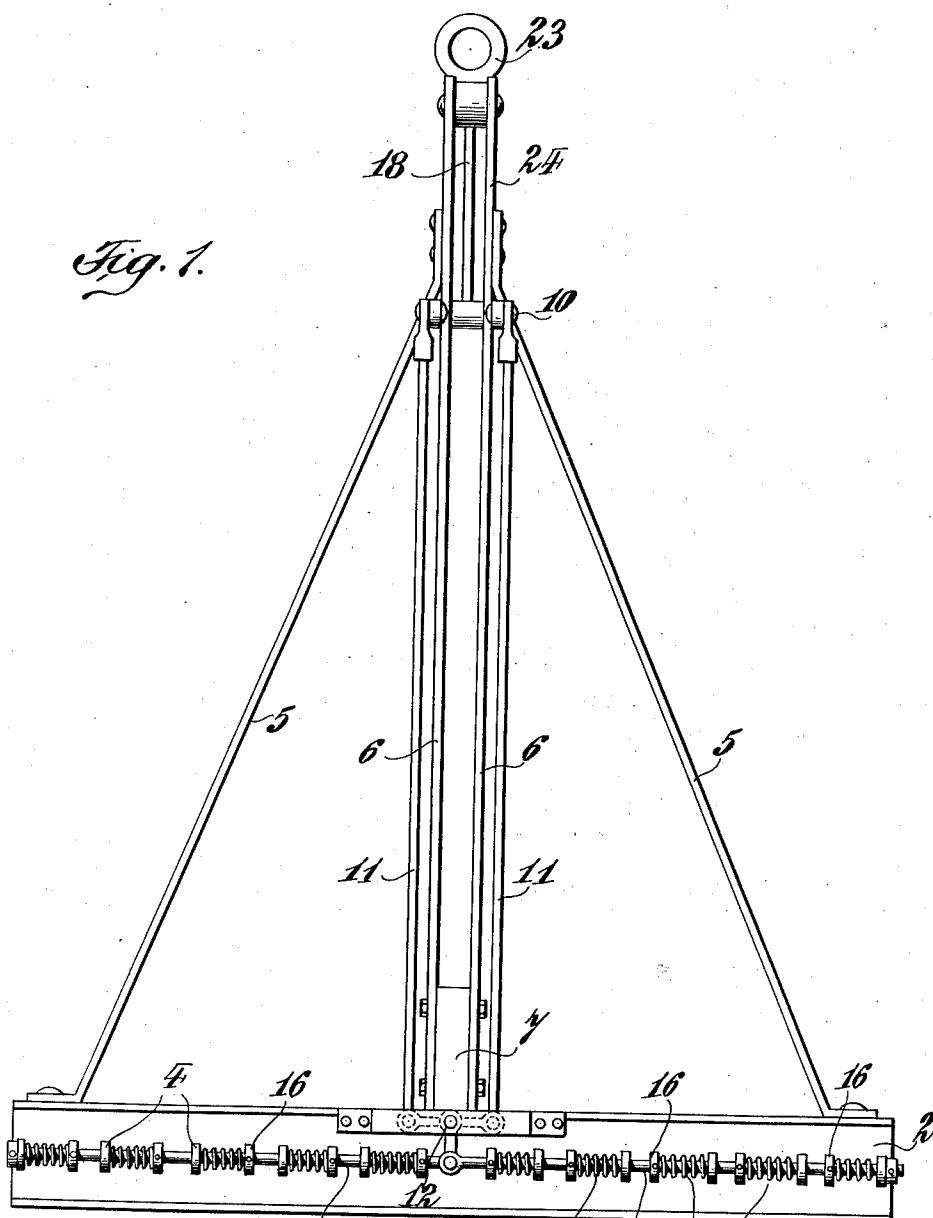


R. C. PENFIELD.
MACHINE FOR HANDLING BRICKS.
APPLICATION FILED JAN. 19, 1909.

976,394.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.



