(No Model.) 2 Sheets—Sheet 1.

A. A. WEIMER.

METAL GRINDING MACHINE.

No. 372,833. Patented Nov. 8, 1887.

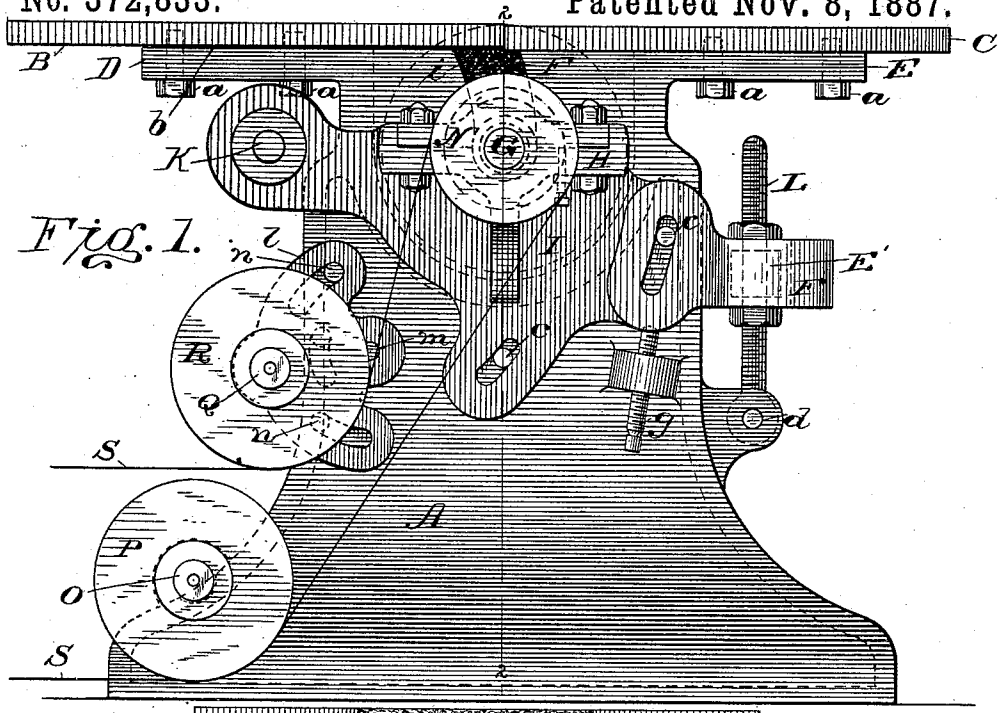


Fig. 1.

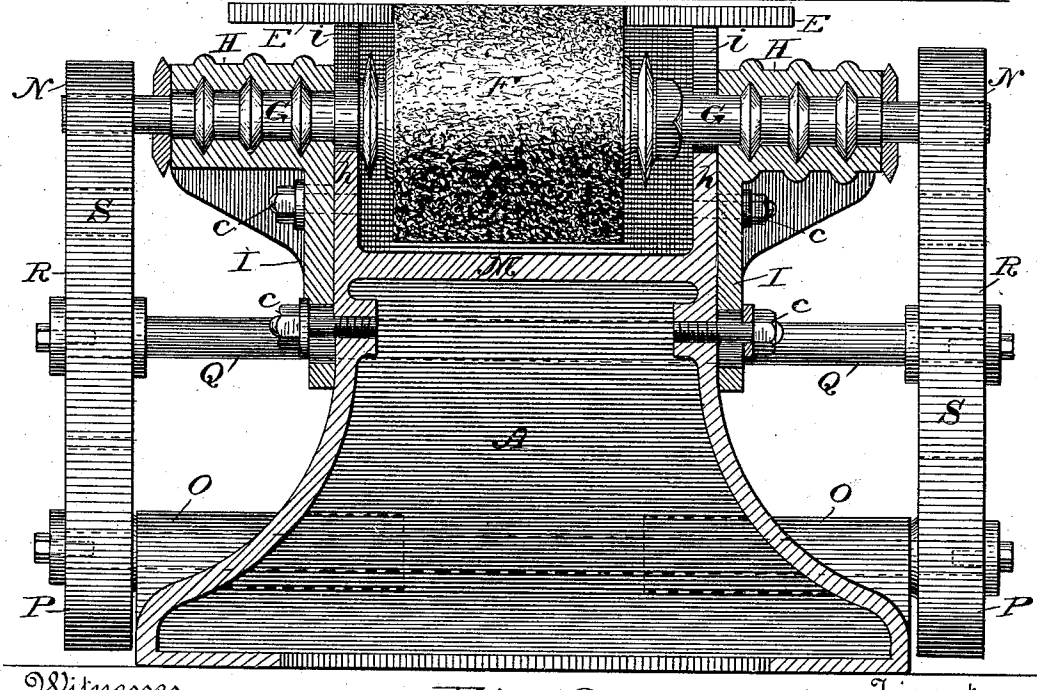


Fig. 2.

