F. N. & F. E. GARDNER.

ATTACHMENT FOR DISK GRINDING MACHINES.

APPLICATION FILED JULY 26, 1910.

990,250.

Patented Apr. 25, 1911.

2 SHEETS—SHEET 1

Fig. 1.

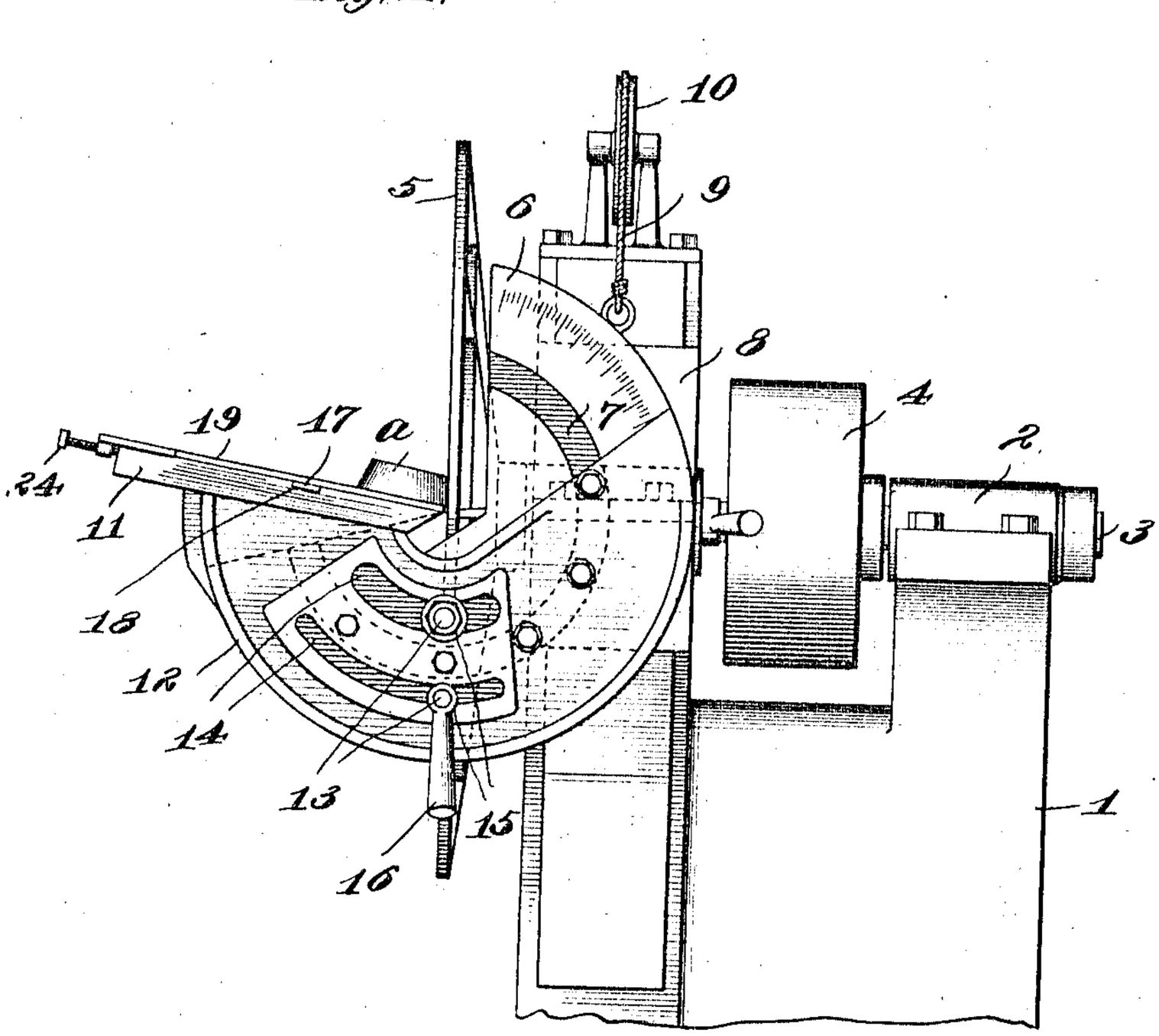
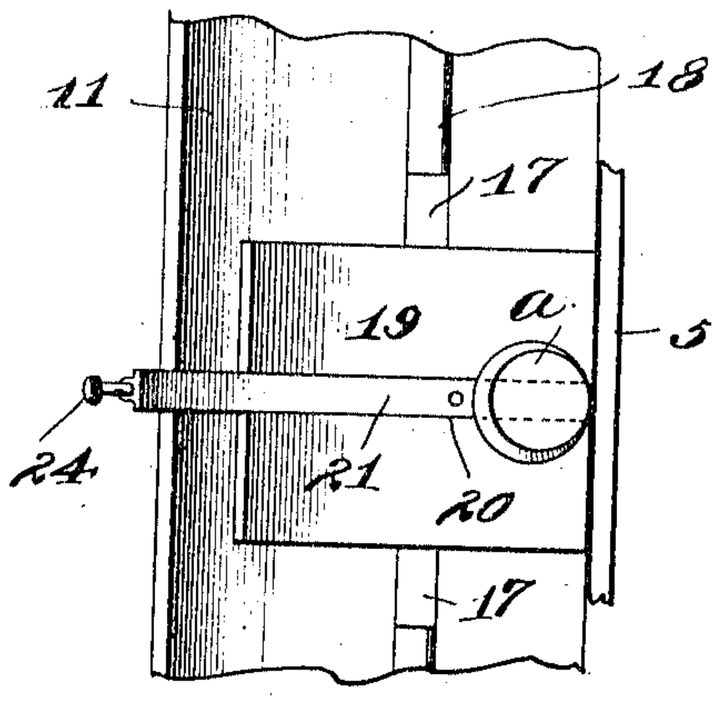


