April 4, 1950 L. GELBMAN 2,502,940

BRICK PROCESSING MACHINE

Filed May 1, 1948 4 Sheets-Sheet 1

FIG. 1

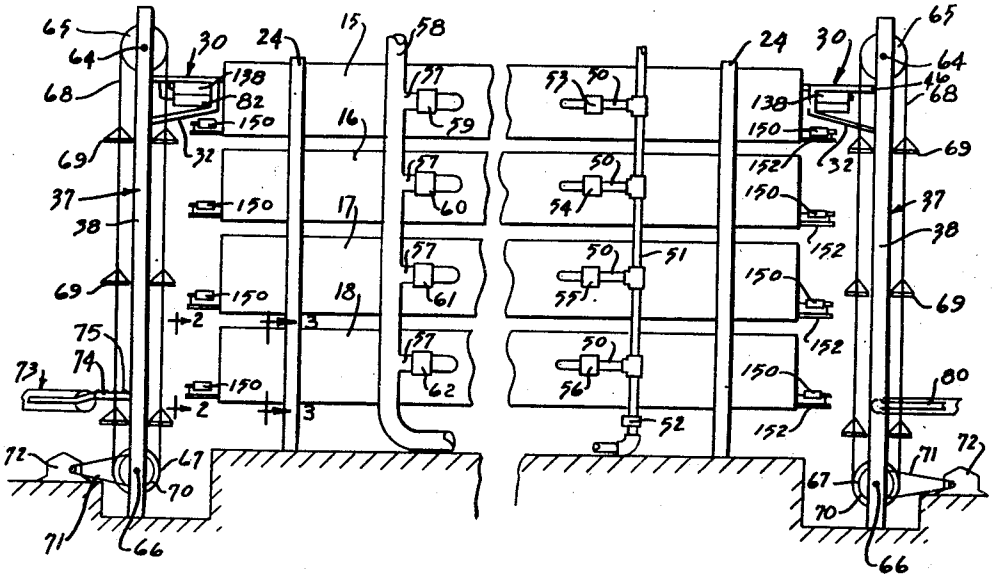


FIG. 2

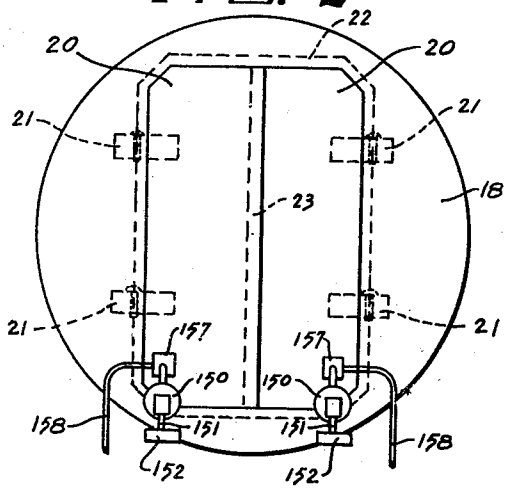


FIG. 3

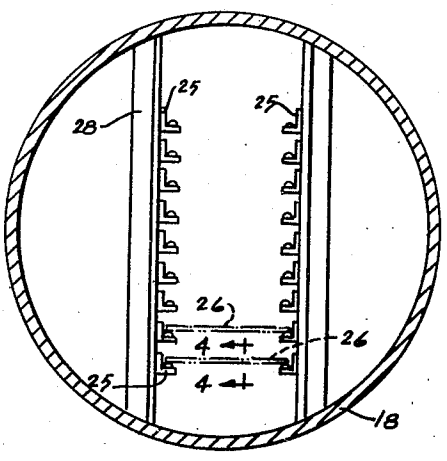
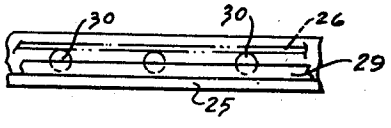


FIG. 4



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April 4, 1950 L. GELBMAN 2,502,940

BRICK PROCESSING MACHINE

Filed May 1, 1948 4 Sheets-Sheet 2

FIG. 8

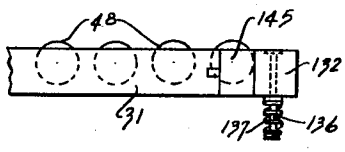


FIG. 5

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April 4, 1950 L. GELBMAN 2,502,940

BRICK PROCESSING MACHINE

Filed May 1, 1948 4 Sheets-Sheet 3

FIG. 6

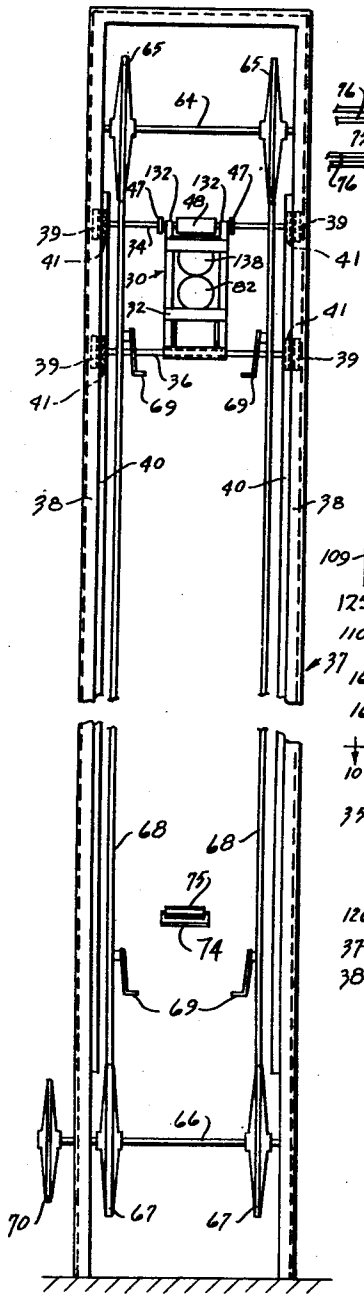


FIG. 7

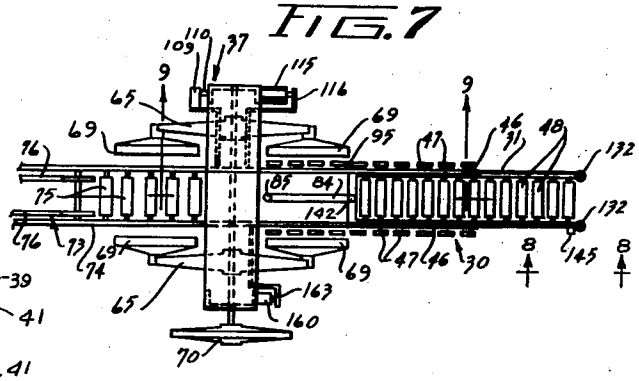


FIG. 9

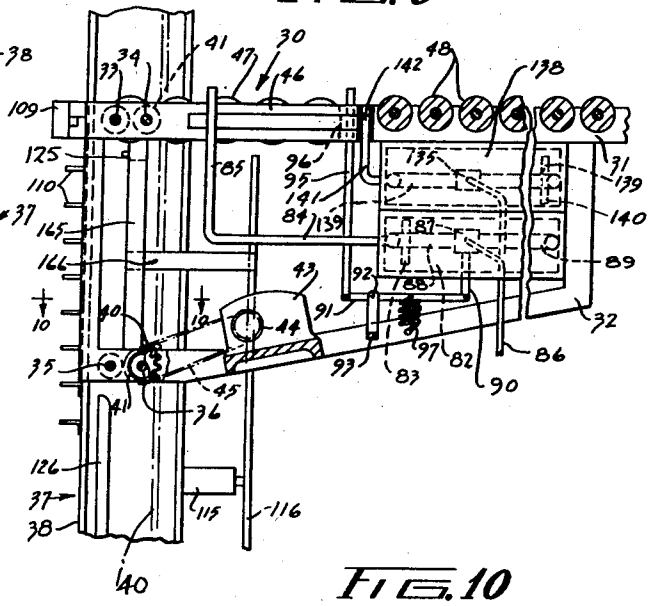
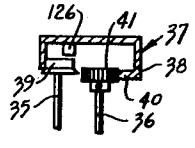


