F. N. & F. E. GARDNER.

DISK GRINDER.

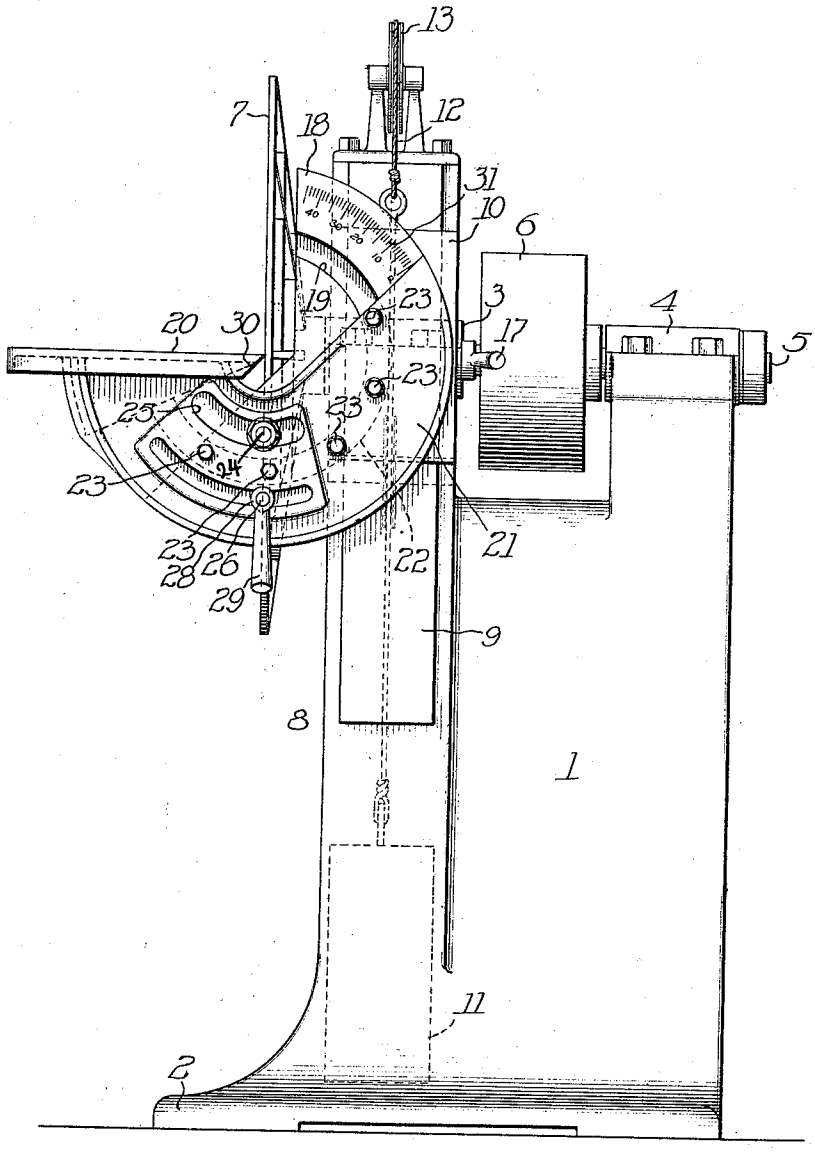
APPLICATION FILED NOV. 18, 1909.

1,013,760.

