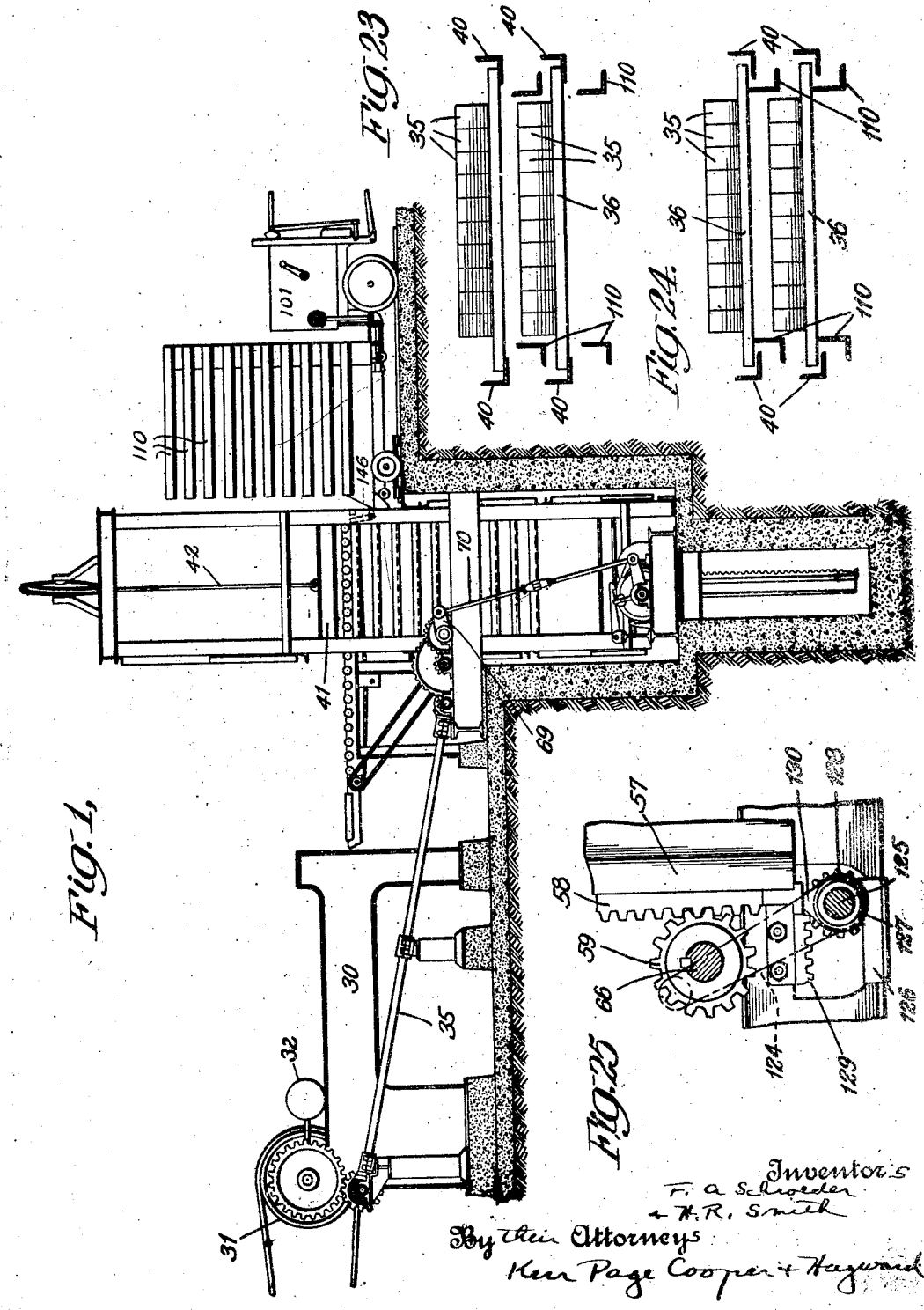
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BRICK HANDLING MACHINE

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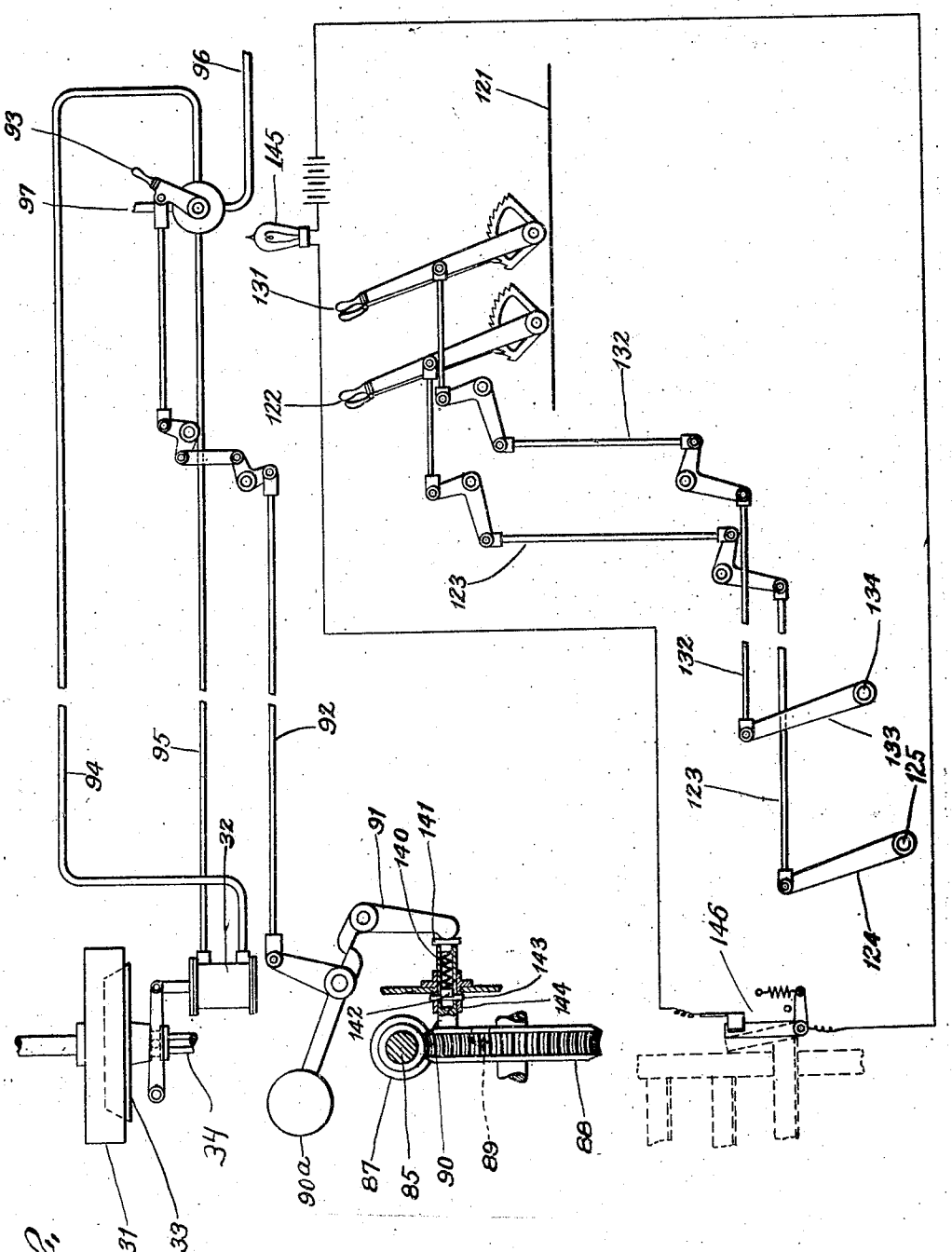


FIG. 2.

