F. N. & F. E. GARDNER.

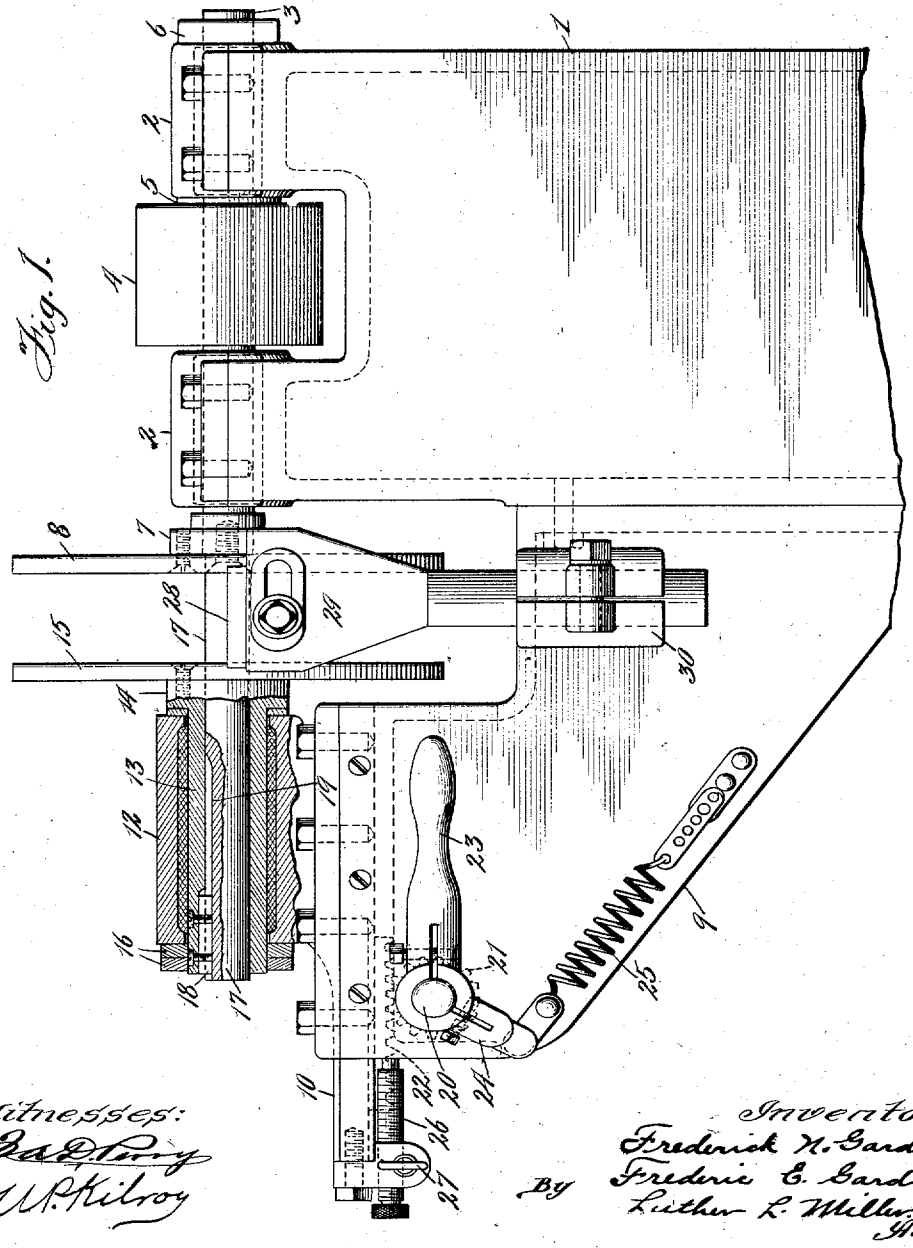
GRINDING AND POLISHING MACHINE.

APPLICATION FILED APR. 25, 1908.

909,882. Patented Jan. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

J. A. D. Tracy

U. P. Kilroy

Inventors

Frederick N. Gardner

Frederic E. Gardner

By Luther L. Miller

Atty.

