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R. G. BARTRAM

3,280,725

STRAPPING MACHINE AND SYSTEM

Filed March 19, 1965

5 Sheets-Sheet 2

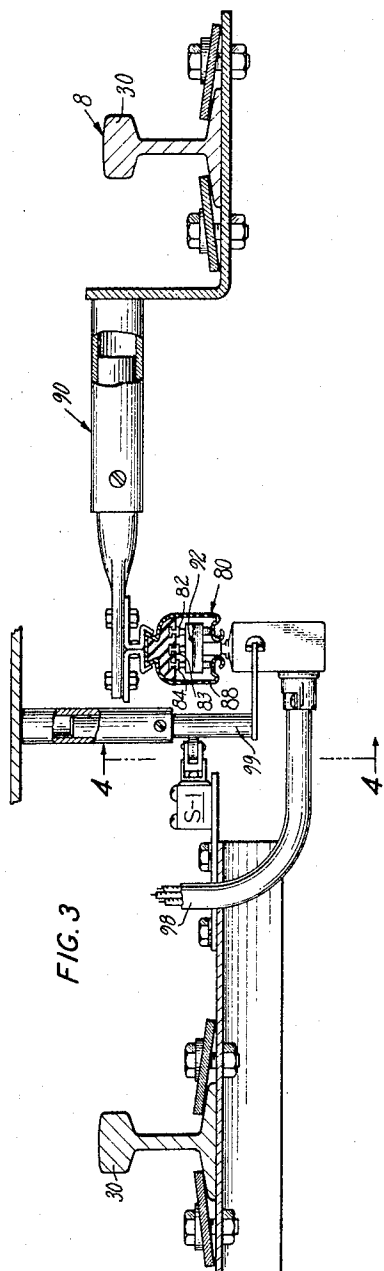


FIG. 3

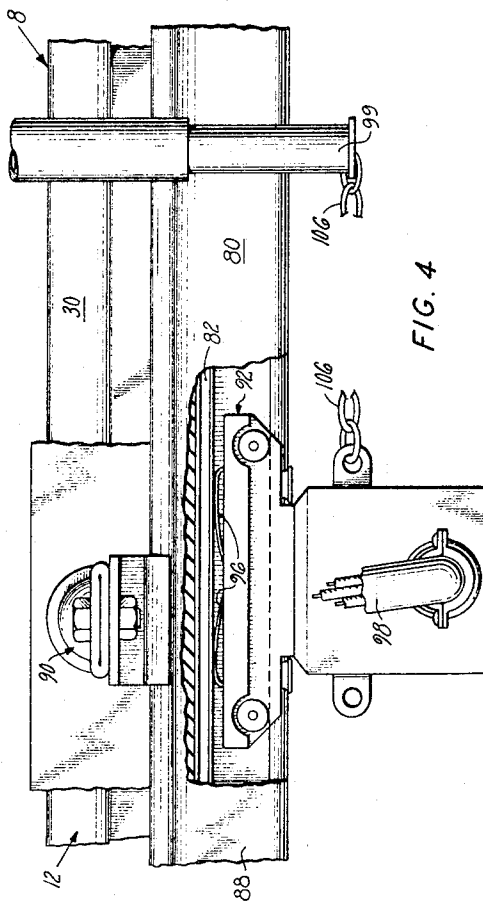


FIG. 4

INVENTOR.
RICHARD G. BARTRAM

BY
Lindsey, Putzman and Hayes
ATTORNEYS

Oct. 25, 1966

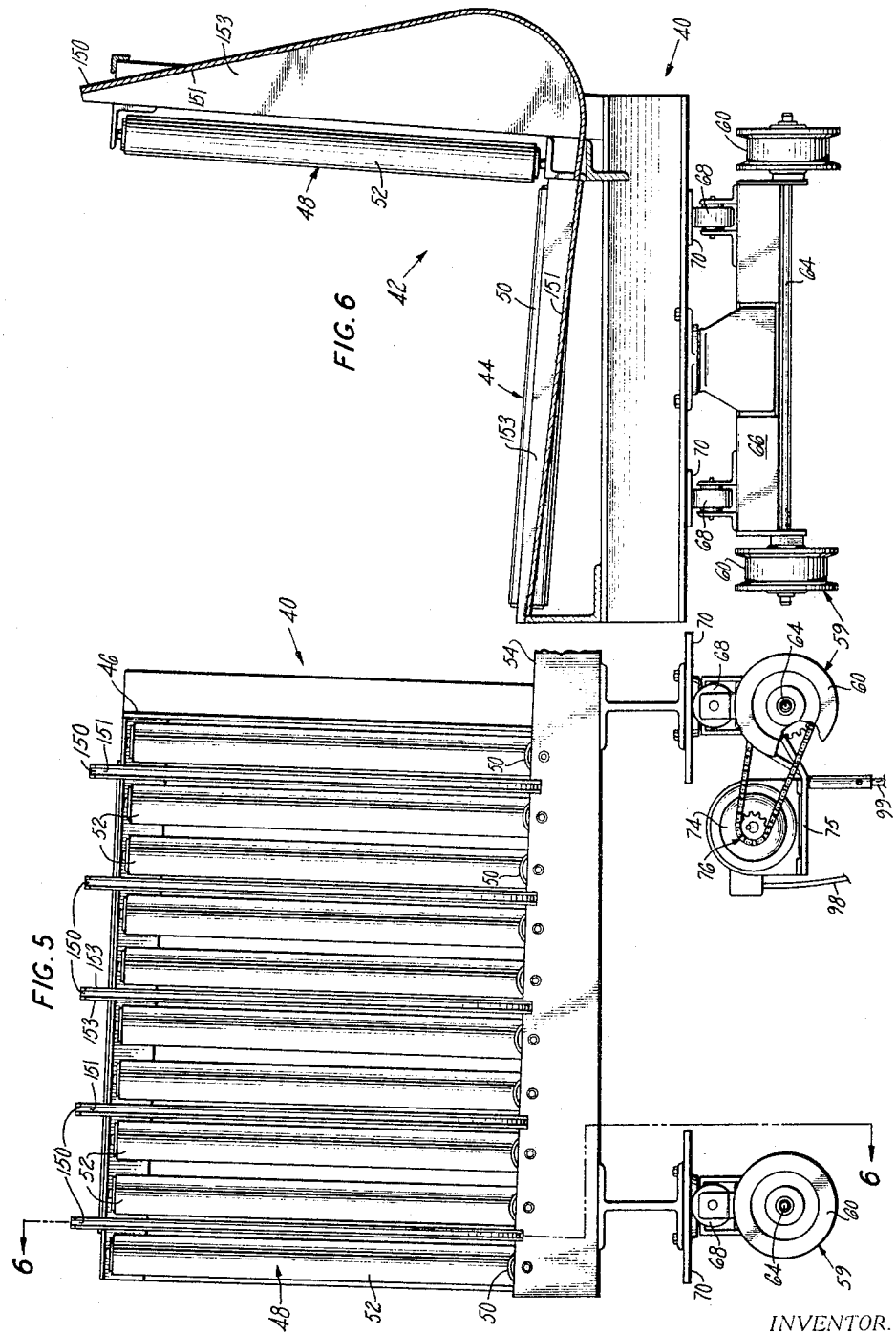
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RICHARD G. BARTRAM