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

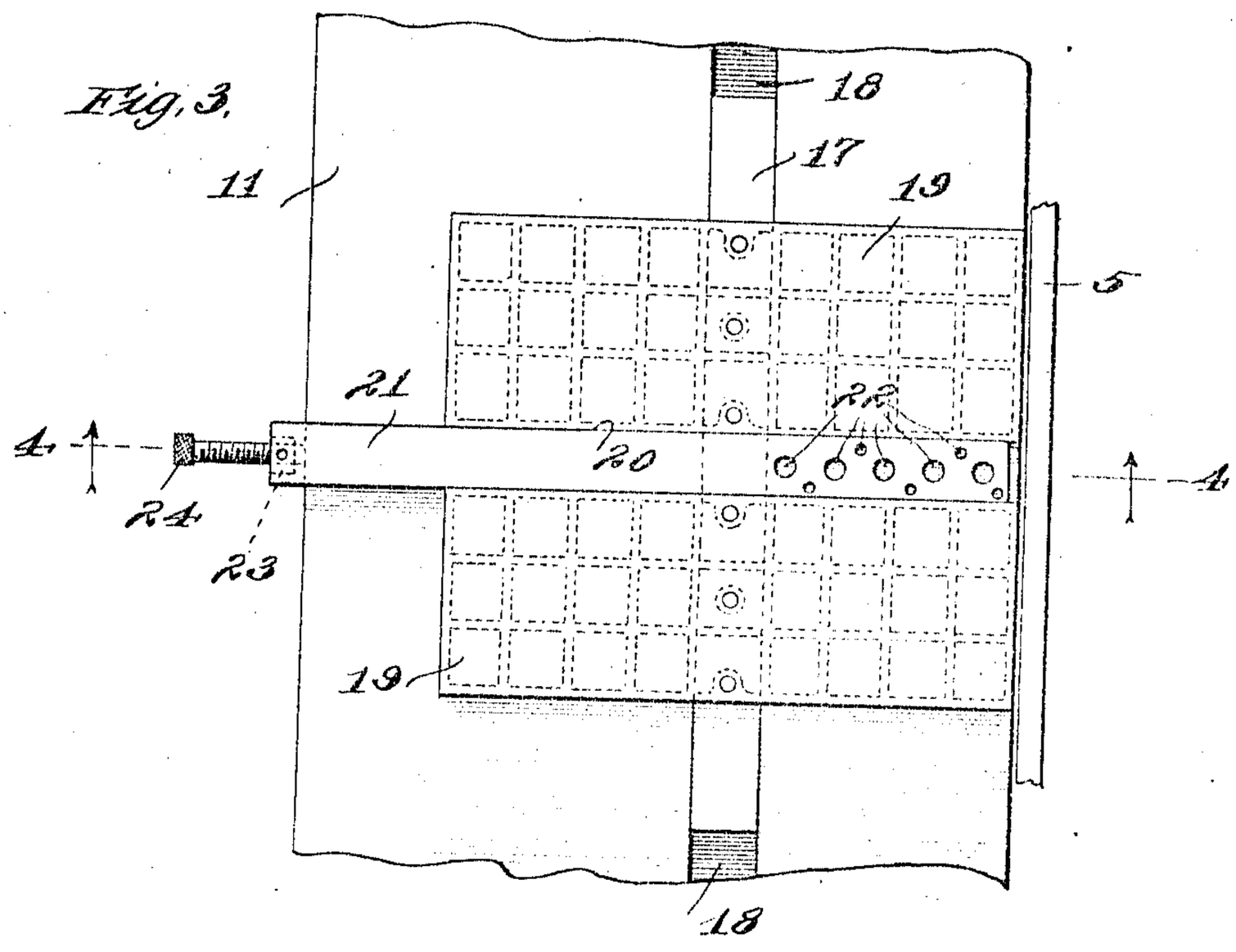


Fig. 4.

