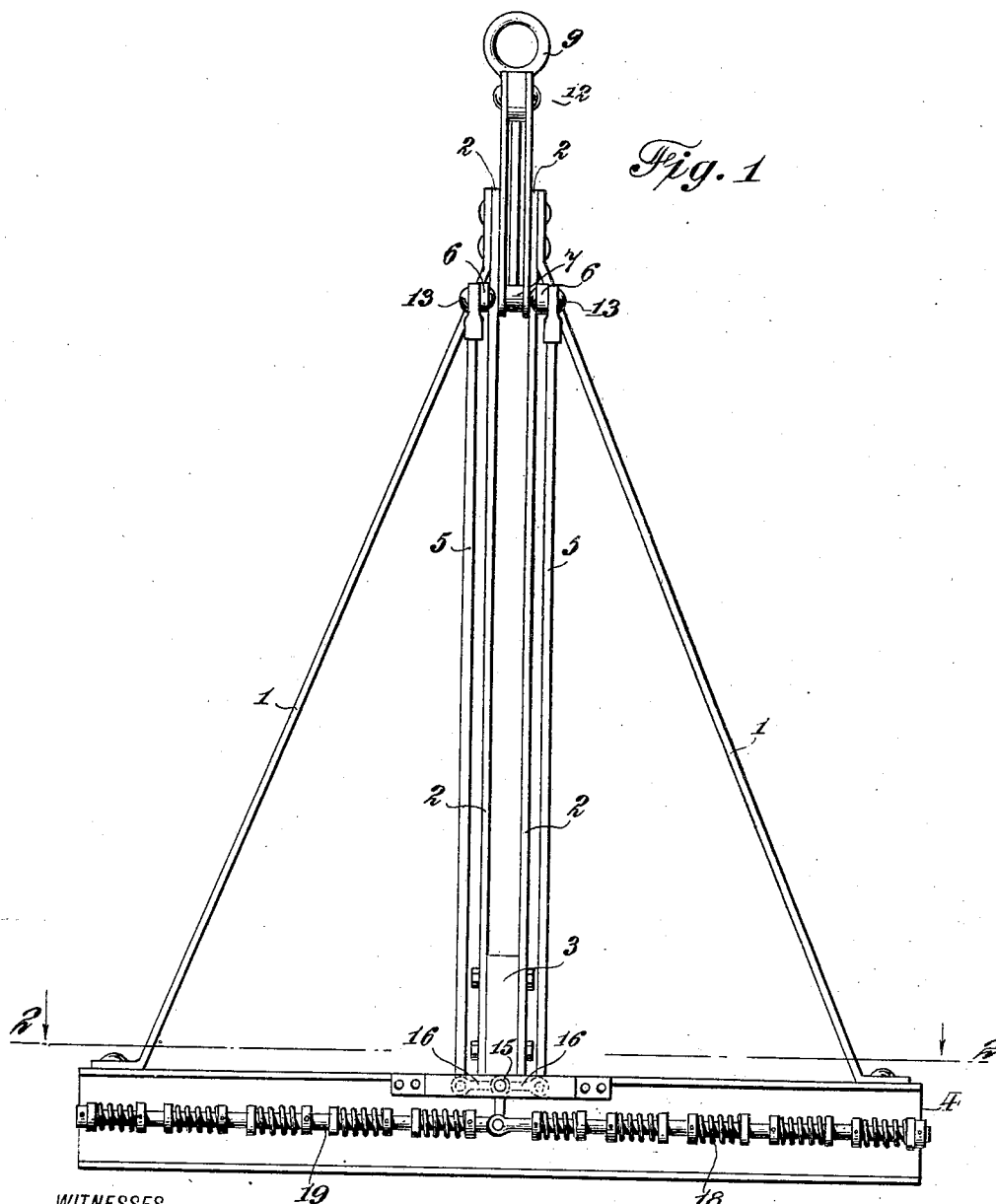


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 APPLICATION FILED OCT. 15, 1908.

