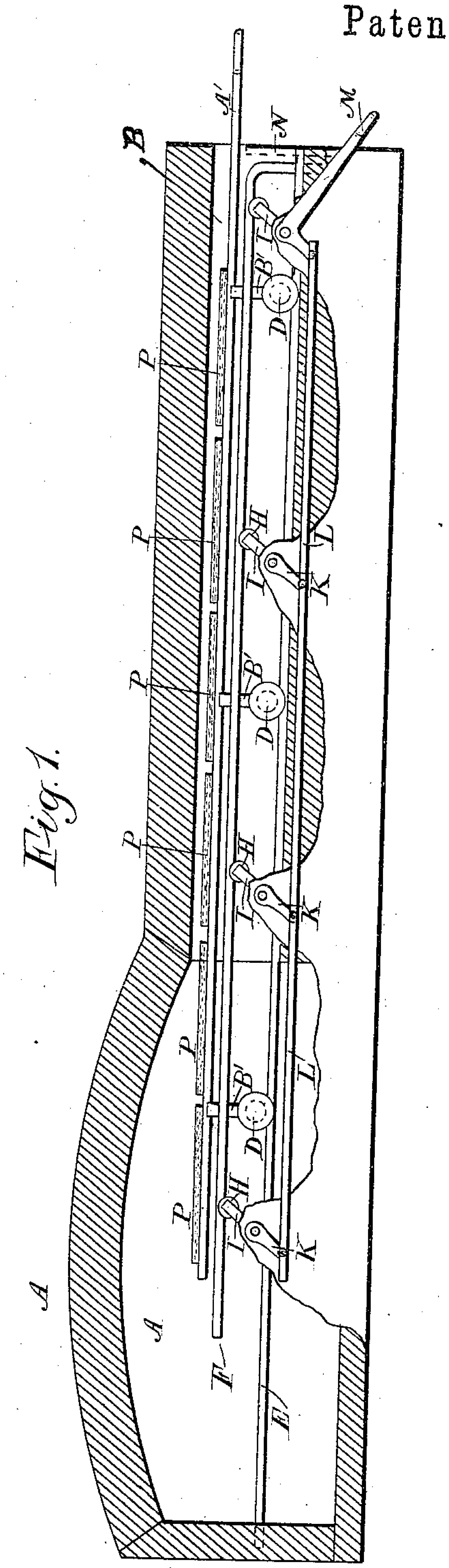
(No Model.)

3 Sheets—Sheet 1.

B. MAYER.

APPARATUS FOR CONVEYING SHEETS OF GLASS THROUGH THE ANNEALING OVEN.

No. 312,141. Patented Feb. 10, 1885.



Witnesses:
G. S. Rafter
E. B. H. Tower

Inventor:
Benedict Mayer
By L. H. Ginsabaugh

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) B. MAYER. 3 Sheets—Sheet 2.

APPARATUS FOR CONVEYING SHEETS OF GLASS THROUGH THE ANNEALING OVEN.

No. 312,141. Patented Feb. 10, 1885.