WITNESSES

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L. B. Schneider

INVENTOR

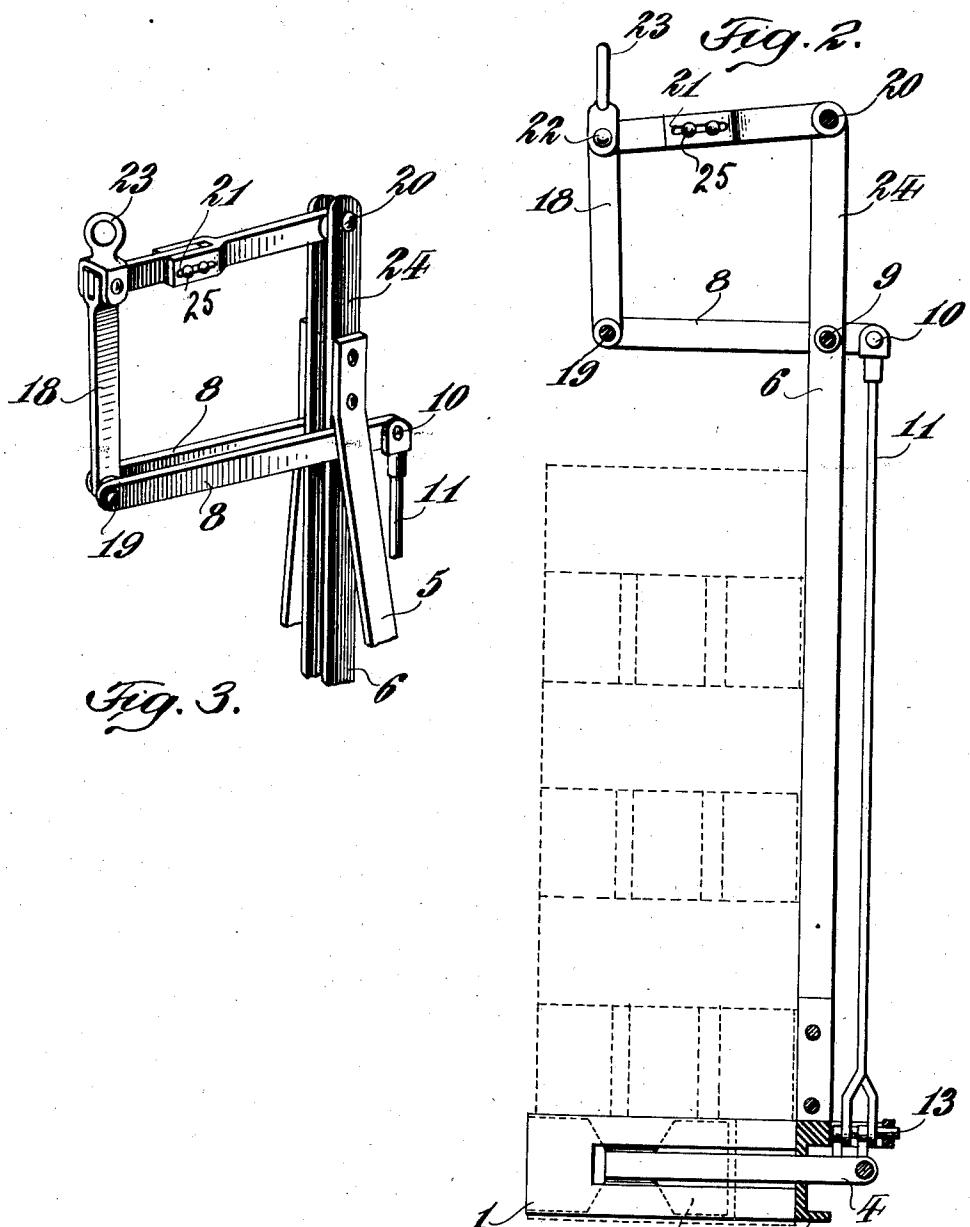
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MACHINE FOR HANDLING BRICKS.