BY
Lindsey, Prutzman and Hayes
ATTORNEYS

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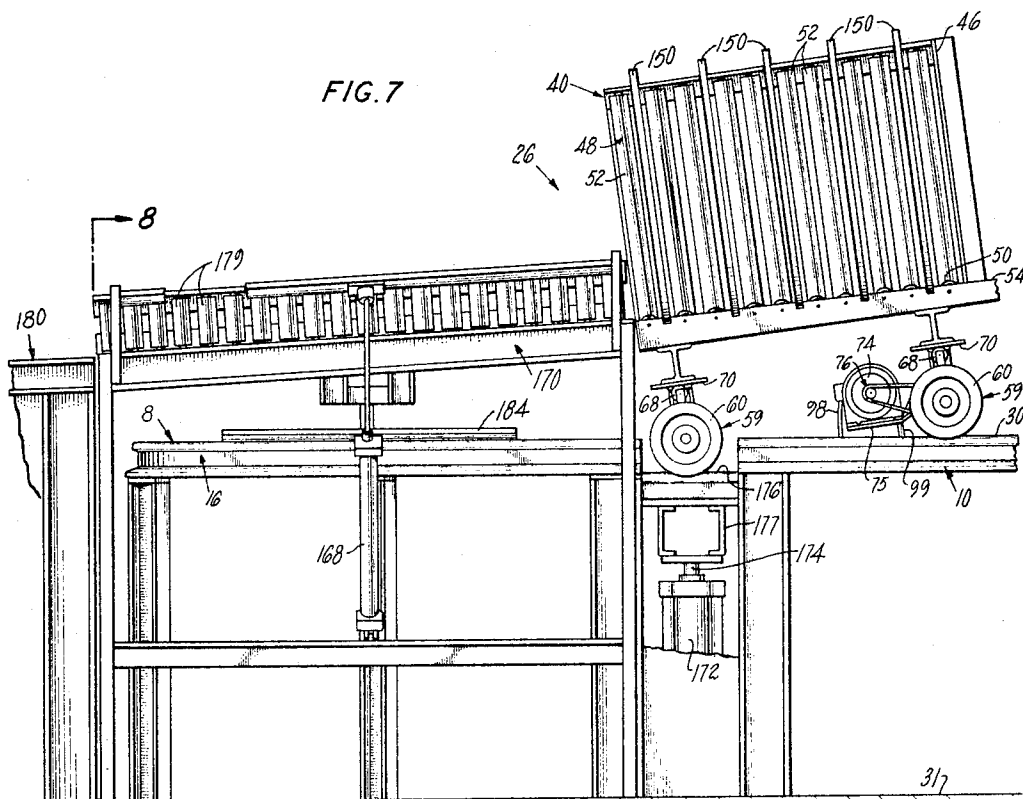
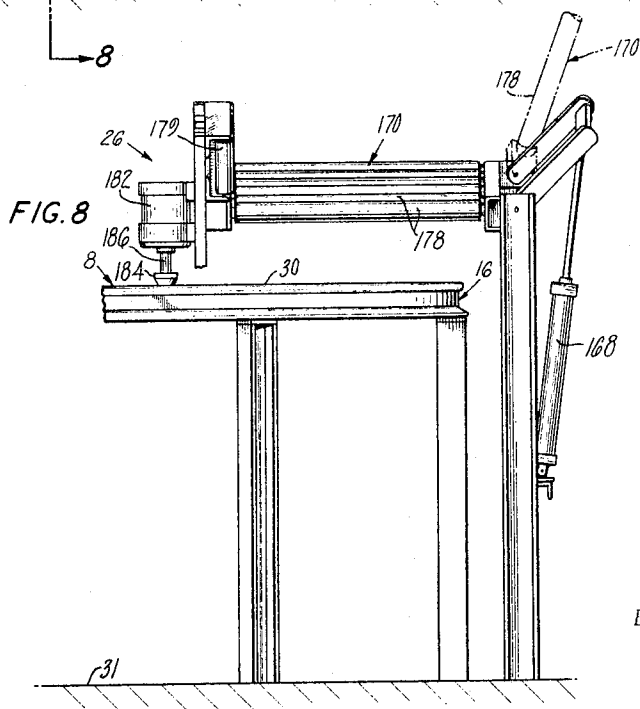
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5 Sheets-Sheet 4



