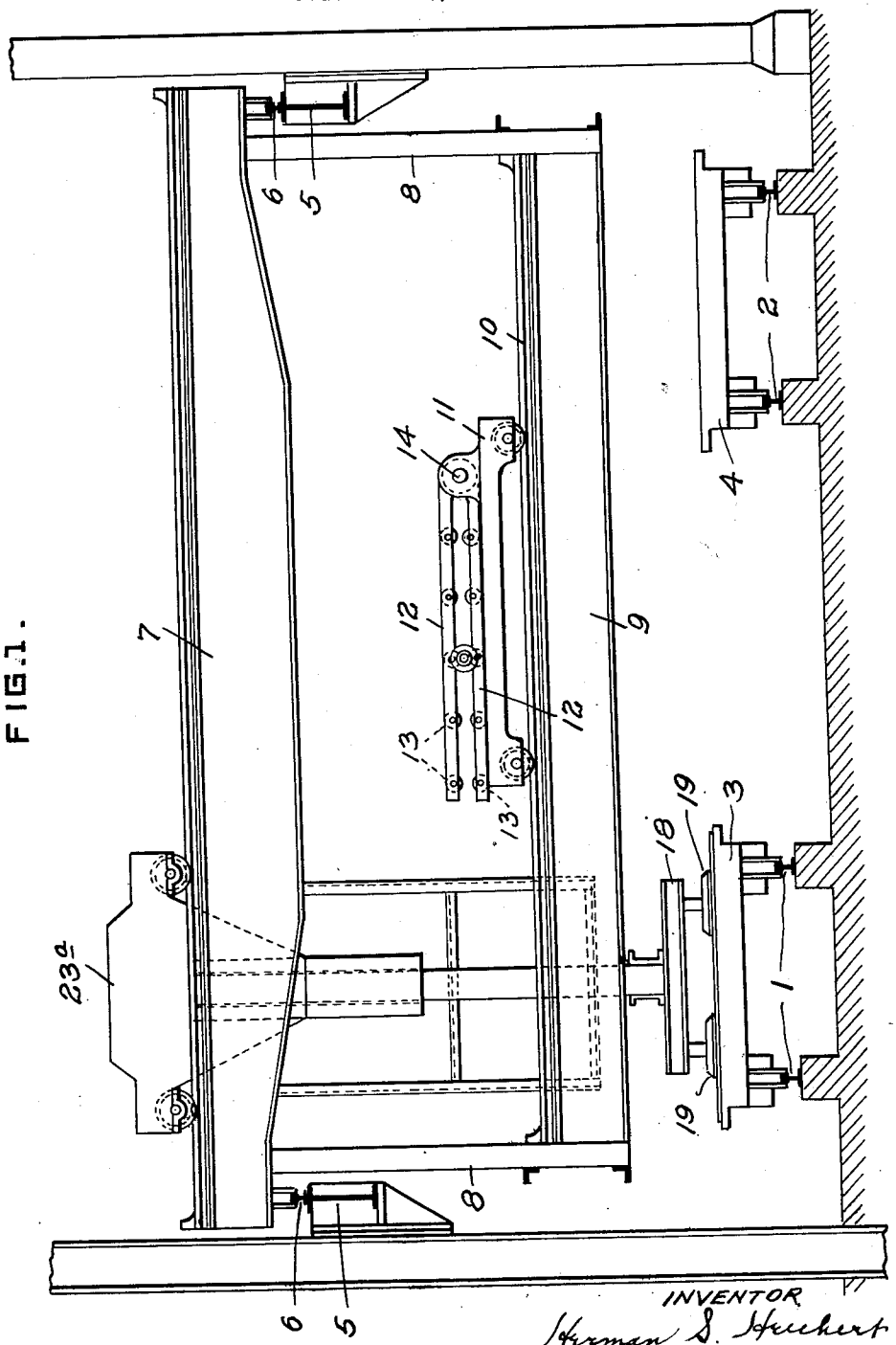
Dec. 16, 1924. 1,519,256

H. S. HEICHERT

PLATE GLASS TRANSFER APPARATUS

Filed Dec. 5, 1923 4 Sheets-Sheet 1

FIG. 1.



