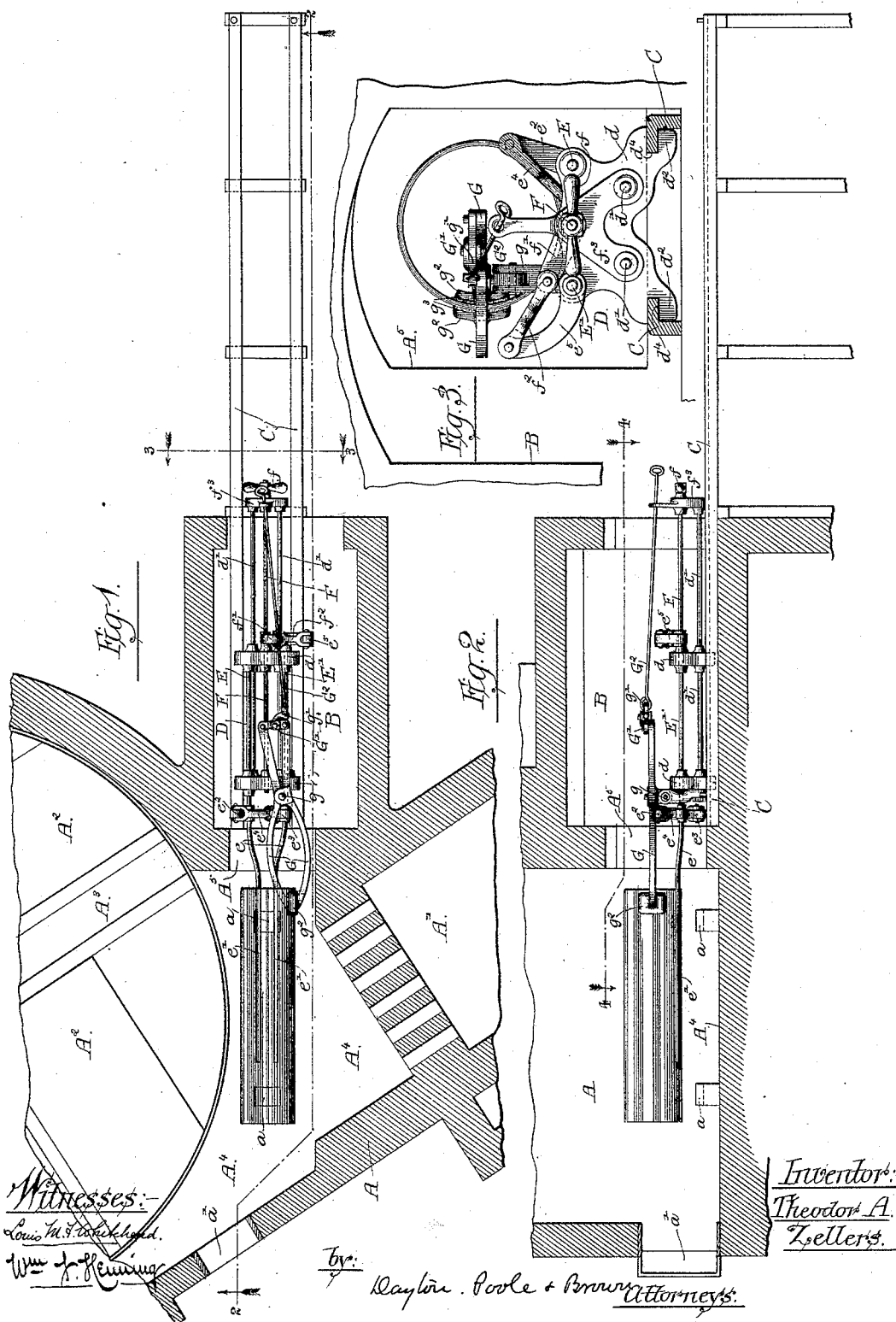


3 Sheets—Sheet 1.

No. 421,152.

Patented Feb. 11, 1890.



(No Model.)

