Aug. 4, 1931. A. O. ROBERTS 1,817,209

OVEN SYSTEM

Filed March 21, 1928 2 Sheets-Sheet 1

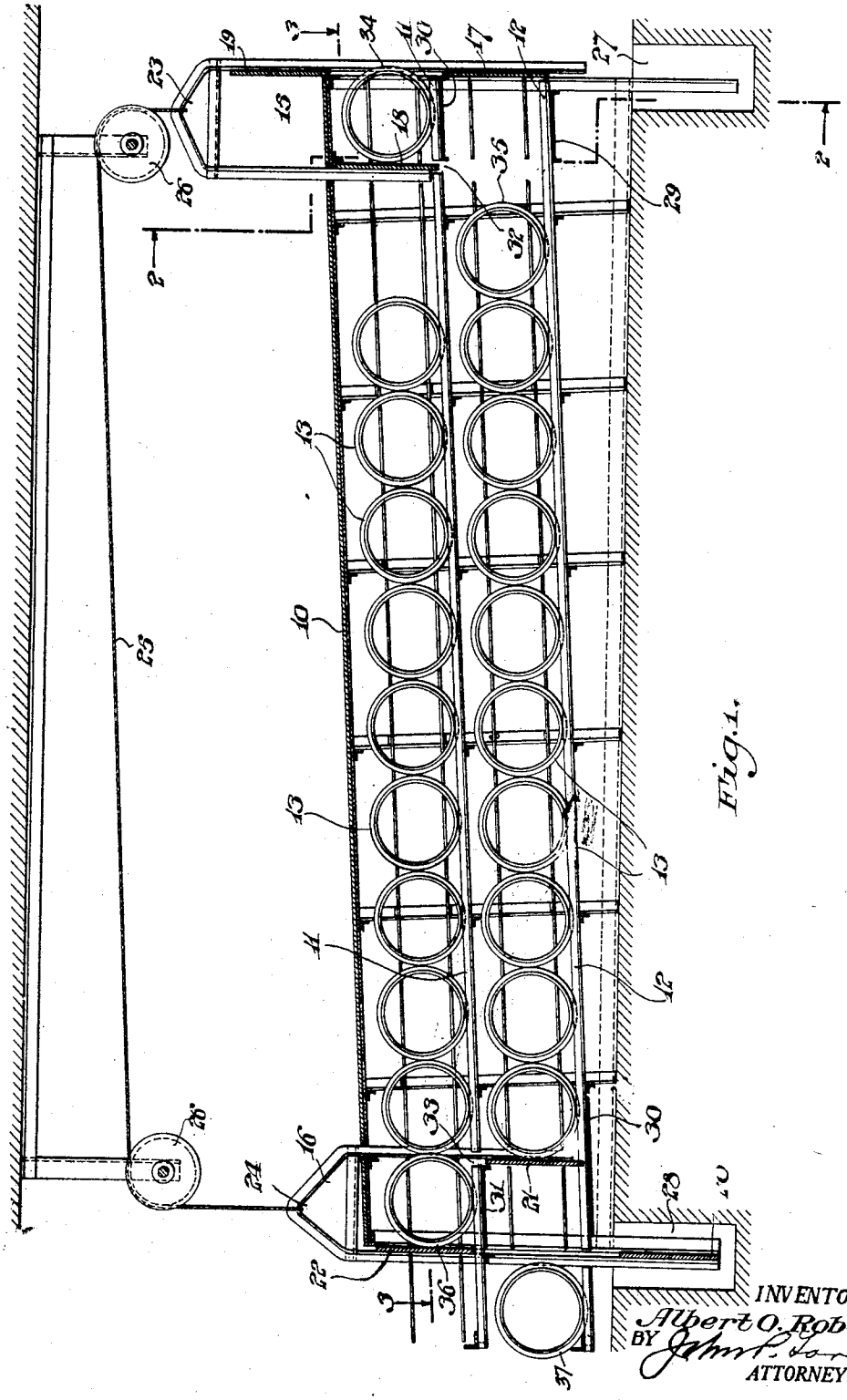


Fig. 1.

