Nov. 22, 1927. 1,650,053

H. R. STRAIGHT

MECHANISM FOR HANDLING BUILDING BLOCKS AND THE LIKE

Filed Sept. 25, 1924 3 Sheets-Sheet 1

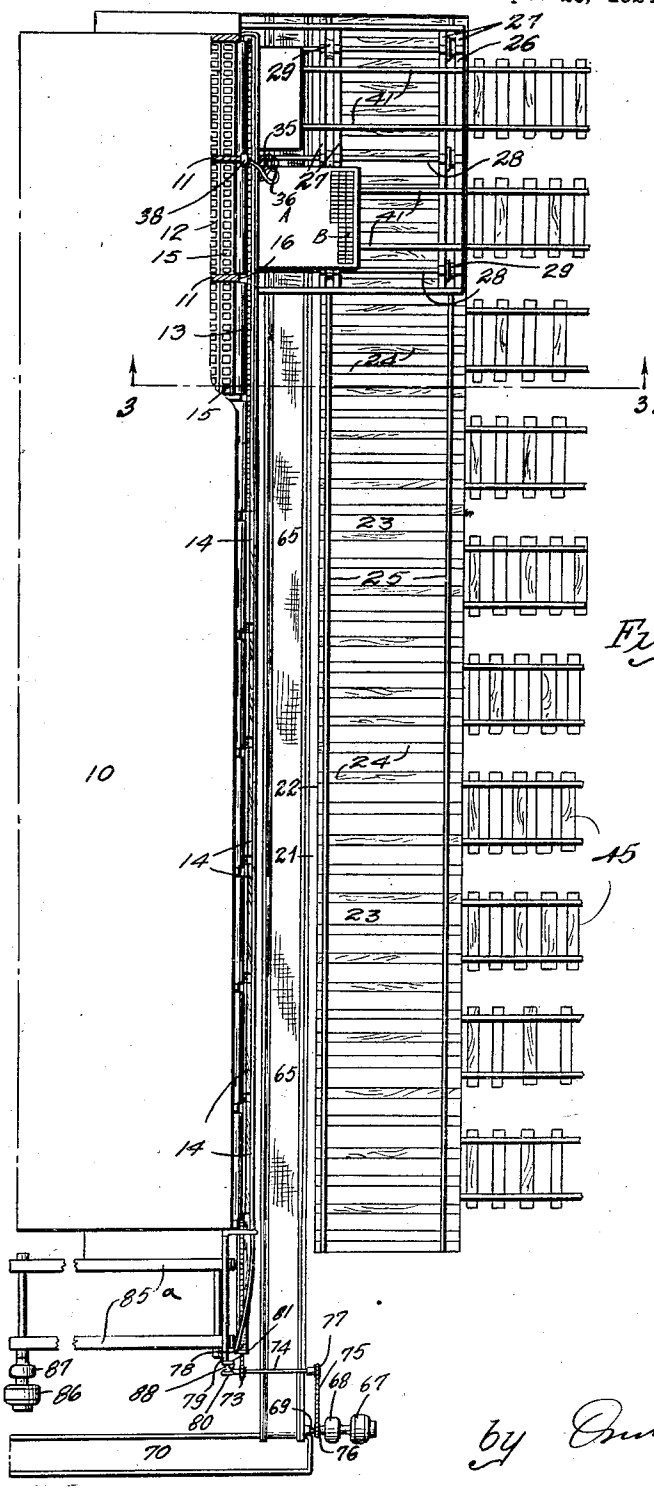


Fig. 1.

