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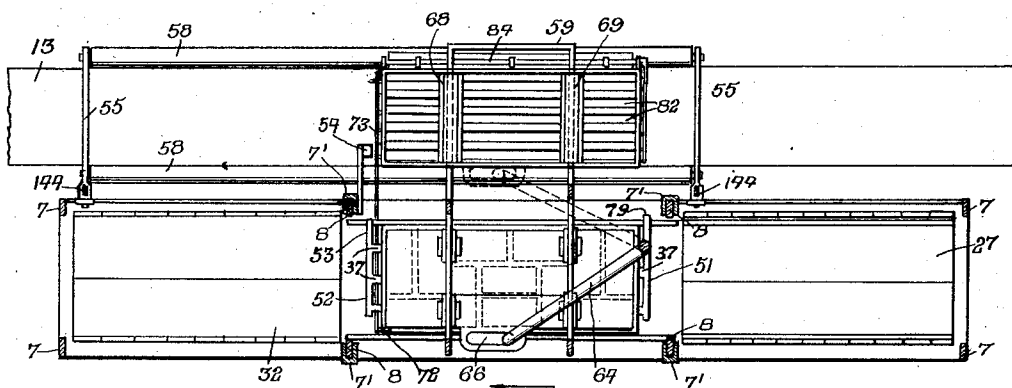
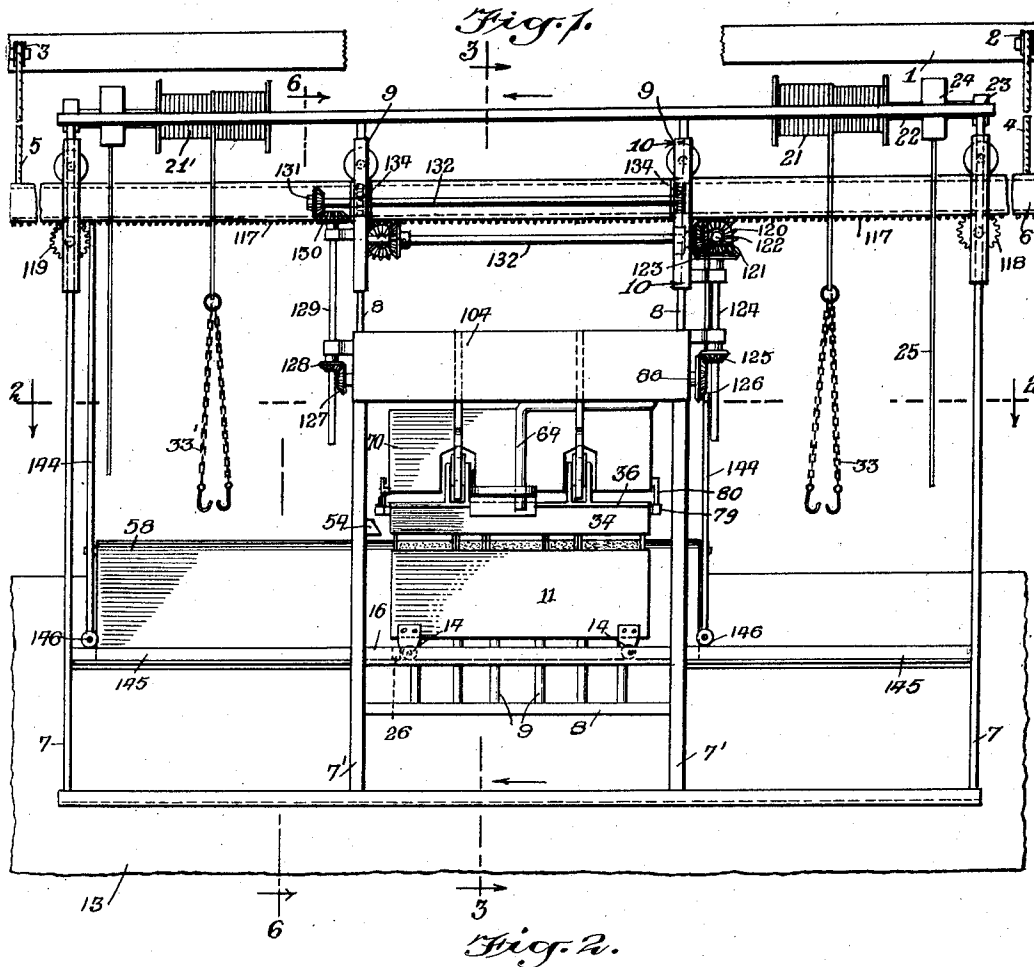
T. PALATINI

1,818,741

BRICK LAYING MACHINE

Filed July 25, 1929

5 Sheets-Sheet 1



WITNESSES

Geo. W. Morgan
A. L. Kitchen

INVENTOR

INVENTOR
Thomas Palatini

BY *Munn Co.*

ATTORNEYS

Aug. 11, 1931.

