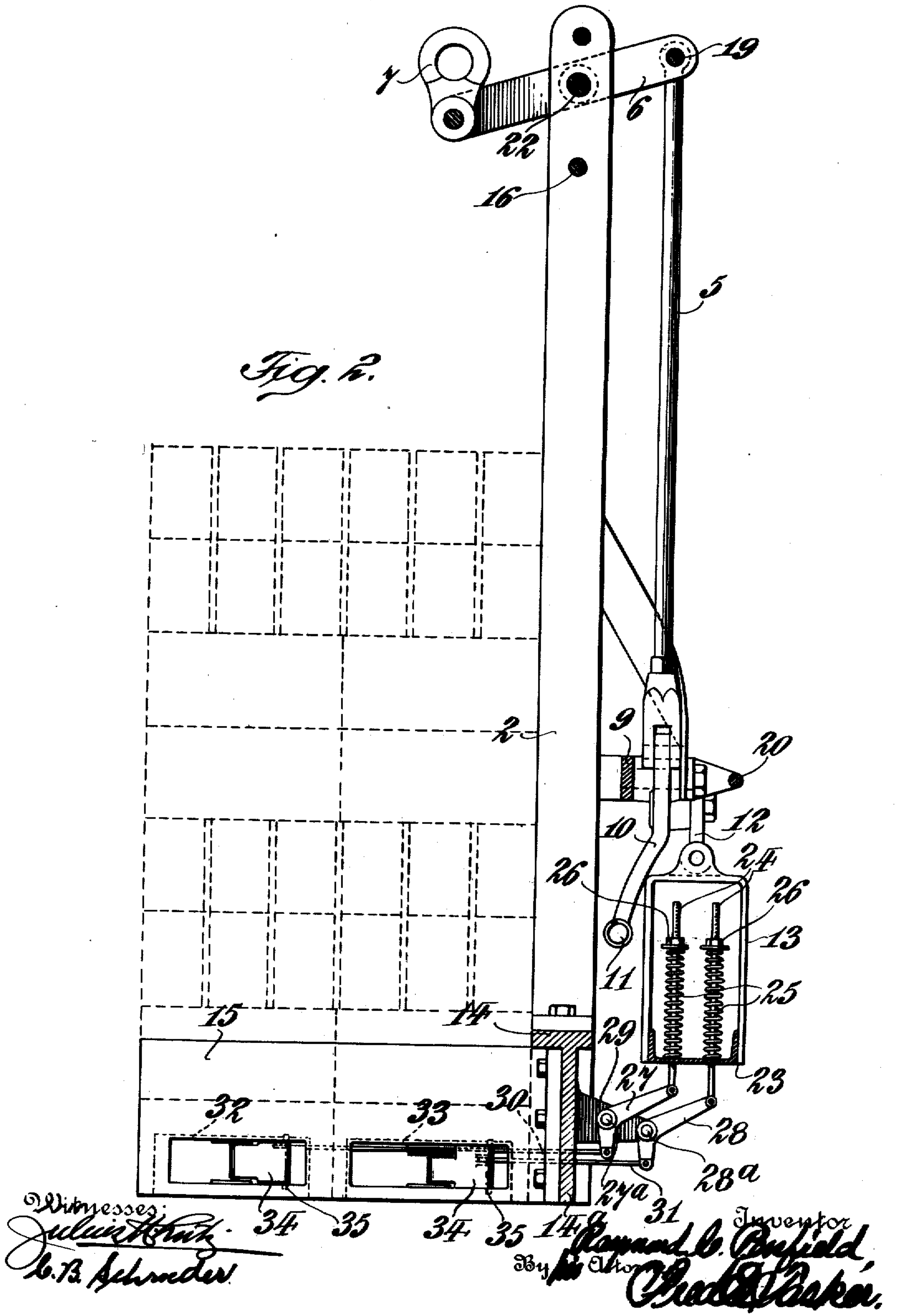


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Fig. 1.

