

No. 664,504.

Patented Dec. 25, 1900.

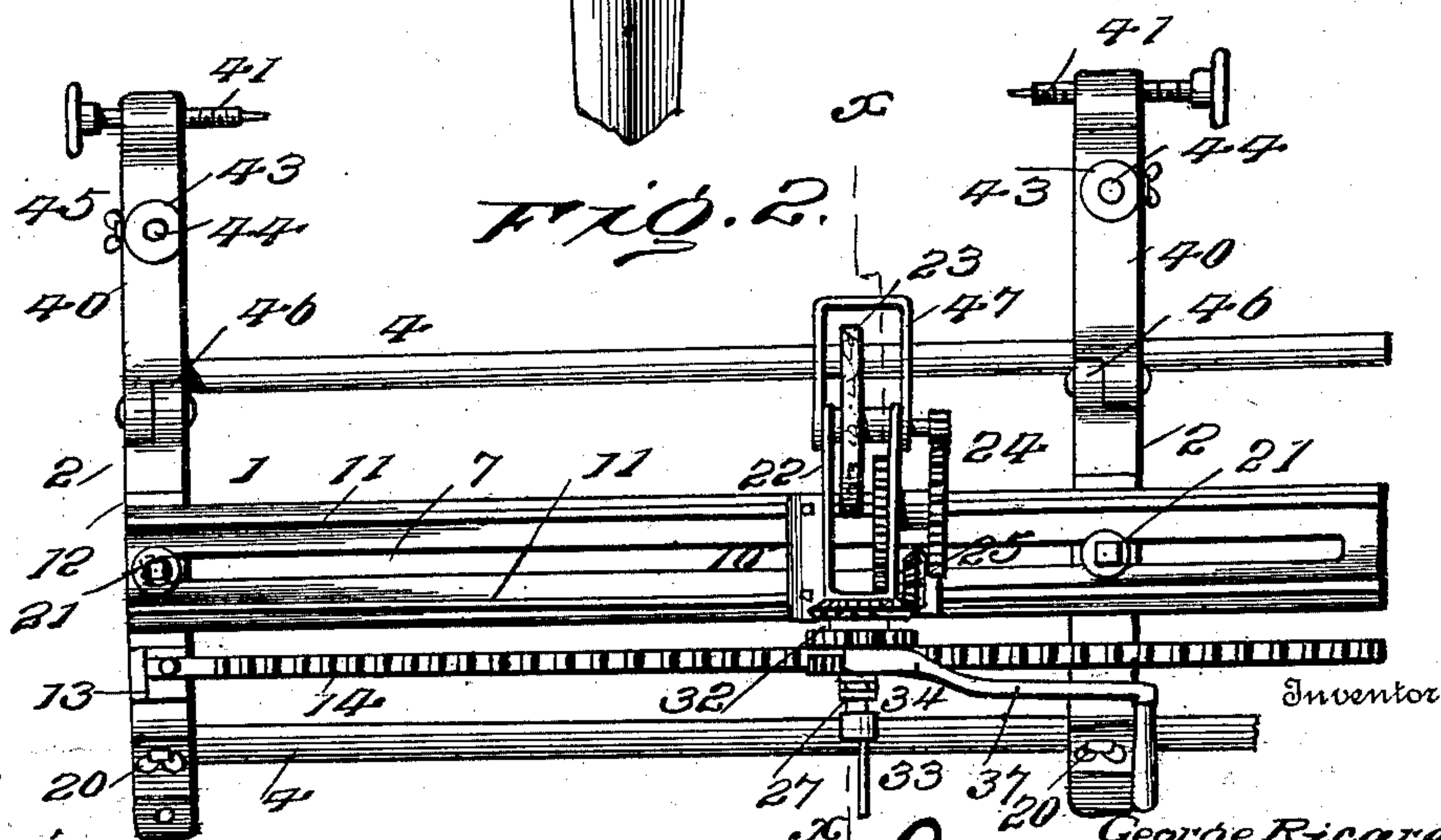
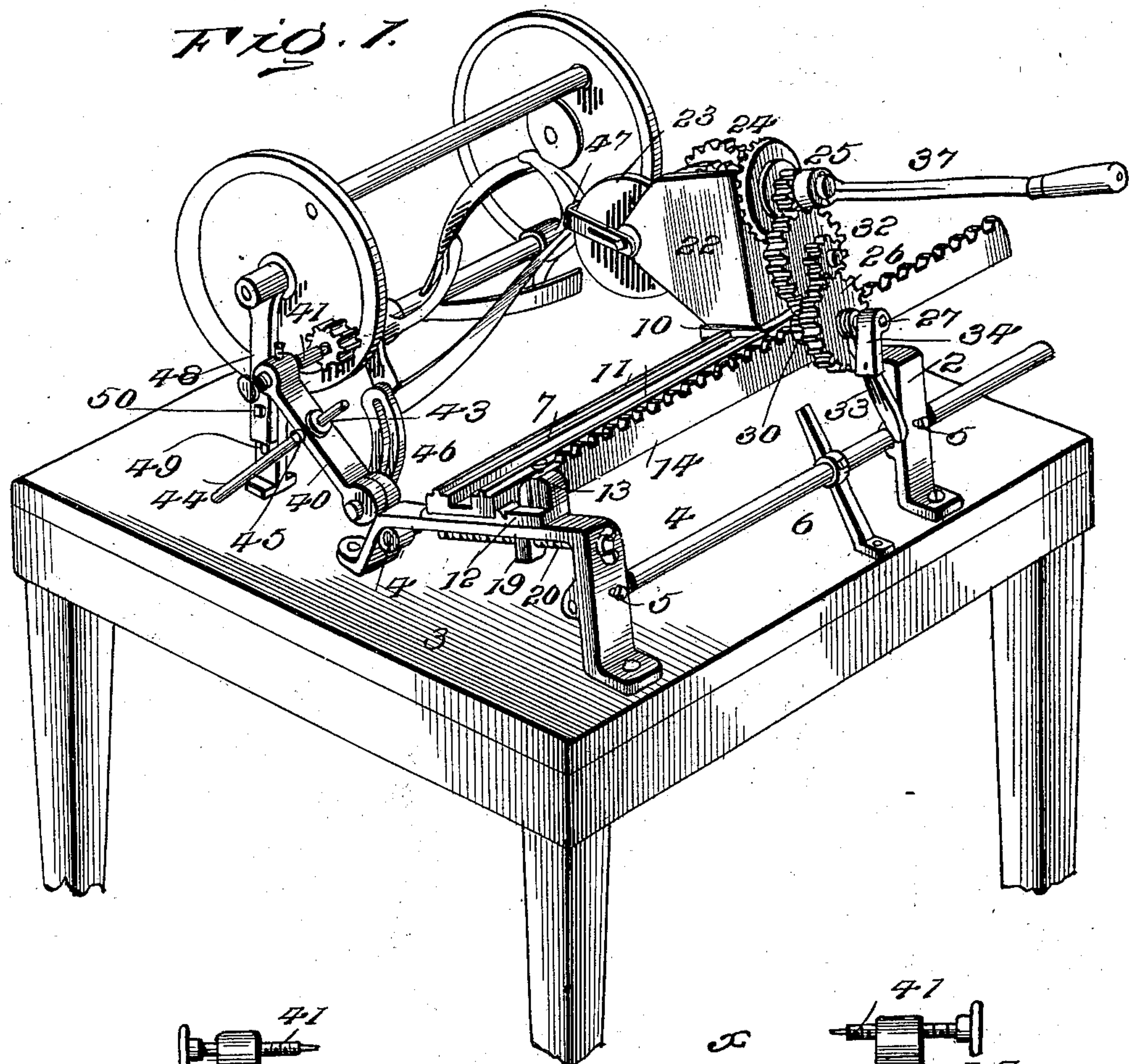
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APPARATUS FOR SHARPENING LAWN MOWERS.