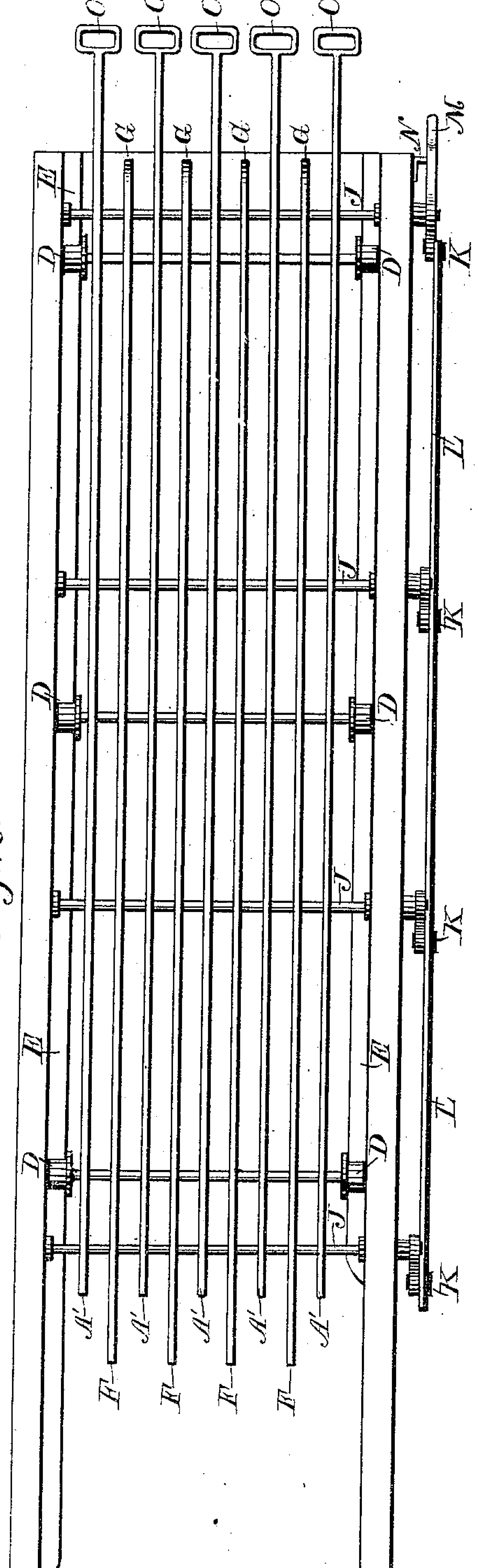


Fig. 2.