Witnesses

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Wm. E. Dyre.

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Asa A. Weimer

By his Attorneys

Johnston, Reinohl & Dyre

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(No Model.)

2 Sheets—Sheet 2.

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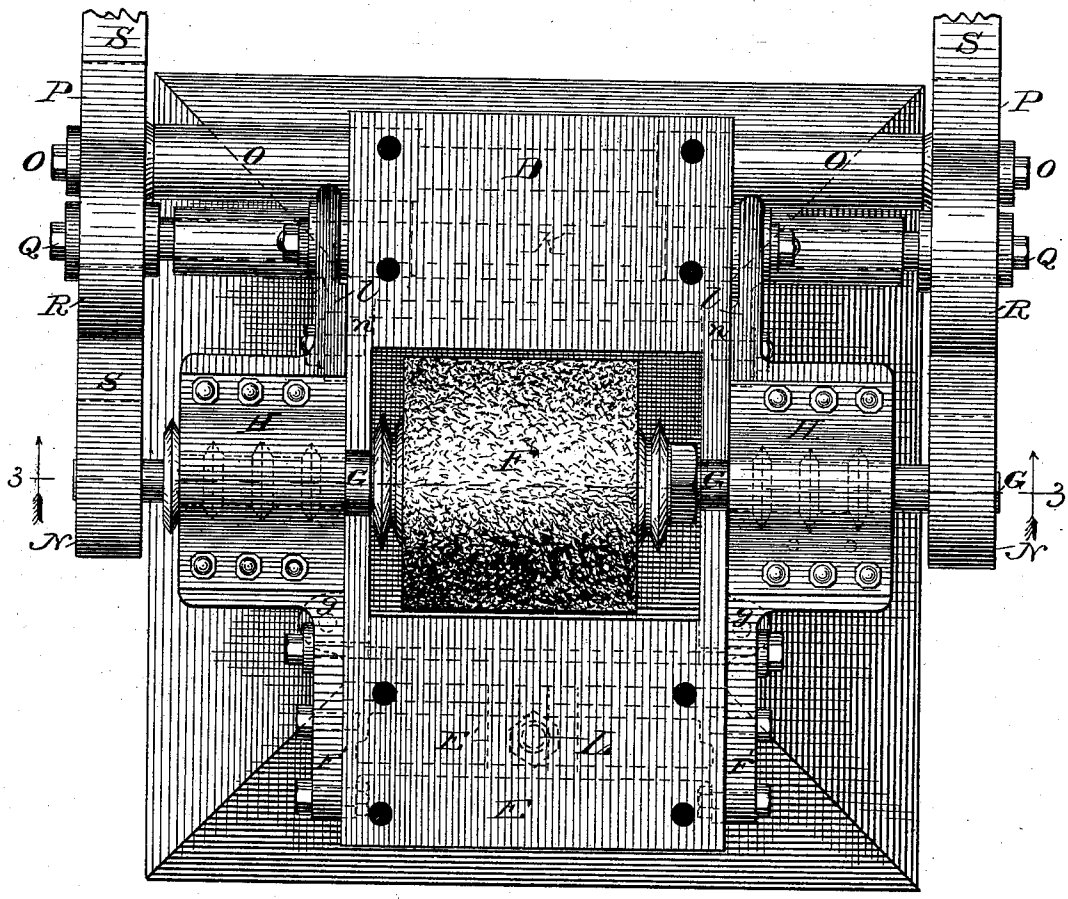


Fig. 3.

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UNITED STATES PATENT OFFICE.

ASA A. WEIMER, OF LEBANON, PENNSYLVANIA.

METAL-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 372,833, dated November 8, 1887.

Application filed April 8, 1887. Serial No. 234,173. (No model.)

To all whom it may concern:

Be it known that I, ASA A. WEIMER, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Metal-Grinding Machines; and I do hereby 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 appertains to make and use the same.

My invention relates to metal grinding or polishing machines, and has for its object the construction of a machine in which the emery-wheel can be adjusted to cut the largest or smallest fraction from articles being finished on it, the article being supported on the side which has passed the wheel in the same plane as the unfinished portion, and perfect safety guaranteed to the operator.

It is well known that the emery-wheel has been extensively adopted as a means for finishing and polishing metal surfaces, and that its use has greatly reduced the cost of manufacture of many useful articles in the market, and devices or machines in which the component factors can be finished by this means. It is also known that one of the greatest objections attending the use of this implement is the danger to which the operator and other persons employed near the machine are exposed by the bursting of the wheel, the bursting being due to the high degree of speed at which the wheel is run and the damage caused thereby to the velocity or momentum acquired by the fragments after separation. From the fact that operators employed on this class of machinery are in constant danger of being injured while at work, but few can be found who can dismiss all concern as to their personal safety and devote their entire attention to the work being done, and as a consequence a large amount of defective work is turned out.

