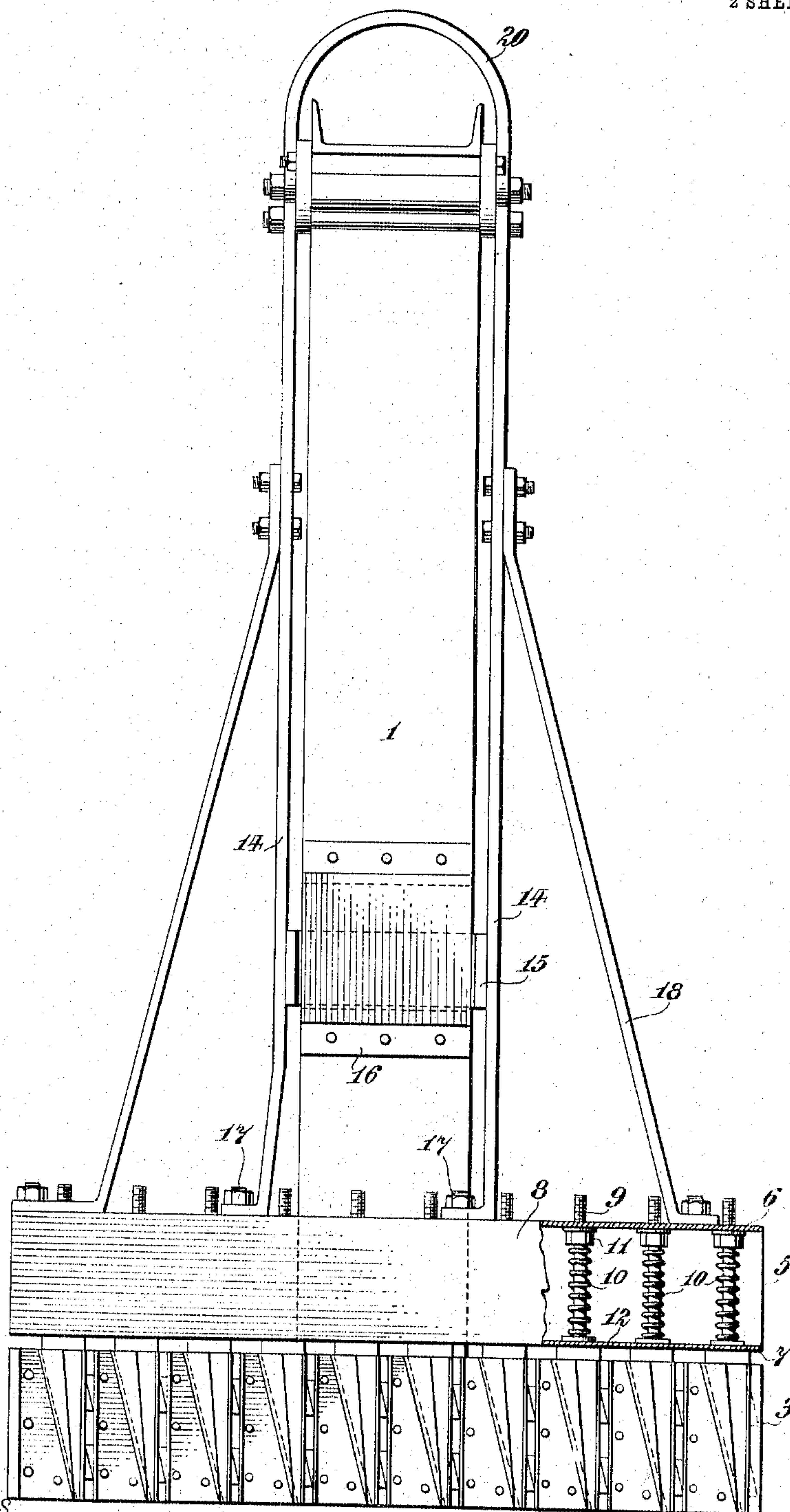


R. C. PENFIELD.
 DEVICE FOR HANDLING BRICKS.
 APPLICATION FILED OCT. 9, 1908.

967,662.