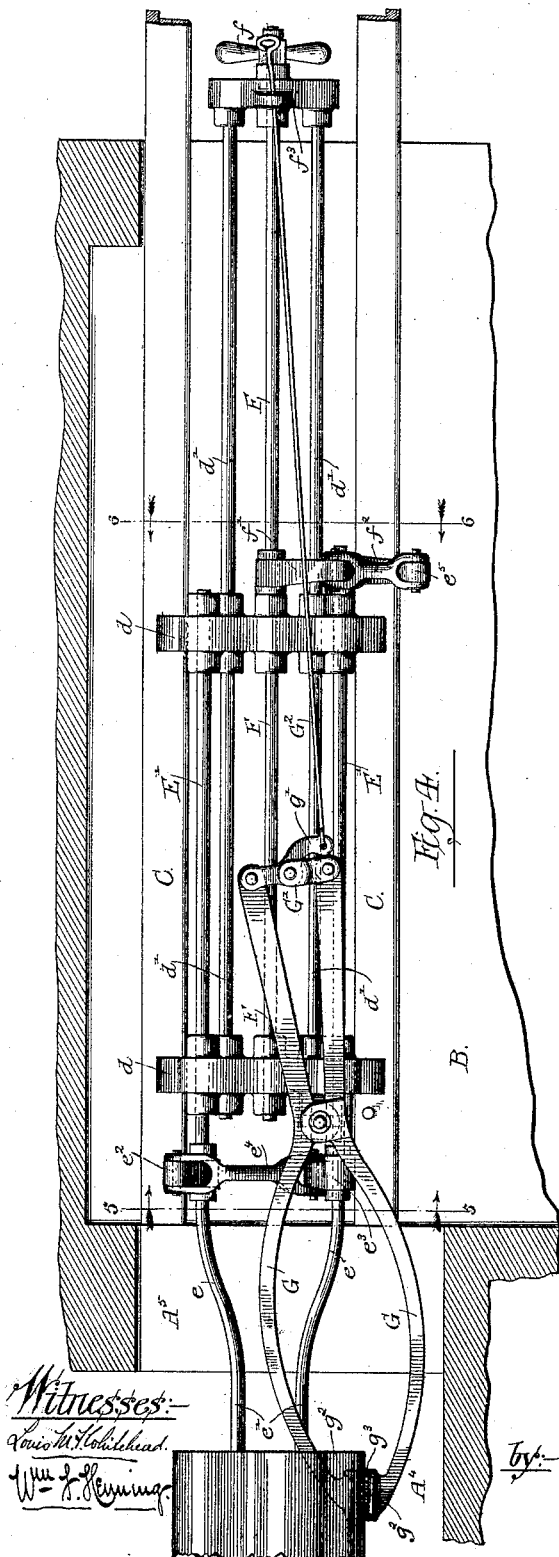
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T. A. ZELLERS.

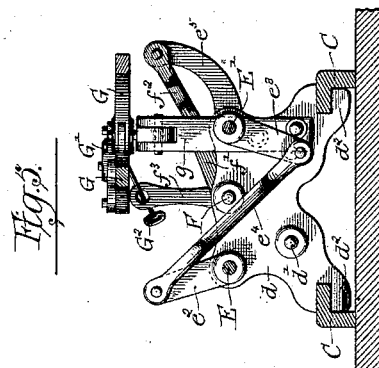
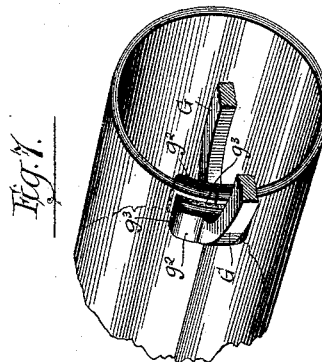
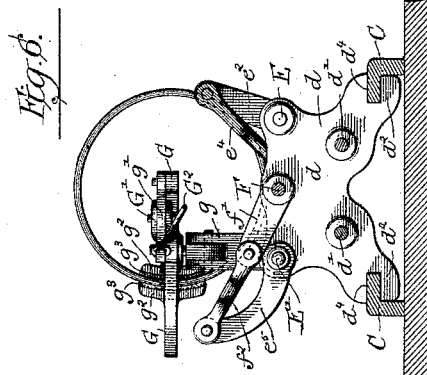
APPLIANCE FOR GLASS FLATTING OVENS.

No. 421,152.

Patented Feb. 11, 1890.



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(No Model.)

