Dec. 29, 1931. J. SYLVESTER 1,838,592

LIFTING DEVICE

Original Filed Jan. 21, 1929 2 Sheets-Sheet 1

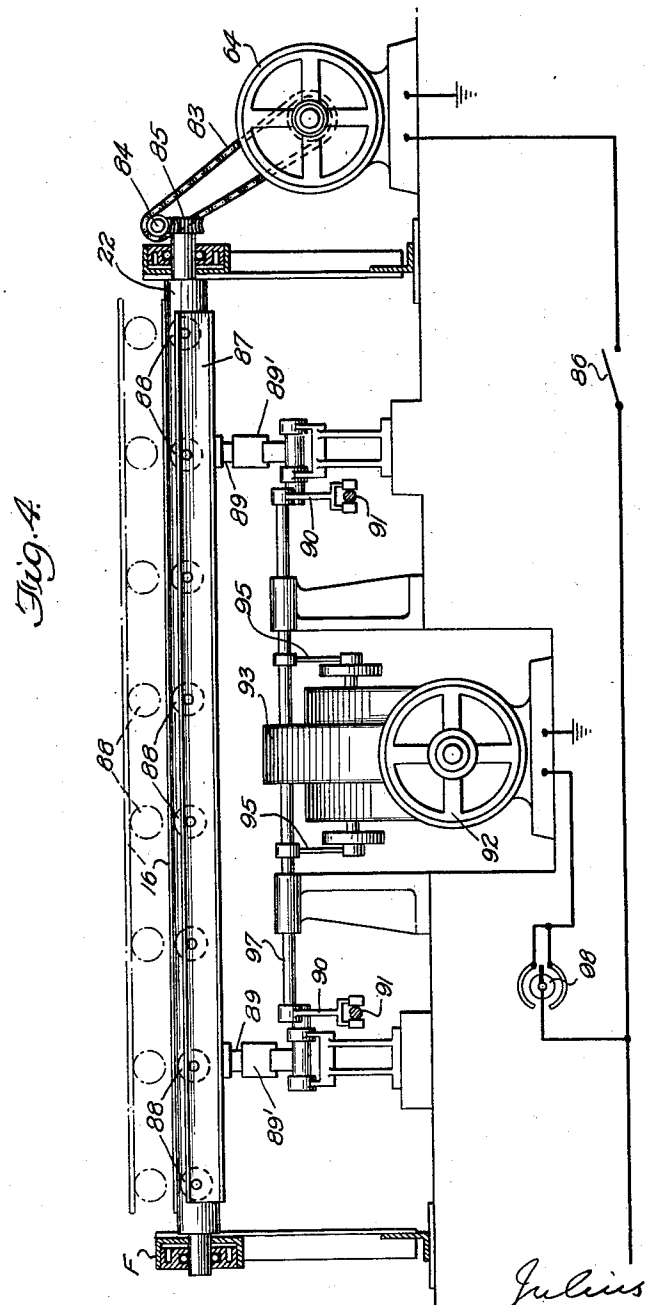


Fig. 4.

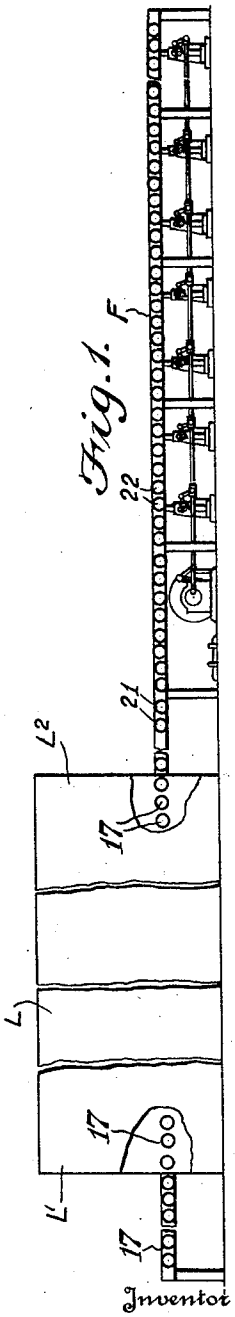


Fig. 1.

