

April 2, 1935.

W. OWEN

1,996,385

CLAMP FOR GLASS

Filed March 15, 1932

2 Sheets-Sheet 1

Fig. 1.

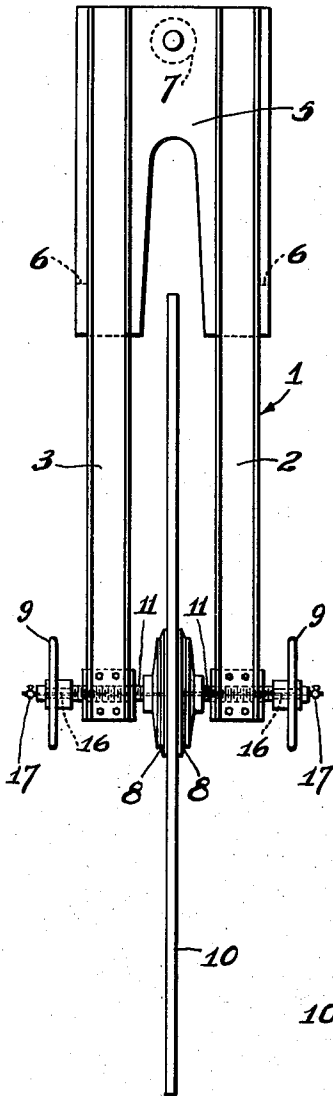
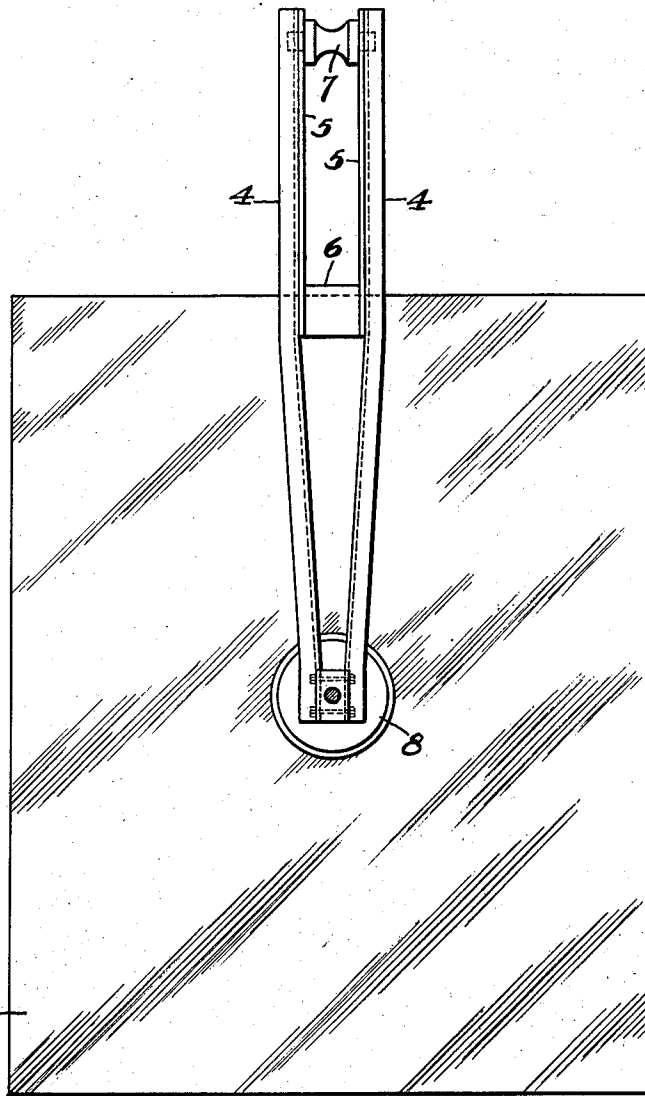


Fig. 2.