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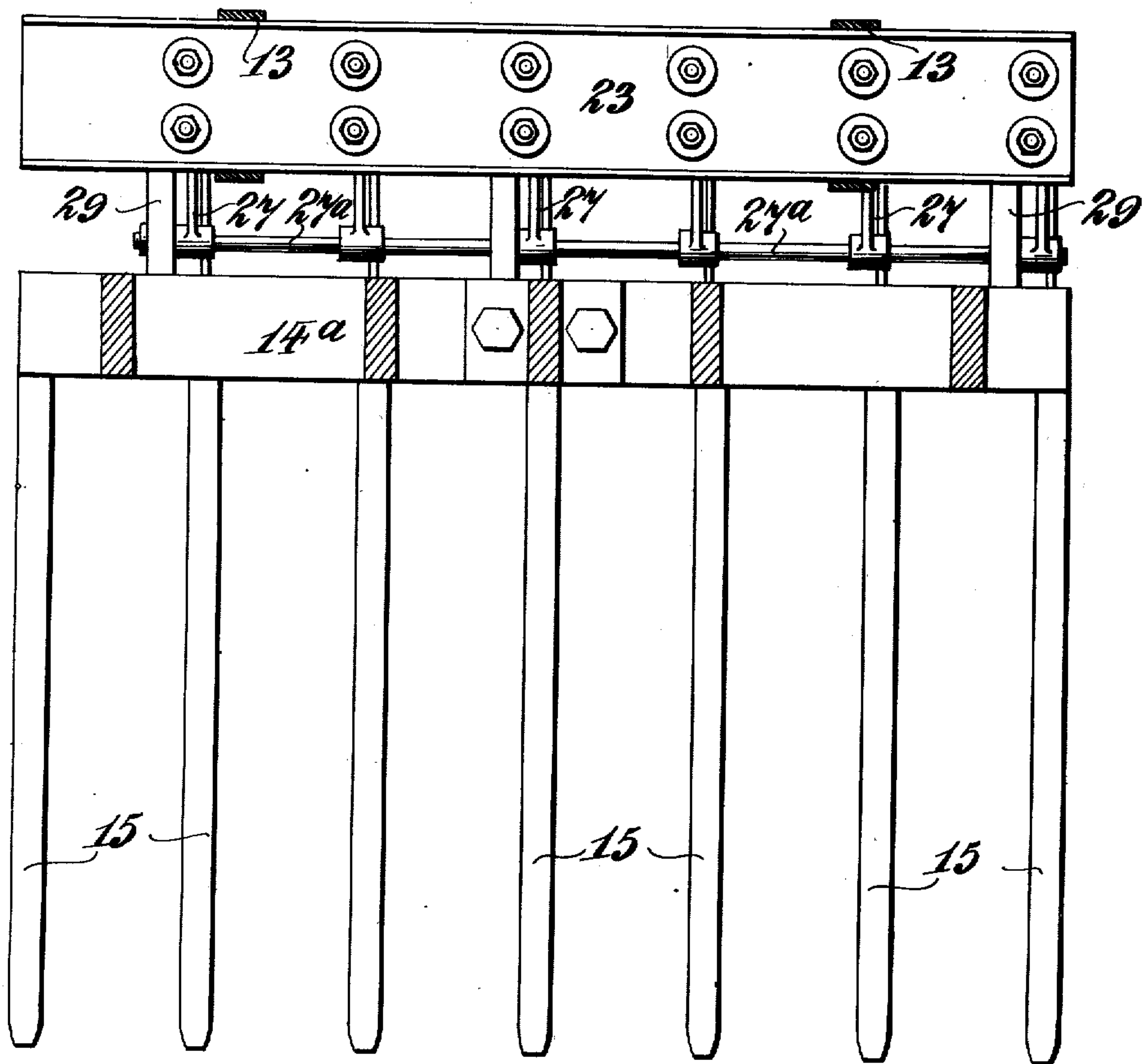


Fig. 3.