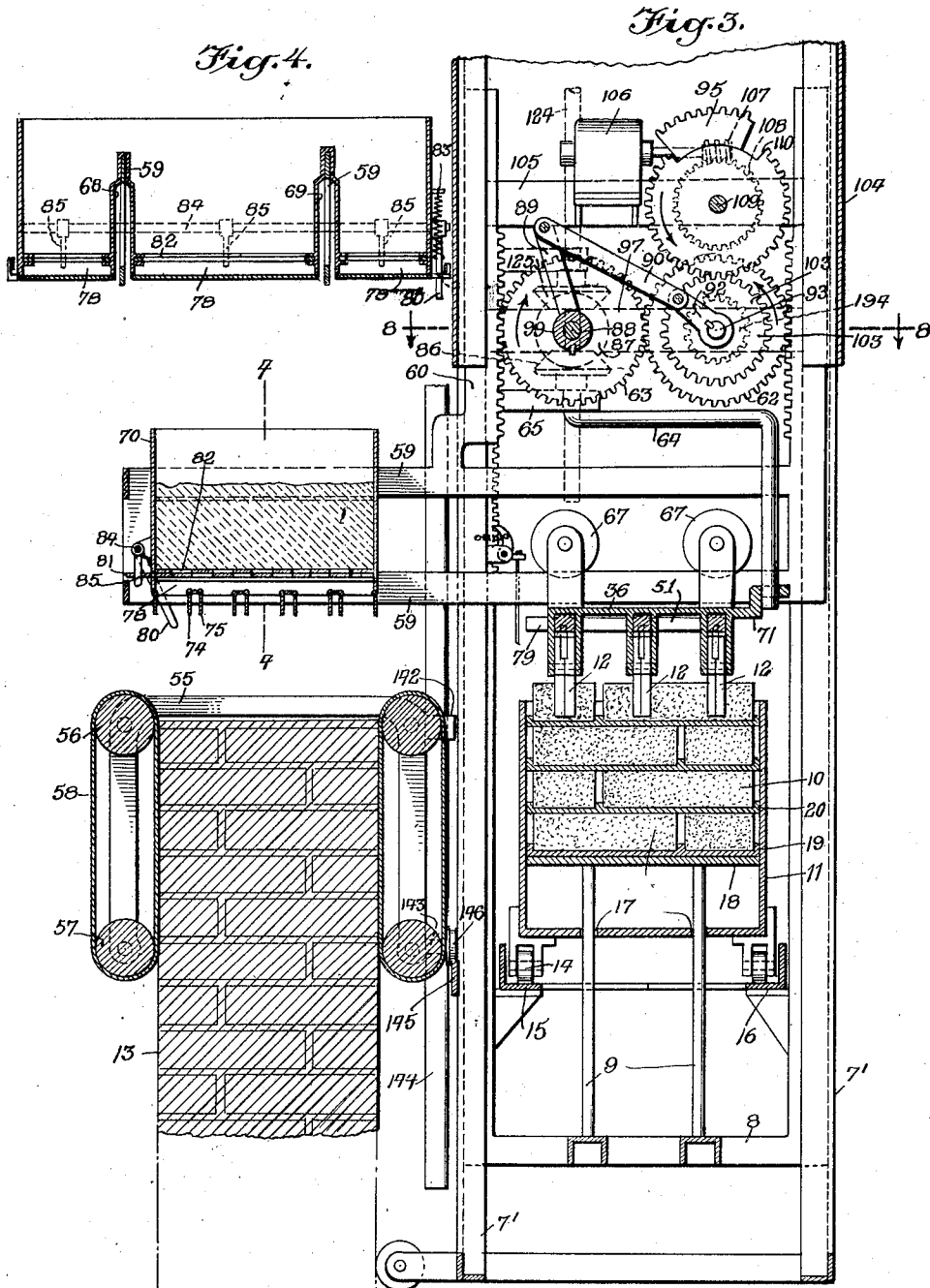
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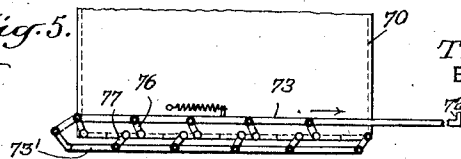
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WITNESSES
George Maylor
A. L. Kitchin

Fig. 5.



INVENTOR
Thomas Palatini
BY *Munn & Co.*
ATTORNEYS

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T. PALATINI

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Fig. 7.

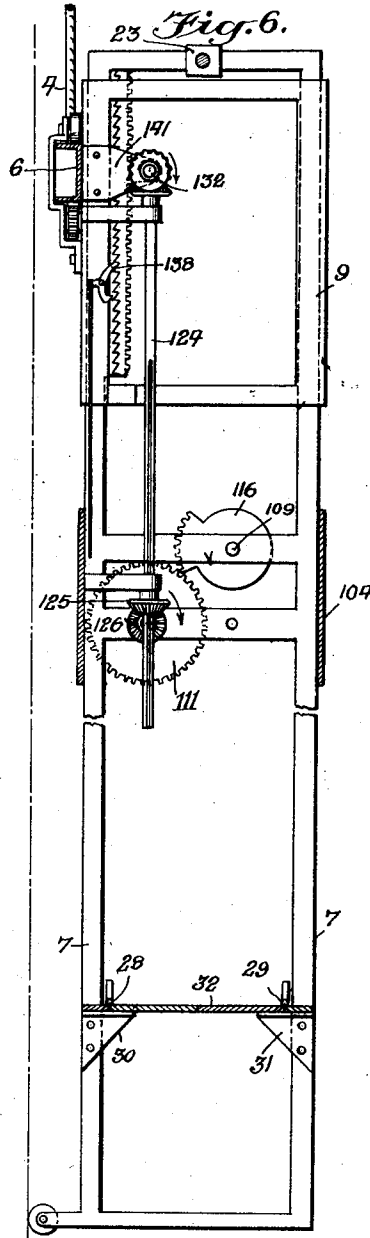
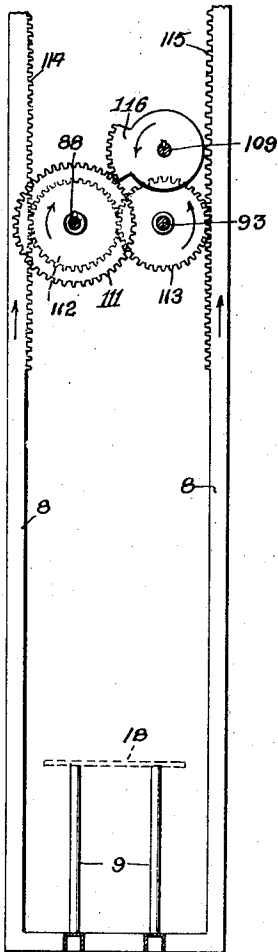


Fig. 11.

WITNESSES

George Taylor
A. L. Kitchen

INVENTOR

Thomas Palatini

BY

Munn & Co.

ATTORNEYS

Aug. 11, 1931.

T. PALATINI

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5 Sheets-Sheet 4

Fig. 8.

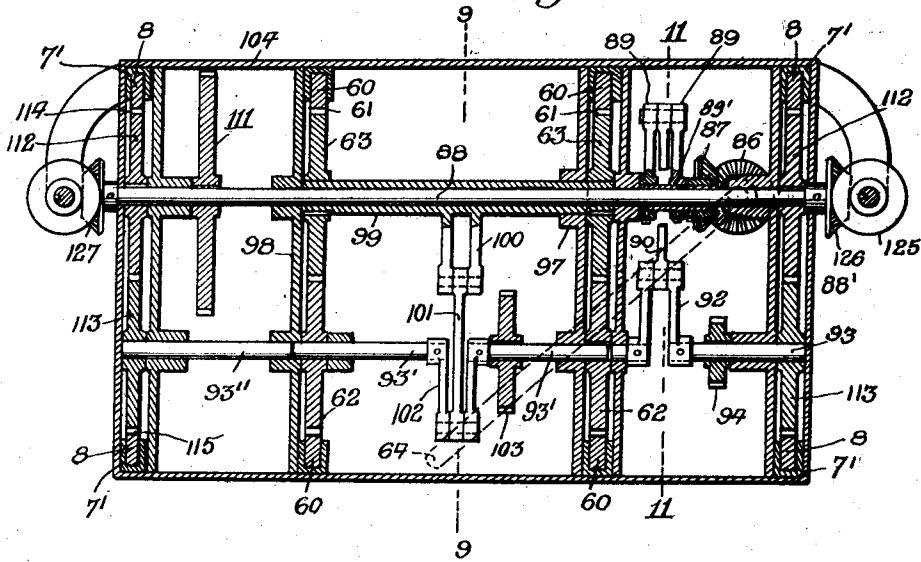
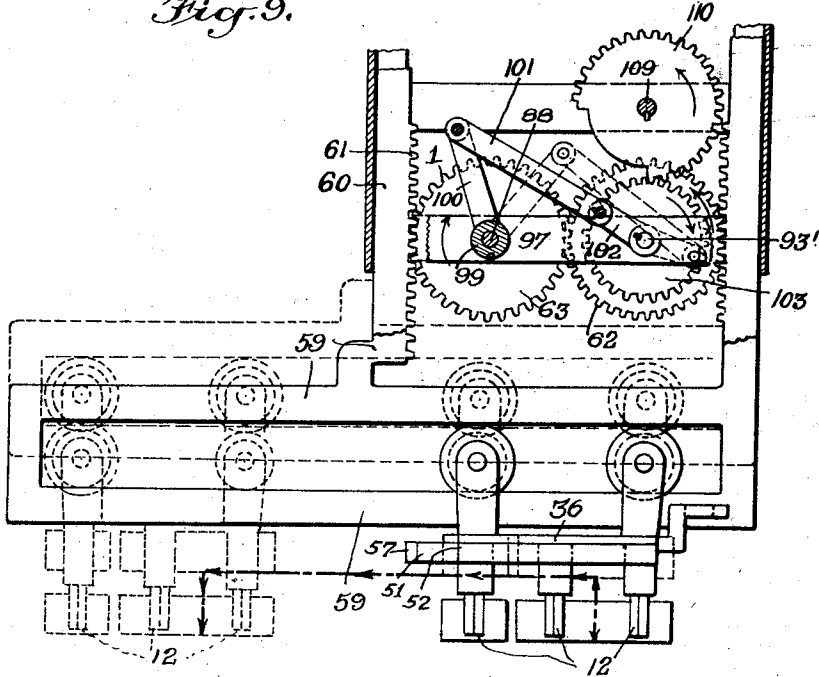