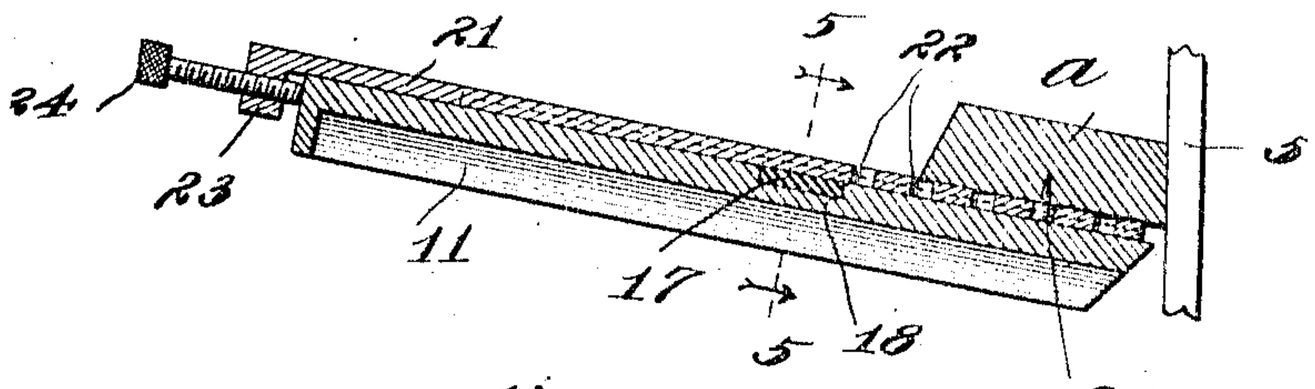


Fig. 5.

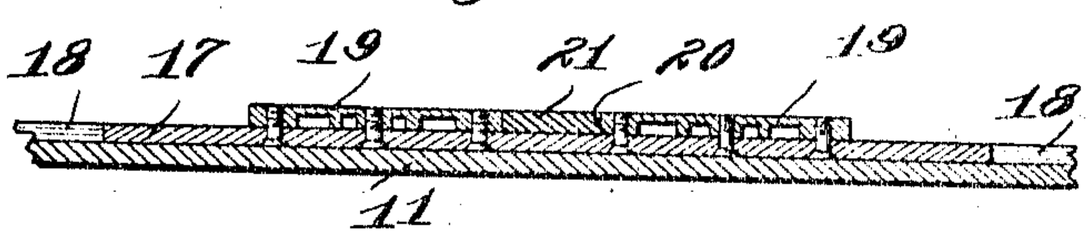


Fig. 7.

