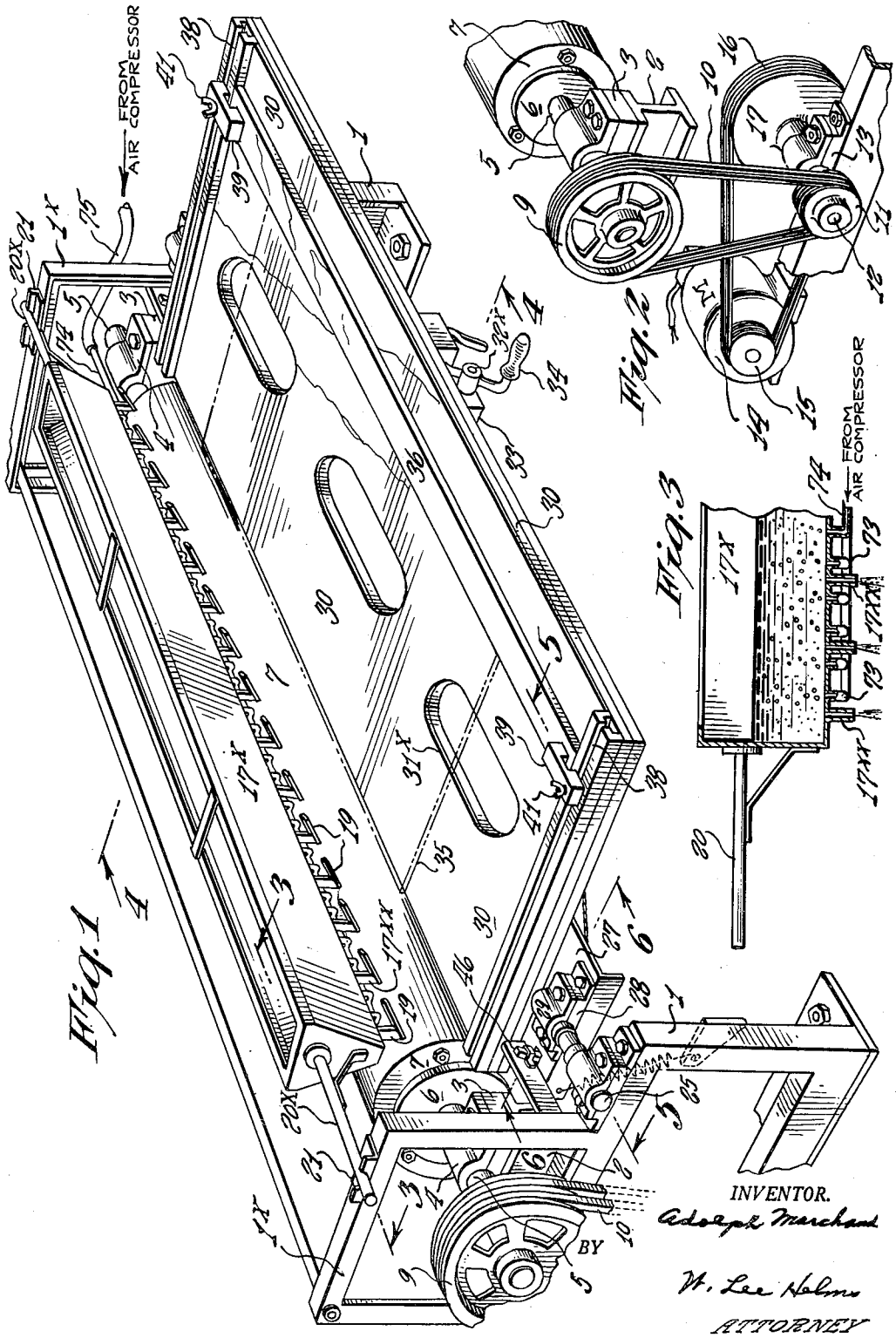
May 27, 1952 A. MARCHAND 2,598,405

GLASS GRINDING MACHINE

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