G. E. LUCE.

REVOLVING CRANE FOR BRICK HANDLING.

APPLICATION FILED AUG. 16, 1919.

1,384,768.

Patented July 19, 1921.

3 SHEETS—SHEET 1.

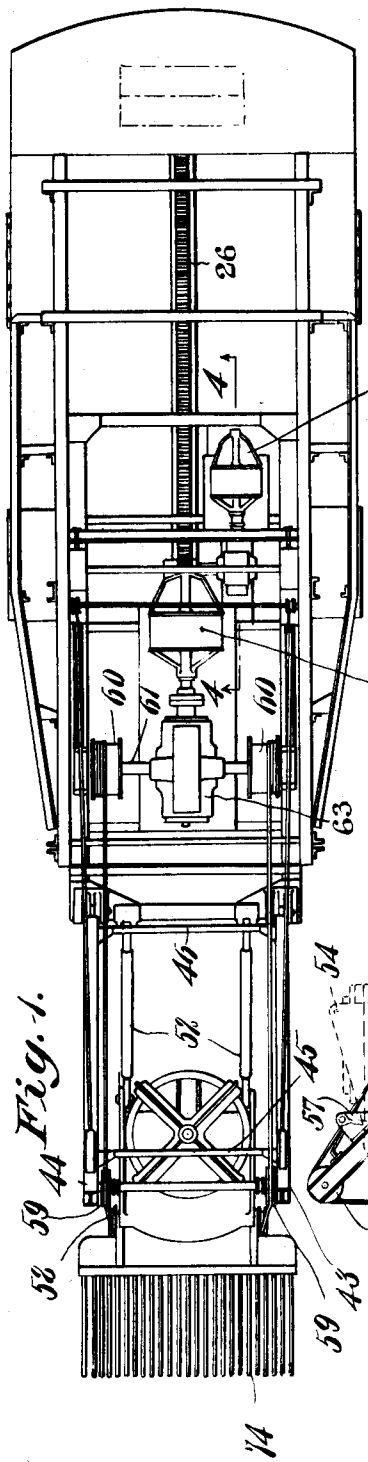


Fig. 1.