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RICHARD G. BARTRAM

BY
Lindsey, Prutzman and Hayes
ATTORNEYS

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R. G. BARTRAM

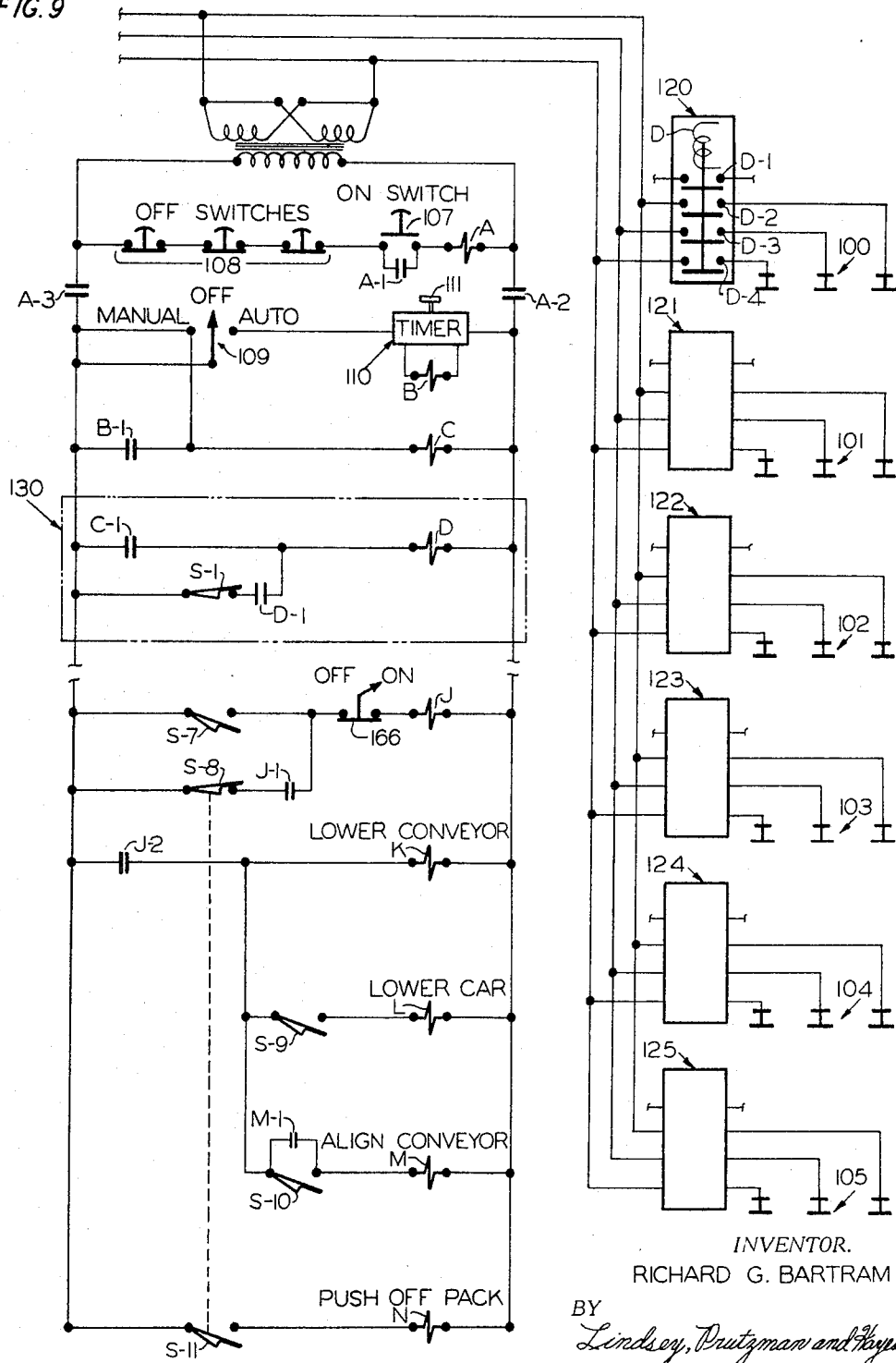
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5 Sheets-Sheet 5

FIG. 9



INVENTOR.
RICHARD G. BARTRAM
BY
Lindsey, Prutzman and Kaye
ATTORNEYS

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STRAPPING MACHINE AND SYSTEM

Richard G. Bartram, Harwinton, Conn., assignor to The Stanley Works, New Britain, Conn., a corporation of Connecticut

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9 Claims. (Cl. 100-4)

The present invention generally relates to a strapping machine and system of the type shown in U.S. Patent No. 3,095,678 of G. J. Cliff et al., dated July 2, 1963, and entitled "Article Stacking and Strapping Machine" and having notable utility in the hacking and packaging of bricks.

A principal object of the present invention is to provide a new and useful strapping machine and system which may be advantageously employed in the hacking and packaging of bricks.

Another object of the present invention is to provide an improved strapping machine and system which may be effectively employed in the hacking of a desired assortment of bricks and which thereby allows for hacking bricks into stacks having a particular blend, grade, color, texture, etc.