GLASS GRINDING MACHINE

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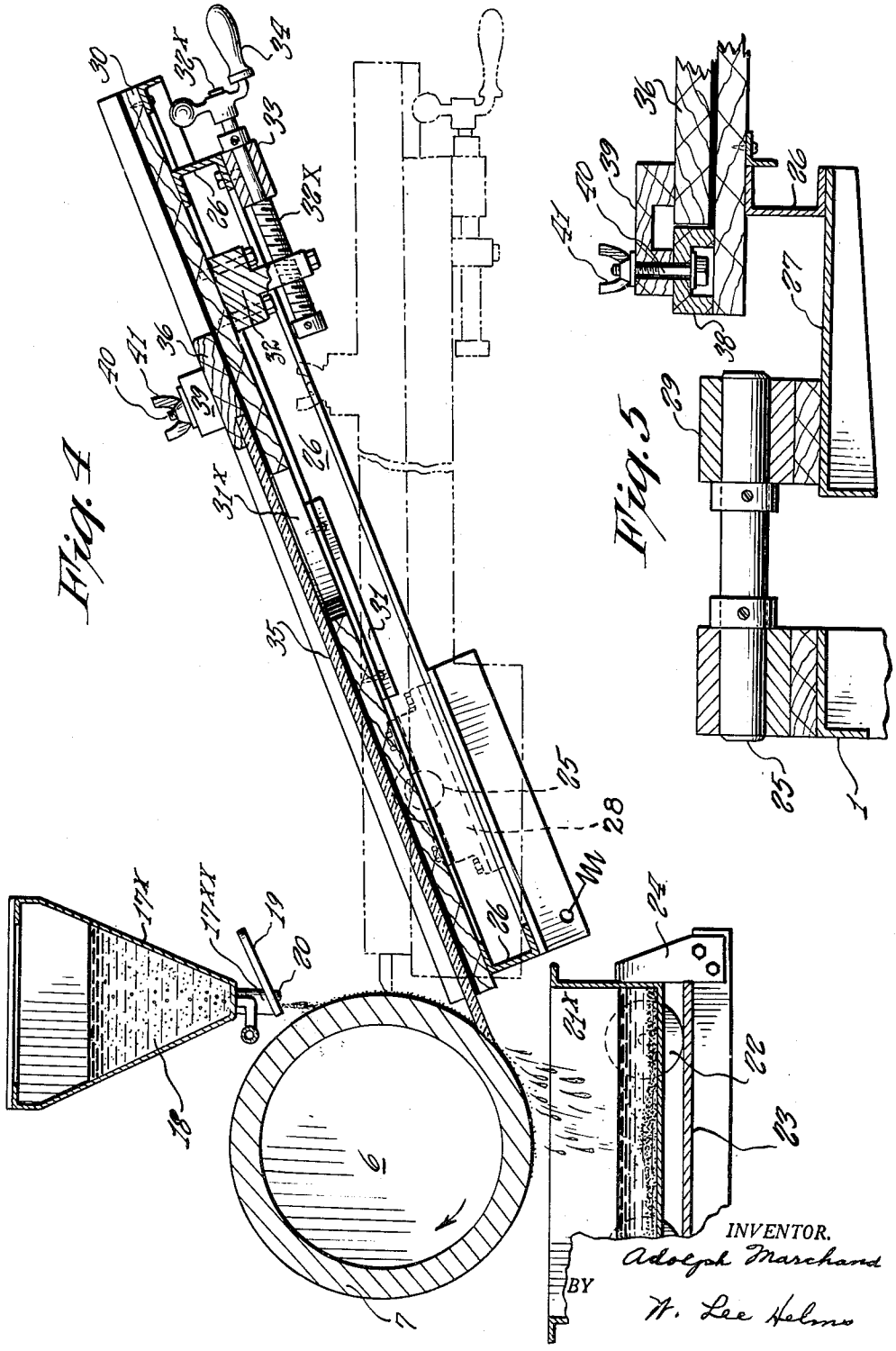