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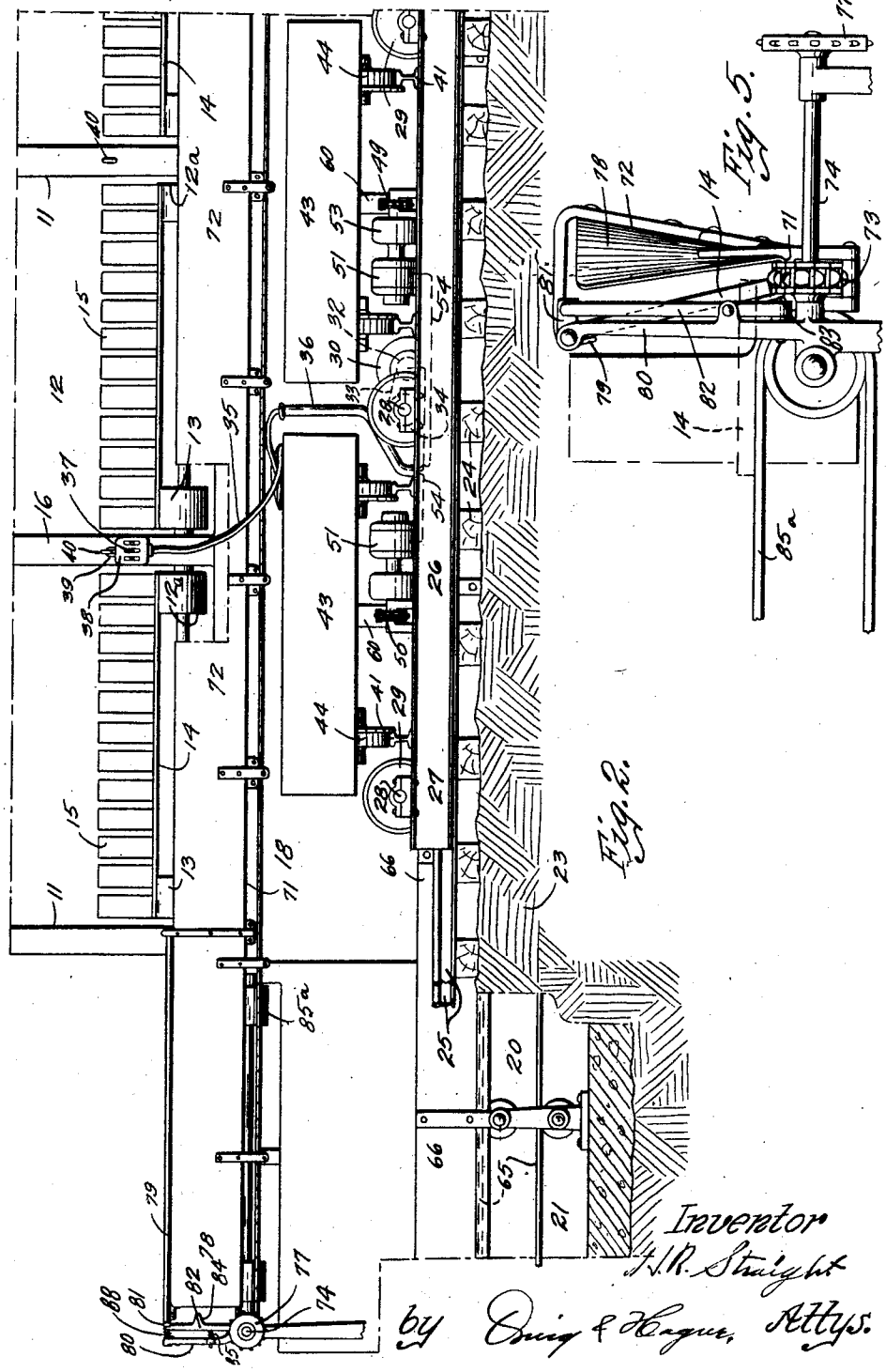


Fig. 2.

Fig. 5.

