

Jan. 21, 1941.

F. SHURLEY

2,229,348

LOADING DEVICE

Filed May 25, 1939

2 Sheets-Sheet 1

FIG. 1.

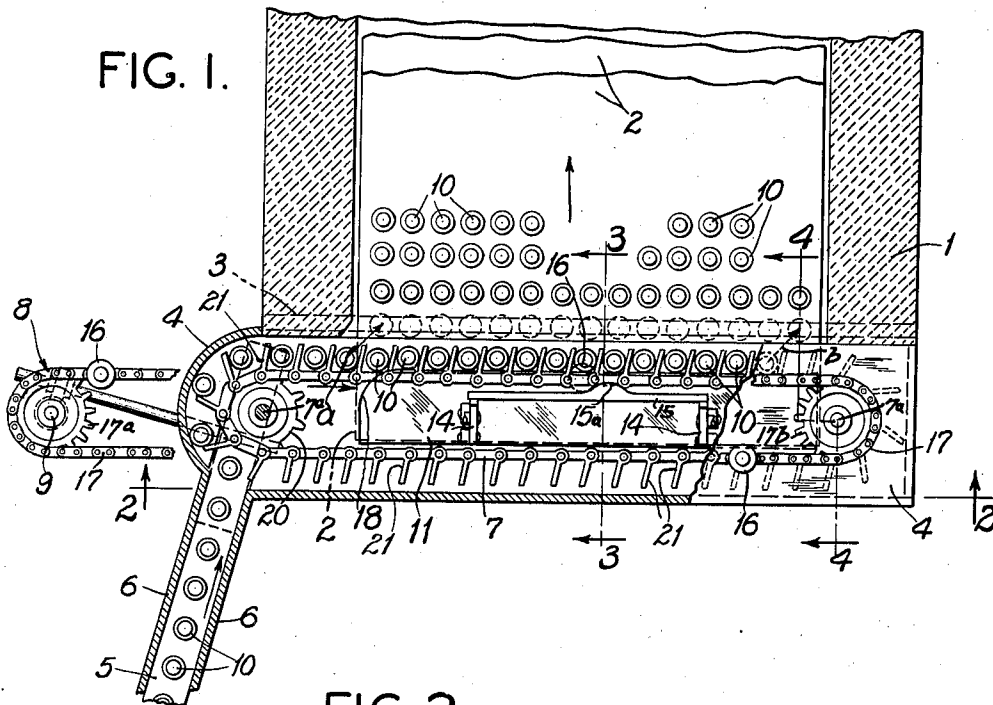
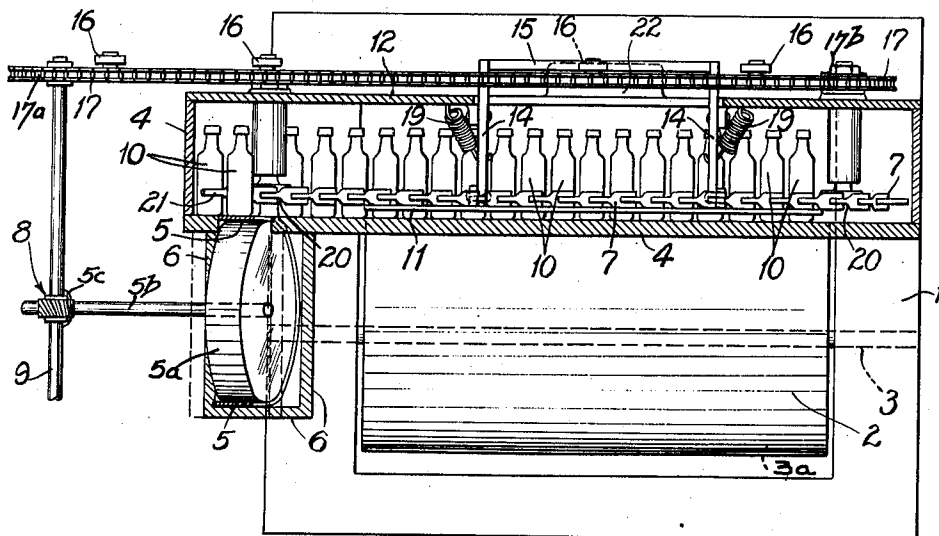


FIG. 2.