A further object of the present invention is to provide a new and useful strapping machine and system which requires a minimum amount of manual labor, which may be employed for efficiently handling and packaging bricks or other articles to be packaged in lots, and which may be automated to provide a predetermined optimum cycle of operation and an optimum time interval between the sequence of steps in the cycle.

Another object of the present invention is to provide a new and improved jig which is usable for efficiently stacking bricks or other articles into lots or packs of varying sizes, which functions to retain the stack of articles in closely packed association, which provides for packaging the pack with a suitable number of straps while the pack is supported in the jig, and which provides for convenient removal of the pack from the jig after it is packaged.

A still further object of the present invention is to provide a new and improved strapping machine and system having a jig car operable along a conveyor track for supporting bricks or other articles stacked thereon and for conveying the articles between working stations spaced along the track.

Another object of the present invention is to provide a new and advantageous method for stacking and packaging bricks or other articles in consolidated lots.

A further object of the present invention is to provide a strapping machine and system of the type described that is adapted to automatically unload the contents of the jig.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth, and the scope of the application of which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a plan view, partly broken away, of a machine installation incorporating an embodiment of a strapping machine and system of the present invention employed in the hacking and strapping of bricks, and showing jig cars of the machine in full lines at a plurality of hacking stations, at a strapping station and at a discharge station, and in broken lines at a standby station;

FIG. 2 is an elevation view of the machine installation of FIG. 1 showing a jig car in full lines at the strap-

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ping station and jig cars in broken lines at standby, hacking and discharge stations;

FIG. 3 is an enlarged fragmentary elevation section view, partly broken away and partly in section, taken substantially along line 3-3 of FIG. 2;

FIG. 4 is an enlarged fragmentary elevation section view, partly in section, taken substantially along line 4-4 of FIG. 3;

FIG. 5 is an enlarged longitudinal elevation view, partly broken away, of a jig car of the strapping machine;

FIG. 6 is a transverse elevation section view of the jig car taken substantially along line 6-6 of FIG. 5;

FIG. 7 is an enlarged fragmentary elevation view, partly broken away, of the machine installation of FIG. 1 showing a jig car at the discharge station;

FIG. 8 is a fragmentary transverse elevation section view taken substantially along line 8-8 of FIG. 7 showing a pivotal discharge conveyor section in part in broken lines in a withdrawn position and in full lines in an extended position; and

FIG. 9 is a schematic, partly broken away, of an electrical control system of the machine installation of FIG. 1.

Referring now to the drawings in detail wherein like numbers represent like parts, an embodiment of the strapping machine and system of the present invention is shown employed in the hacking and packaging of bricks, and as being provided with an endless elongated track or conveyor 8 of generally race track shape having straight track portions 10, 12 and intermediate connecting semicircular track portions 14, 16. The machine is further shown with three hacking or loading stations 18, 20 and 22, an auxiliary strapping or standby station 23, a strapping station 24 and an unloading or discharge station 26 positioned in sequence along the track, and with three hacking stations shown positioned along the straight track portion 10, with the standby and strapping stations shown positioned along the straight track portion 12 and with the discharge station shown positioned adjacent the junction of the track portions 10, 16.

The endless track 8 is provided with two parallel rails 30 that are suitably supported above the floor 31 of the machine installation, as best seen in FIG. 2, to provide sufficient space for kiln or brick supply cars 32, which are mounted on suitable tracks 34 having rails shown embedded within the floor 31, to pass freely under the track 8 when empty. A raised platform 35 extending along the straight track portion 10 is supported to similarly clear the kiln cars 32, and the tracks 34 are shown extending transversely of the track 8 at the hacking stations 18, 20, 22. Accordingly, the kiln cars can be moved forwardly beneath the raised platform 35 and beneath the raised track 8 as they are manually unloaded, and when fully unloaded the kiln cars can be withdrawn to clear the tracks at the hacking stations for succeeding cars. A raised platform 36 is also provided at the strapping station for the strapping station operator, and the raised platform 35 may be provided with lower platform portions 37 intermediate the kiln car tracks to enable the hacker to stand at a lower level when such facilitates the hacking operation. Also, although one hacker is shown at each of the hacking stations, two or more hackers could be employed at each station when the output of the machine is increased, or only one or two of the hacking stations could be manned when the machine is operated at a reduced rate of output.

Hacking or jig cars 40 mounted on the endless track 8 are shown in FIG. 1 positioned on the track at the hacking, standby, strapping, and discharge stations. These jig cars as best seen in FIGS. 5 and 6 are provided with a jig 42 for receiving the bricks loaded thereon by the hackers at the hacking stations. Each jig 42 includes a

bed or base 44 and a front end wall 46 and side wall 48 which extend at right angles to each other and generally upwardly from and normal to the bed 44. The bed 44 is inclined downwardly from the horizontal, preferably approximately 4°, toward the side wall 48 and toward the front wall 46. The bricks are hacked onto the jigs 42 against the rigid side and front walls of the jig, and accordingly the force of gravity will aid in consolidating the bricks and in maintaining them in closely packed association.

The jig car bed 44 is formed by transversely extending rollers 50 and the side wall 48 is formed by similar generally upright rollers 52 whose axes extend normal to the axes of the rollers 50, and which together assist in supporting the bricks on the jig car in closely packed association in a boxlike form by aiding the gravitational displacement of the bricks toward the low corner of the jig bed. Also, as the rollers 50, 52 form a bed and side wall with discontinuous supporting surfaces, the jig provides for removal of extraneous material through the openings intermediate the rollers for self-cleaning.

The jig cars are also provided with auxiliary trays or hoppers 54, shown positioned forwardly of the front end wall 46, which are usable for receiving culls or other somewhat irregular bricks which are not to be included in the lots of bricks being loaded onto the jig 42. The culls or irregular bricks may be subsequently removed from the jig car, for example at the strapping station.