Patented Dec. 6, 1910.
 3 SHEETS—SHEET 1.



WITNESSES

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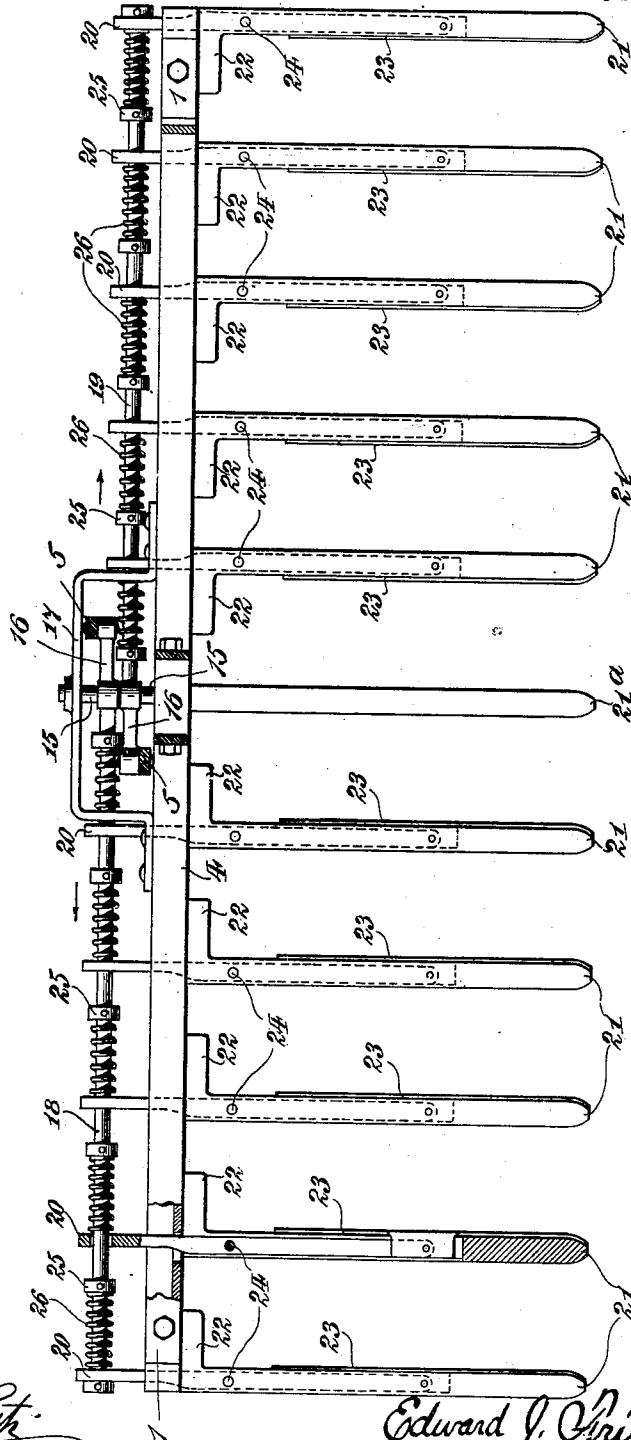
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3 SHEETS—SHEET 2.

Fig. 2



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3 SHEETS—SHEET 3.