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FIG. 3.

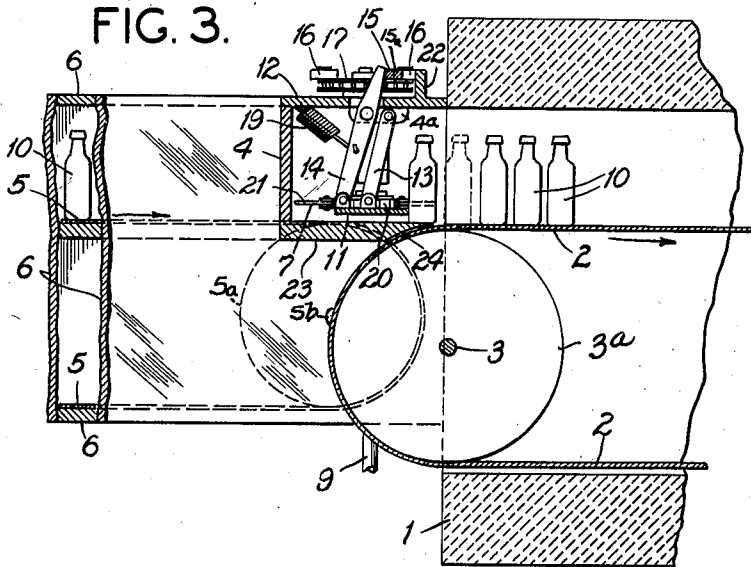


FIG. 4.

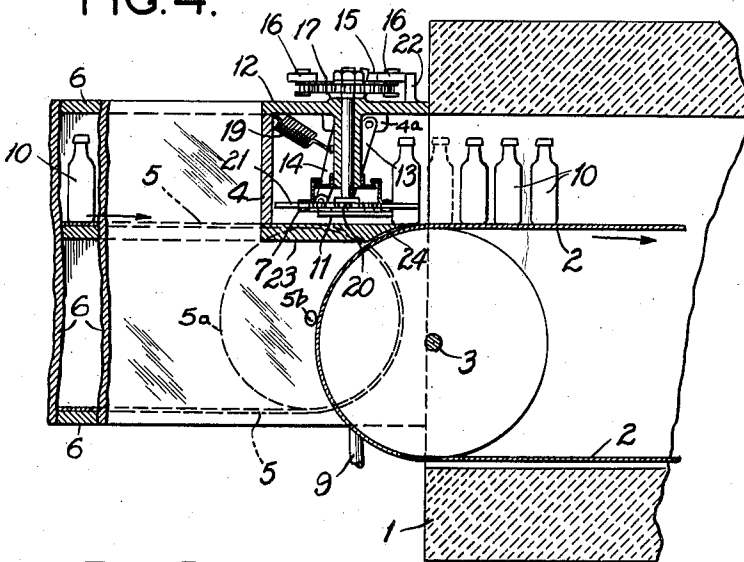
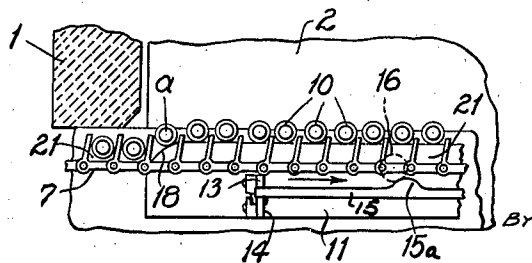


FIG. 5.



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UNITED STATES PATENT OFFICE

2,229,348

LOADING DEVICE

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Application May 25, 1939, Serial No. 275,711

4 Claims. (Cl. 198—31)

This invention relates to improvements in loading devices, and relates particularly to loading devices for conveyors in furnaces.

It is an object of the invention to provide a loading device including a transverse carrier for delivering articles, such as glassware, bottles and the like to be annealed, fired or fused, onto a conveyor upon which the said articles are transported through the furnace.