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LIFTING DEVICE

Original Filed Jan. 21, 1929 2 Sheets-Sheet 2

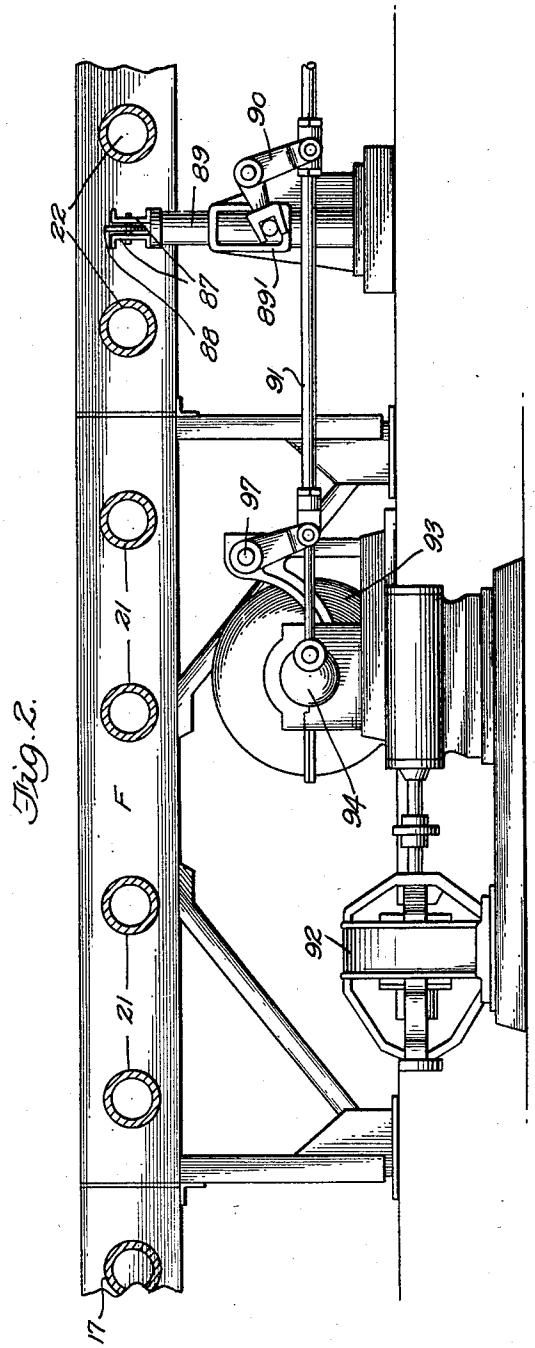


Fig. 2.

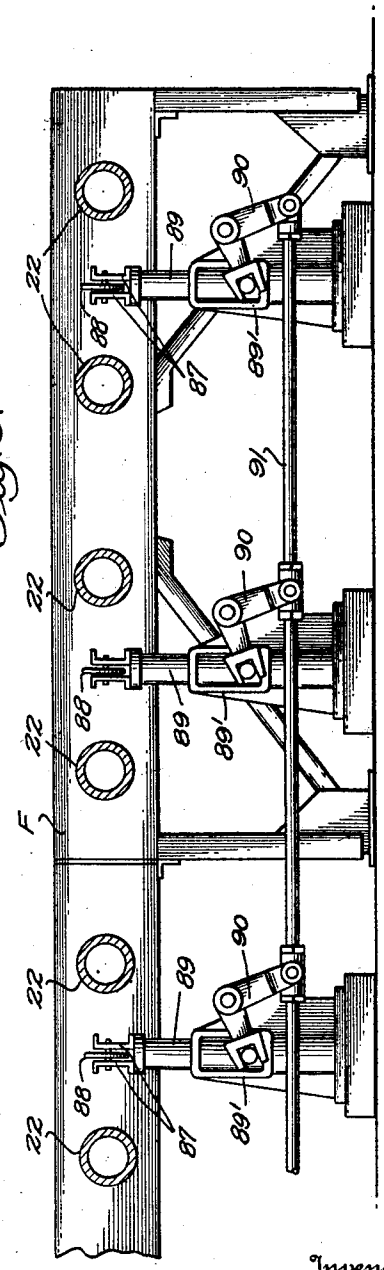


Fig. 3.