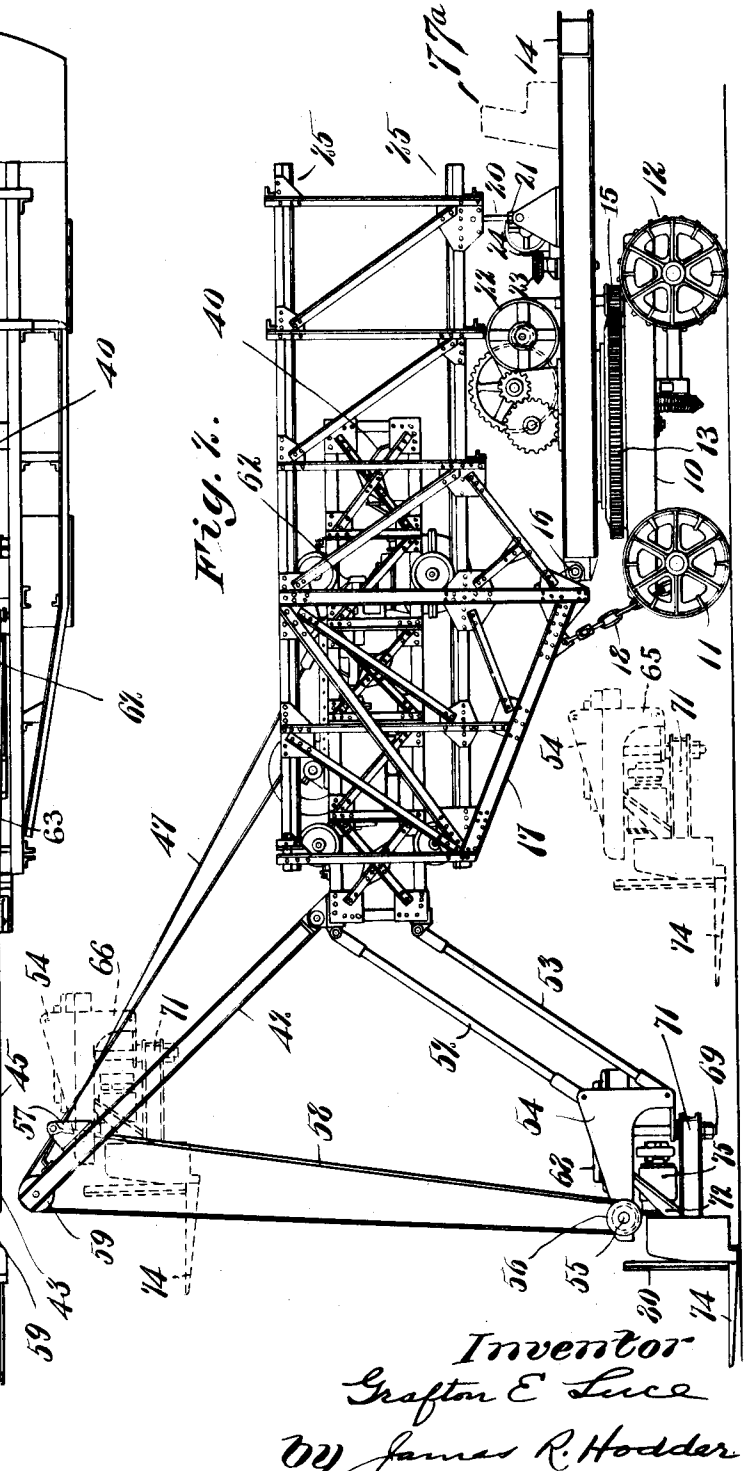


Fig. 2.

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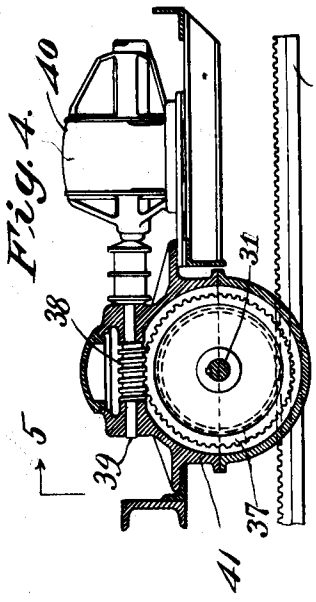


Fig. 4.

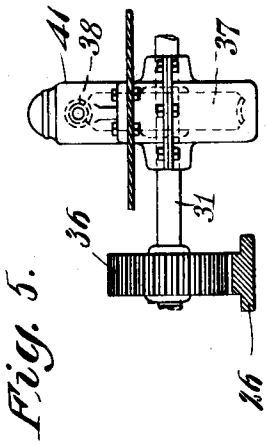


Fig. 5.