Fig. 9.



WITNESSES
Geo. W. Taylor
A. L. Kitchen

INVENTOR
Thomas Palatini
 BY *Munn & Co.*
 ATTORNEYS

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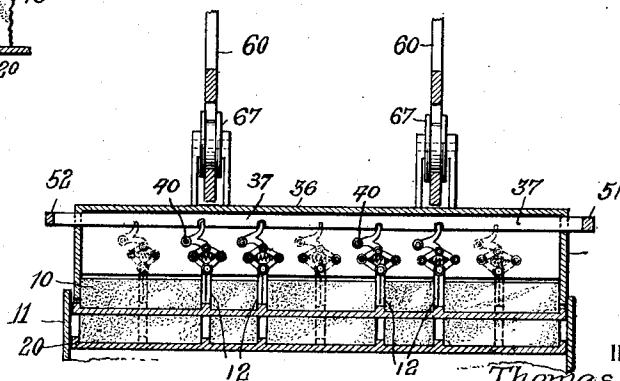
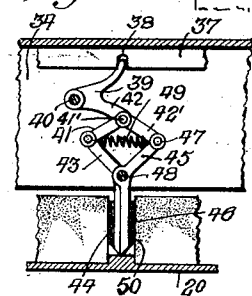
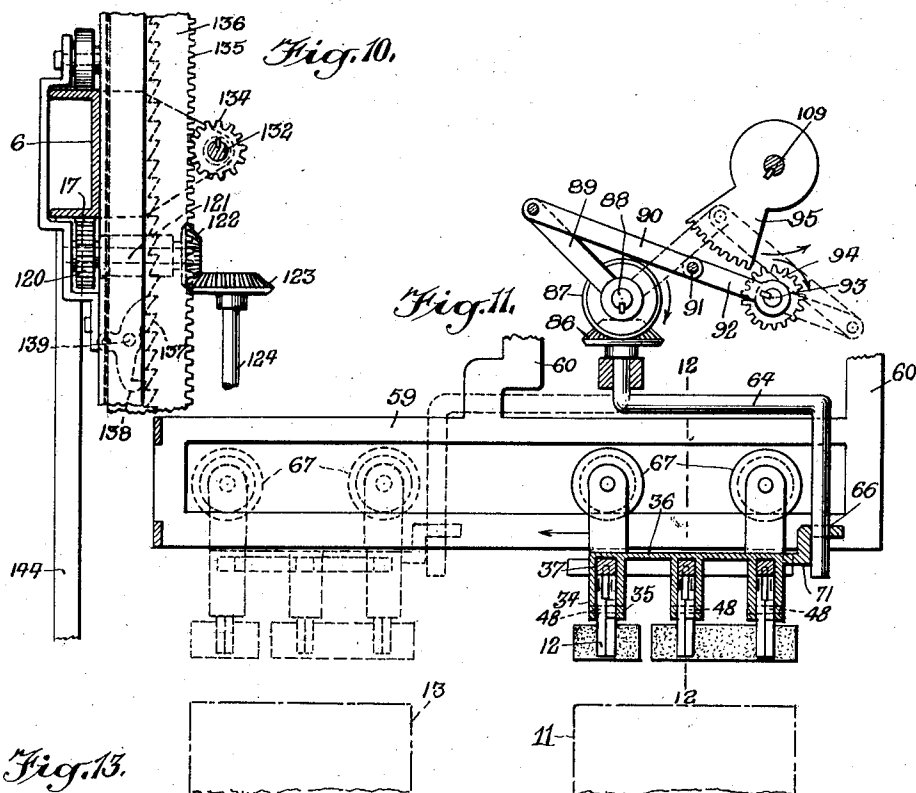
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WITNESSES

WITNESSES
Geo. W. Maylor
A. L. Kitchen

INVENTOR

Thomas Palatini
BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE

THOMAS PALATINI, OF BELMAR, NEW JERSEY

BRICK LAYING MACHINE

Application filed July 25, 1929. Serial No. 381,003.

This invention relates to brick laying machines, and has for an object to provide a construction which is semi-automatic with the parts so arranged that bricks may be laid in the wall rapidly and with the use of inexperienced help.

Another object of the invention is to provide a brick laying machine, wherein means have been provided which may be used to lay walls at any point, but particularly in connection with large buildings, the structure operating to accurately and quickly lay a large number of bricks in a minimum time.

A further object, more specifically, is to provide a brick laying machine wherein one workman arranges the bricks in a suitable box or container on the ground or other support and another workman operates the apparatus to raise the bricks and lay the same with a proper supply of mortar properly distributed.

