

C. B. WATTLES.
GRINDING OR POLISHING WHEEL.
APPLICATION FILED AUG. 16, 1907.

967,592.

Patented Aug. 16, 1910.

Fig. 1.

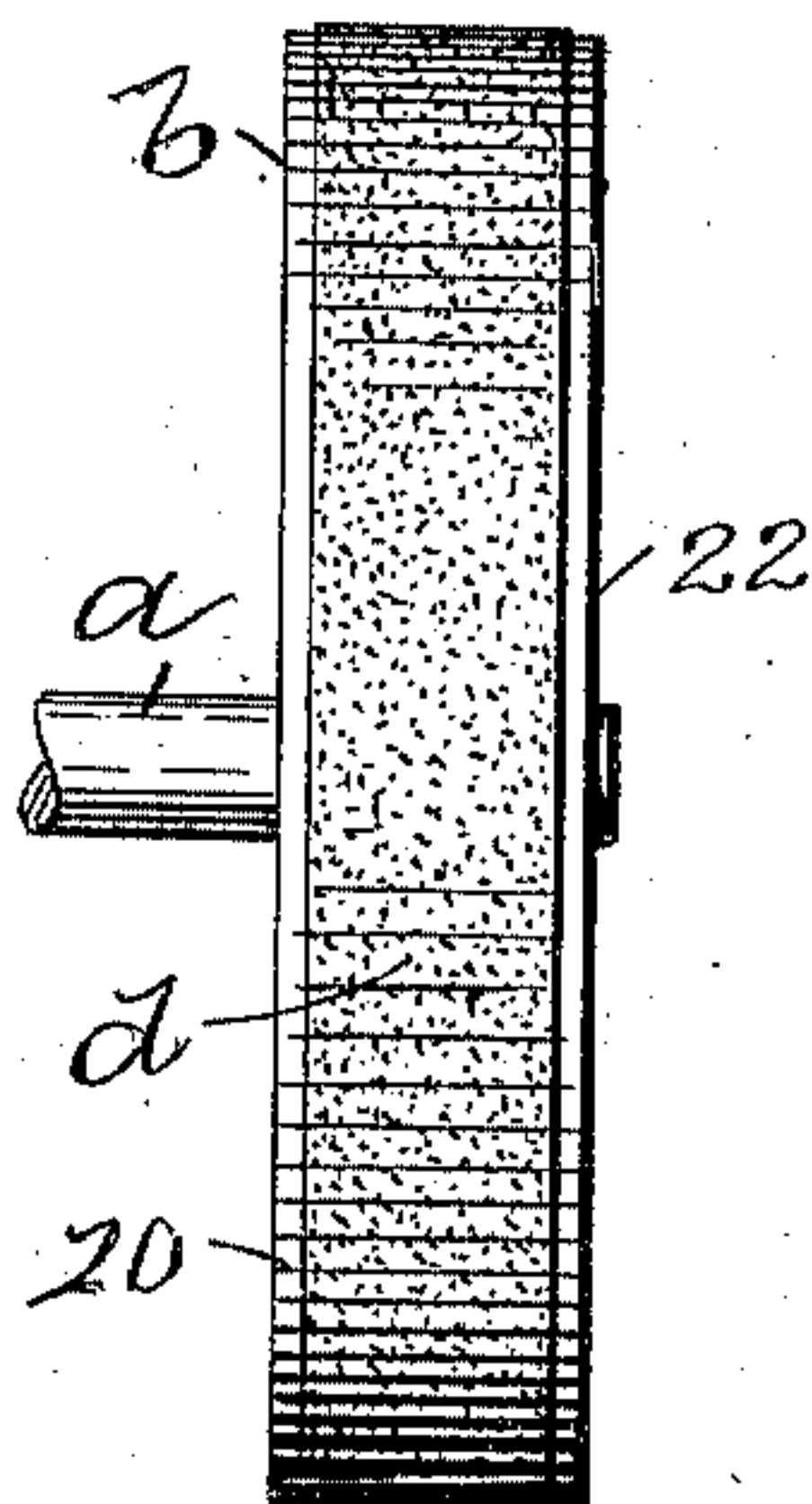


Fig. 2.

