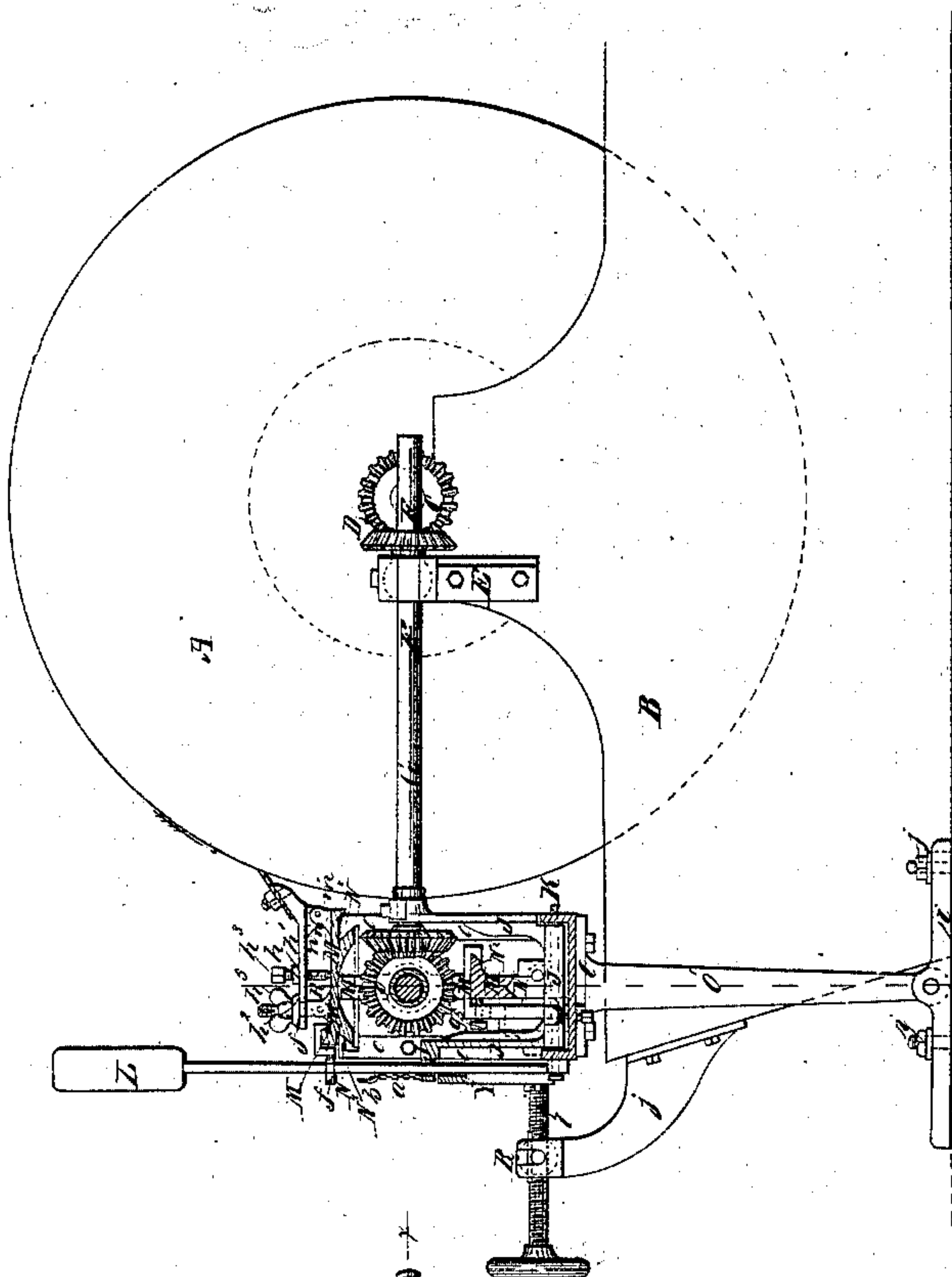


*M. A. & J. H. Diedrich,*  
*Grinding and Polishing Metals.*

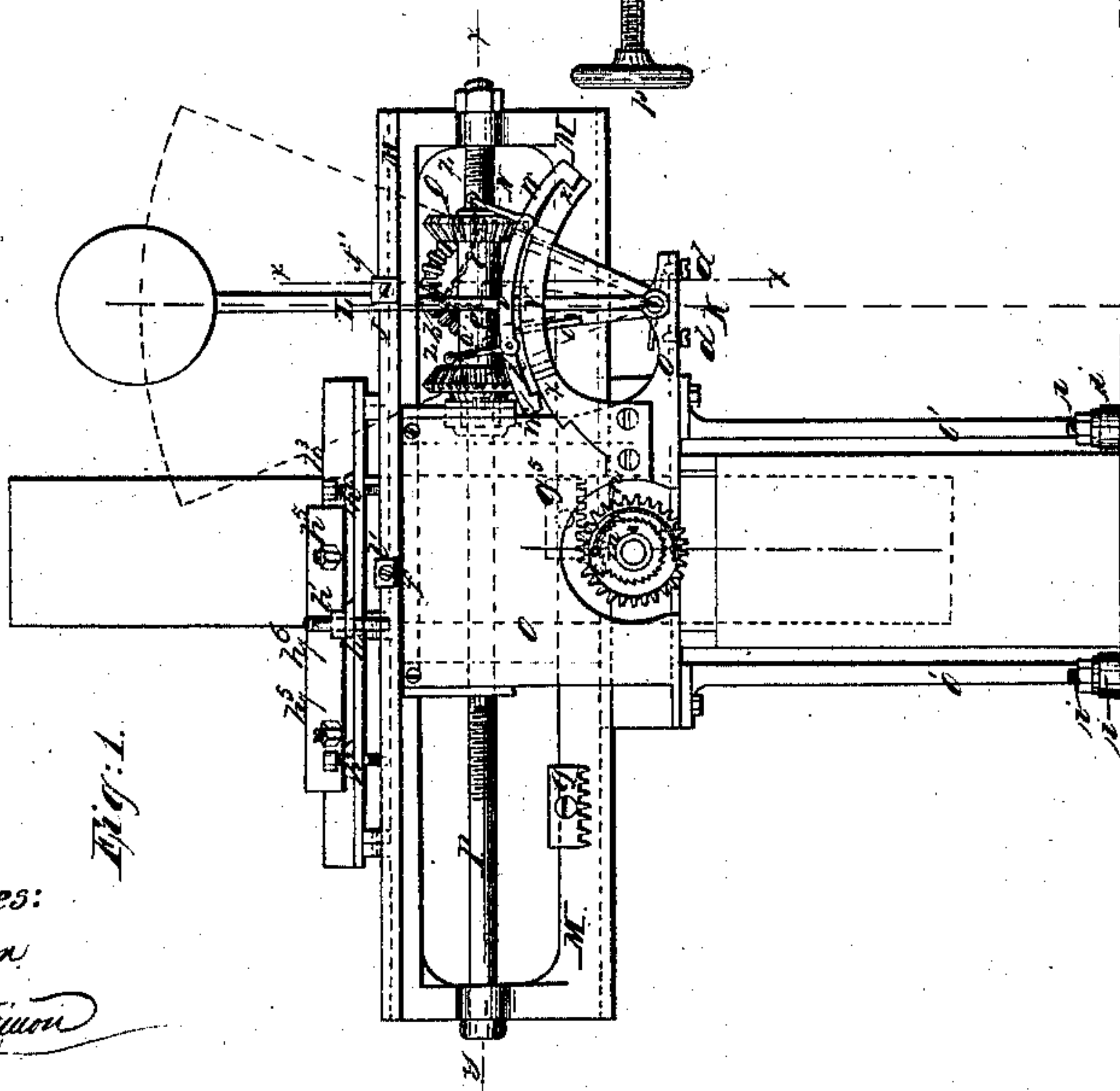
*N<sup>o</sup> 68854.*

*Patented Sept. 18, 1867.*

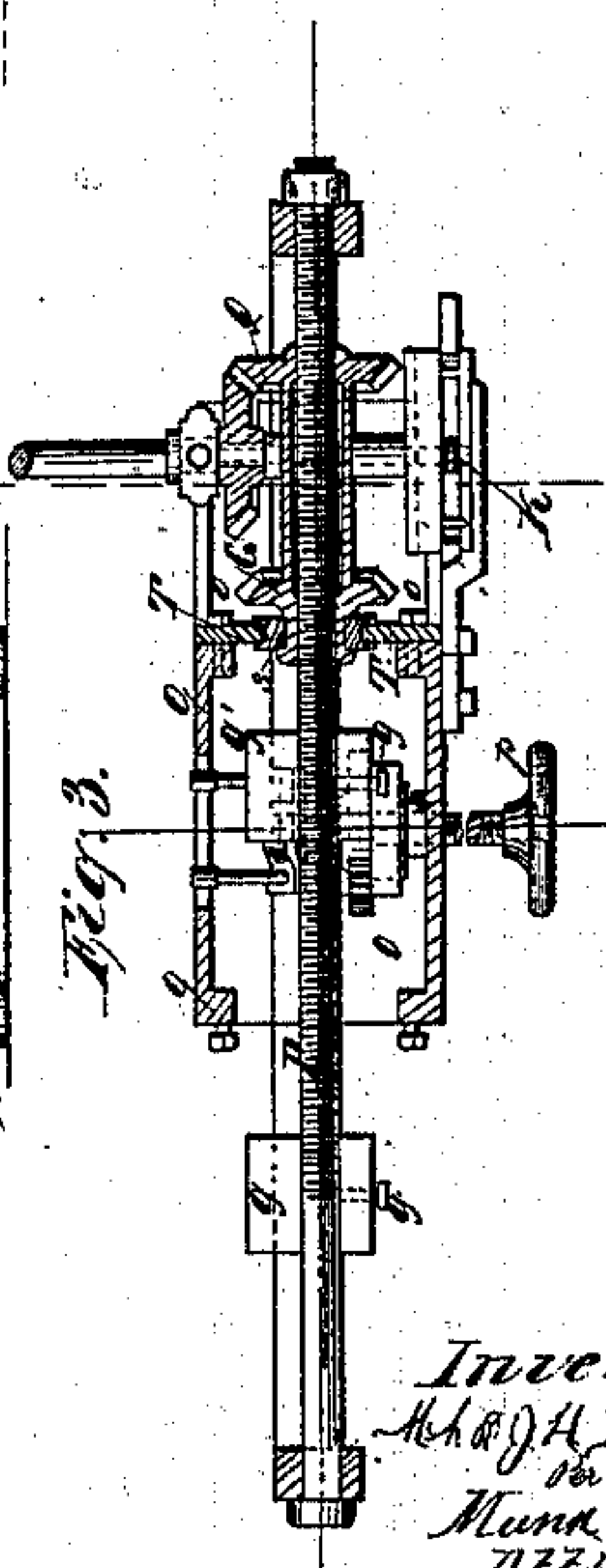
*Fig. 2.*



*Fig. 1.*



*Fig. 3.*



*Witnesses:*

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# UNITED STATES PATENT OFFICE.

MENNO ALBERTUS DIEDRICHS AND JOHANN HENRICUS DIEDRICHS, OF  
BALTIMORE, MARYLAND.

## IMPROVEMENT IN GRINDING AND POLISHING METALS.

Specification forming part of Letters Patent No. 68,854, dated September 17, 1867.

*To all whom it may concern:*

Be it known that we, MENNO ALBERTUS DIEDRICHS and JOHANN HENRICUS DIEDRICHS, of the city and county of Baltimore, and State of Maryland, have invented a new and useful Improvement in Grinding-Machines; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which are made part of the specification, and in which—