Fig. 4

Fig. 5

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Fig 6

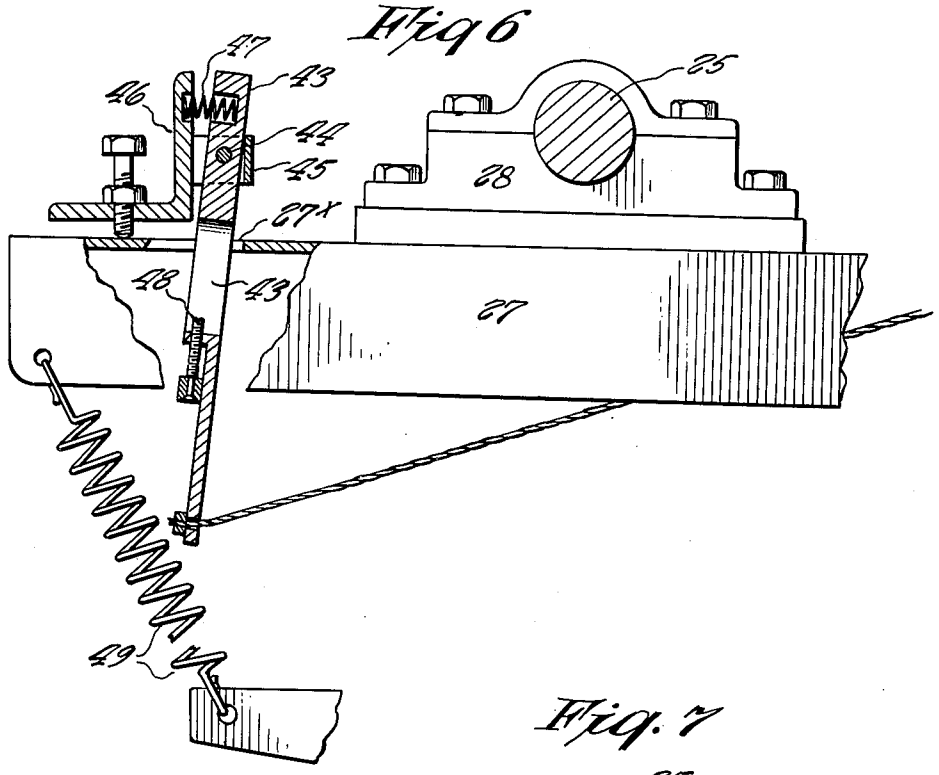
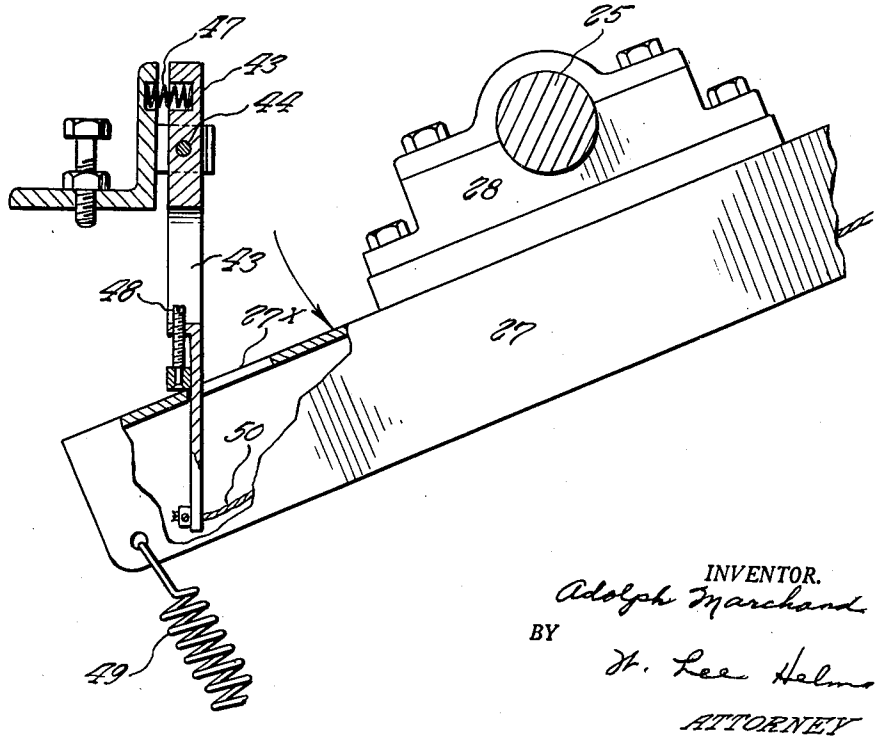