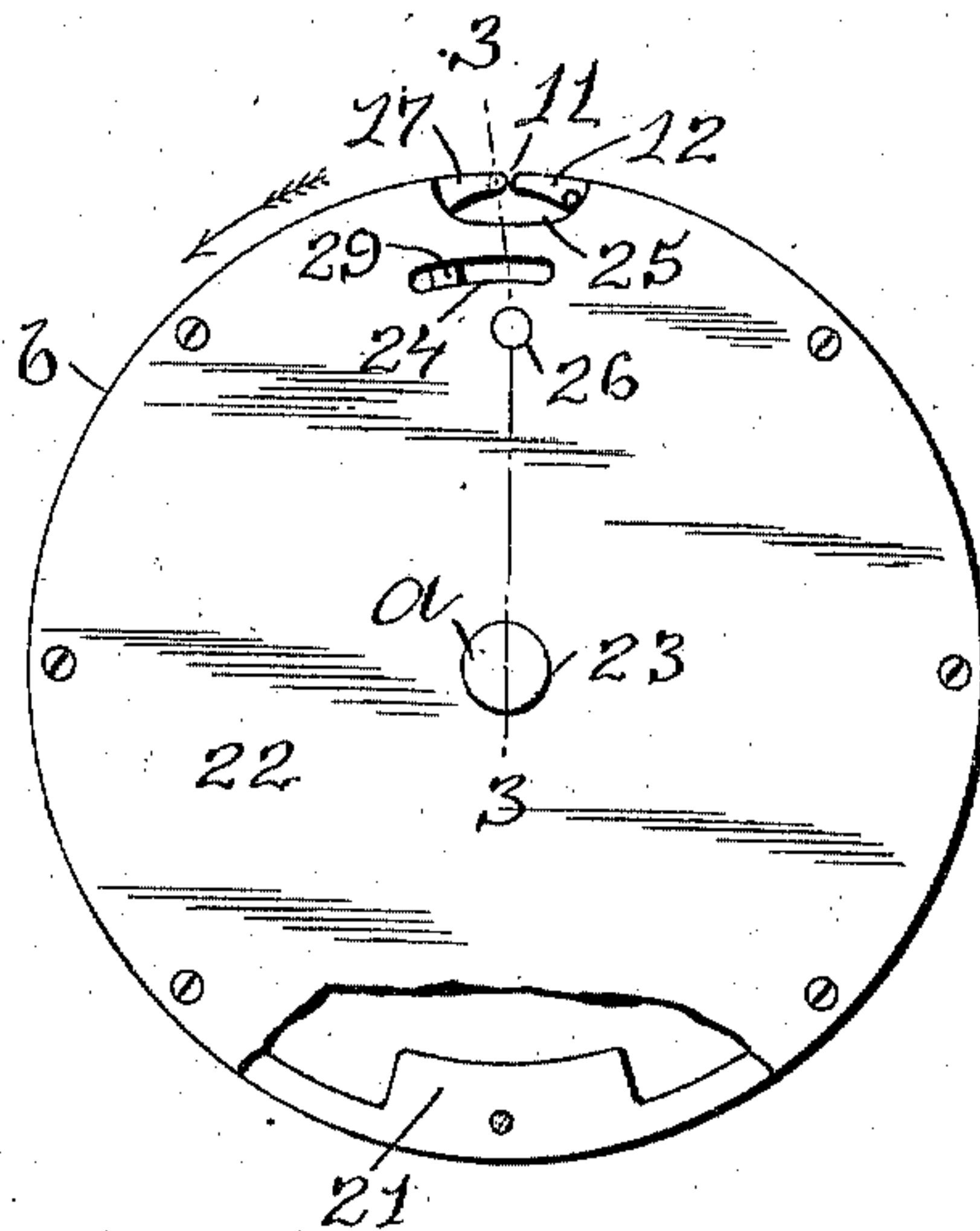


Fig. 3.