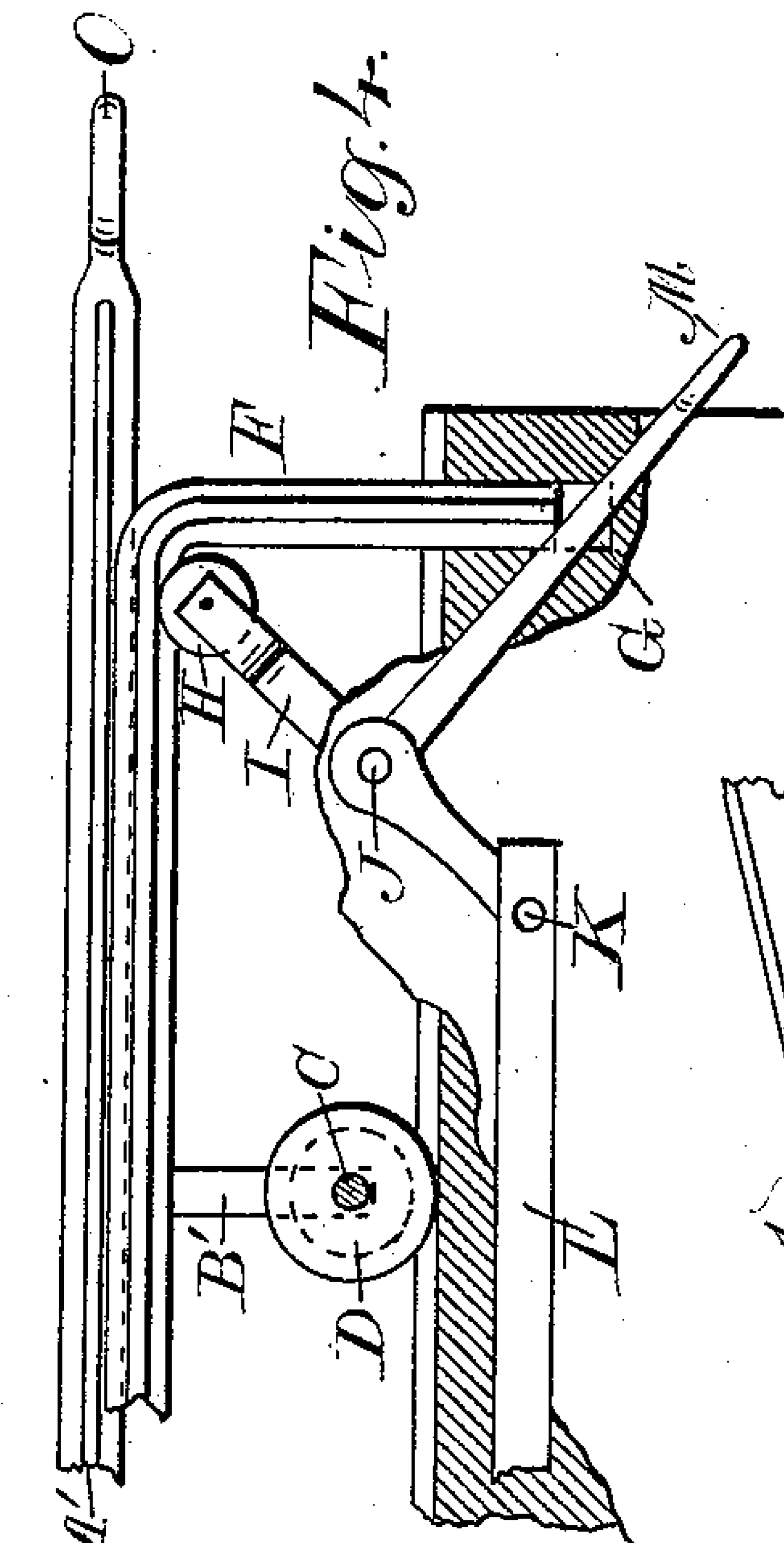


Fig. 4.

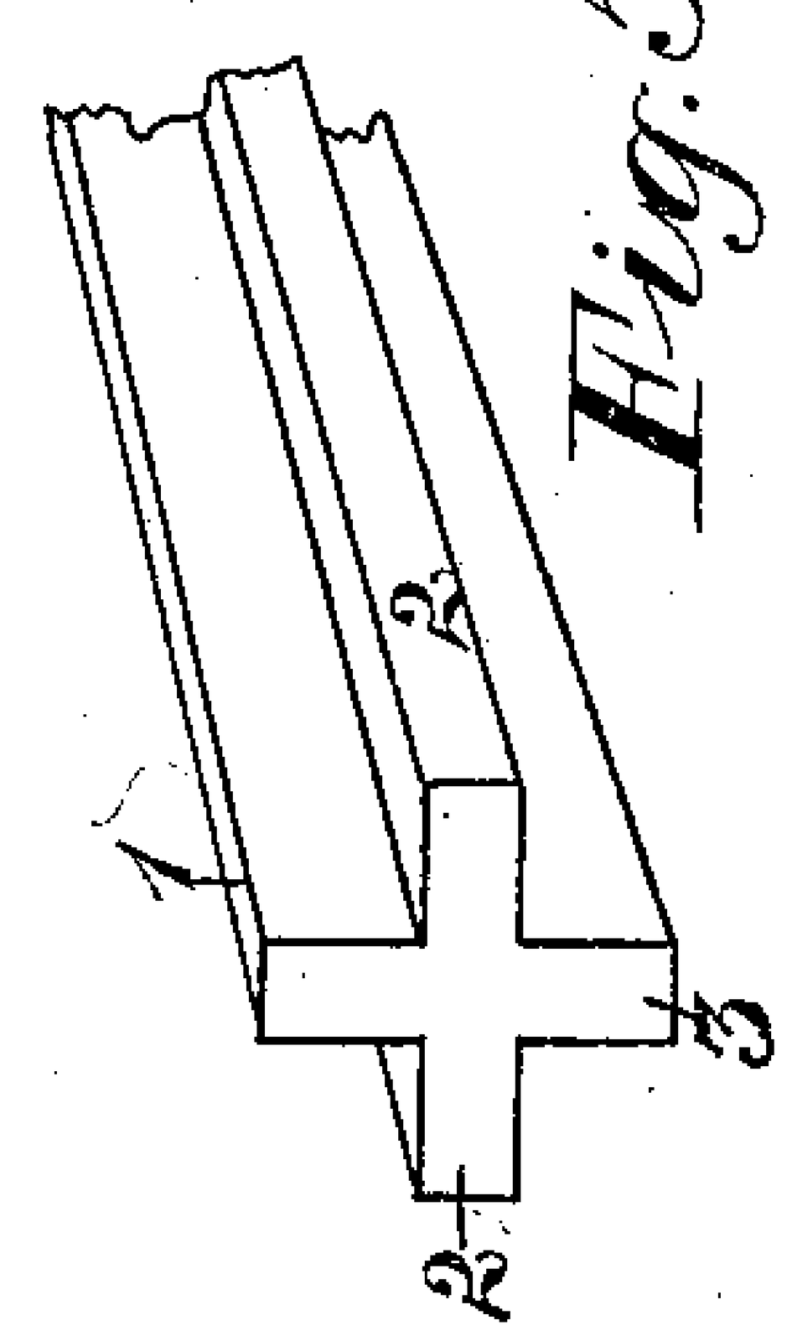


Fig. 5.

