C. L. SMITH.

APPARATUS FOR GRINDING PLATE GLASS.

APPLICATION FILED SEPT. 24, 1913.

1,116,145. Patented Nov. 3, 1914.

Fig. 1.

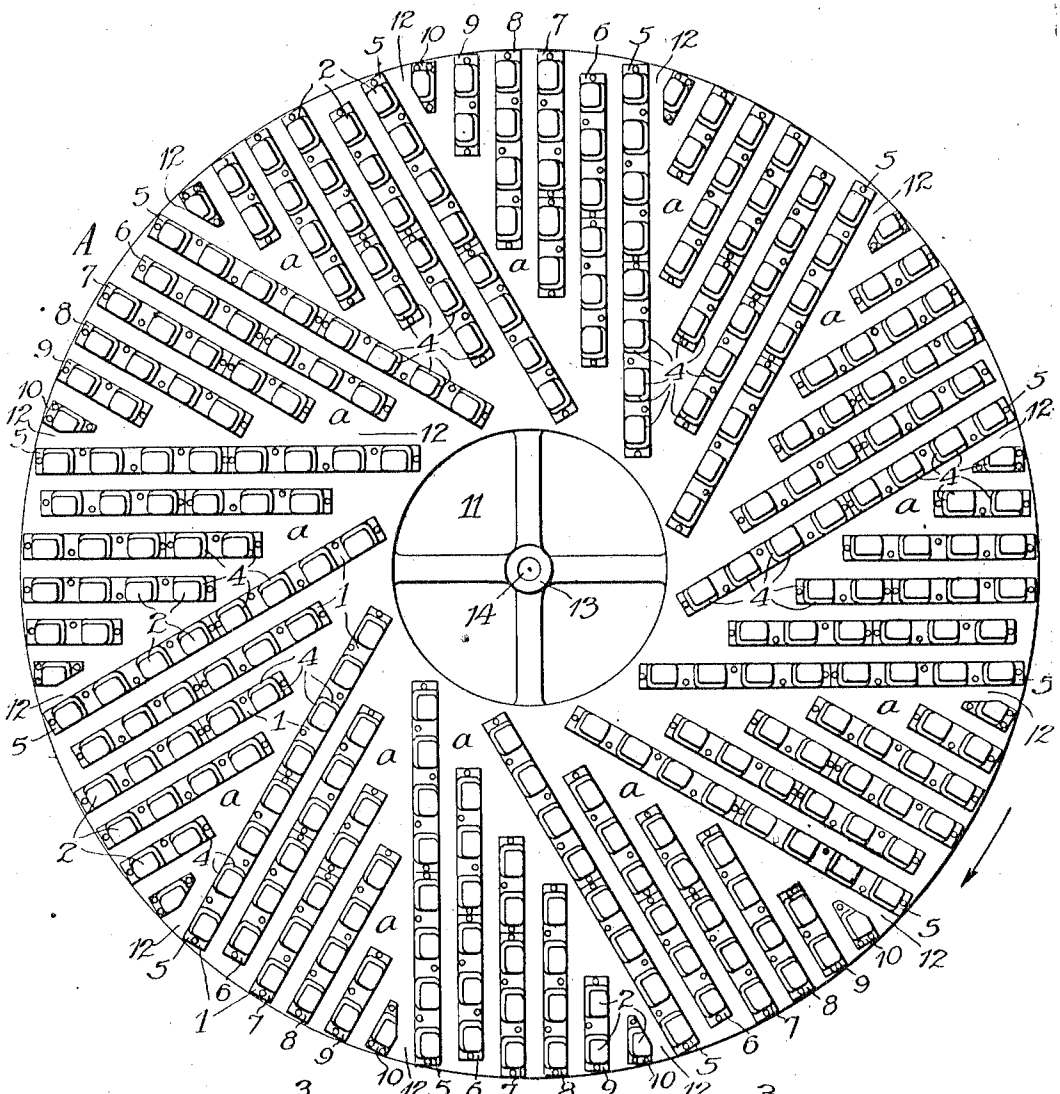


Fig. 2

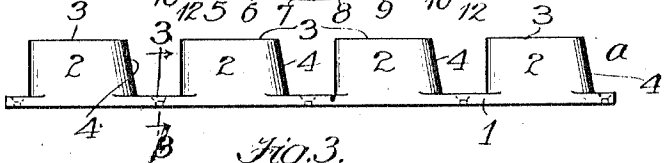
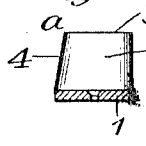


Fig. 3.



