No. 749,961. PATENTED JAN. 19, 1904.

F. F. FISCHER.

APPARATUS FOR GRINDING OR POLISHING GLASS.

APPLICATION FILED JULY 17, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

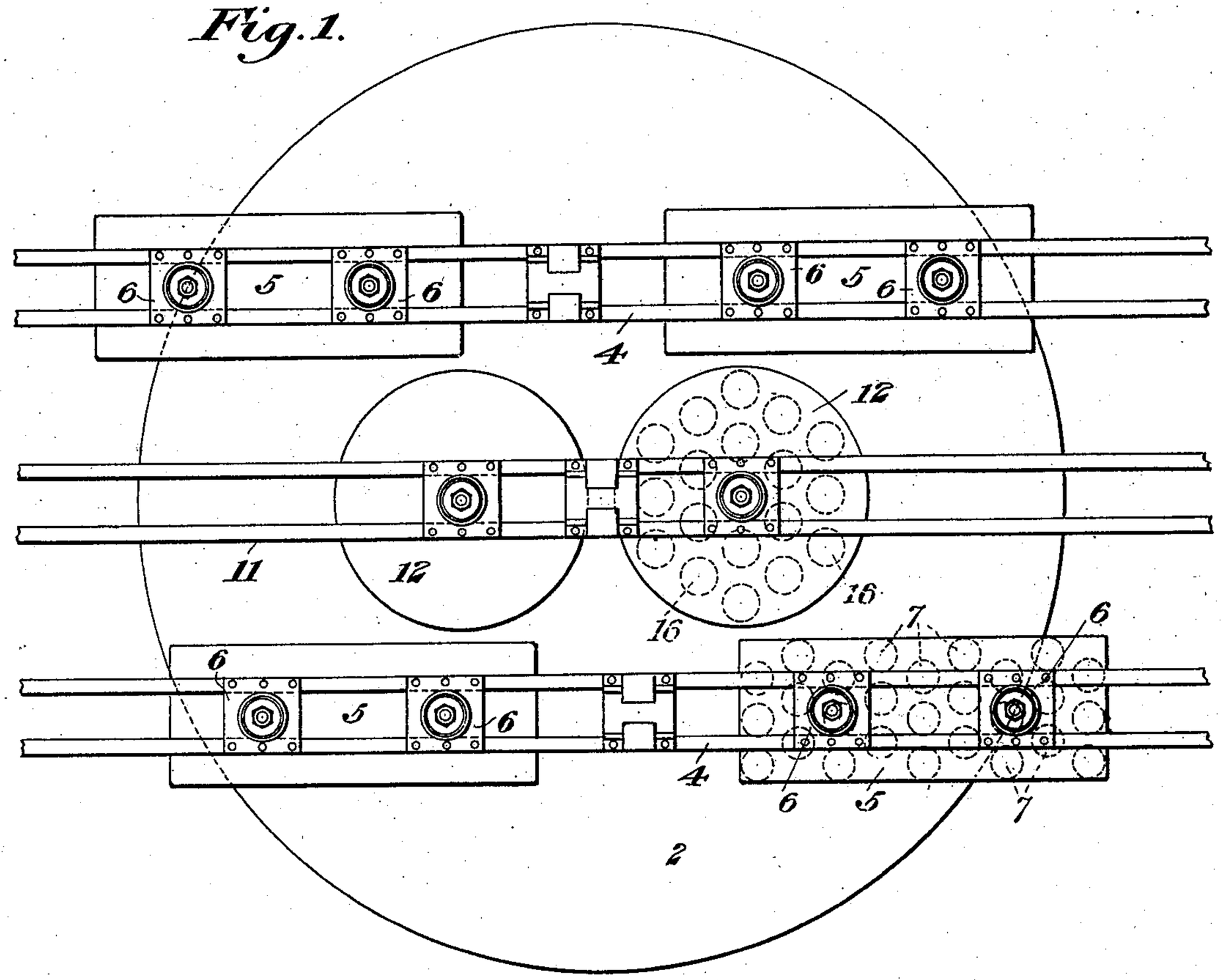
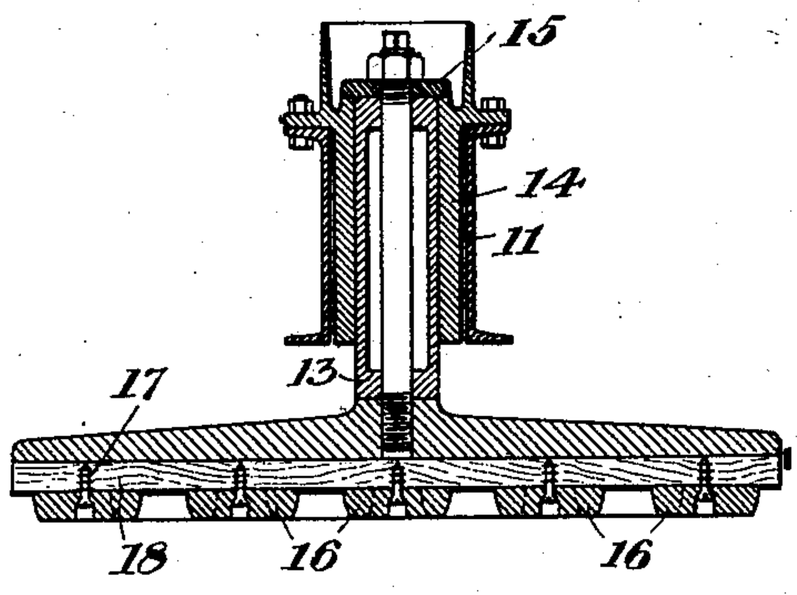