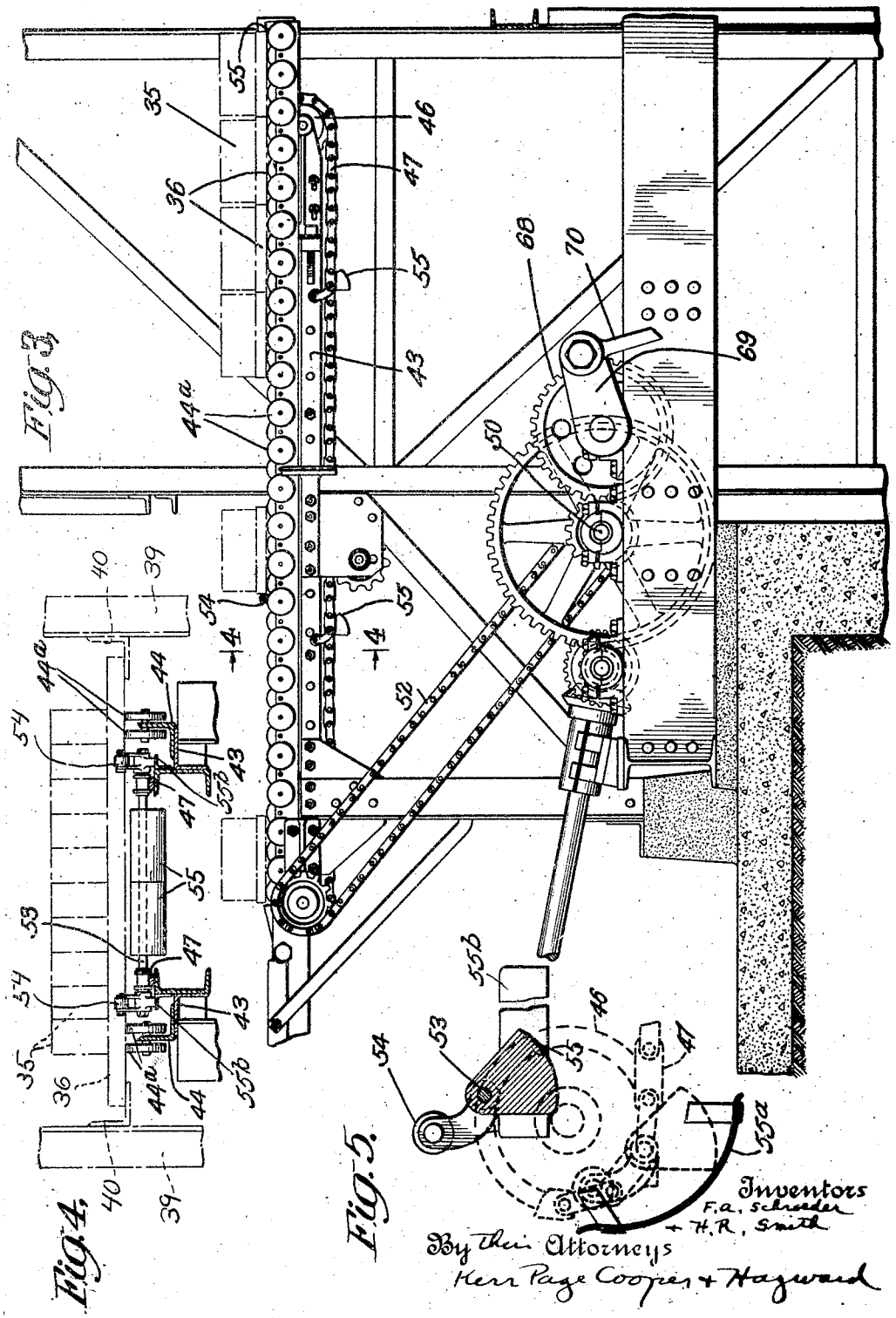
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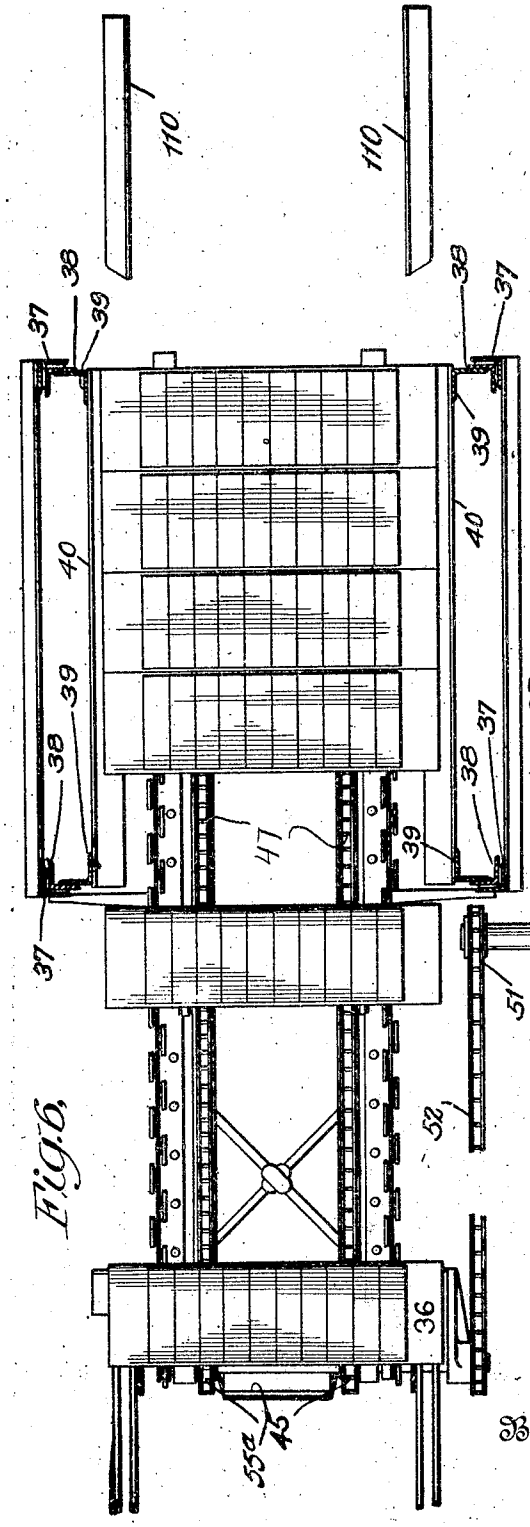


Fig. 6.

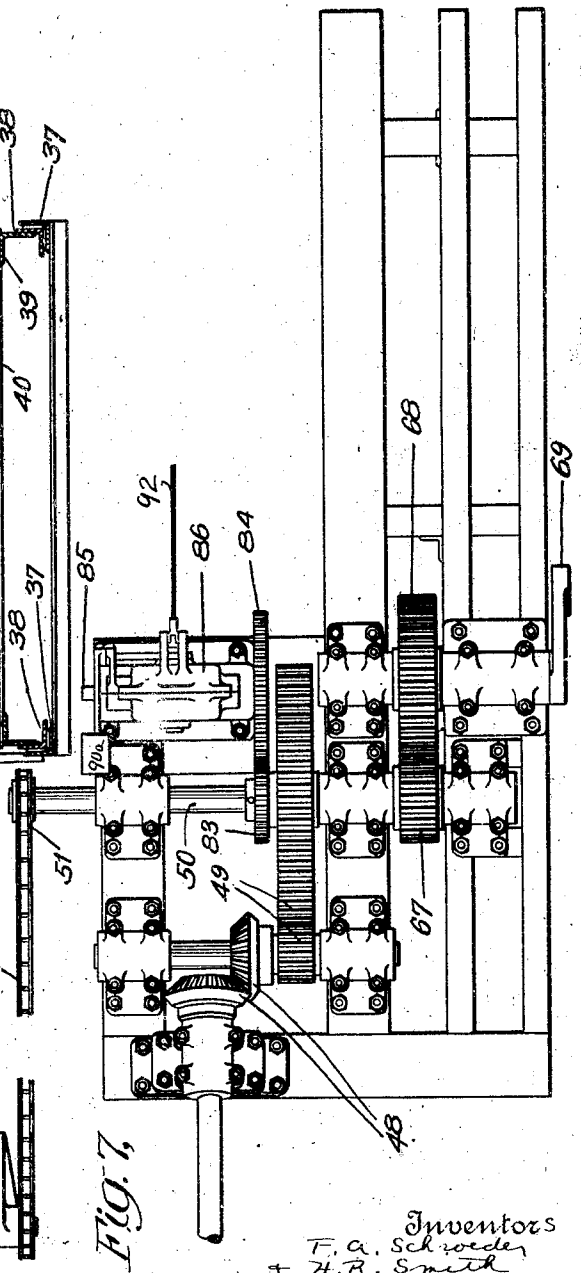


Fig. 7.