Fig. 7



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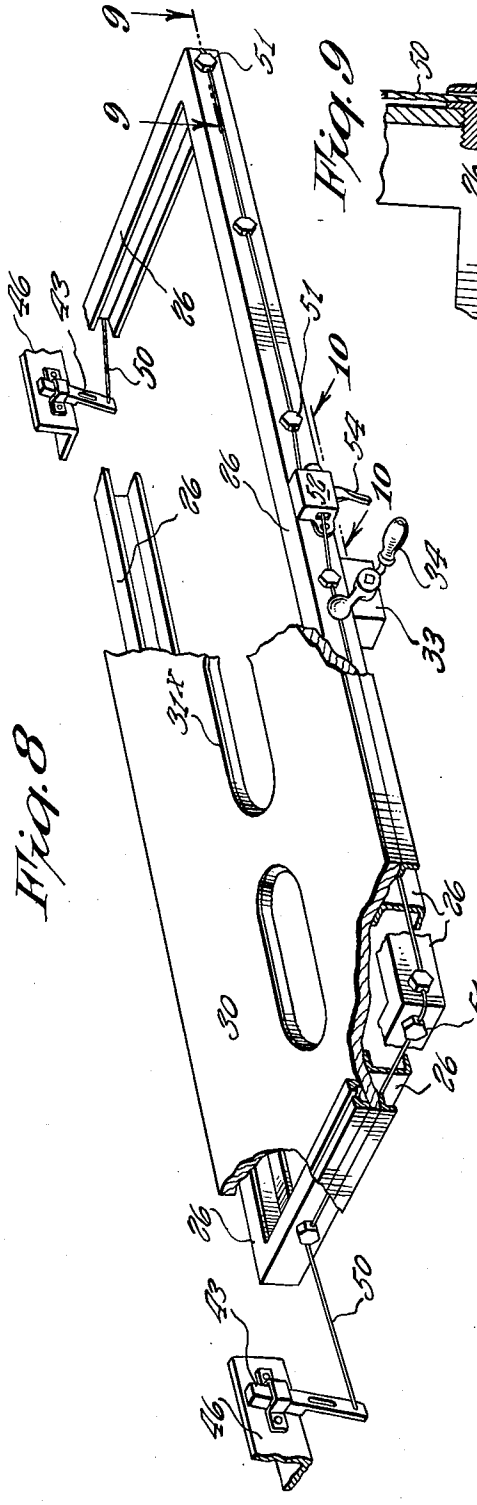