In the accompanying drawings,—

Figure 1 is a side elevation of a brick laying machine disclosing an embodiment of the invention, the same being shown arranged adjacent a wall;

Figure 2 is a sectional view through Figure 1 approximately on the line 2—2;

Figure 3 is a sectional view on an enlarged scale through Figure 1 approximately on the line 3—3;

Figure 4 is a sectional view through Figure 3 on the line 4—4;

Figure 5 is a detail, fragmentary side view of the lower part of the structure shown in Figure 4, the same illustrating how the dampers or doors may be opened and closed;

Figure 6 is a fragmentary view taken substantially on the line 6—6 of Figure 1, the same illustrating how certain of the mechanism functions to raise and lower the supporting frame;

Figure 7 is a fragmentary elevation of a brick elevating frame embodying certain features of the invention, the same being shown in connection with certain elevating gears;

Figure 8 is a fragmentary sectional view through Figure 3 approximately on line 8—8;

Figure 9 is a fragmentary view partly in section with the section taken along line 9—9 of Figure 8;

Figure 10 is an enlarged detail fragmentary sectional view taken along the line 10—10 of Figure 1;

Figure 11 is a fragmentary sectional view taken along line 11—11 of Figure 8, certain parts being left off for the purpose of clearness;

Figure 12 is a fragmentary sectional view through Figure 11 on the line 12—12;

Figure 13 is an enlarged fragmentary detail view showing one of the brick gripping devices;

Figure 14 is a side view of part of the wall showing how each batch of bricks is laid.

In forming a brick laying machine embodying the invention the same may be supported by special supports in various ways, as desired. In Fig. 1 a supporting bar 1 is provided which is adapted to be secured to a building, or if preferred, may be supported by uprights where there is no iron framework of a building available. Pulleys 2 and 3 are carried by the bar 1, and over these pulleys cables 4 and 5 are passed, said cables being secured at their respective ends to the channel iron 6. The free ends of the cables may be tied to the channel irons 6 or to some other article, whereby the device will be supported at the desired height. After the device has been mounted, as desired, it is ready for operation and may be operated by two inexperienced men, or at least, by two men inexperienced in brick-laying, though experienced help may be used, if desired, or may be used in supervising several of the machines. As hereinafter fully described, there are provided a number of boxes to be located on the ground or a suitable flooring, and one of the workmen functions to fill these boxes, while the other workman stands on the device and sees that the parts operate in the manner intended. A box of bricks is elevated from time to time to the workman on the apparatus and the empty box lowered to the workman on the platform. Also, mortar is elevated from time to time and placed in a mortar hopper, whereby it is used as the machine

functions. After the machine has started to operate the same lays batches of bricks from the right end of the wall to the left, or the reverse according to the way the device is set, and after a given series of batches of bricks have been laid the device is elevated and a new series of batches laid. This is carried out until the full height of the wall has been reached and then the device is elevated to a new wall or shifted to a new wall in any desired manner.

As shown in Figs. 1 and 6, the channel bar 6 movably supports a scaffold 7, and the scaffold 7 carries what may be termed a brick-raising frame 8 shown in detail in Fig. 7. Also, scaffold 7 carries a sliding frame or gear casing 9 (Figs. 1 and 6), which in turn carries the brackets 141, shaft 132 and associated parts hereinafter fully described. The frame 8, as shown in Figure 1, is of appreciably less width than scaffold 7 and functions to raise and lower the series of elevating rods 9 (Figure 3), said rods acting to intermittently elevate the various bricks 10 in the box 11. The parts are so proportioned, as hereinafter fully described, whereby each movement of the rods 9 will raise the bricks 10 the height of one brick, so that the various grippers 12 may function to grip the bricks and move them to a position on top of wall 13.

The box 11 is a rectangular box formed of wood, metal or other material and carries suitable rollers 14 which rest on the runways 15 and 16. The box 11 is provided with a number of apertures 17 through which the rods 9 extend, said rods pressing against a plate 18, and on this plate is arranged a special pattern plate 19 adapted to receive the lowermost layer of bricks 10. After the bricks have been laid on the pattern plate 19 a second pattern plate 20 is mounted on top of the first layer of bricks and a second layer of bricks mounted on the pattern plate 20. This idea is carried out until there are provided four layers of bricks, though, if desired, a greater or lesser number of layers may be provided for. The various pattern plates are provided with upstanding flanges, whereby an inexperienced person can lay the bricks properly, the arrangement being identical with the arrangement in wall 13. The workman on the platform or ground arranges the bricks in a box 11 on the ground, and when the workman on the apparatus needs a new box the filled box will be elevated to the workman on the apparatus and the empty box lowered.

In order that a convenient means may be had for elevating the filled box and lowering the empty box, a hoisting drum 21 of any desired kind is provided carried by shaft 22 mounted in suitable bearing boxes 23 on the scaffold 7. A control or driving structure 24 is connected to shaft 22 for rotating drum 21. The device 24 may be an ordinary sheave op-

erated by hand through a suitable rope, or may be an electric motor with the switch controlled by the rod 25. When the box 11 is first placed on the runways 15 and 16 it is rolled to the left, as shown in Figure 1, until it strikes the stop 26. After the bricks have been removed from the box it is moved back manually to a position over the doors 27, which doors are shown particularly in Figure 2. These doors are hinged at 28 and 29, and by reason of the brackets 30 and 31 will move downwardly to a horizontal position but may be moved manually to a vertical position. These doors and a similar arrangement of doors 32 (Figs. 2 and 6) act as platforms for the workman on the apparatus, whereby he may be properly supported as he causes the parts to function properly. When the box 11 becomes empty it is moved to a position over the doors 27 and is then connected to the chain or cable 33. The box is then elevated until the doors 27 may be opened, after which it is lowered and a new, filled box secured to the cable 33. Drum 21 is then caused to function and the new, filled box is raised until the doors 27 may be closed. The filled box is then lowered to a position over the doors 27 and finally moved to a position against stop 26. The new box is then in position for the remaining part of the apparatus to function and lay the bricks in the new box. When the new box becomes empty it is returned to the ground or lower platform and a new one secured, as just described.

In order to remove the bricks from the box after the box has reached the position shown in Figure 1, the various grippers 12 are caused to function, whereby the top layer of bricks is grasped, raised and transported to a position above wall 13. The bricks are then lowered and released, after which the grippers 12 move back to their former position. While this is being done the workman manually removes the top pattern plate and the frame 8 will have functioned, as hereinafter fully described, for raising the next layer of bricks up to a position where they may be engaged by the grippers 12. The grippers 12 are arranged in three rows, as shown in Figures 3 and 12, whereby they may properly engage the ends or sides of the respective bricks. Each of these grippers is mounted between suitable plates 34 and 35 which are formed integral with or rigidly secured to a top plate 36. Between each pair of plates 34 and 35 is positioned a bar 37 having a notch 38 for each of the grippers 12. The grippers 12 are formed, as shown particularly in Figure 13. In this Figure it will be seen that a bell crank lever structure is pivotally mounted at 40 on the plate 34. The link 41 is pivotally connected to the arm 42 of lever 39 and to the outer end of this link is pivotally connected the arm 43 of the grip-

ping jaw 44. The arm 45 of jaw 46 is pivotally connected at 47 to link 42' which is pivoted to arm 42 and link 41 at 41' and is also pivotally connected to jaw 44 by the pin 5 48 attached to plate 34 (Fig. 11). A spring 49 connects the arms 43 and 45 and acts to move these arms for opening the jaws 44 and 46, whereby these jaws will grip adjacent bricks. Each of the jaws is provided with a 10 rubber or other cushion 50 so as to resiliently grip the bricks and also to present a better gripping surface to the bricks. The outer or free end of the bell crank lever 39 extends into notch 38 so that when bar 37 is pulled 15 in one direction the jaws 44 and 46 will be closed. When the bar 37 is released the springs 49 on each of the grippers 12 will have a tendency to move the jaws to an open position so as to grip the bricks if the parts are correctly positioned. The respective bars 20 37 are connected together by transverse bars 51 and 52, as shown in Fig. 2, so that all of these bars act together. Bar 51 is provided with a stop or projection 53 which may be 25 operated manually when the grippers are above wall 13, or may be caused to strike a suitable stop so as to operate the various bars 37 and thereby release the bricks. The bricks as soon as released drop a short distance and 30 automatically take their place in correct order on top of wall 13, mortar having previously been applied as hereinafter described.

