

F. N. & F. E. GARDNER.
ATTACHMENT FOR DISK GRINDING MACHINES.
APPLICATION FILED JULY 26, 1910.

1,001,133.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

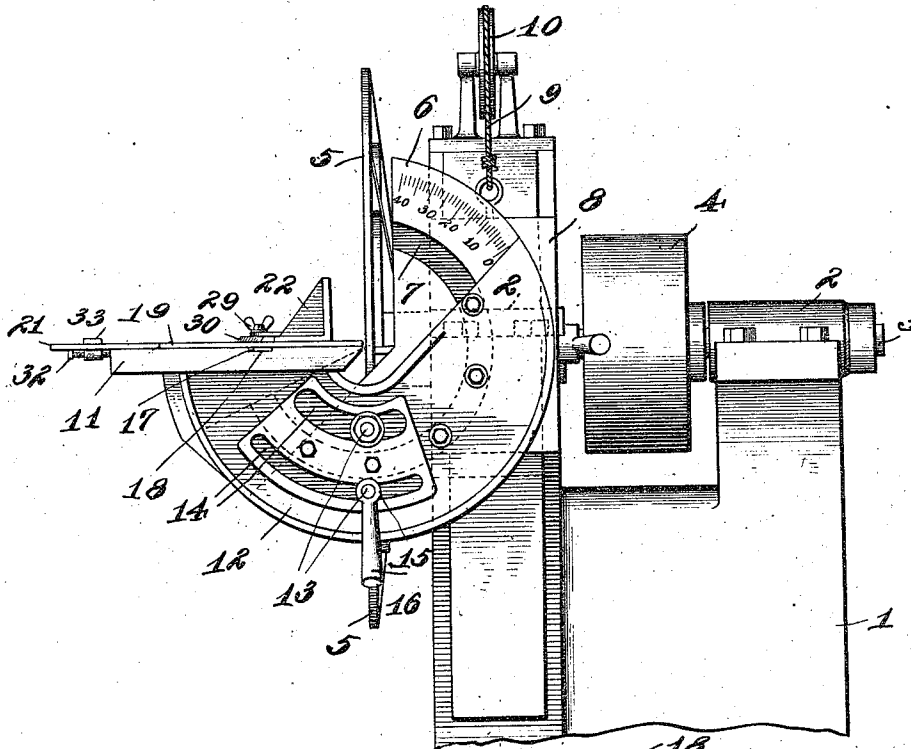
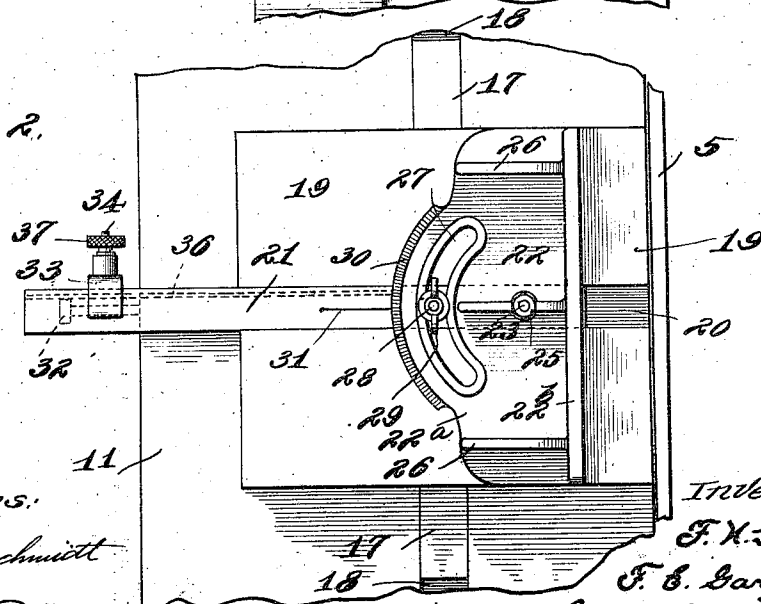


Fig. 2.



Witnesses:

W. Paucherschnitt

C. Paul Parker

Inventors

F. N. Gardner

F. E. Gardner

By

Luther L. Miller

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2 SHEETS—SHEET 2.

Fig. 3.