Fig. 3.



WITNESSES

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NO MODEL. 2 SHEETS—SHEET 2.

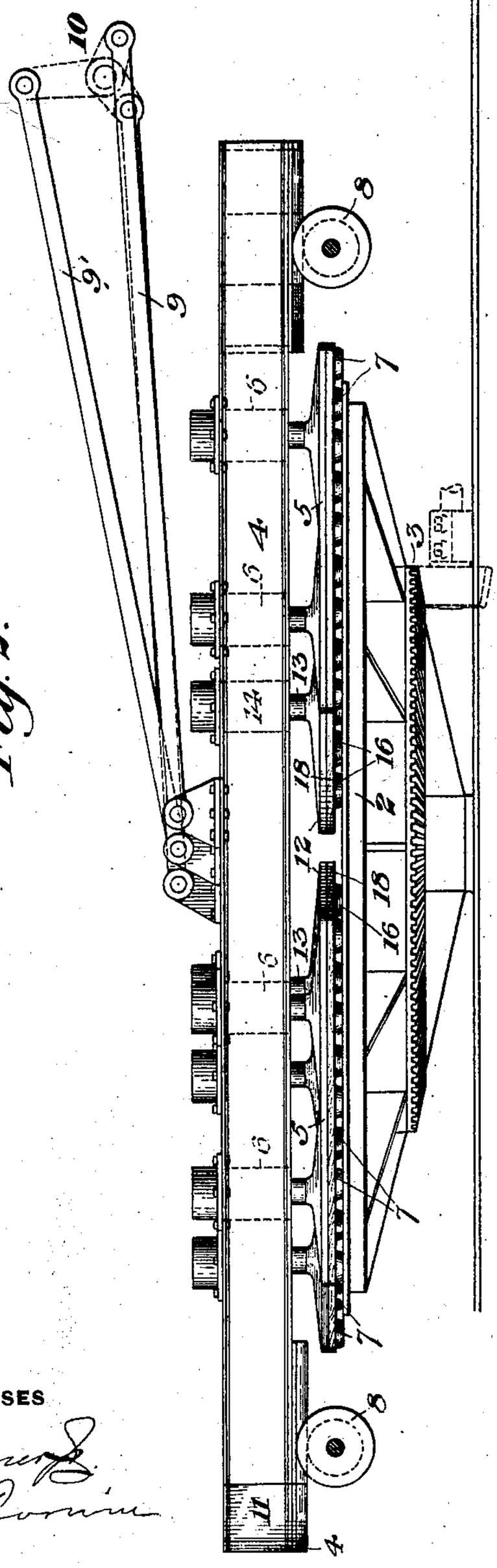

Fig. 2.