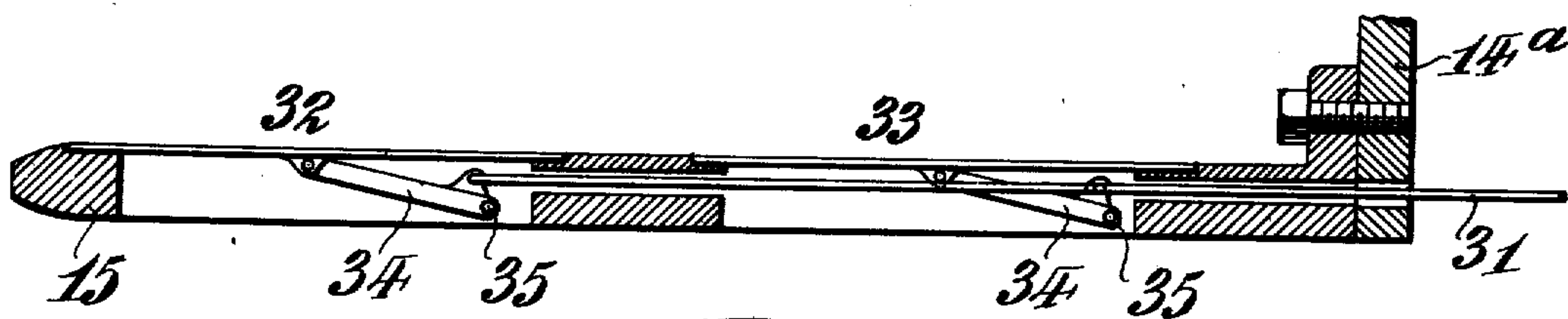
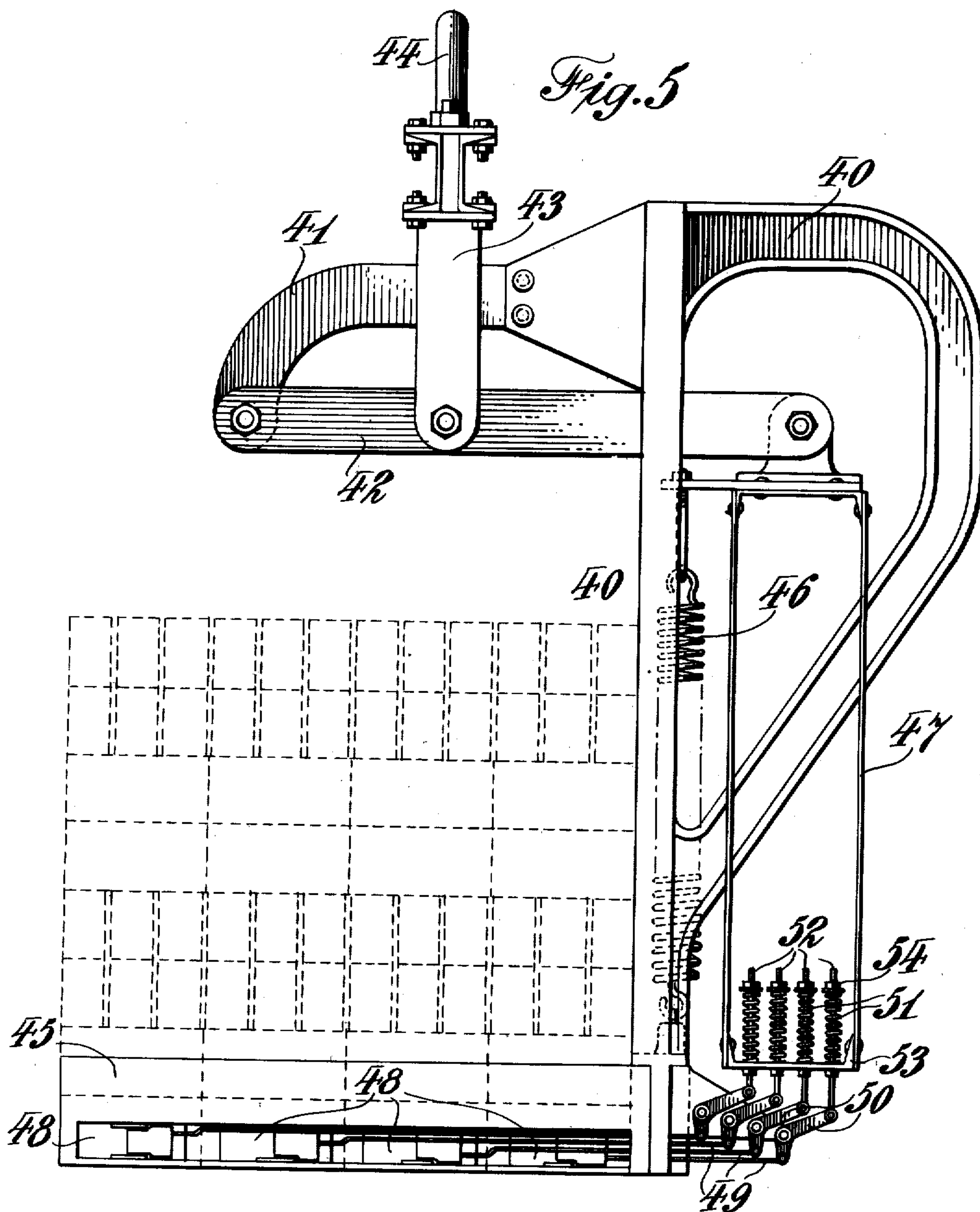


Fig. 4.