In order that the bricks may be properly centered, a guiding structure is provided 35 which consists of a pair of U-shaped frames 55, and on these frames are arranged two pairs of rollers 56 and 57. Each pair of rollers supports a belt 58, said belt snugly fitting against the sides of wall 13. Rollers 40 56 extend above wall 13 normally and thereby the belts 58 with the frames 55 properly guide the fallen bricks to a correct position on the wall, the bricks having been previously arranged in the proper order, as set forth in the description of the box 11. After 45 a layer of bricks has been deposited on the wall 13, the frames 55 and associated parts are moved upwardly the distance of a thickness of one layer of bricks plus the thickness 50 of the mortar, whereby it acts as a guide for the next layer of bricks. In order to swing the grippers back and forth, namely, from the position shown in Fig. 3 to the dotted position in Fig. 11, and then back again, 55 certain mechanism is provided shown more particularly in Figs. 2 and 11.

As shown in Fig. 9, there is provided a rectangular frame 59, the upper part of which merges into a plurality of uprights 60 60, said uprights being provided with suitable teeth 61 forming racks into which mesh the gear wheels 62 and 63, gear wheel 63 being a driving gear and gear wheel 62 being a balancing or idling gear, whereby a sub- 65 stantially even up and down movement may

be secured. These gears also are associated with certain other gears hereinafter fully described, whereby the crank 64 is swung back and forth. This crank is journaled in a suitable bracket 65 and the free end extends 70 through the slot 66 (Fig. 2) in the plate 36. As shown in Fig. 2, when the crank 64 is swung a certain distance the plate 36, grippers 12 and associated parts are moved over to a position above the wall 13. Plate 36 75 and associated parts are supported by suitable trolley wheels 67 positioned to run on the lower bars of the frame 59. As the crank 64 moves from the full-line position shown in Fig. 2 to the dotted line position the 80 wheels 64 will roll along and move the parts to a position directly over the wall 13. The wheels 67 and the brackets to which they are connected pass into suitable recesses or pas- 85 sageways 68 and 69 (Fig. 4), whereby they will not interfere with the mortar box 70.

As the plate 36 and associated parts move back to the position shown in Fig. 3 the shoulder 71 is adapted to strike the projec- 90 tion 72 (Fig. 5) and pull the rod 73. This rod is connected to the various gates 74 and 75 by levers 76 and 77. A return rod 73' is connected to the arms 77 and to the rods 73, so that both of the gates 74 and 75 will be 95 opened or closed according to the direction of rod 73. When the shoulder 71 strikes the projection 72 the gates 74 and 75 will be opened and any mortar in the chamber or space 78 will drop down immediately onto 100 the wall 13 and will cover the bricks thereon to a greater or lesser extent. This mortar is preferably sufficiently fluid to flow into the spaces between the respective bricks and the remaining mortar presents a covering for 105 all of the bricks. Onto this mortar the next layer of bricks is laid or dropped and then a new supply of mortar is deposited on the new layer of bricks. After the gates 74 and 75 have been opened, as described, the parts 110 are caused to function so that a new layer of bricks will be brought over and deposited on the wall 13. As the plate 36 and associated parts move over toward a position 115 above wall 13 the projection 79 (Fig. 2) strikes the lever 80 (Fig. 3). Upon the actuation of lever 80 a slide 81 is moved so that the openings therein will register with the openings 82 in the bottom of the hopper 70 whereupon mortar will flow down into the 120 chamber 78 readily to be discharged at a later time. As soon as the lever 80 is released by the movement of the projection 79 and associated parts back to the position shown in Figure 3, a suitable spring 83 (Fig. 4) will function to close the slide 81. The 125 chambers 78 will then be loaded so that as soon as the shoulder 71 reaches its full return position and strikes the stop 72 (Fig. 5) doors 74 and 75 will be opened and the mortar will be allowed to drop on the newly laid 130

bricks. This action is repeated as often as the parts function and as these parts move the frame 55 and associated parts intermittently move upwardly. As shown in Fig. 4, the slide 81 is divided into three parts, each part being connected with the lever 80 through a suitable rock shaft 84 and through arms 85. In order to cause the parts to function as just described, namely, to cause the crank 64 to swing from one position to the other and thereby cause certain other movements, the end of crank 64 which extends through the bracket 65 is rigidly secured to a beveled gear 86 (Figs. 3 and 11). This gear continually meshes with beveled gear 87 rigidly secured to shaft 88. An arm 89 (Fig. 11) is rigidly secured to shaft 88, and to this arm is pivotally connected link 90 which in turn is pivotally connected at 91 to the arm 92 rigidly connected with the shaft 93. A pinion 94 is also rigidly secured to shaft 93, and this pinion is positioned so that when the teeth of the mutilated gear 95 passes, said teeth will mesh and rotate the pinion 94 for approximately a half revolution, thus pulling the parts from the position shown in Fig. 11 to the dotted position and thereby swinging crank 64 from the full line position shown in Fig. 2 to the dotted line position shown in Fig. 2. The gear wheel 95 moves out of mesh with pinion 94 after it has swung crank 64 to its extreme position, as shown in dotted lines in Fig. 2. The gear wheel 95 continues its movement and on the next revolution meshes with pinion 94 and gives the same another half revolution, whereupon crank 64 is moved back to the full-line position shown in Fig. 2.