The jig cars are provided with leading and trailing swiveling trucks 59 having wheels 60 mounted upon axles 64 and supported on underframes 66 of the trucks 59. For providing lateral support of the jig 42, support rolls 68 are mounted on the underframes 66 adjacent to the ends thereof and suitable bearing plates 70 are mounted on the underside of the jig 42. Thus, as the trucks 59 swivel relative to the jig cars, the support rolls 68 travel along the bearing plates 70 to maintain the lateral support of the jig. The jig car wheels 60 are shown flanged to guide the jig cars along the track 8; however, a lead wheel or roll (not shown) may be provided on the lead underframe of each car for assisting in steering the car around the endless track.

Each jig car is driven, counterclockwise about the track as seen in FIG. 1, by an electric motor of a suitable motor-brake unit 74 shown mounted on the lead underframe 66 of the jig car by a support 75. The support 75 is shown mounted adjacent to the outboard wheel 60 and the motor is shown connected for driving the outboard wheel 60, as by a chain and sprocket connection 76. Also, the brake of the motor-brake unit 74 is employed for automatically braking the jig car when the motor is de-energized and to thereby prevent overtravel or coasting of the jig car.

Referring to FIGS. 3, 4 and 5, the jig car motors are energized by a bus-way 80 mounted along the track 8 centrally between the rails 30, and as the motors are preferably three-phase, the bus-way 80 is shown to include three electrical bus-bars or conductors 82-84 which are suitably mounted in spaced parallel relationship and, as shown in FIG. 3, encased within a housing 88. The bus-way 80 is mounted between the track rails 30 by supports 90 (FIG. 3) and a trolley 92 is supported within the casing 88 to provide electrical connection with the conductors 82-84, for which purpose the trolley is provided with three elongated laterally spaced contacts 96 which resiliently engage the conductors respectively. Electrical leads 98 provide for connecting the contacts 96 with the electrical drive motor, and the trolley is towed by the jig car by a link chain 106 connected to the outer end of an arm fixed to the lower end of a post 99 depending from the support 75.

In the shown embodiment, the bus-way 80 is divided into six separate bus-way control sections 100-105 (shown schematically in FIG. 9) which are associated with the aforementioned hacking, standby, strapping and discharge

stations, respectively. The bus-way sections are preferably collectively energized so that the jig car motors are similarly collectively energized to simultaneously index the jig cars to succeeding stations. However, in the shown embodiment the bus-way sections are independently de-energized as each jig car reaches the next station in the sequence, thus ensuring that each car is accurately indexed to the succeeding station even where the track distances between successive stations and the speed of the jig cars vary.

Referring particularly to FIG. 9, a partial schematic of the electrical control system of the installation is shown with a master ON switch 107 and OFF switches 108 which are preferably located for operation by the operators at the strapping and hacking stations. The ON switch 107 when pressed energizes a solenoid A to close the switches A-1, A-2 and A-3 and thereby energize the control system, and a MANUAL-OFF-AUTO selector switch 109 is provided for selecting automatic or manual operation of the control system. With the selector switch 109 in the AUTO position a timer 110 provides for periodically energizing a solenoid B which through a switch B-1 periodically energizes a solenoid C. Alternatively, the selector switch 109 may be manually placed in the MANUAL position to momentarily energize the solenoid C as desired, and for this reason the selector switch is preferably spring loaded from its MANUAL position to its OFF position. Also, the timer 110 is preferably made adjustable, as by a knob 111, to adjust the time cycle of the solenoid B when the selector switch 109 is in its AUTO position.

The six bus-way sections 100-105 are shown diagrammatically in FIG. 9 with relays 120-125, respectively, for energizing the bus-way sections. For simplicity of illustration, however, the electrical control circuit for the bus-way section 100 which includes the relay 120 and a circuit, generally denoted by the numeral 130, is shown in FIG. 9, and it is to be understood that similar electrical control circuits are provided for controlling the bus-way sections 101-105. The electrical circuit 130 includes a switch C-1 which is operated by the solenoid C to energize a solenoid D. The solenoid D in turn operates a holding switch D-1 to hold the solenoid D energized and switches D-2, D-3, D-4 to energize the bus-way section 110. The solenoid D is de-energized to de-energize the bus-way section 100 by a switch S-1 which is provided at the station associated with the bus-way section 100 and which is actuated by a jig car to de-energize the bus-way section 100 when the jig car reaches that station. In the shown embodiment the switch S-1 is actuated by the depending post 99 of the jig car as seen in FIG. 3.

Thus, with the selector switch 109 in the AUTO position the jig cars are periodically indexed to succeeding stations along the track and the electrical control system provides for automatically de-energizing the jig car motors when the jig cars reach succeeding stations. The jig cars are thereafter retained at the stations by the automatic brake mechanism of the motor-brake combination until the bus-way sections are subsequently energized. With manual operation of the selector switch 109 the jig cars are indexed at intervals determined by the operation of the switch, and the jig car motors are automatically de-energized as in the fully automatic operation. With automatic operation, the timer can be adjusted to provide an optimum time interval in accordance with the number and speed of the hackers and the size of the stack of bricks to be hacked. Accordingly, the system can be adjusted to pace the hackers and so that each of the hackers is able to load a proportional quantity of bricks onto each jig car and to thereby form a blend from the kiln cars. Additionally, with the jig car construction, which it is to be noted is equally usable for hacking bricks into lots less than the maximum capacity of the jig, and with an electrical control system of the type

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described, the machine may be effectively used for hacking bricks on the jig cars with any number of hackers and for forming lots of any desired size or blend.