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# UNITED STATES PATENT OFFICE.

RAYMOND C. PENFIELD, OF NEW YORK, N. Y.

MACHINE FOR HANDLING BRICKS.

999,519.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed March 12, 1909, Serial No. 482,902. Renewed December 22, 1910. Serial No. 598,823.

*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 Machines for Handling Bricks, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to a machine for handling bricks in bulk and transporting the same to any desired point.

The object of the invention is to simplify and perfect a handling mechanism which can lift simultaneously a number of unit stacks or a large stack made up of a plurality of smaller units and carry the same about from point to point without breaking the bulk, at last placing the entire stack formation in the desired location, either in storage or at a point where the bricks are to be used, either locating the stack by itself or placing it in association with other stacks.

The invention consists essentially in a lifting basket having lifting devices which are each provided with a plurality of clamps calculated to independently grip the basic layers of several unit stacks.

In my co-pending application for Letters Patent, filed October 9, 1908, Serial No. 456,994, I have shown and described a lifting basket having clamping devices adapted to be inserted between the units of a basic layer of bricks arranged in a stack formation, and by thus engaging the basic layer and lifting upon the superposed mass to raise the whole and easily transport it from one point to another. In said application, however, the lifting fingers are only associated each with a single clamping mechanism, so that primarily the machine is designed to perform its function with a single basic layer of one stack.

In my present invention the lifting devices are elongated so as to serve with the basic layers of a plurality of stacks, say two or more, and in order to enable this result to be effectively accomplished the lifting devices are provided with two or more clamping agents arranged tandem and which operate independently of each other and apply their clamping effect independently to separate unit stacks located in proximity to each other or to separate basal layers of the

same stack formation; and the invention furthermore consists essentially in the construction, arrangement and combination of the various parts, substantially as will be hereinafter described and then more particularly pointed out in the claims.

In the accompanying drawings illustrating my invention, Figure 1 is a front elevation of my improved brick handling machine. Fig. 2 is a sectional side elevation of the same. Fig. 3 is a top plan view with certain parts removed. Fig. 4 is an enlarged detail longitudinal section of one of the lifting fingers, and shows the associated clamping agents and other appurtenances. Fig. 5 is a side view of a modification.

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

The frame of my improved brick handling machine may vary widely and it is only necessary that it should be so built as to enable it to perform its proper function in supporting the mechanical elements of the machine. It is desirable obviously that it should consist of as few parts as possible, strongly put together, and of a convenient size to be readily handled in practice. The specimen of frame which is represented in the drawings is only one of many that might be adopted for the purpose. In this specimen frame 1, 1 denote inclined side bars between which is a vertical center bar 2. The inclined bars 1 are bolted near the top to the center bar 2 by a suitable bolt 16. The lower ends of the inclined bars 1, 1 are bolted firmly to the triangular frames 3, which in turn are secured to or made a part of the horizontal base bar 14, which is formed with a depending vertical plate 14<sup>a</sup>, to which a series of horizontal lifting bars 15 is firmly bolted as seen more particularly in Figs. 2 and 3.

Bolted to the inclined side bars 1 are vertically disposed braces 8, 8 which are fastened to a horizontal bar 9 that is likewise secured to the inclined bars 1, 1, said bar 9 being provided with a handle 20 by means of which the frame can be manipulated. On the inclined bars 1 are also handles 4 for manipulating the machine. Pivoted to the bar 9 are also curved levers 10 whose lower ends are connected together by the spring 11 which serves as a balancing spring. The other ends of the curved levers



10, which ends are proximate to the center vertical bar 2, are pivotally connected with the lower ends of thrust bars 5, 5, whose upper ends are pivoted at 19 to one or more levers 6 which are supported on a bolt 22 passing through the central bar 2 of the main frame. To the outer end of the lever or levers 6 is pivoted an eye 7 to which a crane or other lifting device or suspension means is adapted to be attached for the purpose of lifting and carrying the machine about. Obviously when the lifting mechanism lays hold of the eye 7 and raises it, the lever or levers 6 will be turned upon the pivot 22, and the thrust bars 5 will be forced downwardly, thereby oscillating the curved levers 10 on their pivots and spreading or expanding the balancing spring 11. Vertical rods 12 are also pivoted to the curved levers 10 at one end, and at the other end to the rectangular frames 13 which are fastened to a movable horizontal bar 23 which serves to carry the stems 24 that are provided with encircling springs 25 which are tensioned between nuts 26 on stems 24 and the bar 23. The various stems 24 project through openings in the bar 23 downwardly beneath the latter and are pivotally attached to bell cranks 27 and 28 which are carried by shafts 27<sup>a</sup> and 28<sup>a</sup> supported in brackets 29 projecting from the plate 14<sup>a</sup>, which I have stated is carried below and by the horizontal base bar 14. These bell crank levers 27 and 28 are pivotally attached to horizontal rods 30 and 31, see Fig. 2, which rods pass through openings in the lifting fingers 15 and are designed to actuate the clamping plates 32 and 33 arranged in series on each lifting finger 15 on the side thereof and between the plate 14<sup>a</sup> and the outer extremity of said finger.