The shaft 88 is divided, as shown in Fig. 8, and the respective arms 89 connect the parts through the pinion 96, thus permitting the shaft to rotate properly throughout its length and at the same time move the link 90. The shaft 88 extends through suitable bearings 97 and 98 and also through a sleeve 99, said sleeve having a pair of upright or outstanding arms 100 pivotally connected with the link 101 which in turn is pivotally connected to the arms 102, and said arms in turn are rigidly secured to the shaft 93', which shaft is divided into several parts, as shown in Fig. 8. The sleeve 99 is adapted to have a back and forth rocking movement, while shaft 93 rotates through the action of mutilated gear 95 acting on the pinion 94. The rotation of the shaft 93 causes an intermittent rotation of the gear wheel 103. These parts are arranged so that not only will the parts shown in Fig. 11 function properly, but the raising mechanism shown particularly in Figs. 3 and 9 will function properly to raise the scaffold 7 and frame 8. To cause an upward movement of the frame 59, the gear wheels 62 and 63 continually mesh with the racks or uprights 60. Gear wheel 63 is rigidly secured to the shaft 93, and as said shaft intermittently rotates motion will be transmitted to gear wheel 63 and through gear wheel 63 to gear wheel 62, so that the racks 60 will be raised and all parts connected therewith. The parts are so proportioned that upon the half revolution of gear wheels 62 and 63 frame 59 and associated parts will be raised the distance of the thickness of one brick plus the thickness of one layer of mortar.

To secure the operation or driving action of the various gear wheels above described, a casing or frame 104 is connected with frame 7 and carries the journal members 97 and 98 and certain other parts, including bar 105 on which is mounted a prime mover, as for instance, an electric motor 106. This electric motor is provided with a worm 107 which continually meshes with worm gear 108, which worm gear in turn is rigidly secured to shaft 109. To this shaft is secured the mutilated gear 95 used to operate pinion 94, and also to this shaft is rigidly secured the mutilated gear 110. Mutilated gear 110 intermittently engages the large pinion 103 which is secured to shaft 93'. From Fig. 8 it will be noted that shaft 93 is separate from shaft 93' but abuts the same and the divided shaft 93' abuts but is separate from the shaft 93''. As indicated in Fig. 8, there are four uprights 60 and two of the gear wheels 63 mesh with two of these uprights, and two of the idlers 62 mesh with the other two uprights, so that when the various gear wheels 62 and 63 function the uprights and also the frame 59 and associated parts will be elevated. In order to elevate the frame 8 and associated parts independently there is provided a large gear wheel 111, said gear wheel being rigidly secured to shaft 88. Connected to this shaft is a pinion 112 meshing with pinion 113, pinion 112 also meshing with the rack 114, while pinion 113 meshes with rack 115. A mutilated gear 116 intermittently meshes with the gear 111, so that this gear and parts associated therewith will be caused to function at the proper time to raise the frame 8, rods 9 and other parts, as heretofore set forth.

In order that the bricks may be properly laid in batches, the device after each batch has been laid, must be moved over a certain distance to the right or left according to which way the bricks are being laid. In order to secure this result automatically, the channel iron 6 on the lower surface is provided with a rack 117 meshing with idlers 118 and 119 and with a driving gear 120. This driving gear is rigidly secured to the shaft 121, and said shaft carries a beveled gear 122 at the outer end. Beveled gear 122 continually meshes with beveled gear 123 rigidly secured to shaft 124. Shaft 124 carries a beveled gear 125 meshing with beveled gear 126

which is rigidly secured to the shaft 88. As shown in Fig. 6, pinion 125 is splined onto the shaft 124, whereby the frame 8 and associated parts may move upwardly or downwardly without interfering with the proper lateral or horizontal movement of scaffold 7 and all parts mounted thereon. Shaft 88 intermittently rotates through the action of the arms 89, link 90 and associated parts. From Fig. 8 it will be noted that the arms 89 are rigidly secured to a sleeve 89' and to this sleeve the beveled gear 87 is rigidly secured. Shaft 88 extends loosely through sleeve 89' so that the beveled gear 126, as well as the beveled gear 127 will operate intermittently as the large gear 111 is moved by the mutilated gear 116 (Fig. 7) actuated through shaft 109. In this way the power from mutilated gear 116 will actuate shaft 88 for raising the casing 104 and associated parts and also for moving the entire scaffold 7 laterally along the supporting channel bar 6. From Figs. 1, 6, 8 and 10 it will be seen that the beveled gear 127 meshes with the beveled gear 108 splined on the rod 129, which rod has a beveled gear 130 rigidly secured to the upper end. The beveled gear 131 continually meshes with gear 130, said beveled gear 131 being rigidly secured to the shaft 132 carrying gear wheels 134, which gear wheels continually mesh with racks 135 formed on one edge of the respective rack bars 136. The respective rack bars 136 are riveted or otherwise rigidly secured to the upper part of the scaffold 7 and depend therefrom so as to continually permit a proper meshing of the gear wheels 134 with racks 135. A series of teeth 137 are formed on the opposite side of the bar 136 to the rack 135, said teeth coacting with an escapement pawl 138. This pawl is pivotally mounted at 139 on the sliding frame 9 and is actuated manually by a rod 140. It will be noted that the shaft 132 is mounted on suitable brackets 141 rigidly secured to frame 9, which frame in turn is riveted or otherwise rigidly secured to the channel support 6. In this way whenever shaft 132 is rotated scaffold 7 and the frame or bars 7' will be raised or lowered according to the direction of rotation of the shaft. During the ordinary operation of the device the shaft is rotated in such a direction as to raise the scaffold 7 a distance equal to the thickness of one layer of brick plus one layer of mortar. While this is taking place the frame 8 is being raised within the scaffold a distance equal to the thickness of one brick plus the thickness of one layer of mortar. As shown in Fig. 3, the device is of a size to lay five layers of brick on the wall 3 before the parts are lowered or reset for a second operation. After all the bricks have been removed from the box 11 and laid on the wall 13 the scaffold 7 must be lowered in respect to the channel irons 6, and then the channel irons 6 with the scaffold raised a distance of five

layers of brick and the mortar associated therewith. When it is desired to lower the scaffold in respect to the bar 6 rod 140 is moved back and forth manually and this actuates the escapement pawl 139, whereby the scaffold is lowered without being dropped. It will be noted that this escapement pawl permits this lowering action, as just described, while also permitting the parts to be raised by the gear wheels 134 and associated parts.

As the scaffold moves up during the laying of the bricks the guiding loops 142 and 143 (Fig. 3) slide along the respective bars 144, said bars being riveted, welded or otherwise secured at their upper ends to the channel bar 6. The scaffold 7 is provided with a transverse rail 145 (Fig. 3) on which the rollers 146 carried by the loops 143 rest, whereby the frames 55 and associated parts are allowed an up and down movement, the latter movement being independent of the scaffold 7, except that the scaffold 7 acting through bar 145 will raise the frames 55 and associated parts each time the scaffold is raised by the gear wheels 134 and associated parts.

