(No Model.) 2 Sheets—Sheet 1.

W. J. FISHER.

GRINDING AND POLISHING APPARATUS.

No. 421,487. Patented Feb. 18, 1890.

Fig. 1.

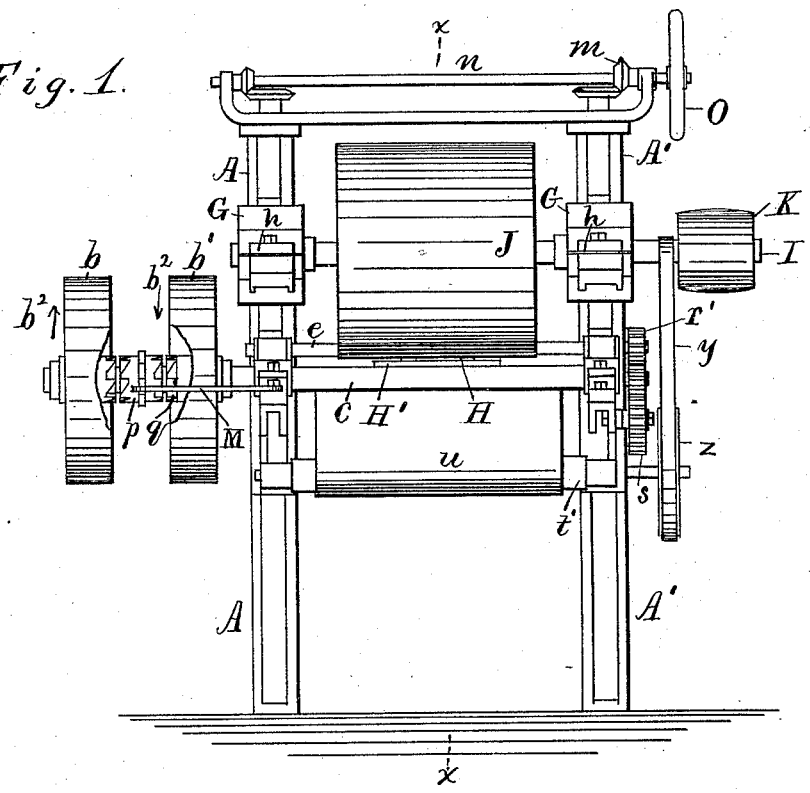
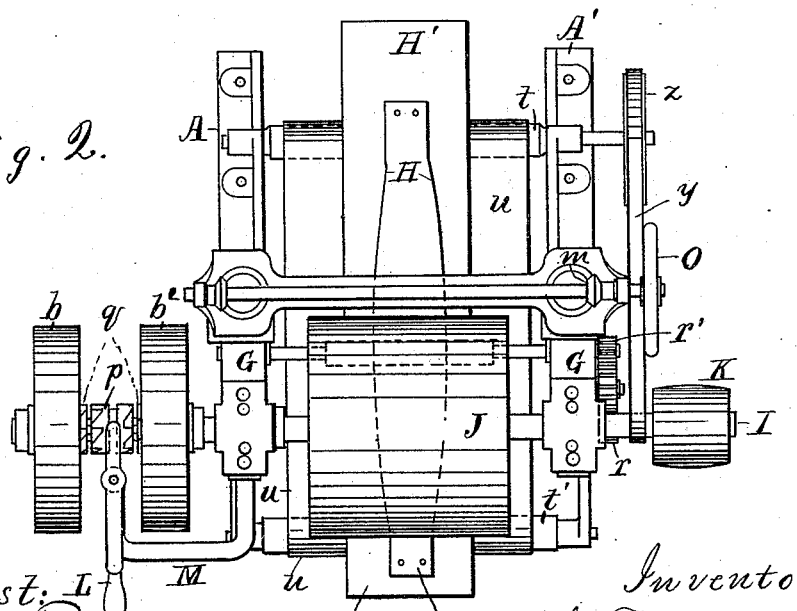


Fig. 2.