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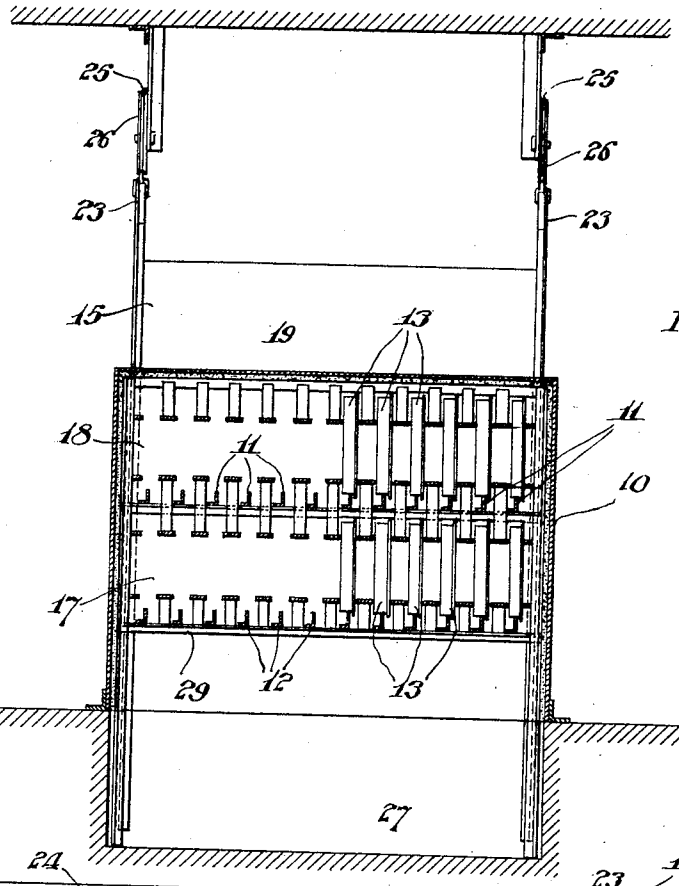


Fig. 2.

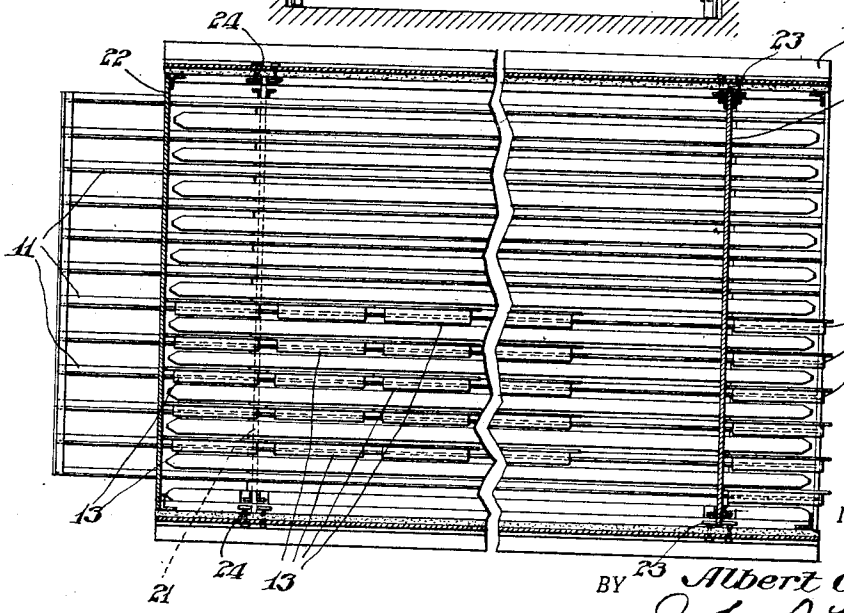


Fig. 3.

