June 24, 1941. J. P. PEARSE 2,247,098

TONG

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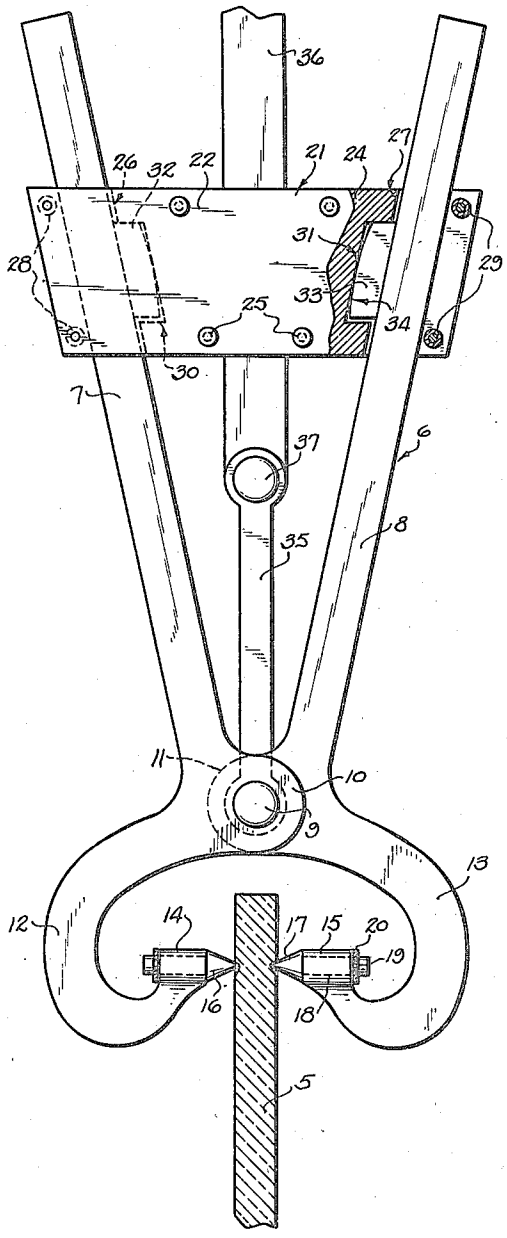


Fig. 1.

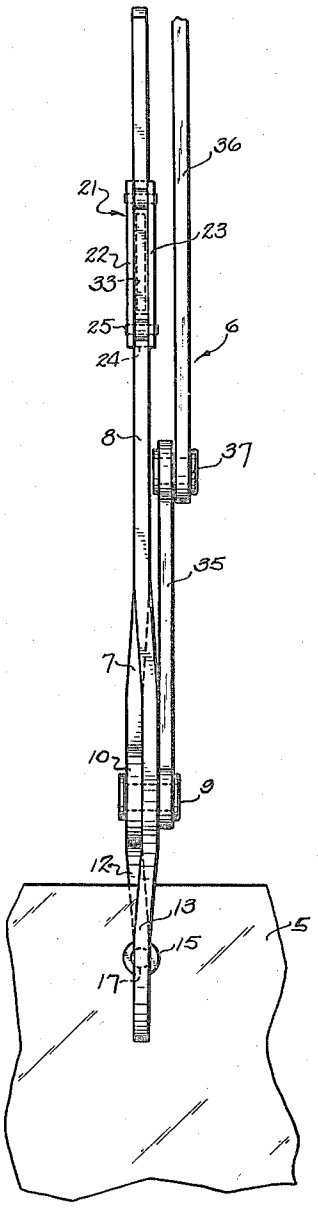


Fig 2.

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TONG

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4 Claims. (Cl. 294—115)

The present invention relates generally to tongs and more particularly to an improved type of tong primarily adapted for supporting glass sheets or plates during tempering, but which is not restricted to such use.

In the tempering of glass sheets according to one process well known in the art, the sheets are first heated to a temperature approximately the point of softening of the glass, and then rapidly cooled to place the outer surfaces of the sheets under compression and the interiors thereof under tension. This tempering operation not only greatly increases the mechanical strength of the glass, but also creates therein characteristics which make it highly desirable for certain installations.

