

A. E. AYER.  
GRINDING MACHINE.  
APPLICATION FILED MAR. 23, 1908.

910,984.

Patented Jan. 26, 1909.

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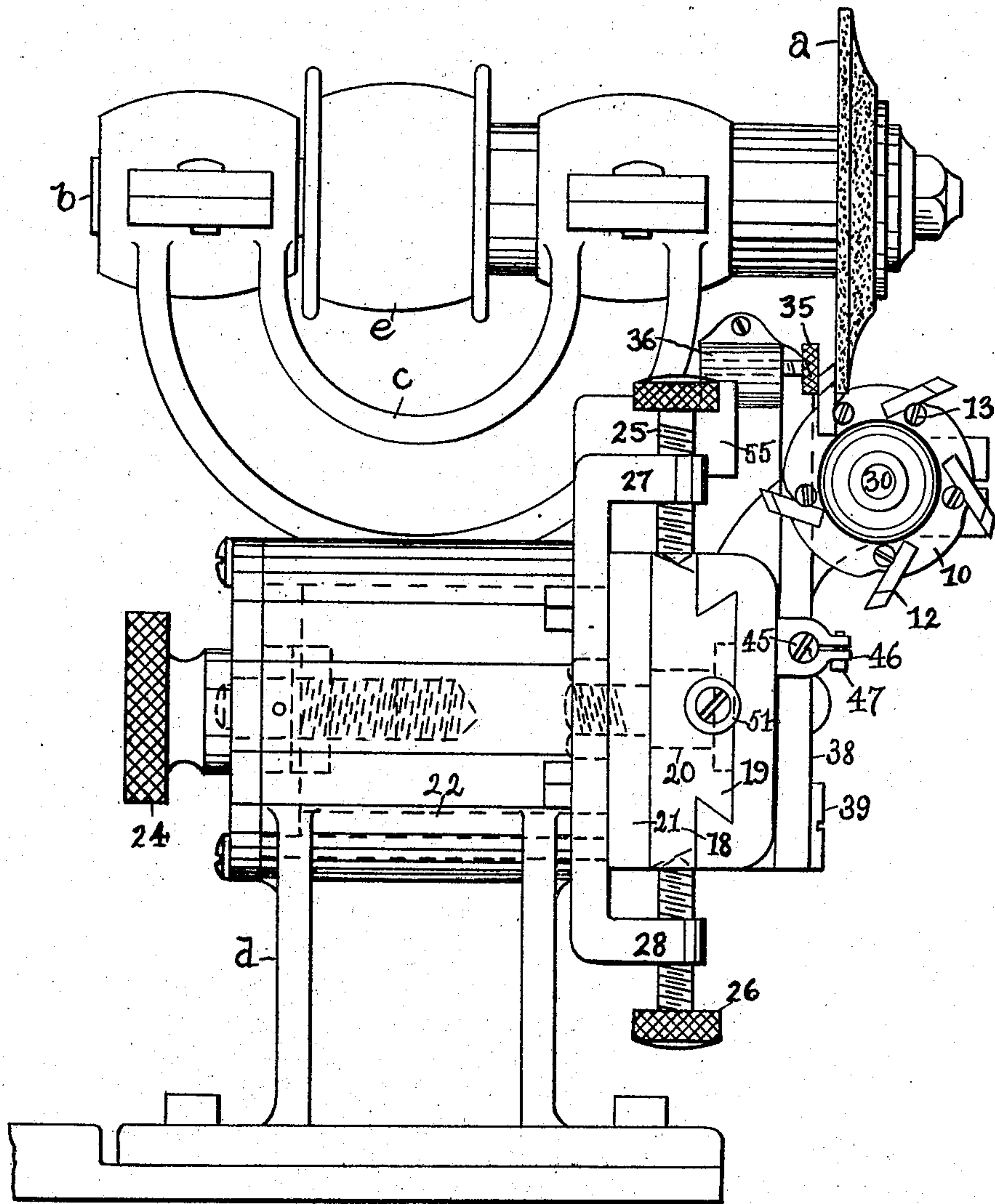


Fig. 1.

Witnesses.