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Patented Aug. 4, 1931 1,817,209

UNITED STATES PATENT OFFICE

ALBERT O. ROBERTS, OF DEARBORN, MICHIGAN, ASSIGNOR TO BUDD WHEEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

OVEN SYSTEM

Application filed March 21, 1928. Serial No. 263,276.

The oven system of my invention is of a special adaptation to those ovens used for conveyors of the gravity type. Such conveyors are commonly inclined ways along which circular articles or the equivalent may roll from the high end to the lower. The particular oven in connection with which my invention is shown is an oven for treating wheel rims. The form of the oven, the form of the conveyor, and the form of the article treated may each or all be varied. So too, the treatment to which the article is subjected may be varied.

Thus while in my invention has been produced an oven in which wheels are dried, it may be used equally well with an oven or the like in which wheels are heat treated, washed, etc.

Irrespective of these considerations, my prime object is to derive an economy of the use of heat or other medium used to treat the wheels. Other objects are to economize the labor used in operating the oven, and the rendering of the treating as highly efficient as possible. A simplified and cheapened oven and conveying system result, and above all, a far greater rate of production.

These several important advantages and their wide field of utility I derive through the combination of one or more thru conveyor ways for articles to be treated, with lock type doors at each end of each way, which lock type doors both at the same end and the opposite ends of each thru-way are connected together for simultaneous operation in such fashion that for doors at the loading end of the oven, the door of one way is open for loading operation while the door of another is open to discharge into the oven; and further in such fashion that doors at the unloading end of the oven are alternately opened for unloading of the rims from the oven and for discharge from the doors; and such that doors at opposite ends the door at the loading end is open to load an article into the oven, while the door at the opposite end is open for discharging an article from the door; and finally, such that all of these various doors are commonly operated by one and the same actuation.

The drawings show that form of my invention best known to me at this time.

Fig. 1 is a longitudinally vertical section of the oven system.

Fig. 2 is a transverse section on line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a horizontal section on line 3—3 looking in the direction of the arrows.

The casing of the oven in general is designated 10. It is of elongated form and substantially rectangular cross section. In it are provided, extending from one end to the other and beyond the discharge end, an upper series of conveyors 11 and a lower series of conveyors 12 in the form of rails forming guides upon and along which the round wheel rims 13 may roll from the high or loading end at the right to the low or unloading end at the left.

The oven casing 10 has a top generally inclined at the same angle as the rails of the conveyors 11 and 12. The opposite ends of the oven are closed by lock type doors designated generally 15 and 16 at the opposite ends of the oven. These lock type doors are the vertically sliding type and are comprised of three gates designated at the loading end from bottom to top as 17, 18, 19 and at the discharge end as 20, 21 and 22. In elevation, the three gates are in series from bottom to top, each upper one beginning where the next lower leaves off. They are of equal height, the height of each gate corresponding to the distance between the conveyors 11 and 12, and also the distance between the upper conveyor 11 and the top of the oven 10. In plan, the gates are spaced apart, the middle one being removed inwardly of the oven a distance sufficient to accommodate a single loading charge of articles to be treated, in this instance, a single wheel rim. In width, the gates are the full width of the furnace simultaneously taking care therefore of the entire number of conveyors in each the upper and lower series 11 and 12. Each group of doors comprising gates 17, 18, 19 on the one end and gates 20, 21, 22 on the other end is connected together for simultaneous movement vertically a distance equal to the

heighth of a gate by the angle iron frameworks 23, 24, respectively. The groups 15, 16 at large are connected together for simultaneous operation by means of cables 25 passing over pulleys 26 overhead. The groups counter-balance each other and can, therefore, be moved with but small effort. Below the furnace recesses 27, 28 are provided at opposite ends to accommodate the lowermost gates in the lowermost position of the doors. Within the body of the furnace and between the outer and inner gates of the groups 15 and 16, the oven is provided with transverse floorings 29, 30 at the loading end and 30, 31 at the discharge end which horizontally divide the door in such manner as to constitute each gate and its associated space truly a door of the lock type, the entire space of which is either open to or cut off from the general space of the oven in accordance with the relative positions of the gates. The rails of the upper series of conveyors 11 are broken in the plane of the gates 18 and 21 at points 32 and 33 so that these inner gates may be moved vertically from the upper portion of the oven to the lower and vice versa.