Witnesses
Otto Brooks
A. C. Borden

Inventor
Carlton L. Smith.

UNITED STATES PATENT OFFICE.

CARLTON L. SMITH, OF SAGINAW, MICHIGAN.

APPARATUS FOR GRINDING PLATE-GLASS.

1,116,145. Specification of Letters Patent. Patented Nov. 3, 1914.

Application filed September 24, 1913. Serial No. 791,522.

To all whom it may concern:

Be it known that I, CARLTON L. SMITH, a citizen of the United States, and a resident of Saginaw, in the county of Saginaw and State of Michigan, have invented a certain new and useful Improvement in Apparatus for Grinding Plate-Glass, of which the following is a specification.

This invention relates to machines or apparatus for grinding plate glass and relates particularly to grinding runners for such machines.

As is well known to persons familiar with the art, in machines of the type to which my invention relates, the glass plates to be ground are laid flat upon a large rotating table or deck, and one or more grinding disks or runners, usually two of different diameters, are rotatably mounted above said deck or table and adapted to rest upon the glass, preferably in such manner that their pressure upon the glass may be adjusted. Secured to the faces of these grinding disks or runners are runner bars having projections, the outer or lower ends of which form the working or grinding faces of the runners. Said disks or runners may be rotated positively by suitable power connections, but are more often arranged to be rotated by their frictional contact with the glass on the rotating table beneath them.

The operation of these machines, of course, involves the simultaneous grinding of the several plates of glass with which the table or deck is covered, and considerable breakage ordinarily occurs because the runners catch at times on the edges of the glass as they advance from one plate to another.

This invention contemplates a peculiar and novel arrangement of the runner bars, having a number of practical advantages, and among other things, breakage from this cause will be minimized and largely eliminated.

According to this improvement, the runner is provided with a series of bars which extend tangent to a circle described from the center of the disk or runner, a desirable relation being such that said bars will respectively extend at an angle of twelve or fifteen degrees to radial lines extending through their outer ends. Said runner bars thus define substantially triangular spaces or segments of the runner surface, each of which is filled by successively shorter runner bars arranged parallel to a tangential runner bar which defines that particular segment. While, as regards the foregoing object, it is immaterial in which direction the runner bars are inclined relative to the direction of rotation of said runner, the inclination of said runner bars is preferably such that the inner ends thereof will be in advance of their outer ends. This relation has a further very important advantage in washing the glass and runners when changing from a coarser to a finer grade of abrasive, where the wash water is delivered to the runners through central openings therein, in the respect that channels are formed at the front sides of the runner bars which are continuous from the inner ends of said runner bars to the outer edges of said runners, and in the case of the tangential runner bars, from the central openings in said runner bars to the outer edges thereof.

In washing the glass and runners, the centrifugal action of said runners will cause the wash water delivered into the central openings of said runners to pass outwardly through said channels or passageways rapidly and with a strong current, which will carry with it all grit and abrasive. I have found in practice that, with runners embodying this construction, the glass and runners may be washed in from one-third to one-half the time required for washing the glass and runners by delivering the water onto the glass outside of the runners, and that the washing will be done much more thoroughly and effectively.

In the accompanying drawings, in which my invention is fully illustrated—Figure 1 is a plan view of the under side of a grinding runner embodying my invention. Fig. 2 is an enlarged side view of one of the runner bars; and Fig. 3 is a sectional plan view of the runner bar on line 3—3 of Fig. 2.

Referring now to the drawing, A designates, as a whole, a grinding runner of my invention secured to the under face or side of which are runner bars designated, as a whole, *a*. Excepting as hereinafter particularly pointed out, both said runner and runner bars may be of any usual or approved construction, and will be readily understood by persons familiar with the art without a detailed description thereof.