The clamping plates 32 and 33 occupy a vertical edgewise position and are susceptible of a lateral movement relatively to the lifting fingers or plates 15, see Figs. 2 and 3. These clamping plates 32 and 33 are designed to act against the adjacent bricks and tightly clamp all of the bricks in the basic or other layer, in connection with which they are arranged, tightly together so that when the machine is lifted the basic layer as well as the superposed mass may be lifted. Said clamping plates 32 and 33 are of any desired size relatively to the lifting fingers 15. In the example shown in the drawings they are something less than half the width, and in such a case the lifting fingers 15 may, if desired, be provided with two or more parallel horizontal series of these clamping plates. If the lifting fingers 15 are wide enough to be used in conjunction with more than one horizontal layer of bricks, then obviously the clamping plates, if a plurality of horizontal series are provided, may exercise their clamping effect upon one or more

layers above and in addition to the lower layer; but these are modifications which will naturally occur to the builder of the machine in fitting the same for any special work which it may be called upon to do, and I reserve the liberty of so changing and modifying the invention as may be required to suit it for these different cases. The clamping plates 32 and 33 are preferably seated in rabbets as shown in Fig. 4 in the finger 15 when they are closed tightly up against the latter. They are pivotally supported near their central points on the ends of levers 34, which levers are pivoted at 35 within the lifting plates or fingers 15. The actuating rods 30 and 31 are loosely connected to the levers 34 at points between their fulcras 35 and the pivotal connections with the clamping plates, said points of connection of rods 30 and 31 with these levers 34 being preferably closely adjacent to the fulcral points 35. Obviously when the bell cranks 27 and 28 are actuated, and the rods 30 and 31 reciprocate, the clamping plates 32 and 33 will, under the impulse of the levers 34, be moved relatively to the finger 15 and caused to exercise their clamping action, or to refrain from so doing and to be retracted into their normal position shown in Fig. 4, accordingly as the operation of the devices may be in one direction or the other.

Although I have represented two clamping plates in connection with finger 15, it is quite obvious that there may be more than two, the only change needed to provide for a multiple number of the clamping plates being that the finger 15 should be longer and should be so built as to accommodate a large number of the clamping plates. Whatever be the number they can all be easily operated by a number of rods similar to rods 30 and 31 which will be actuated by a like number of bell crank levers which in turn will be operated by the movement of the horizontal bar 23 acting against the interposed springs 25 on the stems 24.

The operation of the machine will be evident from the foregoing description of the construction without need of additional detail.

It will be clear that when a lifting crane or other suspension means engages the eye 7 and acts to raise the machine with its load, the lever or levers 6 will be vibrated upon the fulcrum 22 and this will cause the thrust rods 5 to be thrown downwardly, whereby the elbow levers 10 will be oscillated on their pivotal points and the vertical rods 12 will be lifted, carrying with them the frames 13 and the horizontal bar 23, which, through the agency of the springs 25 acting against the nuts 26 on the rods 24, will lift said stems and actuate the bell crank levers 27 and 28, thereby reciprocating the rods 30



and 31 and causing the clamps to move relatively to the lifting fingers in which they are supported.