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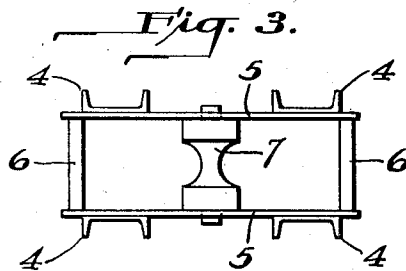
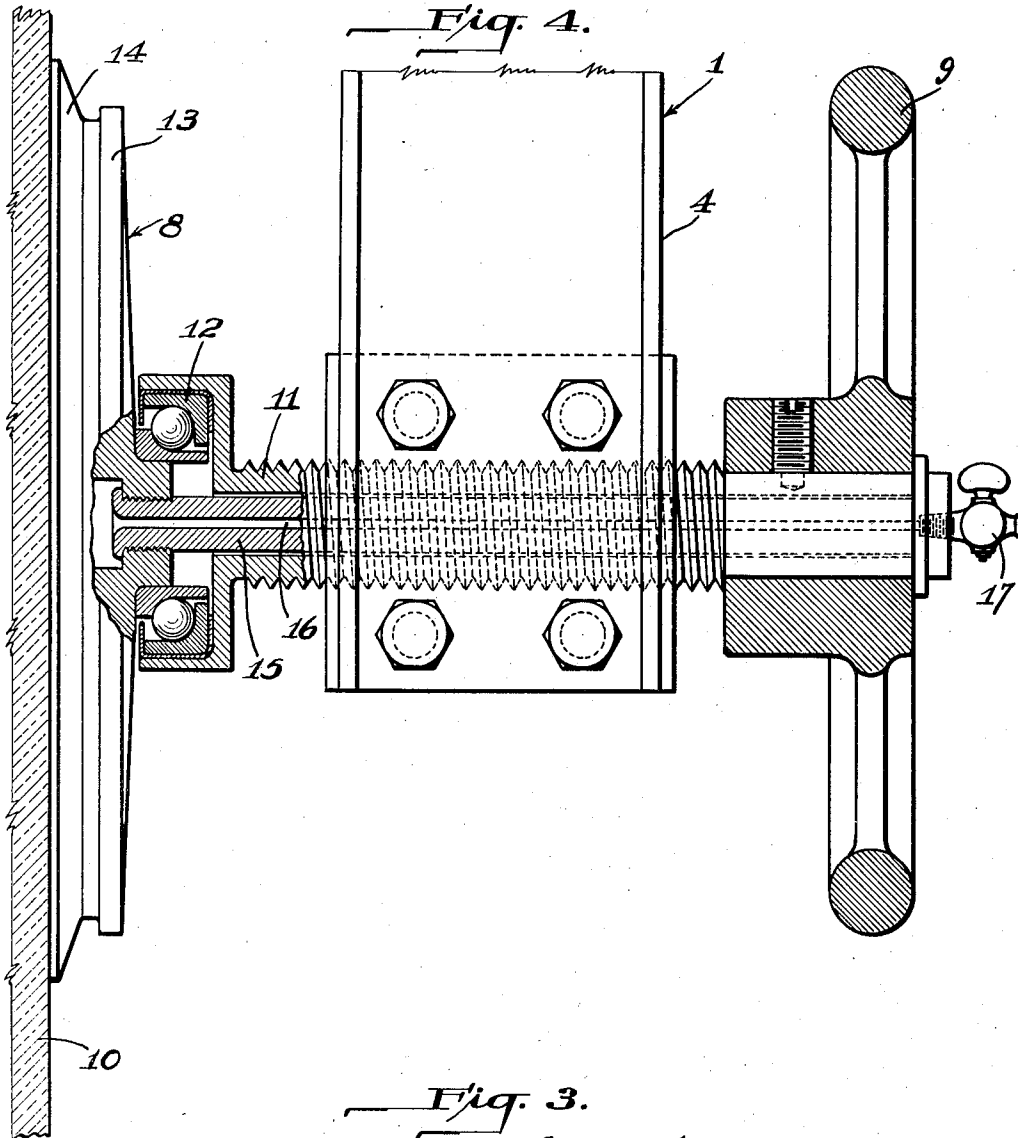
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UNITED STATES PATENT OFFICE

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CLAMP FOR GLASS

William Owen, Pittsburgh Pa., assignor to Pittsburgh Plate Glass Company, a corporation of Pennsylvania

Application March 15, 1932, Serial No. 598,982

2 Claims. (Cl. 294—86)

My invention relates to a clamp for handling glass and it is particularly designed to function in transporting relatively heavy sheets of glass.