In accordance with one of the features of the strapping machine and system of the present invention, the bricks loaded on the jig cars at the hacking stations are strapped to provide a secure package of bricks while they are still compactly retained in a boxlike pack in the jigs. For this reason, the jig cars are provided with a plurality of strap chutes 150 which extend partially around the jigs and which, as seen in FIG. 5, are positioned longitudinally intermediate the rollers 50, 52 forming the bed and the side wall of the jig, for which purpose the discontinuous bed and side wall construction is of additional utility. Each of the strap chutes 150 has an inner wall 151 which functions to guide a strap around the far side and the bottom of the pack of bricks consolidated in the jig and a pair of side walls 153 for retaining the strap for subsequent withdrawal into contact with the bricks when the strap is drawn taut about the stack. Thus, when the jig car reaches the strapping station 24, straps can be readily applied to the pack of bricks on the jig car. Also, where desired the standby station could be outfitted to provide an auxiliary strapping station for use during high capacity operation of the machine.

For applying straps to the stack of bricks, a conventional strapping tool 154 is shown pivotally mounted by an arm 156 above the track at the strapping station and is thereby adapted for selective alignment with the chutes 150. In a well-known manner the operator at the strapping station can operate the strapping tool 154 to feed a strap into the upper end of the chute 150 which then directs the strap around the far side and bottom of the pack of bricks on the jig car. The operator then forms a loop of strap about the bricks, tensions and seals the loop and shears the sealed loop from the remaining strap all in a well-known manner. The strapping tool 154 may then be moved into alignment with the adjacent chute and in a similar manner the operator can affix an additional tensioned loop of strap about the bricks. The pack of bricks in each jig car can thereby be properly packaged and, if desired, securely packaged without the use of protective material along the corners of the pack or between the layers of bricks and/or under and over the pack, in which instance it is preferred that the longitudinal distance between the chutes 150 is approximately equal to the length of the shortest brick which may be packaged with the installation, and that the forward chute 150 be a distance from the front end wall 46 which is approximately equal to one-half the length of the usual brick size. Such spacing of the chutes allows for securely retaining all the bricks within a single package by properly aligning the corner bricks of the package lengthwise of the jig car and by properly stacking the bricks within the intermediate layers in the pack. Also, by stacking all the bricks within the pack lengthwise of the jig car, unitized sections of bricks can be independently formed and can thereafter be independently handled as desired, in which case the usual protective corner material may be employed to retain the brick sections together until separated by severing the corner material.

The strapping system and machine may also be conveniently used where platens are desired for supporting each pack of bricks for convenience of handling, in which instance the hacker at the initial loading station 18 could place a platen on each jig bed before the jigs loaded. Also, filler material between courses and rigid corner protectors could be conveniently employed in the brick packaging process as necessary.

Referring to FIGS. 1, 7, 8 and 9, the packaged bricks on the jig car may be automatically unloaded at the unloading or discharge station, which as previously indicated is located adjacent the junction of the semicircular track portion 16 and the straight track portion 10. The electrical control system is provided with an ON-OFF

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switch 166 which is placed in its ON position to provide for automatic unloading of the jig car. When the jig car reaches the discharge station an unloading cycle, switch S-7 is momentarily closed, as for example in conjunction with the actuation of the switch (not shown) for the bus-way section associated with the discharge station and which is thereby actuated by the jig car reaching the discharge station as described in conjunction with the description of the actuation of the switch S-1. Accordingly, switch S-7 momentarily energizes solenoid J which operates a holding switch J-1 to maintain the solenoid J energized and operates a switch J-2 to energize a solenoid K. The solenoid K provides for operating a suitable valve (not shown) for controlling a pneumatic cylinder 168 (FIG. 8) to pivot a discharge roller conveyor section 170 from a raised withdrawn position, shown in part with broken lines in FIG. 8, to an extended position in overlying association with the semicircular track portion 16 and in longitudinal alignment with and rearwardly of the bed 44 of the jig car at the discharge station. Upon reaching this extended position the discharge conveyor section 170 actuates a suitable microswitch S-9 to energize a solenoid L which operates a suitable valve (not shown) for lowering the rear wheels of the jig car at the discharge station with a pneumatic cylinder 172. For this purpose, the piston rod 174 of the pneumatic cylinder 172 is connected through a suitable supporting structure 177 to a vertically reciprocable track section 176 which is located to support the rear wheels of the jig car at the discharge station. The package of bricks within the jig car is thereby adapted to be conveyed by gravity onto the pivotal discharge conveyor section 170 by the rollers 50, 52 forming the bed and side wall of the jig. Alternatively, the side wall could be formed without rollers and the rollers 50 forming the bed 44 could be positioned with their axes inclined slightly forwardly from a normal from the side wall whereby the package will be laterally withdrawn from the side wall as its moves rearwardly on the bed.