Patented Aug. 16, 1910.

2 SHEETS—SHEET 1.



WITNESSES

John H. Smith
 L. B. Schroeder

Fig. 1.

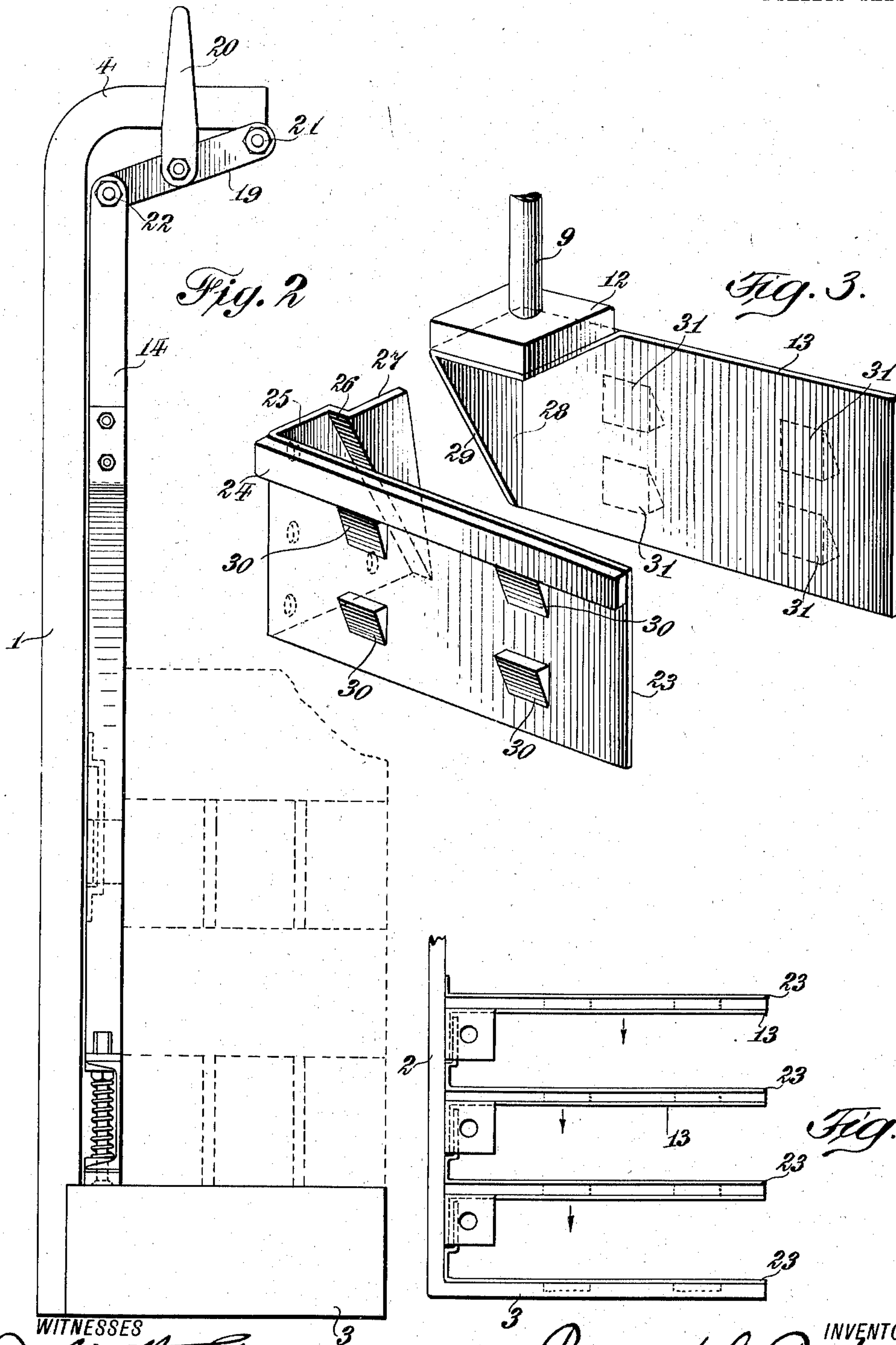
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DEVICE FOR HANDLING BRICKS.