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PLATE GLASS TRANSFER APPARATUS

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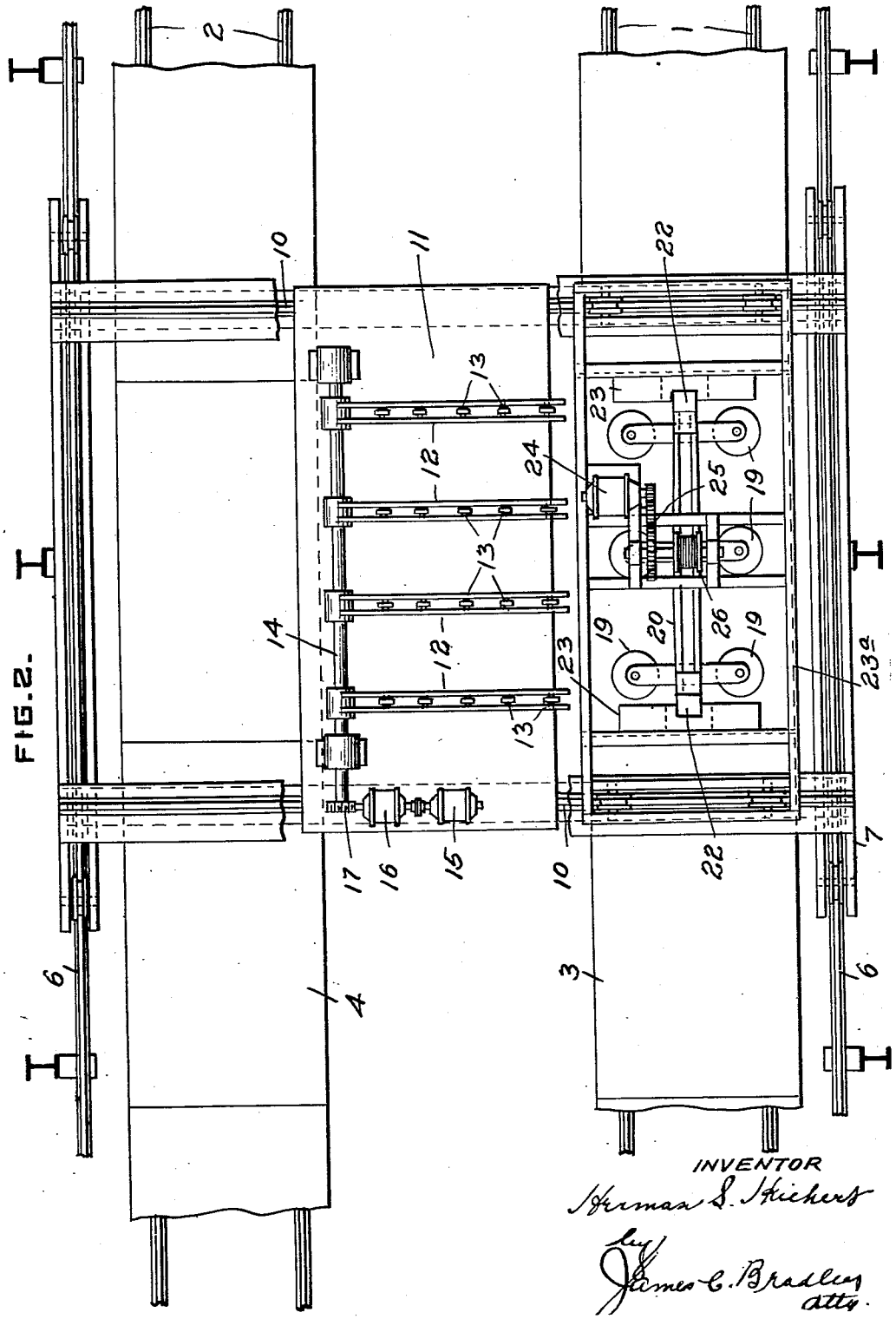


FIG. 2.