In the drawing, 1 designates the backs of the runners, formed on which are the usual projections 2, the ends 3 of which rest upon the plates of glass in the operation of the

grinder and form the working or grinding faces thereof. Said runner bars are usually and preferably made of cast iron.

In the operation of the machine, the ends 3 of the projections 2 rest flat on the glass, and in order that the particles of abrasive will pass freely beneath the ends of said projections and shall not collect on the advancing sides thereof, the advancing sides of said projections are preferably rearwardly inclined or beveled, as shown at 4, a desirable angle of inclination thereof being about ten to fifteen degrees from the vertical.

The runner bars *a* comprise runner bars 5 which are tangent to a circle described from the center of the runner A and successively shorter supplemental runner bars 6, 7, 8, 9, and 10 arranged in the angular spaces or segments defined by the runner bars 5, parallel with one or the other of the runner bars which define said segments, respectively.

With the runner bars arranged as described, it is obvious that the different runner bars will pass the edges of the different plates of glass on which the machine or apparatus is operating with what may be described as a "draw-cut" effect, and that the advancing edges of the rearward projections 2 on the same runner bar will cross the meeting edges of the plates of glass before the adjacent front projections pass out of engagement therewith, and also that the advancing ends of succeeding bars will cross the meeting edges of the plates of glass before preceding bars have passed out of engagement therewith, so that, at their meeting edges, the plates of glass will always be subjected to the weight of closely adjacent runner bar projections, which will operate to hold them flat and to prevent the edges thereof from springing up so that the runner bars will catch thereon. This draw-cut action of the bars in passing over the joints will cause the runner to ride a high joint better and with less danger of breaking the glass. As regards this feature of my invention, it is immaterial whether the inner or the outer ends of said runner bars are in advance, relatively to the direction of rotation of said disk or runner, and also whether the shorter supplemental runner bars 6, 7, 8, 9, and 10 are disposed parallel with the runner bars 5 at the front or rear sides of the different segments of the runners defined thereby. Preferably, however, and as shown, the runner bars 5 are positioned with their inner ends in advance of their outer ends, and the shorter runner bars 6, 7, 8, 9, and 10 are shown as being arranged parallel with the runner bars 5 at the front sides of the different segments defined thereby. This arrangement will give all of said runner bars a rearward "set" relatively to the direction of rotation of said runner, which set will decrease from the front to the back runner bar of each parallel series of bars.

As shown, the runner is of the type in which the wash water, and, if desired, the abrasive, is designed to be delivered thereto through a central opening therein, designated 11, said opening, as shown, being substantially the same size as the circle to which the runner bars 5 are tangent.

With runners constructed as described, continuous channels 12 will be formed at the front sides of the runner bars *a* which will be continuous from the inner ends of the different runner bars to the outer edges of the runners, and, in the case of the tangential runner bars 5, will be continuous from the central opening 11 in the runner through which the wash water is delivered thereto to their outer edges. Thus, when the runner bars *a* are given a rearward set in accordance with the preferable construction shown, said channels 12 will have a corresponding rearward set, and the centrifugal action of the runners in operation will cause the wash water delivered into the central openings of said runners to pass outwardly rapidly into the strong current which will carry with it all grit and abrasive, and will result in effectively and thoroughly washing the glass and runners in a very short time as compared with any method of washing of which I had knowledge prior to the production of my improved grinding runner.

It will be observed that it is important that the projections on intermediate or supplemental runners shall terminate short of the adjacent main runner 5, so that there shall not only be a clear channel between each adjacent pair of supplemental runners but alongside of each main runner.

The shaft connection for the runner is formed in a hub 13 supported within the central opening 11 of said runner by a spider, said hub being provided with a central bore 14 to receive the runner shaft, not shown.