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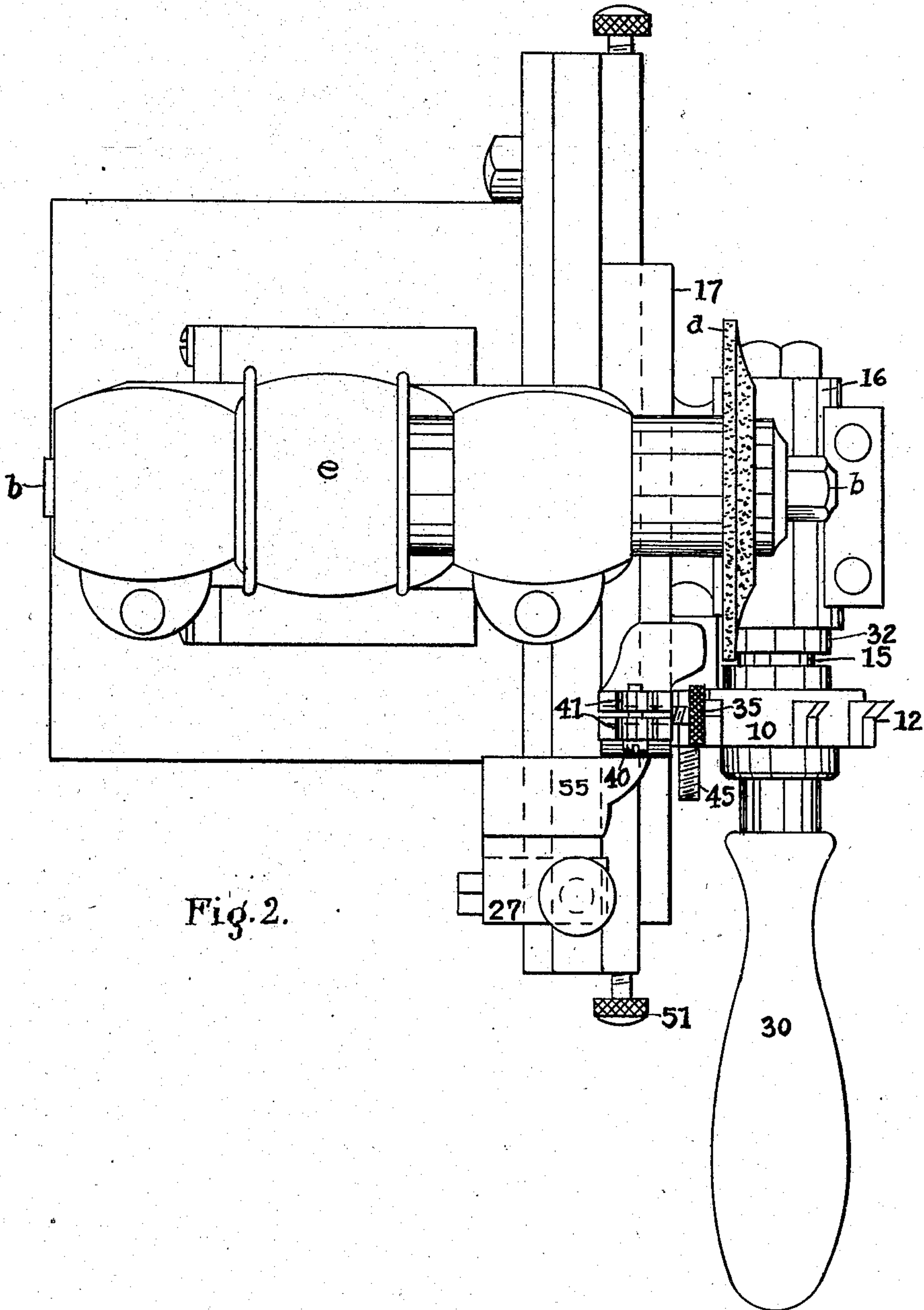


Fig. 2.

