

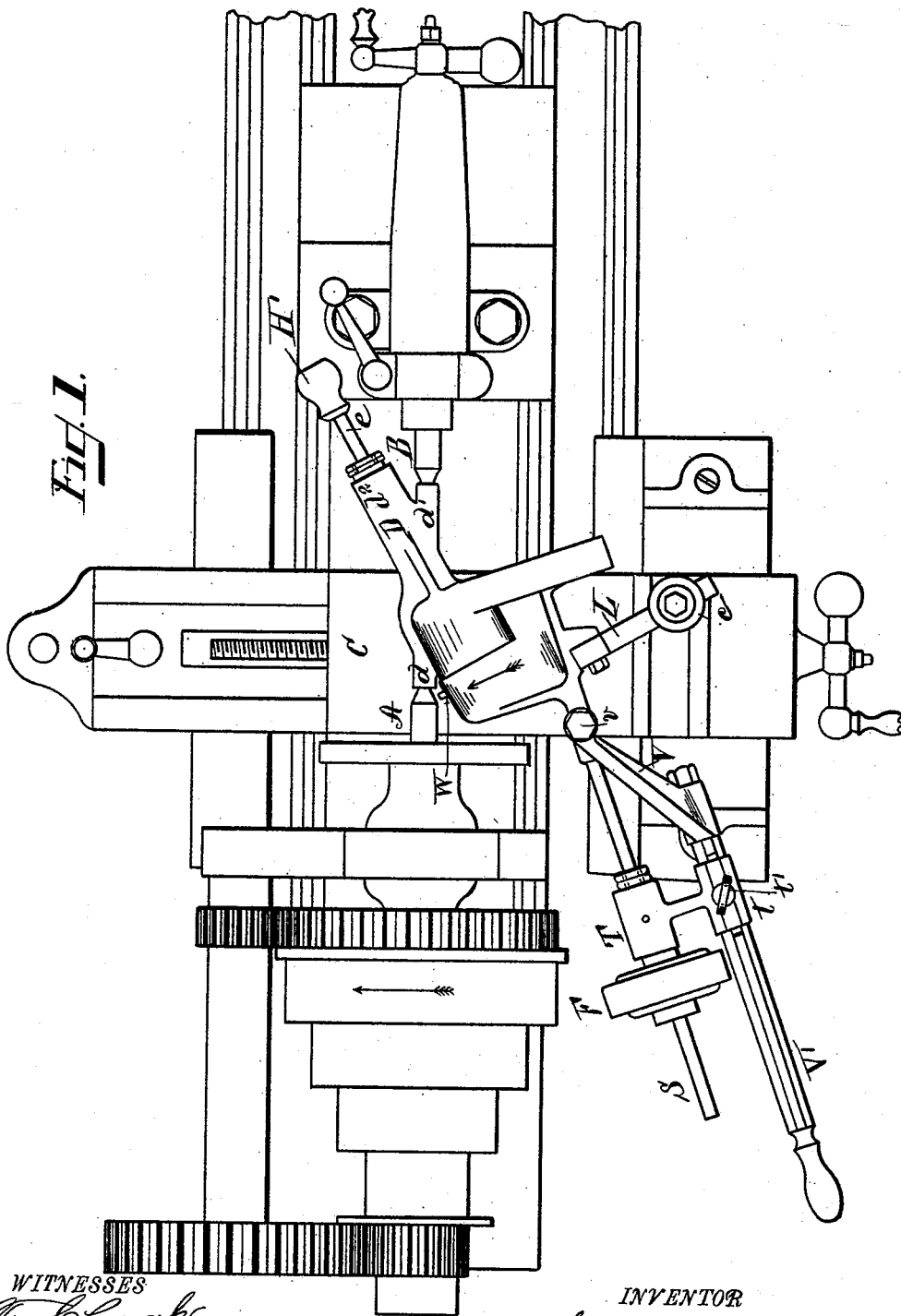
(No Model.)

3 Sheets—Sheet 1.

C. H. NORTON.  
CENTER GRINDER.

No. 496,891.

Patented May 9, 1893.