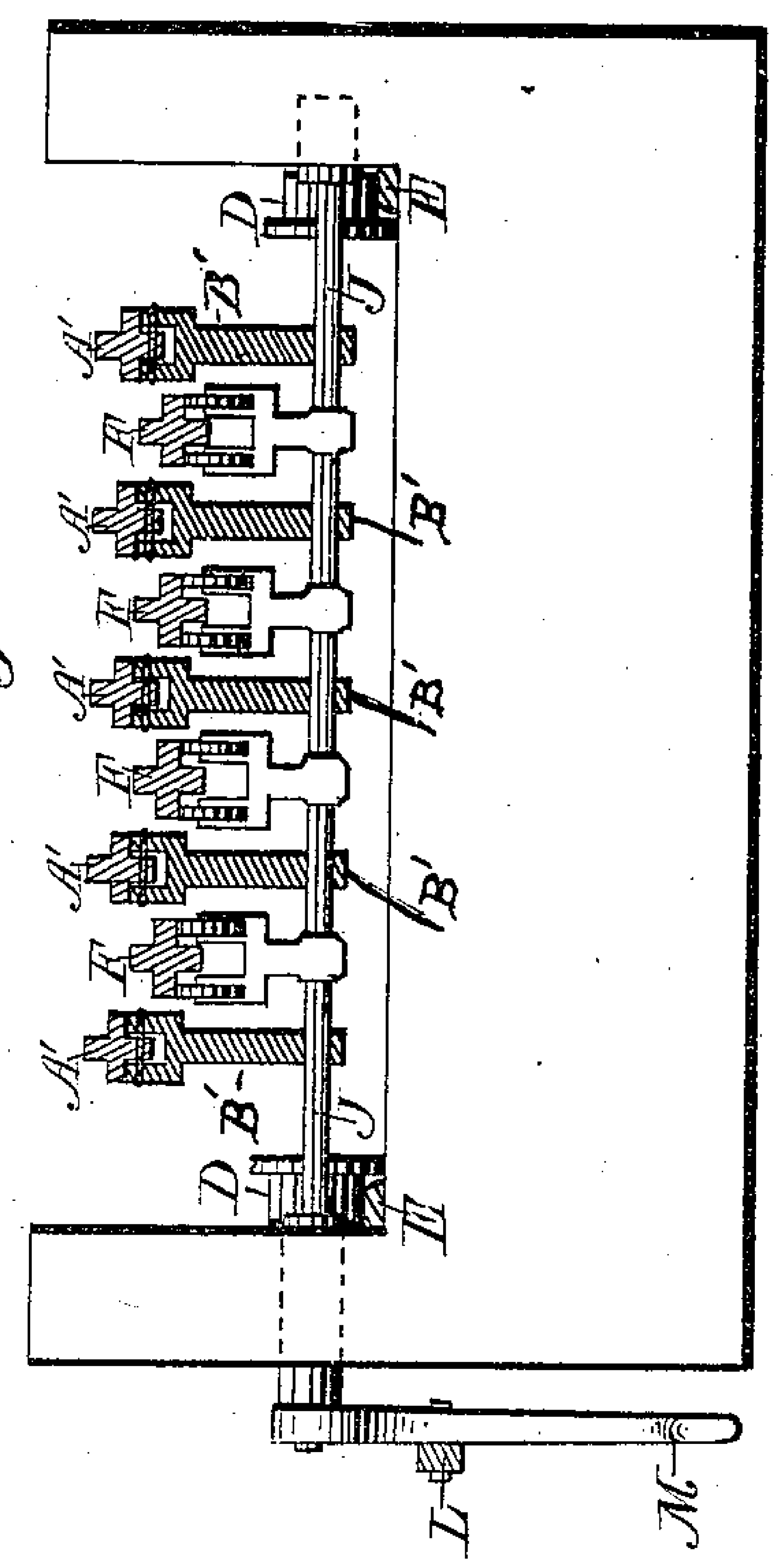


Fig. 3.