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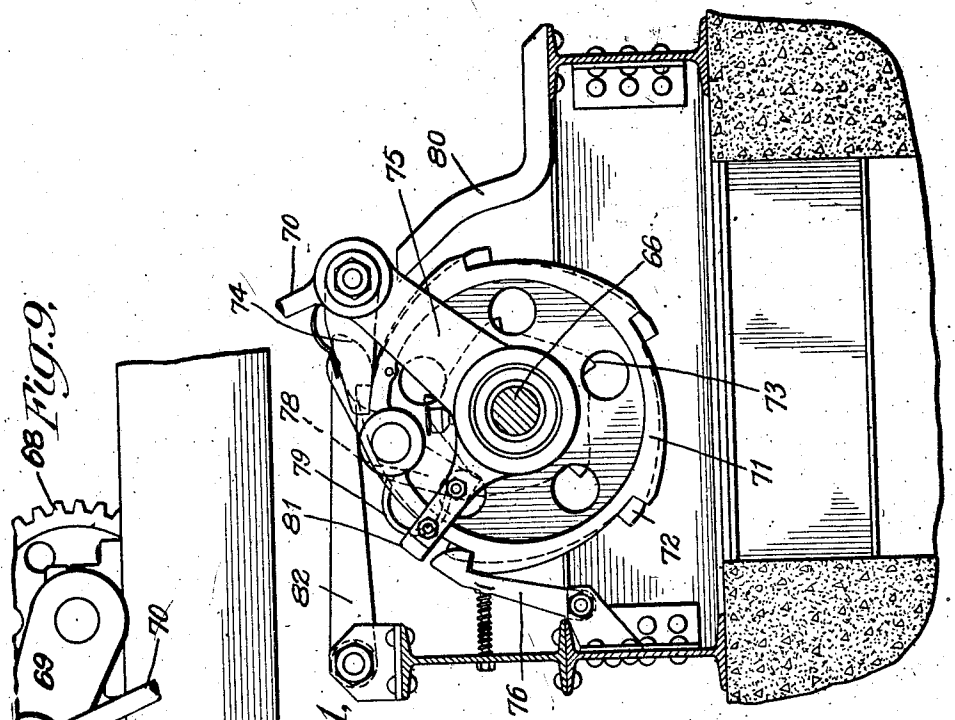


Fig. 9.

Fig. 11.

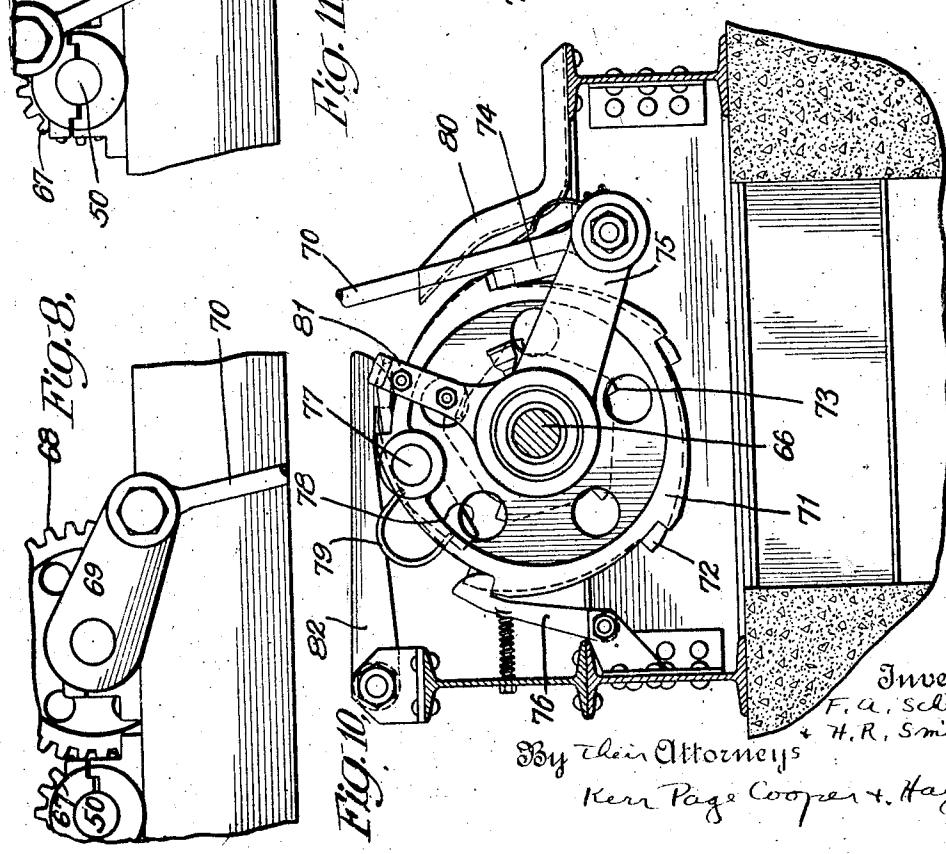


Fig. 8.

Fig. 10.

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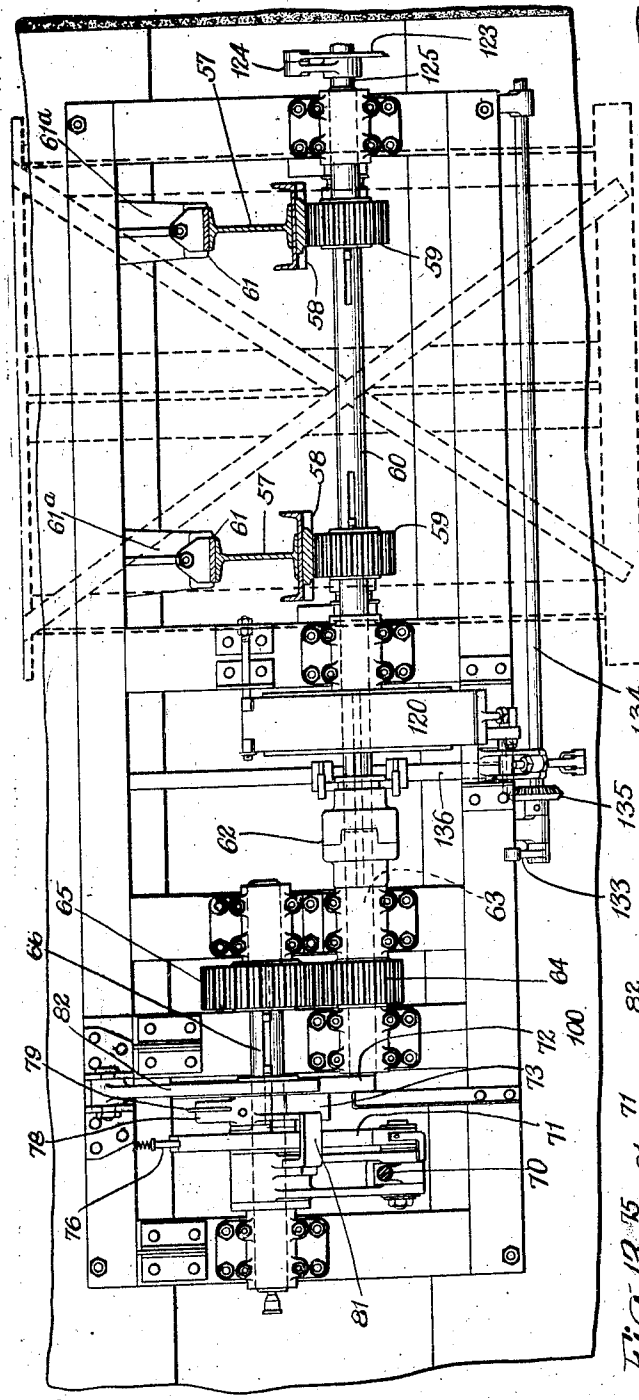


Fig. 12.