Figure 1 is a front elevation, with screw-rod and supporting-arm removed. Fig. 2 is a side elevation, showing section through line *x x*, Fig. 1. Fig. 3 is a section on line *y y*, Fig. 1.

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

This invention relates to an automatic arrangement for holding and feeding the article to be ground in relation to the stone, and in the means for adjusting the different parts to suit different sizes of tools. The tool to be ground is held in a suitable clamp on the upper surface of a reciprocating sliding frame which receives its motion, through a system of miter-wheels, from the shaft of the grindstone. The motion is reversed by the driving-wheel being thrown in and out of gear with the respective ones of a pair of beveled wheels on a stationary screw-shaft on the sliding frame by a weighted lever which is operated by projecting pins on the edge of the sliding frame. This frame slides in and is supported by another frame which is pivoted so as to be adjustable toward the stone, the adjustment being performed by a screw-shaft at right angles with that on the sliding frame pivoted to the frame, and having its bearing in a swiveled box hung in a stationary arm attached to the water-reservoir of the stone. This shaft is provided with a pinion and ratchet device, and also with a hand-wheel. When in operation the screw-shaft is operated by racks attached to the sliding frame in such a manner that, as soon as the tool is past the stone and the motion is being reversed, one of them will come in contact with the pinion and turn the screw, the ratchet serving to keep the screw from being turned backward when the frame is returning. The

tool is thus fed up, so that a new surface will be presented to the stone each time the frame reciprocates. When the operation is completed the tool is withdrawn from the stone by the hand-wheel.