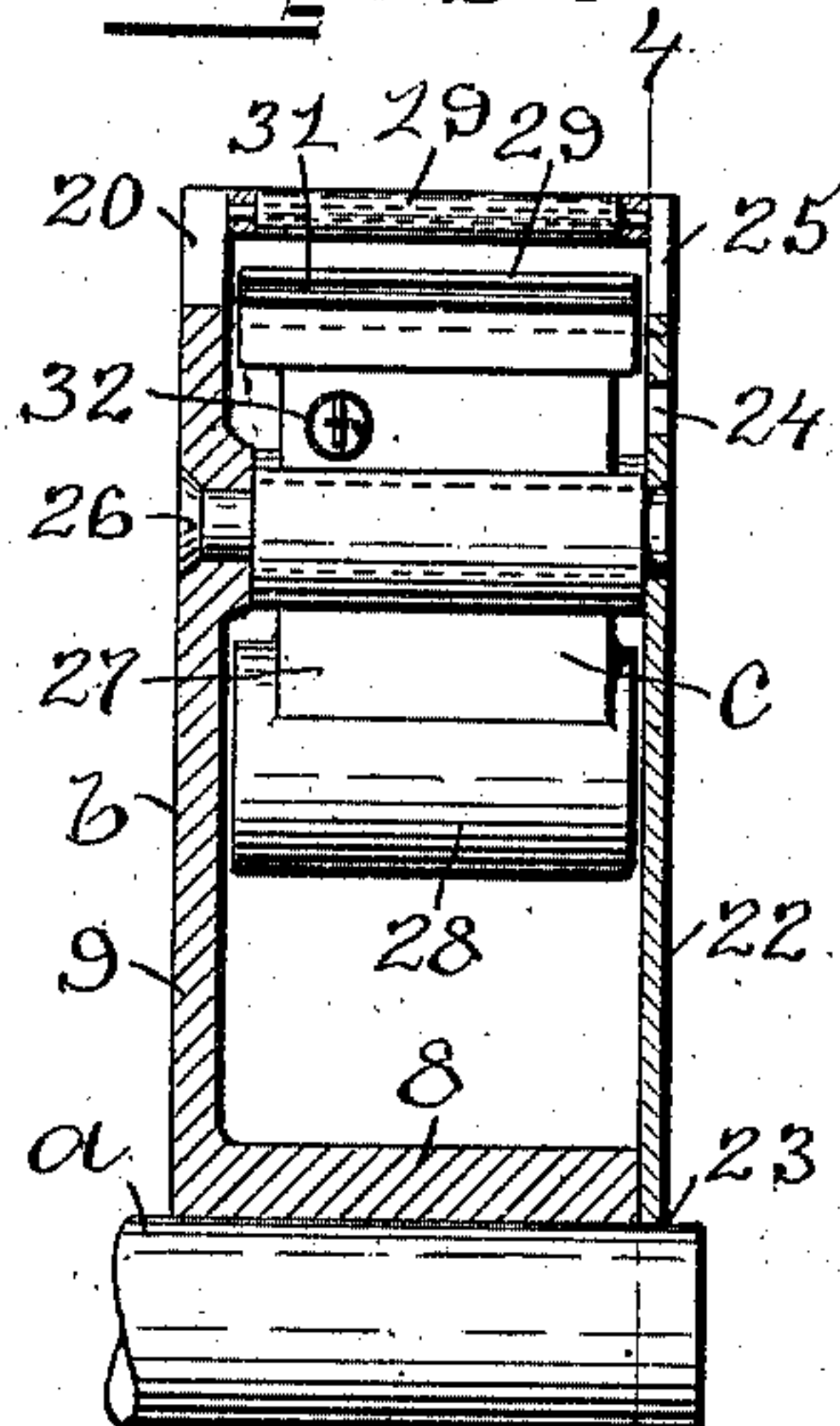


Fig. 4.