Witnesses.  
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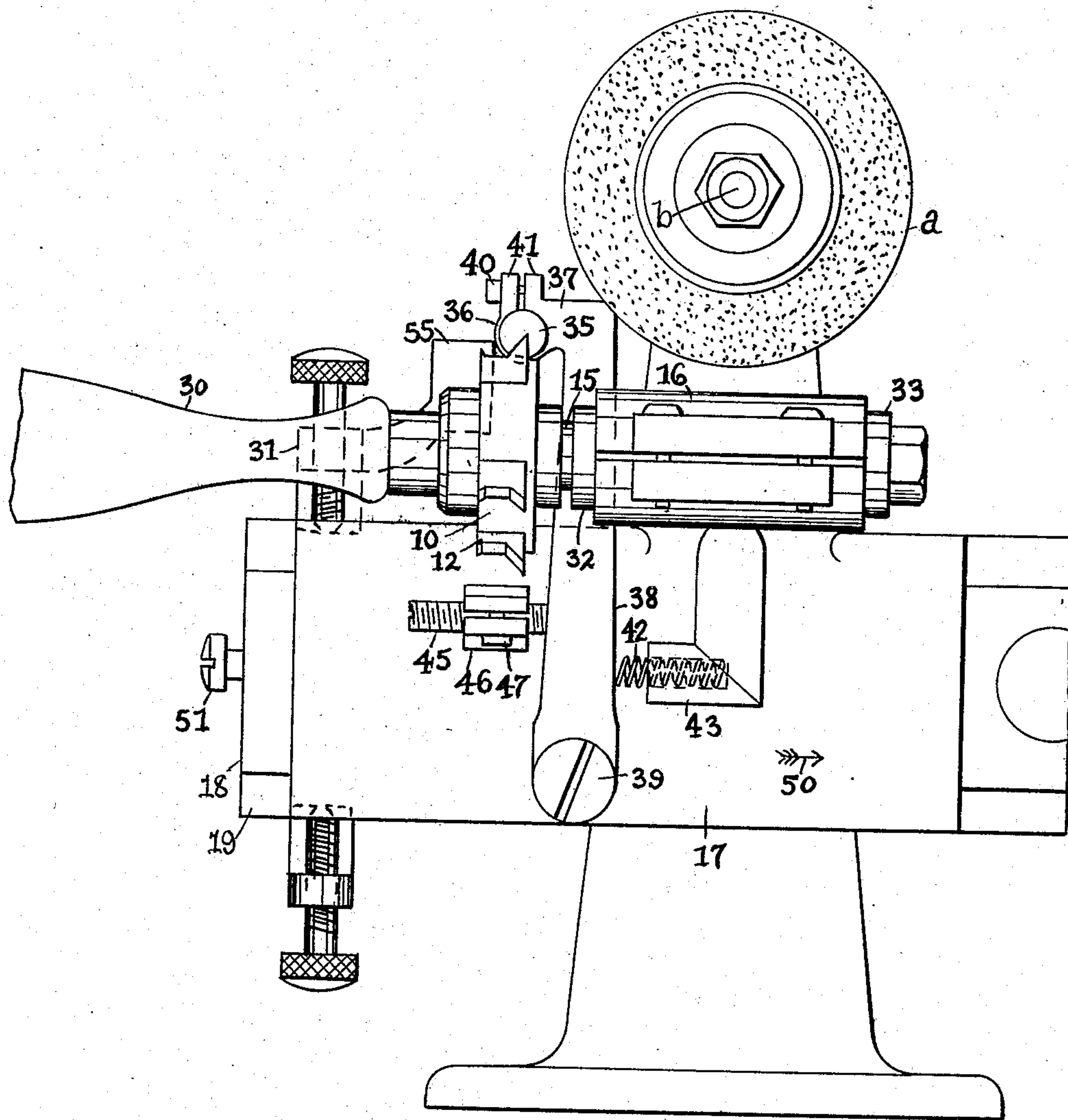


Fig. 3.

Witnesses.