FIG. 10



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April 4, 1950 L. GELBMAN 2,502,940

BRICK PROCESSING MACHINE

Filed May 1, 1948 4 Sheets-Sheet 4

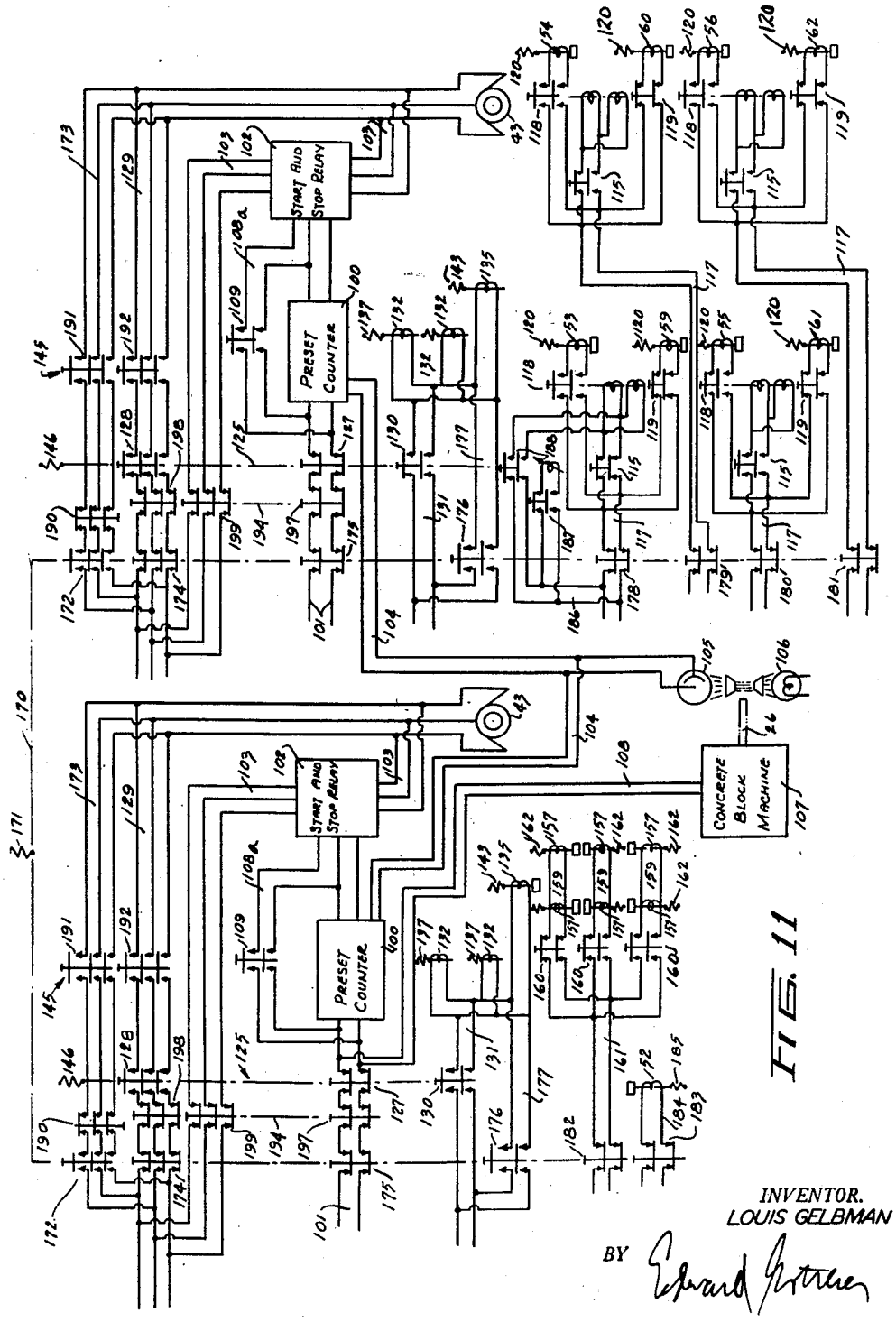


FIG. 11

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Patented Apr. 4, 1950

2,502,940

UNITED STATES PATENT OFFICE

2,502,940

BRICK PROCESSING MACHINE

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Application May 1, 1948, Serial No. 24,611

17 Claims. (Cl. 25—133)

1

This invention relates to new and useful improvements in brick or block processing machines.

More specifically, the invention relates to steam kilns for curing concrete or other kinds of bricks or blocks. Heretofore concrete bricks and blocks, or other types of bricks and blocks, have been cured in steam kilns. However, the operation of the kilns and the loading and unloading of the kilns was accomplished with apparatus requiring manual control and operation. The dominating object of this invention is to construct a kiln brick or block processing machine which will automatically fill the kilns thereof with bricks or blocks and will automatically remove processed bricks or blocks from the kilns thereof and will set the kilns thereof into and out of operation, as required. There will be no necessity for any manual operation from the moment that the bricks or blocks leave the brick or block making machine or device, to the moment they are discharged in cured condition from the kilns of the machine.

It is proposed that a plurality of kilns be used in the brick processing machine and that the automatic mechanism be so arranged that while one kiln is being filled and emptied, the bricks or blocks are being cured in the other kilns thereof. It is proposed that the capacity of the kilns be so calculated that upon the filling and emptying of the entire set of kilns, the bricks or blocks of the first filled kiln will be cured when the last kiln is being filled or refilled. With this arrangement the brick processing machine may be placed in continuous operation, with the brick or block machine manufacturing the brick or block at its normal rate and the cured bricks or blocks being discharged from the brick processing machine at the same rate they are being produced.

In order to cure the bricks or blocks in a minimum of time so as to make it feasible to have a continuously operating brick processing machine, handling all the bricks or blocks produced, high pressure steam is used in the kilns. It is calculated that 150 pounds of steam pressure per square inch would be satisfactory in accordance with this invention. Because of this high steam pressure it is essential that the kilns be constructed and operated in a fool proof manner. Particularly it is proposed to make it impossible for the doors of the kilns to be opened while there is an internal steam pressure high enough to be dangerous. Obviously, if the doors were opened while the kilns contained 150 lbs. of steam pressure, or even less steam pressure, persons in the vicinity would be scalded.

2

An important object of this invention is to so arrange the doors of each of the kilns that they open inwards, that is, into the kilns. It is proposed that in their closed positions the steam pressure tends to hold them closed. It is also proposed to provide door opening mechanism which is relatively weak and incapable of opening the doors against the steam pressure unless the steam pressure is down substantially to atmospheric pressure.

It is proposed that each of the kilns be provided with a plurality of superimposed racks extending through from the front end to the back end thereof and arranged in such a way that the doors may open inwards without being obstructed by the racks.

An important object of this invention is to provide an elevator for each of the ends of the kilns for self alignment with the racks of the kilns during a filling or refilling cycle and to so arrange the elevators as to have extendable and retractable tracks for extending into the ends of the kilns to connect with the racks and to be retractable so that the elevators may pass the kilns.

It is also proposed that the kilns be arranged in superimposed horizontal positions. With this arrangement it is possible for the elevators to move upwards and downwards along the ends of the kilns so that the extendable and retractable tracks may engage into the ends of the kilns for the reasons already pointed out above.

Another object of this invention is to provide the kilns with valve controlled supply pipe lines for the processing substances, the steam, connecting with each of the kilns. It is also proposed to provide a valve controlled exhaust pipe line for the processing substances, the steam, connecting with each of the kilns for exhausting the steam.