Witnesses:
G. S. Rafter
E B H Tower

Inventor:
Benedict Mayer
By [illegible]
Att'y.

(No Model.) 3 Sheets—Sheet 3.

B. MAYER.

APPARATUS FOR CONVEYING SHEETS OF GLASS THROUGH THE ANNEALING OVEN.

No. 312,141. Patented Feb. 10, 1885.

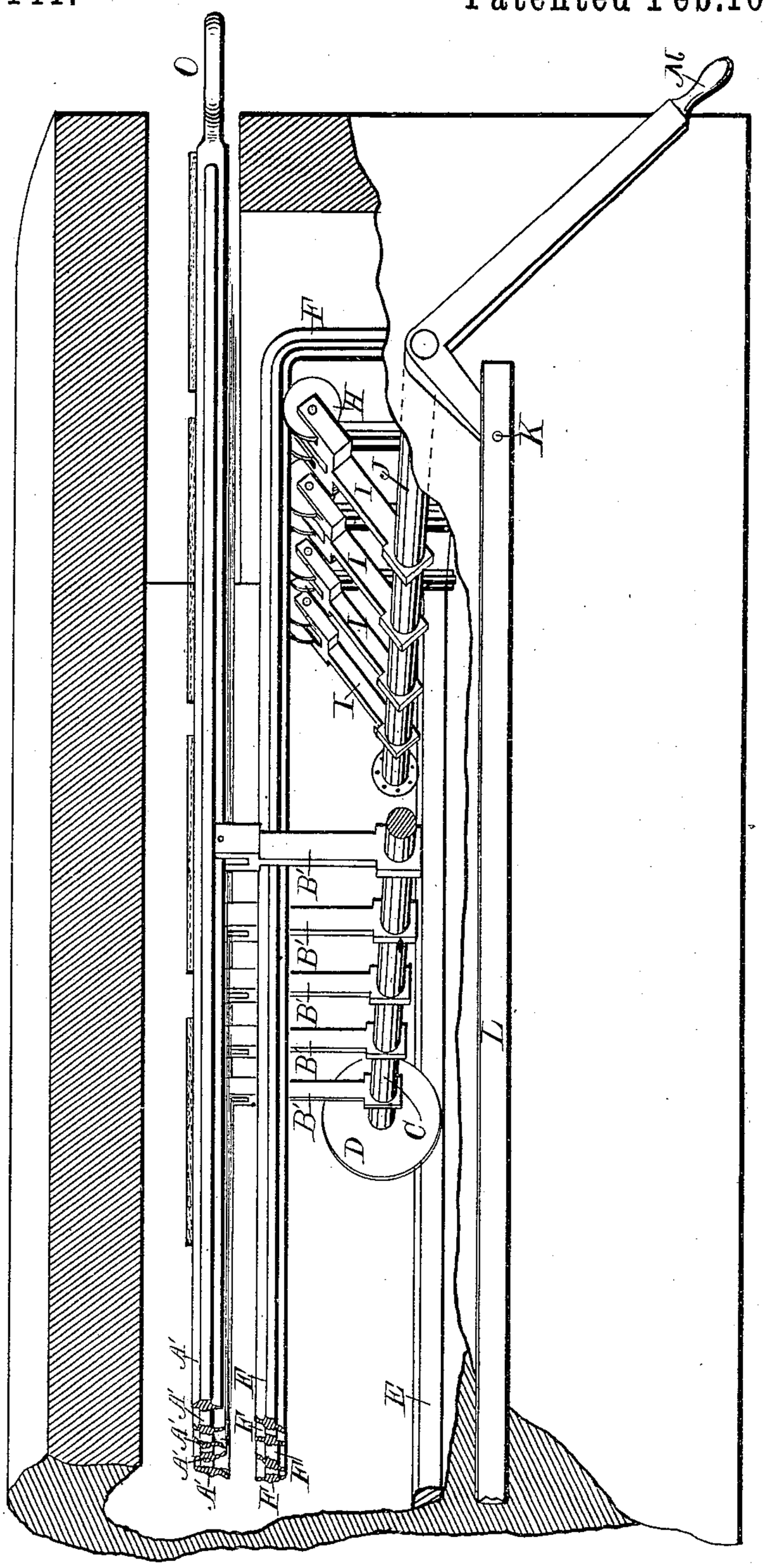


Fig. 6.