Fig. 8

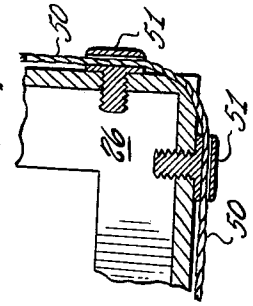


Fig. 9

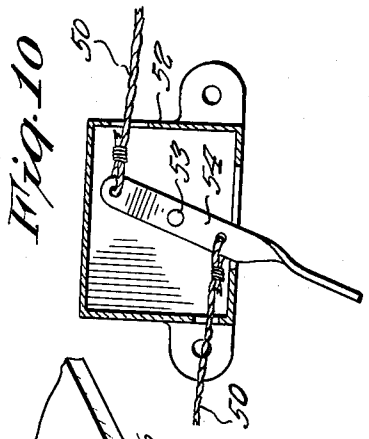


Fig. 10

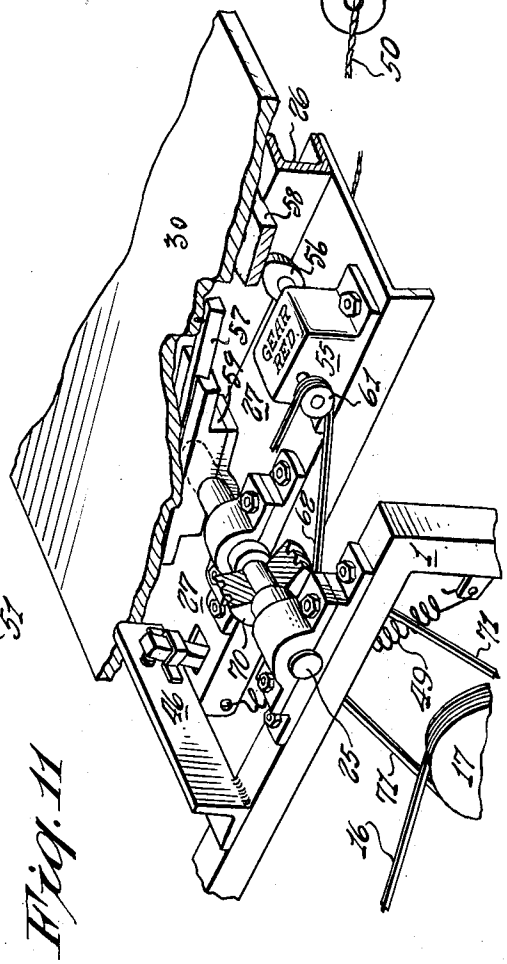


Fig. 11

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UNITED STATES PATENT OFFICE

2,598,405

GLASS GRINDING MACHINE

Adolph Marchand, Jackson Heights, N. Y.

Application February 23, 1949, Serial No. 77,719

4 Claims. (Cl. 51—96)

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The object of the present invention is to provide a grinding machine adapted for bevelling and "seaming" glass in plate form, and it has for its particular object to provide a machine of such character which will accurately bevel or seam the entire margins of a glass plate, applying a controlled pressure between the grinding roll or "mill" and the margin of a glass plate held upon a supporting table, which will enable ready adjustment of the table toward and from the grinding roll, which will automatically feed a grinding medium to the grinding roll, and which will have simple and effective release mechanism.

The invention will be described with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view partly broken away showing an embodiment of the invention;

Fig. 2 is a fragmentary perspective view showing the driving means for the grinding roll;

Fig. 3 is a fragmentary section taken vertically on the line 3—3, Fig. 1;

Fig. 4 is an enlarged transverse section on the line 4—4, Fig. 1;

Fig. 5 is an enlarged fragmentary section on the line 5—5, Fig. 1;

Fig. 6 is a detail view, partly broken away showing latch and release means for the table, the table being in horizontal position;

Fig. 7 is a view similar to Fig. 6 showing the table latched in operative inclined position;

Fig. 8 is a view partly broken away showing the table frame and table, together with the release mechanism as to one form thereof;

Fig. 9 is a detailed corner section taken horizontally on the line 9—9, Fig. 8;

Fig. 10 is a vertical section through the release lever box taken vertically on the line 10—10, Fig. 8;

Fig. 11 is a detailed and fragmentary perspective view showing a modification incorporating means for slowly vibrating the table frame and table, the view being in partial section.