In operation the cables 4 and 5 are connected to the metal work of a building or some other support, so that the bar 6 will be suspended at a desired position adjacent the wall. Preferably there are several boxes 11 on the platform or ground and also containers for mortars. A workman places the plate 19 on box 11, and on this plate places one layer of bricks. By reason of the beads or uprights on this plate the workman must correctly arrange the bricks the same as they will appear in wall 3. After this has been done plate 20 is applied and a second layer of bricks is placed in the box. This method is carried out until the box is filled which, in the present instance, will hold five layers of brick. By reason of the beads of the plates in the box an inexperienced workman will correctly arrange the bricks, and then at the proper time the box is elevated by the chains 33, drum 21 and associated parts. After being properly elevated it is moved over manually to the position shown in Figs. 1 and 3. At a convenient time a similar box or other container is engaged with the chains 33' and elevated through the action of drum 21'. The mortar is manually dumped into the hopper 70 and the empty mortar box is again lowered. This leaves the platform 32, as well as platform 37, empty so that the workman may stand thereon. After the box has been placed in position, as shown in Fig. 1, and the proper supply of mortar provided power is turned on to the motor 106 and the grippers 12 will begin to function. These grippers will grip the top layer of brick and then the frame 59 and associated parts will be raised to a certain extent, after which the crank 64 will move the grippers and bricks over the wall 13. The bricks are dropped

onto the wall by the releasing of the grippers 12 and then the crank 64 moves again to shift the grippers back to a position over the box 11, after which the bricks in box 11 are raised
 5 by rods 9 and associated parts. As soon as the grippers 12 move back to substantially the position shown in Fig. 3 the shoulders 71 will strike abutment 72 (Fig. 5) and will operate the various parts disclosed in Fig. 5 and at the
 10 left in Fig. 3 for opening the doors 74 and 75, thus permitting the mortar in chamber 78 to drop down on top of the new layer of bricks. The mortar is comparatively liquid so that it will flow over the bricks and into
 15 the space therebetween but will be restricted to the newly laid bricks by the frame 55 and bolts 58. At the next operation the projection 79 will strike lever 80 for shifting the slide 81, whereupon the doors 74 and 75 will
 20 be closed and a new supply of mortar will be allowed to flow into the chamber 78 ready for the next layer of bricks. This action is carried out until the box 11 has been emptied and then the empty box is lowered in any desired
 25 way, as for instance, by being connected with the chain 33 and lowered downwardly after the doors 27 have been manually elevated. A new box 11 is then elevated and moved over laterally to the position in Fig. 1, whereupon
 30 the device is ready for a second operation. After each operation of the grippers 12, or rather, after these grippers move back to a position over the wall 11 to substantially the position shown in Fig. 3, scaffold 7 will be ele-
 35 vated and also the frame 8. This is accomplished through the action of the gear wheels 134, shaft 132 and associated parts, as well as through the action of gear wheels 112 and 133 shown in detail in Fig. 7. After each
 40 batch of bricks has been laid on the wall the machine moves laterally along the wall, for instance, toward the right as indicated by the dotted layer of bricks in Fig. 14. It will be understood, of course, that the machine could
 45 move in the opposite direction. This movement is produced by the wheel 120 meshing with the rack 117. The machine could be used to lay the first layer of brick in the wall, but ordinarily this is done by hand and one
 50 corner is built up somewhat, so that the machine will lay the successive bricks from one corner to the opposite corner. At least one experienced workman should be used with the machine so that at certain parts of the
 55 wall where the machine cannot properly function the experienced workman can manually lay the brick in the usual manner so as to connect up parts of the wall or take care of other contingencies.

60 What I claim is:—

1. A brick-laying machine, comprising supporting means, a scaffold movable vertically and longitudinally in respect to said supporting means, a brick-carrying box,
 65 means for supporting the box and bricks on

the scaffold, a plurality of gripping members for gripping one layer of bricks in said box, means for raising the gripping members and bricks gripped thereby, mechanism timed to function immediately after said gripping
 70 members have been raised for moving said gripping members and the bricks carried thereby to a point immediately over a wall, means timed to function immediately after said bricks have been moved to said point over
 75 said wall for releasing the gripping members, means functioning to actuate said mechanism whereby said mechanism will move the gripping members back to their first position, and means coacting with the grippers for
 80 discharging a quantity of mortar on top of the bricks immediately after they have been laid.

2. A brick-laying machine, including a scaffold, means for intermittently raising the
 85 scaffold, a brick-carrying box arranged on the scaffold, an auxiliary frame movable in respect to the scaffold, a plurality of rods connected with said auxiliary frame, means for moving said auxiliary frame simultane-
 90 ously with the scaffold but independently thereof, whereby said rod will elevate the bricks in said box the distance of the thickness of one brick plus the mortar, said means for elevating the scaffold acting to move the scaf-
 95 fold upwardly a distance equal to the thickness of one brick plus the distance of the thickness of one layer of mortar, and means coacting with said scaffold and auxiliary frame for moving the bricks from said box
 100 and depositing the same on a wall, said means functioning to move one layer at a time, and means coacting with the brick moving means for discharging a quantity of mortar upon
 105 each layer of brick as the same is deposited on the wall.

3. A brick-laying machine including a supporting bar having a rack thereon, a scaffold movably mounted on said bar, power driven means coacting with said rack for
 110 moving the scaffold longitudinally of said bar, power driven means moving the scaffold transversely of said bar intermittently, means carried by the scaffold for applying successive layers of brick to a wall adjacent
 115 the scaffold, said means functioning immediately before the movement of the scaffold longitudinally and transversely of said bar, and automatically actuated means for discharging a quantity of mortar on top of each
 120 layer of brick deposited on said wall.

4. In a brick-laying machine, a scaffold, a brick-carrying member removably mounted on said scaffold, and means associated with the brick-carrying means for raising and
 125 transporting successive layers of brick from the brick-supporting means to a wall adjacent the scaffold, said means including a supporting frame having a portion overlapping said wall and a plurality of uprights, each
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upright having a rack, a plurality of grippers, means for movably supporting the grippers on said rack, a swinging crank for shifting the grippers and associated parts from one position on the rack to the other, power driven means for intermittently actuating said crank, and a plurality of power driven means for intermittently elevating said scaffold and independently elevating the brick-supporting member.

5. In a brick-laying machine, a scaffold, a member for receiving a supply of bricks and a plurality of means for raising said bricks layer by layer and depositing same on a wall adjacent the scaffold, said means including a plurality of grippers positioned to grip the various bricks of the top layer, supporting means for the grippers, a swinging crank for shifting the supporting means and grippers from one position to another, a beveled gear connected with said crank, a second beveled gear meshing with the first-mentioned beveled gear, an arm connected with said second-mentioned beveled gear, a link connected with the free end of said arm, an intermittently rotated gear wheel, an arm extending from said gear wheel, means connecting the outer end of said arm to one end of said link, whereby upon each half rotation of said gear wheel movement will be produced which will shift said crank from one extreme position to another, a mutilated gear positioned to intermittently mesh with said first-mentioned gear, power means for rotating said mutilated gear.

6. In a brick-laying machine, a scaffold, means for supporting the scaffold, a plurality of bars connected with said means, a frame adapted to straddle a wall adjacent the scaffold, a pair of rollers carried by said frame on each side of said wall, a belt carried by each pair of rollers, whereby said belts and frames will act as a fence for enclosing one batch of bricks and a supply of mortar therefor, means carried by said scaffold for intermittently raising said frames as bricks are laid on said wall, and means carried by the scaffold for intermittently laying batches of brick on said wall.