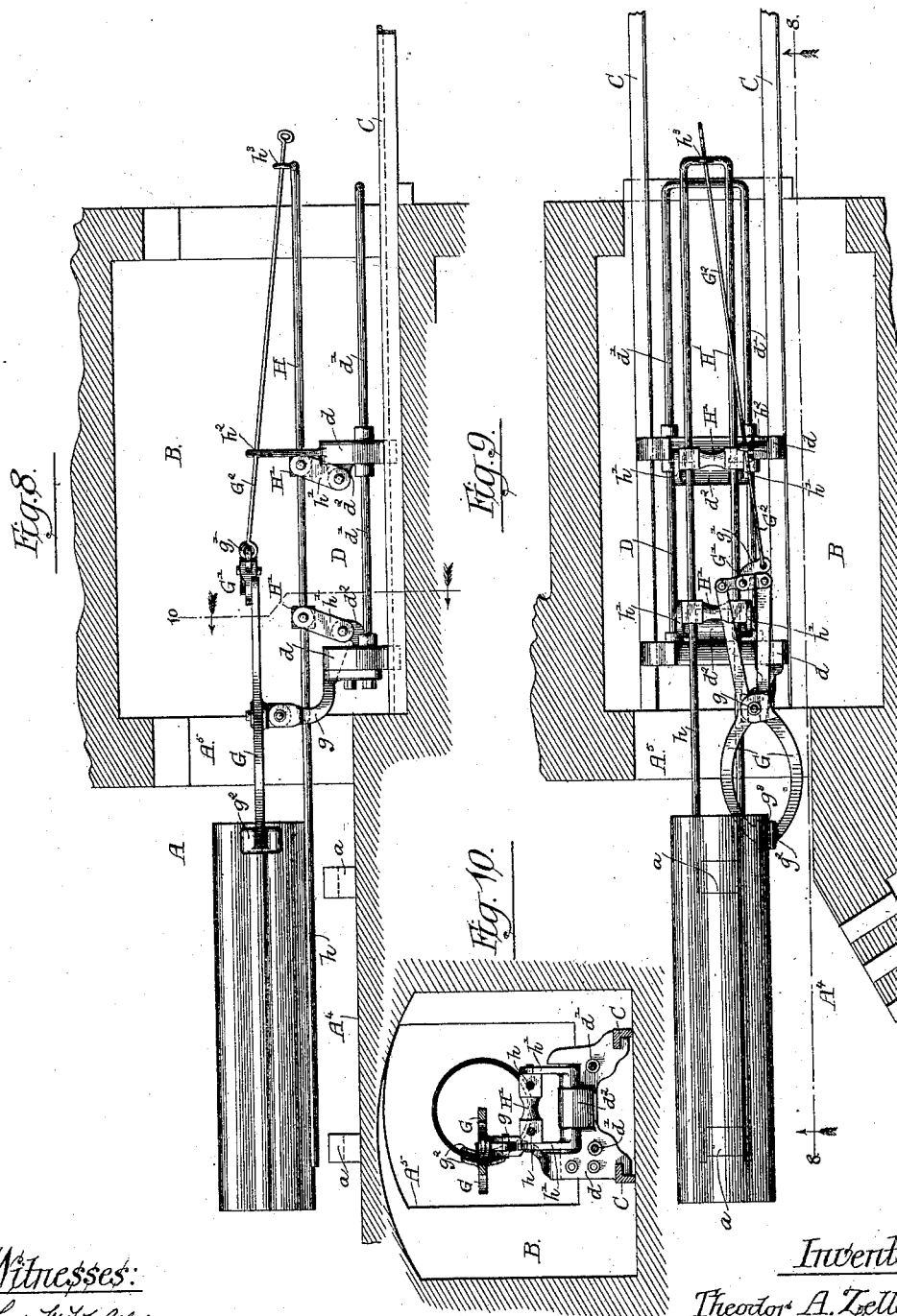
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T. A. ZELLERS.

APPLIANCE FOR GLASS FLATTING OVENS.

No. 421,152.

Patented Feb. 11, 1890.



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# UNITED STATES PATENT OFFICE.

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## APPLIANCE FOR GLASS-FLATTING OVENS.

SPECIFICATION forming part of Letters Patent No. 421,152, dated February 11, 1890.

Application filed May 14, 1889. Serial No. 310,753. (No model.)