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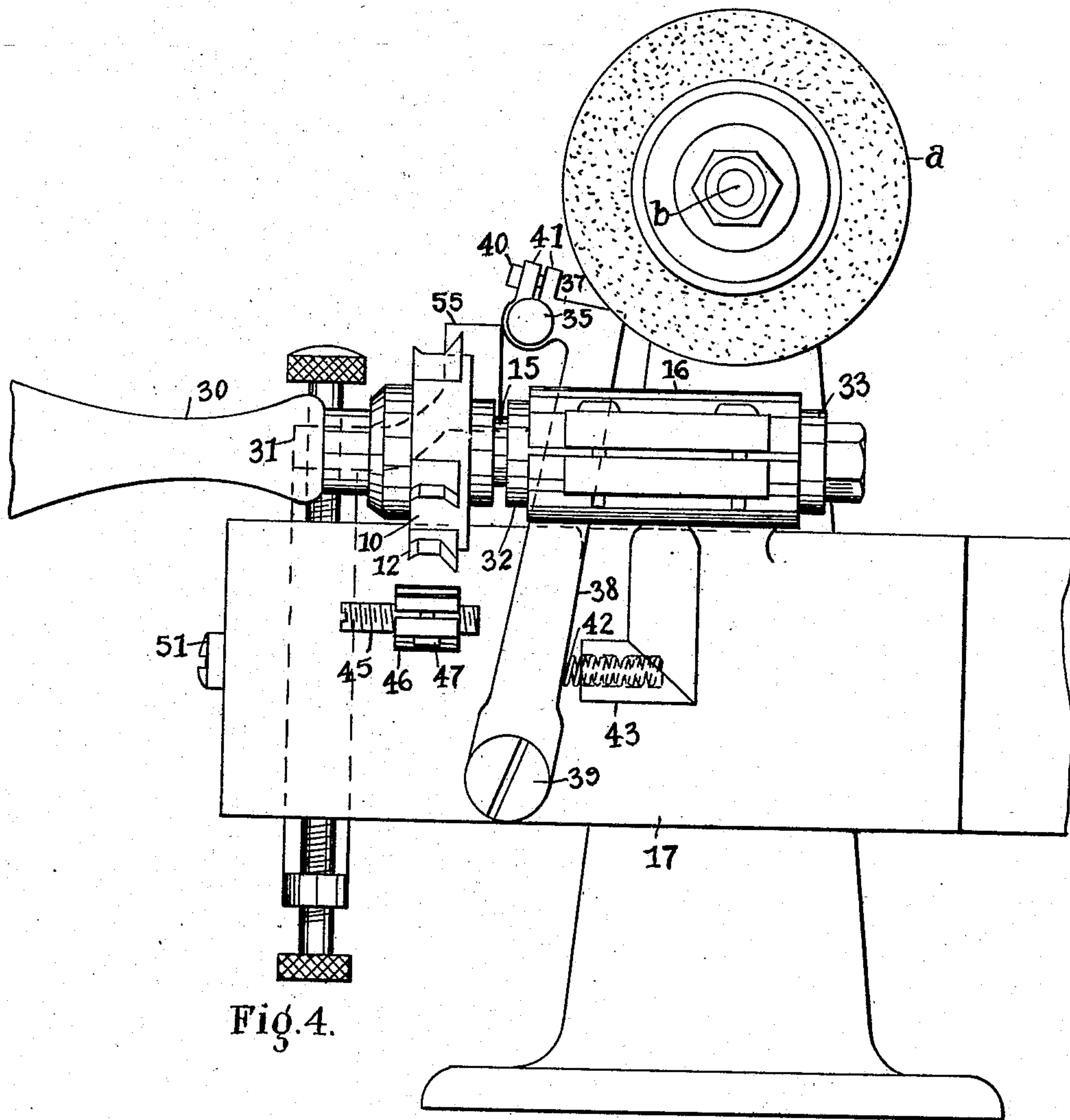


Fig. 4.

Witnesses.

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# UNITED STATES PATENT OFFICE.

ALBERT E. AYER, OF CHELSEA, MASSACHUSETTS, ASSIGNOR TO RUTH L. VOSE, OF  
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## GRINDING-MACHINE.

No. 910,984.

Specification of Letters Patent.

Patented Jan. 26, 1909.

Application filed March 23, 1908. Serial No. 422,582.

*To all whom it may concern:*

Be it known that I, ALBERT E. AYER, a citizen of the United States, residing in Chelsea, county of Suffolk, and State of Massachusetts, have invented an Improvement in Grinding-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a grinding machine especially adapted among other uses, to be employed for grinding the knives of a rotary cutter, such as now commonly employed for trimming the edges of the soles and heels of boots and shoes.