Patented Jan. 2, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



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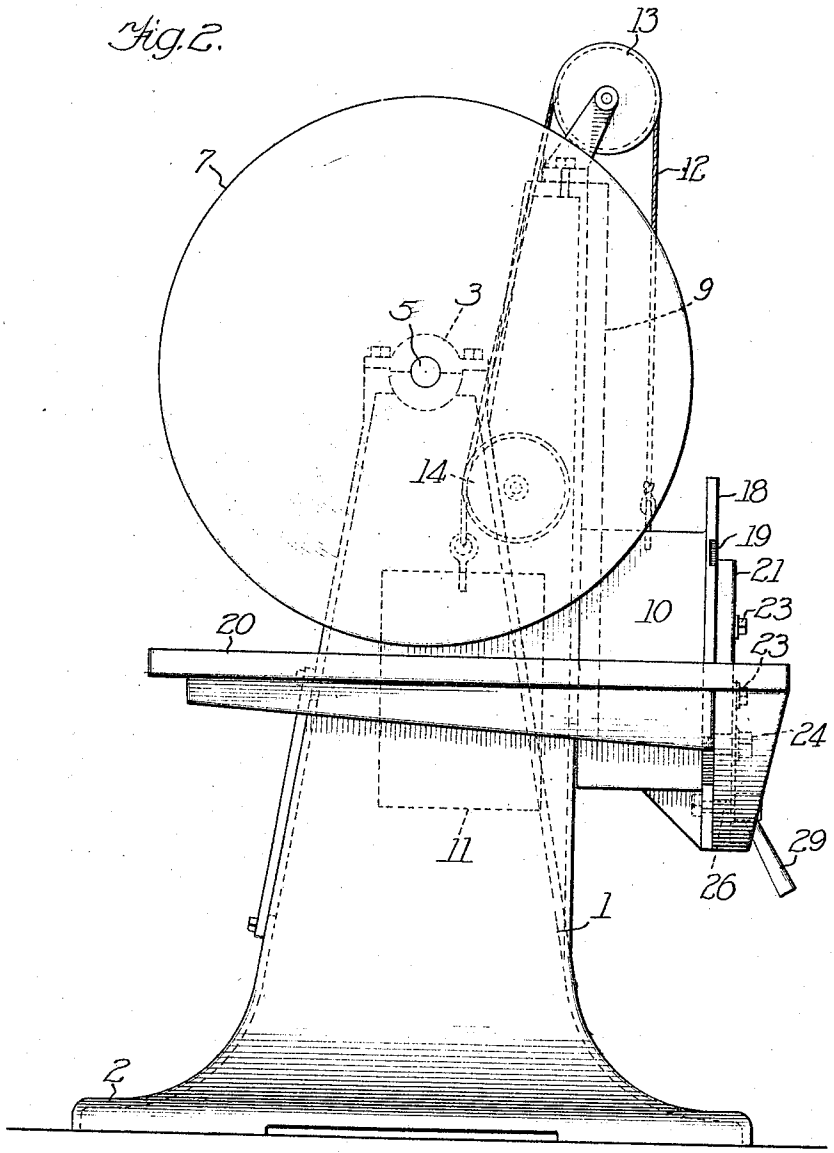
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

