

June 15, 1937.

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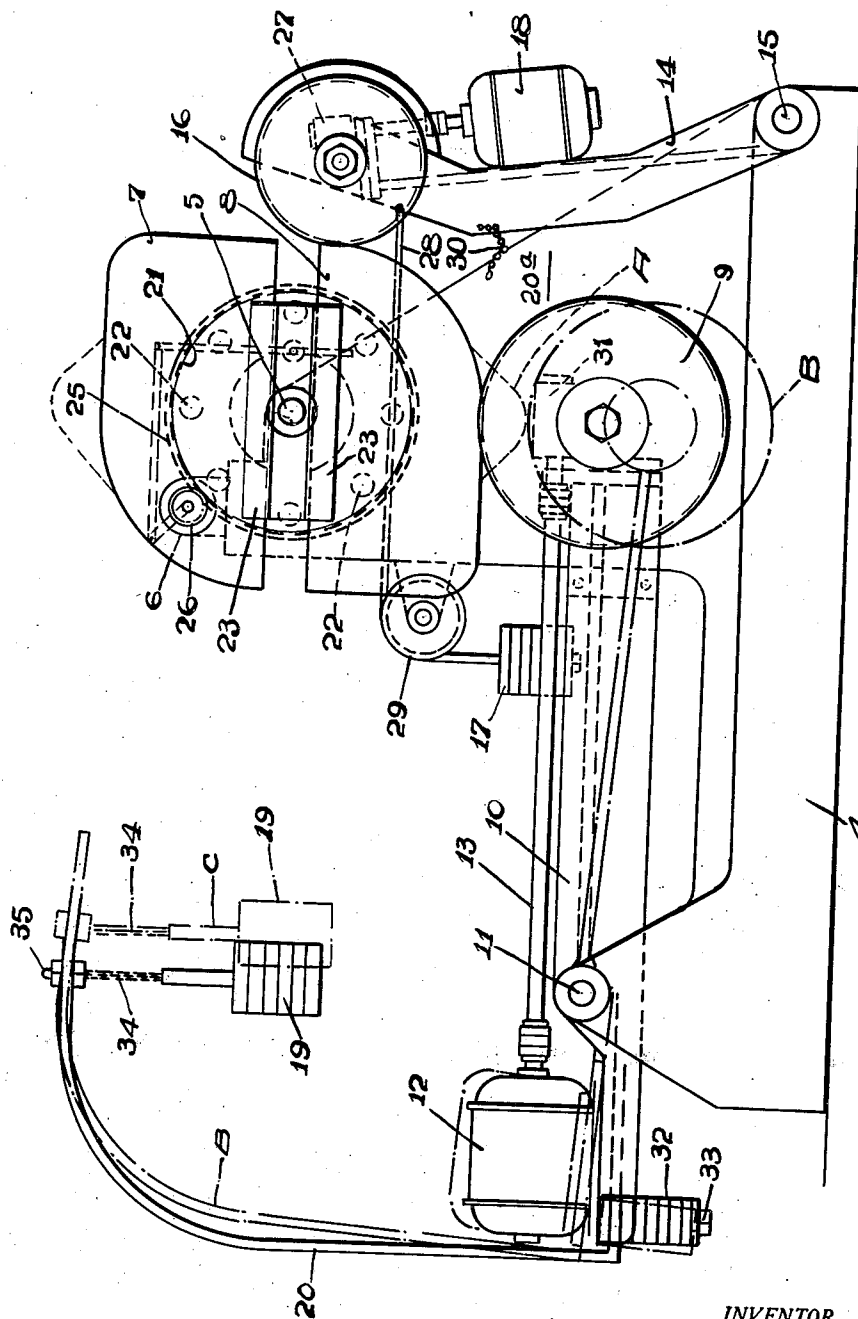
2,084,138

EDGE GRINDING MACHINE

Filed Oct. 31, 1936

2 Sheets-Sheet 1

Fig. 1.