In the drawings, A is the grindstone, which is hung in suitable bearings on the water-reservoir B, and driven by a pulley or crank, and is provided on the end of its shaft with the beveled gear-wheel C, which meshes into and drives the bevel-wheel D. This wheel is provided with a spheroidal shank, which is journaled in a box having a corresponding depression in the upright E, which is rigidly attached to the reservoir B. The wheel D is also provided in its interior surface with a fixed spline, which fits into the groove F in the shaft G, so that the shaft will be made to revolve with, and at the same be allowed to slide through, the wheel, the peculiar shape of the bearing of the wheel D preventing it from being displaced.

The shaft G is provided at its front end with the driving-wheel H, and is there journaled in the box I in the pivoted frame J, which has its bearing on the rod K. On the outer end of this rod is also pivoted a weighted lever, L, which serves to operate the pivoted frame J, as will be hereinafter more fully described.

M is a sliding frame, hung on the flanges N<sup>1</sup> N<sup>2</sup> (see Fig. 2) of the frame O, in which it reciprocates. One of these flanges, N<sup>1</sup>, is provided with an adjustable part, N<sup>3</sup>, which is operated by the set-screw N<sup>4</sup>, for the purpose of steadying the frame M in its movements.

P is a screw-shaft fastened in ends of the frame M in such a manner as to prevent its turning. Journaled on this shaft is the double miter-wheel Q Q, provided on its inner side with a female screw, the thread of which corresponds with that on the screw-shaft P, and on their inner end with a groove, R, in which the sleeve S fits. (See Fig. 3.) This sleeve is suitably fastened in a recess in the plate T, which is secured by screw-bolts U to the frame O, thus allowing the miters Q Q' to revolve freely, and at the same time preventing their being carried with the shaft P, which would inevitably occur were they not so attached.



The pivoted frame J is provided at its upper end with a slotted curved cross-piece, V, to which are pivoted the dogs W W', which engage respectively with the notches X X' in the plate Y, which has a corresponding depression to the slot in piece V for the lever L to work in.

The dogs W W' are provided with arms Z Z', which are attached to the lever L by chains a a' attached to the ends of arms Z Z' and on the hook b on the arm of the lever.

c, Fig. 1, is a spring-plate attached to the lower end of frame J, to lessen the concussion of the wheels when the lever drops, the spring-piece being forced down on the ends of screw-bolts d, which, by their adjustment, increase or lessen the extent of the movement of frame J.

e e are flanges on the side of frame J, on which the lever L rests while the motion is being imparted to miters Q Q'.

f f' are stop-pins set in the dovetailed heads f' f', which are adjustable longitudinally on the dovetailed rib M<sup>1</sup> of the frame M, the pins being threaded so as to form set-screws to hold the blocks in proper positions to operate the lever L, so that the feed will be reversed as soon as the article to be ground has passed the stone a sufficient distance to be fed up.

g g<sup>1</sup> are racks attached to the frame M, flange M<sup>2</sup>, by set-screws g<sup>2</sup> g<sup>2</sup>, by which they are adjusted longitudinally for the purpose of operating the frame O at the proper time, as will be hereinafter described.

h is a clamping-plate provided with lugs h<sup>1</sup>, by which it is pivoted to the lugs M<sup>3</sup> on top of the sliding frame. This plate is also provided with shouldered openings N<sup>2</sup>, through which the set-screws N<sup>3</sup> and pivoted bolt h<sup>4</sup> pass, being grooved to correspond with their thread, and the latter being provided with a thumb-nut, h<sup>5</sup>. By this means the plate is readily set at any desired angle with the stone. The article to be ground may be attached to this frame, as shown at h<sup>6</sup>, or by any other suitable device, that shown being inoperative for some forms of tools, &c.