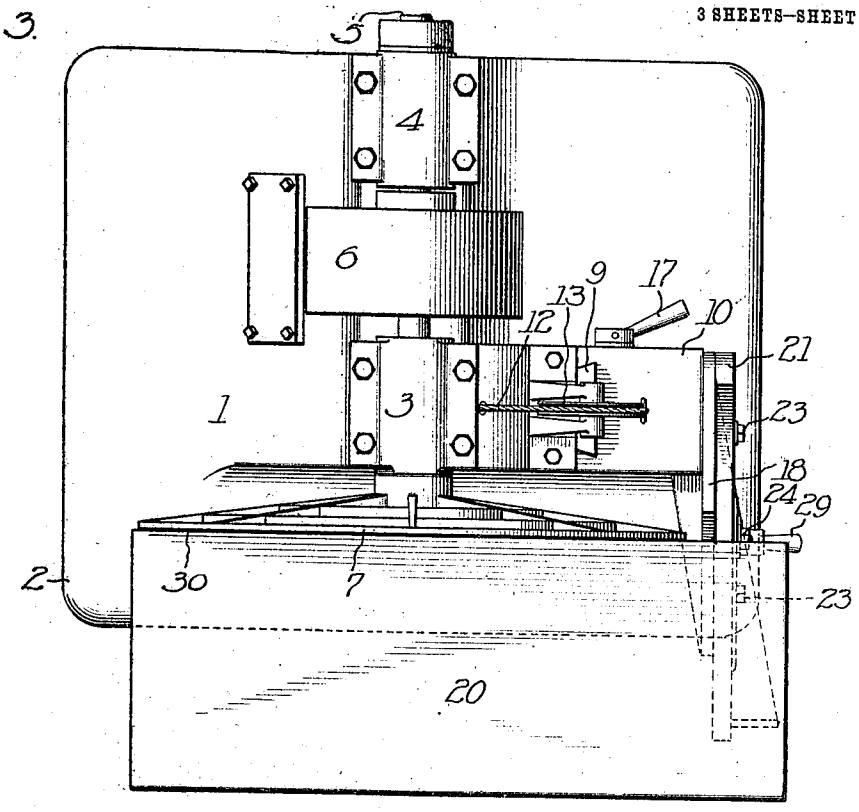


Fig. 5.

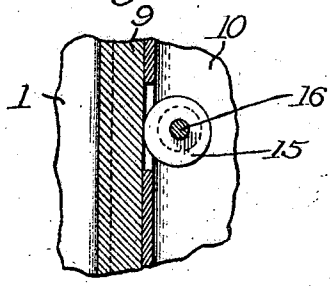
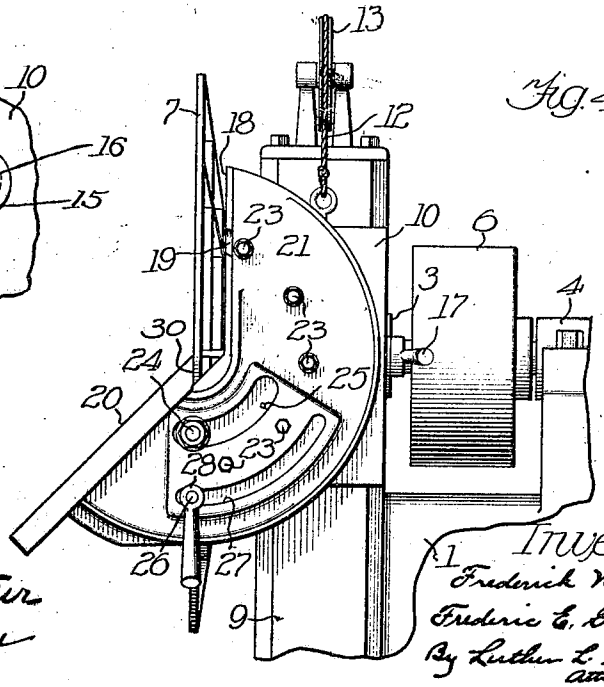


Fig. 4.



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UNITED STATES PATENT OFFICE.

FREDERICK N. GARDNER AND FREDERIC E. GARDNER, OF BELOIT, WISCONSIN, ASSIGNORS OF ONE-THIRD TO LOUIS WALDO THOMPSON, OF BELOIT, WISCONSIN.

DISK GRINDER.

1,013,760. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed November 18, 1909. Serial No. 528,791.

To all whom it may concern:

Be it known that we, FREDERICK N. GARDNER and FREDERIC E. GARDNER, citizens of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Disk Grinders, of which the following is a specification.

This invention is applicable, although not exclusively so, to machines for grinding or surfacing wood, the embodiment herein shown of the invention being especially adapted for the use of pattern-makers.

One of the serious objections to disk grinders heretofore proposed for the use of pattern-makers is that too much time has been consumed in adjusting the table and in renewing the abrasive surface on the disk. By our invention this objection is overcome.

One of the objects of the invention is to provide in a disk grinder a work table so mounted that it may be tilted at various angles without thereby changing the relation of the inner edge of the table to the disk. In prior machines when the table was tilted, the inner edge of the table moved away from the disk, and further means had to be provided to return the inner edge of the table into proper relation to the disk, since it is important, especially in wood working, that the work be supported as close as possible to the point where grinding is taking place.

Another object of the invention is to support the table in such a way that it may be quickly moved entirely off the face of the wheel to permit of conveniently attaching an abrasive sheet to the face of the disk.

A further object is to support the table in such a way as to afford free space for the work over the entire face of the wheel.

