Dec. 15, 1931. J. A. REECE 1,836,393

SHEET GLASS CUTTING APPARATUS

Filed Sept. 13, 1926

Fig. 1.

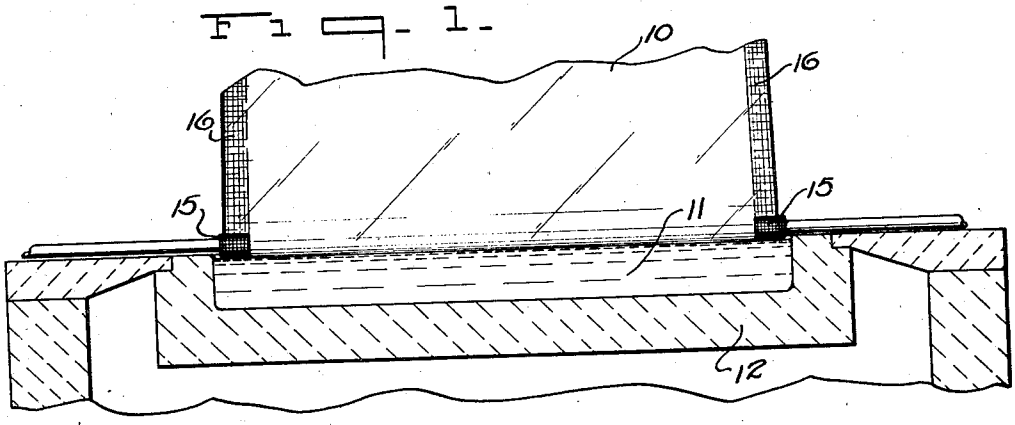
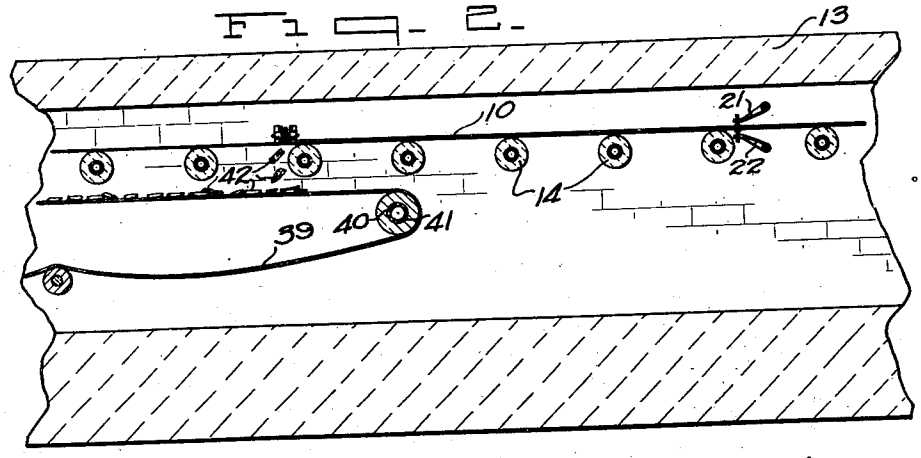


Fig. 2.



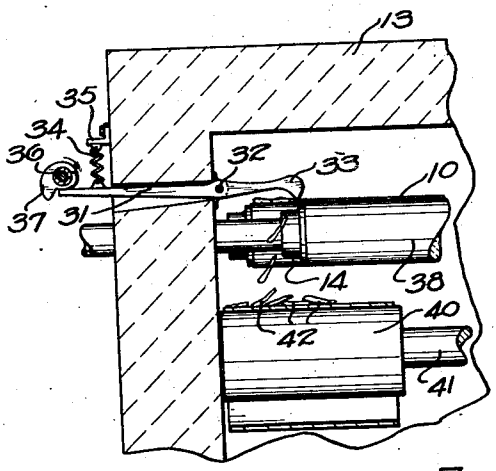
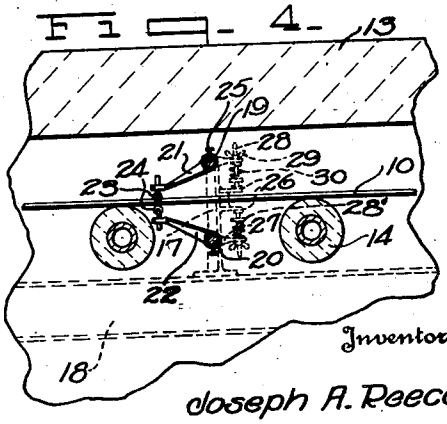