Attest:
F. C. Fischer.
Frank H. Brommer

Inventor.
W. J. Fisher, per
Crane & Miller. attys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

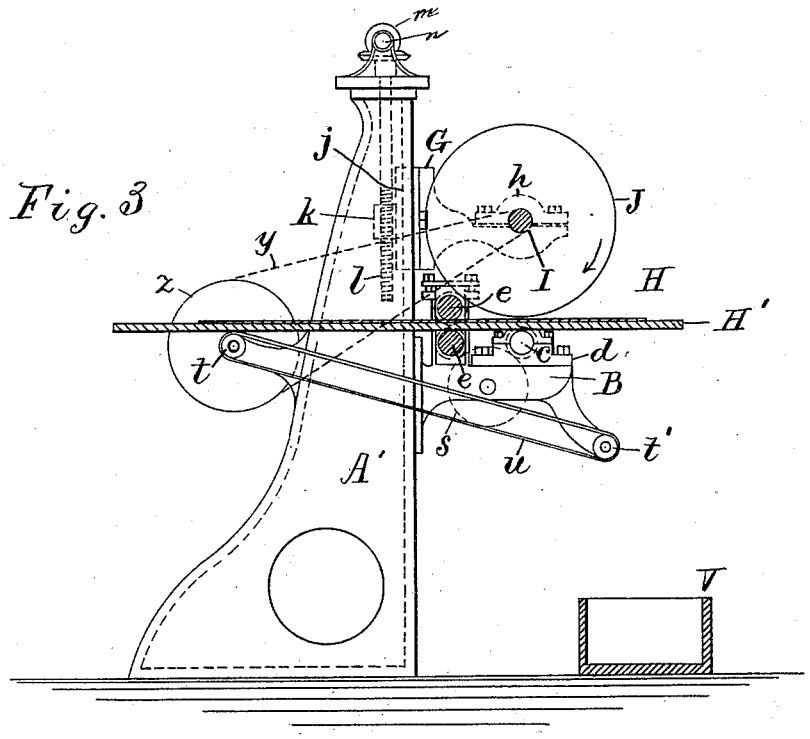
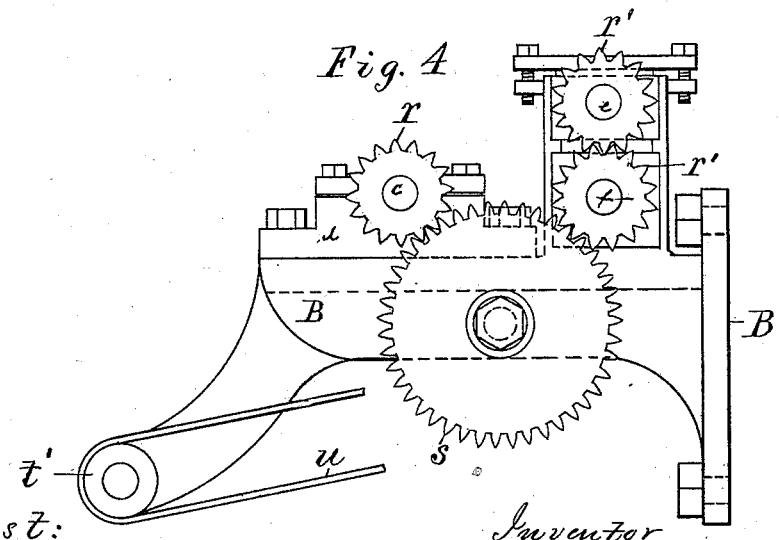


Fig. 4



Attest:
F. C. Fischer
Frank L. Sommer

Inventor
W. J. Fisher, per
Crane & Miller, Attys.

UNITED STATES PATENT OFFICE.

WILLIAM J. FISHER, OF NEWARK, NEW JERSEY.

GRINDING AND POLISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 421,487, dated February 18, 1890.