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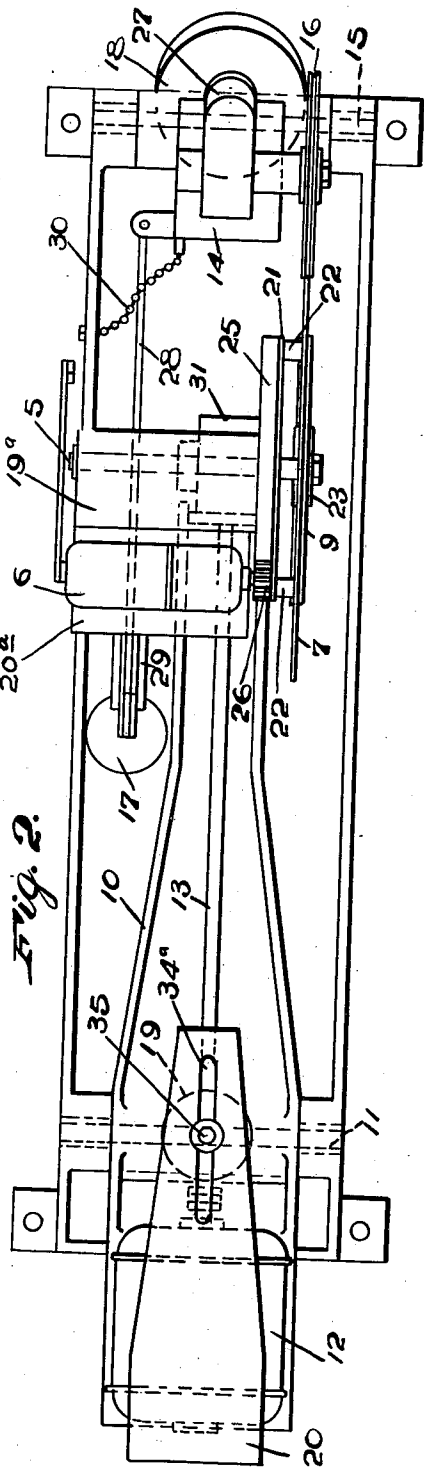
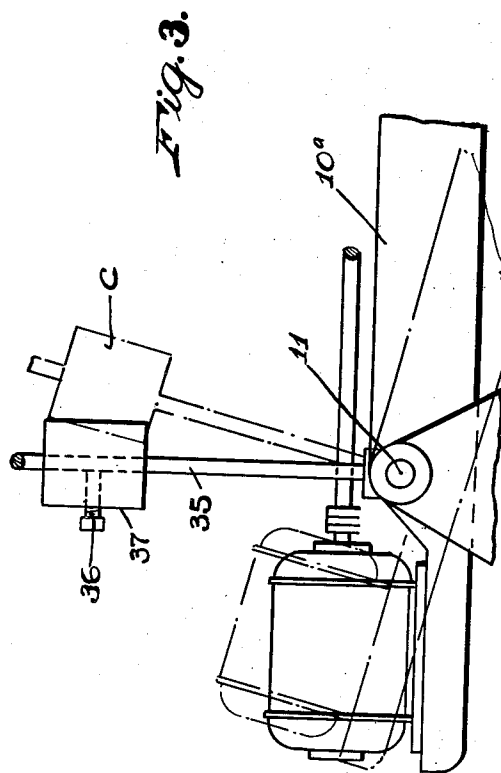
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2 Sheets-Sheet 2



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EDGE GRINDING MACHINE

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6 Claims. (Cl. 51—105)

The invention relates to a machine for grinding the edges of glass sheets, such as plate glass or safety glass, the latter consisting of a pair of relatively thin glass sheets laminated to a sheet of non-shatter material. More particularly it relates to an improvement in that type of machines in which the plate to be edged is rotated slowly about a horizontal axis with a grooved grinding wheel driven at a relatively high speed and lying in the plane of rotation of the glass plate bearing against the edge of the plate. Most of the plates whose edges are ground are for automobile bodies having relatively sharp curves at one or more of the corners, and in the grinding of plates of this kind, there is a tendency to chip such corners due to the concentration of the grinding pressure on the reduced areas at these points as compared with the straight sides of the sheet. This tendency is further increased in those cases in which the machine is provided with automatic control means for speeding up the rotation of the glass plate when the corners of the plate reach the grinding wheel. The principal object of the present invention is to provide a simple, effective means for automatically reducing the pressure of the grinding wheel on the glass at the corners of the plates, so as to avoid the danger of chipping such corners. Briefly stated, this is accomplished by providing a counterweight for the arm carrying the grinding wheel so arranged that when the grinding wheel is approached by the corner of a plate and moved away from the center of rotation of the plate, such movement shifts the counterweight so as to reduce the pressure of the wheel upon the glass. Certain embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view. And Fig. 3 is a partial side elevation showing a modification.