Manifestly difficulties are experienced in transporting heavy sheets of plate glass since it is necessary to utilize a clamp that will obviate probability of breakage. Plate glass having a thickness of one inch to one and one-quarter inches is very heavy in sheets of moderate size and any device that is employed to engage the glass for transporting it must apply a very firm hold. On account of the character of the material, great pressures may not be utilized to apply the engaging members because they may bend or deflect the glass to a sufficient extent as to cause breakage. Moreover, all possibility of the glass slipping during the transporting period must be obviated. Accordingly it is difficult to utilize a device that will not of itself have excessive weight and at the same time assure a sufficiently secure engagement as to obviate danger of slippage with its consequent disasters both in breakage and the danger involved of injuring operators.

In the drawings, Fig. 1 is a side elevational view of a clamp constructed in accordance with my invention; Fig. 2 is an end view thereof, partially in cross-section; Fig. 3 is a top plan view, indicating the method of constructing the clamp; and Fig. 4 is a detail view of the construction of the engaging element.

A better understanding of my invention may be had by reference to the accompanying drawings in which a clamp 1 is shown that is formed of a plurality of spaced arms 2 and 3. The arms are constructed by utilizing four channel members 4 which are secured together in pairs by plates 5. The plates are held in spaced relation to form a rigid structure by tie-plates 6. A spindle 7 is disposed between the plates which functions both to assist in spacing the members and to afford means for lifting the clamp by engagement with a hook of a crane or other lifting device. A plurality of vacuum cups 8 are mounted adjacent the free ends of the arms and are operated by means of hand wheels 9 to effect engagement or disengagement of the cups with a glass sheet 10 disposed therebetween.

The assembly utilized for effecting suitable operation of the vacuum cups 8 is particularly shown in Figure 4. It will be observed that a sleeve 11 is mounted in the end of the arm, being provided with a screw-thread engagement therewith. The hand wheel 9 is securely mounted upon the sleeve 11 which retains a bearing assembly 12 that is secured to a rigid back 13 of a flexible cup 14 that engages the glass. Obviously when the vacuum cup 8 is caused firmly to engage the glass, at least a partial vacuum is created which must be broken when it is desired

to release the sheet. In order to facilitate releasing the sheet, a rod 15 is disposed within the sleeve 11 with a passage 16 that communicates with the interior of the vacuum cup at one end and is closed by a petcock 17 at its other end. When it is desired to release the glass, therefore, it is only necessary to open the petcock to break the vacuum within the cup 8 and thereby facilitate its retraction from the glass.

The operation of the device will be apparent from the description of its construction. In order to transport a sheet of glass 10, it is only necessary to lower the clamp over the sheet and cause the vacuum cups 8 to engage the opposite faces thereof by operating the hand wheels 9. By reason of the fact that vacuum cups are utilized, a very secure engagement of the glass is obtained and the clamp and glass may be lifted for transportation without danger of dropping the sheet by reason of the clamp slipping. Although the clamp is very rugged in construction, its weight is relatively low compared with the size of glass sheets that may be transported thereby.

Moreover, the device affords advantages in finishing operations, such as grinding the edges to provide smooth rounded surfaces. The swivel supports for the vacuum cups permit of turning a sheet in a complete circle while a secure engagement thereof is maintained. This feature introduces economies in various operations over any clamp providing only a rigid engagement.

Although I have described a specific form of my invention, it is obvious that minor modifications may be made therein without departing from the spirit and scope thereof and I desire, therefore, that only such limitations shall be imposed upon the appended claims as may be dictated by the prior art.

What I claim is:

1. A clamp for glass comprising a pair of spaced arms in fixed position relative to each other, a pair of hollow screws threaded through the arms, a vacuum cup mounted for rotation on the inner end of each screw, a connection extending through each screw and communicating with the space on the front side of the cup carried thereby, and a relief valve at the outer end of each of said connections.

2. A clamp for glass comprising a pair of spaced arms in fixed position relative to each other, a pair of hollow screws threaded through the arms, a vacuum cup mounted for rotation on the inner end of each screw, a tube extending through each screw and the vacuum cup carried thereby and secured at its inner end to the cup so as to turn therewith, and a relief valve at the outer end of each tube.