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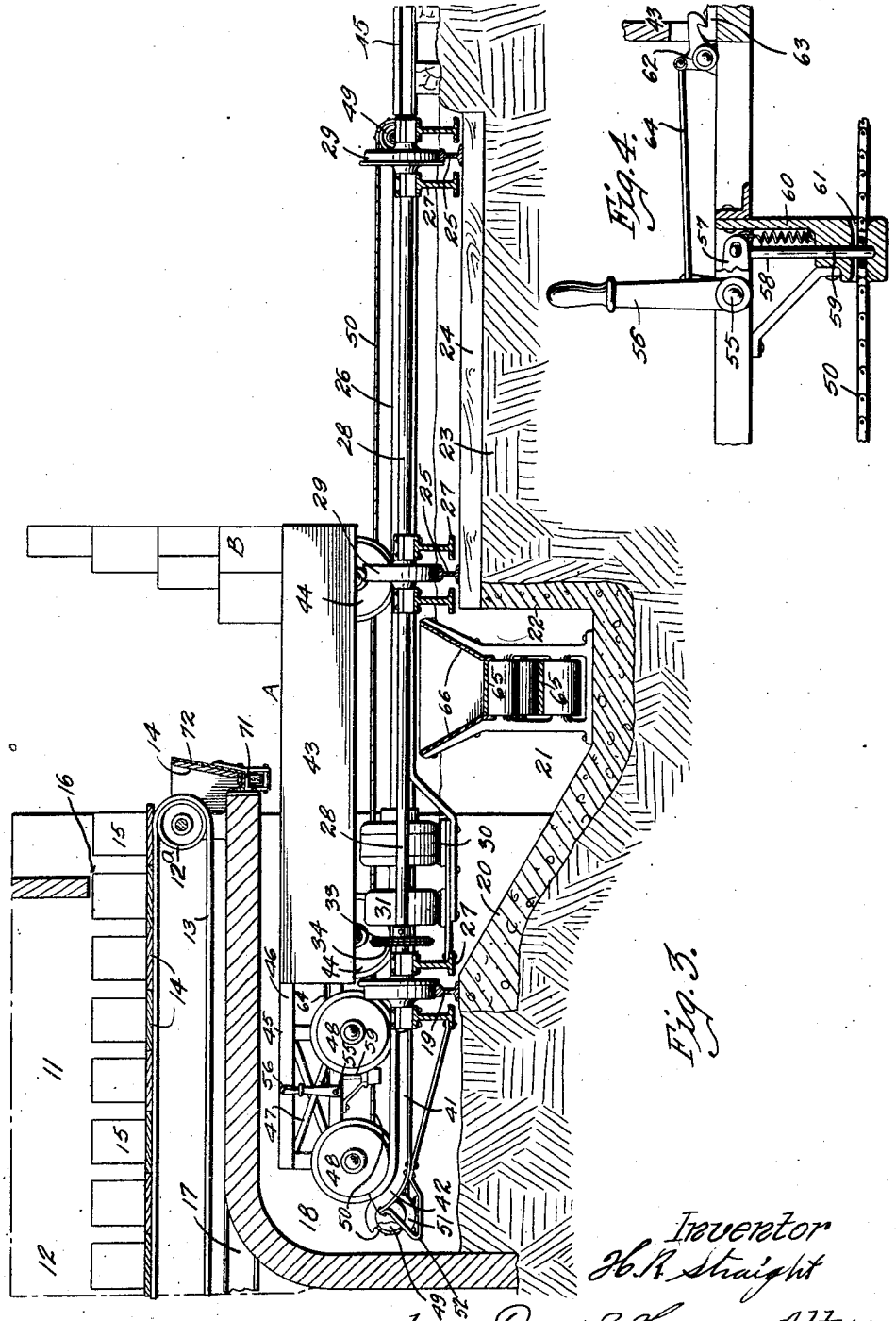


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR HANDLING BUILDING BLOCKS AND THE LIKE.

Application filed September 25, 1924. Serial No. 739,815.

This invention relates to improvements in mechanisms for handling building blocks or bricks, and particularly to the handling of the building blocks or bricks after they have gone through the drier, and is designed to be used in connection with that type of driers which use a series of pallets for bearing the ware as it passes through the drier, said pallets and ware being fed in one side of the drier and delivered automatically to the opposite side. The ware is delivered from the pallets to what is commonly known as a kiln car, the transfer being performed manually.