(Application filed Mar. 7, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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UNITED STATES PATENT OFFICE.

GEORGE RICARDO, OF HACKENSACK, NEW JERSEY.

APPARATUS FOR SHARPENING LAWN-MOWERS.

SPECIFICATION forming part of Letters Patent No. 664,504, dated December 25, 1900.

Application filed March 7, 1900. Serial No. 7,702. (No model.)

To all whom it may concern:

Be it known that I, GEORGE RICARDO, a citizen of the United States, residing at Hackensack, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Sharpening Lawn-Mowers; 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.

This invention relates to apparatus for sharpening the cutting mechanism of mowers without requiring the removal of the cutter from the mower, whereby the operation is greatly facilitated and the edges of the blades brought to the same circumferential plane, which is essential to the subsequent effective operation of the mechanism.

For a full description of the invention and the merits thereof, and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and the drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the improved grinding-machine, showing the cutting apparatus of a lawn-mower in position to be sharpened. Fig. 2 is a top plan view. Fig. 3 is an end view. Fig. 4 is a section on the line X X of Fig. 2 looking in the direction of the arrow. Fig. 5 is a detail view of the centering device for the shaft of the rotary cutter. Fig. 6 is a detail view of slide. Fig. 7 is a detail section, similar to Fig. 4, on a larger scale, omitting the frame and the parts above the traveling base.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The bed 1 of the machine is mounted upon similarly-constructed end standards 2, whose top sides incline. The standards are footed and secured to a bench, table, or like support 3 and are connected by tie-rods 4, the latter passing through openings formed in the leg

portions of the standards and secured in an adjusted position by means of binding-screws 5. The standards 2 may be spaced apart any required distance, according to the length of blade of the cutting apparatus to be sharpened. Braces 6 are adjustably mounted upon the tie-rods 4 and are secured in an adjusted position, by means of binding-screws, in a manner similar to securing the tie-rods to the end standards. These braces 6 support the tie-rods at an intermediate point and stiffen the structure and prevent undue vibration thereof when in operation. The bed 1 is longitudinally slotted, as shown at 7, to receive the connecting-piece 8 of a slide 9, held against the lower side of the bed and secured to the base 10 of a frame carrying the actuating mechanism for the grinder and feeder. Ways 11 extend in parallel relation and are located upon opposite sides of the longitudinal slot 7 and are of approximately V form and serve to direct the base 10 in its reciprocating movements and to hold it upon the bed against lateral displacement.

The plate 12 is placed upon the top side of each standard 2 and is depressed to receive the bed 1 and is formed at one end with a pair of lugs 13, between which is received a rack-bar 14, extending parallel with the bed 1 and spaced therefrom. The plates 12 are held to the top portion of the standards 2 by means of bars 15 and fastening screws or bolts 16, the latter passing through the bars 15 and entering lugs 17, pendent from the plates 12 and working in longitudinal slots 18, formed in the top or inclined portion of the end brackets. Other lugs 19 are pendent from the opposite end portions of the plates 12 and enter the slots 18 and are threaded to receive feed-screws 20, which are connected near their outer ends with the longer legs of the standards by means of a swivel connection. The purpose of the feed-screws 20 is to move the bed and rack-bar across the standards, so as to adjust the grinder transversely with reference to the work and reciprocating movements of the head or frame carrying the actuating mechanism. The bed 1 is secured to each of the plates 12 by means of clamp-screws 21.

The head or frame 22 rising from the base 10 may be of any construction best adapted

to form a substantial support for the parts comprising the trains of gearing for operating the grinder and the feed mechanism. The grinder 23 may be an emery-wheel, stone, 5 or other material commonly employed for sharpening cutlery and edged tools and is secured to a shaft, which is connected by a train of gearing 24 with the master-wheel 25, to which the power is initially applied. The 10 train of gearing 24 may comprise any number of gear elements and is constructed for speed, so as to rotate the grinder 23 at a high speed. A gear-wheel 26 is slidably mounted upon a shaft or axle 27, projecting from the 15 base 10, and is provided upon its inner side with a half-clutch 28 and upon its outer side with an annularly-grooved extension 29. A pinion 30 is mounted upon the shaft 27 and is at all times in meshing relation with the 20 teeth of the rack-bar 14 and is provided with a half-clutch 31 to cooperate with the half-clutch 28, whereby the gear-wheel 26 and pinion 30 may rotate in unison. A train of gearing 32 connects the gear-wheel 26 with 25 the master-wheel 25 and is constructed so as to reduce the speed, whereby the pinion 30 rotates solely, so as not to cause the frame or head to move too rapidly over the bed. A shipper-lever 33 is fulcrumed to a standard 30 34, rising from a portion of the frame, and its inner end enters the annular groove of the part 29. Upon depressing the outer end of the shipper-lever 33 the gear-wheel 26 is moved outward upon the shaft 27 and the 35 half-clutch 28 is disengaged from the half-clutch 31, whereby the feed mechanism is thrown out of action. A dog 35 is pivoted to the standard 34 and is adapted to be turned so as to engage with one of two shoulders 36 40 of the shipper-lever and hold the latter in either of its extreme positions, so as to hold the gear-wheel 26 in or out of gear. When the clutch 28 31 is unshipped, the feeding mechanism for the head is thrown out of ac- 45 tion and the grinder 23 can be rotated and will occupy a relatively-fixed position with reference to the machine, thereby necessitating the work being advanced thereto. A crank 37 is operatively connected with the 50 master-wheel 25 and provides a convenient means for operating the machine by manual power.