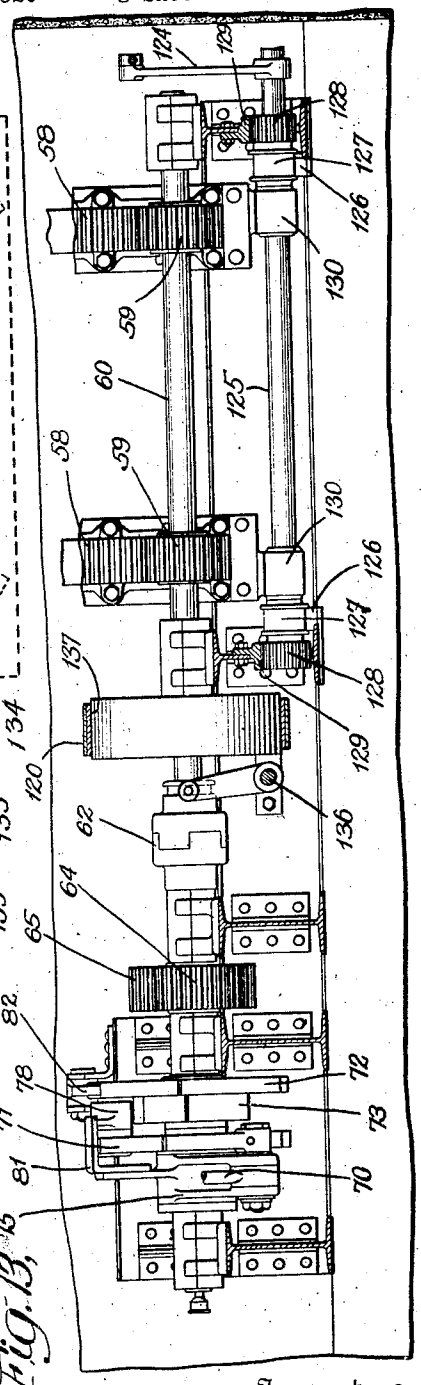


Fig. 13.

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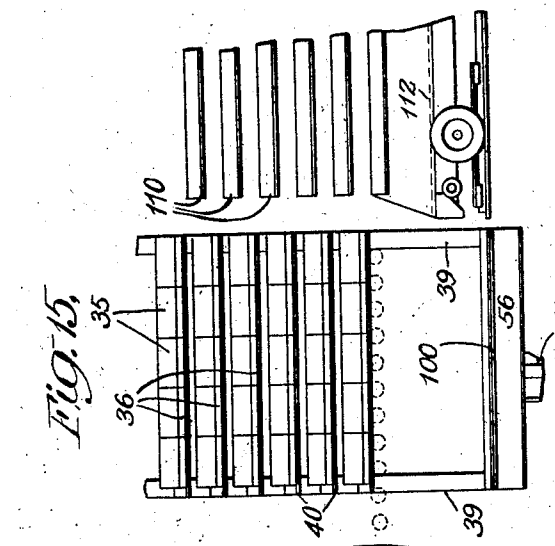


Fig. 15.

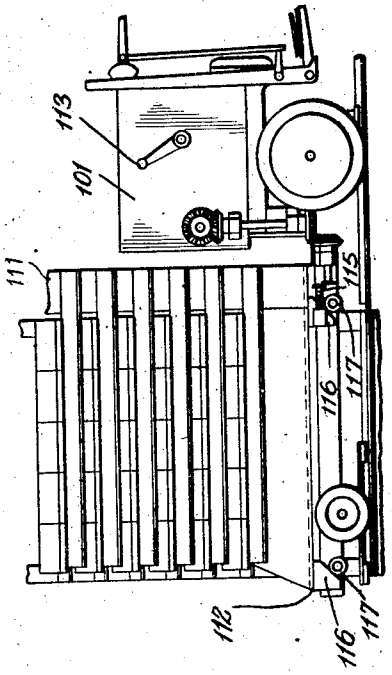


Fig. 17.

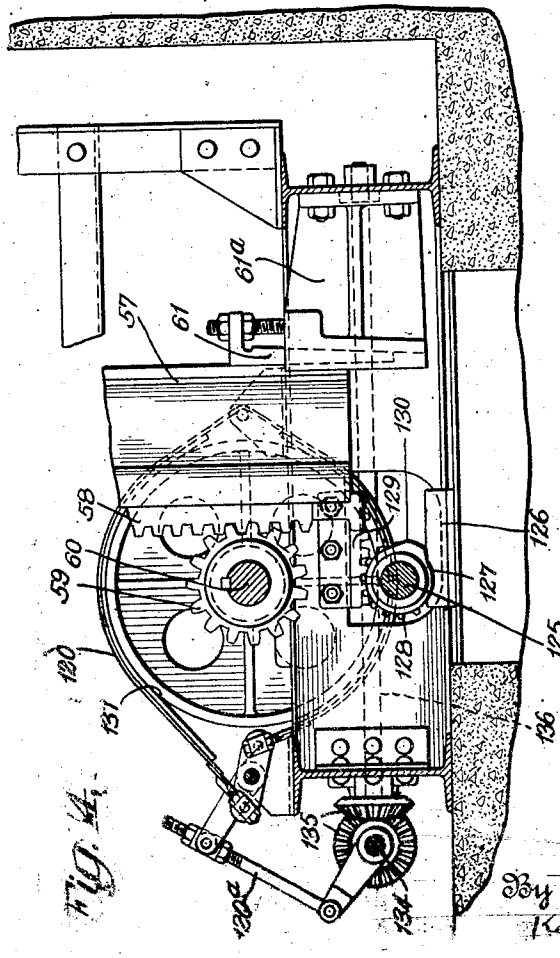


Fig. 14.

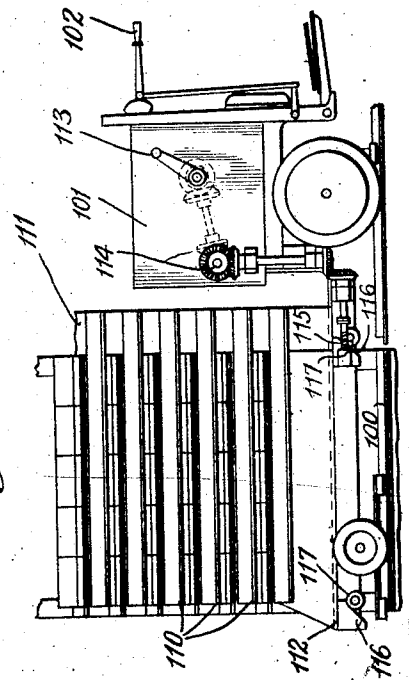


Fig. 16.

