse motion is, of course, communicated to the object D, and is the direct converse of the lateral motion produced in the rest by the irregularities of the bed.

The effect of transverse motion of the rest or saddle B would be to force one grinder against the work and the other away from it; but the object D being supported in any suitable manner, so that it is free to move transversely, instantly yields, and moves either to the right or left, as the case may be, and restores the equality of pressure of the grinders against the work.

It will be understood that my invention is especially designed for grinding objects to a uniform diameter, after the objects have, seemingly to the eye, and even by the application of calipers, been turned true in a lathe, in the ordinary manner.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A machine, constructed substantially as described, for grinding objects cylindrical, whereby the object to be ground shall be so supported in its bearing, that while it is free to move transversely to its axis, it shall be acted upon, in the operation of grinding, by one or two grinding-wheels, placed, one on each side of said object, and being capable of adjustment or fixation on their support, and the said object being dependent for its transverse movement on its contact with the surfaces of said wheels, at opposite parts thereof, as set forth.

J. MORTON POOLE.

Witnesses:

WILLIAM HAYES,  
ALFRED D. POOLE.