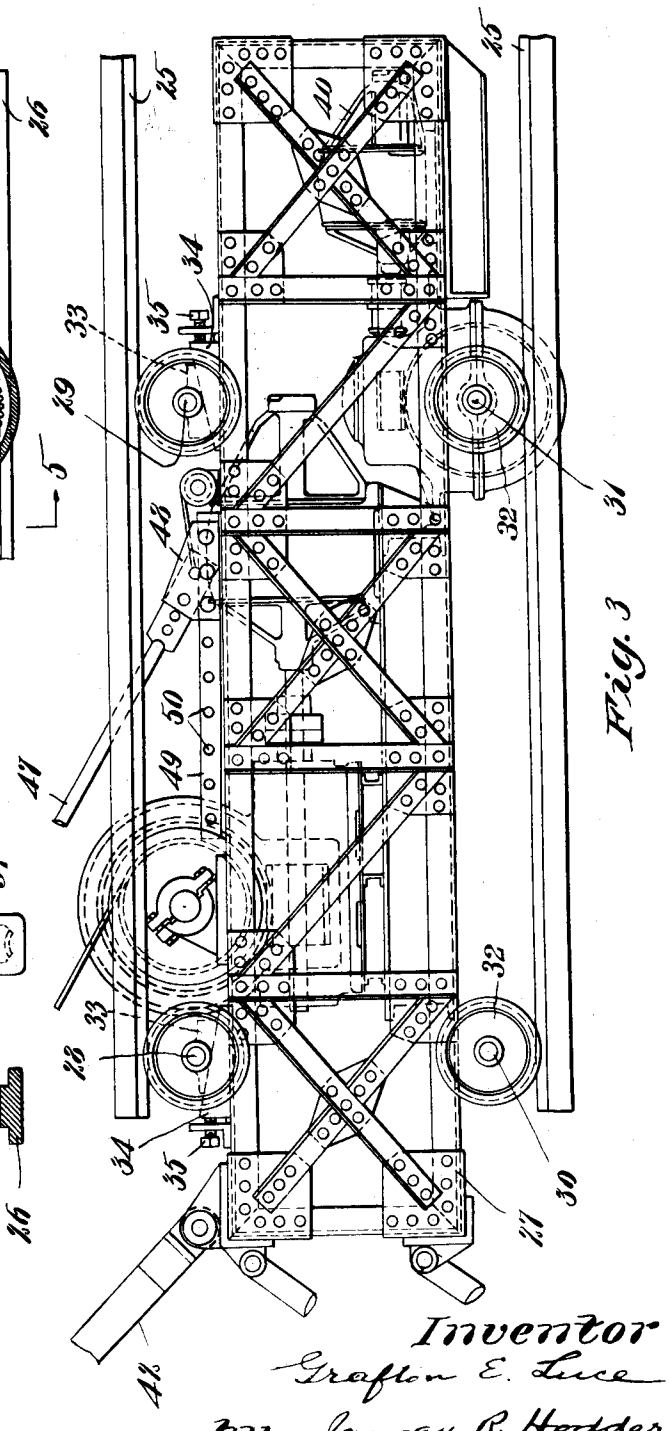


Fig. 3

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3 SHEETS—SHEET 3.

Fig. 7.