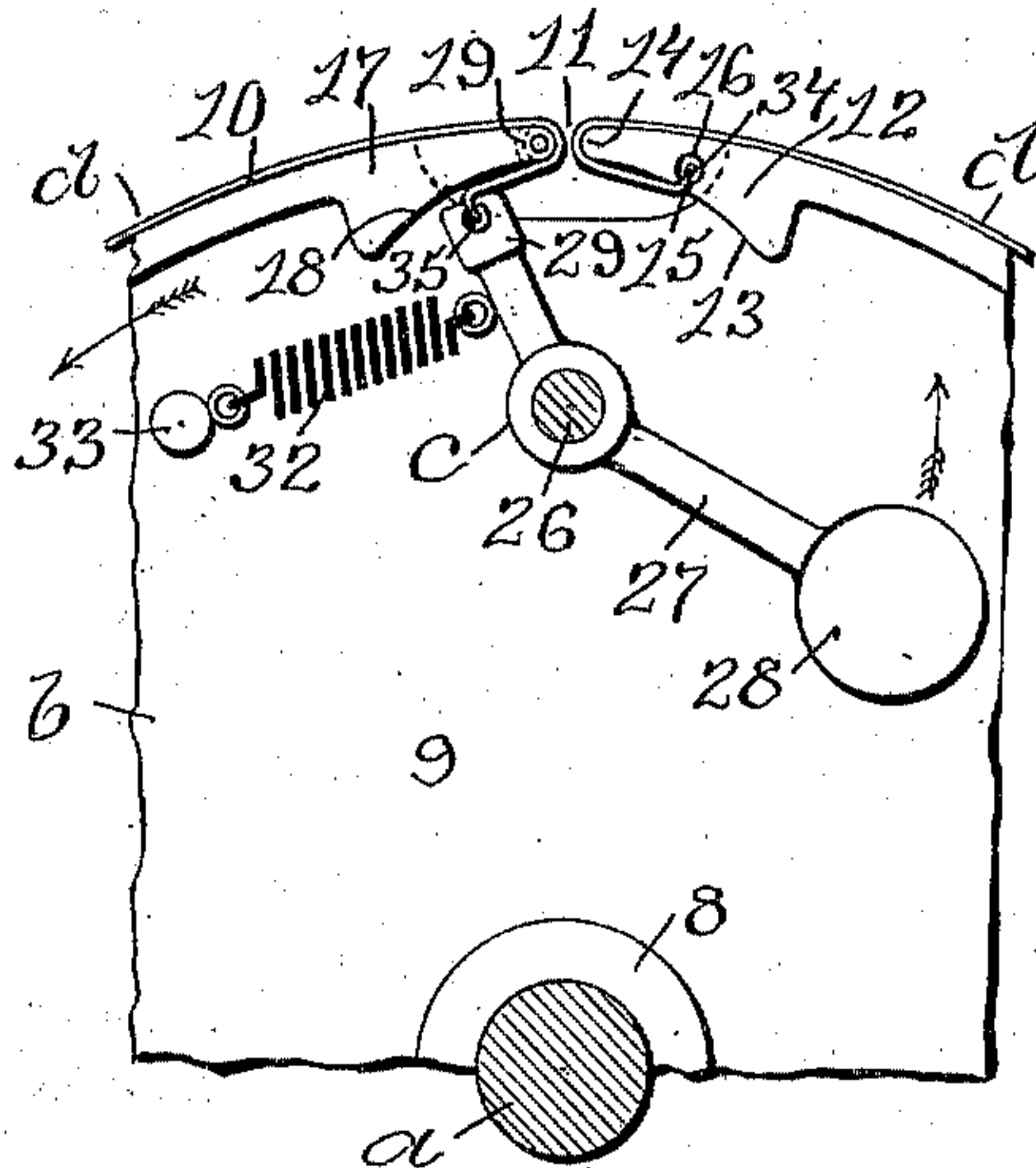


Fig. 5.