The pivotal discharge conveyor section 170 is initially lowered so that its lead end is positioned for alignment with the lowered rear end of the jig car bed, and the supporting rollers 178 of the discharge section are in this position of the conveyor section transversely inclined for alignment with the supporting rollers 50 of the jig car bed. Due to this transverse inclination of the supporting rollers 178, the pivotal discharge conveyor section 170 is provided with side rollers 179 on its low side which laterally support the package of bricks as the package is conveyed by gravity along the pivotal discharge conveyor section. For subsequently aligning the pivotal conveyor section 170 with a stationary discharge roller conveyor section 180 having horizontally extending rollers 181, the conveyor section 170 is raised slightly into alignment with the stationary conveyor section 180 by a pneumatic cylinder 182, for which purpose a suitable micro switch S-10 is provided for operation by the brick package as it travels by gravity along the pivotal discharge conveyor section 170. The micro switch S-10 energizes a solenoid M which operates a holding switch M-1 and a suitable valve (not shown) for operating the pneumatic cylinder 182. A lateral structural support 184 is fixed to the outer end of the piston rod 186 of the pneumatic cylinder 182 for engagement with the rails 30 of the track 8 to support the pivotal discharge conveyor section in overlying relationship with the track and to provide a support for raising the pivotal discharge conveyor section into alignment with the stationary discharge conveyor section 180. Alternatively, the pivotal discharge conveyor section 170 could be constructed with a gradually changing inclination of the rollers 178 for simultaneous alignment of its leading roller with the bed of the jig car and alignment of its trailing roller with the stationary discharge conveyor portion 180.

Finally, the brick package travels down the stationary discharge conveyor section 180 into engagement with a

stop 190 where the package is cushioned by suitable springs 192. Thereupon the package actuates a micro switch S-11 to energize a solenoid N which operates a suitable valve (not shown) to cycle a pneumatic cylinder 194 and thereby push the package laterally onto a terminal conveyor 196. Also, a micro switch S-8 is actuated with the micro switch S-11 to de-energize the solenoid J and thereby de-energize the solenoids K, L, M, and through the valves operated by these solenoids return the track section 176 into alignment with the remaining track, withdraw the pivotal discharge conveyor section 170 from overlying association with the track 8, and withdraw the transverse support 184 with the air cylinder 182 for the succeeding automatic discharge cycle.

Thus, it can be seen that the strapping machine and system of the present invention provides for efficiently hacking bricks or other articles into a consolidated pack onto a jig, for packaging the articles while they are consolidated in the jig and for automatically unloading the package from the jig. Additionally, the machine provides for automatically or manually establishing an optimum time interval between the sequence of operations in the machine cycle and for accurately indexing the jigs to succeeding stations along the jig conveyor. Further, the strapping machine and system provides for using an optimum number of operators for each rate of output and for loading a simple or complex blend of bricks on each jig.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

I claim:

1. A loading system comprising a conveyor track, a plurality of loading jigs operative along the track having individual electrical drive motors for independently driving the jigs along the track, a plurality of working stations arranged in succession along the track, and an electrical bus-way along the track having bus-way control sections associated with said stations respectively, the jigs having means providing electrical connection of the drive motors with the electrical bus-way, and electrical control means having means for collectively energizing the bus-way control sections for indexing the jigs to successive stations and for de-energizing the bus-way control sections for individually de-energizing the jig drive motors when the jigs reach the successive stations.

2. A loading and strapping system comprising an endless conveyor track, a plurality of loading jig cars operative along the endless track having individual electrical drive motors for independently driving the jig cars along the track; a plurality of loading stations, a strapping station, and a discharge station arranged in succession along the endless track; and an electrical bus-way along the track having bus-way control sections associated with said stations respectively, the jig cars having means providing electrical connection of the drive motors with the electrical bus-way, and electrical control means having means collectively energizing the bus-way control sections at predetermined timed intervals and switch means associated with said stations and operable by the jig cars for independently de-energizing the bus-way control sections as the jig cars reach the stations associated therewith respectively.

3. In an automatic brick hacking and strapping system having an endless conveyor, a plurality of working stations including a discharge station arranged in succession along the conveyor, and hacking jigs for receiving bricks hacked in lots thereon for packaging, said jigs being adapted to be periodically indexed along the conveyor to successive stations, the improvement wherein the hacking jig has a bed formed by transversely extending rollers, a first longitudinally extending generally upright side wall formed by generally upright rollers, and a second trans-

versely extending generally upright end wall; said side and end walls being substantially normal to each other and to the bed, said bed being longitudinally and transversely inclined from the horizontal downwardly toward said side and end walls, said jig having longitudinally spaced transversely extending strap chutes intermediate and outwardly of the rollers of the bed and side wall for guiding straps around a side and the bottom of the jig; wherein the plurality of stations includes a strapping station where strapping is fed through the strap chutes of the jig and is tensioned and sealed to package the bricks hacked onto the bed of the jig against the side and end walls; and wherein the hacking and strapping system further comprises means for automatically reversing the longitudinal inclination of the jig bed of the hacking jig at the discharge station and thereby cause a brick package on the jig to be automatically conveyed by the rollers forming the bed off the jig, and a discharge conveyor at the discharge station adapted for receiving the brick package as it is automatically conveyed off the bed.

4. In an automatic brick hacking and strapping system having an elongated endless conveyor, a plurality of working stations including a discharge station arranged in succession along the conveyor, and hacking jigs for receiving bricks hacked in lots thereon for packaging, said jigs being adapted to be periodically indexed along the conveyor to successive stations, the improvement wherein the hacking jig has a bed formed by transversely extending generally parallel rollers, a first longitudinally extending generally upright side wall, and a second transversely extending generally upright end wall, said side and end walls being substantially normal to each other and to the bed, said bed being inclined from the horizontal downward toward at least one of said walls to gravitationally retain the bricks on the bed and against said one wall, said jig having longitudinally spaced transversely extending strap chutes for guiding straps around a side and the bottom of the jig, said side wall being longitudinally discontinuous to provide openings for receiving the straps in the chutes as they are withdrawn from the chutes for packaging the lot of bricks hacked onto the jig, and said chutes being intermediate and outwardly of the rollers forming the bed and the openings in the side wall; wherein the plurality of working stations includes a strapping station where strapping is fed through the strap chutes of the jig and is tensioned and sealed to package the bricks hacked onto the bed of the jig against the side and end walls; and wherein the hacking and strapping system further comprises means for automatically reversing the inclination of the jig bed of the hacking jig at the discharge station and thereby cause a package on the jig to be automatically conveyed by the rollers forming the bed off the jig, and a discharge conveyor at the discharge station adapted for receiving the package as it is conveyed off the jig bed.