967,662.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed October 9, 1908. Serial No. 456,994.

To all whom it may concern:

Be it known that I, RAYMOND C. PENFIELD, a citizen of the United States of America, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Devices for Handling Bricks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention refers to a new and useful device for handling bricks. Its principal object is to avoid the repeated manipulation of the bricks by hand over and over again, and, therefore, to save labor and reduce expense.

The invention consists essentially in means whereby a stack of bricks built up in suitable formation may be lifted bodily and transferred from point to point, as, for instance, from the brick machine to the kiln or elsewhere; and the invention also comprises numerous details and peculiarities in the construction, combination and arrangement of parts substantially as will be hereinafter described and claimed.

This machine provides another and different means for what has heretofore been known for carrying into effect a method covered by Letters Patent granted to William H. Francis, No. 874,582, dated December 24, 1907, Improvement in the method of transporting bricks. This method consists essentially in stacking up the bricks with uniform spaces between the units of the basic layer, so as to permit projecting arms to enter these spaces to carry the superposed load, while the basic layer is itself picked up and carried along with the superposed load by the lateral pinching action of clamping devices; and in said method either the lifting strain is applied at a point below the center of gravity of the bulk, but above the basic layer of the material, simultaneously with the application of a pinching strain to the basic layer, or else the application of the horizontal or lateral pinching or clamping strain to the basic layer exerts so strong a pressure on the latter that in lifting it the superposed load is likewise lifted, the action in this latter case being in effect a single lifting strain without having the lifting arms perform any direct lifting action above the basic layer. The mechanism of the present

invention, therefore, simply provides additional novel means for accomplishing the same object, through either the single clamping power or the combined strains mentioned.

In the accompanying drawings, illustrating my invention, Figure 1 is a front elevation of my improved brick handling machine. Fig. 2 is a vertical sectional side elevation of the same. Fig. 3 is a perspective view on an enlarged scale of two clamping members, one of which is stationary and the other movable, one belonging to one pair of clamps and the other to the next pair. Fig. 4 is a partial top plan view of the clamping mechanism at the bottom of the frame.

Similar characters of reference designate corresponding parts throughout the different figures of the drawings.

The frame of my improved machine may vary within wide limits, provided only it has the necessary principal parts to enable it to perform its function of accommodating the mechanical features of the device and permitting them to operate in the specified way. In the specimen frame shown, there is a vertically-disposed bar 1 of suitable size and strength, which is connected at its lower end to a horizontal member 2 whose ends 3 are turned laterally at right-angles to the main direction of the member 2 so as to constitute a stiff rectangular frame at the base of the main frame. The upper end of the central vertical bar 1 is turned laterally so as to furnish a horizontal portion 4 projecting in the same direction as the ends 3 of the horizontal member 2, so that when the device is placed alongside of a stack of bricks, the laterally-turned upper end 4 of the frame will be situated at a point over the top of the stack, while the projecting ends 3 of the horizontal member 2 will lie alongside the base of the stack vertically below the laterally-turned upper part 4.

Above the horizontal member 2 is a movable horizontal frame 5 consisting of an upper horizontal plate 6, a lower horizontal plate 7, and a vertical connection 8 between them, said parts 6, 7 and 8 being made preferably integral with each other as a channel piece. This movable channel frame is arranged in connection with a series of vertical stems 9 passing loosely through the upper and lower plates 6 and 7. Each pin is