It is my purpose to construct a machine in which this objectionable feature shall be completely overcome, and in which the wheel can be adjusted to cut the maximum or the minimum amount required with great precision, and the article being operated upon so steadily supported that when it leaves the machine it shall be perfectly true on the surface exposed to the action of the emery-wheel.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a side view of my improved machine; Fig. 2, a vertical transverse section on the line 2 2 of Fig. 1, and looking in the direction of arrows on line 3 3 of Fig. 3; and Fig. 3 is a plan view, with the table removed.

Reference being had to the drawings and the letters marked thereon, A represents the frame of the machine, which supports a table made in two parts, B C, both of which are detachable and are secured to the laterally-projecting flanges D E by bolts *a*. The section of the table marked B, it will be observed, is raised from the flange D, so that its upper surface is in the plane of the outer or working surface of the wheel F, while the section C is on a lower plane. The section B may be raised to any extent desired, and is supported by inserting thin sheets or strips *b* of any suitable material between the flange D and the section.

The wheel F is mounted upon a shaft, G, which is supported in journal-bearings H H, which form a part of the plates I I, which are supported on a shaft or trunnions, K, secured to the frame A, and are clamped to the frame by pinch-bolts *c c*.

The wheel F and its shaft G are adjusted to near the position desired by means of the nuts on the coarse screw-thread on the bolt L, which is pivotally secured to a lug, *d*, on the frame A and passes through a brace, E′, between the projecting arms F′ F′ of the plates I I, as shown in dotted lines in Fig. 3. This adjustment is made by slackening one of the nuts on the bolt L and running the other nut up or down the bolt, (according to the direction in which the wheel is to be moved,) and the final or exact adjustment is effected by means of a micrometer-screw, *g*, on each side of the frame A, and which bear against the plates I I. The upper or lower nut on the bolt L (as the condition requires) is then screwed hard against the brace E′. By this means the wheel can be adjusted to suit various kinds of work to be done, and will always produce the kind of work desired.

To insure safety to the operator the wheel F is incased in a strong metallic casing, the cylindrical wall of which is represented by M,

and in the construction shown is of the same thickness as and forms an integral part of the frame A. This portion may, however, be made separate and bolted to the frame. The ends *h h* of the chamber in which the wheel F revolves are provided with curved slots *i i*, in which the shaft G is adjusted. The only portion of the wheel exposed is the working or cutting part, which projects above the section C of the table.

It will be observed that very little space is allowed between the periphery of the wheel F and the inner surface of the cylindrical wall M of the casing, and in consequence thereof the particles of a wheel (should it burst) could not acquire any appreciable degree of velocity or momentum, and could not, therefore, possibly rupture the strong metallic walls of the casing.

The shaft G is provided with one or more angular projections, *k*, which fit corresponding recesses in the journal-bearings, and prevent longitudinal movement of the shaft, and on each end of the shaft is mounted a driving-pulley, N.

O represents a shaft supported in the lower part of frame A, and carries a pulley, P, at each end, and Q represents a shaft also supported by the frame at a point above the shaft O, and is suspended in plates *l*, pivotally secured to the frame at *m*, and is clamped to the frame in any desired position by pinch-bolts *n*. The shaft Q carries an idler-pulley, R, at each end, which pulley rests upon the upper side of the belt S, as shown in Fig. 1.

By providing the shaft G with the angular projection *k*, and applying the belt S in the manner shown, the draft of the belt on the shaft G being downward, the wheel F is held perfectly true and steady in its revolutions, and as a consequence no uneven places occur on the surface of the metal operated upon. As this class of machines are ordinarily constructed, as seen, as the shaft bearing the grinding-wheel or the journal-boxes supporting it have become worn the shaft plays in its bearings and revolves irregularly when the wheel is brought in contact with the metal to be ground or polished and cuts grooves in the metal.

Having thus fully described my invention, what I claim is—

1. In a grinding-machine, a grinding-wheel and vertically-adjustable journal-boxes supported upon plates pivotally secured to the frame of the machine, said plates being provided with elongated slots, in combination with pinch-bolts engaging with said slots and the frame to clamp the plates to the frame, and an adjusting mechanism, substantially as described.

2. In a grinding-machine, a wheel mounted upon a shaft bearing a driving-pulley at each end, and pulleys supported on a plane below the driving pulleys, in combination with idler-pulleys interposed between the former pulleys and bearing upon one side of the driving-belt, substantially as described.

3. In a grinding-machine, a wheel mounted upon an adjustable shaft bearing a driving-pulley at each end, pulleys mounted upon a fixed shaft on a lower plane, and idler-pulleys upon an adjustable shaft arranged between the former pulleys, substantially as described.

4. In a grinding-machine, a wheel mounted upon a shaft having an angular projection or projections on each side of the wheel, and journal-bearings having corresponding grooves or recesses, in combination with pulleys and a belt applied to draw the shaft down to its seat in the journal-bearings, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ASA A. WEIMER.

Witnesses:

JOHN R. RODEARMEL,

TOBIAS REINOEHL, Jr.