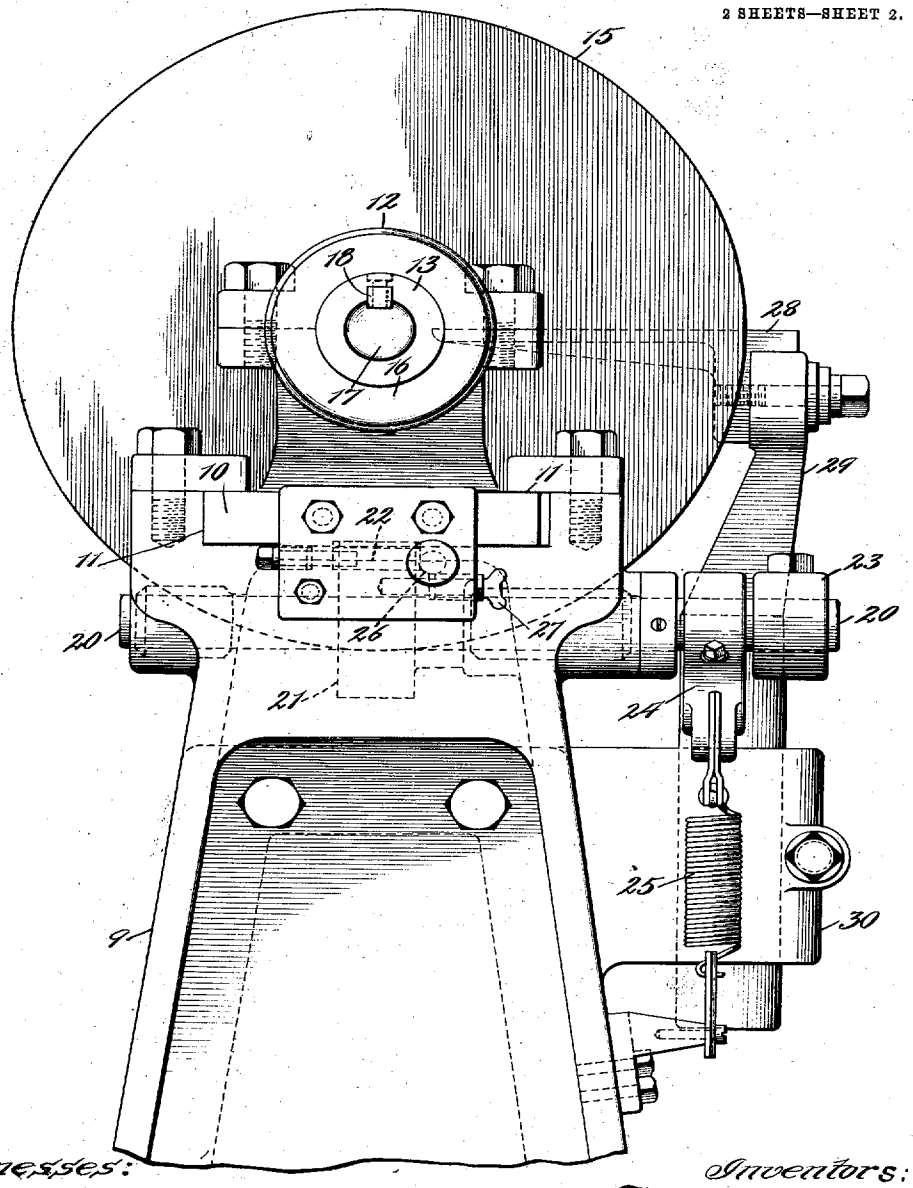
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2 SHEETS—SHEET 2.



Witnesses:
Ba. Dewey
U. P. Kilroy

Fig. 2.

Inventors:
Frederick N. Gardner
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By Luther L. Miller
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UNITED STATES PATENT OFFICE.

FREDERICK N. GARDNER AND FREDERIC E. GARDNER, OF BELOIT, WISCONSIN.

GRINDING AND POLISHING MACHINE.

No. 909,882. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed April 25, 1908. Serial No. 429,132.

To all whom it may concern:

Be it known that we, FREDERICK N. GARDNER and FREDERIC E. GARDNER, citizens of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Grinding and Polishing Machines, of which the following is a specification.

This invention relates to that class of machine tools termed disk grinders, and employing one or more rotatory disks of abrasive material, the work being held in contact with the faces of said disk or disks.

The present embodiment of our invention comprises two opposed grinding disks between which an article to be ground to size is held, one of said disks being movable toward and away from the other disk.

The primary object of the invention is to provide improved means for driving said disks.

The invention also refers to the other improvements in grinding and polishing machines hereinafter set forth.

In the accompanying drawings, Figure 1 is a fragmental side elevation of one form of grinding or polishing machine embodying the features of our invention. Fig. 2 is a fragmental view taken from the left-hand side of Fig. 1.

The embodiment herein shown of the invention is designed for grinding or polishing metals, but obviously it may be used for working many other materials.

The machine frame 1, which may be of any suitable form and construction, carries bearings 2 in which is supported a drive shaft 3 having a drive pulley 4 fixed thereon intermediate said bearings. Endwise movement of the shaft 3 is prevented by the collars 5 and 6. Upon one end of the shaft 3 is fixed a collar 7 to which is secured in any suitable way a grinding or polishing disk 8.