The operation and advantages are clearly apparent. The relative arrangement of the groups 15 and 16 is such that gates 18 and 21 alternately are moved to such that the intermediate gates 18 and 21 always occupy vertically opposite positions, the one being up when the other is down. In the position shown in Fig. 1, the gate 18 is up. This operation has closed off the upper lock space of the loading end from the oven and opened it to receive the newly loaded wheel 34. The movement of this gate 18 to the upper position simultaneously opened the lower lock space to the oven, permitting the previously fed rim 35 to enter the oven. Gate 17 simultaneously closed this lower lock space to the outer air. Thus, only the upper lock space is open to the outer air. At the discharge end, the doors of group 16 have been operated oppositely. The inner gate 21 being lowered as permitted rim 36 to enter the upper lock space, leaving the oven space proper. Thus on the upper thru conveyor series 11 rims 34 are fed from the upper lock space, while rims 36 are discharged to the upper lock spaces at the opposite end. Simultaneously, gate 22 prevents complete discharge of wheel 36. Simultaneously also, the lower gate 20 entering the recess 28 permits complete discharge from the lower end of the wheel 37 occupying the lower lock space. As respects the opposite ends of this lower conveyor series 12, the upward movement of the inner gate 18 has previously permitted the rim 35 to enter the oven space proper, while the downward movement of the lower gate 20 at the opposite end has permitted the complete discharge from the oven of the endmost rim 37.

One man can operate the oven system of my invention, feeding the entire lot of conveyors of both series. He operates from the loading or right hand end, feeding the upper lock space, while the lower lock space is discharging and vice versa. Otherwise, a second operator may be utilized to remove these wheels. The oven is, of course, initially charged by manual prevention of unloading until after a certain number have been received in the oven.

Any and all embodiments of my invention falling within its generic spirit are to be comprehended in the annexed claims.

What I claim is:—

1. An oven comprising a pair of thruways for articles to be treated, and gates for each way at one end of the oven connected together, the one to close through the operation of the other and vice versa.

2. Feed control mechanism for an oven adapted to operate upon a succession of articles and including a pair of runways for articles to be treated, having separate receiving and discharging openings, said feed control mechanism comprising two interconnected gates individual to said runways at one end of said oven and means for simultaneously moving one of said gates to a position permitting access to the oven through the opening controlled thereby and the second gate into a position adapted to close access to the runway controlled by said second gate.

3. Feed control mechanism for an oven adapted to operate upon a succession of articles and including a pair of runways for articles to be treated, having separate receiving and discharging openings, said feed control mechanism comprising two interconnected gates individual to said runways at one end of said oven and means for simultaneously moving one of said gates to a position permitting access to the oven through the opening controlled thereby and the second gate into a position adapted to close access to the runway controlled by said second gate, and a third gate controlling access alternately to an interior portion of each of said runways and actuable by the control means for the first named gates.

4. Feed control mechanism for an oven adapted to operate upon a succession of articles and including a pair of runways for articles to be treated, having separate receiving and discharging openings, said feed control mechanism comprising two interconnected gates of the sliding type, individual to said runways at one end of said oven and means for simultaneously moving one of said gates to a position permitting access to the oven through the opening controlled thereby and the second gate into a position adapted to close access to the runway controlled by said second gate.

5. Feed control mechanism in accordance

with claim 2 in which a pair of gates as specified in that claim are located at each end of the runway, the gates at opposite ends of each individual runway being simultaneously and oppositely actuated by common actuating means.

In testimony whereof he hereunto affixes his signature.

ALBERT O. ROBERTS.