Fig. 3

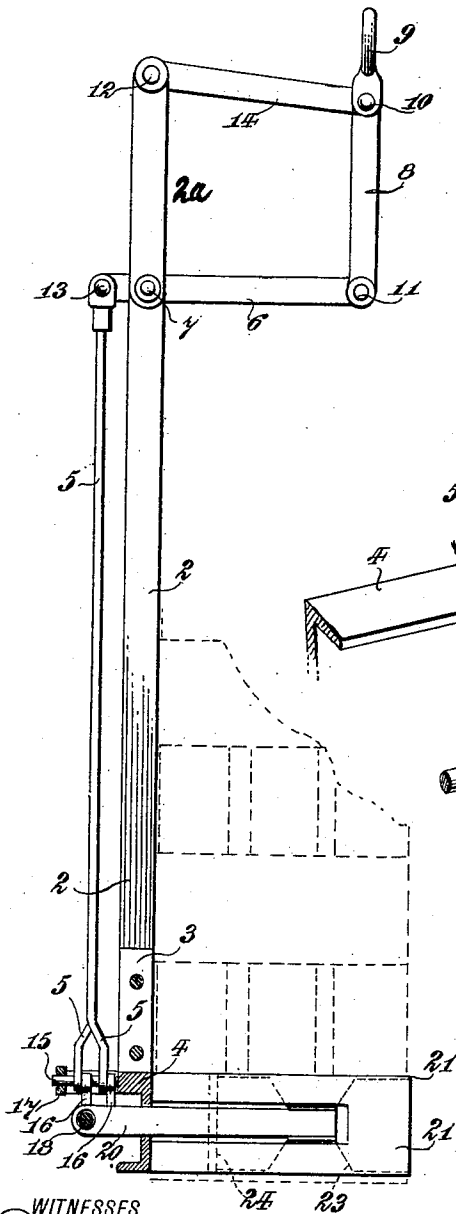
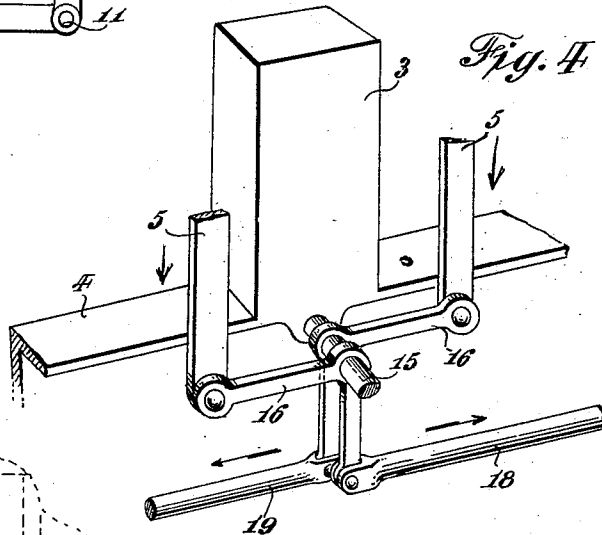


Fig. 4



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UNITED STATES PATENT OFFICE.

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DEVICE FOR HANDLING BRICKS.

977,610.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed October 15, 1908. Serial No. 457,840.

To all whom it may concern:

Be it known that I, EDWARD J. FRITSCH, a citizen of the United States of America, residing at Willoughby, in the county of Lake and State of Ohio, 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.

My present invention is concerned with a machine for handling bricks, the same belonging to the general class wherein a lifting device engages the base of a pile of bricks stacked up in conformity with a pre-arranged plan and with uniform spaces between the units of the basic layer, into which spaces fingers or clamping devices may be projected. An example 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. Said machine of Francis employs a method also patented by him on December 24, 1907, No. 874,582, relating to the handling of brick in bulk so that they may be transported to any desired point without breaking the bulk. According to this method, the bricks are hacked up in a mass with uniform openings between the bricks of the basic layer to permit the lifting arms of the machine to enter these spaces to carry the superposed load; while the basic layer is itself picked up and carried along with the superincumbent mass by means of a horizontal gripping action caused by clamping devices arranged in connection with the lifting arms.

The object of the present invention is to provide a novel and ingenious mechanism for practicing the same method in a simpler, economical, and more efficient way than heretofore; and the invention consists in novel means for gripping or clamping the members of the basic layer of such a bulk or mass of bricks, and further in numerous details and peculiarities in the construction, combination and arrangement, substantially as will be hereinafter more fully set forth and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a front elevation of the entire machine. Fig. 2 is a bottom plan view in partial section. Fig. 3 is a side elevation in partial section. Fig. 4

is an enlarged perspective detail view of certain of the operating parts near the bottom of the machine, showing particularly the leverage at that point.