*Fig. 1.*

WITNESSES  
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*W. W. Bradford*

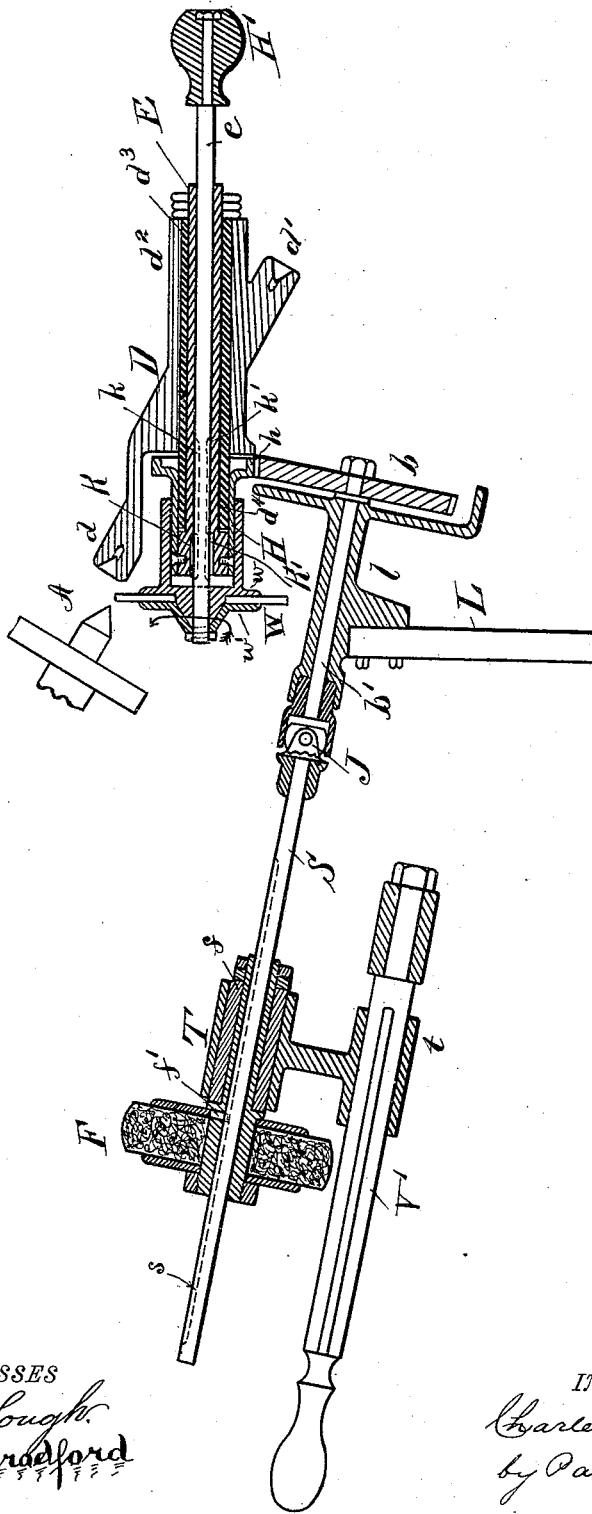
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Fig. 2.



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(No Model.)

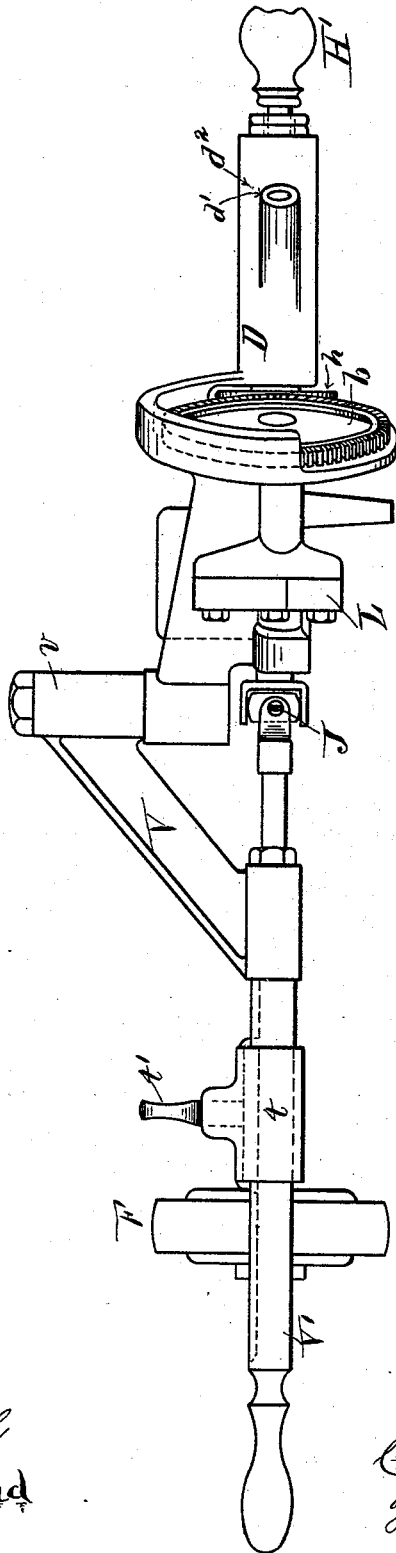
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*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