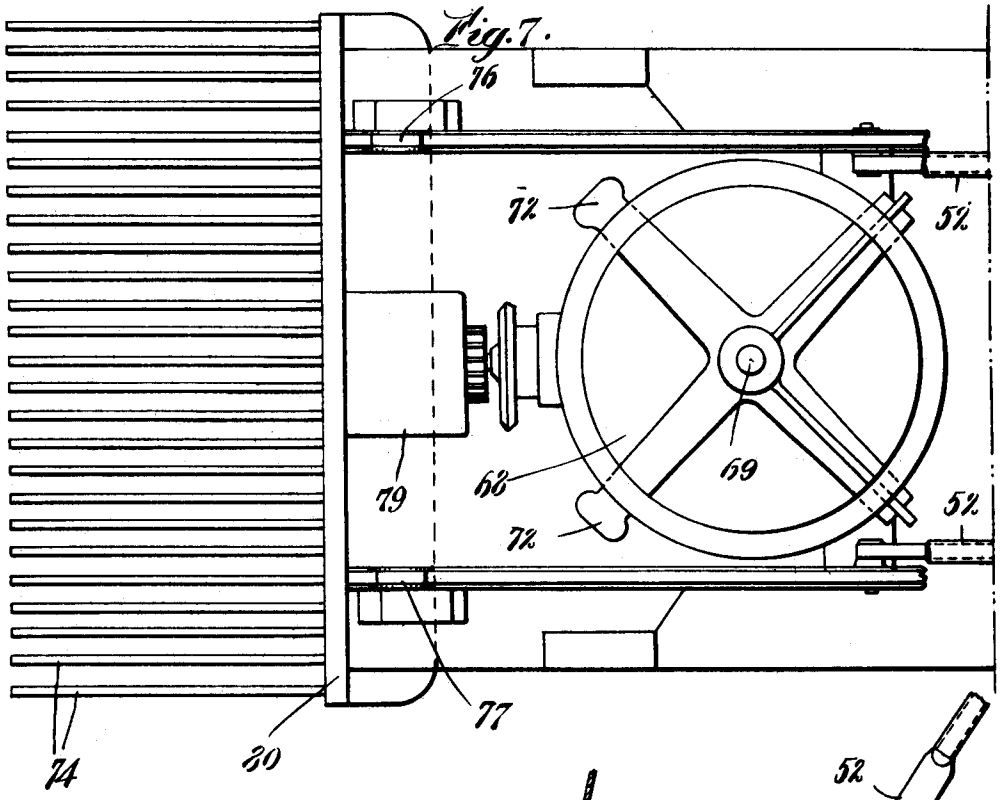
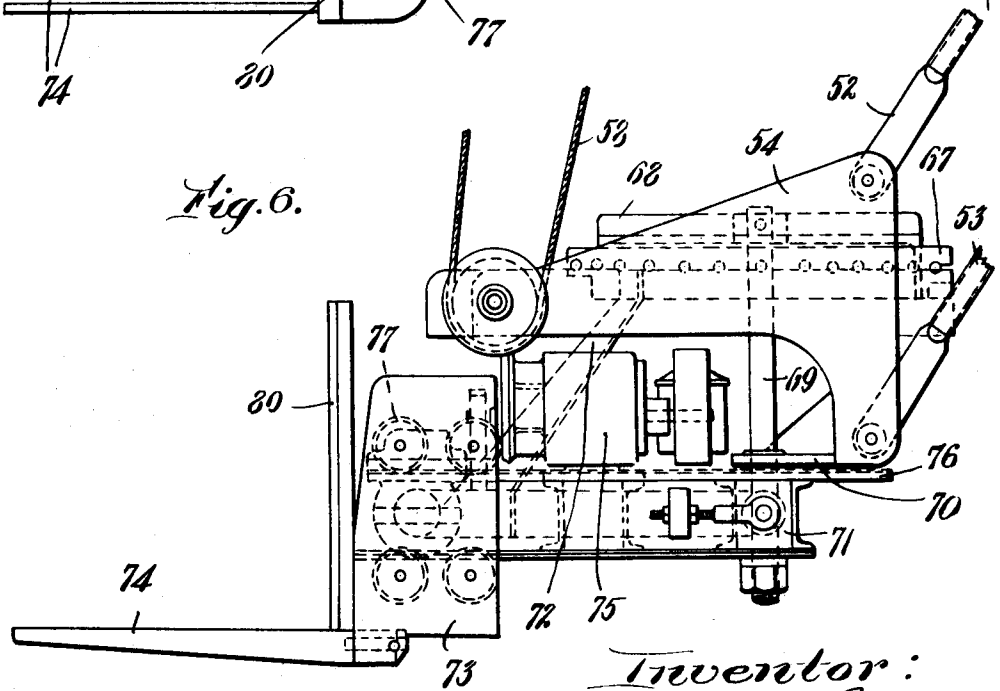


Fig. 6.



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UNITED STATES PATENT OFFICE.

GRAFTON E. LUCE, OF CHICAGO, ILLINOIS.

REVOLVING CRANE FOR BRICK-HANDLING.

1,384,768. Specification of Letters Patent. Patented July 19, 1921.

Application filed August 16, 1919. Serial No. 317,872.

To all whom it may concern:

Be it known that I, GRAFTON E. LUCE, a citizen of the United States, and a resident of Chicago, Illinois, (whose post-office address is No. 140 North Pine avenue, Chicago, Illinois,) have invented an Improvement in Revolving Cranes for Brick-Handling, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention relates to brick handling and setting machines, and more particularly to brick handling and setting machines such as are described and claimed in my prior and co-pending applications Serial No. 259,770, filed October 26, 1918, and Serial No. 262,664, filed November 15, 1918. My present application is a continuation, in part, of said last named prior application, and in certain respects, discloses and claims improvements over the structure therein described and claimed.

