United States Patent

[11] 3,570,734

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[54] **POWER-ACTUATED PLATE GLASS CUTTER'S TABLE**
4 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **225/104,** 225/96.5
[51] **Int. Cl.** **B26f 3/00**
[50] **Field of Search** 225/96.5, 96, 104, 103, 2

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ABSTRACT: A flat table pivotally mounted to rotate about a horizontal axis from a position in which the table is slightly inclined from vertical to a horizontal position there being pegs extending from the table near the lower edge thereof to support a sheet of plate glass inclining against the table, said sheet rocking with the table to horizontal position for a glass cutting operation. A glass-breaking bar is confined in a slot provided in the table and is reciprocable upwardly broadside from said slot by a multiple toggle mechanism to break a sheet of glass lying on said table along a score line cut in said sheet and aligned with said bar.

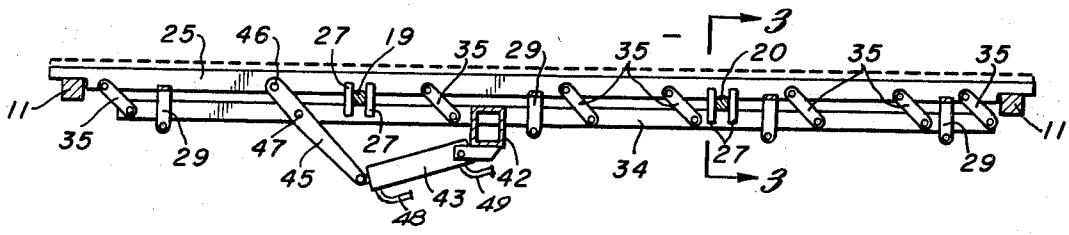


FIG. 1

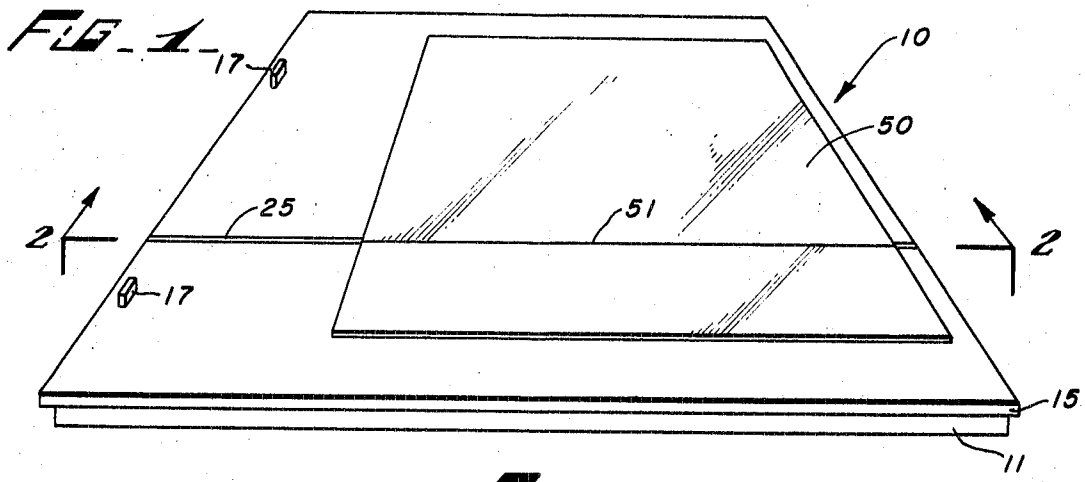


FIG. 2

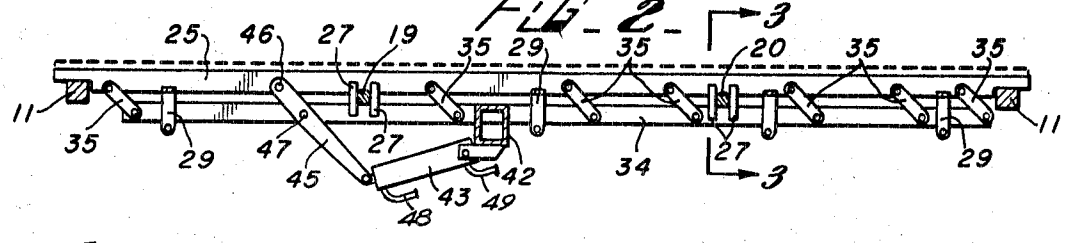


FIG. 4

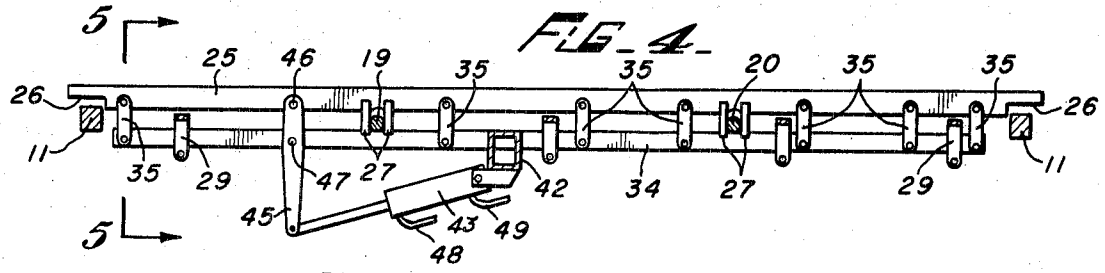


FIG. 5

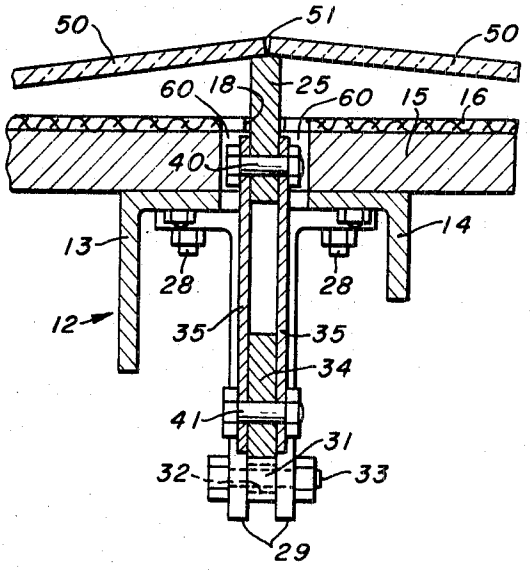
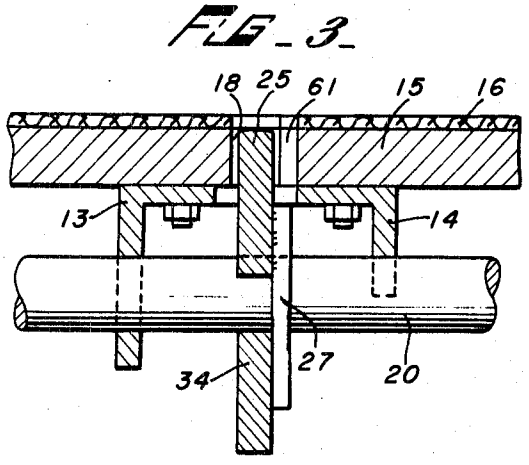


FIG. 3



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POWER-ACTUATED PLATE GLASS CUTTER'S TABLE

BACKGROUND OF THE INVENTION