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE

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SHEET GLASS CUTTING APPARATUS

Application filed September 13, 1926. Serial No. 135,015.

This invention relates to sheet glass cutting apparatus, and more particularly to means for removing the edge portions of the sheet as the said sheet passes through an annealing leer.

In the patent to Colburn, 1,248,809, granted December 4, 1917, there is disclosed an apparatus for producing sheet glass wherein a sheet is drawn initially in an upward direction from a source of molten glass, and subsequently deflected in a horizontal plane over a bending roll, after which the sheet is passed through suitable drawing mechanism into an annealing leer. In this patent means is also provided at the sheet edges in the form of knurled rollers to maintain the sheet to width. These knurled rollers cause a thickened portion to extend inwardly on the sheet a substantial distance from the edge thereof, and these thickened edges are often marred or roughened.

It, therefore, becomes necessary to provide means for trimming off these edge portions of the sheet, and heretofore it has been customary to remove the edge portions after the sheet emerges from the leer.

However, due to the differences in thickness and temperature between the edge portions and main body of the sheet, together with the uneveness of the edge portions, better annealing of the sheet can be achieved if the edge portions are trimmed from the main body of the sheet during the annealing thereof, preferably, although not necessarily, at the beginning of the annealing of said sheet.

The primary object of the present invention is to provide means for automatically scoring the sheet and cracking off the knurled or roughened edge portions thereof as the said sheet is being passed through the annealing leer.

Another object of the invention is the provision of improved scoring means capable of adjustment transversely of the sheet being drawn so that the amount of glass being trimmed off can be effectively controlled.

Still another object of the invention is to provide means for scoring a sheet of glass along its border portions in a manner that the edges can be removed therefrom, before said sheet and edges have become finally set.

Another object of the invention is to provide in an annealing leer a tapping or cracking off device, adapted to remove sections of glass from a sheet after said sheet has been suitably scored.

A further object of the invention is the provision of means for receiving and conveying exteriorly of the leer the waste glass cracked off from the sheet.

Other objects and advantages of the invention will become apparent during the course of the following description when taken in connection with the accompanying drawings.

In the drawings wherein like numerals are employed to designate like parts throughout the same,

Fig. 1 is a transverse section through a draw pot or receptacle showing a sheet being drawn therefrom,

Fig. 2 is a longitudinal section through a portion of the annealing leer showing arranged therein sheet scoring and cracking means constructed in accordance with the present invention,

Fig. 3 is an enlarged detail sectional view of the cracking means, and

Fig. 4 is an enlarged sectional view of the scoring means.

Referring now more in detail to the drawings, the sheet of glass 10 is drawn upwardly from a source of molten glass 11 contained in the receptacle or draw pot 12. The sheet 10 is subsequently deflected into a horizontal plane and passed through an annealing leer 13, within which the sheet is supported upon a plurality of horizontally aligned rollers 14. Means are also provided in the form of knurled rollers or the like 15, disposed at opposite edges of the sheet 10 for maintaining the sheet to width and preventing the narrowing thereof. These knurled rollers create corresponding thick knurled or roughened edges 16 on the sheet 10, and the present invention has been primarily designed for automatically removing these thick knurled edges as the sheet passes through the annealing leer 13.