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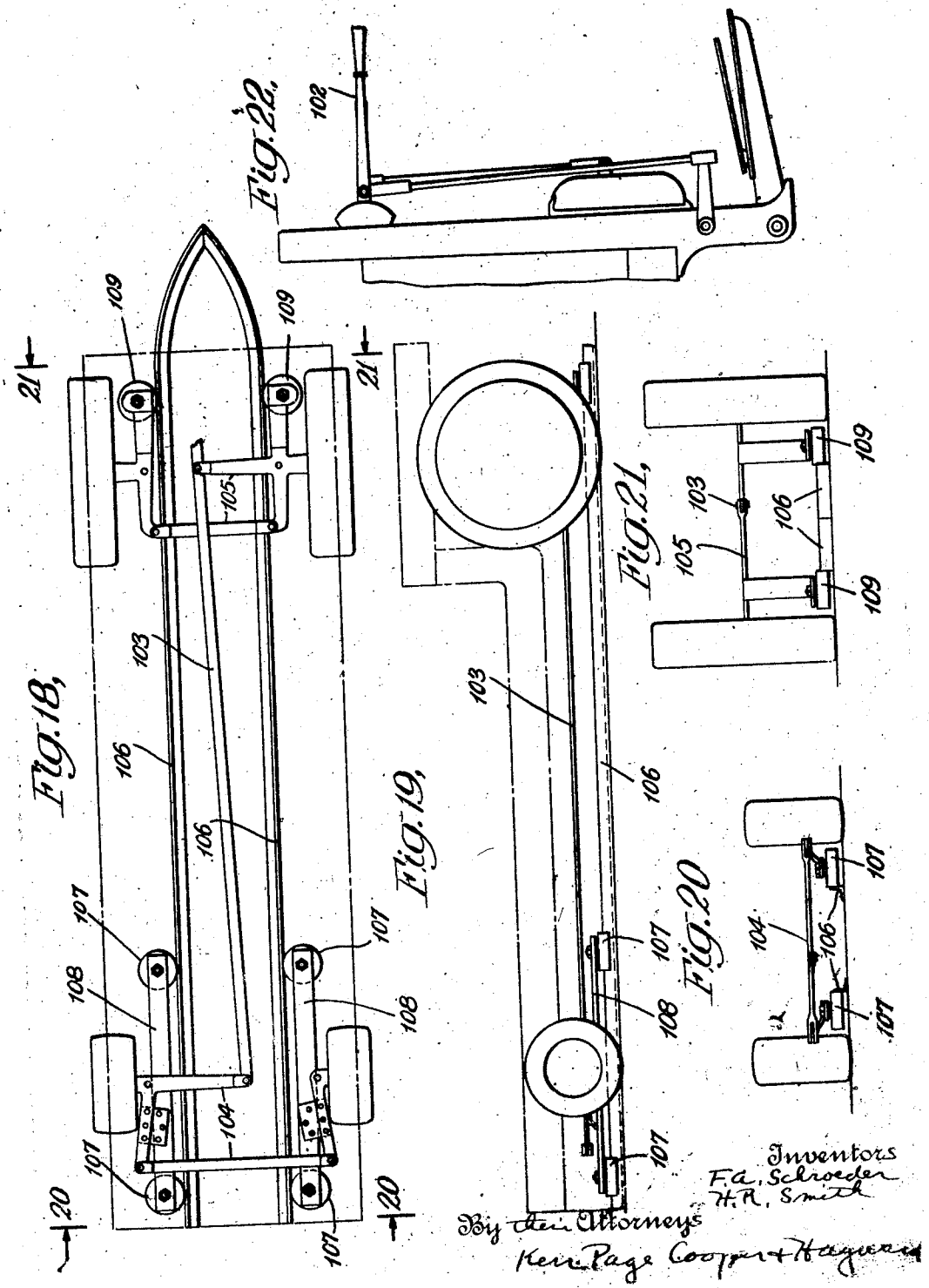
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BRICK HANDLING MACHINE

Filed April 30, 1920 8 Sheets-Sheet 8



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Patented Dec. 9, 1924.

1,518,278

UNITED STATES PATENT OFFICE.

FREDERICK A. SCHROEDER, OF BOGOTA, NEW JERSEY, AND HERMAN R. SMITH, OF BROOKLYN, NEW YORK, ASSIGNORS TO RAYMOND CONCRETE PILE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

BRICK-HANDLING MACHINE.

Application filed April 30, 1920. Serial No. 377,736.

To all whom it may concern:

Be it known that we, FREDERICK A. SCHROEDER and HERMAN R. SMITH, both citizens of the United States of America, residing at, respectively, Bogota, in the county of Bergen and State of New Jersey, and Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Brick-Handling Machines, of which the following is a full, clear, and exact description.

In certain machines used in the manufacture of articles such as bricks, blocks and the like, and more particularly in the manufacture of cementitious products, the articles are formed in a forming machine upon pallets and emerge therefrom upon a conveyor. Inasmuch as the articles have not attained a permanent set it is necessary that they be stored for a period of time to enable the constituent materials to harden sufficiently to permit their removal from the pallets and to permit them to be transported to the place of use or the storage yard. It has been the practise to place the pallets carrying the uncured articles in a superimposed manner upon racks which are arranged to space the articles apart sufficiently to permit free circulation of air. The problem of handing the product in installations of this sort has been one of considerable magnitude.

While conveyors extending from the brick-making or forming machine to the racks have been of some assistance their use has not obviated the employment of manual labor for the racking up of the articles upon the superimposed drying racks.

These factors have largely detracted from the speed of making bricks and the like, since the speed of the forming machine is directly limited by the ability of the plant and the labor required to handle the product.

One of the objects of the present invention resides in the provision of an apparatus for handling the uncured bricks which will permit the article-forming machine to run practically continuously and at a comparatively rapid rate of speed.

In the embodiment of the invention herein shown, the articles here shown as bricks and their supporting pallets emerge from the forming machine onto conveyor rollers which support the individual pallets while they are being advanced by a continuously moving conveyor chain. This chain advances the pallets one by one to a position over a pair of pallet supporting elements carried by an intermittently ascending elevator. When a certain number of pallets are in position over these elements, the elevator ascends thereby picking up the superimposed pallets and bringing a second set of supporting elements in cooperative position to receive the succeeding pallets. This procedure is continued until the elevator is full and in upper position. Thereafter a truck of novel form is brought into cooperation with the elevator and by an elevating of of certain elements of the truck the rows of pallets are lifted clear of their supporting rails forming a part of the elevator and are transferred to the truck. The truck is then driven away and the loads of pallets are deposited upon the drying racks by a lowering of the pallet-supporting elements which form a part of the truck. The elevator now is caused to descend to such position as to receive a new charge of pallets.

The objects of the present invention reside in the provision of the apparatus for carrying out the foregoing operations and broadly this apparatus includes the storage elevator structure, the truck structure, the means for raising and controlling the elevator, the means for feeding the pallets to the elevator, the means for aligning the truck with respect to the elevator and the various subsidiary control devices. Further objects and advantages will be set forth in detail in the accompanying specification and shown in the drawings in which:

Fig. 1 shows a side elevation of the machine with the elevator empty and ready to receive uncured bricks.

Fig. 2 shows a diagrammatic view of the manual control devices operated by the operator and certain details of the stop devices.

Fig. 3 shows an enlarged view of the conveyor and a portion of the elevator.

Fig. 4 shows a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 shows a detail view of one of the conveyor pallet moving pawls.

Fig. 6 is a top plan view of the conveyor

and a sectional view of the elevator. This figure also shows the truck pallet supporting elements prior to being projected into the elevator.

Fig. 7 shows an enlarged view of the driving mechanism of the machine.

Figs. 8, 9, 10 and 11 are detail views of the means for controlling the intermittent lifting of the elevator.

Fig. 12 shows a central sectional view of the elevator lifting means and the control apparatus.

Fig. 13 shows a side view of the same parts shown in Fig. 12.