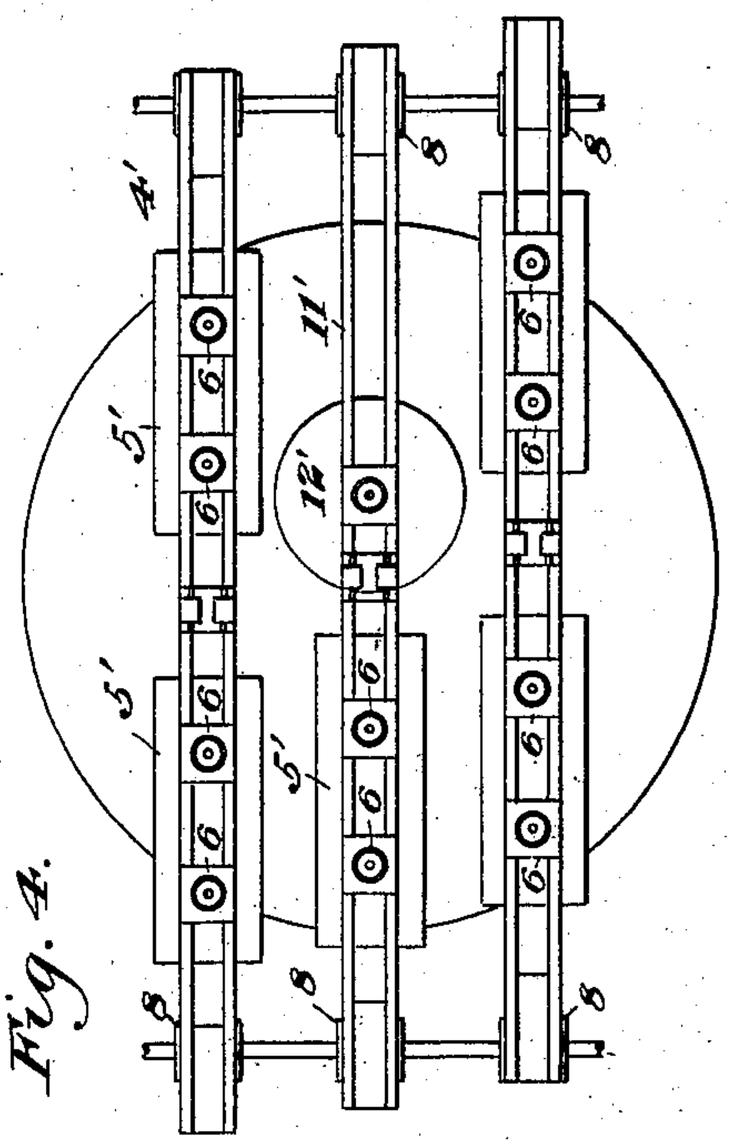

Fig. 4.

WITNESSES

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No. 749,961. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

FRED F. FISCHER, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR GRINDING OR POLISHING GLASS.

SPECIFICATION forming part of Letters Patent No. 749,961, dated January 19, 1904.

Application filed July 17, 1902. Serial No. 115,913. (No model.)

To all whom it may concern:

Be it known that I, FRED F. FISCHER, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Apparatus for Grinding or Polishing Glass, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a partial top plan view showing grinding apparatus constructed in accordance with my invention. Fig. 2 is a partial side elevation of same. Fig. 3 is an enlarged sectional side elevation showing a rotary disk which I employ, and Fig. 4 is a partial top plan view showing a modified form of the invention.