CHARLES H. NORTON, OF DETROIT, MICHIGAN.

## CENTER-GRINDER.

SPECIFICATION forming part of Letters Patent No. 496,891, dated May 9, 1893.

Application filed February 23, 1892. Serial No. 422,385. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. NORTON, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Center-Grinders; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to center grinders, machines for grinding and truing the center projecting from the stock of a lathe, and is especially intended to provide an improved means or tool adapted to be mounted on the ordinary tool holding slide of a lathe, and to accurately point at the true center of revolution of the face-plate or revolving center piece, the holding part usually known as the center. To accomplish the desired result I employ, the tool shown in the accompanying drawings, in which—

Figure 1 is a plan view of the tool in position between the centers of the head and tail stock. Fig. 2 is a horizontal central section through the tool. Fig. 3 is a front elevation.

A represents the center connected to the head stock, and B, the center connected to the tail stock of an ordinary lathe.

C, represents the sliding tool holder, with the ordinary tool holding post *c*.

D, represents what I call the locating holder of the tool. It consists of a bar provided with conical cavities at the ends *d*, *d'*, adapted to be placed between the centers A, and B, and to be held in the same manner that a bar is held between them when the lathe is in use.

Across the bar at an angle, is a holding arm *d*<sup>2</sup>, perforated and fitted with a bushing *d*<sup>3</sup>. The bushing *d*<sup>3</sup> lies across the line between *d* and *d'*, at an angle and the acute angle between the intersecting axes of the two branches, is equal to one-half the angle to which it is desired to finish the point A.

Within the bushing *d*<sup>3</sup>, is a sleeve journal E, attached at its inner end to the interior of the elongated hub H, of a pinion *h*, adapted to turn with the journal E. The inner end *d*<sup>4</sup> of the bushing *d*<sup>3</sup> extends beyond the walls of the branch *d*<sup>2</sup>, and is received within the hub

H of the pinion *h*, and outside of the journal E, thus providing a housing of considerable length adapted to permit the parts to move endwise with respect to one another through a considerable distance, and at the same time to prevent dust or particles of steel or iron from reaching the bearing between the journal E, and the bushing *d*<sup>3</sup>, within which it turns.

Through the sleeve journal E, passes the stem or spindle *e*, on the inner end of which is mounted an emery wheel W; the emery wheel W, is held between the clamping faces of a hub *w*, and a holding nut *w'*. The hub *w*, has a long annular extension telescoping over the hub H, adapted to furnish a guard similar to the one previously described, to prevent dust from entering around the inner end of the hub H. In the spindle *e*, are two key ways on opposite sides of the middle line, and into the key ways *k*, *k'*, project feathers or keys K, K', from the sleeve journal E. A handle H' is attached to the end of the spindle *e*. The construction described allows the wheel W to be shifted or moved parallel with itself through a short distance, while the pinion *h*, is in motion and the wheel W, to which it is connected is at work.