One of the most important operations performed by machines of the above character is that of "crowding" the pile or unit of bricks, carried on the setter or carrying platform, into proper position in the kiln. Heretofore, in machines of this character, the setter or platform on which the unit pile or stack of bricks is placed, has been pivotally attached to a crowding frame by parallel links to enable it to be moved vertically to and parallel with, the crowding platform or frame. In addition, the setter has been suspended from a boom that was pivotally attached to the main platform and on which platform the crowding frame was mounted for reciprocation. This construction, while effective within narrow limits of operation, was defective in that the boom and setter had their pivotal mounting too widely separated and on two distinct parts of the machine, with the result that under certain conditions the setter or brick carrying platform could be so positioned (as when setting in lowest position) that its lifting pulley would be back of the vertical line drawn through the center of the top sheave on the boom. When this occurs, the setter has a tendency to lift backward instead of forward, when power is applied, resulting in either stopping the movement of the setter by cramping it against the ground, or breaking some portion of the machine. Also, the movement of the crowding frame backward and forward changes the length of the line supporting the setter, which results in making the spotting of the setter complicated and uncertain.

With the object of removing the objections noted above, and with the further object of improving and simplifying this class of devices, I have devised the structure of the present application.

In the accompanying drawings illustrating the preferred embodiment of my invention,

Figure 1 is a plan view,

Fig. 2 is a side elevation,

Fig. 3 is an enlarged side elevation of the crowding frame or carriage,

Fig. 4 is a side elevation, partly in section, taken on the line 4—4 of Fig. 1,

Fig. 5 is a sectional view, taken on the line 5—5 of Fig. 4,

Fig. 6 is a side elevation of the suspended frame and parts mounted thereon, and

Fig. 7 is a plan view of Fig. 6.

Referring to the drawings, 10 designates a supporting frame, mounted on suitable wheels 11, 12, and on the frame is rigidly secured the circular rack 13. Mounted on the frame 10 is a rotatable table 14, and a pinion 15 rotated by any suitable means, as an electric motor 22, located on the table, meshes with the circular rack 13 to turn the table on the frame. The motive power on the table may be geared also to the wheel or wheels 12 to render the device a self propelled one.

Pivotally mounted on the horizontal axis 16, at the front end of the table 14, is a frame 17, composed of channel and I-beams, as shown in Figs. 1 and 2, a chain 18 being connected from the point 19 on the frame 17 to a hook (not shown) on the front of the supporting frame 10, to limit the upward movement of the front end of said frame 17. Also, a pivotally mounted depending screw 20 on the rear end of the machine passes through a rotatable threaded hub 21, power to rotate the hub being transmitted from the motor 22 by suitable gearing, including the bevel gears 23 and 24. By this last described means, the frame 17 may be rocked on the axis 16 through any desired practical angle.

On the frame 17, and at either side thereof, top and bottom, are tracks 25, while ly-

ing in the same plane and parallel thereto is the rack 26. The "crowding" frame 27, constructed of angle iron and plates, as clearly shown in Fig. 3, is rectangular in shape and has mounted thereon, top and bottom, and at each end thereof, axles 28, 29, 30 and 31, which carry flanged wheels 32 adapted to engage with and roll on the tracks 25 as the frame moves backward and forward.

The axles 30 and 31 are mounted in rigid bearings (not shown) while the bearings 33 for the axles 30 and 31 are adjustable outward from the frame 27 by the tapered blocks 34 operated by the adjusting screws 35. The shaft 31 has mounted thereon the gear 36 which meshes with the rack 26, so that the shaft 31 acts as a driving shaft. Also mounted on the shaft 31 is a worm wheel 37, with which meshes a worm 38 on a shaft 39 connected to the motor 40. The motor 40 is mounted on the frame 27, as clearly shown in Fig. 4, and the worm 38 and worm-wheel 37 are inclosed in a suitable casing 41 on the frame. From the above description it will be apparent that the frame 27 may be propelled, by means carried thereon, backward and forward on the tracks 25 and that any tilting movement, due to overbalancing of one or the other end of the frame, is prevented by the upper sets of wheels 32 engaging the upper tracks 25.