In the present invention the sheet 10 is first scored longitudinally adjacent the edges

thereof, and the scoring means embodies a pair of vertical brackets 17 mounted upon suitable supporting beams 18 positioned at opposite sides of the leer 13. Journaled within the brackets 17 are the upper and lower shafts 19 and 20 positioned at opposite sides of the sheet. Mounted upon the shafts 19 and 20, adjacent the opposite edges of the sheet, are the cutter arms 21 and 22 which carry the vertically aligned cutters 23 and 24. The cutters may be adjusted longitudinally on the shafts 19 and 20 and transversely of the sheet by means of set screws 25. In this manner the amount of glass trimmed off of the sheet may be effectively controlled by simply sliding the cutter arms along the shafts, and then securing them in the desired positions by means of the set screws 25.

Each of the brackets 17 is provided with a pair of spaced lugs 26, while keyed to the shafts 19 and 20 are fingers 27. Carried by the lugs 26 and loosely received through the fingers 27 are bolts 28 upon which are threaded suitable wing nuts 29. Threaded upon the bolts 28 are nuts 28′, and encircling the said bolts and bearing against the nuts 28′ and fingers 27 are expansion springs 30 which act to rotate the shafts 19 and 20 and force the cutters 23 and 24 into contact with the sheet 10. The cutters 23 and 24 can be moved towards and away from each other to compensate for various thicknesses of sheet by simply rotating the wing nuts 29 in the desired direction, and the pressure of the cutters upon the sheet may be regulated by simply rotating the nuts 28′ to increase or decrease the tension of the springs 30.

The means for tapping or cracking off the edge portions of the sheet after the same has been scored, embodies a lever 31 extending transversely through the side wall of the leer and pivoted intermediate its ends as at 32. The forward or inner end of the lever is provided with a head 33 adapted to contact with the sheet, and this head is normally urged towards the sheet by means of a spring 34 secured to the lever 31 adjacent the outer end thereof and to a bracket 35. Mounted adjacent the leer is a drive shaft 36 upon which is keyed a cam 37, and it will be seen that upon rotation of the shaft 36, the cam engaging the outer end of the lever 31 will impart a rocking motion thereto. As the lever is rocked on its pivot, and the head 33 thereof taps the edge portions 16 of the sheet, it will serve to crack off or remove these edge portions. It is also to be noted that the rollers 14, in advance of the lever 31, are slightly shorter than the other rollers as is indicated at 38 in Fig. 3.

For the purpose of carrying the trimmings or waste glass exteriorly of the leer, there is provided at each edge of the sheet a conveyor 39 in the form of an endless belt, said conveyor being trained about rollers 40 mounted upon shafts 41. As shown in Fig. 2, the waste glass 42 will drop onto these conveyors which will convey it exteriorly of the leer. From the foregoing, it will be appreciated that there has been provided novel and simplified means for automatically scoring and cracking off the knurled edges of the sheet as the same is being passed through an annealing leer.

The cracking-off devices are preferably positioned so that they will remove the edge or border portions from the sheet as soon as the said sheet has become sufficiently set to permit this cracking-off operation. With the present invention the sheet can be scored longitudinally after it has become substantially set, or if desired it can be scored while still in a semi-plastic condition and the edge or border portions subsequently removed after the sheet has become substantially set.

Should any snakes form in the sheet in advance of the tapping off mechanism, this mechanism can be moved or thrown out of operative position so that the snakes following the path of least resistance will run along the score lines.

It is to be understood that the form of the invention herewith shown and described is to be taken as the preferred embodiment of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Claims:

1. In sheet glass cutting apparatus, means for supporting and carrying the sheet in a definite predetermined path, vertically aligned cutters positioned above and beneath the sheet adjacent each edge thereof for simultaneously scoring opposite surfaces of said sheet, and means for subsequently cracking off the cut edge portions.

2. In sheet glass cutting apparatus, means for supporting and carrying the sheet in a definite predetermined path, vertically aligned cutters positioned above and beneath the sheet adjacent each edge thereof for simultaneously scoring opposite surfaces of said sheet, intermittently actuated means for subsequently cracking off the cut edge portions of the sheet, and traveling conveyors for receiving the removed edge portions and carrying them to a desired location.

Signed at Toledo, in the county of Lucas and State of Ohio, this 10th day of September, 1926.

JOSEPH A. REECE.