Another object of this invention is to automatically control said valve controlled pipe lines to feed the steam to the kilns and to exhaust the steam from the kilns correctly during the operating cycle of the brick processing machine.

Another object of this invention is to provide means for continuously supplying the elevator at the front of the kilns with a continuous supply of pallets with bricks and to provide means for removing the pallets with bricks from and as soon as they are deposited on the elevator at the back of the kilns.

Another object of this invention is to provide means for moving the pallets with bricks as they are supplied to the elevator at the front of

the kilns towards and on to a rack of a kiln aligned with the extended tracks of the elevators for forcing the pallets with bricks stored on the rack from the back of the rack and so on to the elevator at the back ends of the kilns.

A further object of this invention is to simultaneously move the elevators at the front and at the back of the kilns to a different one of the racks thereof, of any one of the kilns controlled by counting means counting directly or indirectly the pallets with bricks supplied to the kilns so that the kilns may be correctly filled and emptied.

A still further object of this invention is to provide means for operating the valve controlled supply and exhaust pipe lines mentioned above, of a particular kiln which is to be refilled with bricks a short time before the elevators finish the refilling of another one of said kilns for turning off the supply of processing substances, the steam, and exhausting the processing substances, (the steam), in the said kiln.

A still further object of the invention is to provide means for simultaneously retracting the extendable and retractable tracks of the elevators after one of the kilns has been filled or refilled with bricks and simultaneously moving said elevators to a steam exhausted kiln ready to be filled or refilled with bricks.

Still another object of this invention is to provide means for opening the doors of a steam exhausted kiln after the steam has been exhausted from it, to ready it for being filled or refilled by the elevators.

Another object of the invention is to provide means for extending the tracks of the elevators when said elevators reach a steam exhausted kiln for refilling the racks thereof with bricks.

Still another object of the invention is to provide means for shutting the doors of a kiln when it has been filled or refilled with bricks and said elevators have moved away from it.

Another object of the invention is to provide means for operating said valve controlled supply and exhaust pipe lines of a kiln which was just refilled and had its doors closed for shutting off the exhaust pipe line and turning on the supply of processing substances, the steam.

Another object of the invention is to so arrange the movement of the elevators that filling of the kilns start, for example, at the top and move progressively down to the bottom one of the kilns.

An object of the invention is to provide means for stopping the brick processing machine when the elevators move from kiln to kiln and when they reach the extreme bottom position.

Still another object of the invention is to provide means for restarting the machine by operating a main switch, controlling the simultaneous rising of the elevators to their top positions and to provide means whereby other controls take over control of the elevators, and the brick processing machine is then again in functioning condition.

Additional objects and advantages of the new brick processing machine will become clear as this specification proceeds.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is an elevational view of a brick processing machine constructed in accordance with this invention.

Fig. 2 is a fragmentary enlarged end view of one of the kilns looking in the direction of the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary enlarged vertical sectional view of one of the kilns taken on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary enlarged elevational view looking in the direction of the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary enlarged view of the left hand end of Fig. 1, with the kilns shown in central vertical section.

Fig. 6 is an elevational view of a portion of Fig. 5 showing particularly one of the elevators, this view being taken as though looking in the direction of the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary plan view of Fig. 5 looking in the direction of the line 7—7 thereof.

Fig. 8 is a fragmentary enlarged elevational view looking in the direction of the line 8—8 of Fig. 7.

Fig. 9 is a fragmentary enlarged vertical sectional view taken on the line 9—9 of Fig. 7 with certain parts of this view, namely certain air cylinders, not being shown in section.

Fig. 10 is a fragmentary horizontal sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a schematic wiring diagram of the device.

The brick processing machine, in accordance with this invention, includes a plurality of superimposed horizontal kilns 15, 16, 17 and 18 for steam or other brick processing substances, and each of said kilns having doors 20 closing its front and back ends for confining said substances. These doors 20 are supported with hinges 21 arranged to hinge the doors 20 inwards. Each of the doors 20 is provided with a flange 22 internally of the kilns arranged to prevent the doors 20 from swinging outwards. Moreover, the flanges 22 serve to seal the edges of the doors so as to prevent leakage of steam from the kilns. Each kiln, at each end, is provided with two doors 20, see particularly Fig. 2, which have overlapping adjacent flanges 23 to prevent leakage of steam between the doors. In Fig. 5 the top kiln 15 is illustrated with its doors 20 open, while the other kilns 16, 17 and 18 are illustrated with the doors 20 thereof in closed positions. The kilns 15, 16, 17 and 18 are supported by structures 24.

A plurality of superimposed racks 25 extend through each of said kilns and have their front ends for receiving pallets of bricks at the front ends of the kilns spaced inwards from the front ends of the kilns so as not to interfere with the opening and closing of the doors 20 of the kilns. The arrangement of the rear ends of the racks 25 is identical to the front ends, that is, the rear or back ends of the racks 25 for discharging pallets of brick at the back ends of the kilns are spaced inwards from the back ends of the kilns so that the back doors 20 of the kilns may swing inwards into open positions and then back to closed positions.

The dot and dash lines 26 in Figs. 3, 4 and 11 schematically illustrate pallets for bricks, which may be supported across the racks 25. It is customary in the manufacture of bricks or blocks to have the machines which make them deposit them on flat plates or pallets, such as pallets 26. The racks 25 accommodate these pallets 26 upon which the bricks or blocks are rested, the bricks

or blocks not being illustrated on the drawings. The racks 25 are in the nature of angle irons supported by their vertical arms upon vertical supports 28 mounted within the kilns. The horizontal arms of the angle irons of the racks 25 support strips 29 which have balls 30 projecting at regular distances along their lengths. The pallets 26 rest on the balls 30, as may be understood from an examination of Figs. 3 and 4. With this arrangement there is relatively low resistance to pushing the pallets 26 through the kilns.

Elevators 30 are arranged at the front and back ends of the kilns 15, 16, 17 and 18 for self alignment with the racks 25 during a filling or refilling cycle of the kilns with bricks or blocks. The elevators 30 have extendable and retractable tracks 31 for guiding said pallets with bricks, normally extending into the ends of the kilns to connect with the racks 25, and retractable so that the elevators 30 may pass said kilns 15, 16, 17 and 18. Each elevator 30 includes a frame 32 supporting top shafts 33 and 34 and bottom shafts 35 and 36. The elevators 30 are arranged to move up and down in frames 37. These frames 37 have channel sides 38 with the arms thereof directed towards each other. The shafts 33 and 35 are provided with flanged wheels 39 which engage the edges of one of the arms of the channels 38, see Figs. 9 and 10. A vertical rack 40 is mounted along the length of the other arms of the channels 38. The shafts 34 and 36 are provided with gears 41 which mesh with the racks 40. Each frame 32 is provided with an electric motor 43 having a speed reduction drive to a pinion 44 which is connected with a transmission 45 driving the shaft 36. When the motors 43 operate in one direction the shafts 36 are driven in one direction and the gears 41 thereof will cause the elevators 30 to move either up or down. When the motors 43 are reversed the elevators will move in the opposite direction. The top shaft 34 and its gears 41 are merely idlers helping to properly guide the elevators 30 up and down on the frames 37.

The extendable track 31 of each of the elevators 30 is horizontally slidably mounted between top arms 46 of the frame 32. These arms 46 are provided with wheels 47 along their outer faces. The wheels 47 project slightly above the top edges of the arms 46 so as to be capable of supporting pallets 26 with brick. The tracks 31 are provided with rollers 48 which project slightly above the top edges of the tracks so as to be capable of supporting the pallets 26 with brick which may also rest on the wheels 47. On the drawings the tracks 31 are illustrated in their extended positions extending to the front and back ends of the top kiln 15. The tracks 31 would be retracted when they move outwards of the ends of the kiln upon the frames 32 so as to be clear of the ends of the kiln 15, whereupon, the elevators 30 will be capable of moving up and down past the ends of the kilns. In other words, the tracks 31 are telescopically mounted on the frames 32 of the elevators 30 so as to move horizontally into and out of the ends of the kilns. As illustrated in Figs. 1 and 5 the elevators 30 are in their top positions in which the tracks 31 are aligned with the top rack 25 of the kiln 15. The elevators 30 are now ready to start moving downwards, for filling all of the racks 25 of said kiln 15, as will be hereinafter more fully described.