My invention relates to that class of grinding and polishing machines for glass wherein a revolving table is employed in connection with non-rotatory rubbers. These non-rotatory rubbers may be arranged to reciprocate in straight lines over the glass, as shown in United States Letters Patent No. 639,621, granted to Phillip Semmer on December 19, 1899, or in curvilinear lines, as in my Patent No. 619,399, granted on February 14, 1899, or may be held rigidly without reciprocation. In the use of this type of apparatus difficulties have been experienced in grinding the central portion and in washing away the sand from the central part of the table to change the grade of the sand or other abrading material. This is due, in my belief, to the smaller relative motion between the rubbers and rotary table near the central part of the table, and the result of this difficulty is that less grinding occurs in the central portion and that as the coarser sand is removed and the finer grades fed to the machine the coarser grade will not be entirely washed away at the center and will scratch and score the glass in its repeating operations. Another difficulty has arisen from the grinding material being forced away from the corners of the angular rubbing-blocks which were employed, thus giving an uneven distribution of the abrading material, and consequently a non-uniform grinding of the glass.

My invention overcomes these difficulties; and it consists in using a rotary table with non-rotatory rubbers and in increasing the speed of the rubbers acting upon the central parts of the table either by increasing the reciprocatory speed of the rubbers acting upon the central part, where the rubbers are reciprocated, or by using a rotary rubber or rubbers upon this portion whether the rubbers are reciprocated or not.

It further and more specifically consists in combining with a rotary table having reciprocating rubbers moving in straight lines one or more rotary polishing-disks arranged to act upon the intermediate or central portion of the table.

It also consists in securing to the non-rotating rubbers a series of substantially circular polishing-disks, which are rigidly fastened thereto and which will give an even distribution of the abrading material and a more uniform grinding action.

In the drawings, referring to Figs. 1, 2, and 3, in which I show a preferred form of my invention, 2 represents a rotary polishing-table, which is mounted upon a central bearing and may be rotated in any suitable way, such as by bevel-wheel 3 intermeshing with a bevel-wheel upon a driven shaft. I have shown two sets of reciprocating straight-line rubbers, each consisting of a beam 4, having two rectangular blocks 5 connected thereto by stems which extend up through bearings 6 in the beam, which bearings allow the block to rest by gravity upon the glass. To the lower face of each of these blocks is rigidly secured a series of circular polishing-disks 7, which may be secured by screws or other securing means. These circular rubbing-disks may be of iron or other suitable material for grinding or polishing and are preferably arranged in staggered form, as shown in Fig. 1. I have shown the beams as resting upon and guided by flanged rollers 8, the reciprocatory motion being connected by connecting-rods 9, leading to cranks secured to the common crank-shaft, (indicated at 10). These cranks are preferably arranged so that as one beam is moved in one direction the other beam is simultaneously re-

ciprocated in the opposite direction. The two beams 4 are preferably arranged at opposite sides of the table and preferably equidistant from the center, and between them is arranged a reciprocatory beam 11, which may be moved back and forth by connecting-rod 9′, leading to a third crank on the shaft 10. The beam 11 is provided with one or more rotary blocks 12, of which I have shown two, each block having a cylindrical stem 13 at the center, which extends up through a bearing 14 and is provided with a cap-plate 15, which rests upon the top of the bearing when the block is in its lowermost position. A vertical adjustment of the circular block is thus provided, which allows it to rest by gravity on the glass, while at the same time the block is allowed to rotate under the action of the rotating table. Each of the blocks 12 is provided with a set of circular polishing-disks 16, which are preferably rigidly secured thereto. For this purpose I have shown screws 17 within recesses of the disk and entering a wooden facing 18, secured to the block. A greater reciprocatory speed may be imparted to the central beam by the longer crank shown or otherwise whether the rubbers thereon rotate or not, and as the outer polishing-disks are reciprocated in straight lines the intermediate beam is also reciprocated, and the polishing block or blocks thereon is rotated during such reciprocation. An even and uniform grinding or polishing action is thus obtained, and when it is desired to change the grade of sand or abrading material the coarser sand which has been used has been washed away, and owing to the use of the rotary block or blocks the sand can be washed away from the center equally with that in the outer portions of the table. The next finer grade of sand is then supplied and the grinding carried on as before.