The slide 9 is in the form of a plate having a centrally-disposed projection 8, which is 55 adapted to operate in the slot 7 of the bed and to which the base 10 is bolted or otherwise firmly attached. The top sides of the end portions of the slide 9 are grooved to receive gibs 38, which are seated therein and 60 which bear against the bottom side of the bed 1, said gibs being adjusted by means of set-screws 39, threaded into the end portions of the slide. By this means any lost motion or play between the bed and the base 10 can 65 be taken up and vibration from this source wholly obviated. It is also possible to use the parts 38 and 39 as clamping means for se-

curing the base 10 in any desired position in the length of the bed, it being understood that when the base is stationary the feed 70 mechanism must be thrown out of gear.

Arms 40 have pivotal connection with the standards 2, and their outer ends are provided with centers 41 to engage with and 75 hold the apparatus to be sharpened, said centers consisting of set-screws having their engaging ends pointed either to make direct connection with the shaft of the cutting apparatus or to receive a cup 42 constituting a 80 female center to receive the terminals of the shaft when the latter is not adapted to receive the male centers. The pivoted arms 40 are provided intermediate of their length with sleeves or apertured bosses 43, in which are 85 adjustably fitted supporting-rods 44, held in place by clamp-screws 45. By a proper adjustment of the arms 40 with reference to the rods 44 their outer ends may be raised or lowered, as desired. Any suitable means may 90 be employed for pivotally connecting the arms 40 with the standards 2, and, as shown, the latter are formed with offstanding ears 46, apertured to match with corresponding portions formed at the inner or pivotal ends 95 of the said arms, the overlapping parts being pivotally connected by bolts or like fastenings. The pivoted and adjustable arms 40 constitute work-holders, since the cutting apparatus is held between the centering device thereof. 100

When it is desired to sharpen the cutting apparatus of a lawn-mower, such as the rotary part, the shaft thereof is secured between the centering devices 41, as most clearly 105 shown in Fig. 1 of the drawings, it not being necessary to detach the blades from the arms or either to remove the rotary cutter from the frame. After the cutting apparatus has been positioned about as shown in Fig. 1 the 110 head or frame 22 is moved to a position in the length of the bed, so as to bring the grinder opposite the extremity of the blade to be sharpened, and the feed-screws 20 are turned, 115 so as to bring the grinder in contact with the blade. The grinder 37 is now rotated and motion is imparted to the grinder and feed mechanism in the manner stated, the head being gradually advanced to the opposite ends 120 of the blade as the sharpening progresses. When the blade has been sharpened throughout its length, the feed mechanism is thrown out of gear by operating the shipper-lever 33, and the head 22 is moved back to the 125 starting-point, so as to sharpen the next blade, which is brought in position by turning the rotary cutter upon its axis, as will be readily comprehended.

A rest 47 has adjustable connection with the head or frame 22 and projects beyond the periphery of the grinder, so as to extend over 130 the blade being sharpened and hold it in place during the grinding operation. The tendency of the blade is to move upward. Hence as the head advances along the bed the blade is

moved upward by the abrasive action of the grinder thereon, the upward feed of the blade being automatic as well as the longitudinal feed of the grinding mechanism.

5 When the frame of the mowing-machine is carried to the grinding apparatus, it is supported by means of posts 48, whose upper ends are forked to receive the bearings projecting outwardly therefrom, as shown most
10 clearly in Fig. 1. These posts 48 are adjustable in length and are composed of two parts having their inner ends overlapped, one of the parts being slotted, as shown at 49, to receive the bolt 50, by means of which the parts
15 are secured in an adjusted position.

Having thus described the invention, what is claimed as new is—

1. In a grinding-machine of the character described, a bed, a rack-bar parallel with the
20 bed, a head movable upon the bed and provided with a rotary grinder, a master-wheel, a train of gearing connecting the master-wheel with the grinder, a pinion intermeshing with the teeth of the rack-bar, a reducing train of gearing connecting the master-wheel with the said pinion, a clutch interposed between the pinion and train of gear-
25 ing, and a shipper-lever constructed to shift the gear-wheel into and out of clutched engagement with said pinion, and means for securing the lever in either position.

2. In a grinding-machine of the character specified, end standards, tie-rods connecting said standards, the standards being adjust-
35 able on the tie-rods to vary the distance between them, a bed adjustably supported by the standards, and a head mounted on the bed and provided with a rotary grinder.