976,394.

Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed January 19, 1909. Serial No. 473,067.

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.

This invention relates to a machine for handling bricks, the same belonging to the general class wherein a lifting device in the general form of a basket engages the base of a pile of bricks stacked up in conformity with a prearranged plan with uniform spaces between the members of the basic layer, into which spaces lifting fingers or clamping devices may project. An example 15 of a machine of this class is seen in the Letters Patent granted to William Henry Francis for a brick handling machine, No. 859,445, dated July 9, 1907, and also in the co-pending application of Edward J. 20 Fritsch for device for handling bricks, filed October 15, 1908, Serial No. 457,840.

The special object of the present improvement is to so arrange the application of the suspension means at the top of the basket or 25 frame that the machine itself may occupy a vertically disposed position whether loaded or unloaded, or whatever may be the variability in the size of the load. It is evident, of course, that in the use of a machine 30 of this kind the results are not obtained unless the machine can be kept vertical at all times both when it is empty and is being manipulated for the purpose of engaging the load, and also after it is loaded and 35 when it is being transported from point to point with its load.

The invention, therefore, consists essentially in a leverage device at the top of the machine so constructed and arranged as to 40 properly maintain at all times the equilibrium of the machine both when loaded and unloaded, and also it comprises numerous details and peculiarities in the construction, combination and arrangement of parts sub- 45 stantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating 50 my invention, Figure 1 is a front elevation of the entire machine. Fig. 2 is a side elevation in partial section. Fig. 3 is an en-

larged detail perspective view of the lever devices at the top of the machine.

Similar characters of reference designate 55 corresponding parts throughout the different figures of the drawing.

The general form of the frame of a machine of the class to which the present invention relates embraces a vertically disposed structure having at the upper end a laterally turned or forwardly projecting 60 horizontal arm device which when the machine is in its operative position extends partly over the top of the pre-arranged stack formation of bricks, and at the bottom of this vertical frame there is a series consisting of a suitable number of clamps which 65 engage the stack of bricks near the base thereof. The lower portion of said frame which carries the clamping devices has a general yoke-shape so as to provide members which will embrace the ends and one of the longitudinal sides of the stack formation 70 of bricks, and when the stack is so engaged the clamping agencies will operate to hold the frame and the stack of bricks securely 75 together. This general frame and the clamping mechanism may vary widely, but in every instance it is necessary that the lifting crane or suspension means which is applied to the upper end of the machine and 80 which usually engages the latter by having some form of adjustment that the forwardly projecting upper arm must so lift the machine as that the equilibrium thereof will be maintained and the vertical portion of the 85 frame kept at all times in a substantially vertical position. There is a wide diversity in the form of the upper arm, it being sometimes rigid and sometimes pivotally connected, and my present invention relates particularly to a certain form of lever motion for 90 the upper arm as I shall presently specify. The special mechanism illustrated and described in this application with which the top lever motion is employed is the same as 95 that found in the application of Edward J. Fritsch, hereinabove alluded to, Serial No. 457,840, and reference is made to said application for a fuller disclosure of the details of the machine than is given herein, although I believe that the description presented here 100 is ample for a thorough understanding of the construction and operation. It must be kept in mind, however, that this form of clamping mechanism and carrying frame

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taken from the Fritsch application is given here simply as one specimen and example, and that I am by no means restricted thereto for the lever motion at the top of the frame is adapted to be used with a great variety of lifting devices where it is desirable to control the center of gravity of the machine both when loaded and unloaded.

