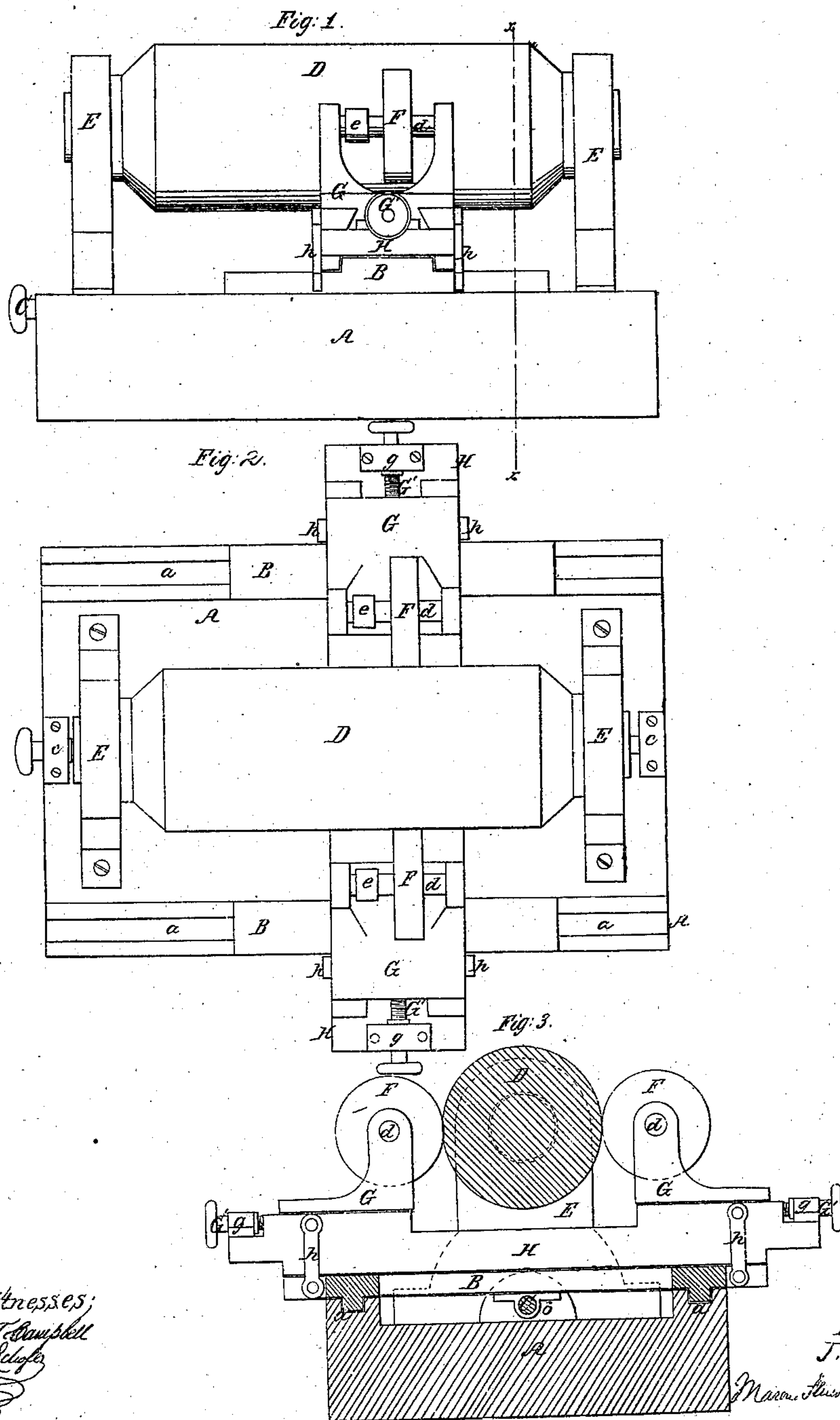


No. 79,683.

PATENTED JULY 7, 1868.

J. M. POOLE.
MACHINE FOR TURNING CYLINDERS.



Witnesses:
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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.

IMPROVED MACHINE FOR TURNING CYLINDERS.

Specification forming part of Letters Patent No. 79,683, dated July 7, 1868.