A valve controlled supply pipe line 50 for steam, or other processing substances, connects with each of the kilns 15, 16, 17 and 18 for supplying

the kilns with steam. These pipe lines 50 connect with a main steam supply line 51 which is controlled by a main electrically operated valve 52. The pipe lines 50 are controlled with electrically operated valves 53, 54, 55 and 56, respectively, for the kilns 15, 16, 17 and 18. A valve controlled exhaust pipe line 57 for steam, or other processing substances, connects with each of the kilns 15, 16, 17 and 18. These pipe lines 57 connect with a main steam exhaust pipe 58. The pipe lines 57 are individually controlled with electrically controlled valves 59, 60, 61 and 62 for the kilns 15, 16, 17 and 18, respectively. With this arrangement when the doors 20 of the kilns are closed, the kilns may be selectively filled with steam, or other processing substances, through the supply lines 50 and when required the kilns may be emptied of the steam and other processing substances through the exhaust lines 57.

The front ends of the kilns 15, 16, 17 and 18, which are the ends at the left of Fig. 1 are associated with means for supplying the elevator 30 at said front ends with a continuous supply of pallets with bricks. The rear ends of the kilns are associated with means for removing the pallets with brick as fast as they are supplied to the elevator 30, at the rear. These pallets supply and removing means include top shafts 64 each provided with a pair of spaced sprocket wheels 65. The top shafts 64 are mounted across the arms 38 of the frames 37. There is also a bottom shaft 66 mounted across the arms 38 of each frame 37 and provided with bottom sprocket wheels 67. A pair of endless chains 68 engage over the sprocket wheels 65 and 67 of each frame 37. At spaced points these endless chains 68 are provided with adjacent pairs of opposed lifting fingers 69 which are capable of engaging beneath the edge portions of a pallet 26 for lifting or lowering it. The shafts 66 are also provided with sprockets 70 engaged by chains 71 connected with electric motors 72.

A pallet supply conveyor 73 from a standard brick or block machine 107 is adapted to discharge pallets between one of the sides of the endless chains 68 of the front frame 37. More specifically, the conveyor 73 has a pallet receiving extension 74 provided with a plurality of rollers 75 upon which a pallet is finally discharged in a position between the sides of the endless conveyor 68 in a position so that the pallet may be picked up by a pair of fingers 69. The elevator 30 at the front ends of the kilns has its top arms 46 extended in between the other side of the endless chains 68 so that pallets with brick picked up off the rollers 75 will be deposited upon the rollers 47 of the elevator 30. In this way the elevator 30 is being supplied with a continuous supply of pallets with brick. Said elevator 30 is provided with a mechanism for discharging a pallet with bricks as soon as it is supplied upon the racks 25. The details of this mechanism will be covered later in this specification. The elevator 30 at the back ends of the kilns has its arms 46 extending in between the inner sides of the endless chains 68, and therefore the fingers 69 of the means at the back ends of the kilns pick up the pallets with the brick from the elevator 30 at the back ends of the kilns and deposit them upon a conveyor 80 which removes them as fast as they are deposited.

The elevator 30 at the front ends of the kilns 15, 16, 17 and 18 is provided with a means for moving the pallets with bricks as they are supplied to said elevator towards and on to one of the

racks 25 which is aligned with the extended track 31 of said elevator 30 at the front of the kilns for supplying said rack with pallets with bricks and for forcing other of the pallets with brick on said rack from the back end of said rack and on to the elevator 30 at the back ends of the kilns 15, 16, 17 and 18. This means includes a cylinder 82 mounted on said front elevator 30 and provided with a piston 83 adapted to move from end to end of the cylinder. A piston rod 84 connects with the piston 83 and has its outer end 85 turned upwards and engaging in between the top arms 46 of the said front elevator 30. The piston 83 is moved by compressed air supplied from an air line 86. This air line 86 connects with a three way valve 87 connecting with air lines 88 and 89 connected with the ends of the cylinder 82.

The valve 87 is operated by an operator stem 90 connected with a lever 91 pivotally supported by a pintle 92 intermediate of its ends on a bracket 93 mounted on the elevator frame 32. The lever 91 connects with a plunger 95 vertically slidably mounted in a bushing 96 and having its top end projecting slightly above the rollers 47. When a pair of the fingers 69 lower a pallet with bricks upon the rollers 47 the plunger 95 is depressed, pivoting the lever 91 and moving the stem 90 and operating the valve 87 for causing the piston 83 to move in the direction of the kilns and correspondingly moving the piston rod 84 so that the bend end 85 forces the pallet with bricks towards the kilns moving along all of the pallets with bricks which are on the elevators 30 and on the rack 25 aligned with the extendable tracks 31 of the elevators. When the pallet with the brick is moved the full length of the travel of the piston 83 it will be moved off the projecting end of the plunger 95 which is then released. A spring 97 acting between the lever 91 and the frame 32 pivots the lever 91 for extending the plunger 95 and moving the valve stem 90 to operate the valve 87, causing the piston 83 to move back to its original position towards the left. This same operation is repeated for each pallet with bricks placed on the rollers 47 of the front elevator.

The elevators 30 are automatically operated by means for simultaneously moving said elevators 30 to a different one of the racks 25 of any one of the kilns 15, 16, 17 and 18 controlled by counting means counting said pallets with bricks as they are supplied to the kilns. These means include a pair of pre-set counters 100, one for each elevator 30. The counters 100 are connected in main electric circuits 101 which control start and stop relays 102. These relays 102 control circuits 103 connected with the electric motors 43 which operate the elevators 30. The counters 100 are actuated by circuits 104 connected with a photoelectric cell 105 operated by a lamp 106 and by the pallets 26 with bricks which pass in between the lamp 106 and cell 105. Preferably, the lamp 106 and cell 105 are placed near the concrete block machine 107 which processes the brick or block on pallets for delivery to the conveyor 73. The concrete block machine 107 is controlled by an electric circuit 108 connected with one of the main electric circuits 101 controlling one of the counters 100.

Each pre-set counter 100 is shunted by a circuit 108a which is controlled by a push button switch 109. These push button switches 109 are mounted on the elevators 30 and are periodically momentarily operated by having their depressible buttons engaging fingers 110 mounted upon the frames 37. These fingers 110 are spaced distances corresponding with the spacing of the racks 25. When one of the racks 25 is completely filled with pallets of brick, the counters 100 function to turn on the start and stop relays 102 which then turn on the circuits 103 to the electric motors 43 so that both of the elevators 30 start traveling downwards. They continue traveling downwards until the switches 109 engage the next fingers 110. This momentarily closes the switches 109 which operate the start and stop relays 102 for stopping the electric motors 43, and now the elevators 30 are positioned at the adjacent rack 25. When this latter-mentioned rack 25 is filled or refilled with pallets of brick, the operation is repeated by the counters 100 again operating the relays 102 for moving the elevators 30 to the next rack 25.