Pivotally mounted at the upper left-hand corner of the frame 27 is a boom 42, comprising a pair of beams 43, 44, tied together by angle beams 45, 46. Attached at either side of the angle beam 45 are the guy rods 47, which terminate at the end remote from the angle beams 45 and 46 in perforated plates 48. On the upper side members of the frame 27 are angle irons 49, perforated at 50, as clearly shown in Fig. 3. Pins passing through the perforations 50 and through the perforated plates 48, provide means for adjusting the angle of the boom 42 within desired limits.

Two pairs of parallel rods 52 and 53 are pivotally mounted on the forward end of the carriage 27, the pair 52 being located at the upper left corner, and the pair 53 at the lower left corner. These pairs of rods 52 and 53 are also pivotally mounted, at the same relative position on the rear end of the frame 54, the distance between pivot points on the frame 27 being equal to the distance between pivot points on the frame 54, the pairs of rods thus constituting a parallel motion means for maintaining the parts carried by said frame 54 horizontal through all the movements of the rods 52 and 53 on their pivots. On the forward end of the frame 54 and transversely thereof, is a shaft 55, on either end of which is rotatably mounted the sheaves or pulleys 56.

On either side of the boom 42 near the upper end thereof are lugs 57, to which are attached the ends of the pairs of cables 58. These cables pass downward, around the sheaves 56, thence upward, and over sheaves 59, rotatably mounted at the extreme upper end of the boom 42, then downwardly and rearwardly onto drums 60, located at either end of the shaft 61, rotatably mounted on the top of the carriage 27. The shaft 61 is rotated in either direction by the motor 62, mounted on the top of the carriage 27, through a suitable driving mechanism, located in the housing 63, such driving mechanism being similar to that above described and illustrated in Fig. 4. As the carriage may be moved from its extreme forward position, shown in Fig. 2, to its extreme rearward position, shown in dotted lines in said figure, the frame 54 and parts carried thereby may be moved into the position indicated in dotted lines at 65, without altering the relative position of the boom 42 and pairs of parallel rods 52 and 53. Also, with the carriage 27 in its extreme forward position as shown in Fig. 2, the pairs of parallel rods 52, 53 may be rotated to bring the frame 54 and parts carried thereby into their extreme upward position, as indicated by dotted lines at 66, and by moving the carriage to the position indicated by the dotted lines a correspondingly elevated rearward position of the frame 54 may be attained. Throughout all the positions of the pairs of parallel rods 52, 53 and the carriage 27, the frame 54 will be maintained horizontal.

Mounted between the side members comprising the frame 54 is a bearing member 67 having rotatably mounted thereon the turntable 68, a shaft 69 depending from said turntable and through a bearing 70 at the lower end of the frame 54. A forwardly extending frame 71 rigidly attached to the lower end of the shaft 69 is fastened near its forward end to the turntable 68 by braces 72. The frame 71 is constructed of channel iron to provide tracks for the wheels on which a reciprocating frame 73 is mounted.

On the top of each of the side members of the frame 71 is a rack bar 76, with which mesh the gears 77 on the shaft 78. A motor 75 rotates the gears 77 through a worm and worm wheel drive, similar to that shown in Fig. 4, and inclosed in casing 79. The reciprocating frame 73 has mounted on the front end thereof a plurality of brick engaging fingers 74, while rigidly attached to the front end of the frame 71 is an alining or pressure plate 80.

The operating circuits for the motors 22, 40, 62 and 75 are so arranged that the motors may be operated either singly or in any desired combination from a single point, such as the table 14 of the setting device. This feature of interlocking control of a plurality

of predetermined motors at will is outlined in my co-pending application, Serial No. 266,669, filed Dec. 14, 1918, and claimed broadly therein as applied to the apparatus and control illustrated in the present application. In my co-pending application Serial No. 262,947 filed Nov. 18, 1918, I have claimed this feature of interlocking control as applied to the type of apparatus illustrated in said last named application, and of which the present application is in part a continuance, and in part an improvement.