Witnesses:
G. S. Rafter
E. B. Hoover

Inventor:
Benedict Mayer
By. S. St. Finsabaugh
Atty.

UNITED STATES PATENT OFFICE.

BENEDICT MAYER, OF DURHAMVILLE, NEW YORK, ASSIGNOR OF ONE-HALF TO ROBERT ANDRIS, OF SAME PLACE.

APPARATUS FOR CONVEYING SHEETS OF GLASS THROUGH THE ANNEALING-OVEN.

SPECIFICATION forming part of Letters Patent No. 312,141, dated February 10, 1885.

Application filed June 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, BENEDICT MAYER, a citizen of the United States, residing at Durhamville, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Apparatus for Conveying Sheets of Glass Through the Annealing-Oven, of which the following is a full, clear, and exact description, when taken in connection with the accompanying drawings, which form a part thereof.

The object of my invention is to provide safe and reliable means for conveying plate and sheet glass from the flattening table or furnace to and through the annealing-arch.

My invention consists in certain details of construction, which will be fully described hereinafter, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a side elevation of my device with the walls of the annealing-arch and flattening-oven broken away. Fig. 2 is a top or plan view. Fig. 3 is an end view. Fig. 4 is an enlarged view of the rear end of the car and with the parallel bars and devices for raising and lowering said bars. Fig. 5 is a view in perspective showing the contour of the parallel bars. Fig. 6 is a view in perspective of my device, showing the loose parallel bars depressed or in their lower position.

A is the flattening oven or chamber, in which the cylinders or plates of glass are heated and flattened, and in which a turn-table may be located, as is common in this class of furnaces.

B is the annealing-arch, which may be of any suitable or desirable dimensions best adapted for the work, and is provided with tracks E, on which the wheels of the car rest and are free to be moved back and forth thereon.

The car consists of a series of parallel bars, A′, secured to standards B′, which in turn are secured to the axles C, on which are mounted the wheels D, adapted to fit the track or ways E. The top of the car is, by preference, on a level with the flattening table or hearth, so that the sheets of glass after being heated and flattened can be readily slid from the table onto the car. The bars A′, which form the top of the car, are designed to extend the full length of the annealing arch or tunnel and into the heating and flattening chamber, while their rear ends extend outside of the annealing-arch and are provided with handles O, by means of which the car can be pushed back and forth on the track E.

F are bars placed between the bars of the car A′ and parallel therewith, the outer ends of which are bent at right angles to the main portion of the bar, and adapted to enter the holes or sockets G in the bed of the arch. The bars F are supported and operated by arms I, which are secured to shafts J, said shafts being mounted in bearings in the sides of the arch. The shafts J pass through the sides of the arch, and their outer end or ends are provided with arms K, to which the rods L are secured, and by which the series of shafts J are connected together. It will be noticed that the arms K and rods L are located on the outside of the furnace and are not liable to be affected by the heat as would be the case were they located within the arch.

M is a lever secured to the outer arm, I, and by means of which all the arms can be raised at once to a vertical position or lowered to an inclined position.

N is a ratchet-bar secured to the side of the arch for holding the lever M in any desired position. The arms I are provided with friction-wheels H, on which the bars F rest, and the bars F are by preference made of the form shown—*i. e.*, of bar-iron cruciform in cross-section—so that the arm or flange 1 of the bar will project up between the bars A′ when the bars F are raised, and the flanges or wings 2 2 are the portions against which the friction-wheels impinge to raise the bars F.

I prefer to employ two arms, with a friction-wheel on each side of the flange 3, so that the bars will be elevated in a direct line and not be twisted or distorted in their vertical movement.

Tubular bars may be used instead of the cruciform bars shown and described, and when

such bars are used the peripheries of the friction-wheels H should be grooved to conform to the peripheral outline of the tubular bars.