*To all whom it may concern:*

Be it known that I, THEODOR ARREN ZELLERS, of Ottawa, in the county of La Salle and State of Illinois, have invented certain  
5 new and useful Improvements in Appliances for Glass-Flattening Ovens; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form  
10 a part of this specification.

This invention relates to devices employed in the manufacture of sheet or window glass, and more especially to certain improved devices for inserting and depositing in the flattening-oven the glass rollers or cylinders from which the flat sheets are made, after the same have been cracked or split longitudinally.

Heretofore in the manufacture of window-glass, wherein longitudinally cracked or split rollers or cylinders of glass are flattened out to form a sheet after being heated in a flattening-oven, various forms of devices have been employed to aid in the manipulation of said  
20 rollers during their insertion into said oven. The device most commonly used consists of a manually-operated fork, upon the prongs of which the cylinders are supported, and which is arranged adjacent to the door of the oven, and swung from a crane or other similar support, whereby the rollers have been sustained while being inserted and deposited in the oven. This device is found objectionable, first, from the fact that, owing to the flexibility of the glass roller after being longitudinally split, the separated edges thereof are liable to overlap each other if the cylinder is slightly jarred, so that when the roller is inserted in the oven the cylinder will be heated  
30 unequally, (by reason of the greater thickness of the overlapped portion,) whereby the cylinder is liable to become broken; in fact, a large proportion of rollers do break in the flattening-oven from the cause named; second, a chamber is commonly employed adjacent to the door of the oven, in which chamber the rollers may remain and become heated to some extent before the same are placed in the flattening-oven, thereby rendering the breakage from the sudden application of heat less

liable to occur, and when such chamber is present the use of a crane or similar device is inconvenient; third, when handling the rollers or cylinders by any of the means referred to, there is the liability of scratching them in withdrawing the fork from beneath the cylinders after the latter have been placed on the oven-floor.

The object of this invention is to provide improved devices to overcome these several objections; and it consists in the features of construction and combination of parts hereinafter fully described, and pointed out in the appended claims.

In the drawings, Figure 1 is a sectional plan view of a flattening-oven provided with apparatus embodying my invention. Fig. 2 is a vertical longitudinal section of the same on the line 2 2 of Fig. 1. Fig. 3 is an enlarged vertical transverse sectional view on the line 3 3 of Fig. 1. Fig. 4 is an enlarged plan view taken on the line 4 4 of Fig. 2. Figs. 5 and 6 are vertical transverse sectional views, respectively, on lines 5 5 and 6 6 of Fig. 4. Fig. 7 is a perspective detail view of a portion of a cylinder or roller with the clamping-plates in engagement therewith. Fig. 8 is a side view illustrating a modified form of apparatus embodying my invention. Fig. 9 is a plan view of the same. Fig. 10 is a vertical transverse sectional view on the line 10 10 of Fig. 8.

A indicates a flattening-oven, comprising a furnace A' and revoluble flattening-stones A<sup>2</sup>, supported on a flattening-wheel A<sup>3</sup> in the usual manner.

A<sup>4</sup> is the floor of the oven, which is on the same level, or nearly so, with the flattening-stones, and A<sup>5</sup> is a doorway in the back of the oven, through which the glass cylinders or rollers are inserted. Upon the floor A<sup>4</sup> in the line with the doorway A<sup>5</sup> are located elevated supports or saddles a a, upon which the cylinders are placed and from which they may be easily removed in transferring them to the flattening-stones.

a' is an opening or door in the side of the oven adjacent to the flattening-stones, through which the operator can insert a suitable tool to remove the rollers from the saddles to the

flattening-stones, and there flatten out the same after they have been heated.

B is an inclosed heating-chamber constructed round the doorway A<sup>5</sup>, and extended beyond the same a sufficient distance to receive a cylinder or roller.

C C are tracks or guideways arranged along the floor of the heating-chamber in front of the doorway A<sup>5</sup>, and extending some distance outside of and beyond the same, said tracks being shown as supported by suitable posts or standards at their outer parts.

D indicates a carriage consisting, as herein shown, of cross-bars *d d* and longitudinal side pieces *d' d'*. The said cross-bars are provided with feet *d<sup>2</sup> d<sup>2</sup>*, having guide-notches *d<sup>4</sup> d<sup>4</sup>*, adapted to embrace and slide upon the guideways C. Other forms of traveling supports may be obviously substituted for the sliding support shown—as, for instance, wheels or rollers could be employed in place of the guide-notches *d<sup>4</sup> d<sup>4</sup>*; but these features are not of the essence of my invention.