The present invention is an improvement in the Power Actuated Glass Cutter's Table disclosed and claimed in my copending application Ser. No. 776,526, filed Nov. 18, 1968. The invention there disclosed employs a multiplicity of air cylinders individually connected to the breaker bar at spaced intervals along that bar and air actuated from a common control valve, to accomplish the broadside reciprocation of a breaker bar in the breaking a sheet of glass.

SUMMARY OF THE INVENTION

The present invention aims to improve the aforesaid glass cutter's table so as to assure that all portions of the outer edge of the breaker bar are applied to a glass sheet simultaneously and with the same velocity and pressure. It includes a rockable table slotted to receive the breaker bar and a novel toggle means which embodies the breaker bar as one of its elements, and a drive bar which is coextensive with the breaker bar and mounted for only longitudinal sliding movement on the table parallel with and close to the breaker bar, and these two bars are connected to each other by uniformly inclined toggle links located at spaced intervals. The breaker bar is guided on the table frame so that it is restricted in its movement to being readily slidable broadside out of said slot or retractable thereinto. Thus, endwise sliding movement of the drive bar imparts such broadside movement to the breaker bar, the direction of the latter movement depending on the direction of the endwise movement of the drive bar.

Suitable power means is preferably provided for shifting said drive bar and thus actuating the breaker bar for breaking sheets of glass resting on said table.