Application filed September 4, 1889. Serial No. 322,987. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. FISHER, a citizen of the United States, residing at Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Grinding and Polishing Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention consists in various improvements in the construction adapted to diminish the number of parts required to form an organized machine for grinding and polishing saws and analogous articles, to expose the saw more plainly to view in an automatic grinding-machine, and to collect and preserve the grinding-powder for repeated use.

Heretofore the automatic machines constructed for grinding saws have usually been provided with a bearing-roll beneath the grinding-roll and a pair of feed-rolls at each side of the bearing-roll, as in United States Patent No. 50,606, dated October 24, 1865, and No. 132,898, dated November 12, 1872, and the frame of the machine, as well as the arrangement of feed-rolls at both sides of the bearing-roll, has tended greatly to obscure the point or line where the grinding roll or wheel operates upon the saw-blade, and to thus prevent a free inspection of the same to regulate the action of the grinding-wheel.

In my construction the cost of the apparatus is reduced and the inspection of the operation is greatly facilitated by employing only one pair of feed-rolls, located in the rear of the bearing-roll, and the mounting of the journals for the bearing and grinding rolls at one side of vertical stanchions.

The device for collecting the grinding-powder consists in an endless apron extended beneath the operative parts and actuated to carry the grit to a receiving-box, one of the apron-rolls being arranged in the rear of the feed-rolls, to support the saw as it is delivered therefrom.

In the drawings, Figure 1 is a front elevation of the apparatus with a part of the driving-pulleys broken away to expose the clutch. Fig. 2 is a plan of the same; Fig. 3, a vertical section on line $x\,x$ in Fig. 1, and Fig. 4 a side view of the feed-gearing enlarged.

By providing feed-rolls in the rear only of the bearing-roll the operator is required to sustain the saw upon a board or other flat support and to hold it in the proper position when first applied to the grinding or polishing wheel; but the bearing-roll is connected to turn positively with the feed-rolls in my apparatus, and both are provided with reversible clutch mechanism, whereby their rotations may be reversed at pleasure, and the bearing-roll thus operates, as soon as the saw is supported upon the same, to feed it toward the bearing-roll, and to afterward feed it away from the same if the motion of both be reversed.

In the drawings, A A′ are upright stanchions, from the front side of which project fixed brackets B, carrying the bearing-roll c in boxes d and the feed-rolls e in boxes f. Above the brackets B movable brackets G are held upon the stanchions, carrying bearings h for the arbor I of the grinding or polishing wheel J. The roll c is arranged vertically under the arbor I, and the rolls e are arranged between the roll c and the stanchions A′ A. The feet of the brackets G are held to the stanchions by gibs j, and are provided with nuts k, fitted to screws l, which screws are connected together at the top of the machine by gears m and a shaft n, having a hand-wheel O.

The bearing-roll c is not adjustable vertically, and thus always retains the same relation to the feed-rolls e, and the wheel J is adjusted to bear upon the saw or other article with the required pressure by turning the hand-wheel O, the gibs j being clamped upon the stanchion, if desired, by bolts a.

The bearing-roll has its shaft extended outside the bracket B and provided with driving-pulleys b and b', which would be rotated in opposite directions, as indicated by the arrows b^2, by straight and crossed belts, as is commonly practiced in such cases. A clutch-block p, with teeth at both ends, is fitted to rotate with the shaft, and each of the pulleys is provided with teeth q to fit the clutch-block. The pulleys turn loosely upon the shaft, so as not to rotate it except when engaged with the clutch-block.

A hand-lever L is pivoted upon an arm M, adjacent to the clutch-block, and operates, when moved in opposite directions, to engage

the block with either of the pulleys, by which construction the operator can cause the bearing-roll to rotate in either direction.

Gears r r' are provided upon the outer ends of the bearing and feed rolls, and are connected by an intermediate gear s, pivoted upon the bracket B, so that the feed-rolls always rotate in the same direction as the bearing-roll.