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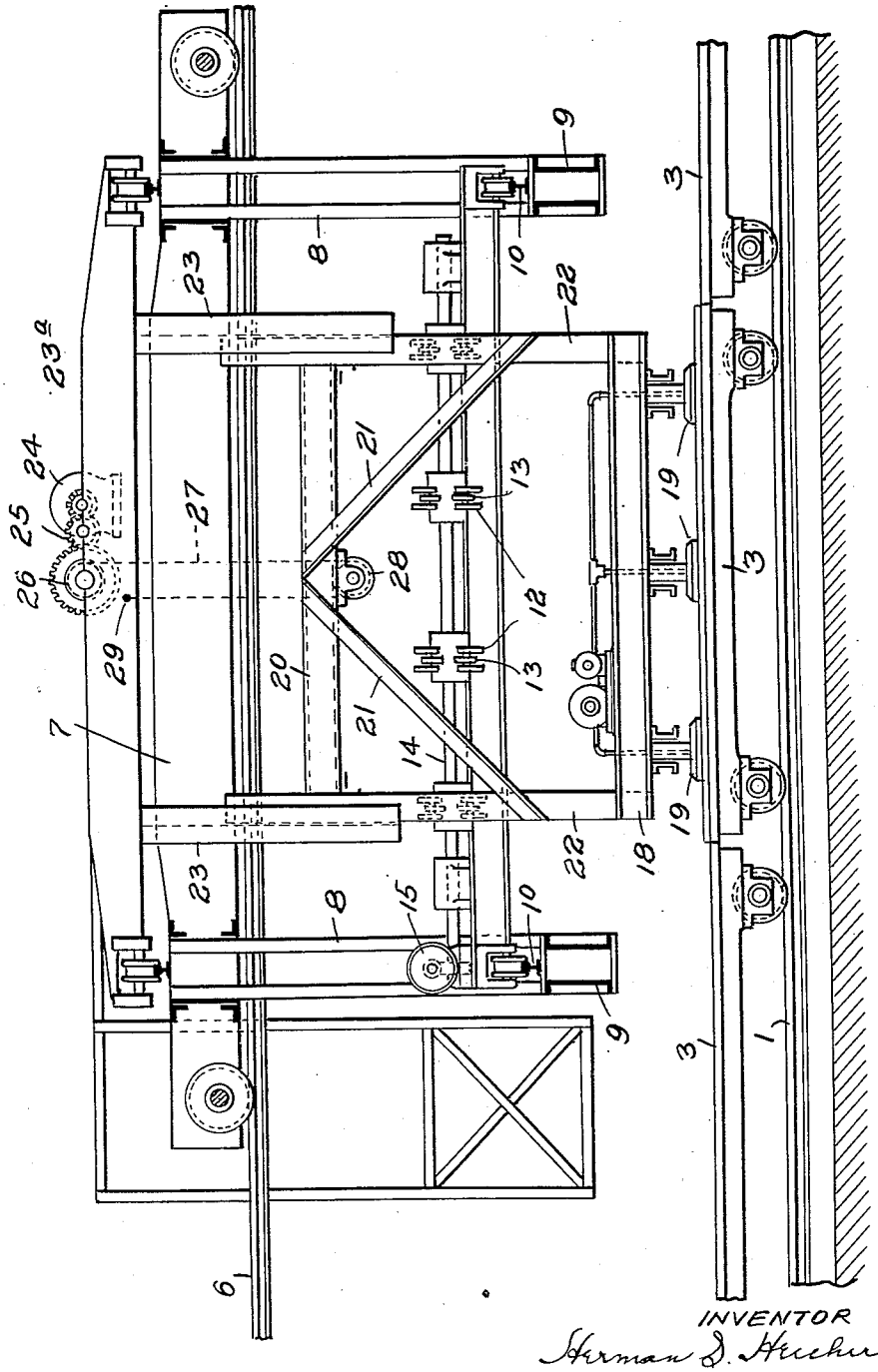
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PLATE GLASS TRANSFER APPARATUS

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FIG. 3.