Fig. 14 is a side view of the elevator brake and relieving gear (the latter being shown in normal position).

Fig. 15 shows the elevator in upper completely loaded position and the truck in position to back into place to remove the bricks therefrom.

Fig. 16 shows the truck in position on the elevator and ready to have its pallet supporting elements elevated to lift the pallets clear from their support by the elevator.

Fig. 17 shows the truck pallet supporting elements elevated and supporting the pallets.

Figs. 18 and 19 show top and side views of the truck-aligning devices.

Figs. 20 and 21 show the steering aligning devices for the truck.

Fig. 22 shows the steering gear for the truck.

Fig. 23 shows the relation of the elevator pallet supporting elements, the truck pallet supporting elements and the pallets with the truck pallet supporting elements in position prior to lifting the pallets.

Fig. 24 shows the same parts with the truck pallet supporting elements lifted so as to support the pallets clear of the supporting elements carried by the elevator.

Fig. 25 shows a detail view of the relieving gear for the elevator drive shaft gear and rack.

In the drawings:—

The brick-forming machine is shown diagrammatically at 30 (Fig. 1). This machine is driven in any suitable manner as by belt which, by means of a pulley, drives a cone clutch member 31 (Fig. 2). An air cylinder 32 is adapted to engage and disengage a cone clutch 33 and effect rotation of a shaft 34 carrying gearing which drives the forming machine and also drives a drive shaft 35 which drives the handling machine.

The bricks 35 (Fig. 3) are formed in the forming machine 30 and emerge therefrom upon pallets 36, (Fig. 3).

A short distance from the exit end of the forming machine is a structure which will be termed the storage elevator. This elevator is provided with vertical guide rails 37 (see Fig. 6) which form the framework of the elevator supporting structure. Guide members 38 are vertically slidable in the guide rails 37 and to these members 38 are bolted vertical angles 39. These vertical angles have fastened thereto a series of pairs of superimposed angles 40. These angles form supporting elements for the pallets 36 and will hereafter be termed elevator pallet supporting elements. These elements form a rack which receives the pallets from the brick-forming machine and stores them in superimposed relation. The angles 39 are joined together at the top by a cross frame 41 which has a cable 42 attached to it leading over a pulley and connected to a suitable counterbalance (not shown).

Between the elevator pallet supporting elements there is considerable clear space as best shown in Fig. 4. This space provides room for a conveyor which is adapted to carry the pallets from the forming machine to the elevator. This conveyor will now be described. Horizontal frames 43 are suitably supported with one end projecting into the elevator and the other end extends adjacent the exit end of the forming machine (see Fig. 3). The angles 44 forming a part of this frame are provided with a series of rollers 44^a which support the pallets 36. Suitable sprockets 45 and 46 are mounted in the frame and over these sprockets run parallel chains 47. These chains are advanced during the rotation of the driving shaft 35 by the following train of mechanism; bevel gearing 48 (see Fig. 7), gears 49, shaft 50, sprocket 51 and chain 52. At intervals the chains 47 carry cross shafts 53 which have fastened thereto pairs of pawl fingers 54. Counterweights 55 (see Figs. 3, 4 and 5) are also fastened to these shafts 53 and these counterweights tend to keep the pawl fingers elevated up above the top of the chains but permit the pawls to swing back and pass under the pallets under certain conditions. The pallets are advanced from the forming machine onto the rolls 44^a. Thereafter the pawl fingers which have been swung upwardly above the conveyor chain by the counterweights aided by a spring 55^a (shown in Fig. 5) come into contact with the rear walls of a pallet and advance the same over rolls 44^a. During the preliminary advance of the pallets over the conveyor outside the elevator the pawls are prevented from swinging anticlockwise by a rail 55^b. The advance of the pallet continues until it is arrested either by contact with a stop 55 or by contact with the pallet just ahead of it (see Fig. 3). When the forward movement of the pallet is arrested the pawl fingers now clear of rail 55^b swing down and pass idly under the lower faces of the pallet or pallets. The conveyor just described is adapted to bring the pallets into a position to be supported by the

elevator pallet supporting elements upon the ascent of the elevator. With the construction disclosed the elements are of sufficient size to carry five pallets. After these five pallets have been brought into position over the elevator supporting elements the elevator must be raised to present the next lower pair of supporting elements in cooperative relation with the conveyor and the upward movement of the elevator must be effected during the period of advance of a pallet over that portion of the conveyor which is outside the elevator.

Elevator lifting mechanism.

The frame members 39 of the elevator are fastened at their lower ends to a cross-member 56 (see Fig. 15) to which are fastened I-beams 57 (see Fig. 12) carrying vertical racks 58. The racks mesh with pinions 59 splined upon a shaft 60 and to provide an adjustment for the depth of enmeshment of the racks and pinions the backs of the I-beams are backed by adjustable wedge blocks 61 carried by brackets 61^a (see Fig. 14).

Shaft 60 is mounted in suitable bearings and connects by a spline connection with one element of a jaw clutch 62. The other element of the clutch is fixed upon a short shaft 63 which carries a gear 64 meshing with a gear 65 upon shaft 66. By the periodic rotation of shaft 66 the elevator will be elevated step by step. In order to rotate this shaft 66 the following mechanism is provided. Referring to Fig. 7, shaft 50 carries a gear 67 meshing with gear 68 and rotating crank arm 69. The rotation of this crank is continuous so long as the brick-forming machine is in operation. Crank 69 is connected to a connecting rod 70 and is adapted to reciprocate said rod. (See Figs. 1, 8 and 9.)

Figs. 8 to 13 show the mechanism for rotating the shaft 66 intermittently. In these figures 71 is a ratchet disc rotatably mounted upon shaft 66, and 72 and 73 are ratchet discs which are splined to the shaft 66 so as to rotate the same. All of the ratchet wheels are provided with five teeth, corresponding with the number of pallets carried on each of the elevator pallet supporting members.

An arm 75 is rotatably mounted upon shaft 66 and is connected to the connecting rod 70 so as to be rocked up and down upon the reciprocation of the connecting rod. The arm 75 carries spring-pressed pawl 74 which is adapted to advance the ratchet wheel 71 one step each time the connecting rod is elevated. A suitable spring-pressed retaining pawl 76 prevents retrograde movement of ratchet wheel 71. A stud 77 carried by wheel 71 forms a pivot for a pawl 78 which overlies ratchet wheel 73. Pawl 78 tends to drop into engagement with ratchet 73 when above the ratchet and drops out by gravity when below the center. During the forward rotation of ratchet 71 from the position shown in Fig. 10 this pawl remains out of engagement with the ratchet 73 until such time as a blade 79 carried by the pawl 78 comes into contact with a cam 80. This cam forces the pawl into engagement with a tooth of ratchet 73 and advances the ratchet one step upon the next elevation of the connecting rod 70. To free the pawl from the ratchet and to prevent its re-engagement upon the next forward movement of wheel 71 an arm 81 is employed which is fastened to rock arm 75 and which has an end extending over the tail of the pawl 78.

Fig. 10 shows the pawl 78 held out by means of arm 81 and Fig. 11 shows the pawl in "in" position prior to being disengaged by the arm. The ratchet 73 being keyed to shaft 66 is adapted to advance the shaft 66 one step for each five steps of advance of the wheel 71. Ratchet 72 is provided with a retaining pawl 82 which prevents retrograde movement of shaft 66. The mechanism just described is adapted to elevate the elevator one step after the pallet supporting elements have received their complete load of pallets.

The operation of loading the elevator continues until all the pallet supporting elements have received a load and the elevator has attained its extreme elevated position. Means are provided for then stopping the operation of the forming machine and the formation of further brick until the elevator is discharged and in position to receive additional pallets.

Automatic stop.