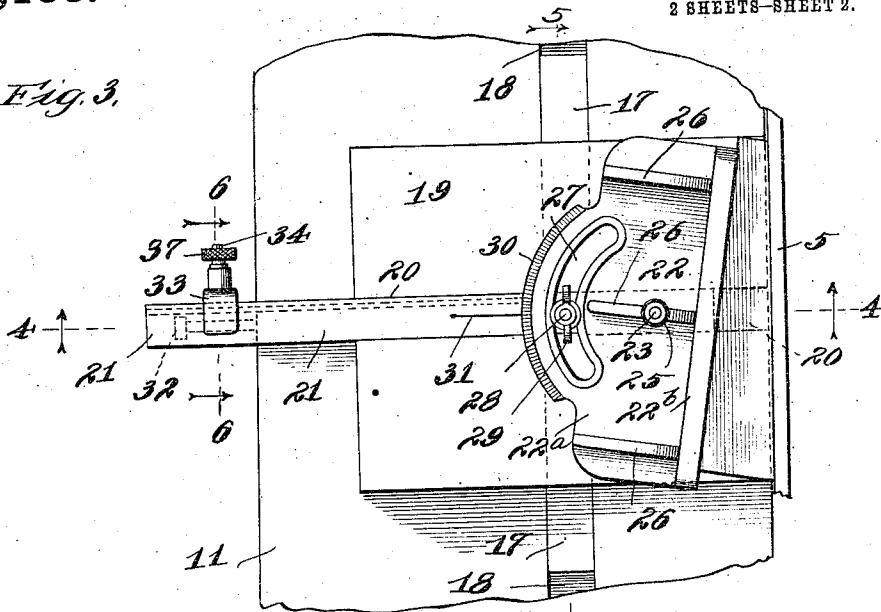


Fig. 4.

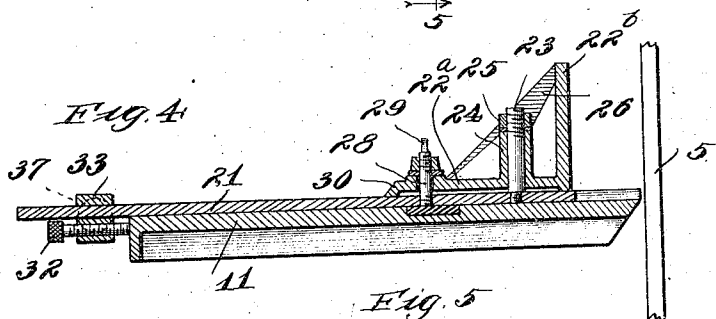


Fig. 5.

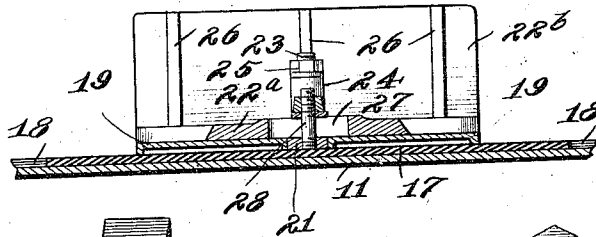


Fig. 6.

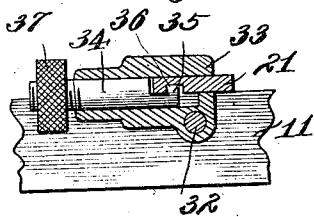


Fig. 7.

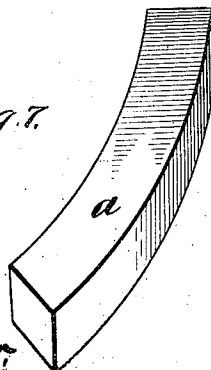
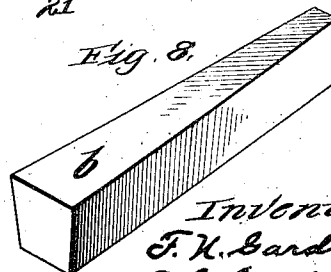


Fig. 8.



Witnesses:
J. A. Paulschmidt,
C. Paul Parker,

Inventors
F. N. Gardner
F. E. Gardner
By Luther L. Miller, atty.

UNITED STATES PATENT OFFICE.

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

ATTACHMENT FOR DISK GRINDING-MACHINES.

1,001,133.

Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed July 26, 1910. Serial No. 573,824.

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
5 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.

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

The object of this invention is to provide a gage attachment for disk grinding machines by means of which a number of
20 pieces of work may be easily, rapidly and accurately ground down to the same size, as to one or more dimensions; or may be ground so that the faces of each piece extend exactly at the same angle to one
25 another as those of the other pieces. In other words, it is the object of our invention to provide an attachment by which a piece of work may be rapidly and accurately reproduced any desired number of
30 times.

In the accompanying drawings, Figure 1 is a fragmental side elevation of a disk grinding machine having an attachment thereon embodying the features of our
35 invention. Fig. 2 is a plan view of the attachment, a portion of the table of the machine being broken away. Fig. 3 is a view similar to Fig. 2 but showing the attachment in a different position. Figs.
40 4, 5 and 6 are sections on lines 4-4, 5-5 and 6-6, respectively, of Fig. 3. Figs. 7 and 8 are perspective views of two pieces of work which the attachment is adapted to handle.

45 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
50 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
55 end of said cable carrying a counter-balancing 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
60 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.

65 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
70 permit such tilting movement. The center of the arc upon which the groove 7 is formed is 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
75 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
80 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.

85 An attachment embodying our invention may comprise a bar 17 adapted to slide in a groove 18 formed in the face of the work table 11 and extending parallel to the face of the disk 5. Fixed upon the upper side of the bar 17 is a plate 19. The plate 19
90 has a slot 20 extending therethrough at right angles to the groove 18. In the present instance the plate 19 is formed in two duplicate pieces spaced apart on the bar 17 to form the slot 20. Slidably mounted in
95 the slot 20 is a bar 21.