Referring to the drawings, it will be seen from Fig. 1 that the machine comprises end frame members 1 which in practice are tied by intermediate tie frames which are not shown in the drawings. Each frame member 1 has welded or bolted thereto a T-member 2 which supports the lower bearing block 3 which in turn has secured thereto a bearing strap 4, the two elements providing a sleeve bearing for a shaft 5. This shaft may extend through a roll 6 which has mounted thereon a cast iron cylinder 7, the face thereof being smoothly machined in practice. The shaft 5 at one end has secured thereto a grooved pulley 9 having a belt connection 10 with a driven pulley 11 on a shaft 12 secured by a bearing block and strap arrangement generally indicated at 13, Fig. 2 on one of the primary frame members 1. The power device is a motor 14 having a driven pulley 15 connected by belt assembly 16 with a large pulley 17 on shaft 12.

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Carried by U-shaped risers 1x extending upwardly from primary frame members 1 is a removable feed box 17x for grinding material. This grinding material may be granular "Carborundum" in a water bath. Fig. 4 shows a cross section through box 17x with the aqueous and "Carborundum" content indicated at 18. As shown in Figs. 3 and 4 the bottom of box 17x is apertured in communication with discharge nipples 17xx, and means may be provided for simultaneously or individually controlling flow from the nipples by a suitable valve arrangement. In Figs. 1 and 4 of the drawing the means indicated is for individual control of the nipples by means of pivoted door-like elements 19, the base of each nipple being cut at an angle and members 19 being pivoted at 20, Fig. 4. Thus by swinging members 19 the nipples may be entirely closed or opened partially or completely.

The immediate carriers for box 17x are rods 20x which may rest in the channels of saddle plates 21 secured to the tops of the frame extensions 1x.

As shown in Fig. 4 the nipples discharge the granular material somewhat inwardly of a tangential line meeting the grinding roll 7—6 somewhat vertically. The grinding roll rotates clockwise and the spent grinding material drops downwardly into a collection box 21x, Fig. 4, which box may carry supporting rollers 22 and the latter when the box is in position may be held upon a support 23 under the grinding roll assembly. The support may have a stop member 24.

Forwardly of the grinding roll assembly and mounted on each primary frame member 1 is a strap and block secured shaft 25 which serves as a pivot support for one end of the table holding frame. This frame is shown best in Fig. 8, and is a rectangular member formed of connected U-channel bars, the frame being generally indicated at 26. At each side of the table frame there is welded or otherwise secured thereto a heavy plate 27 having bolted thereto a bearing block 28 which receives shaft 25, the

latter being loosely held in place by a strap 29. As stated, this arrangement is at each end of the table frame and therefor the table frame can swing on the two shafts 25.

The table frame 26 supports a table 30, which may be of wood. It is movable toward and from the grinding roll. Two guide blocks 31 may be secured to the under face of the table for abutment with the side bars of the table frame, one of said guide blocks being shown in Fig. 4 at 31. Depending from the table 30 is a worm-nut 32 which receives a worm on a shaft 32x, the shaft being held in a bearing block 33, Fig. 4, secured to one of the end members of the table frame. By means of a handle 34 the worm may be rotated to move the table forwardly or backwardly toward and from the grinding roll.

The table 30 is formed with suitable apertures at 31x so that a glass plate laid thereon, such a plate being indicated at 35, may be given an under face pressure by the hands for conveniently raising it from the table for removal. The table is provided with a rear abutment and holding member for various widths of glass plates, said member being a bar 36 undercut, as shown in Fig. 4, so that the glass may be received in the undercut and abutted at its top and edge by the bar. The adjusting means for the bar 36 consists of a T-slotted arrangement 38 at each end of the table, and two clamping members 39, best shown in Fig. 5, each clamping member being apertured to receive a stud 40 headed in its appropriate slot, the stud being threaded to receive a wing nut 41.