The object of my invention is to handle the kiln cars in such a manner relative to the drier that a minimum amount of energy need be exerted by the workmen in order to perform the transfer of the blocks from the pallets of the drier to the said kiln car.

A further object is to provide improved means for automatically moving the pallets as they are discharged from the drier.

A further object is to provide improved means for automatically removing the defective ware from the said pallets, thereby eliminating a considerable amount of manual labor.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a rear portion of a drier showing the manner in which my improved apparatus is operatively connected therewith.

Figure 2 is an elevation of the delivery end of the drier showing my improved device as in operative relation therewith.

Figure 3 is an enlarged detail sectional view taken on the line 3—3 of Figure 1.

Figure 4 is an enlarged detail view of the locking mechanism for locking the auxiliary car to the driving chain, a portion of the frame work being broken away.

Figure 5 is an enlarged detail elevation of a portion of the mechanism for handling the empty pallets.

I have used the reference numeral 10 to indicate the rear or delivery end of a drier, said drier being provided with a series of longitudinally extending and vertically arranged partitions 11, so that the drier chamber may be divided into a series of independent compartments 12. Each of the compartments 12 is provided with a horizontally arranged conveyer 13 mounted on suitable pulleys 12^a, said conveyors being driven through any suitable mechanism which forms no part of my present invention, the driving mechanism, however, being arranged to impart intermittent motion simultaneously to all of the said conveyors.

The conveyors 13 are designed to carry a series of pallets 14 which rest on the upper runs of said conveyors and extend transversely across the chamber 12, with their edges adjacent, as clearly shown in Figure 3. Each of the pallets 14 is provided with a series of building blocks or bricks 15 arranged in the usual manner, the blocks being delivered through an opening 16 in the rear end of the drier. The pulleys 12^a of the delivery ends of the conveyors 13 are supported by means of overhanging beams 17, so that a space 18 is provided beneath the delivery end of the conveyors throughout the entire width of the drier.

Extending transversely and centrally on the bottom of the space 18 is a track member 19, which rests on a concrete base 20, said base being inclined downwardly and outwardly to form a ditch 21. The outer end of said ditch is provided with a vertical wall 22, the upper edge of which is even with a horizontal road bed 23 which is provided with a series of rail ties 24. Each end of said ties is designed to carry a track member 25, which are parallel with each other and with the track member 19, and of a length somewhat greater than the width of the drier. The track members 19 and 25 are designed to carry what I shall term a transfer 26. Said transfer comprises a series of beams 27 supported by means of axles 28 carried by supporting wheels 29, which are designed to travel on the track members 19 and 25. One end of the transfer is provided with a motor 30 hitched to a speed reducing gear mechanism 31, provided with a sprocket wheel 32 designed to carry a chain 33 to operate a sprocket wheel 34, said sprocket wheel being mounted on one of the axles 28. This provides means whereby the transfer may be moved transversely with the delivery end of the drier.

The said motor 30 is provided with a control cord 35 which extends upwardly through a casing 36. The cord 35 is extended to one of the switch devices 37 of

the switch box 38. Said switch box 38 is provided with an eyelet 39 designed to rest on any one of a number of hooks 40. The end of each of the partitions 11 is provided with one of said hooks by means of which the switch box may be placed at convenient points where it may be grasped by the operator.

The transfer 26 is provided with two sets of track members 41 which are mounted transversely with the movement of said transfer, or longitudinally with the movement of the conveyors 13, the inner end of said tracks extending inwardly and beyond the inner side of the transfer, as clearly shown in Figure 3, the said inner ends being provided with curved portions 42 to form a stop for the cars mounted thereon. Each pair of tracks 41 is designed to carry a kiln car 43, said cars being provided with supporting wheels 44. Adjacent to the outer side of the transfer and mounted on the ground surface is a series of tracks 45 arranged in pairs, and designed to aline with the tracks 41 when the said tracks are in certain positions of their movement. This provides means whereby the kiln cars 43 may be moved to and from the transfer.