Fastened to shaft 50 (Fig. 7) is a gear 83 which meshes with a gear 84 carried on a shaft 85 leading to the control devices contained within case 86. Figure 2 shows somewith diagramatically an embodiment of these devices. The shaft 85 carries a worm 87 which turns a worm wheel 88. This wheel is provided with a recess 89 that comes into alignment with a plunger 90 when the elevator is completely loaded. Upon attaining such alignment a counterweight 90^a acting through a bell crank 91 forces the plunger into the recess 89 and draws control rod 92 to the left. This control rod through a suitable linkage swings an air valve control lever 93 to the left from the position shown.

The air cylinder control for the main clutch 33 is so arranged that with air admitted through pipe 94 the clutch will be engaged, and will be disengaged by the admission of air through pipe 95. Control of air flow is by air valve control lever which is arranged to admit air from supply pipe 96 to either pipes 94 or 95 and to concur-

rently connect the pipe to which air is not being admitted to exhaust pipe 97. When lever 93 is drawn to the left the clutch is disengaged and the entire machine is brought to a standstill.

Elevator unloading devices.

With the elevator full of pallets and in upper position, the machine is brought automatically to a stop. With the elevator in this position an elevator base plate 100 is brought into alignment with the floor of the room so that a truck 101 can be backed onto the base plate 100 (see Figs. 15 and 16). The truck proper is in many respects similar to the well-known industrial storage battery trucks now on the market. It is, however, necessary to align the truck accurately with the elevator before it can be backed in place and remove the pallets therefrom. The truck is of the four-wheel steer type being normally steered by means of lever 102 (Fig. 22), which connects in the usual manner through a reach rod 103 (Fig. 18) to the rear steering control system 104 and to the front wheel controls 105. To align the truck properly a pair of guide-rails 106 are provided on the floor just adjacent and properly aligned with the elevator. Similar rails are provided on the base 100 of the elevator. These rails are adapted to co-operate with guide rollers 107 carried by bracket plates 108 which are connected to the rear steering control linkage 104. A similar pair of guide rolls 109 co-operate with these rails at the front of the truck, and these rolls are adapted to likewise actuate the steering control linkage. The arrangement described provides means for rapidly and accurately aligning the truck with the elevator thereby eliminating time-consuming delays. The front and rear control systems and guiding rollers being linked together, the most unskilled operator can rapidly back a truck into accurate position on the elevator (see Fig. 16). The front rollers 109 control the steering after the rear rolls 107 have passed beyond the ends of the rails and the rear rollers effect the control when the front rollers are beyond the rails.

The truck in addition to having the usual chassis and drive parts is provided with a plurality of angle-shaped members 110 which are fastened to an upright 111 and project rearwardly therefrom. These angles will hereinafter be termed truck pallet supporting elements. The upright 111 is fastened to a base member 112 which is adapted to be moved longitudinally relatively to the truck frame by means of a handle 113 which, through gearing 114 (see Fig. 16), connects with screws 115 adapted upon rotation to draw the base 112 endwise and to cause the same to be elevated by camming edges 116 riding up the rollers 117. In this manner by the manipulation of the handle 113 the pallet supporting elements may be simultaneously elevated or lowered. After the truck is in position as shown in Fig. 16, the handle 113 is turned to elevate the truck pallet supporting elements 110 (see Fig. 17). With the truck pallet supporting elements in lifted position they have assumed the position shown in Fig. 24. With the parts in this position the pallets 36 are all concurrently lifted clear of the elevator pallet supporting elements, and stop 55, and are supported upon the angles 110. The truck can now be driven away thereby clearing the elevator of its load. The pallets carried by the truck are deposited upon suitable racks in the drying room by rotating handle 113 in reverse direction. The racks would be similar in design to the elevator but would be of such size as to permit the storage of a large number of pallets and bricks. Suitable aligning rails would be provided adjacent the storage racks.

With the elevator in upper position and empty it must now be returned to lower position to be ready to receive additional pallets. The lowering of the elevator should be effected without disturbing the timing of the lifting mechanism and without shock or jar to the elevator.

The lowering of the elevator is effected by declutching shaft 60 from shaft 63 by clutch 62 and concurrently applying a brake 120 to shaft 60. Prior to disengaging the jaw clutch 62 the driving strain must be relieved from shaft 60. This is effected by the following mechanism: Mounted upon the operating pulpit 121 (Fig 2) is a lever 122 which through a linkage 123 connects with a crank arm 124 (Figs. 12 and 13). Arm 124 is adapted to rock a shaft 125, which shaft is supported to roll upon plates 126 by rollers 127. The shaft also carries pinions 128 which mesh with racks 129 so as to cause the shaft to travel upon rotation thereof. The traveling shaft is also provided with lifting cams 130 which are brought under the ends of the racks 58 during the travel of the shaft and thereafter slightly elevate the racks 59 so as to relieve the tooth pressure against the pinions 59 and between gears 64 and 65. This action of the parts is clearly shown in Figs. 14 and 25, the former showing initial normal position and the latter showing driving strain relieved with lever 122 displaced. After the driving strain is relieved from the gearing the pressure between the jaws of the clutch 62 is relieved so that the clutch can be readily disengaged. The operator holds lever 122 displaced (by a suitable latch or by hand) and draws forward lever 131 (Fig. 2) which through a linkage 132 (Figs. 2 and 12) rocks an arm 133 carried on shaft 134. This shaft through the bevel gearing 135

rocks a cross shaft 136 and disengages the clutch 62. Simultaneously the brake 120 is applied to the drum 137 by the linkage 120ª best shown in Fig. 14. The elevator is now released from the lifting gear and under control of the brake 120. The lever 122 is then returned to normal position thereby clearing the cams 130 from the path of the racks 58.

The operator then relieves the pressure on lever 131 and allows the elevator to descend under the control of the brake 120. As soon as the elevator has reached its lowermost position the operator restores lever 132 to normal position and re-engages the clutch 62, thereby coupling the elevator with the lifting gear. All parts are now in proper time relation for a new cycle and the operator starts up the machine by swinging air valve lever 93 to the right. This applies the air to the cylinder 32 so as to re-engage the main clutch 33. The operator after swinging the air valve to "on" position must hold the valve in such position to permit the automatic stop mechanism to be displaced sufficiently to prevent the immediate restopping of the machine. When the lever 93 is moved to "on" position counterweight 90ª is lifted so as to provide clearance for the bell crank 91. The plunger 90 being in the recess 89 must be retracted before the worm wheel 88 moves appreciably. This is effected by means of a spring 140 which presses outwardly upon the head 141 of the plunger and also presses upon a base block 142 carried by a pin 143. The pin extends through slots in the plunger wall and is secured in a fixed guide 144. It will therefore be apparent that as soon as the counterweight 90ª is elevated, the spring 140 (already under compression) will extend and retract the plunger 90 from the recess. After the worm wheel 88 has turned slightly the plunger no longer is in alignment with the recess and the operator can release handle 93. This handle will remain in "on" position until the elevator is again full and the automatic stop is brought into action. The main control valve 93 can also be used for purposes of an automatic stop in cases of accident and such use will not in any way disturb the timing for subsequent operations.

In the foregoing specification one machine only has been described. It will be understood, however, that in practice a number of machines may be used. In multiple machine installations of this sort the operator's pulpit or platform is preferably elevated above the floor level so that the operator can observe the operation and loading status of all the machines under his control. The operating control levers and valves of the different machines may be conveniently located upon this platform so as to be accessible to a single operator. It will be understood that the different machines are automatically brought to a stop when the storage elevators are loaded and it is only necessary for the operator to observe that the unloading truck has been driven away from a particular machine, to know that this machine is ready to be restarted. As a check upon the condition of the storage elevator it may be desirable to provide an electric light upon the operator's platform which will be illuminated to indicate that the elevator of a particular machine is within one step of being loaded. This light is in effect a safety indicator and indicates to the operator that the machine should be stopped by hand in case the automatic stop fails for any reason.