It will be seen that when the machine is employed for bevelling a glass plate, as in the Fig. 4 position, the table frame, table and glass plate assembly has been swung from the horizontal to the desired angle of cut. The glass may then be moved toward the grinding roll, as for example just short of edge contact with the roll, and a limit stop for the table may then be adjusted, or it may previously be adjusted, to stop the pressure of the glass upon the roll at a predetermined point, and thus limit the extent of the cutting action. For example, it may be desired in some classes of edge bevelling to limit the bevels to a fraction of an inch above one face of the glass so at that face the glass edge will be blunt for a portion of its thickness and hence not go to a sharp point.

The limit stop, which is releasable, is shown more particularly in Figs. 6 and 7 and its releasing means is shown in Figure 8 as applied to two of the limit stops, one at each end of the table frame. Referring to Figure 6, it will be seen that the table frame is in horizontal position, although the frame itself is not shown and only the members 27, 28 and 29 with one of the supporting shafts 25. Heavy plate 27 is apertured at 27x and through the aperture extends a stop or latch pawl 43 pivoted at 44 upon a bracket arm 45 carried by an angle bar 46 which, as shown in Fig. 11 may be secured to the upper extension of frame 1. By means of a spring 47 stop pawl 43 is normally held in latching position. The latch adjustment is an adjustable screw 48. Thus when the table is swung to the position of Fig. 7 the pawl 43 will move into latching position. That position is not the initial position of the table for the beginning of the cut, but will be the predetermined position at which the table will be restrained against further movement of the margin of the glass plate against the face of the grinding roll.

The initial angle of the glass plate relatively to the grinding roll determines the degree of inclination of the bevel which will be cut, whereas the adjusted position of the stop pawl 43 will determine the relative positions of grinding roll and glass plate at the end of the bevelling operation. When the table has been moved to an angle and the glass plate brought into contact with the grinding roll, through rotation of the handle 34, the gravitational pressure of the glass edge against the cutting roll will effect sufficient pressure of the glass edge upon the roll to insure the proper action. For example, and with reference to Fig. 4, the weight of the table rearwardly of the shaft axes 25 may be such as to cause a ten pound pressure of the glass against the cutting roll. A counter-spring 49 or any suitable counter-balancing means may be employed on the table frame for counter-balancing in part the weight of the table frame and the members it carries, as to that area to the right of the pivotal point 25, Fig. 4.

When a bevelling operation has been completed the glass plate may be retracted by rotation of handle 34 and the table restored to horizontal position as shown in dotted lines, Fig. 4. Preceding such return of the table to horizontal position the stop member or members 43 are released. Reference to Fig. 8 will show that the lower ends of said pivoted stop members 43 are engaged by a cable 50 which is led through guide members 51 on the frame and thence to the interior of a box 52, being connected at opposite points of the pivot 53 of a hand lever 54. By moving the hand lever to the right from its position in Fig. 10, stop members 43 will be released from the table frame, and the latter may swing upwardly.

In Fig. 11 I have illustrated means for periodically giving a slight intermittent retraction to the table, and hence the glass margin, undergoing a bevelling operation. For example, the glass plate margin may be slightly retracted from the grinding roll a number of times per minute to allow the layer of grinding material to pass on the roll beyond the edge of the glass, and to maintain a more even coating of "Carborundum" or other grinding material on the surface of the grinding roll, particularly during the early stages of the cutting action when the sharp edge of the glass has the greatest effect as a scraper. To that end there is carried by plate 27 secured to the table frame 26 a reduction gear assembly 55 driving a cam 56 which may engage a wear plate 58 secured to the under face of the table 30, the latter carrying at each side a slide bar 57 in a slideway assembly 59 loosely mounted on shaft 25. In such case the table may have a spring connection with the worm nut 32. The reduction gear assembly leads to a shaft carrying a driven pulley 61 which receives a belt 62 leading to a pulley 70 loosely mounted on shaft 25 and in turn driven by a belt 71 leading to pulley 17, Fig. 11. Of course pulley 17 will have a channel for the reception of belt 71 in addition to the channels for the belt lengths 15. Thus by operation of the cam 56, the table frame will have an intermittent slight movement independently of the frame sufficient to carry the glass plate margin a slight distance away from the grinding wheel, which distance may be restricted to a sixteenth inch or even less.