E E' are parallel longitudinally-arranged shafts mounted on the sliding carriage D. Said shafts are supported in bearings in cross-bars *d d*, and are extended beyond or overhang the carriage at the front end of the latter, or that nearest the oven, and are there provided with double bends or offsets *e e*, forming overhanging parallel eccentrically-arranged supporting arms or prongs *e' e'* for sustaining the rollers or cylinders to be inserted in the oven. The shaft E is provided in the rear of the bend thereof with an upwardly-extending rigid arm *e<sup>2</sup>*, and the shaft E' is similarly provided with a depending rigid arm *e<sup>3</sup>*. The free ends of said arms are connected by a link *e<sup>4</sup>*. The shaft E' is extended beyond the cross-bar *d*, and is provided with another upwardly-extending rigid arm *e<sup>5</sup>*.

F is a longitudinally-arranged operating-bar supported in bearings in the cross-bars *d d*, extending rearwardly or outwardly a considerable distance from the adjacent end of the carriage, and desirably supported near its rear end in a bearing in another cross-bar *f<sup>3</sup>*, which, as herein shown, is secured to rearwardly-extended ends of the longitudinal side pieces *d' d'*.

*f* is a transverse handle or crank attached to the operating-bar F.

*f'* is an upwardly-extending rigid arm upon the operating-bar F, the same being connected at its outer end with the arm *e<sup>5</sup>* by a link *f<sup>2</sup>*. It will be obvious that by turning the operating-bar F the shaft E' will be similarly turned by means of the arm *f'* and *e<sup>5</sup>* and link *f<sup>2</sup>*, and thus the shaft E will be turned in an opposite direction by means of the arm *e<sup>2</sup>* and *e<sup>3</sup>* and link *e<sup>4</sup>*. It will also be seen that the eccentric supporting arms or prongs *e' e'*, turning upon the shafts as centers, will both describe a partial revolution in a downward direction and thus lower the roller or cylinder supported thereon.

G indicates tongs of the kind wherein the jaws open when the handles are brought together. Said tongs are pivotally supported upon a post *g*, mounted on the forward cross-bar *d* of the carriage.

G' is a toggle-lever having its arms pivoted to the handles of the tongs. A lever-arm *g'* is formed on one of the arms of said toggle-lever G', and an operating-rod G<sup>2</sup> is connected with said lever-arm and passes rearwardly, and is for convenience held at its end in a guide formed in the rear cross-bar *f<sup>3</sup>* of the carriage. It will be readily seen that when the operating-rod G<sup>2</sup> is pulled rearwardly it will bring together the arms of the toggle-lever G', and with them the handles of the tongs, thereby opening the jaws thereof. The said jaws are preferably provided with wide clamping-plates *g<sup>2</sup> g<sup>2</sup>*, suitably curved to conform to the shape of the cylinder or roller to be grasped. It is desirable to provide the said clamping-plates *g<sup>2</sup> g<sup>2</sup>* with a lining *g<sup>3</sup> g<sup>3</sup>* of asbestos, or cushions of other incombustible material, at the points where they come in contact with the glass. In constructing said tongs the jaws and handles are so arranged and curved and the length of the arms of the toggle-lever G' is so adjusted that when the clamping-plates *g<sup>2</sup> g<sup>2</sup>* grasp a cylinder or roller, the said handles will be in such position that the arms of the toggle-lever will be at an angle to each other, after which by still further pushing said operating-rod the flexibility of the handles will permit the arms of said toggle-lever to further expand and spring them outward until they reach the limit of their outward movement, when the lever-arm *g'* will strike against the end of one of the handles and prevent a further forward movement of said toggle-lever and thereby lock the tongs. It will be noted that when the handles are sprung outward the clamping-plates will firmly grasp the said cylinder or roller and hold the same rigorously in position.