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 Turning or 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 is an elevation of one side of those parts of the machine which are necessary to illustrate my invention. Fig. 2 is a plan view of Fig. 1, showing an object in the act of being rendered cylindrical. Fig. 3 is a transverse section through the machine, taken in a vertical plane, indicated by red line *xx* 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 machinery 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 the 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 two or more grinding or turning tools, or a suitable tool and a stop, which are arranged opposite each other, on each side of the axis of the object to be rendered cylindrical, upon a saddle or support, which is free to move transversely to the axis of said object, and still maintain a uniform or a given distance between said tools, or tool and stop, said saddle or support also being free to move longitudinally or in a direction with the axis of said object, as will be hereinafter explained.

To enable others skilled in the art to under-

stand 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, B, is supported and guided by the tenons on said rest fitting into grooves *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 back and forth in a direction with the length thereof by means of a leader-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 *c c* 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 turn or grind cylindrically. These bearings should be so constructed that the work can be readily introduced into the machine and removed therefrom. F F represent grinding-wheels, which are placed on opposite sides of the axis of the object D and upon horizontal shaft *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 grinding-wheels suitable turning-tools, arranged opposite each other, may be substituted, or, if desirable, a single turning-tool and a stop arranged opposite it may be employed instead of the grinders or the two turning-tools. The screws G' G' with their band-wheels are designed for adjusting and fixing the grinding or turning tools 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, H. The saddle H is hung from the upper ends of links or arms *h h h h*, so that it is free to swing transversely—that is to say, it will swing at right angles to the axis of the object D. The four arms *h* are piv-

oted at their lower ends on the sides and near the extremities of the rest B, and at their upper ends to the sides of the saddle H, sufficient space being left between this saddle and the rest to allow of the swinging movement above mentioned.

If the bed A were made perfectly straight, the tools or grinding-wheels rigidly fixed to an unyielding saddle, the axis of the object to be turned or ground perfectly parallel to the line of motion of the rest, and the machine set in motion, it is evident that a perfectly cylindrical object could be obtained. But in practice it is found impossible to make a bed perfectly straight, and, even if it were so, the varying travel of the rest with objects of different length would soon wear the parts out of true.

By my invention it will be seen that, while the main rest B is forced to follow any irregularities of the bed A, the saddle H, carrying the tool-rests, is free to move transversely and still preserve a uniform distance between the tools or grinders, this transverse motion being the direct converse of the lateral motion produced in the rest by the irregularities of the bed and want of parallelism of the object to be turned or ground. The effect of transverse motion of the rest B would be to force one tool or grinder against the work and the other away from it, but the saddle H, being suspended or supported in any suitable manner, so that it is free to move transversely, instantly yields and moves either to the right or the left, as the case may be, and restores the equality of the pressure of the tools or grinders against the work.

It will be understood that my invention is specially designed for turning cylinders to a uniform diameter after such cylinders have seemingly to the eye and even under the application of the calipers been turned true in a lathe which has but one stationary tool, or which has been turned thus seemingly true, in my machine herein described, by adjusting one of the pair of tools, and fixing it and its support so that it works singly and alone upon the article being turned.

I am aware that it is not new to construct

and arrange turning and grinding mechanism so that two tools shall simultaneously cut or grind opposite surfaces of a metallic object moving between them, such tools having no chance to move with one another transversely to the article being wrought during the act of grinding or turning. I also am aware that such grinding or cutting tools, whether on fixed or rotating axes, have been arranged so as to have imparted to them a translatory movement in a direction either parallel or inclined to the axis of the object which is being operated upon. I also am aware that the object which is being wrought has been arranged with relation to two such tools, so as to have a movement of translation in the direction named, to wit, longitudinally, and also to have or not have a motion of rotation or reciprocation. But I am not aware that two or more tools, or a pair consisting of a tool and a rest, have been arranged so as to be free to move together laterally or transversely to the object which is being turned or ground during the act of grinding and turning.

My invention does not consist simply in any one of the arrangements which I stated, that I am aware of, nor in any combination of them; but

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

An arrangement of one or more pairs of cutting or grinding tools, or one or more pairs composed respectively of a cutting or grinding tool and a rest, upon a frame which is free to move laterally or transversely to the object which is being turned or ground, the tools constituting a pair being capable of adjustment and fixation thereon in relation to one another, and dependent for their movements to and from the surface of the object placed between them to be turned or ground by their contact with the surface or surfaces of said object at opposite points thereof, substantially as herein described.

J. MORTON POOLE.

Witnesses:

JOSEPH HAYES,
WM. T. PORTER.