Proceeding now to describe briefly the machine elements, it will be seen by referring to Fig. 2 that I have represented in dotted lines a stack of bricks with which the handling machine is designed to operate. The bricks of the stack are piled so that the members of the basic layer are spaced apart a uniform distance. Into the several spaces thus left between the members of the basic layer project a plurality of lifting arms 1 consisting of vertically arranged bars or plates which are securely fastened to the base bar 2 of the main frame. Each of the lifting bars 1 is provided with a clamping plate 3 supported at its center on the end of the lever 4 so that said clamping plate will lie alongside of the lifting bar 1. Each carrying lever 4 passes through a recess or opening formed in the lifting bar 1, and the opposite end of the lever 4 projects through the base bar 2 and is perforated to allow a long rod to pass through it by which rod a number of the clamp-operating levers 4 are moved in a manner to effect the clamping. Obviously the movement of the clamping plate 3 toward and away from its companion 1 is for the purpose of clamping or tightly gripping a brick between it and the next adjacent fixed bar 1.

The vertical frame of the machine to which belongs the base bar 2 that carries secured thereto the series of horizontal lifting arms 1 may obviously vary widely in its construction, but I may say that it consists essentially of two inclined bars 5, 5 between which are two parallel vertical bars 6, 6. The inclined bars 5 are bolted at their lower ends to the base bar 2, and at their upper ends to the parallel vertical bars 6. Said bars 6 are secured at their lower ends to a block 7 which is attached to or firmly connected with the base bar 2. Near the top of the frame a pair of levers 8 are supported by a pivot bolt 9 which passes through the parallel vertical bars 6, and the ends of these levers 8 are pivoted by means of pins 55 or bolts 10 to the upper ends of downwardly extending thrust bars 11. The lower ends of the downwardly extending thrust bars 11 are pivotally attached to the upper arms of bell crank levers 12 which are hung loosely upon a horizontal shaft 13 supported in suitable bearings in the base of the frame. The downwardly extending arms of the two bell cranks 12 are pivoted to the ends of long horizontal rods 14 and 15, one of which extends toward the right of the machine and

the other toward the left, the two rods together running the entire length or thereabout of the base bar 2 as seen in Fig. 1. These bars 14 and 15 are supported in the perforated ends of the horizontal clamp-operating levers 4 to which allusion has already been made. On the rods 14 and 15 at intervals are collars 16 provided with set screws to enable them to be adjustable and to be held securely at any desired point, and between these adjustable collars and the ends of the levers 4 are interposed springs 17 so that the levers 4 when vibrated are actuated yieldingly in consequence of the pressure of the springs 17 against them. It will be obvious that when the thrust bars 11 act downwardly, the result will be to oscillate the bell cranks 12 on their supporting shaft 13 and move the rods 14 and 15 in opposite direction, and this endwise movement will actuate the clamping plates bodily with reference to the lifting arms 1.

The ends of the parallel levers 8 opposite to the pivotal point 9 are pivoted to vertical links 18 by means of a pivot 19. The pivot 9 by means of which the levers 8 are pivoted to the upright parts 6 of the main frame is located a short distance below the extreme upper ends of the bars 6, and at said extreme upper ends is a pivot 20 for the lever 21, whose other end is pivoted at 22 to the top extremity of the link 18. The eye 23 is preferably connected to the foregoing arrangement of levers by being held by the pivot 22 which connects lever 21 and link 18. That section of the parallel vertical bars 6 which lies between the pivotal points 9 and 20, I designate by the reference numeral 24, and may be referred to as a link or rod section.

It is to be noted particularly that the quadrilateral or rhomboidal arrangement of links and levers which I have just been describing is not correctly described by the expression "parallel motion", since the parts are not arranged in the parallel manner required by such a term, the angles not being right angles strictly; but the motion is a lever motion, and the effect thereof in properly upholding the frame whether loaded or unloaded is found in actual practice to be of a most successful character. Further describing these parts, it is to be noted that the sections 24 are longer than the oppositely located link 18, and furthermore that the horizontal levers 8 are shorter in length than the oppositely located lever 21. The section 24 and the link 18, though both substantially vertical, are not therefore parallel, and the levers 8 and 21 though substantially horizontal are not strictly speaking parallel. This inequality in the length of the two vertical members, and also the inequality in the length of the horizontal members of the quadrilateral lever motion results in en-