7. In a brick-laying machine of the character described, a scaffold and means carried by the scaffold for moving bricks therefrom and laying the same on a wall adjacent the scaffold, said means including a plurality of grippers, each of said grippers having a pair of gripping arms pivotally connected together, a spring for normally holding said gripping arms apart, and manually actuated means for moving said arms together, said means including a bell crank lever connected at one end to said arms, and a sliding bar loosely connected to the other arm of said bell crank lever.

8. In a brick-laying machine, a scaffold, means on said scaffold including a box for

supporting a plurality of layers of brick, means carried by the scaffold adapted to move said brick and place the same on a wall, said means acting to move one layer at a time and means for elevating the brick in said box after each layer has been removed therefrom, said means including a plurality of rods extending through the bottom of the box acting on the bricks for elevating the same, a sliding frame carrying said rods, a prime mover, and means connecting the prime mover with said sliding frame, said means giving the sliding frame an intermittent movement in time relation to the movement of the means which removes the bricks from the box and places the same on said wall.

9. A brick-laying machine including a scaffold, means for supporting a plurality of layers of bricks temporarily on the scaffold, means for moving said bricks one layer at a time to a given point, mechanism for causing the bricks to be placed on top of a wall which is being built after said moving means have moved the bricks to said given point, means for intermittently raising said scaffold, and means for intermittently raising the bricks in said box, said last-mentioned means functioning simultaneously with but independently of the means for raising the scaffold.

10. In a brick-laying machine a scaffold, means on the scaffold adapted to support several batches of brick, a plurality of means on the scaffold for moving said brick in layers and depositing the same at one side of the scaffold to build a wall, and means for depositing a layer of mortar on top of each layer of brick, said last-mentioned means including a mortar magazine, a shutter structure forming a bottom to said magazine, a plurality of hinged doors spaced below the shutter structure, whereby a chamber is arranged between the shutter structure and said doors, said shutter structure being adapted to be opened substantially simultaneously with the closing of said doors, whereby mortar will be discharged into said chamber, and means for opening said doors as said shutter closes, whereby the mortar in the magazine is held in place and the mortar in said chamber is allowed to drop by gravity on top of the bricks which have been laid.

11. In a brick-laying machine a scaffold, means on the scaffold for temporarily supporting a plurality of layers of brick, means carried by the scaffold for moving said brick upwardly and then to one side for deposit on a wall, said means including a frame extending laterally from the scaffold to a position over said wall, and a plurality of grippers supported by a carriage mounted on said frame, and a mortar-carrying hopper arranged permanently above said wall for discharging mortar thereon, said hopper having a pair of passageways therethrough for ac-

commodating said frame and part of said carriage as the carriage, grippers and bricks are moved over to a position over said wall.

12. In a brick-laying machine a scaffold, means for supporting the scaffold, a box carried by the scaffold adapted to carry a plurality of layers of brick, and means for successively moving said layers of brick to one side of the scaffold and depositing the same on a wall, said means including grippers, a supporting frame for said grippers and means for shifting the grippers from one end of the frame to the other, said means acting to raise the grippers in a straight line vertically away from said box and then horizontally along said frame to a position over said wall and then vertically downwardly to a position on said wall.

13. In a brick-laying machine a scaffold, means for supporting the scaffold, means on the scaffold for supporting a plurality of layers of bricks, mechanism carried by the scaffold for successively gripping each layer of brick and moving the same to one side for deposit on a wall, means for intermittently raising the scaffold, said means acting to raise the scaffold after each layer of brick has been removed, and manually-actuated means for permitting a return of the scaffold to its lowered position without danger of dropping, said means including a rack and an escapement pawl coacting with the rack.

14. In a brick-laying machine a scaffold, a pair of platforms carried by the scaffold, said platforms being comprised of two hinged doors, a stop for each door to permit the doors to swing upwardly but to be stopped in a horizontal position, elevating means arranged above said doors, said elevating means acting to elevate bricks and mortar upwardly past said doors to a position on the scaffold, and a plurality of means for moving said bricks to one side and depositing the same on a wall, and other means for providing a layer of mortar on top of each layer of bricks.

15. In a brick-laying machine a scaffold and means for supporting temporary layers of brick on the scaffold and means for transporting said brick to one side to be laid in a wall, said means including a frame having a pair of runways extending over said wall, wheels mounted on said runways, a plate supported by said wheels, means associated with said plate for moving the plate over said wall and back to a position within said frame, a plurality of brick-gripping means carried by said plate and a plurality of automatically-actuated means for opening and closing said grippers.

16. In a brick-laying machine a scaffold, means for supporting brick thereon temporarily and means for moving said brick to one side of the scaffold preparatory to being deposited on the wall, said means including

a frame, a transporting carriage movably mounted on said frame, a gripping structure carried by said carriage for gripping certain of said bricks and moving the same to a position over said wall as said carriage is moved, a swinging crank for moving said carriage back and forth, a plurality of driving mechanisms for swinging said crank back and forth, said frame being provided with a plurality of uprights, each upright having a rack, a gear wheel meshing with each of said uprights, and means for moving said gear wheels, said means acting to cause the gear wheels to raise and lower said frame as said grippers function so that after a supply of brick has been gripped the frame will be raised and held in an elevated position while said carriage moves the bricks over said wall, said means also functioning to lower the frame before said grippers release said bricks on said wall, said means also functioning to again raise said frame while the carriage is moved back to a position within said scaffold.

17. In a brick-laying machine a scaffold, a box structure mounted on said scaffold and adapted to contain a supply of bricks, a plurality of plates arranged in said box structure, each of said plates having upstanding beads forming recesses into which the bricks are adapted to be placed, said bricks projecting beyond said beads, said beads functioning to cause the bricks to assume the correct relative position that they occupy when built in a wall, and substantially automatically acting means for successively gripping each layer of brick and transporting the same to one side while in proper arrangement so that when lowered to a position on the wall the bricks will be properly arranged.

18. In a brick-laying machine a scaffold, means for supporting the brick temporarily on the scaffold, and means for transporting said bricks in batches to one side, said means acting to deposit the transported bricks on top of a wall, said means including a plurality of grippers and mechanism for operating the grippers, each gripper comprising a pair of scissor-shaped members, a pad on each member adapted to press against the bricks when the grippers are functioning, a spring connecting said members and acting to produce a gripping action, a bell crank lever having a long arm and a short arm, one of said members being pivotally connected to the outer end of said long arm, a link pivotally connecting the other of said members to said long arm, and a sliding bar formed with a notch accommodating one end of the arm of said bell crank lever, said bar being adapted to be slid in one direction for causing the closing of said grippers while said spring acts to open the grippers.

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