Upon the opposite side of the stanchion from the bearing-roll is mounted an apron-roll t, and another one t' is mounted upon bearings attached to the brackets B, and an endless apron u is stretched upon such rolls to catch the emery or grit falling from the parts above and discharges into a box V.

A pulley K is attached to the arbor I to drive the wheel J, and a belt y is applied to the arbor and to a pulley z upon the roll t to drive the apron as required.

The machine is operated as follows: The article H to be polished or ground is laid upon a board or plate H', the end of the board is inserted between the bearing-roll and the wheel J by the operator standing in front of such wheel, and the end of the board is projected beyond the end of the saw in laying the same thereon sufficiently to engage the feed-rollers before the saw enters the space between the wheel and bearing-roll. The operator then actuates the clutch to turn the feed-rolls away from the bearing-roll, thus drawing the board, with the saw thereon, gradually beneath the wheel, as desired. The board, when thus moved by the feed-rolls, is sustained without the help of the operator and without the necessity for any feed-rollers upon the opposite side of the bearing-rolls, and the operator may then traverse the saw back and forth beneath the wheel J by shifting the clutch-handle L whenever the end of the saw is carried by the board to the cutting-face of the wheel. The left-hand end of the board is shown in Figs. 2 and 3 projected beyond the end of the saw the required distance, and such arrangement of the saw when laying it upon the board and the provision of clutch mechanism for reversing the bearing-roll and feed-rolls at pleasure adapt the machine to operate effectively in grinding or polishing the entire length of a saw without employing feed-rolls at both sides of the bearing-roll. The absence of feed-rolls at the front side of the wheel J enables the operator to inspect the surface of the saw more readily and to apply the grinding or polishing powder, and to regulate the pressure of the saw upon the article with great facility, while the projection of the bearings for the wheel and bearing-roll from one side of the stanchions also renders the operation of the machine to be more easily inspected and adjusted, as all obstructions are thus removed from the front and ends of the working parts when they touch the saw.

The wheel J may be covered with leather, or made of wood, stone, or other material, as desired.

The apron u would be made of canvas or leather, and the feed-rolls e would be preferably covered with india-rubber, to give them an elastic grip upon the saw or its supporting-board. The bearing-roll may also be covered with yielding material, if desired, and the entire apparatus may be used for grinding or polishing any objects that can be passed between the feeding-rolls.

A peculiar advantage results from constructing the machine with only one pair of feed-rolls, as it permits the delivery of the saw or other article, when finally polished, directly from the polishing-surface of the wheel without passing between any feed-rolls whatever or in contact with any part of the machine where the polished surface would be touched by the grit, and thus scratched or defaced.

In machines provided with a pair of feed-rolls at each side of the bearing-roll the feed-rolls are invaribly affected by the grip in such manner as to mark and deface the polished surface of the saw during its final delivery from the machine, whereas in my apparatus the provision of the reversible clutch mechanism enables me to discharge the article from the machine at either side, which, when an article is finally polished, I do at the front side of the machine, where there are no feed-rolls, and thus perfectly preserve the finished surface from damage.

The final delivery of the article upon that side of the machine where the article is introduced thus enables a single operator to work the machine and handle the articles without the assistance that would be required if the articles were delivered from the sides opposite the workman.

Having thus set forth my invention, what I claim herein is—

1. A grinding and polishing machine having the wheel J, movable vertically to and from the fixed bearing-roll c, the feed-rolls provided at one side only of the bearing-roll, gearing connecting the feed-rolls and bearing-roll, and reversible clutch mechanism adapted to rotate the feed and bearing rolls in opposite directions when required, substantially as herein set forth.

2. The grinding and polishing machine consisting in the upright stanchions A A', the brackets B, carrying the bearing and feed rolls, the wheel J, and the adjustable brackets G and reversible clutch mechanism adapted to rotate the feed and bearing rolls in opposite directions when required, substantially as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM J. FISHER.

Witnesses:
THOS. S. CRANE,
F. C. FISCHER.