A gage plate 22 is pivoted to the inner end of the bar 21 to swing in a plane par-

allel to the work table by means of a bolt 23 fixed in said strip 21 and extending upwardly through a bearing 24 on the gage plate, said bolt having a nut 25 threaded on its upper end. The gage plate 22 may comprise a base portion 22^a adapted to contact the face of the plate 19, and a perpendicular portion 22^b adapted to bear against the work to hold it against the grinding disk 5. Strengthening ribs 26 may be provided, if desired.

In the base portion 22^a of the gage plate 22 is formed an arcuate slot 27, the center of the arc being the pivot 23 for the gage plate. A stud 28 fixed in the bar 21 extends upwardly through the slot 27 and carries at its upper end a wing nut 29 by means of which the gage plate may be clamped in any desired position.

30 is a protractor by means of which the angle of the gage 22 may be determined. The bar 21 may have a zero line 31 thereon. A stop screw 32 threaded in a member 33 carried by the bar 21 is arranged to engage the outer edge of the work table 11 and limit the inward movement of the bar 21 and gage 22. The member 33 is slidably mounted on the bar 21 so that it may remain adjacent to the edge of the work table 11 regardless of whether the gage plate 22 is close to the abrading disk 5 or at a distance therefrom. A bolt 34 slidably mounted in the member 33 has at one end a projection 35 lying in a groove 36 in the under side of the bar 21, the other end of said bolt having a nut 37 thereon adapted to clamp the member 33 in adjusted position upon the bar 21.

In Fig. 7, we have shown a sample piece of work in the form of a segment *a* such as is generally used in making pulley patterns and the like. By means of the attachment herein disclosed it becomes possible to grind any number of such segments to exactly the same thickness, so that when the proper number are glued together at their ends they match up perfectly without further finishing of their sides to form the complete ring.

Heretofore it has been the practice to first glue the segments together to form a ring and, after waiting for the glue to set, face off the ring on a lathe. By our attachment, however, the segments can be made exact duplicates of each other in thickness, thereby eliminating the lathe operation above mentioned and saving a very large percentage of the labor formerly required. In grinding such a segment upon the machine herein shown, the gage 22 is set with the perpendicular face 22^b parallel to the face of the disk 5. The gage is then moved outwardly a short distance and a segment is laid on the plate 19 between the

gage and the grinding disk 5 with the convex side of the segment up. When the stop screw 32 has been adjusted so as to limit inward movement of the gage at the proper point, said gage is moved inwardly to carry the work against the grinding disk 5. The stop screw 32 comes into contact with the edge of the work table 11 when the piece of work has been ground down to the thickness desired.

Fig. 8 illustrates another piece of work in the form of a stave *b* having beveled tapering sides. To finish this stave the gage plate 22 is set at the proper angle with reference to the face of the disk 5, and the stop screw 32 is adjusted to limit inward movement of the gage plate at the desired point. The work table 11 may be tilted as a whole from its horizontal position as hereinbefore described to produce the desired bevel upon the sides of the piece of work.

In the pattern-making art, it becomes necessary very frequently to duplicate pieces of widely varying size and shape such as is shown in Fig. 8. Heretofore this has usually been done with the hand plane, involving a large amount of skilled hand labor which is expensive. By the use of the attachment herein shown, pieces of almost any shape, provided the sides are flat, may be easily, rapidly and accurately duplicated on a disk grinder.

The bar 17 can be adjusted laterally in the groove 18 over the entire face of the disk. This is important since it permits of utilizing the entire grinding surface of the disk. If the cutting is confined to one space on the grinding disk, the abrading material at this space becomes filled with the fine wood dust, thus materially reducing its cutting action.

We claim as our invention:

1. In a disk grinding machine, the combination of a rotary grinding disk; a work table adjacent the face of said disk, said table having a groove therein parallel with the face of said disk; a bar slidable in said groove; a plate fixed to said bar; a second bar mounted on said plate and being slidable therein in a line perpendicular to the first bar; a gage plate adjustably carried by the inner end of said second bar; and means for limiting inward movement of said second bar.

2. In a disk grinding machine, the combination of a rotary grinding disk; a work table supported adjacent said disk, said table having a groove therein parallel with said disk; a bar slidable in said groove; a plate fixed to said bar and having a slot there-through perpendicular to said groove; a second bar slidable in said slot; a gage plate pivoted on the inner end of said second bar and having an arcuate slot therein; a stud

fixed in said second bar and projecting
through said slot; a nut threaded on said
stud and being adapted to clamp said gage
plate in adjusted position; a member slid-
5 able on the second bar; a stop screw carried
by said member and adapted to engage the
edge of the work table to limit inward move-

ment of said second bar; and means for fix-
ing said member to said second bar.

FREDERICK N. GARDNER.
FREDERIC E. GARDNER.

Witnesses:

H. N. ADAMS,
CARRIE HICKSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."