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UNITED STATES PATENT OFFICE

JULIUS SYLVESTER, OF WASHINGTON, PENNSYLVANIA, ASSIGNOR TO SIMPLEX ENGINEERING COMPANY, OF WASHINGTON, PENNSYLVANIA, A CORPORATION OF DELAWARE

LIFTING DEVICE

Original application filed January 21, 1929, Serial No. 333,887. Divided and this application filed January 4, 1930. Serial No. 418,578.

This invention relates to improvements in lifting devices for use in removing sheet glass or other materials from roller lehr conveyors or other roller conveyors, and the present application is a division of my prior application filed January 21, 1929, Serial No. 333,887.

The object of the invention is to provide a simple, reliable and efficient construction of lifting device whereby sheets of glass may be readily and conveniently lifted off the conveyor rollers and shifted laterally of the conveyor for discharge at one side thereof.

A further object of the invention is to provide a lifting device of the character described whereby large sheets of glass or other materials may be expeditiously handled without injury thereto.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Fig. 1 is a diagrammatic side elevation of a sheet glass annealing lehr, to which the invention, for purpose of exemplification, is shown applied.

Figs. 2 and 3 are side elevations of the conveyor rolls at the discharge end of the lehr and the lifting device associated therewith.

Fig. 4 is a transverse section through the conveyor, showing the glass lifting device in end elevation and illustrating in dotted lines its lifting action.

Referring now more particularly to the drawings, L designates the heating chamber or tunnel of a sheet glass annealing kiln or lehr, in which the glass sheets 16, one of which is shown, are intermittently supplied to the lehr at certain intervals, said sheets being supported and conveyed by rolls 17 from a point in advance of the receiving end L′ of the lehr to and through the lehr chamber to the discharge end L^2 thereof. The rolls 17 are suitably power driven in practice and the lehr chamber suitably heated for the annealing action. At the discharge end of the lehr chamber the glass sheets pass outward upon a section of idler rolls 21 beyond which are located a plurality of power operated manually-controlled delivery rolls 22, said rolls 22 being journaled on an elevated frame F. The length of the idler section of rolls 21 with relation to the length of the glass sheet 16 is such that a sheet of glass 16 will entirely bridge this section, so that one end of the sheet may still rest upon the rolls 17 at the discharge end of the lehr chamber when the other end of the sheet has reached the manually controlled rolls 22.

The lifting device for removing the glass from the rolls 22 comprises a plurality of pairs of vertically reciprocable channel bars 87, extending between certain of the rolls 22, and of somewhat less length than the rolls. Between the pairs of bars 87 are carried anti-friction transfer rollers 88 which when the bars 87 are raised from a normal lowered position to the position shown in dotted lines in Fig. 4 are adapted to support the sheet 16 in such a manner that it may be run sidewise off the conveyor on the rollers 88.

For raising and lowering the channel bars 87 a plurality of plungers 89, movable in cylinders 89′, may be employed, these being operated by bell cranks 90. These bell cranks are connected to a pair of operating rods 91 extending lengthwise of the lehr. Power is furnished from a suitable motor 92, which, through reducing gear 93, acts through eccentrics 94, links 95, transverse rock shaft 97 and links 90 to move the rods 91 forward or backward to thereby raise or lower the glass lifting rollers 88. The motor is provided with a suitable limit switch 98 which stops the motor whenever the eccentrics 94 have moved through an angle of 180°.