In the accompanying drawings, Figure 1 is a side elevation of a disk grinder embodying the features of our invention. Fig. 2 is a front elevation of said machine, the table being represented as having been lowered entirely clear of the disk. Fig. 3 is a top plan view of the machine. Fig. 4 is a fragmental view similar to that of Fig. 1, but showing the table as having been tilted. Fig. 5 is a detail view of a locking means.

In the embodiment herein shown of our invention the supporting frame consists of a pedestal 1 having an enlarged base 2 to rest upon the floor. In bearings 3 and 4 on said pedestal is rotatably mounted a spindle 5, said spindle carrying a drive pulley 6 at a point between the bearings 3 and 4. Upon the forward end of the spindle 5 is mounted a suitable abrading element, as, for example, a disk 7 to the face of which may be cemented or otherwise secured a sheet of cloth or paper having thereon a layer of abrasive material. It will be noted from Fig. 1 that the front side 8 of the machine frame is entirely free from projecting parts that might limit the movements of the work-table to be hereinafter described. There is upon one side of the pedestal (in this instance, upon the right-hand side) a vertical guide 9 on which is mounted a slide 10. The slide is counter-balanced by means herein shown as a weight 11 attached to said slide by a flexible connection 12, said connection extending over guide sheaves 13 and 14. The slide may be fixed in adjusted position upon the guide 9 by any suitable means, as, for example, an eccentric 15 (Fig. 5) fixed upon a rock shaft 16 and adapted to bear against the face of the guide. A handle 17 is attached to the shaft 16. A portion 18, having in this instance the form of a segment, is fixed to the slide 10 in position to lie in a vertical plane at the right of the right-hand side of the disk 7. Said segment has formed therein a groove 19 which is curved on the arc of a circle, the center of which circle lies very close to the plane of the abrading surface of the disk 7.

The work table 20 may be arranged, in a generally horizontal position, as illustrated in the drawings, and may be of suitable form, it being herein shown as oblong. It is tiltably attached by one of its ends to the slide 10, the means herein shown for this purpose consisting of a segment 21 attached to or cast integral with the table and extending in a vertical plane. Said segment is adapted to fit slidably on the face of the segment 18 and is provided with a curved rib 22 (Fig. 1) fitting within the curved groove 19 and secured to the segment 21 by suitable means, as, for example, screws 23. A screw 24 fixed in the segment 18 extends through an elongated arcuate opening 25 in

the segment 21. The head of said screw or a washer underneath said head lies in contact with the segment 21 for the purpose of removably securing such segment to the segment 18. It will be seen that the segment 21 may be moved with relation to the segment 18 and that such relative movement will cause a tilting movement of the work table. The table may be locked with relation to the slide 10 by any suitable means, as, for instance, a screw stud 26 fixed in the segment 18 and extending through a curved slot 27 in the segment 21. On the outer screw-threaded end of the stud 26 is a nut 28 having an operating handle 29. When the nut 28 is screwed up tightly against the segment 21 the table is rigidly locked in adjusted position with relation to the slide.

The inner edge of the work table, in this instance, is disposed close to the working face of the disk 7, the distance between the inner edge of the table and the abrading surface of the disk being in practice about one-sixty-fourth or one-thirty-second of an inch. The inner edge of the work table at the upper or work-supporting side thereof coincides with the center of the circle on which the groove 19 is formed. The movement of the segment 21 fixed to the table, with relation to the segment 18 being a rotative one, and the axis of rotation being coincident with the inner upper edge of the work table, it will be seen that the work table may be tilted without changing the position of the inner edge thereof. In order that the table may be tilted without bringing its inner end into contact with the grinding disk, said inner end is beveled or chamfered, as indicated at 30 in Fig. 1. If desired, graduations 31 may be indicated upon the segment 18 to indicate the relative position of segments 18 and 21 and thus indicate the degree of inclination of the work table.