In the practice of the above process, the glass sheets are ordinarily maintained in a vertical position during the treatment thereof, and it is customary to suspend the sheets from a plurality of relatively small hooks or tongs which engage opposite faces of said sheets near their upper edges. With the type of tongs heretofore used, the supporting of the sheets therefrom is dependent primarily upon the weight of the glass. That is to say, the glass gripping elements carried by the jaws of the tongs have been so constructed that the downward pull of the glass sheet causes the jaws to close and to grip the glass, so that the greater the weight of the glass the more securely it is gripped by the tongs. This type of clamping action results in considerable penetration of the surfaces of the sheet by the gripping elements, especially during the heating thereof when the glass is softened. Also, with this clamping action, the sheet could be released from the tongs simply upon lifting thereof relative to said tongs, with the result that any accidental upward movement of the sheet with respect to the tongs might tend to dislodge the sheet or disturb the hanging thereof.

An important object of this invention is the provision of a novel and improved type of tong which will effectively support the glass sheet during the tempering operation and which will at the same time prevent undue penetration of the sheet surfaces by the glass gripping elements.

Another important object of the invention is the provision of a novel and improved type of tong of such construction that the supporting of the glass sheet therefrom is not dependent upon the weight of the glass and, further, wherein the glass sheets cannot be detached from the tong simply upon vertical movement of said sheet with respect to said tong.

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

In the drawing wherein like numerals are employed to designate like parts throughout the same:

Fig. 1 is an elevation, partially broken away, of a tong constructed in accordance with the invention; and

Fig. 2 is a side view thereof.

With reference to the drawing, a sheet or plate of glass or the like 5 is shown as being suspended in a vertical position from the tong designated in its entirety by the numeral 6, said tong engaging opposite surfaces of the sheet adjacent its upper end. The tong 6 comprises a pair of substantially vertical or upstanding complemental tong members 7 and 8 pivotally connected together adjacent their lower ends by means of a transverse pin 9. This pin passes through overlapping ears 10 and 11 formed upon the tong members 7 and 8 respectively.

The tong members 7 and 8 are formed at their lower ends with the oppositely disposed jaw portions 12 and 13 respectively which are formed at their inner ends with the horizontally aligned bearing portions 14 and 15 carrying the glass gripping elements 16 and 17 respectively. Each gripping element 16 and 17 is provided at the outer end of a shank 18 passed horizontally through the respective bearing portion 14 or 15, said shank being reduced in diameter adjacent its opposite end as at 19 to provide a circumferential groove within which is fitted a ring or the like 20 for securing the gripping element in place. The gripping elements 16 and 17 engage opposite surfaces of the glass sheet and the outer ends thereof which contact the sheet may be pointed or rounded as preferred.

The upper ends of the tong members 7 and 8 constitute upwardly diverging lever arms and associated therewith is the wedging means, designated in its entirety by the numeral 21. The purpose of this wedging means is to force the upper ends of the tong members away from one another to urge the gripping elements 16 and 17 into engagement with the sheet and to maintain them in firm clamping engagement therewith during the tempering operation.

The wedging means 21 comprises a pair of spaced flat plates 22 and 23 between which is arranged a block 24, said plates and block being secured together by rivets or the like 25. The plates 22 and 23 are disposed at opposite sides of

the tong members 7 and 8 and extend laterally beyond the same, while the block 24 is somewhat shorter than said plates and is received between said tong members. The opposite end edges of the block 24 are cut on an angle as indicated at 26 and 27 so that the said edges diverge upwardly. Arranged between and carried by the plates 22 and 23 at opposite ends thereof are small rollers 28 and 29 which limit the outward movement of the upper ends of the tong members 7 and 8.

The block 24 is provided at its opposite ends with recesses 30 and 31 and loosely arranged therein are the wedge elements 32 and 33 respectively. The outer surfaces of the wedge elements engaging the tong members are flat, whereas the inner surfaces thereof facing the bottoms of the recesses 30 and 31 are preferably rounded or otherwise suitably shaped as at 34 to permit a limited amount of rocking movement of said wedge elements within said recesses so that the outer flat surfaces thereof can adjust themselves to the angle of the upper ends of the tong members.

The means for supporting the tong comprises a link 35 pivotally connected at its lower end to the pin 9 and at its upper end to a support 36 by a pin or the like 37. It will thus be readily seen that the supporting means for the tong is entirely independent of the wedging means 21 and also independent of any pivotal movement of the tong members. As a consequence, the clamping action of the gripping elements 16 and 17 upon the glass sheet 5 is in no way dependent upon the weight of the glass, but instead is controlled entirely by the wedging means 21.