The valve controlled supply and exhaust pipe lines 50 and 57, respectively, are associated with a means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators 30 finished the filling or refilling of another one of said kilns, for shutting off the supply of steam and for exhausting the steam in said kiln. This means includes a push button switch 115 for each kiln. These switches 115 are mounted upon one of the frames 37. They are operated by a bar 116 mounted on the elevator 30 of said frame 37. The bar 116 is quite a long bar to as to maintain the switch 115 of one of the kilns depressed as long as the elevator 30 is in front of the particular kiln. When the elevator 30 is filling the bottom rack 25 of this particular kiln, the bar 116 extends a sufficient distance downwards to close the switch 115 of the adjacent kiln. The switches 115 control circuits 117 which operate pairs of relays 118 and 119 which in turn control pairs of the electrically operated valves of the kilns controlling the supply lines and the exhaust lines, respectively. This may be clearly understood by inspecting Fig. 11 and noting that one pair of relays 118 and 119 control the electrically operated valves 53 and 59. The next pair of the relays 118 and 119 control the valves 54 and 60. The next pair control the valves 55 and 61, and the final pair control the valves 56 and 62.

Springs 120 urge said valves, referred to in the previous paragraphs, into initial positions in which the steam feeds 50 are open and in which the exhausts 57 are normally closed. When any one of the push button switches 115 is closed, it indirectly causes energization of one pair of the relays 118, 119 which operates a pair of the electrically controlled valves so as to close the steam feed and open the steam exhaust of one kiln. As soon as the particular push button switch 115 is released the valves return to their initial condition due to the spring action 120, in which the steam feed is again opened and the steam exhaust is closed. Now it should be noted that when the elevators 30 reach the bottom rack 25 of one of the kilns, the rod 116 extends a sufficient distance down to close the switch 115 of an adjacent kiln. This causes the valve controlled supply and exhaust pipe lines of said adjacent kiln to cut off the supply of steam to the adjacent kiln and to open the exhaust to said adjacent kiln, readying the kiln for the opening of the doors thereof and for the refilling of the pallets with bricks thereof.

The extendable and retractable tracks 31 are controlled by means for simultaneously retracting and extending the tracks 31. It is necessary to simultaneously retract the tracks 31 after one

of the kilns has been filled or refilled with pallets of brick. The elevators 30 are also associated with means for simultaneously moving them to the adjacent kiln as soon as the tracks 31 are retracted. The retracting means include compound switches 125 mounted respectively on the elevators 30 and cooperative with operator rods 126 mounted on the frames 37, there being one rod 126 for each of the kilns. These rods 126 are located between the bottommost of the fingers 110 of one kiln and uppermost of the fingers 110 of an adjacent kiln. The compound switches 125 include normally closed switch sections 127 for controlling the circuits 101, normally opened switch sections 128 for controlling shunt circuits 129 to the motors 43, and normally opened switch sections 130 for controlling circuits 131 operating pairs of solenoids 132 and electrically operated air valves 135.

The solenoids 132 are mounted on the ends of the retractable tracks 31 (see Figs. 7 and 8). The solenoids 132 are provided with cores 136 which normally are in lowered positions beneath the tops of the rollers 48. However, when the solenoids 132 are energized the cores 136 will move upwards so as to project above the tops of the rollers 48. These cores 136 then engage the edges of pallets with bricks rested on the rollers 48 so as to move the pallets with brick back when the tracks 31 are retracted. Springs 137 normally urge the cores 136 into lowered positions. The electrically operated valves 135 control air cylinders 138. More specifically, valves 135 are connected with the air lines 86 and with the air line branches 139 connected with the ends of the cylinders 138. The cylinders 138 are provided with pistons 140 connected with piston rods 141 having ends 142 connected with the tracks 31.

Each of the electrically operated air valves 135 are normally urged into one position by springs 143. In this latter position the tracks 31 are extended. However, when the electrically operated air valves 135 are electrically energized they function to cause the pistons 140 to move so as to move the piston rods 141 causing the ends 142 to retract the tracks 31. A push button switch 145 is mounted on each of the tracks 31, and are so positioned that their buttons will be depressed when the tracks 31 are in fully retracted positions. For example, the switches 145 may be so positioned that their buttons strike the frames 32 of the elevators when the tracks 31 are fully retracted. The switches 145 have switch sections 192, normally opened, arranged in series with the switch sections 128 in the circuits 129.

When the elevators 30 are positioned at the bottom rack 25 of one of the kilns, the switches 125 will still be free. However, when the elevators 30 are now started down again by the preset counters 100, the switches 125 will engage the rods 126 and take over control of the elevators 30. As soon as the switches 125 have control of the elevators, the switches 109 will strike the last one of the fingers 110 of the particular kiln so as to reset the start and stop relays 102 to stop the electric motors 43. However, the electric motors 43 will continue operating because now the switches 125 are in control. It will take but an instant for the switch sections 130 to operate the electrically controlled valves 135 to indirectly cause the tracks 31 to be retracted. When fully retracted the switches 145 will be closed, which close the circuits 129 shunting the start and stop relays 102 and causing the electric

motors 43 to operate for continuing to move the elevators downwards.

The switch sections 127 of the compound switches 125 will cut the circuit 101 and the circuit 108 to the concrete block machine, stopping its operation so that the supply of pallets 26 with bricks stops. It is not necessary to stop the supply of pallets with bricks while the elevators 30 move from one rack 25 to another rack 25 in the same kiln, since the time consumed for this operation is very short and the fingers 69 are so spaced to permit the change of position of the elevators without interrupting the operation of the concrete block machine. However, the time consumed by the elevators 30 in traversing the distance from one kiln to another is sufficiently long to require the concrete block machine 107 to stop. Also when the switch sections 127 are opened the circuits 101 are cut to the counters 100 and to the start and stop relays 102. The bars 126 are of a sufficient length so that the elevators 30 will reach positions level with the top rack 25 of the adjacent kiln. Then the switches 125 will ride off the bars 126. Springs 146 are connected with and return the switches 125 to their original positions in which the sections 128 and 130 are opened and the sections 127 are closed.

The doors 20 of the kilns are connected with means for opening the doors 20 of the steam exhausted kilns after the steam has been exhausted from them. This means includes a cylinder 150 for each door. Each cylinder 150 is horizontally pivotally supported on a vertical stud 151 mounted upon a bracket 152 attached to the kiln. Within each cylinder 150 there is a piston 153 which connects with a piston rod 154, in turn pivotally connected with lugs 155 mounted on a door 20. Each cylinder 150 is provided with air pipes 156 connecting with the ends thereof, and connecting with an electrically operated air valve 157. The air valves 157 connect with an air supply pipe 158. The electrically operated air valves 157 are connected in electric circuits 159 which are controlled by push button switches 160. The circuits 159 are connected in parallel with a main circuit 161. The electrically operated air valves 157 are normally urged in one direction by springs 162. These springs 162 urge the valves 157 into positions in which the doors 20 are closed. The switches 160 are normally open.

The switches 160 are mounted upon one of the arms 38 of the one frame 37. They are operated by a bar 163 mounted upon one of the elevators 30. The bar 163 is supported by a rod 164 in turn connected with a brace 165 mounted on the frame 32. The bar 116 is supported by an arm 166 connected with the brace 165. The bar 163 is of such a length that the switch 160 of one of the kilns is held closed when the elevators 30 are positioned before this kiln. In Fig. 5 the elevator 30 is illustrated positioned so that its track 31 is aligned with the top rack 25. In this position the switch 160 for this kiln is closed. The switch 160 will remain closed as the elevator proceeds down to the last rack 25 of this kiln. It will also remain closed while the retractable tracks 31 are retraced and then will remain closed a little longer until the elevators 30 move slightly further downwards. At this point the switch 160 will be released, opening the closed circuit 159 for causing the springs 162 of the valves 157 of the kiln which the elevators 30 just left, to reset the valves 157 for indirectly causing the doors 20 of this kiln to close. When the elevators 30 reach new posi-

tions in which their extendable tracks are nearly aligned with the first rack 25 of the adjacent kiln, the bar 163 will close the switch 160 of this kiln causing the doors 20 thereof to open.