The parts of the apparatus embodying my invention being constructed and arranged as described, the operation is as follows: When a cylinder or roller of glass that has been cracked or split longitudinally is to be placed in the flattening-oven, the carriage D is drawn out upon the guideways until the arms or prongs *e' e'* are outside of the chamber B, and the said roller is then placed upon the said prongs. By means of the operating-rod G<sup>2</sup> the clamping-plates are clamped and locked upon the said roller or cylinder, engaging the inner and outer surfaces of the same at either side of the longitudinal crack or split therein, thereby holding the edges from becoming overlapped in the moving of the roller. The operator then pushes the carriage, with the roller supported thereby, into the heating-chamber, where it is allowed to remain long enough to give the roller the desired temperature preparatory to its being inserted into the oven. The carriage is then pushed forward to carry the roller into the flattening-

oven and until the said roller is brought over the saddles *aa*. The handle *f* is then turned to the right, by which the eccentric arms or prongs *e' e'* are depressed, thus lowering the roller upon the saddles, where it will rest. The operating-rod is actuated to separate the clamping-plates and the carriage withdrawn, after which the handle *f* is turned to the left to bring the eccentrically-arranged arms or prongs into position to receive another roller. A suitable tool is inserted through the opening *a'* in the furnace and the roller removed from the saddle to the flattening-stone, where it is flattened out in the usual manner.

It will be manifest that any one of a great variety of clamping devices may be employed for holding the cracked or split edges of the cylinder from becoming overlapped, instead of the particular one shown, and I do not therefore intend to limit myself to the exact construction herein shown in the clamping device, except in the appended claims covering such specific construction.

In Figs. 8 and 9 I have illustrated a modified form of apparatus embodying some of the principal features of my invention. In this form of apparatus the supporting arms or prongs are capable only of a combined longitudinal and vertical movement with respect to the carriage. The carriage *D* in this instance consists of cross-bars *d d* and rods *d' d'*, which extend rearwardly beyond the rear cross-bar and are connected at their rear ends to form a handle by which to move the carriage. The supporting arms or prongs *h h* are formed by the end portion of long straight rods *H H*, connected by two cross-bars *H' H'*. Said cross-bars are connected with the carriage by means of links *h' h' h' h'*, pivoted to the said cross-bars *H' H'* and to lugs *d<sup>3</sup> d<sup>3</sup>* upon the cross-bars *d d* of the carriage. Said links are arranged to swing in vertical planes parallel with the rods *H H*, so that when the said rods are moved longitudinally they will also be given a vertical movement by the action of the links. The rearward movement of the said rods is limited by the contact of the rear links *h' h'* with the rear cross-bar *d*, when said links are slightly inclined backward from the vertical, so that when the rods are drawn backward they will be elevated in this position. The forward movement of the rods is limited by contact with the forward links *h' h'* with the forward cross-bar, which latter is shown as notched to afford a sufficient extent of angular movement in said links. The rods *H H* are shown as connected at their rear ends by a cross-bar, which forms a handle by which they can be conveniently moved backward and forward with reference to the carriage. The tongs *G* are located, as before described, upon a post on the forward cross-bars of the carriage, and have an operating-handle which extends rearwardly and is held and guided by a post *h<sup>3</sup>* on the rear cross-piece *d* of the carriage, and a post *h<sup>3</sup>*

on the cross-bar connecting the rear ends of the rods *H H*. The operation of moving the carriage into and out of the oven is the same as heretofore described. When it is desired to deposit a roller within the oven, the rods *H H* are first pulled back to elevate the same, and the roller is then placed upon the arms *h h*. The carriage is then thrust forward and the operator then pushes the said rods *H H* forward, when the links describe a partial revolution and carry the supporting-arms *h h* forward and downward. In their downward movement they pass on either side of the saddles *aa* and below the upper edges of the same, thus allowing the rollers or cylinders to rest upon the saddles. The carriage can then be withdrawn and the operation repeated.

It will be understood from the above that as far as the main features of my invention are concerned I do not wish to be limited to the particular devices shown for giving vertical movement to the arms or prongs which sustain the glass rollers or cylinders, but that any one of a great variety of devices which will readily suggest themselves to a mechanic may be used to movably sustain said prongs on the carriage and to actuate the same from a point outside of the oven. Certain of the features illustrated, however, in themselves are novel, and are therefore herein claimed as part of my invention.

I claim as my invention—

1. An apparatus for handling and depositing glass cylinders or rollers, comprising a movable carriage provided with devices for supporting the cylinders or rollers, said devices embracing a plurality of arms or prongs upon which said cylinders or rollers rest, said arms or prongs being horizontally arranged and secured to the carriage by vertically-movable parts, substantially as described.