Another object of the invention is to provide such a loading device wherein means are provided for, to a large extent, preventing the escape of heat from the end of the furnace at which the loading occurs.

A further object of the invention is to provide a loading device including a transverse carrier, automatic means for discharging the articles from the carrier onto a furnace conveyor moving at right angles thereto, and means for delivering the articles to the transverse carrier.

Yet another object of the invention is to provide a loading device including an automatic means for delivering the articles from the transverse carrier relatively slowly onto the furnace conveyor each time a row of the said articles extends the desired distance across the width of the furnace conveyor.

Having thus briefly stated some of the objects and advantages of the invention I will now describe a preferred embodiment of my invention with the aid of the accompanying drawings, in which:

Figure 1 is a plan view showing one end of a furnace having a conveyor extending there-through and my loading device with a portion of the top of the housing broken away and a part of the drive chain omitted.

Figures 2, 3 and 4 are sections on the lines 2—2, 3—3 and 4—4 respectively of Figure 1.

Figure 5 is a detail.

Referring to the drawings, 1 indicates a portion of a furnace which may be fired in any preferred manner—not shown. Through the furnace 1 articles to be heated, such as the bottles 10, are transported upon a conventional conveyor belt 2 one extremity of which is shown passing around a pulley 3a mounted upon a suitably supported shaft 3. The pulley 3a is so arranged as to substantially close the lower portion of the furnace at one extremity thereof.

4 denotes a housing which extends across the upper portion of the furnace opening and closes one extremity thereof. This housing is suitably mounted upon the end of the furnace and its

lower margin terminates adjacent the upper face of the conveyor belt 2. Extending outwardly from the housing 4 towards one extremity thereof is a tubular casing 6 through which a feed conveyor belt 5 passes and travels at one extremity around a drive pulley 5a mounted upon a horizontal shaft 5b extending beneath the housing 4. A portion of the latter is cut away to provide clearance for the top of the pulley 5a and to permit passage of the belt 5 around the latter. Fixed on the shaft 5b is a gear 5c which meshes with a gear 8 upon a drive shaft 9, driven by any preferred means not shown. Mounted upon the upper extremity of the shaft 9 is a sprocket 17a.

Mounted for rotation in the upper side of the housing 4 and extending downwardly therein are spindles 7a one adjacent each end of the housing. Secured upon the spindle 7a remote from the drive shaft 9, and outwardly of the housing 4, is a sprocket 17b. Extending around the sprockets 17a and 17b is a drive chain 17. Fixed on the spindles 7a towards their lower extremities and within the said housing are sprocket wheels 20 around which an endless drag chain 7 is arranged. 21 denotes fingers extending laterally outward from the chain 7 and uniformly spaced from one another. The conveyor belt 5 and the belt pulley 5a are so positioned that the articles 10 carried on the former are delivered against the drag chain 7 between adjacent fingers 21, and the adjacent extremity of the housing 4 is so formed that the articles remain between the fingers as the drag chain 7 passes around the adjacent sprocket 20 and then travels in the opposite direction across the adjacent extremity of the conveyor belt 2.

Provided in the top of the housing 4 are downwardly disposed lugs 4a upon each of which two links 13 and 14 are pivoted, and pivotally supported by the lower extremities of the links 14 and 13 is a pusher plate 11. The upper extremities of the links 14 extend through the top of the housing 4 and above the latter are connected to a cam plate 15 having a cam 15a formed thereon. Mounted on the drive chain 17 and spaced from one another are a plurality of rollers 16 each of which in turn contacts the cam 15a and moves the tops of the arms 14 outwardly thereby moving the pusher plate 11 inwardly towards the furnace. The pusher plate 11 is spaced somewhat above the base of the housing 4 along the bottom of which the articles 10 slide as they are moved by the fingers 21. Forward movement of the pusher plate 11 pushes the articles 10 from

between the fingers 21 onto the conveyor belt 2. In order that the pusher plate shall be returned to its normal position shown as soon as each roller 16 disengages the cam 15a suitable springs 19 are provided each of which is attached at one extremity to one link 14 and at its other extremity to the outer wall of the housing 4. Owing to the fact that movement of the pusher plate 11 cannot be too rapid since the device is primarily intended for loading glassware, I prefer to provide a radius at one extremity 18 of the plate so that the article 10 nearest to the plate when it is advanced will contact the curved extremity and be gradually forced outwardly thereby along the line indicated at *a* and thus be moved from between two of the fingers 21 onto the belt 2 as the remaining articles in front of the pusher plate are plowed onto the said belt. Arrow *b* indicates the path of movement of one of the articles 10 due to the travel of the drag chain during the forward movement of the pusher plate 11.