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PLATE GLASS TRANSFER APPARATUS

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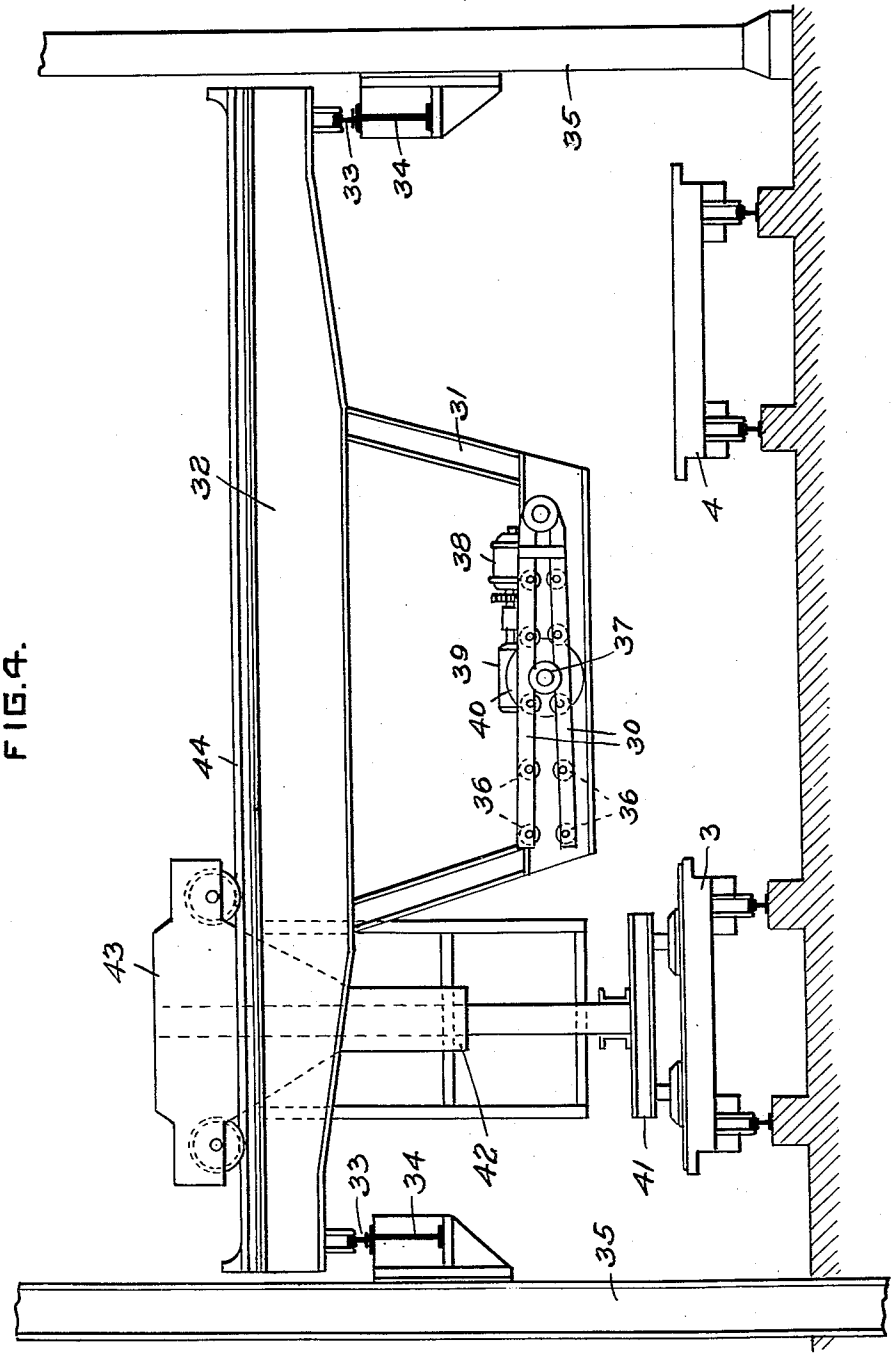


FIG. 4.

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UNITED STATES PATENT OFFICE.

HERMAN S. HEICHERT, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO PITTSBURGH PLATE GLASS COMPANY, A CORPORATION OF PENNSYLVANIA.

PLATE-GLASS-TRANSFER APPARATUS.

Application filed December 5, 1923. Serial No. 678,600.

To all whom it may concern:

Be it known that I, HERMAN S. HEICHERT, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have made a new and useful invention in Improvements in Plate-Glass-Transfer Apparatus, of which the following is a specification.