The operation of my device is as follows: The car is pushed forward so that the bars A′ of the car are close to the flattening table or hearth. A sheet or plate of glass is placed on the front end of the bars, and the car with the glass thereon is drawn back a short distance into the annealing-arch. The bars F are now raised in a direct vertical line, being prevented from moving in a longitudinal direction by means of the bent ends working within the sockets G. This vertical movement of the bars F lifts the sheet or sheets of glass from off the bars A′ of the car, and holds them there until the car is pushed forward to the flattening table or hearth and another sheet or plate of glass has been placed on the bars A′ of the car. The bars F are now lowered, and the sheets of glass permitted to rest on the bars A′ of the car. The car is now drawn back a short distance, the bars F raised, and the operation as above described repeated, and as the sheets of glass approach the rear end of the arch by this step-by-step motion they are in condition to be removed, and are ready for the cutting-shop.

I am aware that a double series of elevating and oscillating bars have been used to move the glass through the annealing oven or arch, said bars being limited in their movement by pivoted bars, thus confining the movement of the sheets of glass in their passage rearward to short spaces at each operation of the bars.

I am also aware that a sliding frame, having bars pivoted thereto to raise the sheets of glass and deposit them on ledges formed in the sides of the arch, and thus move the glass rearward by a step-by-step movement through the arch, is not new, and such I do not claim.

By the use of the car and the vertically-moving bars, as described and shown by me, I am enabled to move the glass the distance of the width or length of the sheet of glass at each step, and the risk or liability of breaking or distorting the glass is reduced to a minimum.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In devices for moving glass from the flattening hearth or table to and through the annealing arch or furnace, a car adapted to receive the glass from the flattening-table and be moved back a short distance therefrom, and a series of vertically-moving bars adapted to raise the glass from the car and hold the same in an elevated position until the car is run forward and another sheet of glass has been placed on the car, in substantially the manner described.

2. In a glass-annealing furnace or arch, a car composed of a series of parallel bars mounted on wheels, as set forth, and a series of parallel bars located beneath the bars of the car and adapted to be vertically raised up between and a short distance above the parallel bars of the car, as and for the purpose set forth.

3. In a glass-annealing furnace or arch, the combination of a car adapted to be moved to and fro within the arch, with a series of bars adapted to be raised vertically through and a short distance above the top of the car, as and for the purpose set forth.

4. The vertically-movable bars F, provided at their outer ends with the bent portions to enter the guiding-sockets G, in combination with the arms I, shafts J, arms K, connecting-rods L, and operating-lever M, whereby the bars F are raised and lowered in a vertical line, as set forth.

5. The vertically-moving parallel bars made of bar-iron cruciform in cross-section, and having the down-turned ends to enter the sockets or openings G in the floor or bed of the arch, as set forth.

6. The vertically-moving parallel bars F, constructed as described, having the upwardly-projecting flange 1 to enter between the parallel bars of the car, and the horizontally-projecting wings or flanges 2 2, against which the lifting devices impinge, as set forth.

7. The shafts J, having their bearings in the sides of the arch or tunnel and extending therethrough, provided with the arms I, that are within the arch, and the arms K, that are on the ends of the shafts outside of the arch, in combination with the connecting-rods L and operating-lever M, as and for the purpose set forth.

8. In a device for moving sheets of glass from the flattening hearth or table through the annealing-arch, the shafts J, having their bearings in the sides of the arch or tunnel and extending therethrough, provided with the arms I, which loosely support the parallel bars F, in combination with the arms K, connecting-rods L, and operating-lever M, whereby the bars F are raised and lowered in a vertical line, as set forth.

9. In a furnace for flattening and annealing sheet-glass, a series of parallel bars secured to shafts mounted on wheels, and a series of parallel bars adapted to be raised and lowered vertically between the first-mentioned series of parallel bars, the vertically-moving bars being operated by shafts and bars which extend beyond the influence of the heat of the annealing-chamber, as set forth, whereby the operating bars and shafts are prevented from being warped or bent by the heat of the furnace, as set forth.

10. A device for carrying sheets of glass through the annealing-arch, consisting of a car having a series of longitudinal parallel bars elevated above the axles of the car, said car being adapted to run on ways or tracks in the arch, and a series of longitudinal par-

allel bars adapted to be raised above and lowered beneath and between the parallel bars of the car, as set forth.

11. A car for conveying sheets of glass from the flattening-hearth through the annealing-arch, composed of a series of parallel bars secured to standards, which in turn are secured to the axles of the car, said axles being provided with wheels adapted to run on a track or way located within the arch or furnace, as set forth.

BENEDICT MAYER.

Witnesses:
PETER PFEIFER,
EDWIN E. DEANE.