The elevators 30 are connected with manually controlled means for causing them to rise back to their top positions. This means includes a main compound switch 170 normally urged in one direction by a spring 171. In its normal condition the main compound switch 170 has a number of open and closed sections. It includes switch sections 172 controlling reversing circuits 173 for the electric motors 43. The compound reversing switch 170 also includes sections 174 controlling the circuits 129 of the motors 43. The sections 172 are normally open and the sections 174 are normally closed. The main compound reversing switch 170 also includes sections 175 controlling the circuits 101 to the preset counters 100. The main compound reversing switch 170 also includes sections 176 normally open and controlling shunt circuits 177 shunting the switch sections 130 of the compound switches 125. The compound reversing switch 170 also includes sections 178, 179, 180 and 181 normally closed and controlling the circuits 117 of the means for opening and closing the valves of the steam supply lines 50 and the exhaust lines 57. The compound reversing switch 170 also includes a section 182 normally closed and controlling the main circuit 161 of the means for operating the doors 20. The compound reversing switch 170 also includes a section 183 normally closed and controlling a circuit 184 which controls the main steam valve 52. The steam valve 52 is normally urged into an open position by current flowing through the circuit 184 and when the circuit 184 is broken it is urged into a closed position by a spring 185.

An auxiliary feed circuit 186 joins in the control of the electrically controlled valves 53 and 59 controlling the steam inlet and steam exhaust to the top kiln 15. This auxiliary feed circuit 186 includes a normally open push button switch 187 which is mounted upon one of the arms 38 and is operated by the bottom end of the bar 116. When the elevators 30 are in their extreme bottom positions the bar 116 closes the switch 187. Switch 187 operates a time controlled relay 188 which supplies current to the circuit 117 of the electrically controlled valves 53 and 59. The switch 187 is positioned at a point to be closed by the bar 116 when the elevators 30 reach positions in which their extendable tracks 31 are aligned with the bottom rack 25 of the bottom kiln 18. When the elevators 30 move down to their extreme bottom positions the bar 116 will still keep the switch 187 closed.

The reversing circuits 173 include top limit switches 190 mounted on one of the arms 38 of each frame 37 and normally closed and adapted to be opened by the elevators 30 when the elevators 30 reach their topmost position. These limit switches 190 serve to stop the elevators 30 after they have moved to their top positions. The switches 145 which controlled downward movement of the elevators 30 when the extendable tracks 31 were retracted include normally opened sections 191 controlling the reversing circuits 173 and said sections 192 controlling the forward circuit 129. The switches 145 require that the retractable tracks 31 be in retracted positions before the elevators 30 may move from one kiln to another, up or down. Bottom limit switches 194 have normally closed sections 197 controlling the main electric circuits 101 to the block machine 107 and to the preset counters 100. This switch 194 is mounted on one of the arms 38 of each frame 37 and is closed by the bars 116 when the elevators 30 are in their extreme bottom position. For this reason each elevator 30 has a bar 116. The switches 194 also have normally closed sections 198 and 199 controlling circuits 129 and 103 respectively, to the motors 43.

The operation of the device may be understood from the following:

Let use assume that the elevators 30 are in the positions as illustrated in Figs. 1 and 5. In these positions of the elevators 30, the doors 20 of the top kiln 15 are open, the electrically operated steam valve 53 is closed, and the electrically operated exhaust valve 59 is open. The doors 20 of the kilns 16, 17 and 18 are closed and the electrically operated steam control valves 54, 55 and 56 are open, while the electrically controlled exhaust valves 60, 61 and 62 are closed. The motors 72 are operating continuously, and the endless members 68 are moving, causing the fingers 69 upon the left hand sections of the endless members 68 to move upwards, while the fingers 69 upon the right hand sections of the endless members 68 to move downwards. The concrete block machine 107 is functioning and periodically supplies a pallet 26 with bricks. This pallet with bricks is carried by the conveyor 73 and discharged upon the rollers 75 where it remains until it is picked up by the next set of fingers 69 coming along. The pallet 26 with the bricks is lifted all the way to the top of the sprockets 65, then across the shaft 64 and then starts coming down along the right hand side of the endless members 68. Soon it is deposited upon the elevator 30 at the front ends of the kilns.

The pallet 26 with bricks depresses the plunger 95, pivoting the lever 91 and moving the stem 90 of the air valve 87 causing the piston 83 in the cylinder 82 to move towards the right. The piston rod 84 and bent end 85 then moves the pallet 26 with bricks towards the kilns and correspondingly move all pallets with bricks which stretch across the extendable tracks 31 and the top rack 25 of the top kiln 15 towards the right. Consequently, as one pallet with bricks is fed towards and into the kiln, another will be pushed out onto the elevator 30 at the back ends of the kilns. The discharged pallet with bricks will be picked up by a pair of fingers 69 of the endless members 68 at the right (see Fig. 1) and will be carried up around the sprockets 65 and then down and deposited upon the conveyor 80 which takes it away. This operation keeps repeating until the entire top rack 25 of the kiln 15 has been refilled. In the meantime the counters 100 were counting the number of pallets with bricks which were being fed into the top rack 25 and the top kiln 15. When the required number have been counted off the counters 100 operate and cause the start and stop relays 102 to function so that current now flows through the circuits 103 to the electric motors 43. The motors 43 indirectly drive the shafts 36 and the pinions 41 which work on the racks 40 and cause the elevators 30 to simultaneously move downwards.

Each of the elevators 30 keep moving downwards until its switch 109 strikes the top fingers of the fingers 110 momentarily closing the circuits 108a. The circuits 108a cause the relays 102 to open the circuits 103, stopping each elevator 30 in correct position in which its extended track 31 is now aligned with the second rack 25 of said kiln 15. In this way the operation

repeats, until the elevators 30 reach the lowermost of the racks 25 of the top kiln 15. When this occurs one of the bars 116 extends down and closes the switch 115 of the kiln 16. Said switch 115 immediately closes circuit 117 of the relays 118 and 119 which operate the electrically operated valves 54 and 60 causing the steam inlet to the kiln 16 to be closed and opening the steam exhaust. In the meantime the elevators 30 are refilling the bottom rack 25 of the top kiln 15. During this period the steam pressure in the kiln 16 falls to atmospheric pressure.

When the bottom rack 25 of the top kiln 15 has been completely refilled, the counters 100 cause the elevators 30 to start moving downwards. At this instant the compound switches 125 engage the rods 126 closing the switch sections 128 and 130 and opening the switch sections 127. The closed switch sections 130 close the circuits 131 which cause the solenoids 132 to project their cores 136 upwards to extend across the pallets with bricks on the extended tracks 31. Simultaneously, closing of the circuits 131 operate the electrically operated air valves 135 causing the pistons 140 in the cylinders 138 to move so that the upturned ends 142 of the piston rods 141 retract the tracks 31. The opened switch sections 127 stop the concrete block machine 107 and stop the counters 100. The closed switch sections 128 close the circuits 129 to the motors 43, but the motors 43 do not operate until the tracks 31 are fully retracted and then the sections 192 of the switches 145 close the circuits 129 and the motors 43 function to continue to send the elevators 30 downwards. As soon as the switches 125 take over the control of the elevators 30 the switches 109 engage the bottom fingers of the sets of fingers 110 for the kiln 15, momentarily closing the circuits 108 and resetting the relays 102 to open the circuits 103. However, the motors 43 continue functioning because the circuits 129 remain closed.

When the elevators 30 reach positions in which they are nearly aligned with the top racks 25 of the kiln 16, the bar 163 closes the switch 160 of the kiln 16 operating the electric air valves 157 and indirectly causing the doors 20 of the kiln 16 to open. By this time the switches 125 ride off of the rods 126 and the springs 146 return the switches 125 to their original positions. This causes the switch sections 128 and 130 to open and the switch sections 127 to close. When the switch sections 130 open, circuits 131 are broken and the cores 136 are retracted, while the electric operated valves 135 function to indirectly extend the tracks 31. The closed switch sections 127 restart the counters 100 and the block machine 107. Now the top rack of the kiln 16 will be refilled.