The invention relates to apparatus for turning over and transferring glass plates. The apparatus is designed particularly for picking up glass from one car or carrier upon a track, turning it over, carrying it to another car or carrier on a second parallel track and depositing it upon such other car or carrier. The invention has for its primary object, the provision of improved and simplified apparatus for accomplishing the above function, which can be conveniently and easily used in the space available and which will perform the necessary steps of the procedure rapidly and safely. Certain embodiments of the invention are illustrated in the accompanying drawings wherein:

Figure 1 is an end elevation of the apparatus. Fig. 2 is a plan view. Fig. 3 is a side elevation. And Fig. 4 is an end elevation of a modification which is somewhat simpler in construction and method of operation than the apparatus of Figs. 1, 2 and 3.

Referring to Figs. 1, 2 and 3, 1 and 2 are parallel tracks upon which are mounted the cars or carriers 3 and 4 which are carried beneath grinding and polishing machines in order to surface the glass thereon. After one side of the sheets carried by the cars 3 has been ground and polished, the cars are returned to their starting position and the glass, after being released from the plaster, is transferred to the cars 4 and turned upside down so as to bring the rough side of the glass uppermost, after which the cars are passed beneath another set of grinders and polishers to finish the surfacing of the glass. The apparatus as illustrated in Figs. 1, 2 and 3 is designed to accomplish this function. It includes an overhead framework 5, 5 upon which is mounted a track 6, 6 carrying the crane 7. Suspended from this crane 7 by means of the beams 8, 8 is a transverse bridge 9 upon which are mounted the rails 10, 10 (Fig. 3) carrying the turnover truck 11.

The turnover truck carries a turnover frame in the form of a plurality of parallel U shaped arms 12 provided with rollers 13. The U shaped arms open laterally (to the left, Fig. 1) and the rollers are spaced apart so as to permit the introduction of a sheet of glass between the rollers. The arms are mounted at their ends upon the transverse shaft 14 so that they may be swung through 180 degrees from the position illustrated in Fig. 1 so as to bring the sheet of glass between the arms upside down. The shaft 14 is rotated from the motor 15 carried by the truck 11, suitable reducing gearing in the casings 16 and 17 being employed.

In order to lift the sheet of glass from the table 3 and place it between the U shaped arms of the turnover frame, the vacuum lifting frame 18 having the suction cups 19 (Fig. 2) is employed and this frame is supported upon a framework made up of the beams 20, 21 and 22 (Fig. 3) and mounted for vertical movement in a framework carried by the trolley 23^a mounted upon the crane 7 and consisting of the depending beams 23, 23. The framework upon which the vacuum frame is supported is moved vertically by means of a motor 24 carried by the trolley and acting through suitable reducing gearing 25 to operate the pulley 26 to which is secured the lifting cable 27. This cable passes around the pulley 28 and is secured at 29 to the framework of the trolley. A means is thus provided for raising and lowering the vacuum frame 18 to transfer the sheet of glass from the table 1 to the turnover frame 12 and subsequently to transfer such sheet from the turnover frame to the table 4.

The method of operating the apparatus is as follows: The vacuum frame 18 is first lowered to the position indicated in Fig. 1, so that the vacuum cups engage the sheet of glass on the table 1, after which the frame is lifted until the sheet of glass is brought opposite the slot in the turnover frame 12. The turnover frame is then moved to the left (Fig. 1) until the glass sheet carried by the vacuum frame lies within the turnover frame. The turnover frame is then moved to the right and swung through an arc of 180 degrees to bring the rough side of the sheet of glass uppermost. The vacuum frame 18 is then moved on its trolley to the right until it comes over the turnover frame and its vacuum cups are engaged with the

upper face of the glass sheet in the turnover frame. The turnover frame is then moved to the left so that the vacuum frame may be lowered to deposit the sheet of glass upon the table 4, thus completing the operation.

In the modification illustrated in Fig. 4, which is somewhat simpler and more easily operated and is preferred for that reason, the turnover frame 30 is carried by a framework 31 depending from the crane 32. This crane is mounted upon the rails 33, 33 carried by the I beams 34, 34 supported upon suitable posts 35, 35. In this construction, as in the first one, the turnover frame is made up of U shaped arms provided with the rollers 36, but in this case, the frame is mounted to rotate upon trunnions 37 at the sides of the frame and midway between the two ends instead of being mounted upon an axis at the end of the frame as in the first construction. The frame thus turns within a less space than is required in the first construction. The frame is swung about its trunnions 37 by means of a motor 38 operating through a worm in the casing 39 which engages a worm wheel 40 carried by one of the trunnions 37. The vacuum frame 41 is provided with vacuum cups and mounted for vertical movement in a framework 42 depending from the trolley 43 as in the construction of Fig. 3, the method of raising and lowering the vacuum frame being similar. The trolley 43 is mounted upon a track 44 extending across the crane.