The light is indicated at 145 in Fig. 2. The current from the source is preferably controlled by a contact device 146 (see Figs. 1 and 2), adapted to be operated by the elevator when the latter is within one step of the top of its travel. The light is extinguished automatically upon the descent of the elevator.

Various other indicating lights may be provided, for example a light might be provided on the operator's platform to show that a truck was upon the elevator. The control for this light would be similar to the light previously described, except that the contact device would be controlled by the truck in moving to and off the elevator.

The method of handling the pallets as set forth in this application is not herein claimed. The novel method will form the subject matter of a separate application.

What we claim is:—

1. In a machine adapted to handle the output of a forming machine, in combination, a storage elevator, a continuous conveyor leading from the forming machine to the elevator, means for automatically intermittently adjusting the position of the elevator with respect to the conveyor to permit the storage of the pallets received from the forming machine in superimposed relation upon the elevator, and means for removing the superimposed pallets from the elevator.

2. In a machine adapted to handle the output of a forming machine, in combination, a storage elevator adapted to support pallets in superimposed relation thereon, said elevator being mounted for a vertical up and down movement in an elevator shaft, a conveyor leading from the forming machine to the elevator for conveying the pallets thereto, means for intermittently raising the elevator to permit the storage of pallets in superimposed relation thereon, and means for simultaneously removing all of the pallets from the loaded storage elevator.

3. In a machine of the class described adapted to handle the output of a forming machine, in combination, a storage elevator,

a conveyor leading from the forming machine to the elevator, means for automatically intermittently raising the elevator to permit the storage of pallets received from the forming machine in superimposed relation thereon, and means for withdrawing the pallets from the loaded elevator, said means comprising means for first elevating the pallets from their position of support by the elevator and means for thereafter horizontally withdrawing the said pallets from the elevator.

4. The invention set forth in claim 3 in which means is provided for aligning the pallet withdrawing means with the elevator.

5. In a machine of the class described, in combination, a forming machine, a storage elevator and a conveyor leading from the forming machine to the elevator, means for intermittently raising the elevator to permit the storage of pallets in superimposed relation thereon, means for discharging the elevator when the same is raised, said means comprising a truck for withdrawing the pallets from the elevator, means for aligning the truck with the elevator, and means for lowering the entire elevator after the same has been discharged.

6. In a handling machine, in combination, a storage elevator having a plurality of superimposed pairs of pallet supporting elements, a conveyor adapted to deliver a series of pallets over a pair of said pallet supporting elements, and means for raising the elevator to present successive pairs of said pallet supporting elements in cooperative relation with the conveyor, said means being operable upon a predetermined number of pallets being conveyed into position over the pallet supporting elements.

7. In a machine of the class described, in combination, an elevator, a plurality of pallet supporting elements thereon, means for advancing the article supporting pallets over said elements, means for raising the elevator after a predetermined number of pallets are in position over said supporting elements, to thereby bring additional pallet-supporting elements into position to receive pallets, means for concurrently withdrawing all of said pallets from the elevator, and means for thereafter lowering the elevator.

8. In a machine adapted to handle articles from a continuously operating forming machine, in combination, an elevator having a plurality of superimposed pallet supporting elements thereon adapted to intermittently ascend, means for advancing pallets from the forming machine to a position to be supported by the pallet supporting elements carried by the elevator, means for stopping the operation of the machine when the elevator is loaded and in upper position, means for simultaneously removing all of the pallets from the elevator, and means for thereafter lowering the elevator and for restarting the machine.

9. In a handling machine adapted to receive pallets from a forming machine, means for driving the forming machine from a power source, a storage elevator adapted to store pallets in superimposed relation thereon, means for delivering the pallets from the forming machine to the elevator, said means being driven in unison with the forming machine, means driven in timed relation with the forming machine and said delivery means for intermittently raising the elevator to permit the storage of pallets in superimposed relation thereon, and means for automatically stopping the operation of the forming machine, the delivery means and said raising means when the elevator is completely loaded.

10. In a machine of the class described, in combination, a power-driven conveyor, a power-driven intermittently ascending storage elevator adapted to receive articles from the conveyor, said ascending movements of said elevator being timed with relation to the delivery of articles by the conveyor, means for stopping the conveyor and the raising of the elevator when the elevator is loaded, and means for disconnecting the elevator to permit the same to descend and for recoupling the elevator after the descent is completed, in proper time relation with the conveyor.

11. In a machine of the class described, in combination, a power-driven conveyor a power-driven intermittently ascending storage elevator adapted to receive articles from the conveyor, said ascending movements of said elevator being timed with relation to the delivery of articles by the conveyor, means for stopping the conveyor and the raising of the elevator when the elevator is loaded, means for disconnecting the elevator to permit the same to descend and for recoupling the elevator after the descent is completed, in proper time relation with the conveyor, and means for restarting the conveyor and for re-establishing the intermittently ascending movement of the elevator.

12. In a machine of the class described, in combination, a power-driven conveyor, a power-driven intermittently ascending storage elevator adapted to receive articles from the conveyor, said ascending movements of said elevator being timed with relation to the delivery of articles by the conveyor, means for stopping the conveyor and the raising of the elevator when the elevator is loaded, means for disconnecting the elevator to permit the same to descend and for recoupling the elevator after the descent is completed, in proper time relation with the conveyor, and means for applying a brake to control the speed of descent of the elevator.

13. In an article-handling machine adapted

to receive articles upon supporting pallets from a forming machine, a storage elevator adapted to receive the pallets delivered by the forming machine, means for intermittently raising the elevator, said means comprising mechanism to time the ascent and dwell of the elevator in accordance with the time of delivery of the pallets said means including a clutch and connections between said mechanism and the elevator, and means for disconnecting said clutch to permit the descent of the elevator whereby the same timing relations are secured upon the re-engagement of the clutch after the elevator has descended.

14. In an article-handling plant, a storage means for the product, a platform for a truck, a truck, steering means upon said truck to adjust the wheels thereof, said truck being adapted to handle the product carried by said storage means, and means associated with said platform and cooperating with the steering means upon said truck for aligning the truck with said storage means.

15. In a truck for the purpose described in combination, a chassis, a steering control therefor and guide rollers carried by said steering control adapted to cooperate with fixed guide-rails for aligning the truck in a predetermined position.

16. In a machine adapted to handle the products of a forming machine, in combination, a storage elevator, having superimposed supporting elements adapted to receive the articles produced by the forming machine, a conveyor leading from the forming machine to the elevator, and means operating automatically when the elevator has received a certain charge of articles from the conveyor, for adjusting the position of the elevator with respect to the conveyor to permit the storage of articles received from the forming machine in superimposed relation upon the elevator.

17. In a machine adapted to handle the product of a forming machine, a storage elevator adapted to store a plurality of the articles produced by the forming machine in superimposed relation thereon, a conveyor leading from the forming machine to the elevator for delivering the articles in cooperative position therewith, means operating in timed relation with the delivery of the articles by the conveyor for adjusting the vertical position of the elevator with respect to the conveyor, whereby the articles delivered are stored in a superimposed manner upon the elevator and means for unloading the elevator.

18. A storage elevator having provision for storing articles in superimposed relation thereon, means for intermittently adjusting the vertical position of the elevator to permit the aforesaid superimposed storage of articles, and means for automatically discontinuing said adjusting of the elevator when it is completely loaded.

19. A storage elevator having provisions for storing articles in superimposed relation thereon, means for intermittently adjusting the vertical position of the elevator to permit the aforesaid storage of articles, means for automatically discontinuing said adjusting when the elevator is completely loaded, means for simultaneously unloading and removing all of the articles from the elevator, and means for thereafter positioning the elevator so it may receive additional articles.

It testimony whereof we hereunto affix our signatures.

FREDERICK A. SCHROEDER.
HERMAN R. SMITH.