3. In a grinding-machine of the character
40 described, end standards, tie-rods connecting said standards, the standards being adjustable on the tie-rods to vary the distance between them, a bed, a rack-bar supported by the standards in parallel relation and adapted
45 to be positively connected therewith in any adjusted position within the range of movement of the standards, a head mounted upon the bed and provided with a rotary grinder, and means cooperating with the rack-bar for
50 effecting a movement of the head upon the bed simultaneously with the action of the grinder, substantially as specified.

4. In a machine of the character described, a support having its top side sloping or in-
55 clined transversely with reference to the length of the machine, a bed mounted upon the support, means for adjusting the bed laterally, and a head movable longitudinally upon the bed and laterally therewith and comprising a rotary grinder and actuating mechanism therefor, substantially as set forth.

5. In a machine of the character described, a longitudinally-slotted bed, a head mounted
60 upon the bed and adapted to travel thereon and provided with a rotary grinder and actuating mechanism therefor, a slide underlapping the bed and having a portion operating

in the longitudinal slot thereof and connected with the aforesaid head, gibs interposed be-
70 tween the bottom side of the bed and the adjacent portions of the slide, and means for adjusting the gibs to take up wear and prevent any play between the head and bed, substantially as set forth.

6. In combination, a longitudinally-slotted
75 bed, a head mounted to travel upon the bed and provided with a rotary grinder and actuating mechanism therefor, a slide having portions underlapping the bed and a part operating in the slot thereof and connected to the
80 said head, gibs seated in grooves or depressions formed in the top side of the slide, and set-screws for adjusting the gibs, substantially as set forth.

7. In combination, a support having trans-
85 verse slots, a longitudinally-slotted bed having pendent portions operating in the transverse slots of the support, means for securing the bed to the support and cooperating with the slots thereof, feed-screws applied to the
90 support and adapted to effect a lateral shifting of the bed, and a head mounted upon the bed to travel longitudinally thereon and provided with a rotary grinder and actuating mechanism therefor, substantially as set forth.

8. In a machine of the character described, a support having a slot extending transversely
100 of the machine, a plate slidably mounted upon the support and having pendent lugs passing through the slot of the support, means applied to one of the lugs for securing the plate to the support, a feed-screw cooperating with the
105 other lug and with the support, a bed secured to the plate and movable therewith, and a head provided with a grinder and mounted upon the said bed, substantially as set forth.

9. In combination, end supports having their upper portions slotted, plates mounted
110 upon the standards and having pendent lugs, means applied to one of the lugs for securing the plates upon the standards, feed-screws cooperating with the other lugs and having a swivel connection with the standards, a bed
115 secured to the plates and movable transversely therewith, and a head mounted upon the bed to travel thereon and provided with a rotary grinder, substantially as set forth.

10. In a grinding apparatus of the character described, end standards, a plate seated
120 on said standards, means for adjusting said plate lengthwise of the standards, said plate being formed with spaced lugs and with a depression, a rack-bar held between the lugs, a bed adjustably secured in said depressions,
125 a head mounted on the bed and provided with a grinder, and feed mechanism for moving said head in relation to the bed.

11. In combination, a support, a framework secured thereto and having suitable grinding
130 mechanism, a supporting-rod bearing on the support, a work-holder having pivotal connection with the framework, said rod having adjustable connection with the work-holder.

12. In combination with a framework pro-

vided with a grinding device, a support to which the framework is secured, arms having pivotal connection with the framework and provided at their free ends with centering devices, and rods having adjustable connection with the pivoted arms and bearing on said support.

13. In combination with a frame for grinding apparatus, a support to which said frame is secured, arms having pivotal connection with the frame, centering devices having adjustable connection with the free ends of the arms to receive the work, and supporting-rods adjustably connected with the arms intermediate their ends and bearing on said support.

14. In combination with the frame of a grinding apparatus, a support therefor, an adjustable work-holder connected with the frame, and posts adjustably cooperating with the work-holder and bearing on said support,

said posts passing through the work-holder intermediate its ends.

15. In a grinding apparatus of the character described, end standards relatively adjustable toward and from each other, a bed adjustably supported by the standards and carrying the grinding mechanism, arms having pivotal connection with the end standards and provided at their ends with means for supporting the work, and means cooperating with the pivoted arms to hold them in adjusted position, said means comprising posts adjustably connected with the arms and bearing on a separate support.

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

GEORGE RICARDO. [L. S.]

Witnesses:

JOHN QUACKENBUSH,
HUBERT G. DE WOLF.