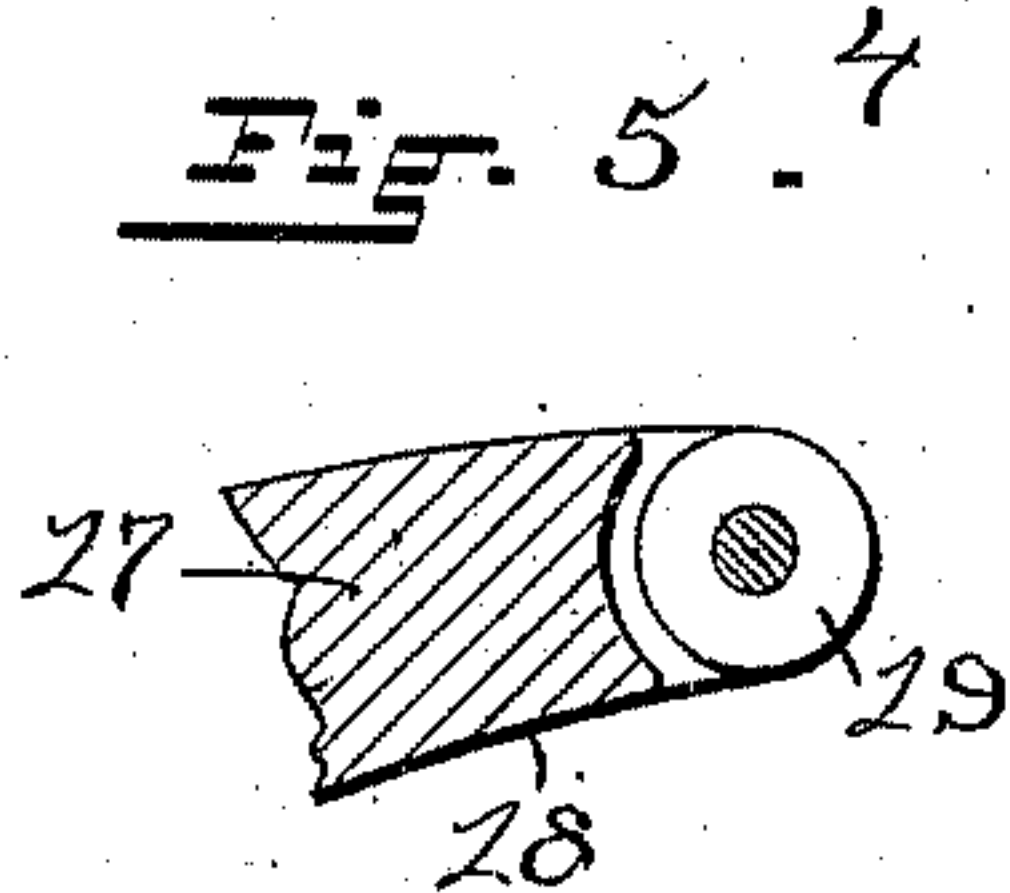


Fig. 6.