In order to aid suspension of the grinding material in its liquid carrier, I employ air jets through ducts 73, Fig. 3 leading to the interior of box 17x, preferably at the base thereof, these

ducts leading to a manifold pipe 74, connected as by tubing 75, Fig. 1, to an air compressor (not shown).

By means of the invention glass plates may be quickly and economically bevelled or seamed, the latter term referring to the grinding down of rough edges.

It will be understood that various modifications may be made in the form and arrangement of the elements of the embodiment illustrated and described herein, without departing from the spirit of the invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is as follows:

1. A glass bevelling machine comprising a primary frame, a longitudinal grinding roll rotatably mounted on the primary frame for rotary movement about a horizontal axis, a tiltable frame pivoted on said primary frame for pivotal movement about a horizontal axis parallel to said grinding roll axis of rotation, a glass plate-supporting table pivoted on said primary frame for pivotable movement about a horizontal axis parallel to the axes of rotation of said grinding roll and said tiltable frame, means for adjusting the angular orientation of said tiltable frame with respect to said primary frame, and means for oscillating said table about its axis of rotation so as to move a portion of said table intermittently toward and away from the grinding roll while maintaining said tiltable frame stationary in its adjusted position.

2. In a glass bevelling machine, a primary frame, a grinding roll mounted on said frame and power means for rotating said roll, a tiltable frame pivoted to the primary frame, a glass plate-supporting table on the tiltable frame, means for moving said table toward and from the grinding roll, said tiltable frame having a center of gravity offset from its pivoting axis, a member pivotally mounted on said primary frame, an abutment element adjustably connected to said member and pivotably movable with said member into and out of the path of pivotal movement of the tiltable frame, said abutment element being adapted to engage the tiltable frame so as to prevent the action of gravity from causing said tiltable frame to pivot, spring means engaging said member for pivoting the latter and thereby moving said abutment element into the path of pivotal movement of the tiltable frame, and manually operable means for pivoting said member against the action of said spring means and thereby moving said abutment element out of the path of pivotal movement of the tiltable frame.

3. A glass bevelling machine comprising a primary frame, a longitudinal grinding roll rotatably mounted on the primary frame for rotary movement about a horizontal axis, a tiltable frame pivoted on said primary frame for pivotal movement about a horizontal axis parallel to said grinding roll axis of rotation, a glass plate-supporting table rotatably mounted on said primary frame for pivotable movement about a horizontal axis parallel to the axes of rotation of said grinding roll and said tiltable frame, said tiltable frame having a center of gravity offset from its pivoting axis, a stop member movably mounted on said primary frame for movement into and out of the path of pivotal movement of the tiltable frame and adapted to engage the latter so as to prevent it from continuing to tilt toward the grinding roll, said stop member being adjustable so as to vary the angular inclination of the tiltable frame at which the latter will engage said stop member, and manually operable means for moving said stop member out of the path of pivotal movement of the tiltable frame.

4. In a glass bevelling machine, a primary frame, a grinding roll mounted on said frame and power means for rotating said roll, a tiltable frame pivoted to the primary frame, a glass plate-supporting table on the tiltable frame, means for moving said table toward and from the grinding roll, means for movably mounting said table on said tiltable frame for movement with respect to the frame in a direction toward and away from the grinding roll, said tiltable frame having a center of gravity offset from its pivoting axis, a member pivotally mounted on said primary frame, an abutment element adjustably connected to said member and pivotably movable with said member into and out of the path of pivotal movement of the tiltable frame, said abutment element being adapted to engage the tiltable frame so as to prevent the action of gravity from causing said tiltable frame to pivot, spring means engaging said member for pivoting the latter and thereby moving said abutment element into the path of pivotal movement of the tiltable frame, and manually operable means for pivoting said member against the action of said spring means and thereby moving said abutment element out of the path of pivotal movement of the tiltable frame.

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