surrounded by a spiral spring 10 which is tensioned against a regulating nut 11 at the top just below the plate 6 and also against the plate 7, so that the movable frame when lifted will carry with it the series of vertical stems 9, but with a yielding lift due to the interposed springs 10, so that the lifting of the series of stems 9 takes place with a certain degree of elasticity which allows certain of the clamping devices to operate in a compensatory way, providing for inequalities, etc., as will be presently explained. On the lower end of each of the stems 9, below the plate 7 of the channel piece is a block 12 which enables the pin 9 to be effectively connected to the movable clamp 13, as I shall more fully explain. This movable frame is supported by means of vertical bars 14, 14 connected together by a horizontal strut 15 which is held in place by a guide strap 16 that is secured firmly to the face of the central bar 1 of the main frame. Said strap 16 is of sufficient length to allow the strut 15 to move up and down the necessary distance during the up and down movement of the channel frame. The lower ends of the bars 14 are bolted at 17 to the upper plate 6 of the channel frame. Braces 18 are bolted both to the bars 14 and also the channel frame near the outer ends of the upper plate 6, as shown in Fig. 1. The upper ends of the bars 14 are pivoted to a horizontal lever 19 whose outer end is pivotally supported on the laterally-turned upper end 4 of the main frame; and pivoted to the lever 19 is a hook or bail 20 by means of which a lifting crane or other supporting means is applied to the machine for the purpose of raising it together with the mass of brick which it is designed to carry. The pivoting of the lever 19 to the laterally-turned end 4 of the main frame is accomplished by means of a suitable pivot pin or bolt 21, while the pivoting of the upper ends of the bars 14 to the lever 19 is accomplished by means of a suitable pin or bolt 22, see Fig. 2.

Secured to the horizontal member 2 of the base frame are a plurality of equidistant relatively stationary plates 23 arranged to stand vertically edgewise, as shown in Figs. 3 and 4. These plates 23 are spaced from each other, and from the right-angled ends 3 of the horizontal member 2 a distance which will be greater than the thickness of a brick. Alongside of the relatively stationary plates 23 are arranged a plurality of equidistant movable plates 13 of a somewhat different construction, but they are arranged to stand vertically edgewise and to be moved relatively to the stationary plates 23. Thus I provide pairs of plates, one member of each pair being relatively stationary, and the other being relatively mov-

able. When the members of each pair are brought close together the clamping of the bricks is relieved, but when they are spread apart the action results in tightly gripping the adjacent faces of the bricks between which these pairs of plates are arranged. In Fig. 3, the stationary plate 23 belongs to one pair, and the movable plate 13 belongs to the next pair in the series.

Each of the stationary clamping plates 23 is preferably provided with a horizontal bar 24 secured thereto near the upper edge, see Fig. 3. This bar has the function of a lifting bar when it rests beneath the superposed mass at the time that the clamping members are between the spaced units of the basic layer. I do not desire to restrict myself to the use of this lifting bar, for in most cases the probability is that the horizontal clamping action of the pairs of clamping plates upon the basic layer will be sufficient to lift the entire mass without employing lifting fingers, but should the latter be deemed desirable, I provide a simple and easy method of furnishing the lifting fingers by thus enlarging or broadening the upper edge of the stationary clamping plates 23 through the addition of the lifting bar 24 as stated.

Proceeding now to further describe the detailed construction of the stationary clamping plates 23 and the movable clamping plates 13, it will be noted that the plates 23 are provided at one end with a right-angled plate 25 having at one edge an oblique offset or angular incline 26 which provides a vertically-inclined face, and alongside of this inclined face 26 is a guiding extension 27, which is parallel to but offset from the plate 25. The end of the movable clamping plate 13, nearest the aforesaid inclined face 26 of the stationary plate 23, is provided with a right-angled plate 28 having an inclined edge 29. This inclined edge 29 of the movable plate 13 is designed to ride upon the inclined face 26 of said adjacent stationary plate 23, when the members of a clamping pair are being spread apart to perform the clamping action, and after the clamping is finished, and it is desired to replace the parts in their original position where the members of the clamping pair will be close together, the said inclined edges by their engagement with each other cause said members to be brought into close association with each other; for, as the movable member 13 drops and the inclined edge 29 slips back down the inclined surface 26; it is evident that the movable member 13 will be brought closer into contact with the corresponding stationary member 23 of the clamping pair. The inclined surface 26 may, therefore, be termed a replacing incline, for, in association with the