Briefly the operation is as follows: The articles 10 are fed on the conveyor belt 5 by which they are delivered into the housing 4 between adjacent fingers 21. In this connection it will be noted that the speed of the belt 5 and drag chain 7 are synchronized as they are both driven from the common drive shaft 9. The drag chain 7 delivers the articles 10 into position to be discharged by the pusher plate 11, and the spacing of the rollers 16 is such that the plate 11 is advanced each time a row of articles is in position to be plowed off onto the furnace conveyor 2. It will also be seen that the housing effectually prevents the escape of heat from the upper portion of the furnace opening, and the conveyor pulley 3a equally effectually closes the lower portion. Again the casing 6 through which the feed conveyor 5 travels has a relatively small opening and is angularly disposed at one side of the furnace 1 so that relatively only a very small amount of heat escapes therethrough.

Having thus described my invention, what I claim is:

1. A loading device comprising a housing having an apertured side, spaced vertical spindles mounted in the housing one of which projects therethrough, a sprocket on each spindle, a drag chain extending around the sprockets in engagement therewith, spaced fingers projecting from the chain, a wheel fixed on the extremity of the spindle which extends through the housing, driving means passing around the wheel for rotating the latter, links pivoted on the housing which project therethrough, a pusher plate mounted on the links for movement towards the apertured side of the housing, a cam plate connecting the extremities of the projecting links having a cam thereon, means carried by the driving means for contacting the cam and moving the pusher plate to plow a row of articles carried between the fingers out of engagement with the latter through

the apertured side of the housing, and means tending to return the pusher plate and links to their normal positions.

2. A loading device comprising the combination set forth in claim 1, wherein the driving means consists of a chain, and the means thereon for contacting the cam consists of at least one roller carried by the chain.

3. A loading device for furnace conveyors comprising a furnace having an opening therethrough, a conveyor extending longitudinally therethrough, said conveyor substantially closing the lower portion of said opening at one end of the furnace, a housing extending across said end of the furnace and substantially closing the upper portion of said opening, said housing being open on its inner side, sprockets mounted about vertical axes adjacent opposite ends of the housing and within the latter, a drag chain around the sprockets and in engagement therewith, 20 spaced fingers extending from said chain, a casing projecting outwardly from the housing, a feed conveyor mounted for movement therethrough, said feed conveyor being so positioned that articles are adapted to be delivered thereby between said fingers for movement in the housing, a pusher plate mounted in the housing for movement substantially parallel to the direction of movement of the furnace conveyor and towards the housing opening, driving means for the drag chain, driving means for the feed conveyor, a common drive shaft operating both driving means, and means operated by the drag chain driving means for moving the pusher plate at predetermined intervals to plow a row of articles from between the fingers on to the furnace conveyor.

4. A loading device comprising a conveyor adapted to be loaded, a housing extending transversely of said conveyor adjacent one extremity thereof, said housing being apertured on its side adjacent said conveyor, two vertical spindles mounted adjacent opposite extremities of the housing, a vertical drive shaft in horizontal alignment with said spindles and outwardly beyond one spindle, a sprocket on the drive shaft, one sprocket on the spindle adjacent thereto, two sprockets on the spindle remote from the drive shaft, a drag chain extending around one sprocket on each spindle, a drive chain around the sprocket on the drive shaft and the other sprocket on the spindle remote from the drive shaft, laterally projecting fingers extending from the drag chain to engage articles to be moved across said housing, a pusher plate pivoted on said housing for movement at right angles to the plane of said spindles, said plate being adapted to plow the articles from between the fingers onto the first named conveyor, and elements carried by the drive chain for intermittently actuating the pusher plate.

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