The present invention has for its object to provide a simple and efficient machine, with which the knives may be quickly and accurately ground. For this purpose, the rotary cutter is mounted on a rotatable shaft, supported in bearings in a support or carrier movable across the grinder, and said cutter coöperates with a gage, which is movable with the said carrier or support toward said grinder, so as to back up the cutter while it is being ground. Provision is made for moving the carrier or support independently of the gage, so that the rotary cutter may be moved out of engagement with the gage, to permit it and its shaft to be rotated to bring another or unground knife into its grinding position, as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of a grinding machine embodying this invention. Fig. 2, a plan view of the machine shown in Fig. 1. Fig. 3, an end elevation of the machine shown in Fig. 1, and Fig. 4, an end elevation showing the rotary cutter in what may be termed its turning position.

In the present instance, the invention is shown in a machine provided with a grinding disk or wheel *a*, which is mounted on a shaft *b*, journaled in a yoke *c* secured to or forming part of an upright frame *d*, which supports the operative parts. The shaft *b* is provided as shown with a pulley *e*, by means of which said shaft is rotated by a belt (not shown). The grinding wheel *a* is designed to grind a rotary cutter, such, for instance, as is now commonly employed in trimming the edges

of the soles and heels of boots and shoes, and, in the present instance, one form of such cutter is shown, which comprises a head 10 having a plurality of knives 12 extended from the periphery of the same. The knives 12 may be set into slots in the periphery of the head 10 and secured therein by screws 13, as herein shown.

The cutter head 10 is detachably mounted on a shaft 15 rotatably supported in a substantially long bearing 16, secured to a carrier or bar 17, which is movable in a direction substantially at right angles to the grinder shaft *b*. The carrier 17 is mounted to slide on a support, shown as a bar 18, having a rib 19, upon which said carrier is dovetailed. The bar 18 may be vertically movable, and as shown is pivoted at 20 to a plate or bar 21, having extended from it substantially near its center a bar 22, which is mounted to slide in a guideway in the upright frame *d*. The bar 22 may be adjusted by the thumb-screw 24. The guide bar 18 may be turned on its pivot 20 by manipulating the set screws 25, 26, (see Fig. 1) extended through lugs 27, 28, on the plate 21. The cutter carrying shaft 15 is designed to be rotated in its bearing 16 by the operator, and for this purpose, a handle 30 is screwed upon the end 31 of said shaft. The shaft 15 is free to be rotated in its bearing 16, but is held from longitudinal movement therein by collars 32, 33, which engage the ends of the said bearing, and serve as means for moving the bearing and the carrier 17 toward and away from the grinder, when the operator pushes or pulls upon the handle 30.

Provision is made for positioning the individual cutters or knives with relation to the grinder and for backing up or supporting the said cutters or knives while being ground. For this purpose, I employ a gage which is movable with the carrier 17, yet is capable of being held against movement with the same. The gage referred to is shown as a thumb-screw 35 adapted to engage a threaded socket in a split boss or hub 36 attached to an arm 37 on a lever 38, which is pivoted at its lower end as at 39 to the front face of the carrier 17. The thumb-screw 35 is capable of being turned into or out of the threaded hub 36 so as to adjust the head of the screw into proper working position with relation to the



grinder, and said screw or gage, may then be clamped in its hub and thus secured against accidental movement, by the clamping screw 40, which is extended through the ears 5 41 on the split hub or boss 36 (see Fig. 3).

The gage lever 38 is normally held in a fixed relation to the carrier 17 by a spring 42 located in a socket in a boss 43 attached to the carrier 17, and normally forcing the said 10 lever against an adjustable back stop 45 movable in a split boss 46 on the said carrier. The back stop 45 is adjustable in the boss 46 and is secured in its adjusted position by the clamping screw 47. Normally the lever 38 15 occupies a substantially vertical position as represented in Fig. 3, with the gage 35 in the path of rotation of the knives 12 on the cutter head 10, and by adjusting the gage 35 with relation to the grinder *a*, the knife en- 20 gaging the gage is properly positioned with relation to the grinder, so as to cause the desired amount of the front face of the knife to be removed by the grinder, to leave the front face substantially parallel with the back of 25 the knife and to have all the knives of uniform thickness, and as a result, the cutting edges of all the knives cut to the same depth in the stock.