incline 29 on the movable clamp, it replaces the clamping device in the position where it is ready again to perform the clamping function when the spreading operation is performed therewith. Further, one longitudinal side of each of the stationary members 23, as also of each of the movable members 13, is perfectly plain and smooth, this being the side next to the brick with which it is to come into contact, while the opposite side of each of the clamping members 13 and 23 is provided with a certain number of wedge-shaped projections, those on the stationary members 23 being inclined in the same direction as those on the adjacent movable members 13, so that when the two members which are in contact with each other are caused to move relatively, they will be spread apart. On each of the stationary members 23 are indicated in the drawings four wedge-shaped projections 30, and on each of the movable clamping plates 13 I have indicated four similar wedging projections 31. These wedging projections are placed thus in two horizontal lines. Obviously, the two horizontal lines will be sufficient to clamp two rows of brick, if the wedges are a sufficient distance apart, but if desired, and they are placed close enough together, there may be two rows of wedges for the same row of brick. Details of this kind will be subject to change to meet the exigencies of individual cases, and I do not wish to be restricted to any particular number or arrangement of the wedges. It is important, however, that the thin ends of the wedges on the stationary plates 23 should be at the bottom and on the movable plates 13 should be at the top, that is to say, should be opposite to each other, so that the wedges may properly act in association with each other, they being arranged in this way to allow the wedging faces 31 to so slide on the wedging faces 30, when the movable plate 13 is lifted, that said movable plate 13 will spread horizontally away from one stationary plate 23 at this time, but toward another on the opposite side of the intervening brick, and this will cause an efficient clamping action to take place against the sides of the adjacent brick, that is to say, the brick at the side of the movable clamping plate 13 and that at the side of the corresponding stationary clamping plate 23, said spreading action taking place in the direction shown by the arrows in Fig. 4.

When each movable clamping plate 13 is in its lowermost position, *i. e.*, that of close contact with the companion fixed plate 23, the inclined edge 29 reposes on the angular face 26 with the guide 27 alongside of the plate 28; and when the movable plate 13 is lifted, the contact of the edge 29 with the face 26 continues, while, at the same time,

the wedges 31 are co-acting with the wedges 30. Of course, the lifting of the movable plate 13 is only for a short distance, and only enough to enable the wedges to spread the plates apart, so that the adjacent bricks may be tightly caught thereby. When the movable plates 13 are released and are permitted to resume their normal place, they obviously will drop or be forced down by the action of the leverage mechanism, and at this time the inclined contacting faces 29 and 26 will bring the movable plate 13 again into as close contact as possible with the companion fixed plate 23.

The operation of the machine proceeds as follows: As the bricks are hacked up, the lowermost tier or tiers will be spaced apart with uniform distances between. The derrick, or other suitable hoisting mechanism, will then be brought up to the stack and caused to lay hold of the lifting device, grappling the bail 20, and raising the device after the pairs of clamping members have first been inserted in the uniform spaces between the units of the basic layer. The lifting force applied to the bail 20, raises the movable channel frame and the entire device. The lifting strain thus applied to raise the machine automatically operates the clamps, for as the movable channel frame is raised, its lower plate 7 will compress the springs 10 to a greater or less extent, and lift the stems 9 which are attached, as I have shown, to the movable plates 13, thereby lifting said plates and spreading them away from their fixed companion plates 23, so as to effect a clamping action on the adjacent devices of the bricks. The springs 10, which are introduced in the lifting process, allow a yielding character to be imparted to the movement of the movable clamps so as to take up any inequalities in the space between the bricks. In consequence, however, of the movement of the plates 13, the bricks of the lowermost tier or tiers will all be firmly clamped between a movable plate and a fixed plate, or, as at the ends, between the movable plate and the rectangular arms 3 of the horizontal member 2. After the plates have been thus firmly clamped against the several bricks of the lowermost tier or tiers, there will be no further movement of the movable members 13 with respect to the frame; but the entire device, with the stack of bricks thereon, will be lifted bodily and transferred to the kiln or other desired place. Thus it is seen that during this operation, the entire weight of the stack is utilized in the clamping action. Of course, in those cases where it is thought desirable to have a direct vertically-acting lifting strain under the superposed mass to act in conjunction with the horizontal clamping strain, the auxiliary bars 24 at the top of

the fixed clamps 23 will serve the purpose of lifting fingers as I have already pointed out.