Instead of using a pair of rotary blocks upon the central beam I may use a single rotary block thereon in connection with a non-rotatory block. Thus in Fig. 4 I show the beam 11′ as having a rotary block 12′ mounted thereon, the beam also having a non-rotatory block 5′, similar to those upon the outer beams 4′.

The advantages of my invention result from the use of the rotatory disk or block in connection with the non-rotatory blocks upon the reciprocatory supports moving in straight line, since the grinding action is made more uniform and the sand is readily changed and graded, and, further, from the use of the circular polishing-disks upon the non-rotatory block, which being free from corners are found to evenly distribute the abrading material and give uniform action.

Four or more beams may be used instead of the three shown, in which case the two inner beams are preferably reciprocated at a higher speed than the outer one if they do not carry the rotatory rubbers. If the two inner beams carry rotary rubbers, they may be reciprocated at the same speed as the outer ones. All of the beams may be rigidly supported without reciprocating any of them, in which case the inner beam or beams would carry the rotary rubber. All or part of the beams may be given a reciprocating curvilinear movement, the polishing-disks may be mounted in other ways than shown, the rubbers may all be rectangular and non-rotatory by increasing the speed of the middle beam, and many other variations may be made in the form and arrangement of the parts without departing from my invention.

I claim—

1. The combination with a revolving table, of rigidly-mounted non-rotatory rubber supports coacting therewith and carrying rubbers, and mechanism for reciprocating the rubber supports, said mechanism having connections arranged to give a greater speed to the rubber acting upon the central portion of the table than to those acting on the side portions; substantially as described.

2. The combination with a revolving table, of non-rotatory rubbers coacting therewith, and a rotatory rubber arranged to act upon the central portion of the table; substantially as described.

3. The combination with a revolving table, of outer supports having non-rotatory rubbers, mechanism for reciprocating said outer supports, and an inner support having a rotary rubber; substantially as described.

4. The combination with a revolving table, of outer rubber supports, mechanism for reciprocating them, said supports carrying non-rotatory rubbers, an intermediate support, a rotary rubber mounted thereon, and mechanism for reciprocating the latter supports; substantially as described.

5. The combination with a revolving table arranged to receive the article to be treated, of rubber supports mounted over the table, and arranged to reciprocate in a straight line in contact with the article, a reciprocatory support, and a rotary rubber mounted thereon and arranged to act upon the intermediate part of the article, and actuating connections for reciprocating the rubber supports; substantially as described.

6. The combination with a revolving table arranged to receive glass, of a pair of reciprocating supports at opposite sides of the table arranged to reciprocate in straight lines and having rubbers, a reciprocating support between said pair of supports and having a rotary rubber mounted thereon, and mechanism for reciprocating the rubber supports; substantially as described.

7. The combination with a revolving table arranged to receive the glass, of a pair of rubber supports mounted over the table and ar-

ranged to reciprocate in straight lines, rubbers mounted thereon, actuating connections arranged to move one of the rubber supports in one direction and the other simultaneously in the opposite direction, a third rubber support between the pair and having a rotary rubber mounted thereon, and mechanism for reciprocating the last-named rubber support; substantially as described.

8. The combination with a revolving table arranged to receive the article to be treated, of rubber supports mounted over the table and arranged to reciprocate in straight lines in contact with said article, a series of substantially circular rubbers mounted on the rubber supports, and actuating connections arranged to move at least one of the rubber supports in one direction and another simultaneously in the opposite direction during the revolving of the table; substantially as described.

9. A revolving table, a pair of rubber supports at opposite sides of the table having non-rotatory rubbers secured thereto, a third rubber support between the outer two and having a rotatory rubber thereon, circular polishing-disks secured to the rubbers, and mechanism for reciprocating the rubber supports in straight lines during the revolving of the table; substantially as described.

In testimony whereof I have hereunto set my hand.

FRED F. FISCHER.

Witnesses:
WARREN W. SWARTZ,
H. M. CORWIN.