In the use of the tong above described, the wedging means 21 is first moved upwardly to permit the jaw portions 12 and 13 of the tong to be opened and the gripping elements 16 and 17 slipped over the upper edge of the glass sheet. The wedging means is then forced downwardly to spread the upper ends of the tong members apart until the gripping elements firmly engage the sheet. At such time, the wedge elements 32 and 33 will bind or wedge tightly against the tong members 7 and 8 and thereby maintain the gripping elements in positive clamping engagement with the sheet. The tong and glass sheet can then be transported from place to place by the supporting means 35—36 without any danger of the sheet dropping from the tong or being disturbed on its hanging. When it is desired to release the sheet, the wedging means is manually moved upwardly whereupon the jaw portions 12 and 13 can be opened. The wedging means provides a positive clamping action which cannot be released until the wedging means itself is moved upwardly relative to the tong members. This is of particular advantage when the tongs are used for supporting glass sheets in a vertical position while being bent between convex and concave mold members.

Since the tong herein provided is of such construction that the supporting of the sheet thereby is not dependent upon the weight of the glass, it provides a positive support for the glass sheet with minimum penetration of the sheet surfaces by the gripping elements. Although in certain installations, the indentations formed in the sheet by the gripping elements may be covered by a frame or sash, in many other cases the indentations cannot be covered and are objectionable. Due to the physical characteristics of the tempered glass, it is not possible to cut the treated sheet and so remove the indentations, because any attempt to cut the sheet results in a complete breakage thereof.

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.

I claim:

1. A tong for supporting a glass sheet or the like in a vertical position, comprising a pair of upstanding complemental tong members pivotally connected together intermediate their ends and formed with oppositely disposed jaw portions at the lower ends thereof and upwardly diverging lever arms at their upper ends, sheet gripping elements carried by said jaw portions and adapted to engage opposite faces of the sheet, wedging means associated with said lever arms including a block positioned therebetween and provided at its opposite ends with recesses, and wedge elements loosely received within said recesses and engaging adjacent edges of said lever arms, said wedging means being movable toward said jaw portions to urge the said lever arms away from one another and the said sheet gripping elements toward one another into sheet engagement, the inner surfaces of said wedge elements facing the bottoms of said recesses being so shaped as to cause rocking of the said wedge elements to conform to the angle assumed by the said lever arms.

2. A tong for supporting a glass sheet or the like in a vertical position, comprising a pair of upstanding complemental tong members, a pin for pivotally connecting said tong members together intermediate the ends thereof, said tong members being formed with oppositely disposed jaw portions at the lower ends thereof and upwardly diverging lever arms at their upper ends, sheet gripping elements carried by said jaw portions and adapted to engage opposite faces of the sheet, wedging means associated with said lever arms including a block positioned therebetween and provided with recesses in the opposite ends thereof, wedge elements loosely received within said recesses and engaging adjacent edges of said lever arms, said wedging means being movable toward said jaw portions to urge the said lever arms away from one another and the said sheet gripping elements toward one another into sheet engagement, the inner surfaces of said wedge elements facing the bottoms of said recesses being so shaped as to cause rocking of the said wedge elements to conform to the angle assumed by the said lever arms, and means pivotally connected to said pin for supporting said tong members.

3. A tong for supporting a glass sheet or the like in a vertical position, comprising a pair of upstanding complemental tong members pivotally connected together intermediate their ends and formed with oppositely disposed jaw portions at the lower ends thereof adapted to engage opposite faces of the sheet and with upwardly diverging lever arms at their upper ends, wedging means associated with said lever arms including a block positioned therebetween and provided at its opposite ends with recesses, and wedge elements loosely received within said recesses and engaging adjacent edges of said lever arms, said wedging means being movable toward said jaw portions to urge the said lever arms away from one another and the said jaw por-

tions toward one another into sheet engagement, the inner surfaces of said wedge elements facing the bottoms of said recesses being so shaped as to cause rocking of the said wedge elements to conform to the angle assumed by the said lever arms.

4. A tong for supporting a glass sheet or the like in a vertical position, comprising a pair of upstanding complemental tong members pivotally connected together intermediate their ends and formed with oppositely disposed jaw portions at the lower ends thereof adapted to engage opposite faces of the sheet and with upwardly diverging lever arms at their upper ends, wedging means associated with said lever arms including a block positioned therebetween and provided at its opposite ends with recesses, wedge elements loosely received within said recesses and engaging adjacent edges of said lever arms, said wedging means being movable toward said jaw portions to urge the said lever arms away from one another and the said jaw portions toward one another into sheet engagement, the inner surfaces of said wedge elements facing the bottoms of said recesses being so shaped as to cause rocking of the said wedge elements to conform to the angle assumed by the said lever arms, and means independent of said wedging means and pivoted to said tong members for supporting the same.

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