In use, when it is desired to place an abrasive sheath on the rotatory disk 7 the slide 10 is lowered until the table is entirely below the grinding disk. The whole face of the disk is now unobstructed thereby facilitating the application of the abrasive sheet to said disk. After the sheet has been attached to the disk, the slide 10 is raised to place the table at the desired height with relation to the disk so that a greater or lesser portion of the disk may act upon the work, and the slide locked in such position. The table may now be placed in horizontal position or tilted to the desired angle and secured in place. Power being communicated to the drive pulley 6, the disk 7 is rotated and articles may be ground by supporting them upon the table 20 and pressing them against the face of the disk. By reason of the proximity of the inner edge of the table to the face of the disk, the work is supported close to the point where grinding is taking place, which is very desirable, especially when grinding certain varieties of wood, as unless the work is supported close to the plane of action, a bur is formed upon the work. It is, of course, necessary to have the inner edge of the table close to the face of the abrading element when very small or very thin pieces are to be ground.

By reason of the location of the slide 10 behind the abrading element, it is possible to arrange the abrading element at a convenient height and still have room to lower the table entirely clear of said element. Since the sand-paper or other abrasive surface for the disk 7 must be frequently renewed, it will be seen that the ability to place the table in a position where the face of the disk is completely accessible for conveniently renewing the abrasive surface results in the saving of much time.

It will be seen that upon loosening a single fastening (the nut 28), the work table can be tilted to the desired angle without disturbing the relation of the inner edge of the table to the abrading element.

We claim as our invention:

1. In a disk grinder, the combination of a pedestal, a horizontal shaft rotatably supported by said pedestal, a grinding disk carried by the forward end of said shaft, a vertical guide on the pedestal, said guide extending entirely at one side of the vertical plane of the shaft, said guide being located behind the plane of said grinding disk, a slide adjustably mounted on said guide, a work-table arranged to extend across the face of the disk, a vertical supporting segment rigidly secured to one side face of said slide, the latter extending between the vertical plane of the shaft and the vertical plane of the segment, and a complemental segment carried by one end only of said table and adjustably engaging the first mentioned segment.

2. In a disk grinder, in combination, a base; a rotary grinding disk; a work table positioned along the forward face of said disk; means at the rear of said disk connected with said table for supporting the latter, said means being slidable vertically along said base; and means for counterbalancing the weight of the first mentioned means.

3. In a disk grinder, in combination, a base; a rotary grinding disk; a work table positioned along the forward face of said disk; a member slidable vertically on said base at the rear of said disk; connections between said member and said table for supporting the latter; a sheave in the upper portion of said base; a cable attached at one end to said slidable member and passing upwardly over said sheave; and a weight attached to the other end of said cable for

counterbalancing the work table and its supporting means.

4. In a disk grinder, in combination, a base in the form of a pedestal; bearings at the upper end of said base; a horizontal shaft rotatably mounted in said bearings; a driving pulley fixed on said shaft between said bearings; a grinding disk fixed on the forward end of said shaft; a vertical guideway on said base at the rear side of said grinding disk; a member slidable on said guideway; means for fixing said member in adjusted positions on said guideway; a horizontal work table positioned along the forward face of said grinding disk; a pair of vertically disposed segments lying side by side at one edge of said grinding disk, one of said segments being fixed to said slidable member, and the other of said segments being attached to one end of said work table; a curved rib and groove connection between said segments, adapted to permit said work table to be tilted on an axis coincident with the inner edge thereof; means for locking said segments together; and means for counterbalancing the weight of said slidable member, segments and work table.

5. In a pattern-maker's disk grinder, in combination, a pedestal; a horizontal drive shaft supported by said pedestal; a grinding disk fixed to the forward end of said shaft; a vertical guide on one side of said pedestal at the rear side of the disk; a member slidable vertically on said guide and located rearwardly of the vertical plane of the face of the disk; means for fixing said member in adjusted position on said guide; a horizontal work-table positioned along the face of said disk; a segment fixed to said slidable member and lying in a vertical plane intersecting the plane of the disk and disposed so as to clear the periphery of the disk during the vertical movement of the slidable member; a segment fixed to the end of the work-table and lying beside the other segment; a rib and groove connection between said segments, the rib being curved upon the arc of a circle the center of which coincides with the inner edge of the work-table and is close to the face of the disk, the lower side of the table being beveled at its inner edge; means for adjustably securing the second mentioned segment to the first mentioned segment; and means for counterbalancing the weight of the slidable member, the segments and the table.

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