Mounted on the tracks 41 inside of the cars 43 is what I shall term an auxiliary platform 46, which is mounted on a frame work 47 carried by suitable wheels 48. The top of the platform 46 is level with the top of the kiln car 43. Between the ends of each set of tracks 41 I have provided a sprocket wheel 49 which are designed to carry a sprocket chain 50, the upper run of which extends slightly below the axles of the wheels 48 and centrally below the platform 46. A motor 51 is provided for operating each of said chains, said motors being carried on brackets 52 which extend beyond the inner edge of the transfer, as clearly shown in Figure 3.

Each of the motors 51 is provided with a speed reducer 53, said reducers being designed to operate the adjacent sprockets 49. The motors are provided with suitable conductors 54 which extend upwardly through the casing 36 of the switch box 37. Mounted on the frame of the platform 46 is a transversely arranged shaft 55 having on its outer end a lever 56, and on its inner end an arm 57, the free end of said arm being pivotally connected to a vertically arranged slide bolt 58. The lower end of said bolt 58 is designed to extend through a lug 59 from a downwardly extending frame member 60. The lug 59 is provided with a horizontally arranged opening 61 through which the upper run of the chain 50 extends, the parts being so arranged that the bolt 58 will slide downwardly through one of the links of the chain 50, and thereby provide means whereby, when the chain 50 is operated, the platform 46 will be moved on the tracks 41. The platform 46 and the kiln car 43 are locked together by means of a catch device 62 which is pivotally mounted to the outer end of the platform 46 and designed to coact with a lug 63 mounted on the kiln car 43. The latch 62 is operated through a horizontally arranged rod 64 which extends through the lever 56, as clearly shown in Figure 4. This provides means whereby the kiln car may be moved with one end beneath the beam 17 and with the other end projecting slightly beyond the end of said beam in the position shown in Figure 3.

Thus it will be seen that an operator may stand on the kiln car 43 at the point "A" and may start setting blocks on the outer end of the kiln car as indicated at "B". As the blocks are moved from the conveyor 13, they may be stacked in position as shown at "B" without the operator moving his position. The transfer will also be operated so that the operator may take off one row of blocks throughout the entire width of the kiln. The car 43 is moved outwardly as fast as it is filled. The operator stands on the platform 46, thereby providing means whereby the car 43 may be completely filled with a minimum amount of exertion on the part of the operator. After one row of blocks has been removed from the conveyor 13, the said conveyor is moved outwardly, which will cause any rejected blocks 15 to be thrown from the pallets 14 by gravity, and to be received in a transversely arranged conveyor 65 mounted in the ditch 21. Said conveyor 65 is provided with flanged side members 66 to form a sort of hopper. The conveyor 65 is driven by means of a motor 67 through a speed reducer 68 and the shaft 69, the rejected ware being delivered to a longitudinally extending conveyor 70 on which the said rejected ware is delivered to the mill for regrinding. As the conveyor 13 is advanced outwardly, the pallet 14, from which the blocks have just been removed, will be moved to a substantially vertical position and be delivered to a conveyor 71.

The outer edge of the conveyor 71 is provided with an upwardly and outwardly extending side member 72, the pallet 14 resting with its lower edge on top of the conveyor 71 and with its top face adjacent to the inner face of said member 72. The conveyor 71 is driven from a sprocket 73 mounted on and driven from a shaft 74, said shaft being driven by means of a sprocket chain 75 which is operated from the shaft 69 by means of a sprocket 76. The shaft 74 is driven through the sprocket 77, which provides means whereby the pallets 14 will be moved transversely across the kiln and have their forward ends engage a twisted side member 78, and so arranged that the upper edge of the pallet 14 will be thrown inward-

ly against a bar 79, the ends of the upper edge of which are pivotally mounted in upright supports 80. One end of the bar 79 is provided with an outwardly projecting lug 81 designed to be engaged by a notched lever 82, said lever serving to hold the outer end of the member 81 against downward movement. The lever 82 has its lower end pivoted at 83. The central portion of the lever 82 is provided with an inwardly extending lug 84 which lies in the path of the pallet 14.