Fig. 6.

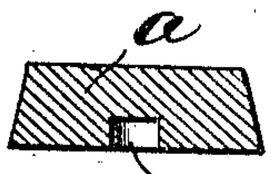
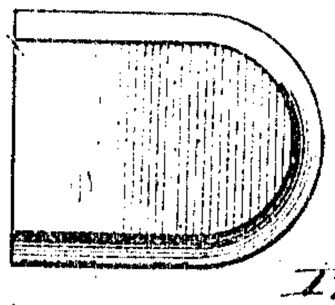


Fig. 8.

Fig. 9.



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UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR DISK-GRINDING MACHINES.

990,250. Specification of Letters Patent. Patented Apr. 25, 1911.

Application filed July 26, 1910. Serial No. 573,825.

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 Attachments for Disk-Grinding Machines, of which the following is a specification.

This invention contemplates an attachment for disk grinding machines of the type disclosed in our copending application, Serial No. 528,791, filed November 18, 1909. The machine shown in said application is especially adapted for grinding or surfacing wood, and is particularly intended for use by pattern makers.

The object of this invention is to provide an attachment for disk grinders by means of which circular pieces of work of widely varying diameter may be quickly and accurately finished or ground down to the desired size.

In the accompanying drawings, Figure 1 is a fragmental side elevation of a disk grinding machine having thereon an attachment embodying our invention. Fig. 2 is a fragmentary plan view showing the attachment and a portion of the machine in the position in which they appear in Fig. 1. Fig. 3 is an enlarged plan view of the attachment and fragment of the machine with the work table in a horizontal position. Fig. 4 is a section taken in the plane of line 4 4 of Fig. 3. Fig. 5 is a section on line 5 5 of Fig. 4. Fig. 6 is a sectional view through a piece of work. Fig. 7 is a plan view of another piece of work. Figs. 8 and 9 are elevations of two forms of pins for mounting the work.

The machine illustrated in Fig. 1 comprises a suitable base 1 having bearings 2 thereon in which is mounted a shaft 3 carrying a drive pulley 4. Fixed on one end of the shaft 3 is a disk 5, to the outer face of which is secured a sheet of sand paper or other abrasive material. A segment 6 having a groove 7 therein is fixed to a member 8 which is vertically slidable upon the base 1. Said member is attached to one end of a cable 9 passing over a sheave 10, the other end of said cable carrying a counterbalancing weight (not shown). The work table 11 is carried by a segment 12 having a curved rib on its inner face which travels in the groove 7 in the segment 6. The segments 6 and 12 are secured together by means of bolts 13 passing through the segment 6 and through arcuate slots 14 in the segment 12, said bolts having nuts 15 turned thereon.

It will be seen that the work table 11 may be tilted either upwardly or downwardly from a horizontal position into planes at various angles with the disk 5. The inner edge of said table is beveled, as shown, to permit such tilting movement. The center of the arc upon which the groove 7 is formed in a point which lies close to the abrading surface of the disk 5 and coincides with the innermost portion of the beveled edge of the table 11. The movement of the segment 12 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. To clamp the table in the desired position one of the nuts 15 may be turned up tightly by means of a handle 16 formed thereon.

Our attachment, in the form herein shown, comprises a bar 17 which fits slidably in a groove 18 formed in the face of the work table 11 parallel to the grinding disk 5. Fixed upon the bar 17 is a plate 19 having a slot 20 extending therethrough at right angles to the bar 17. In the present instance the plate 19 is formed in two duplicate pieces spaced apart on the bar 17 to form the slot 20. A bar 21 is slidably mounted in the slot 20, said bar having a plurality of holes 22 therein. The outer end of the bar 21 has an angular lug 23 thereon in which is threaded a stop screw 24, said screw being arranged to engage the outer edge of the work table 11 and limit the inward movement of the bar 21.