Referring to the drawings, 4 is the base of the machine; 5 is a horizontal axle driven from the motor 6 by means of which the pair of glass sheets 7 and 8 are rotated in a vertical plane; 9 is a grooved grinding wheel rotating in the plane of the glass sheets and carried by a swinging arm 10 pivoted to the frame at 11; 12 is a motor for rotating the grinding wheel through the shaft 13, such motor being mounted upon the arm and serving in part to counterweight it; 14 is a second arm pivoted to the frame at 15 and provided with a grooved polishing wheel 16 drawn toward the edges of the glass sheets by the counterweight 17; 18 is an electric motor mounted on the arm 14 for driving the polishing wheel; and 19 is an additional counterweight for the arm 10, such counterweight being carried by the arm 20.

The horizontal axle 5 which rotates the chuck

carrying the glass plates 7 and 8 is mounted in a boss 19a carried by the upright projecting frame portion 20a. Keyed to the shaft is a face plate 21 provided with the steady posts 22 which engage the faces of the glass sheets opposite the face plate. The edges of the plates 7 and 8 are received between a pair of opposing plates 23 which act as a chuck and are clamped between a pair of clamping members secured to the end of the shaft. The face plate 21 is provided with a rack 25 around its periphery and this rack is engaged by a pinion 26 carried by the shaft of the motor 6, such motor being suitably mounted on the upwardly projecting frame portion 20a which carries the horizontal shaft 5. Means are thus provided for giving the glass plates a relatively slow movement of rotation to carry their edges past the grooved grinding wheel 9. The glass plates 7 and 8 are body lights of an automobile. They are ground in pairs, as together they present an approximate rectangle rendering the grinding operation more uniform than if they were ground separately. The grinding in pairs also increases the capacity of the machine, this being a feature which is well known in the art. It will be understood, of course, in this connection that the machine may be used to grind the edges of plates individually in those cases in which it may be found desirable to do so.

The grooved polishing wheel 16 has nothing to do with the present invention, and is shown and described because it forms a part of the complete equipment of the machine. It is driven from the motor 18 through the intermediary of a worm drive in the casing 27, and the wheel is caused to yieldingly engage the edges of the glass sheets by the counterweight 17 which is connected to the arm 14 by the cable 28 passing over the sheave 29 on the upwardly projecting frame portion 20a. A chain connection 30 limits the swinging movement of the arm to the right when the machine is not in operation.

The grinding wheel 9 is of the ordinary grooved type in order to give the glass plates the so-called "pencil edge" and it is driven at a relatively high rate of speed from the motor 12, a worm drive being provided between the wheel and the shaft 13 in the casing 31. The wheel is caused to yieldingly engage the edges of the glass plates due to the weight of the motor 12 which is supplemented by suitable counterweights 32 carried upon a rod 33 projecting from the lower side of the arm 10 at its rear end. The counterweight 19 is supported from the arm 20 by a chain 34 and the position of the chain may be adjusted in a horizontal direction by reason of the slot 34a (Fig. 2) which carries the rod 35 constituting an extension of the chain, such rod being provided with a pair of nuts, as shown, for holding it in adjusted position. When the

glass sheets are positioned, as indicated in full lines, so that the grinding wheel is operating upon one of the flat sides thereof, the arm 10 is in substantially horizontal position and the counterweight 19 occupies the position shown in full lines directly above the pivot 11. When the shaft 5 rotates the plate 8 so that the corners of such plate engage the grinding wheel and occupy the dotted line position marked A in Fig. 1, the arm 10 is depressed so that the grinding wheel occupies the position marked B in dotted lines. When this swinging movement of the arm occurs, the counterweight 19 is moved from the full line position to the dotted line position C of Fig. 1. This movement of the counterweight 19 to the right of the center line of the pivot 11 causes a reduction of pressure of the grinding wheel upon the glass sheet which is a desirable condition, as heretofore pointed out, in order to reduce the pressure of the grinding wheel on the glass and avoid the danger of chipping the sheet at this point. This is particularly desirable if the machine is provided with means for speeding up the rotation of the axle 5 as the glass sheet approaches positions, such as indicated at A, as in such case there is a still greater tendency to chip the corners of the sheets due to the high pressure and increased speed of the glass plates.