abling a general vertical position of the main frame whether loaded or unloaded to be maintained at all times when said four-sided lever motion is suspended by means of 5 a lifting crane or other device applied at that end of the lever motion farthest from the axis of the main frame. It is to be understood that in a machine of this character, the forwardly projecting or outwardly 10 turned upper end of the main frame which projects over the stack formation of bricks is susceptible of a great diversity of construction in different forms of the machine, in some being a rigid arm and in others being 15 a movable device, and in the present case while it is a movable device as I have explained, the four-sided character of the same consisting of the levers and links of unequal length provides a means whereby the equilibrium 20 of the machine is uniformly and properly controlled and regulated and the vertical character of the main frame is sustained sufficiently so that the manipulation of the frame in carrying out the work of the 25 machine is easily performed.

Referring to the quadrilateral arrangement of links and levers at the top of the machine, I desire to state that the top lever 21 is preferably adjustable in length so as to 30 accommodate changes in the action of the levers, and in order to so make it adjustable in length I preferably form it in two parts as shown in the drawing, said two parts being slotted and engaging each other and 35 held together by means of pins or bolts 25. One section of the link 21 may be provided with a vertical slot as shown in Fig. 3, which receives the end of the other section of said link, or some other method of connecting the 40 two parts may be employed. By loosening and removing the bolts 25 and shifting the sections of the link 21 relatively to each other, the latter may be lengthened or shortened as desired and the action of the lever- 45 age mechanism of which said link 21 forms a part correspondingly altered or changed.

Many changes in the precise construction, combination and arrangement of the various parts of the invention may be made without 50 exceeding the scope of the appended claims, and I reserve the liberty therefore of modifying the invention as the exigencies of the individual application thereof may require.

Having thus described my invention, what 55 I claim as new and desire to secure by Letters Patent, is:

1. A machine for handling bricks, comprising a vertically disposed frame, a horizontally projecting pivoted frame at the 60 upper end thereof consisting of four inter-pivoted members, to which the lifting crane

is adapted to be attached, and clamping means at the base of the frame actuated automatically by the initial lifting movement of the pivoted upper frame. 65

2. A machine for handling bricks, comprising a vertically disposed frame, a clamping mechanism at the lower end thereof for engaging a stack of bricks set in a pre-arranged order, and a pivoted frame at the 70 upper end of the main frame, said pivoted frame projecting horizontally over the stack formation, and consisting of four inter-pivoted members, those opposite to each other being of unequal length. 75

3. A machine for handling bricks, comprising a main frame having a basal clamp, in combination with a pivoted frame at the upper end of the main frame, said pivoted frame consisting of four inter-pivoted members, those opposite to each other being of unequal length, means for connecting the suspension means to the end of said pivoted frame farthest from the main frame, and means whereby the motion of the pivoted 85 frame is communicated to the clamping mechanism. 80

4. A machine for handling bricks, comprising a vertically disposed frame, a series 90 of clamping devices at the base thereof adapted to enter the spaces between the units of the basal layer of a stack formation of bricks, a pivoted frame consisting of two members of unequal length pivoted to the main frame and a third member connecting 95 the outer end of said two members, and of a length unequal to the distance between the pivoted points on the main frame, suspension means attached to the outer end of said pivoted frame, and thrust connections between the latter frame and the basal clamp- 100 ing mechanism. 100

5. A machine for handling bricks, comprising a main frame having at its base a yoke partially surrounding a stack formation of bricks, a clamp for connecting the frame to the stack formation, and a pivoted frame at the upper end of the main frame for keeping the machine in proper equilibrium when loaded and unloaded, said pivoted frame consisting of four members, those opposite to each other being of unequal length, and a connection between said pivoted frame and the clamping mechanism, all arranged so that the initial lifting move- 105 ment actuates the clamp. 110

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

RAYMOND C. PENFIELD.

Witnesses:

FRANK PAUL,
C. B. SCHROEDER.