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

In Fig. 3, I have represented in dotted lines a stack of bricks with which my improved brick handling machine is adapted 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 21 which consist of vertically arranged bars or plates having at the rear end an angular part 22 which is securely fastened to the base bar 4 of the main frame of the machine. Each of the lifting bars 21 is provided with a clamping plate 23 pivotally supported at its center on the end of a lever 20 so that said clamping plate will lie alongside the lifting bar 21. The carrying lever 20 passes through a recess or opening formed in the lifting bar 21, and is pivoted therein by means of a suitable pivot pin or bolt 24; while the opposite end of lever 20 projects through the frame 4 and is perforated to allow a long rod to pass through it, by which rod a number of the said clamp-operating levers 20 are moved in a manner to be hereinafter fully explained. Obviously the movement of the clamping plate 23 toward and away from its companion bar 21 is for the purpose of clamping or tightly gripping a brick between it and the next adjacent fixed bar 21. The entire series of projecting lifting arms or plates 21 is fully delineated in Fig. 2, and the way in which they are extended between the members of the basic layer so as to act under the superincumbent mass for the purpose of raising the latter is clearly indicated in Fig. 3.

The vertical main frame of the machine, to which belongs the base bar 4 that carries secured thereto, as I have stated, the series of horizontal lifting arms 21, may vary in a great number of ways, and hence I do not intend to be limited to what I have shown in the drawings or described herein. The specimen of frame which is illustrated consists essentially of two inclined bars 1, 1 between which are two parallel vertical bars

2, 2. The inclined bars 1 are bolted at their lower ends to the base bar 4, and at their upper ends to the parallel vertical bars 2. Said bars 2 are secured at their lower ends to a block 3 which is attached to or firmly connected with the base bar 4. Near the top of the frame, a pair of levers 6 are supported by a pivot bolt 7 which passes through the parallel vertical bars 2, and the ends of these levers 6 are pivoted by means of pins or bolts 13 to the upper ends of downwardly-extending thrust bars 5. The other ends of the levers 6 are pivoted to a vertical bar 8 by means of a pivot pin 11, and bar 8 is pivoted near its upper end to a link 14 which in turn is pivoted at its other end at 12 to the extreme upper ends of the parallel links 2^a that are pivoted to the vertical uprights 2, 2 at 7. The pivoting of the link 14 to the vertical bar 8 is accomplished by means of a pivot 10. The end of the bar 8 above the link 14 is provided with an eye 9 to which some supporting means, like a lifting crane or other hoist, may be connected. Thus I provide at the top of the frame a parallel motion mechanism consisting of the links 2^a and the parallel vertical bar 8 and the horizontal substantially parallel levers and links 6 and 14. This parallel motion mechanism projects over the top of the mass of brick, and vertically above the series of horizontal lifting bars 21 at the lower end of the frame. The object of having a parallel motion mechanism, instead of merely a lever or pair of levers, is to assist in keeping the machine in equilibrium, this being accomplished in a more successful way by such a mechanism, for without it the frame is apt to throw over to one side when the weight is lifted, and thus disturb the equilibrium of the mass which is being transported.

The lower ends of the downwardly extending thrust bars 5 are pivotally attached to the upper arms of bell crank levers 16 which are hung loosely upon a horizontal shaft 15 supported in suitable bearings in the base bar 4 and a bracket 17 which is bolted horizontally to the base bar 4, see Figs. 2 and 3. The arrangement of the two bell cranks 16 is neatly depicted in Fig. 4. The downwardly extending arms of the two bell cranks 16 are pivoted to the ends of long horizontal rods 18 and 19, 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 thereabouts, of the base bar 4, as seen in Figs. 1 and 2. These bars 18 and 19 are supported in the perforated ends of the horizontal clamp-operating levers 20 to which allusion has already been made. On the rods 18 and 19 at intervals are collars 25 provided with set screws to enable them to be adjustable and to be held securely in any desired point