When the pallet 14 has been moved outwardly until its outer end engages the lug 84, the upper end of the lever 80 will be moved outwardly against the action of a spring 85 until the latch 81 disengages the lug 80. The lower edge of the bar 79 will then be free to swing inwardly, which will allow the upper edge of the pallet 14 to fall inwardly and upon the conveyor 50, which is driven by means of a motor 86 and a speed reducing mechanism 87. The conveyor 85^a is designed to deliver the pallets to the mill so they may be refilled.

A spring 88 is provided on one of the pivot members of the bar 79 so as to return the said bar 79 to its normal position when the pallets 14 have been released therefrom, the weight of the pallets being sufficient to move the bar 79 to any open position. Thus it will be seen that I have provided means whereby the pallets may be automatically collected and delivered to a predetermined starting point.

Thus it will be seen that I have provided an improved mechanism which is especially adapted to operate in connection with a drier having means for automatically conveying the ware through the drier, and so arranged and constructed that the building blocks may be easily and quickly removed from the conveyors and stacked on suitable kiln cars, said cars being capable of both transverse and longitudinal movement, which enables the operator to stack the ware on the car without making any unnecessary steps. The pallets will be automatically delivered to the conveyor 71 by means of which they will be automatically delivered to a second conveyor, said second conveyor being adapted to move to the mill where it may be refilled. The cracked and rejected ware is left on the pallets 14, and thereby obviate the necessity of handling the same. As soon as the pallets 14 have been moved outwardly so they lay in a partially inclined plane, the blocks will fall over the upper edge of the side member 72 of the conveyor 70 onto the conveyor 65. Occasionally a block will fall on the top of the kiln car 43. This is a simple matter to slide it transversely over the top of the said car by means of the operator's foot, where it will drop onto the conveyor 65. The kiln car 43 would receive only a small proportion of these broken blocks, due to the fact that all of the conveyors 13 are operated simultaneously. The length of the kiln car being a good deal less than the length of the kiln. Most of the blocks would fall directly into the conveyor 65.

By providing two of the cars 43, I have provided means whereby the operator may be transferred from one kiln car to the other, after the first car has been filled, so that the filled car may be removed while the second one is being filled. A third car may be moved into position while the filling of the second one takes place, thereby providing an arrangement whereby the operator may work almost continuously and without a longer interruption than the time necessary to pull the loaded car off and an empty one on to the transfer.

I claim as my invention:

1. In combination, a drier, a horizontally arranged conveyor, a series of pallets for said conveyor, each of which is designed to carry a row of ware and deliver it to one end of said drier, a kiln car designed to receive the ware from said pallets, a conveyor located beneath the discharge end of said ware bearing conveyor and extending longitudinally with the row of ware and designed to receive the pallets as they are discharged from the first said conveyor, the last said conveyor being located above said kiln car, a third conveyor located beneath the last said conveyor and extending longitudinally therewith, the pallet conveyor and the last said conveyor being so located that as the first said conveyor is operated any ware remaining on the pallets of said conveyor will be discharged over the pallet conveyor and into the last said conveyor.

2. In combination, a drier, a ware bearing conveyor adapted to carry ware through said drier and to deliver it to one end, a kiln car for receiving the delivered ware, means for supporting said kiln car beneath the discharge end of said ware bearing conveyor, an auxiliary car having a platform level with the top of said kiln car, means for locking said auxiliary car and said kiln car together, means for imparting lateral movement to said auxiliary car, and means for imparting longitudinal movement to both of said cars.