The lifting device above-described is simple, reliable and efficient in construction and action and allows large and weighty sheets of glass to be removed from rolls 22 with ease and celerity and with a minimum of liability of damage to the sheet. While the invention has been disclosed, for purpose of example, for use in a lehr organization for handling glass sheets, it is not limited thereto, as it is obvious that in practice it may be employed in connection with roller conveyors generally for removing therefrom various

materials which have been transported thereby.

Having thus fully described my invention, I claim:—

1. In combination with a roller conveyor having spaced conveying rolls, a section of idle rolls succeeding the conveyor rolls for receiving articles successively fed by the conveyor rolls, a section of power driven delivery rolls succeeding the idle rolls for conveying an article from the idle rolls, all of said rolls being mounted for rotation in the same direction, and a lifting and discharge device comprising members arranged parallel with and between and normally disposed below the plane of the delivery rolls for lifting an article vertically from the delivery rolls to a level above the same, said members having transfer rolls rotating at right angles to the delivery rolls for supporting the article and on which the article may be withdrawn transversely of said roller conveyor.

2. In combination with a lehr for annealing glass sheets, said lehr embodying a roller conveyor having spaced conveying rolls, a section of idle rolls succeeding said conveyor rolls for receiving glass sheets successively fed by the conveyor rolls, a section of power driven delivery rolls succeeding the idle rolls for conveying a glass sheet from the idle rolls, the length of the section of idle rolls with relation to the glass sheet being such that the sheet may bridge over the same between the conveyor rolls and delivery rolls, and a lifting and discharge device comprising members arranged parallel with and between and normally disposed below the plane of the delivery rolls for lifting an article vertically from the delivery rolls, said device having transfer rolls rotating at right angles to the delivery rolls for supporting the glass sheet and on which the sheet may be withdrawn transversely of the conveyor, and power means for conjointly raising or lowering said members.

3. In combination with a roller conveyor having spaced parallel conveying rolls, a lifting and discharge device comprising bars parallel with and movable vertically between certain of the conveyor rolls, each bar being formed of spaced angle metal members, supporting rollers on each bar journaled between the angle metal members thereof so as to be rotatable in a direction transversely of said conveyor rolls, and mechanism for jointly raising and lowering said bars.

4. In combination with a roller conveyor having spaced parallel conveying rolls, a lifting and discharge device comprising spaced bars arranged parallel with each other and with the conveyor rolls and movable vertically between certain of the conveyor rolls, supporting rollers on said bars rotatable in a direction transversely thereof and of said conveyor rolls, sets of plungers for raising and lowering said bars, bell cranks coupled to the plungers, reciprocatory rods connecting the bell cranks of the sets of plungers, a rock shaft coupled to the rods, and motor driven means for operating the rock shaft.

5. In combination with a roller conveyor having spaced conveying rolls, a lifting and discharge device comprising bars arranged parallel with and movable vertically between certain of the conveyor rolls, supporting rollers on said bars rotatable in a direction transversely thereof, sets of plungers for raising and lowering the bars, bell cranks coupled to the plungers, reciprocatory rods connecting the bell cranks of the respective sets of plungers, a transverse rock shaft, links connecting said shaft to the rods, a reducing gear, eccentrics operated thereby for actuating the rock shaft, and a motor for driving said reducing gear.

6. In combination with a roller lehr for annealing glass sheets, a discharge mechanism therefor comprising a section of idler rollers succeeding the lehr rolls for receiving glass sheets from said lehr rolls, a section of power operated delivery rolls succeeding the idler rolls for conveying a glass sheet from the idler rolls, the length of the section of idler rolls with relation to the glass sheet being such that the sheet may bridge over the same between the lehr rolls and delivery rolls, and means for lifting the sheet vertically, said lifting means having transfer rolls rotatable at right angles to the last-named rolls and movable from a normal horizontal position below and upwardly between and to a position above the horizontal plane of the said last-named rolls for raising a sheet therefrom and permitting the sheet to be slid laterally thereof.

In testimony whereof I affix my signature.

JULIUS SYLVESTER.