of adjustment, and between these adjustable collars 25 and the ends of the levers 20 are interposed springs 26 so that the levers 20 when vibrated are actuated yieldingly in consequence of the pressure of the springs 26 against them. It will be obvious that when the thrust bars 5 act downwardly or in the direction shown by the arrows in Fig. 4, the result will be to oscillate the bell cranks 16 on their supporting shaft 15 and move the two rods 18 and 19 in the opposite directions as shown by the arrows in Fig. 4, and this endwise movement of the rods 18 and 19 will through the medium of the collars 25 and springs 26 vibrate the levers 20 on their pivots 24, and move the clamping plates 23 bodily with reference to the lifting bars 21. In this arrangement, I find it convenient to so locate the several clamping bars 23, with reference to the lifting bars 21, as that the series on one side of the center of the machine will work oppositely from the series on the other side. That is to say, the central lifting bar 21^a is not provided with any clamping plate, but is a lifting bar solely, and the series of lifting bars 21 at one side of this central bar 21^a will have their clamping plates 23 movable toward the central bar 21^a; while the lifting bars 21 at the other side of the central bar 21^a will have their clamping plates 23 also movable toward the central bar 21^a. Or, in other words, one-half of the clamps are adapted to expand in one direction and the other half in the other direction. This result is easily accomplished by having the two long bars 18 and 19 working in opposite directions, one actuating one half of the series of clamps, and the other the other half.

In the operation of the machine, it will be perceived that as soon as the parallel motion at the top of the frame is engaged by a lifting crane the latter device will be raised carrying with it a mass of bricks. The initial lifting movement of the machine and mass of bricks will cause the thrust bars 5 to move downwardly and actuate the leverage mechanism at the base of the frame so that the clamps will be automatically applied. The interposition of the springs 26 in the leverage movement causes the application of the clamping plates 23 to the surface of the bricks to be elastic, and enables the space between the fingers 21 to be taken up and the clamping made tight, even though the bricks vary slightly in thickness and there are differences in the width of the spaces between them. Thus I insure an effective gripping of all the bricks in the basic layer, and provide that the entire layer may be lifted with the superposed mass.

Various changes in the precise construction and arrangement of the various parts may be made without exceeding the scope of the invention, and I reserve the liberty of re-

arranging and modifying the mechanical features as much as may be desirable in adapting the machine for various uses.

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

1. In a machine for handling bricks, the combination of a vertical frame, a series of lifting bars at the base thereof, clamping plates arranged in connection with said bars, levers pivoted to said plates and to the bars, and means connecting the ends of the levers for simultaneously operating them.

2. In a machine for handling bricks, the combination of a frame having lifting bars adapted to be inserted in the spaces between the individual bricks of a layer, the series of movable clamps operating in conjunction with the lifting fingers, levers pivoted to said clamps, a lever pivoted to the upper end of the frame, means for operating said lever, and means whereby the motion of the top lever is transmitted to actuate the aforesaid levers which operate the clamps.

3. In a machine for handling bricks, the combination of a frame having a series of horizontal lifting bars, a series of clamping plates alongside said bars, levers pivoted at one point to said clamping plates and also pivoted to the lifting bars, longitudinal rods

connected to the ends of said levers, and means for thrusting said longitudinal bars endwise to actuate the levers.

4. In a machine for handling bricks, the combination of a vertically disposed frame having a series of lifting bars, clamping plates alongside of said bars, levers pivoted to the clamping plates and to the bars, longitudinal rods passing through the ends of the levers, yielding connections between the levers and fixed points on said bars, bell crank levers for actuating said bars endwise, and means whereby said bell cranks are oscillated by the initial lifting movement of the entire machine.

5. In a machine for handling bricks, the combination of a vertically disposed frame having a series of lifting bars, the top lever pivoted to the upper end of the frame, thrust bars connected thereto, bell-cranks to which said thrust bars are pivoted, longitudinal rods pivoted to said bell-cranks, and clamping devices actuated by the movement of the longitudinal rods.

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

EDWARD J. FRITSCH.

Witnesses:

FRANK PAUL,
C. B. SCHROEDER.