In an application for U. S. Letters Patent for a machine for polishing plate glass, filed by me concurrently herewith and numbered serially 791,521, I have shown and described a polishing runner which comprises a body portion having a multiplicity of relatively very small felt pads secured thereto and which project from the under face thereof. As with the grinding runner of the present application, the polishing runner of my said co-pending application, Serial No. 791,521, is designed to be washed by water delivered thereto through a substantially central opening therein, and to facilitate the washing of said polishing runner, the felt pads thereof are arranged in the same relation to the central opening

therein as, in the present application, the runner bars are arranged relatively to the hole in the grinding runner. Considered broadly and in a mechanical sense, the grinding runner of the present application and the polishing runner of my said co-pending application are equivalents. I have not, therefore, included in my said co-pending application, any claims for the polishing runner provided with an opening and the arrangement of the felt pads relatively thereto, as this construction is covered by claims of my present application. In order to cover the different applications of my invention as it relates to this feature, I have, in the claims drawn to cover said feature, used the generic designation "a runner for a plate glass finishing machine" for the runners of both the present and my co-pending application, Serial No. 791,521, and the designation "projections" for the cast iron projections on the under face of the runner of the present application and for the felt pads of my said co-pending application.

I claim:—

1. A runner for a glass grinding machine, comprising a series of runner bars which are tangent to a circle adjacent to the center of said runner, and runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with one of the runner bars which define said segment, substantially as described, each of said runner bars comprising a series of projections spaced apart lengthwise thereof.

2. A runner for a glass grinding machine comprising a series of runner bars which are tangent to a circle adjacent to the center of said runner, and the outer ends of which are "set" rearwardly relatively to the designed direction of rotation of said runner, and runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with the runner bar at the front side of the segment, substantially as described, each of said runner bars comprising a series of projections spaced apart lengthwise thereof.

3. A runner for a glass grinding machine comprising a series of runner bars which are tangent to a circle adjacent to the center of said runner, the relation being such that said runner bars will extend at angles of approximately 15 degrees to radial lines extending through the outer ends of said runner bars, and said runner bars also comprising runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with one of the runner bars which define said segment, substantially as described, each of said runner bars comprising a series of projections spaced apart lengthwise thereof.

4. A runner for a glass finishing machine provided with an opening adjacent to its center, said runner having projections on its under face comprising series of projections which extend parallel with a circle adjacent to the center of said runner and the outer ends of which are "set" rearwardly relatively to the designed direction of rotation of said runner, and series of projections in the segments defined by said first series of projections and which extend parallel with said first series of projections, said series of projections defining channels which are continuous from the inner ends of said series, respectively, to the outer edge of said runner, and, in the case of the tangential series of projections, are continuous from the circle to which said series of projections are tangent.

5. A runner for a glass finishing machine provided with an opening adjacent to its center, said runner having spaced projections comprising series of projections which are tangent to a circle adjacent to the center of said runner, and series of projections in the segments defined by said first series of projections which extend parallel with said first series of projections, the outer ends of said series of projections being "set" rearwardly relatively to the designed direction of rotation of said runner, substantially as described.

6. A runner for a glass grinding machine, comprising a series of runner bars which are tangent to a circle which is substantially concentric with said runner, and runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with one of the runner bars which define said segment, and the advancing sides of the projections on said runner bars being downwardly and rearwardly inclined, substantially as described.

7. A runner for a glass grinding machine, comprising a series of main runner bars which are tangent to a circle described from the center of said runner, and supplemental runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with one of the main runner bars which define said segment and terminate short of the adjacent main runner bar, substantially as described.

8. A runner for a glass grinding machine comprising a series of main runner bars which are tangent to a circle described from the center of said runner, and the outer ends of which are "set" rearwardly relatively to the designed direction of rotation of said runner, and supplemental runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with the main runner bar at the front side of the segment and terminate short of the adjacent main runner bar, substantially as described.

9. A runner for a glass grinding machine comprising a series of main runner bars

which are tangent to a circle described from the center of said runner, the relation being such that said runner bars will extend at angles of approximately 15 degrees to radial lines extending through the outer ends of said runner bars, and supplemental runner bars in the segments defined by said first runner bars, the bars in each segment being parallel with one of the main runner bars which define said segment and terminate short of the adjacent main runner bar, substantially as described.

In testimony that I claim the foregoing as my invention, I affix my signature in presence of two subscribing witnesses this 3rd day of September, A. D., 1913.

CARLTON L. SMITH.

Witnesses:

ARTHUR B. CRANE,

A. C. BORDEN.