When the knife to be ground is in engagement with the gage, as shown in Figs. 1 and 30 3, the operator pushes upon the handle 30 so as to move the carrier 17 in the direction indicated by the arrow 50, Fig. 3, and thereby carry the knife up to and beyond the 35 grinder, which removes the front face thereof and leaves the knife with a sharp cutting edge. The carrier 17 is moved so as to preferably carry the knife beyond the grinder, and on this movement of the knife, the latter 40 is held against the gage, by the operator through the handle 30. After one knife has been ground as described, the operator pulls upon the handle 30 and thus draws the carrier backward or in the direction opposite to 45 that indicated by the arrow 50, and preferably until the said carrier is brought up against a stop or set screw 51 carried by the supporting bar 18. On the backward movement of the carrier 17, the gage 35 and its 50 supporting lever 38 are moved with it, for a part of the travel of said carrier, and as herein shown, until the boss 36 engages a fixed stop 55, shown as a lug or projection on the framework of the machine. On the continued 55 backward movement of the carrier 17, the upper part of the lever 38 practically remains stationary, and the lower part moves with the carrier and assumes substantially the position shown in Fig. 4, in which position, it 60 will be noticed, that the carrier has been moved backward so that the rotary cutter is out of line with the gage 35 and is free to be rotated to bring an unground knife into position to engage the gage when the handle 30

is again pushed forward, so as to bring the 65 parts into their normal or starting position shown in Fig. 3, after which the carrier and gage with the knife held against the gage, is moved forward to bring the knife into en- 70 gagement with the grinder, as above described. It will thus be seen that the gage and the carrier are moved forward simultaneously, and that on the backward movement, the carrier is capable of being moved 75 independently of the gage, so as to move the knife out of engagement with the gage and permit the cutter head to be turned and bring an unground knife into operative relation to the gage. In this manner, all the 80 knives are ground uniformly and in the least possible time, with minimum inconvenience to the operator.

#### Claims—

1. In a machine of the character described, in combination, a rotatable grinder, a rotatable 85 cutter-carrying-shaft arranged substantially at right angles to said grinder and capable of having a cutter attached thereto to rotate therewith, a support for said grinder, a carrier for said shaft movable toward and 90 from said grinder, a lever pivoted to said carrier, means to hold said lever in a substantially fixed relation to said carrier while the latter is moving toward said grinder, a gage 95 carried by said lever and cooperating with said cutter and engaged thereby while said cutter is being ground, and means cooperating with said lever to permit the carrier to be moved independently of the gage to re- 100 move the cutter from engagement with the said gage and enable it to be rotated, for the purpose specified.

2. In a machine of the character described, in combination, a rotatable grinder, a rotatable 105 cutter-carrying-shaft arranged substantially at right angles to said grinder and capable of having a cutter attached thereto to rotate therewith, a support for said grinder, a carrier for said shaft movable toward and 110 from said grinder, a lever pivoted at its lower end to said carrier, a gage adjustably secured to the free end of said lever, a back stop on the carrier cooperating with said lever, a 115 spring carried by said carrier to normally hold said lever against its back stop, and a stop cooperating with the free end of the said lever, to render the gage stationary and enable the cutter to be moved out of line therewith, substantially as described.

3. In a machine of the character described, 120 in combination, a rotatable shaft, a grinding wheel mounted thereon, a rotatable cutter-carrying-shaft capable of having mounted thereon a cutter head provided with a plurality of knives or cutters, a carrier for said 125 cutter-shaft substantially at right angles to the said grinder shaft, a gage for the cutters normally in the path of rotation of the same,



and movable with the carrier toward the grinding wheel to back up the knife being ground, and means coöperating with said gage to permit the carrier to be moved independently thereof to disengage the ground cutter from said gage and enable an underground cutter to be engaged therewith, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of 10 two subscribing witnesses.

ALBERT E. AYER.

Witnesses:

JAS. H. CHURCHILL,  
J. MURPHY.