In Fig. 5 I show a sectional side view of a modified form of the invention, having more than two clamping plates on each lifting finger. In this figure I represent four clamping plates on each lifting finger. I do this simply for the purpose of explaining more fully with what ease the number of clamping agents on the lifting finger may be multiplied without increasing to any extent the complication of the mechanism. Briefly describing Fig. 5, it will be seen that there is a main frame 40 having a curved forward end 41 which projects over the pile of bricks which have been set in pre-arranged stack formations, there being several of these stacks, four for example, placed alongside of each other. A lever 42 is pivoted to the overhanging projection 41, and to said lever is pivoted a lifting yoke 43 having an eye 44 to which a crane or other suspension means may be attached. The other end of the lever 42 is pivotally connected to a frame 47 which lies alongside of the main frame 40 and extends downwardly to near the bottom of said frame where its lower end, which is constituted of the horizontal bar 53, supports the series of vertical stems or rods 52 around which are coiled springs 51, said springs being tensioned between the bar 53 and adjustable nuts 54 on the stems 52. These stems 52, in like manner with the stems 24 in that form of the invention shown in Fig. 1, have their lower ends that project downwardly through the bar 53 pivotally connected to the upper arms of bell crank levers 50 which are movably supported in the lower part of the frame, and which bell crank levers have their lower arms pivotally fastened to the rods 49 that are connected to and operate the clamping plates 48. Thus it will be seen that the arrangement, construction and operation of the parts comprising the bell crank levers, the clamping plates, the connections between the plates and the levers and the spring-provided stems which are interposed between the lifting frame and the clamp-actuating leverage for the purpose of enabling any unevenness in the thickness of the bricks or any inequalities in the width of the spaces between the bricks to be readily compensated for, are all substantially the same as in the other form of the invention shown in Figs. 1, 2, 3 and 4, except that there is a larger number of clamps and a corresponding larger number of mechanical devices for operating them.

In order that the mechanism may work with evenness and regularity, a balancing spring 46 is employed which is interposed between the upper end of the frame 47 and the lower end of the frame 40, as indicated

in Fig. 5, so that when the lever 42 lifts the frame 47 the spring 46 is expanded. Said spring assists in enabling the parts to work together in a proper and even manner. It will be understood, obviously, that when the lifting crane lifts the frame the yoke 43 will raise the lever 42 and shift it on its pivot, thereby lifting the frame 47 and actuating the several clamps, whereby the basic layers of the stacks are gripped and held so that the machine may raise the whole mass of brick. Obviously also, while it is understood that the clamping devices 48 exert their clamping effect upon separate basic layers of separate unit stacks, it is possible that in some cases it will be found desirable to have each finger 45 provided with more than one horizontal series of clamps 48, in order that one or more layers in each stack above the basic layer may be gripped by the clamping plates; but this can be easily accomplished by a simple multiplication of the parts without any change in the principle of operation.

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

1. A machine for handling bricks, comprising a vertically disposed frame, a series of lifting fingers carried by the lower end of said frame, and a plurality of clamping devices arranged in series on each finger and adapted to be operated for the purpose of clamping separately the basic layers of several unit stacks or masses of material.
2. A machine for handling bricks, comprising a vertically disposed frame, a series of lifting fingers carried by the lower end thereof, a lever hung in the upper end of the frame, a plurality of clamps arranged in series in connection with each lifting finger, and connections between the upper lever and the said clamps, whereby the initial lifting movement of the machine automatically actuates the clamps, so that the latter may exercise their clamping effect on different basic layers.
3. A machine for handling bricks, comprising a vertically disposed frame, and clamps arranged in a horizontal series at the base of the frame, said clamps being also arranged in several lengthwise and parallel series, the members of the series being end to end, so that a clamping effect may be produced separately on several basic layers of material.
4. A machine for handling bricks, comprising a vertical frame, a lever pivoted in the upper end thereof and projecting laterally, a series of parallel clamping devices at the base of the frame, each series comprising several members placed endwise of each other so as to exercise their clamping effect on the basic layers of several unit stacks, and mechanical connections between the top



lever and the several clamps so that each clamp may be actuated to produce a separate clamping effect and all may be simultaneously actuated by the initial lifting movement of the machine.

5 5. A machine for handling bricks, comprising a vertically disposed frame, a series of parallel lifting fingers rigidly secured to the base thereof, a series of clamps pivoted  
10 to each lifting finger, a lever at the top of the frame pivotally supported and projecting over the load which the machine carries, and mechanical connections between said lever and the clamps, the said connections including yielding springs whereby the clamps  
15 are enabled in their operation to compensate for inequalities in the thickness of the bricks.

6. A machine for handling bricks, com-

prising a vertically disposed frame, suspension means therefor, a series of parallel lifting fingers rigidly secured to the base of the frame, a plurality of clamps pivoted endwise of each other in each lifting finger and designed to move laterally toward and away  
20 from the finger in clamping and unclamping, rods loosely connected for operating said clamps, bell crank levers actuating said rods, and connections between said bell crank levers and the top of the frame whereby they are actuated for the purpose of  
25 automatically applying the clamps.  
30

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

RAYMOND C. PENFIELD.

Witnesses:

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