Fig. 3 illustrates a modification of the invention, in which the counterweight 37 corresponding to the counterweight 19 in Fig. 1 is supported upon a rod 35 projecting from the arm 10a directly above the pivot 11. When the arm 10a is tilted downward, as described in connection with Fig. 1, the counterweight 37 is moved to the position C, so that it performs the same function as that performed by the counterweight 19 of Fig. 1 when it is moved to the position C. The counterweight is preferably made adjustable longitudinally of the arm 35 and held in position by a set screw 36. Other modifications of the invention are possible, the only requirement being that the arm which carries the grinding wheel shall be counterweighted by means of some description located above the fulcrum of the arm so that when the end of the arm carrying the wheel is moved downward, the counterweight is shifted so as to relieve the pressure between the wheel and the glass.

What I claim is:

1. In combination in an edge grinding machine, means for supporting a glass sheet and giving it a movement of rotation about a horizontal axis, a driven grooved grinding wheel therebeneath in the plane of the glass sheet, an arm in one end of which the grinding wheel is mounted for rotation, such arm being pivotally mounted and having the end carrying the grinding wheel yielding pressed upward, and a weight carried by the arm above its point of pivotal support and arranged so that the downward movement of the end of the arm carrying the grinding wheel carries the weight toward the axis of rotation of the glass sheet thus reducing the pressure of such wheel upon the edge of the sheet.
2. In combination in an edge grinding machine, means for supporting a glass sheet and giving it a movement of rotation about a horizontal axis, a grooved grinding wheel therebeneath in the plane of the glass sheet, such arm being pivotally mounted and counterweighted so that the wheel is pressed into engagement with the edge of the glass sheet, driving means for the wheel carried on the arm, and a weight carried by the arm and arranged so that the downward

movement of the arm carries the weight transversely of the point at which the arm pivots and towards the axis of rotation of the glass sheet thus reducing the pressure of the wheel upon the edge of the sheet.

3. In combination in an edge grinding machine, means for supporting a glass sheet and giving it a movement of rotation about a horizontal axis, a grooved grinding wheel in the plane of the glass sheet therebeneath, an arm in which the grinding wheel is mounted for rotation, such arm being pivotally mounted and counterweighted so that the wheel is pressed into engagement with the edge of the glass sheet, driving means for the wheel carried on the arm, and a weight carried by the arm above the pivot on which the arm swings and remote from such arm adapted to move toward the vertical plane in which the center line of the wheel lies as the wheel moves downward.

4. In combination in an edge grinding machine, means for supporting a glass sheet and giving it a movement of rotation about a horizontal axis, a grooved grinding wheel in the plane of the glass sheet therebeneath, an arm in which the grinding wheel is mounted for rotation, such arm being pivotally mounted and counterweighted so that the wheel is pressed into engagement with the edge of the glass sheet, driving means for the wheel carried on the arm, and a weight carried by the arm above and remote therefrom but in substantial vertical alinement with the pivot on which the arm is mounted when such arm is in approximately horizontal position, such weight being adapted to swing toward the vertical plane in which the center line of the wheel lies as the wheel moves downward.

5. In combination in an edge grinding machine, means for supporting a glass sheet for rotation about a horizontal axis, a motor and connections for rotating the sheet, a horizontally extending arm beneath said axis pivotally supported intermediate its ends, a grooved grinding wheel pivoted at one end of the arm beneath said axis in the plane of the glass sheet, a motor on the other end of said arm, driving connections between the motor and the grinding wheel, said arm being proportioned and weighted so that the grinding wheel is pressed upward into grinding engagement with the edge of the glass sheet, and a weight member supported on the arm above the pivotal point thereof and remote from the arm adapted to swing toward the axis of rotation of the glass sheet as the end of the arm carrying the wheel moves downward.

6. In combination in an edge grinding machine, means for supporting a glass sheet for rotation about a horizontal axis, a motor and connections for rotating the sheet, a horizontally extending arm beneath said axis pivotally supported intermediate its ends, a grooved grinding wheel pivoted at one end of the arm beneath said axis in the plane of the glass sheet, a motor on the other end of said arm, driving connections between the motor and the grinding wheel, said arm being proportioned and weighted so that the grinding wheel is pressed inward into grinding engagement with the edge of the glass sheet, a bar secured at its lower end to said arm and extending upwardly therefrom, and a weight carried by the arm above the pivotal point thereof and adapted to move from such position to a point nearer the axis of rotation of the wheel as the end of the arm carrying the wheel moves downward.

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