In Figs. 6 and 7, we have shown sample pieces of work which may be ground with our attachment. The work is mounted on the bar 21 by means such as a pin 25 (Fig. 9) the point of the pin being driven into the work and the head fitting closely but rotatably in one of the openings 22 in the bar 21, as shown in Fig. 4. Another form of pin 26 is shown in Fig. 8. The head of this pin fits tightly into a recess a' formed in the block a (Fig. 6), the stem of the pin being adapted to enter one of the openings 22 in the bar 21, so that the work may be rotated. By providing a series of the holes 22 it is possible to grind circular shapes varying

from very small to relatively large radius, the variation not depending entirely upon the length of the adjusting or stop screw 24.

The attachment is slidable in the groove 18 over the entire face of the grinding disk 5. This is very important in practice because it permits of shifting the work for contact with different points along the face of the disk, or in other words, permits of shifting the cutting point. When circular pieces of work are being ground, the cutting is confined to a narrow space on the disk, and unless the work can be readily and frequently moved with reference to the disk, the abrading material in this space becomes filled with tightly packed wood dust, thus materially reducing the cutting action of the disk.

In use, a pin 25 or 26 is fixed in a piece of work, the slidable bar 21 is drawn outwardly a short distance, and the pin fitted into one of the openings 22, depending upon the size of the piece of work. When the stop screw 24 has been set to limit inward movement of the bar 21 at the proper point, said bar is slid inwardly to carry the work against the grinding disk 5. The workman may rotate the work with his fingers to present its entire circular face to the disk. The stop screw 24 limits inward movement of the bar 21 when the work has been ground down to the desired size. The work table 11 may be tilted as a whole, as shown in Fig. 4, to form a bevel upon the edge of the work if desired.

We claim as our invention:

1. In a disk grinding machine, the combination of a rotary grinding disk; a work table supported adjacent to the face of said disk; a member slidably mounted on said table to move toward and away from the face of said disk; said member having an opening therein; a pin adapted to be fixed to the work and rotate in said opening so that the work may be rotated; and adjustable means for limiting the inward movement of said member.

2. In a disk grinding machine, the combination of a rotary grinding disk; a work table supported adjacent to said disk; a bar slidably mounted on said table to move toward and away from said disk; said bar having an opening therein; a pin adapted to be fixed to the work and rotate in said opening; and stop means carried by said bar and adapted to limit the inward movement of said bar.

3. In a disk grinding machine, the combination of a rotary grinding disk; a work table supported adjacent to said disk; a bar slidably mounted on said table to move toward and away from said disk, said bar having a series of holes therein; a pin adapted to be fixed to the work and rotate in one of said holes; and a stop screw carried by the outer end of said bar, said screw being arranged to engage the edge of the work table for limiting inward movement of said bar.

4. In a disk grinding machine, the combination of a rotary grinding disk; a work table supported adjacent to said disk, said table having a groove in its upper face parallel with said disk; a bar fitting slidably in said groove; a plate fixed upon said bar and having a slot therethrough perpendicular to said bar; a second bar slidably mounted in said slot; said second bar having a longitudinal series of holes therein; a pin adapted to be fixed to the work and rotate in one of said holes; and an adjustable stop screw carried by the outer end of said second bar, said screw being adapted to engage the outer edge of the work table for limiting inward movement of said second bar.

5. In a disk grinding machine, the combination of a rotary grinding disk; a work table supported adjacent to said disk, said table having a groove in its upper face parallel with said disk; a bar slidable in said groove over substantially the entire face of said disk; a member mounted on said bar to slide toward and away from said disk; means for forming a rotatable connection between said member and a piece of work; and adjustable means for limiting the inward movement of said member.

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