A knee 9 forming a part of the machine frame carries a slide 10 mounted in guideways 11 in said knee, said slide carrying a bearing 12. Rotatably mounted in the bearing 12 is a sleeve 13 having at its forward end an annular flange 14 to which is secured in any suitable way a grinding or polishing disk 15, said sleeve being held against longitudinal movement with relation to the bearing 12 by means of the nuts 16. The sleeve 13 rotatably supports and is movable longitudinally of a shaft 17 which is driven from the shaft 3. We have herein shown the inner end of the shaft 17 as reduced in diameter and furnished with a left-hand screw-thread to engage in a correspondingly screw-threaded opening in the adjacent end of the drive shaft 3. In this instance the driving connection between the sleeve 13 and the shaft 17 consists of a key 18 secured to said sleeve and fitting within a keyway 19 formed in said shaft. It will be seen that the movement of the slide 10 in its guideway will produce a movement of the disk 15 toward or away from the disk 8, and that both of said disks are driven by the single driving means 4.

In the present embodiment of the invention, the slide 10 is arranged to be moved by means comprising a shaft 20 rotatably mounted in suitable bearings in the knee 9, said shaft carrying a pinion 21 meshing with a rack 22 fixed to said slide. Upon one end of the shaft 20 are adjustably fixed a hand lever 23 and an arm 24, the latter being acted upon by a coiled tension spring 25 adjustably secured at one end to a suitable point in the machine frame, the other end of said spring having a link connection with said arm. The spring 25 tends to move the disk 15 away from the disk 8. The movement of the disk 15 toward the disk 8 is limited by means consisting, in this instance, of a stop screw 26 carried by the slide 10 and arranged to impinge against a portion of the machine frame, said stop screw being fixed in adjusted position by means of a locking screw 27.

The article to be ground or polished may be supported upon a table 28 horizontally adjustably secured to an arm 29, which arm is vertically adjustable in a clamp bearing 30 upon the machine frame.

So far as the present invention is concerned, the disks 8 and 15 may be solid emery or corundum wheels, or steel disks faced with abrasive material, or of any other suitable construction.

The method herein disclosed of mounting the grinding or polishing wheels permits of driving all of them by means of a single belt or equivalent device.

In operation, the piece to be ground, which is preferably held in a suitable holder, is laid upon the table 28, and the disk 15 pressed against it by swinging the hand lever 23. The stop screw 26 limits the movement of the disk 15 toward the disk 8.

The work being free to move horizontally, it is acted upon substantially equally by the disks 8 and 15.

In the present embodiment the tops of the wheels 8 and 15 are arranged to rotate toward the front, the inertia of the wheel 15 and the pressure of the work holding the shaft 17 in screw-threaded engagement with the shaft 3. When one of the disks 8 and 15 is to be removed, said shafts are disconnected, as by holding the disk 8 stationary and turning the disk 15 toward the front. After the shafts 3 and 17 have been disengaged from each other, the latter may be slid to the left far enough to permit of slipping the disk out from between the adjacent ends of said shafts. The latter may be operatively connected by turning the wheel 15 toward the rear while the wheel 8 is held stationary.

It is evident that the mechanism herein shown at the left-hand side of the drive pulley 4 may be duplicated upon the right-hand side thereof, and the four wheels driven from the pulley 4.

We claim as our invention:

1. A grinding or polishing machine comprising a plurality of alined shafts separately connected together, an operating member upon each of said shafts, and means for rotating one of said shafts.

2. A grinding or polishing machine comprising two alined shafts having a screw-thread connection, an operating member upon each of said shafts, and means for rotating one of said shafts.

3. A grinding or polishing machine comprising two alined shafts separably connected together, an operating member upon each of said shafts, one of said operating members being movable longitudinally of its shaft, and means for rotating one of said shafts.

4. A grinding or polishing machine comprising two bearings, a shaft in each of said bearings, said shafts being alined and separably connected together at a point between said bearings, an operating member upon each of said shafts between said bearings, and means for rotating one of said shafts.

5. A grinding or polishing machine comprising a rotatable shaft, means for preventing longitudinal movement of said shaft, a shaft alined with and separably connected with the other shaft, a movable bearing for the second mentioned shaft, an operating member rotatably carried by the second mentioned shaft, and movable with said bearing, an operating member upon the first mentioned shaft, and means for rotating said shafts.

6. A grinding or polishing machine comprising a plurality of wheels, a sliding support for one of said wheels, a hand lever having a gear connection with said sliding support for moving said support in one direction, and means for moving said support in the opposite direction.

7. A grinding or polishing machine comprising a bearing, a shaft rotatable in said bearing, a second bearing alined with the first mentioned bearing, a sleeve rotatable in said second bearing, means for preventing longitudinal movement of said sleeve in said second bearing, a shaft having a separable connection with the first mentioned shaft at a point between said bearings, a driving connection between said sleeve and the second shaft, a wheel on the first mentioned shaft, a wheel on said sleeve, said wheels being located between said bearings, a slide upon which the second mentioned bearing is mounted, and a hand lever and a spring for moving said slide.

FREDERICK N. GARDNER.
FREDERIC E. GARDNER.

Witnesses:
T. D. WOOLSEY,
F. F. LIVERMORE.

Correction in Letters Patent No. 909,882.

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Signed and sealed this 9th day of February, A. D., 1909.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

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