Many changes in the precise construction and arrangement of the various parts may be made without exceeding the scope of the claims.

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

1. A device for handling bricks, comprising a frame having pairs of clamping members adapted to be inserted between adjacent bricks of a stack, means for spreading said members apart, and wedging means for returning said members to their normal position.

2. A device for handling bricks, comprising a frame having a clamping mechanism at the base, a wedging mechanism for opening the said clamping mechanism, and cooperating inclines for closing it.

3. A device for handling bricks, comprising a vertical frame having pairs of clamping members adapted to be inserted between adjacent bricks of a stack, means for spreading the members apart consisting of wedge devices cooperating with each other, and means for restoring the clamping members into close association consisting of cooperating inclined parts.

4. A device for handling bricks, comprising a frame and a plurality of pairs of clamping members at the base thereof, wedges on said clamping members cooperating with each other to spread the members apart to clamp the bricks, and inclines for replacing the clamping members in their closed position again.

5. A device for handling bricks, comprising a vertical frame, and a series of pairs of clamping members adapted to be inserted between adjacent bricks of a stack, means for spreading the clamping members apart to clamp the bricks, and means for replacing the clamping members in close association, consisting of inclines on the two members cooperating with each other.

6. A device for handling bricks, comprising pairs of clamping members, one member of each pair being fixedly mounted, and the other being movable relatively thereto, means on the fixed and movable members for spreading them apart, and means on the fixed member for causing the adjacent movable member to be brought back into close association with the next fixed member when the clamping action is released.

7. A device for handling bricks, comprising a frame having pairs of clamping members adapted to be inserted between adjacent bricks of a stack, and means for returning the clamping members to their idle position when the clamp is released, said means

consisting essentially of cooperating inclines on the clamping members.

8. A device for handling bricks, comprising a frame having pairs of clamping members adapted to be inserted between adjacent bricks of a stack, one member of the pair being relatively stationary and the other relatively movable, a wedging mechanism for opening the clamping members, means for lifting the movable member, and means for restoring the said members to their normal closed position consisting essentially of an inclined surface on the stationary member and a cooperating inclined part on the movable member.

9. A device for handling bricks, comprising a frame having a plurality of spaced pairs of members adapted to be inserted between adjacent bricks of a stack, wedges on said members co-acting directly with each other for spreading said members apart to clamp the bricks, and means for causing the action of each clamp to be elastic to provide for bricks of different thickness.

10. A device for handling bricks, comprising a frame having a plurality of pairs of members adapted to be inserted between adjacent bricks of a stack, directly coacting wedges on said members for spreading the members apart to clamp the bricks, and means consisting of individual lifting springs interposed in the train of the expanding devices for each clamping device.

11. A device for handling bricks, comprising a frame having a plurality of spaced pairs of members adapted to be inserted between adjacent bricks of a stack, and means on the members operating in direct contact with each other at the time the members are moved in the clamping operation for spreading said members apart to clamp the bricks together with elastic mechanism to compensate for variations in the bricks and the spaces between them.

12. A machine for handling bricks, comprising a vertically disposed frame, a laterally-extended arm at the top thereof, suspending means connected to the outer end of said arm, clamping devices having directly coacting wedges thereon and arranged at the bottom of the frame, and means for operating said clamping devices by the initial movement of the lifting strain, said means including individual elastic devices for the clamping mechanism to compensate for variations in the thickness of the bricks and the width of the spaces between them.

13. A device for handling bricks, comprising a vertically-disposed frame having a laterally-turned upper end, supporting means carried by the outer part of said upper end, laterally-extending clamping devices carried by the lower end of said frame and consisting essentially of spaced pairs of

members adapted to be inserted between adjacent bricks of a stack, said members having directly co-acting wedges thereon, and means for operating said clamping devices
5 with an elastic effect which provides for variations in the thickness of the bricks and the width of the spaces between them.

In testimony whereof I affix my signature in presence of two witnesses.

RAYMOND C. PENFIELD.

Witnesses:

FRANK PAUL,
C. B. SCHROEDER.