3. In a drier, a ware bearing conveyor adapted to carry pallets from its receiving end to its delivery end, a pallet return conveyor opposite and parallel with the first said conveyor, a transverse conveyor for receiving the pallets from the first said conveyor and delivering them to the second said conveyor, the transverse conveyor including an upright inclined side member for supporting the pallets on said transverse conveyor in an upright inclined position, a piv-

oted trip bar for supporting the upper edge of said pallets when in a position opposite the second conveyor, and means for releasing said trip bar to permit the pallets to fall by gravity to a horizontal position on the second conveyor.

4. In combination, a drier, a horizontally arranged conveyor, a series of pallets for said conveyor, each of which is designed to carry a row of ware and to deliver it to one end of said drier, a kiln car designed to receive the ware from said pallets, means for imparting longitudinal and lateral movement to said kiln car beneath the discharge end of said rows of ware, a conveyor located beneath the discharge end of said ware bearing conveyor and extending longitudinally with the said row of ware designed to receive the pallet as it is discharged from the ware bearing conveyor, and means for imparting movement to the last said conveyor.

5. In combination, a drier, a horizontally arranged conveyor, a series of pallets for said conveyor, each of which is designed to carry a row of ware and to deliver it to one end of said drier, a kiln car designed to receive the ware from said pallets, means for imparting longitudinal and lateral movement to said kiln car beneath the discharge end of said rows of ware, a conveyor located beneath the discharge end of said ware bearing conveyor and extending longitudinally with the said row of ware designed to receive the pallet as it is discharged from the ware bearing conveyor, the last said conveyor being designed to receive the pallet on one edge and in an upright position, means for operating said conveyor to move the pallet longitudinally to a point beyond the said drier, and means at the delivery end of said pallet conveyor for tilting the pallet to a horizontal and right-side-up position.

6. In combination, a drier, a horizontally arranged conveyor, a series of pallets for said conveyor, each of which is designed to carry a row of ware and to deliver it to one end of said drier, a kiln car designed to receive the ware from said pallets, means for imparting longitudinal and lateral movement to said kiln car beneath the discharge end of said rows of ware, a second conveyor located beneath the discharge end of said ware bearing conveyor and above the said kiln car, said second conveyor being designed to receive the pallet on edge, means for operating said second conveyor, and means for receiving the pallet from the discharge end of said second conveyor.

7. In combination, a drier, a horizontally arranged conveyor, a series of pallets for said conveyor, each of which is designed to carry a row of ware and to deliver it to one end of said drier, a kiln car designed to receive the ware from said pallets, means for imparting longitudinal and lateral movement to said kiln car beneath the discharge end of said rows of ware, a second conveyor located beneath the discharge end of said ware bearing conveyor and extending longitudinally with the said row of ware designed to receive the pallet as it is discharged from the ware bearing conveyor, said second conveyor being located above said kiln car, a third conveyor located beneath the second conveyor and said kiln car and extending longitudinally therewith, the second conveyor and the third conveyor being so located that as the ware bearing conveyor is operated any ware remaining on the said pallet will be discharged over the second conveyor and into the third conveyor.

8. In combination, a drier, a horizontally arranged conveyor, a series of pallets for said conveyor, each of which is designed to carry a row of ware and to deliver it to one end of said drier, a kiln car designed to receive the ware from said pallets, means for imparting longitudinal and lateral movement to said kiln car, means for supporting and moving said kiln car beneath the discharge end of said ware bearing conveyor, a conveyor located beneath the discharge end of said ware bearing conveyor and extending longitudinally with the said row of ware designed to receive the pallet as it is discharged from the ware bearing conveyor, the last said conveyor being located above said kiln car, a conveyor located beneath the last said conveyor and said kiln car and extending longitudinally therewith, the pallet conveyor of the last said conveyor being so located that as the ware bearing conveyor is operated any ware remaining on the said pallet will be discharged over the pallet conveyor and into the last said conveyor and the said pallet onto said pallet conveyor, and means for imparting movement to all of said conveyors.

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