When the elevators 30 left the bottom rack 25 of the top kiln 15 the bar 163 rode off of the switch 160 of the top kiln 15 and opened the circuit 159 to the electric operated air valves 157 of the door operating mechanism of the doors 20 of the top kiln 15, causing the doors 20 to close. A short period later the top end of the bar 116 rode off of the valve 115 of the top kiln 15 opening the circuit 117 of the top kiln 15 which indirectly causes the steam valve 53 to open and the exhaust valve 59 to close. The top kiln 15 now receives live steam and the brick in it is being cured.

The operation of filling the second kiln 16 is identical to the top kiln 15. The elevators 30 keep working their way down refilling the racks 25 of the kilns until they simultaneously reach the bottom kiln 18. When the elevators 30 reach the bottom rack 25 of the bottom kiln 18 the bar 116 closes the switch 187 which closes the feed circuit 186. This immediately supplies electric current to the electrically operated valves 53 and 59 of the top kiln 15, which indirectly exhaust the steam from this kiln. When the bottom rack of the bottom kiln 18 is completely refilled the counters 100 cause the operation of the stop and start relays 102 which in turn close the circuits 103 to the motors 43. The elevators 30 now proceed moving downwards. This sets into motion the switches 125 against the bottom-most rods 126 which indirectly causes the tracks 31 to be retracted and causes the elevators 30 to continue downwards to their complete down positions. As soon as the elevators 30 leave the bottom kiln 18 the bar 163 rides off the bottom-most switch 160 indirectly closing the doors of the bottom kiln. The bar 116 also rides off the bottom-most switch 115, indirectly causing operation of the valves 56 and 62 to close the exhaust and to open the steam to said bottom kiln 18. The elevators 30 move downwards until the bars 116 engage the limit switches 194 which open the main circuits 101 stopping the concrete block machine 107 and the counters 100 and open the motor circuits 103 and 129, bringing the elevators 30 to a stop. The entire machine is now at rest.

The machine is restarted by closing the main compound reversing switch 170. This switch must be held down while the elevators 30 travel up to their top positions. When the elevators 30 reach their top positions the top limit switches 190 will be opened causing the elevators 30 to come to rest in their top positions in which their tracks 31 will be aligned with the top racks 25 of the top kiln 15. When the compound switch 170 was depressed the sections 172 were closed, closing the circuits 173 and causing the motors 43 to reverse to drive the elevators 30 upwards. The sections 174 were opened, opening the circuits 129 which drive the motors 43 to move the elevators downwards. The sections 175 were opened to cut the circuits 101 so that the concrete block machine 107 and the counters 100 do not receive current. The sections 176 were closed for closing the circuits 177 for operating the electrically operated air valves 135 and indirectly causing the tracks 31 to assume or maintain retracted positions. The section 182 was opened to open the circuit 161 to cut the current to the electrically operated air valves 157 to make certain that all the kiln doors remain closed. The section 183 opened the circuit 184 to cut the current to the electrically operated valve 52 to make certain that the supply of steam is cut to all of the kilns.

It should be noted that the feed circuit 186 remains on so that current is supplied to the electrically operated valves 53 and 59 so as to keep the top kiln 15 exhausted of steam. The time relay 188 keeps circuit 186 closed a sufficient amount of time to give the elevators 30 time to reach their top positions. The sections 179, 180 and 181 of the compound reversing switch 170 are also opened to retain the setting of the steam valves and exhaust valves of the kilns 16, 17 and 18 even though the bar 116 operates the switches 115 as the elevators 30 move to their top positions. When the elevators 30 reach their top positions and stop due to the fact that the limit switches 190 are open, the

compound reversing switch 170 is released and it will move back to its original position due to the action of spring 171. The parts then assume the positions shown in Fig. 5 and the operation of the device is ready to be continued, as already described.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order and controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators finish the filling or refilling of another of said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of the kiln which has just been refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam.

2. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means including an air cylinder and piston for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators finish the filling or refilling of another of said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of the kiln which has just been refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam.

3. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order and controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators finish the filling or refilling of another said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said eleva-

tors have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of the kiln which has just been refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam, said means for moving said pallets with bricks as soon as they are supplied to said elevator at the front of said kilns towards and on to said rack, comprising an air cylinder and piston, a piston rod connected with said piston and having an end engageable against one edge of a pallet with bricks engaged on said elevator for moving same, an air supply to the ends of said cylinder, a valve for controlling said air supply to move said piston from one end to the other end of said cylinder, a plunger depressed by said pallet with bricks on said elevator, means connecting said plunger with and for operating said valve, and resilient means for returning said plunger to a raised position when said pallet with bricks has been moved off it.

4. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order and controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators finish the filling or refilling of another said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of the kiln which has just been refilled and had its doors closed for shutting off the exhaust lines and turning on the supply of steam, said means for simultaneously moving said elevators to a different one of said racks of any one of said kilns includes electric motor driven means for moving said elevators, start and stop relays for controlling said electric motors, said counting means being connected with said relays for starting said motors, and a stopping circuit for said relays for stopping said motors, said stopping

circuits including switches mounted upon said elevators, and stationary fingers for each of said racks engageable with said switches as said elevators reach pre-selected points for stopping said elevators.

5. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order and controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators finish the filling or refilling of another said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of the kiln which has just been refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam, and means for operating said valve controlled supply and exhaust pipe lines includes an electrically operated valve for each of said pipe lines, the valves for said supply pipe lines being normally open and the valves for said exhaust pipe lines being normally closed, circuits for operating said electrically controlled valves including switches, said switches being stationarily mounted along the path of motion of said elevators, and a bar mounted upon one of said elevators engageable with said switches as said elevators reach pre-selected positions.

6. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, a valve controlled supply pipe

line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order and controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be filled or refilled with pallets with bricks a short time before said elevators finish the filling or refilling of another said kilns for shutting off the steam and exhausting the steam of said first kilns, means for simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of the kiln which has just been refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam, said means for opening the doors of said kilns includes pneumatic door opening means controlled with electrically operated valves, circuits for controlling said electrically operated valves including switches, said switches being mounted along the paths of travel of said elevators and a bar mounted on one of said elevators and engageable with said switches.

7. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam and hinging inwards to open positions, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns spaced upwards from the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns spaced inwards of the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks during a filling cycle and having extendable and retractable tracks for said pallets with bricks extendable into the ends of said kilns to connect with said racks and retractable so that said elevators may pass said kilns, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with the extended track of said elevator at the front of said kilns and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back ends of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order and controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be refilled with pallets with bricks a short time before said elevators finish the refilling of another said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously retracting the said tracks of said elevators after one of said kilns has been refilled with pallets with bricks and simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for extending the tracks of said elevators when said elevators reach said exhausted kiln for refilling the racks thereof, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of a kiln which was just refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam.

8. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors closing their front and back ends for confining said steam, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns spaced upwards from the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns spaced inwards of the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks during a filling cycle and having extendable and retractable tracks for said pallets with bricks extendable into the ends of said kilns to connect with said racks and retractable so that said elevators may pass said kilns, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust pipe line for said steam connecting with each of said kilns, means for supplying said elevator at the front of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with the extended track of said elevator at the front of said kilns and forcing pallets with bricks on said rack from the back end of said rack and on to said elevator at the back ends of said kilns, means for simultaneously moving said elevators progressively from rack to rack of any one of said kilns for filling the racks thereof in order controlled by counting means counting said pallets with bricks as they are supplied, means for operating said valve controlled supply and exhaust pipe lines of a kiln which is to be refilled with pallets with bricks a short time before said elevators finish the refilling of another of said kilns for shutting off the steam and exhausting the steam of said first kiln, means for simultaneously retracting the said tracks of said elevators after one of said kilns has been refilled with pallets with bricks and simultaneously moving said elevators to said steam exhausted kiln, means for opening the doors of said steam exhausted kiln, means for extending the tracks of said elevators when

said elevators reach said exhausted kiln for refilling the racks thereof, means for shutting the doors of each kiln when it has been refilled with pallets with bricks and said elevators have moved away from it, and means for operating said valve controlled supply and exhaust pipe lines of a kiln which was just refilled and had its doors closed for shutting off the exhaust line and turning on the supply of steam.