In operating this form of apparatus, the glass sheet on the table 3. which has had its upper face ground and polished, is engaged by the cups of the vacuum frame and lifted so that it comes opposite the slot in the turnover frame 30. The trolley 43 is then moved to the right to bring the sheet of glass into the slot, after which the suction cups are released and the vacuum frame moved to the left so as to give clearance for reversing the turnover frame. The turnover frame is then turned through an arc of 180 degrees to bring the rough side of the glass sheet uppermost. The vacuum frame 41 is then again moved to the right over the sheet and the cups brought into engagement with the upper surface of the sheet. after which the frame is moved to the right to a position over the table 4 and then lowered, depositing the sheet upon the table 4 and completing the operation.

What I claim is:

1. In combination in apparatus for transferring glass sheets from one car or carrier mounted on a track to another car or carrier on a parallel track to one side of the first track and turning it over, which comprises a vacuum lifting frame, a U shaped turnover frame adapted to receive the sheet to be transferred through its open side, when such sheet is lifted by the vacuum frame and such frame and the turnover frame are given a relative lateral movement, and overhead means for raising and lowering the vacuum frame and for shifting such frame from a position over one track to a position over the other track.

2. In combination in apparatus for transferring glass sheets from one car or carrier mounted on a track to another car or carrier on a parallel track to one side of the first track and turning it over, which comprises a vacuum lifting frame, a U shaped turnover frame adapted to receive the sheet to be transferred through its open side, when such sheet is lifted by the vacuum frame and such frame and the turnover frame are given a relative lateral movement, and overhead means for raising and lowering the vacuum frame and for shifting such frame from a position over one track to a position over the other track, the said turnover frame being located between the two tracks and having its axis of rotation parallel to the tracks.

3. In combination in apparatus for transferring glass sheets from one car or carrier mounted on a track to another car or carrier on a parallel track to one side of the first track and turning it over, which comprises a vacuum lifting frame, a U shaped turnover frame adapted to receive the sheet to be transferred through its open side, when such sheet is lifted by the vacuum frame and such frame and the turnover frame are given a relative lateral movement, and overhead means for raising and lowering the vacuum frame and for shifting such frame from a position over one track to a position over the other track, the said turnover frame being located between the two tracks and having its axis of rotation parallel to the tracks, and midway between its two ends.

4. In combination in apparatus for transferring glass sheets from one car or carrier mounted on a track to another car or carrier on a parallel track to one side of the first track and turning it over, which comprises a vacuum lifting frame, a lifting crane supporting said frame and mounted for movement transversely of the two tracks, and a U shaped turnover frame between the tracks mounted on an axis parallel thereto and adapted to receive the glass sheet to be transferred when such sheet is lifted by the vacuum frame and moved laterally.

5. In combination in apparatus for transferring glass sheets from one car or carrier mounted on a track to another car or carrier on a parallel track to one side of the first track and turning it over, which comprises a vacuum lifting frame, a turnover frame consisting of spaced U shaped

arms opening laterally adapted to receive the sheet to be transferred through the open sides of the arms when such sheet is lifted by the vacuum frame and such frame and the turnover frame are given a relative lateral movement, and overhead means for raising and lowering the vacuum frame and for shifting such frame from a position over one track to a position over the other track.

6. In combination in apparatus for transferring glass sheets from one car or carrier mounted on a track to another car or carrier on a parallel track to one side of the first track and turning it over, which comprises, a crane extending across the tracks and movable longitudinally of the tracks, a trolley mounted on the crane for movement laterally thereof, so that it may be positioned over either track, a vacuum frame carried by the trolley and movable vertically thereon, and a turnover device carried by the crane intermediate the tracks and comprising a U shaped frame adapted to receive the sheet of glass to be transferred through its open side, and pivotally mounted for reversal on an axis parallel to the tracks.

In testimony whereof, I have hereunto subscribed my name this 21st day of Nov., 1923.

HERMAN S. HEICHERT.