The superiority of the present invention is derived from the precise uniformity with which all portions of the breaker bar are simultaneously ejected from a table slot confining the same thereby maintaining the upper edge of the breaker bar parallel with the plate glass sheet supporting surface of the table as said sheet is engaged by the breaker bar. Under this condition, a clean, straight fracture of a sheet of glass along a properly produced score line properly aligned with the breaker bar is practically assured.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic perspective view of the glass cutter's table of the present invention illustrating the latter provided with a breaker bar mounted in a slot extending from edge to edge of the table in a plane perpendicular to the axis of rotation of said table and with a plate of sheet glass resting on said table with a straight score line cut in said sheet with said score line aligned with said bar in readiness for elevation of the latter to break such sheet along said line.

FIG. 2 is an enlarged sectional view taken on the line 2–2 of FIG. 1 and illustrating the toggle mechanism of the present invention provided for actuating said breaker bar and with said breaker bar in retracted position.

FIG. 3 is an enlarged detailed sectional view taken on line 3–3 of FIG. 2 and illustrating the means for guiding said breaker bar to restrict its movement to a broadside movement of said bar.

FIG. 4 is a view similar to FIG. 2 illustrating said toggle mechanism actuated to eject said breaker bar broadside from the slot confining the same in the table of the invention so as to break a sheet of glass overlying said bar.

FIG. 5 is an enlarged sectional detailed view taken on the line 5–5 of FIG. 4 and illustrating details of the structure of said toggle breaker bar actuating mechanism with the breaker bar ejected broadside from the table into glass sheet breaking position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring specifically to the drawings, the improvement of which the present invention consists comprises a glass cutter's table 10 which includes a perimetric frame 11 which is strengthened by a series of angle iron members 12 transversely disposed in said frame and spaced at intervals throughout the length thereof, said angle iron members including angle iron members 13 and 14. Secured to perimetric frame 11 and to angle iron members 12 is a table top 15 covered with a carpet 16. Said table top is provided with a pair of pegs 17 along the lower edge of said table top and the table top has formed therein a slot 18 which extends transversely across the table parallel with and between angle iron members 13 and 14. Embodied longitudinally in the table 10 and extending lengthwise thereof from end to end of the frame 11 is a pair of solid shafts 19 and 30 which are fixed at their ends to frame 11 and extend through suitable apertures formed in angle iron members 12 and are welded to said frame and said members.

Vertically slidable in slot 18 is a breaker bar 25 which extends transversely the full width of the table top 15. This breaker bar is cut out at 26 at its ends so as to fit over end members of the perimetric frame 11 and is also slightly cut out along its lower edge to fit over shafts 19 and 20. Welded on the breaker bar at right angles therewith are guide lugs 27 which are spaced to just receive the shafts 19 and 20 therebetween and thus guide the breaker bar 25 to restrict movement of said breaker bar to a movement which is parallel with said lugs, which is to say, a broadside movement of the breaker bar 25 in the plane of slot 18.

Table 10 is pivotally mounted on shaft 19 in a manner clearly shown in detail in my copending application (supra). For the purposes of disclosing the present invention, it will be unnecessary to have reference to this means for rotating table 10 and said table will be considered merely as supported in a horizontal position as shown in FIG. 1.

Secured by bolts 28 to angle iron members 13 and 14 is a series of pairs of drive bar support brackets 29 which have the form of right angles and have parallel legs 30 between the extremities of which a roller 31 is rotatably supported on a sleeve 32 which is secured to the brackets by a bolt 33. Slidably fitting between the legs 30 and riding on rollers 31 is a drive bar 34. The drive bar 34 is thus supported parallel with the breaker bar 25 and is connected to the latter by a series of toggle links 35 which are pivotally connected at their upper ends to the breaker bar 25 and at their lower ends to the drive bar 34 with said links parallel with each other at all times, these links have the same distance between the axes of their pivotal connections with said bars. The axes of their upper pivotal connections are all in a given horizontal line and the axes of their lower pivotal connections are all on another horizontal line. The links 35 are formed in pairs each link 35 comprising a pair of links 36 applied to opposite sides of the bars 25 and 34, the upper end of each pair of such links 36 being pivotally connected by a bolt 40 to the breaker bar 25 and the lower ends of each such pair of links 36 being pivotally connected by a bolt 41 to the drive bar 34.

Mounted on certain of the angle iron members 12 of the table 10 is a cylinder mount 42 on which is pivotally mounted a fluid cylinder 43, the piston rod 44 of which pivotally connects to the end of a lever 45, this lever being pivotally connected by a pin 46 to the breaker bar 25 and by a pin 47 to the drive bar 34. The distance between the centers of the pins 46 and 47 is identical with the distance between the upper and lower pivot points in each of the links 35 and the line connecting the centers of pins 46 and 47 is parallel with the lines connecting the upper and lower pivot centers of the links 35.