9. In a brick processing machine, a kiln for steam for curing bricks and having open ends, doors for closing the ends of said kiln to confine said steam and hingedly mounted to swing from closed positions inwards into said kiln to open positions so that internal pressures within said kiln hold said doors closed, a plurality of superimposed racks extending through said kiln and having their ends spaced inwards of the ends of said kiln so as not to obstruct said doors from swinging inwards to their open positions, and elevators at the ends of said kiln for selective alignment with said racks and having extendable and retractable tracks for guiding pallets with bricks extending into the ends of said kiln to connect with said racks and retractable so that said elevators may pass said kiln.

10. In a brick processing machine, a kiln for steam for curing bricks and having open ends, doors for closing the ends of said kiln to confine said steam and hingedly mounted to swing from closed positions inwards into said kiln to open positions so that internal pressures within said kiln hold said doors closed, a plurality of superimposed racks extending through said kiln and having their ends spaced inwards of the ends of said kiln so as not to obstruct said doors from swinging inwards to their open positions, elevators at the ends of said kiln for selective alignment with said racks and having extendable and retractable tracks for guiding pallets with bricks extending into the ends of said kiln to connect with said racks and retractable so that said elevators may pass said kiln, and means for moving said pallets with bricks from one of said elevators towards and on to a rack aligned with the extended tracks of said elevators and for forcing pallets with bricks from said rack on to the other of said elevators.

11. In a brick processing machine, a plurality of superimposed horizontal kilns for steam, a plurality of superimposed racks extending through each of said kilns for supporting pallets with bricks, a frame for an elevator adjacent one of the ends of said kilns, an elevator vertically movably mounted on said frame for selective alignment with said racks, an electric motor for raising and lowering said elevator, a plurality of fingers mounted on said frame in a vertical path and spaced from each other corresponding with the spacing of said racks, an electric circuit for said electric motor, a start and stop relay controlling said circuit, counter means connecting said circuit for starting said relay for operating said motor for moving said elevator from one of said racks, and a switch mounted on said elevator and operated by engaging said fingers and connected in said circuit for operating said relay to stop said elevator adjacent another of said racks.

12. In a brick processing machine, a plurality of superimposed horizontal kilns for steam, a plurality of superimposed racks extending through each of said kilns for supporting pallets with bricks, a frame for an elevator adjacent one of the ends of said kilns, an elevator vertically movably mounted on said frame for selective alignment with said racks, an electric motor for raising and lowering said elevator, a plurality of fingers mounted on said frame in a vertical path and spaced from each other corresponding with the spacing of said racks, an electric circuit for said electric motor, a start and stop relay controlling said circuit, counter means connecting said circuit for starting said relay for operating said motor for moving said elevator from one of said racks, a switch mounted on said elevator and operated by engaging said fingers and connected in said circuit for operating said relay to stop said elevator adjacent another of said racks, and a shunt circuit and a reversing switch for reversing said motor for moving said elevator to starting position and having a switch section for opening the first named circuit while said motor is operated in reverse.

13. In a brick processing machine, a plurality of superimposed horizontal kilns for steam, doors for closing said kilns, electric means for closing the doors of each kiln and including a circuit and a control switch for each kiln, a plurality of superimposed racks extending through each of said kilns for pallets of bricks, a frame for an elevator adjacent one of the ends of said kilns, an electric elevator vertically movably mounted on said frame for selective alignment with said racks, said control switches being mounted on said frame, and a bar mounted on said elevator for engaging said switches selectively for opening the doors of any one of said kilns while said elevator is adjacent said kiln.

14. In a brick processing machine, a plurality of superimposed horizontal kilns for steam, doors for closing said kilns, electric means for closing the doors of each kiln and including a circuit and a control switch for each kiln, a plurality of superimposed racks extending through each of said kilns for pallets of bricks a frame for an elevator adjacent one of the ends of said kilns, an electric elevator vertically movably mounted on said frame for selective alignment with said racks, said control switches being mounted on said frame, a bar mounted on said elevator for engaging said switches selectively for opening the doors of any one of said kilns while said elevator is adjacent said kiln, and a shunt circuit and reversing switch for reversing said electric elevator for moving said elevator to starting position and having a switch section for opening said first named circuit while said elevators operate in reverse.

15. In a brick processing machine, a plurality of superimposed horizontal kilns for steam and having doors for closing their ends for confining said steam, a plurality of superimposed racks extending through each of said kilns for pallets of bricks, a frame for an elevator adjacent one of the ends of said kilns, an elevator vertically movably mounted on said frame for selective alignment with said racks, an electric motor for raising and lowering said elevator, an electric circuit for said motor, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust line for steam connecting with each of said kilns, means for closing and opening the doors of each kiln and including a control switch mounted on said frame, a bar mounted on said elevator for engaging said switches selectively for opening the doors of any of one of said kilns while said elevator is adjacent said kiln, electric means for normally opening said supply pipe line to each

kiln and normally closing said exhaust pipe line to each kiln and including a switch for each kiln for controlling said electric means for said supply pipe line thereof and opening said exhaust pipe line thereof, said second named switches being mounted on said frame, and a bar on said elevator for engaging said second named switches for closing the supply pipe line and opening the exhaust pipe line of any one of said kilns while said elevator is adjacent said kiln.

16. In a brick processing machine a plurality of superimposed horizontal kilns for steam and having doors for closing their ends for confining said steam, a plurality of superimposed racks extending through each of said kilns for pallets of bricks, a frame for an elevator adjacent one of the ends of said kilns, an elevator vertically movably mounted on said frame for selective alignment with said racks, an electric motor for raising and lowering said elevator, an electric circuit for said motor, a valve controlled supply pipe line for steam connecting with each of said kilns, a valve controlled exhaust line for steam connecting with each of said kilns, means for closing and opening the doors of each kiln and including a control switch mounted on said frame, a bar mounted on said elevator for engaging said switches selectively for opening the doors of any one of said kilns while said elevator is adjacent said kiln, electric means for normally opening said supply pipe line to each kiln and normally closing said exhaust pipe line to each kiln and including a switch for each kiln for controlling said electric means for closing said supply pipe line thereof and opening said exhaust pipe line thereof, said second named switches being mounted on said frame, a bar on said elevator for engaging said second named switches for closing the supply pipe line and opening the exhaust pipe line of any one of said kilns while said elevator is adjacent said kiln, an electrically operated main valve for said supply pipe line, a shunt circuit and a reversing switch for reversing said motor for moving said elevator to starting position and having a switch section for controlling the closing of said main valve while said motor is reversed.

17. In a brick processing machine, a plurality of superimposed horizontal kilns, a plurality of superimposed racks extending through each of said kilns and having front ends for receiving pallets with bricks at the front ends of said kilns and having back ends for discharging pallets with bricks at the back ends of said kilns, elevators at the front and back ends of said kilns for selective alignment with said racks, means for supplying said elevator at the front ends of said kilns with a continuous supply of pallets with bricks, means for removing pallets with bricks from and as soon as they are deposited on said elevator at the back of said kilns, means for simultaneously moving said elevators from rack to rack of any one of said kilns for filling the racks thereof and controlled by counting means counting said pallets with bricks as they are supplied, and means for moving said pallets with bricks as they are supplied to said elevator at the front of said kilns towards and on to a rack aligned with said elevators in order to force pallets with bricks on said rack from the back end of said rack and on to said elevator at the back of said kilns.

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