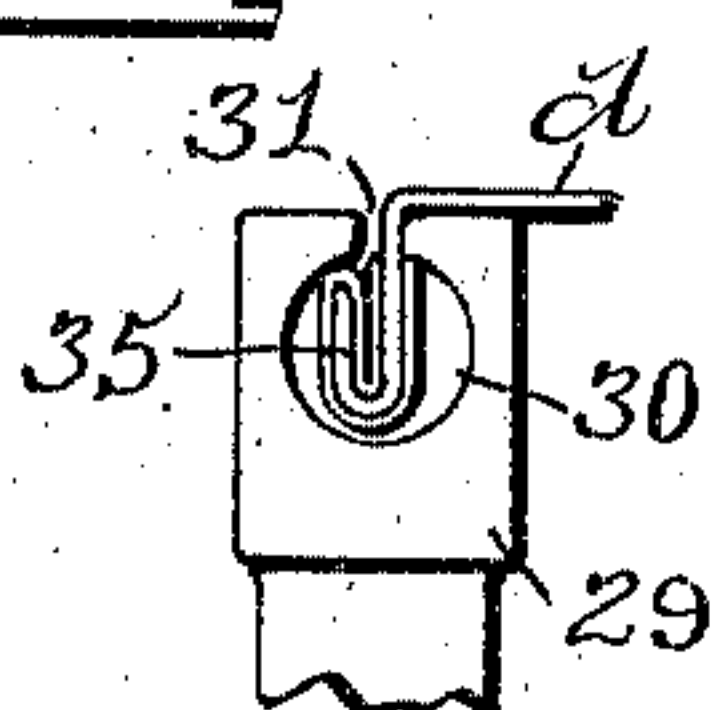
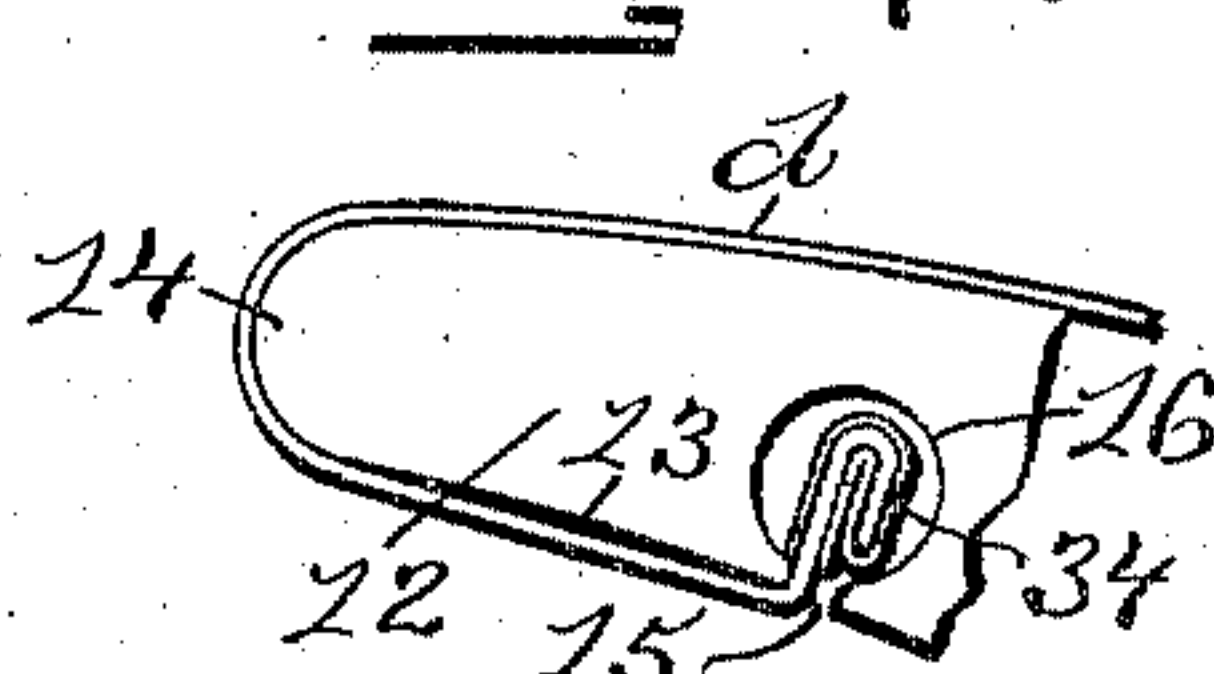


Fig. 7.



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GRINDING OR POLISHING WHEEL.

967,592.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed August 16, 1907. Serial No. 388,809.

To all whom it may concern:

Be it known that I, CYRA B. WATTLES, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Grinding or Polishing Wheels, of which the following is a specification.

This invention has reference to an improvement in grinding or polishing wheels and more particularly to an improvement in grinding or polishing wheels having a flexible detachable covering, such as paper or cloth having a surface of sand, emery or corundum for grinding, or a fabric adapted for polishing.

The object of my invention is to improve the construction of a grinding or polishing wheel or roll, whereby a flexible abrasive or polishing material is detachably secured on the peripheral surface of the wheel or roll and the slack of the abrasive or polishing material (caused by the same coming into contact with the work) automatically taken up by mechanism operated by the centrifugal force of the revolving wheel or roll.