5. In an automatic brick hacking and strapping system having an elongated endless conveyor, a plurality of working stations including a discharge station in succession along the conveyor, and hacking jigs for receiving bricks hacked into lots thereon for packaging, said jigs being adapted to be periodically indexed along the conveyor to successive stations, the improvement wherein the hacking jig has a bed formed by transversely extending rollers, a first longitudinally extending generally upright side wall and a second transversely extending generally upright end wall, said bed being longitudinally and transversely inclined from the horizontal downwardly toward said side and end walls to provide a low corner on the bed, said jig having longitudinally spaced transversely extending chutes intermediate and outwardly of the rollers of the bed and outwardly of the first wall for guiding straps around a side and bottom of the jig, said side wall being discontinuous to provide openings for receiving the strap as it is withdrawn from the chutes for packaging the lot of bricks hacked onto the jig; wherein the plurality

of stations includes a strapping station along the track where strapping is fed through the strap chutes of the jig and is tensioned and sealed to package the bricks hacked onto the bed of the jig and against the side and end walls; and wherein the hacking and strapping system further comprises means for automatically reversing the longitudinal inclination of the jig bed of the hacking jig at the discharge station to cause the package of bricks on the jig to be conveyed by the rollers forming the bed off the jig, and a discharge conveyor at the discharge station adapted for receiving the package as it is conveyed off the jig bed.

6. A brick hacking and strapping system comprising an endless conveyor track, a plurality of hacking jig cars on the endless track having individual motor brake units with electrical drive motors for driving the jig cars and brakes for braking the jig cars when the motors are de-energized; a plurality of hacking stations, a strapping station and a discharge station arranged in succession along the endless track; supply car tracks extending transversely below the endless track at the hacking stations and supply cars adapted to be advanced along the supply car tracks forwardly to the hacking stations for hacking from the supply cars onto the jig cars and forwardly from the hacking stations for withdrawing the supply cars after they have been unloaded, operator platform means at the hacking stations, an electrical bus-way along the track having bus-way control sections associated with said stations respectively, the jig cars having means providing electrical connection of the drive motors with the electrical bus-way, electrical control means having means for energizing the bus-way control sections for indexing the jig cars to successive stations and for independently de-energizing the jig car motors as the jig cars reach the successive stations, and means operated by the electrical control means for automatically unloading the jig cars at the discharge station.

7. The brick hacking and strapping system of claim 6 wherein the jig cars have a jig bed formed by transversely extending rollers, a first longitudinally extending generally upright side wall, and a second transversely extending generally upright end wall, said bed being inclined from the horizontal to provide a downward longitudinal inclination of the bed toward said end wall and a downward transverse inclination toward said side wall, and wherein the means for automatically unloading the jig car at the discharge station comprises a discharge conveyor section pivotally mounted between a first position withdrawn from the endless track and a second position in overlying relationship with the endless track and with its leading end adjacent to and in longitudinal alignment with the bed of the jig car at the discharge station, means for lowering a track section at the discharge station for lowering the wheels of the jig car at the end of the jig car adjacent to said pivotal discharge conveyor section and opposite said end wall to reverse the longitudinal inclination of the bed, said leading end of the pivotal discharge conveyor section in said second position being transversely aligned with the transversely inclined bed, and a stationary discharge conveyor section positioned for cooperative association with the pivotal discharge conveyor section in a pivotal position thereof intermedi-

ate its first and second pivotal positions, and motor means for lowering said track section, for pivoting said discharge conveyor section between its first and second positions and to said intermediate position; and wherein said electrical control means is adapted to automatically operate said motor means to discharge the brick package from the jig onto the discharge conveyor.

8. In a loading and strapping system comprising an elongated endless conveyor, a plurality of loading stations, a strapping station, and a discharge station arranged in succession along the elongated conveyor, and a plurality of jigs for receiving articles stacked in lots thereon for packaging, said jigs being adapted to be indexed along the conveyor to successive stations, the improvement wherein the jig has a bed formed by generally parallel rollers, a first longitudinally extending generally upright side wall, and a second transversely extending generally upright end wall, said side and end walls being substantially normal to each other and to the bed, said bed being inclined from the horizontal downwardly toward at least one of said walls to gravitationally retain the stacked articles on the bed and against said one wall, the axis of the rollers forming the jig bed extending generally normal to said one wall, and said jig further having parallel strap chutes extending parallel to and generally between the rollers of the jig bed for guiding straps around and thereby for packaging the articles stacked on the jig bed, and wherein the loading and strapping system further comprises means for automatically reversing the inclination of the bed of the jig at the discharge station to cause the packaged articles on the jig to be conveyed by the rollers forming the bed off the jig.

9. A brick hacking jig car adapted for longitudinal movement along a track comprising a longitudinal extending bed formed by transversely extending rollers, a first longitudinally extending generally upright side wall formed by generally upright rollers, and a second transversely extending generally upright end wall; said side and end walls being substantially normal to each other and to the bed, said bed being longitudinally and transversely inclined from the horizontal downwardly toward said side and end walls, and said jig having longitudinally spaced transversely extending strap chutes intermediate and outwardly of the rollers of the bed and side wall for guiding straps around a side and the bottom of the jig.

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WALTER A. SCHEEL, *Primary Examiner.*

BILLY J. WILHITE, *Examiner.*