OPERATION

For effecting the actuation of the toggle mechanism of the glass cutter's table 10 to accomplish the breaking of a sheet of glass, the fluid cylinder 43 is provided with fluid hoses 48 and 49 which lead to a suitable control valve (not shown but

located at one edge of the table 10) for the controlling of delivery of fluid under pressure alternately to opposite ends of said cylinder. By this means the operator is able to extend the piston rod 44 of said cylinder from the position in which it is shown in FIG. 2 to the position in which it is shown in FIG. 4 thereby shifting the drive bar 34 endwise over the rollers 31 and causing a precisely uniform broadside shifting of the breaker bar 25 from the position in which it is shown in FIG. 2 to the position in which it is shown in FIG. 4. The actuation of said toggle mechanism in this manner is accomplished after a sheet of plate glass 50 has been laid on the table 10 and provided with a score line 51 and the plate of glass then shifted to bring said score line directly over the breaker bar 25 and parallel therewith, as shown in FIG. 1. This view illustrates completion of the steps just mentioned prior to ejecting the breaker bar 25 upwardly from slot 18 so as to accomplish the breaking of said sheet of glass along said line.

FIG. 5 illustrates the manner in which the ejection of the bar causes a cracking of the glass along the score line 51, following which the operator immediately reverses the flow of fluid under pressure in the cylinder 43 so as to return this to the position in which it is shown in FIG. 2 and retract the breaker bar 25 from its extended position to its retracted position in which it is confined to the table slot 18.

The restraint placed upon the breaker bar 25 by the lugs 27 which guide this bar on shafts 19 and 20 restricts the movement of said bar to a direction parallel with the lugs 27 which is to say to a broadside movement of the breaker bar 25 in a direction at right angles to the bar itself. The drive bar 34 being given antifriction support by the rollers 31 with said bar parallel with the breaker bar 25, the links 35 by their parallelogram toggle action on the breaker bar 25, when the drive bar 34 is moved horizontally, produces an upward ejection of the breaker bar 25 from slot 28 in which the upper edge of the breaker bar is at all times maintained in true parallelism with the top surface of the table top 15. The engagement of the upper edge of the breaker bar 25 with the lower surface of the sheet of plate glass 50, when the breaker bar is thus ejected upwardly from the slot 18, is such that the breaker bar contacts all portions of the sheet 50 disposed over said bar simultaneously and with a uniform upward pressure and rate of movement so as to produce only balanced strains in the glass along this line without variation.

While the table 10 of the present improvement is disclosed herein as having the breaker bar 25 thereof mounted in a plane lying at right angles to the shaft 19 about which the table is rockably mounted, this position of the breaker bar 25 is optional and it may be incorporated with the table 10 along any desired straight line such, for instance, as with the breaker bar 25 parallel with said axis of rotation of the table, as the breaker bar is mounted in the glass cutter's table disclosed in my copending application (supra).

To accommodate links 35, suitable enlargements 60 are provided in slot 18 in the table top 15. Likewise, enlargements 61 in said slot are provided to accommodate lugs 27.

I claim:

1. A plate glass cutter's table comprising:
a flat table having a relatively nonabrasive upper surface which is provided for supporting horizontally a sheet of plate glass for the purpose of making one or more straight cuts in said glass;
there being a slot formed in said surface of said table;
a breaker bar mounted in said slot;
guide means restricting movement of said bar in said slot to a movement broadside and edgewise upwardly therefrom and then a return into said slot;
a drive bar mounted close to and parallel with said breaker bar;
means for guiding said drive bar to effectively restrict the movement of said bar to a sliding lengthwise movement;
a series of toggle links located at longitudinally spaced intervals along said drive bar;
each link being pivotally attached at one end to said drive bar at one of a longitudinally aligned series of axes;
said links being uniformly inclined obliquely relative to said bars; and
the other ends of said links being pivotally attached to said breaker bar on a longitudinally aligned series of axes, said links being of equal length measured pivotal center to pivotal center.

2. A table as recited in claim 1 wherein one of said toggle links has a downward extension from its lower end forming an operating lever for accomplishing the endwise shifting of said drive bar and the broadside elevation of said breaker bar.

3. A table as recited in claim 2 wherein remotely controlled power means connected to the lower end of said lever is provided for accomplishing the rapid elevation and lowering of said breaker bar as required in a glass-sheet-breaking operation.

4. A table as recited in claim 3 wherein said power means comprises a fluid-extensible cylinder and piston means pivotally mounted at one end on said table and pivotally connected at its other end to said lever.