My invention consists in the peculiar and novel construction of a grinding or polishing wheel or roll having mechanism operated by the centrifugal force of the revolving wheel or roll, whereby a flexible abrasive or polishing material is detachably secured on the peripheral surface of the wheel or roll and the slack of the same automatically taken up, said grinding or polishing wheel or roll having details of construction, as will be more fully set forth hereinafter and claimed.

Figure 1 is a face view of my improved grinding or polishing wheel, showing a strip of flexible grinding material secured on the peripheral face of the same. Fig. 2 is an end view of the wheel, showing the end plate partly broken away to show the counter-balanced portion of the wheel. Fig. 3 is an enlarged vertical sectional view taken on line 3 3 of Fig. 2, showing the construction of the automatic take-up mechanism. Fig. 4 is an enlarged sectional view taken on line 4 4 of Fig. 3, showing the automatic take-up mechanism in its operative position. Figs.

5, 6 and 7 are still further enlarged detail views, showing the roll at the edge of the slot in the peripheral face of the wheel, the means for detachably securing one end of the abrasive or polishing material to the lever of the automatic take-up mechanism and the means for detachably securing the other end of the abrasive or polishing material to the roll respectively.

In the drawings, *a* indicates a shaft, *b* a hollow cylindrical wheel, *c* an automatic take-up mechanism and *d* a strip of flexible abrasive material detachably secured on the peripheral surface of the wheel by detachably securing one end to the wheel and the other end to the automatic take-up mechanism *c*.

The shaft *a* is supported in suitable bearings (not shown) and revolved at a high rate of speed by any usual means.

The wheel *b* is constructed to have a central hub 8 secured to the shaft *a*, a closed end 9, an annular flange 10 in the peripheral face of which is a transverse slot 11 parallel with the shaft *a*, a thickened transverse rib 12 having a curved inner face 13 merging into a rounded edge 14 forming one edge of the slot 11, and a transverse slit 15 in the curved inner face 13 extending into a tubular transverse hole 16 in the rib 12, a thickened transverse rib 17 having a curved inner face 18, a roll 19 rotatably supported in the rib 17 and forming the opposite edge of the slot 11, an opening 20 formed in the edge of the end 9 on a line with the slot 11 and a thickened counterweighted portion 21 on the inner face of the flange 10 opposite the slot 11 and shown in Figs. 2, 3 and 4. A circular end plate 22, having a central hole 23 for the shaft *a*, a curved slot 24, and an opening 25 corresponding to the opening 20 in the edge of the end 9, is secured to the edge of the flange 10 by screws in a position for the opening 25 to coincide with the opening 20, as shown in Figs. 2 and 3.

The automatic take-up mechanism *c* consists of a stud 26 secured to the end 9 parallel with the shaft *a* and under the slot 11, a bent lever 27 pivotally supported adjacent its center on the stud 26 and having a weighted inner end 28 and an outer end 29

the width of which is approximately the interior width of the wheel. The outer end 29 of the lever 27 is constructed to have a tubular hole 30 extending through the width of the end and a slit 31 extending from the tubular hole 30 out through the end, as shown in Figs. 4 and 6. A coiled spring 32 is connected to the end 29 of the lever 27 under the transverse rib 17 and to a stud 33 secured to the end 9 of the wheel, as shown in Fig. 4.

The abrasive material *d* consists of a strip of paper or cloth covered on one surface with an abrasive substance, such as sand, emery or corundum, and having the beaded ends 34 and 35 formed by clamping a strip of metal over the ends and then folding the strip of metal, as shown in Figs. 6 and 7.