2. An apparatus for handling glass rollers or cylinders, comprising a carriage provided with a support for the rollers or cylinders and two opposing jaws for engaging the separated edges of said cylinders or rollers, substantially as described.

3. The combination, with a carriage provided with a support for a glass roller, of a clamping device for engaging the separated edges of said rollers, said clamping device being connected with the carriage by a universal joint, substantially as described.

4. The combination, with a flattening-oven, of a heating-chamber located outside said flattening-oven and a carriage provided with a support for glass rollers or cylinders, said support being movable toward and from said flattening-oven through said heating-chamber, substantially as described.

5. The combination, with a flattening-oven and saddles located therein for supporting a glass cylinder, of a carriage movable toward and from said oven and provided with vertically-movable arms or prongs for supporting a glass cylinder, said arms or rods being lo-

ated in position to deposit the cylinder on the saddles when said arms or rods are lowered, substantially as described.

6. The combination, with a flattening-oven, of  
5 a carriage movable toward and from said oven and provided with forwardly-projecting and vertically-movable arms or prongs and a rearwardly-extending operating-handle connected with said arms or prongs, substantially as described.  
10

7. The combination, with a flattening-oven, of a carriage movable toward and from said oven and provided with a support for glass cylinders or rollers, a clamping device located on  
15 said carriage, and a rearwardly-extending handle connected with said clamping device for actuating the same, substantially as described.

8. The combination, with a flattening-oven, of a carriage movable toward and from said oven  
20 and provided with forwardly-projecting arms or prongs for supporting a glass cylinder, a clamping device located on said carriage, and rearwardly-extending handles connected with and actuating said arms or prongs and clamping device, substantially as described.  
25

9. The combination, with a flattening-oven having elevated supports or saddles, of a carriage movable toward and from said oven and provided with forwardly-projecting vertically-movable supporting arms or prongs, an  
30 operating-handle, clamping-plates located upon said carriage for grasping the separated edges of said cylinders, pivoted arms supporting said clamping-plates, a toggle-lever having its arms connected with the supporting-arms of the clamping-plates, and an operating-rod connected with said toggle-lever, substantially as described.  
35

10. An apparatus for handling and depositing glass cylinders or rollers in a flattening-oven, comprising a carriage movable toward  
40 and from said oven, longitudinal shafts E E', supported in bearings in said carriage, overhanging parallel eccentrically-arranged supporting arms or prongs e' e', and an operating-handle, substantially as described.  
45

11. An apparatus for handling and depositing glass cylinders or rollers in a flattening-oven, comprising a carriage movable toward

and from said oven, shafts E E', supported  
50 in bearings in said carriage, operative connections between the shafts, overhanging parallel eccentrically-arranged supporting arms or prongs e' e', and an operating-handle attached to said carriage and connected with  
55 one of said shafts, substantially as described.

12. An apparatus for handling and depositing glass cylinders or rollers in a flattening-oven, comprising a carriage movable toward and from said oven, shafts E E', supported  
60 in bearings in said carriage, overhanging parallel eccentrically-arranged supporting arms or prongs e' e', oppositely-extending arms e<sup>2</sup> and e<sup>3</sup>, connected with each other at their free ends, a rotating operating-handle, an  
65 arm thereon, and an arm upon one of said shafts connected with the arm of said handle, substantially as described.

13. The combination, with a flattening-oven having supporting-saddles, of an outside  
70 heating-chamber located around the door of said oven, guideways extending from said oven through and beyond said chamber, and a carriage provided with vertically-movable and forwardly-projecting arms or prongs and  
75 a clamping device, said supporting arms or prongs and clamping device being provided with rearwardly-extending operating-handles, substantially as described.

14. An apparatus for depositing longitudinally cracked or split glass cylinders or rollers in a flattening-oven, comprising a support for the glass-cylinders movable toward and from said oven, clamping-plates located upon  
80 said movable support, arms upon said clamping-plates, a toggle-lever having its arms pivoted to the arms of the clamping-plates and provided with a lever-arm, and an operating-rod connected with said lever-arm of the toggle-lever, substantially as described.  
85

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.  
90

THEODOR ARREN ZELLERS.

Witnesses:

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