A working holder L, is adapted to be received within the ordinary tool holding post of the slide rest. The working holder L, is firmly connected to the locating holder D, and the relative positions of the two are constant. At the inner end of the working holder L, is a cross arm *l*, bored out to receive the spindle of the beveled gear *b*, which is arranged to mesh with the pinion *h*. The spindle *b'* of the beveled gear wheel *b*, on the end remote from the gear wheel *b*, is connected by a universal joint J, with a driving shaft S. The driving shaft S is supported by a movable hanger T, that slides or is capable of sliding on an arm V'. The arm V', springs from a hanging arm V, that is hinged at *v*, to the main or body part of the tool; the axis of the hinge *v*, is in line with and above the center of the joint J, and consequently the holding arm V', and the driving shaft S, can both of them be moved in an arc around the axial line passing through the hinge *v*, and the joint J, and the hanger T, can be moved along the arm V', and along the driving shaft S, either

toward or away from the joint J. The branch *t*, of the hanger T is secured from turning on the holding arm V', by a feather and spline and is held after having been suitably adjusted by a set screw.

5 Journalled within the hanger T is a friction wheel F preferably made of rubber secured between metallic holding faces. The friction wheel F is secured to the shaft S, by a spline 10 *f'*, projecting into a long key way and thus while the wheel itself can be moved endwise with the hanger T, it compels the shaft S to rotate with it whenever it is itself rotated. To employ this center grinder the setting 15 holder D, is placed between the centers of the lathe, and the working holder L, in the tool holding post of the ordinary slide rest, and the tool is made fast in position like any ordinary tool; the slide rest is then moved 20 until the setting holder D, is away from the points to be ground. The use of the setting holder D, and the working holder L in unison adjusts the shaft of the grinding wheel W, at the proper angle with respect to the center 25 to be ground; the subsequent movement of the slide rest does not change this angle, but by the use of the slide rest the setting holder D may be moved out of the way, and the grinding wheel W moved up into contact with the center, and its grinding edge will lie parallel to the 30 edge of the coned surface of the center, and can be pressed into contact with any degree of force desired by the use of the slide rest, also while the grinding wheel W, is revolving it 35 can be moved along the coned surface from apex to base by moving the spindle *e*, on the end of which the grinding wheel is mounted through the hollow journal E. The grinding wheel W, is set in motion of revolution by 40 means of the pinion H, and gear wheel *b*, the shaft S, and the friction wheel F, the friction wheel F, receiving its motion from contact with one of the faces of the coned pulley of the lathe. The object of the hinge at *v*, 45 and J, is to permit the friction wheel to be pressed against the cone pulley of the lathe.

The various adjustments of which the tool is capable permit of the use of the same grinding tool, with different lathes in which the 50 cone pulleys may be of different sizes or the centers and cone pulleys at different distances.

What I claim is—

1. In a tool for grinding lathe centers, the

combination of a setting holder, a working holder fixed with respect to each other; a 55 grinding wheel having its axis of revolution fixed with respect to said holders and means for giving motion to said grinding wheel, substantially as and for the purpose described. 60

2. In a tool for grinding lathe centers, the 60 combination of a working holder, a grinder frame supported thereby a bushing projecting beyond the framework, a hollow journal within said bushing, a spindle traversing the 65 hollow journal, splined thereto provided with a grinding wheel at one end, and a handle at the other end, a housing secured to one of said parts, and telescoping over another of said parts, substantially as and for the purpose specified. 70

3. In a tool for grinding lathe centers the combination of a working holder, a grinding wheel movable lengthwise of its axis, a hinged 75 supporting arm provided with a handle, a friction driving wheel supported on and adjustable lengthwise of its shaft, a sliding hanger uniting the hinged supporting arm and the shaft of the driving wheel, jointed 80 shafting intermediate the driving wheel and the grinding wheel, substantially as and for the purpose specified.

4. In a tool for grinding lathe centers, the combination of a working holder, a grinding wheel, a hinged arm provided with a handle, 85 a swinging shaft supporting a driving friction wheel, a sliding hanger uniting the arm and the shaft, a fixed shaft jointed to said swinging shaft, substantially as and for the purpose specified.

5. In a tool for grinding lathe centers, the 90 combination of a locating holder and a working holder; a grinding wheel having its axis of revolution at an angle of said locating holder a friction wheel adapted to swing in an arc as described, a driving shaft adapted 95 to be driven by said friction wheel and connected by a universal joint, to fixed shafting, adapted to drive said grinding wheel substantially as and for the purpose described.

In testimony whereof I sign this specification in the presence of two witnesses. 100

CHARLES H. NORTON.

Witnesses:

CHARLES F. BURTON,

EFFIE I. CROFT.