The strip of abrasive material *d* is secured on the peripheral surface of the wheel by sliding the beaded end 34 through either of the openings 20 or 25 into the tubular hole 16, with the adjacent portion of the strip extending out through the slit 15, over the curved inner face 13 and rounded edge 14, and out through the slot 11, as shown in Figs. 4 and 7. The strip of abrasive material is now wrapped around the peripheral surface of the wheel, a suitable tool inserted through the curved slot 24 in the plate 22 against the spring side of the lever 27 and the end 29 of the lever moved into a central position under the slot 11 against the tension of the coiled spring 32. The beaded end 35 of the strip of abrasive material is now secured to the end 29 of the lever 27 by sliding the same into the cylindrical hole 30 in the end of the lever with the adjacent portion of the strip extending through the slot 11 and over the roll 19. The lever 27 is now released, when through the tension of the spring 32 the end 29 of the lever and the beaded end 35 of the strip *d* are pulled toward the stud 33, thereby drawing the strip of abrasive material closely onto the peripheral surface of the wheel. When in use the wheel is revolved at a high rate of speed in the direction of the arrow, as shown in Figs. 2 and 4. The centrifugal force of the revolving wheel acts on the take-up mechanism *c* to throw the weighted end 28 of the lever 27 outward or away from the center of the wheel, thereby moving the end 29 of the lever in the direction in which the wheel is revolving and automatically taking up the slack of the strip of abrasive material *d* caused by the same stretching through coming into contact with the work. The roll 19 materially assists the movement of the strip of abrasive material around the edge of the slot 11 and the coiled spring 32 could have sufficient tension only to hold the take-up mechanism in its operative position, when it

can be readily seen that after the wheel has started to revolve, the action of this spring is practically eliminated, or the spring could have sufficient force to materially assist the take-up action of the take-up mechanism.

It is evident that the structural details of the take-up mechanism *c* could be varied without materially affecting the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent;—

1. A grinding or polishing wheel having a hub adapted to be secured to a shaft, a closed end, an annular flange on the closed end forming the peripheral face of the wheel, a transverse slot in the flange parallel with the hub, an automatic take-up mechanism consisting of a weighted lever having its fulcrum adjacent its center and operated by centrifugal force, a spring for holding the lever in operative position, a strip of abrasive or polishing material on the peripheral face of the wheel, means for securing one end of the abrasive or polishing material to the inner face of the annular flange, and means for securing the other end of the abrasive or polishing material to the weighted lever forming the automatic take-up mechanism.

2. A grinding or polishing wheel having a hub adapted to be secured to a shaft, a closed end, an annular flange on the closed end forming the peripheral face of the wheel, a transverse slot in the flange, an automatic take-up mechanism consisting of a pivoted lever weighted at its inner end and operated by centrifugal force, a strip of abrasive or polishing material on the peripheral face of the wheel, means for securing one end of the abrasive or polishing material to the inner face of the annular flange through the transverse slot, means for securing the other end of the abrasive or polishing material to the outer end of the weighted lever through the transverse slot, and a spring for holding the weighted lever in operative position.

3. In a grinding or polishing wheel, the combination of a shaft *a*, a hollow cylindrical wheel *b* having a central hub 8, a closed end 9, an annular flange 10 in the peripheral face of which is a transverse slot 11, a transverse rib 12 having a rounded edge 14 forming one edge of the slot 11, and a slit 15 extending into a tubular hole 16 in the rib 12, a transverse rib 17, a roll 19 rotatably supported in the rib 17 and forming the opposite edge of the slot 11, an opening 20 formed in the edge of the end 9, a thickened counterweighted portion 21 on the flange 10, a circular end plate 22 having a central hole 23 for the shaft *a*, a curved slot 24 and an opening in its edge, an automatic take-up

mechanism *c* consisting of a stud 26 secured to the end 9, a lever 27 pivotally supported adjacent its center on the stud 26 and having a weighted inner end 28 and an outer end 29 in which is a tubular hole 30 and a slit 31 extending from the hole 30 out through the end of the lever, a coiled spring 32 connected to the end 29 of the lever 27 and to a stud 33 secured to the end 9 of the wheel, and an abrasive material *d* consisting

of a strip of paper or cloth covered with an abrasive substance and having the beaded ends 34 and 35, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CYRA B. WATTLES.

Witnesses:

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J. A. MILLER.