i i are adjustable base-plates, having longitudinal slots, through which the bolts i<sup>1</sup> pass to secure them to the floor or bed-piece, and lugs i<sup>2</sup>, to which the arms O' of the frame O are pivoted. The arms O' may be made separate from the body of the frame O and attached to it by screw-bolts, as shown in the drawings, or may be cast in one piece therewith, as desired.

j is an arm extending upward from the reservoir B, and slotted at its upper end to receive the pivoted box k, which is provided with a female screw, through which the screw l passes. This screw is set at right angles with that by which the lateral movement is effected, and is for the purpose of feeding the article to be ground up closer to the stone. It is swiveled in the piece N of frame M, which is there provided with a friction-plate and set-screws for the purpose of steadying its motion.

m is a ratchet-wheel keyed to screw l and

operated by the spring-pawl n on the loose pinion o, which engages with the racks g g<sup>1</sup> on the sliding frame M, so that when the frame is going toward the right the rack g<sup>1</sup>, before the tool comes in contact with the stone, will feed it up for that stroke, and as soon as the tool leaves the stone the rack g will commence feeding for the return-stroke, the pawl, when the frame is going from right to left, passing over the ratchet without turning it. This shaft is also provided on its outer end with a hand-wheel, p, by which, when either of the racks is engaged with the pinion, the tool is withdrawn from the stone, or fed up to it when the stone is not in motion.

The operation is as follows: The tool or other article to be ground having been secured in the clamp h, with its face parallel with the edge of the stone, the frame is fed up by the hand-wheel p, supposing the wheel H in gear with the miter Q on the screw-shaft, rack g having just passed from the pinion, and all other parts in corresponding positions. The stone A being started in the direction shown by arrow in Fig. 2, the frame M will, by the miters on its screw-shaft, be driven toward the left, bringing the tool in contact with the stone, and, passing on until it passes the stone, the pin f, nearest the right end of the frame, comes in contact with the lever L, forcing it over, and dropping the dog W' into the notch X', thus changing the wheel H from Q to Q', and consequently changing the direction of the frame from left to right. At about the same time that the pin begins to operate on the lever rack g<sup>1</sup> will commence to operate on the pinion o, so that when the motion has been reversed, and the tool comes in contact with the stone, it will have passed over it a sufficient distance that, in returning, it will feed up the frame for the right movement. Then, passing on to the right, the same operation is performed, with the exception that when the rack g comes in contact with the pinion on the screw-shaft it will feed for the left movement, and so on, feeding for both directions, while the frame is passing from left to right, the tool being always past the stone when it is being fed forward.

When the operation is performed the tool is withdrawn from the stone by the hand-wheel.

Care should be taken that the racks are past the pinion when the hand-wheel is used, and that the stops and racks are properly adjusted, so that the tool may not be fed forward until it has passed the stone.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The sliding frame M, in combination with flanges or tracks N N<sup>1</sup> N<sup>2</sup>, adjustable strip N<sup>3</sup>, and set-screw N<sup>4</sup>, when constructed and operating in the manner and for the purpose set forth.

2. The pivoted frame J, in combination with the weighted lever L, slotted cross-piece V, dogs W W', curved notched arm Y, and spring-



plate *c*, constructed and operating as and for the purpose set forth.

3. The adjustable stop-pins *f*, heads *f'*, and rib *M*<sup>1</sup>, in combination with the lever *L* and pivoted frame *J*, constructed and operating as and for the purpose set forth.

4. The lever *L*, provided with hook *b*, in combination with the hinged dogs *W W'*, arm *Z Z'*, and chain *a*, constructed and operating as and for the purpose specified.

5. The frame *O*, provided with arms *O' O'*, in combination with the slotted adjustable bed-plate *i* and bolts *i i'*, constructed and operating as and for the purpose set forth.

6. The combination of the adjustable racks *g g*<sup>1</sup>, having set-screws *g*<sup>2</sup>, screw-shaft *l*, pinion *o*, pawl *n*, fixed ratchet *m*, upright arm *j*, pivoted box *k*, and pivoted frame *O*, substantially as described, for the purpose specified.

To the above specification of our improvement in grinding-machines we have signed our hands this 13th day of March, 1867.

MENNO ALBERTUS DIEDRICHS.  
JOHANN HENRICUS DIEDRICHS.

Witnesses:

SOLON C. KEMON,  
O. KNIGHT.