In the operation of the apparatus, the motor 62 is operated to lower the frame 54 to the proper position with respect to the pile or stack of bricks to be lifted, an attendant swinging the turntable, and parts carried thereby, until the fingers 74 are in alinement with the cross-wise grooves in the top of the drier car, on which the pile of bricks is so arranged that the lower courses of brick are directly over the grooves. Motor 75 is now operated to move the fingers 74 into the grooves in the drier car, until the alining or pressure plate 80 engages with the side of the brick pile. Motor 62 is operated to rotate the drums 60 to wind up the cables 58 and raise the frame 54 and parts carried thereby to the desired height, the fingers 74 and, therefore the brick pile or stack, because of the pairs of parallel rods 52, 53 being maintained horizontal throughout this movement. Motor 22 is operated to rotate table 14 and all parts carried thereby into position to "spot" the pile of bricks in the kiln. When this position is reached, motor 40 is operated to move the fingers 74 and alining plate 75 forward to a position to deposit the pile of bricks.

As the pile or stack of bricks moves into position, it engages with the wall of the kiln or with the preceding pile or stack of bricks, swinging the turntable 68 and associated parts until the pile or stack of bricks is in alinement with the walls of the kiln. As the carriage 27 moves forwardly, the pile or stack of bricks is crowded into place in the kiln and is virtually held in position by the alining or pressure plate 76. While thus held the motor 75 is operated to retract the fingers 74, after which the motor 40 is operated to withdraw the alining or pressure plate 80 from the pile, which settles into place in the kiln.

It may be desirable when stacking the lower piles in the kiln to have the fingers 74 slope slightly forward and downward, or when stacking the upper piles, forward and upward. Such adjustment may be readily made by means of the screw 20 and hub 21, operated by the motor 22 through the bevel gears 23 and 24.

When the apparatus is to be operated on heavy piles or stacks of bricks, the weight of such piles may be counterbalanced by the weight 77ª on the rear end of the table 14.

Simultaneously with the operation of the motor 40 to move the carriage forward to crowd the pile of bricks into place, the motor 62 is operated to rotate the drums 60 to take up the slack in the cables 58 and maintain the frame 54 and parts carried thereby in a horizontal position.

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

1. Apparatus of the kind described comprising, a rotatably mounted table, a carriage mounted for forward and backward movement thereon, a boom carried by said carriage, a frame suspended from said boom, and links connecting said frame and said carriage to maintain the same parallel to each other.

2. Apparatus of the kind described comprising a support, a table rotatably mounted thereon, a frame pivotally mounted on said table, a carriage mounted for forward and backward movement in said frame, a boom pivotally mounted at one end of said carriage, a setting frame suspended from said boom, means connecting said setting frame and said carriage for parallel movement, and means for operating the carriage and boom simultaneously.

3. Apparatus of the kind described comprising, a support, a table mounted thereon for rotary movement, a frame pivotally mounted on said table, a plurality of tracks extending longitudinally of said frame, a reciprocating carriage mounted on said tracks, means carried by said carriage for moving the same backward and forward on said tracks, a boom mounted at one end of said carriage, means on said carriage for operating said boom, a frame suspended from said boom, and parallel rods connecting said frame with said carriage for maintaining the frame substantially horizontal at any desired height.

4. Apparatus of the kind described comprising, a tiltable frame, tracks mounted thereon, a rack mounted on said frame and parallel to the tracks, a carriage, a boom pivotally mounted at one end of said carriage, a frame suspended from said boom, parallel rod connections extending from said frame to the carriage, means for operating said boom to move the frame to any vertical position within the limits of movement of the boom, and driving means for said carriage including a pinion meshing with said rack for moving said carriage back and forth on said tracks, whereby the boom, suspended frame and parallel rod connections are moved as a unit with said carriage.

5. Apparatus of the kind described comprising, a reciprocatable frame, a boom pivotally mounted thereon, a setting platform suspended from said boom for vertical movement with respect thereto, and means pivot-

ally connected to said platform and to said frame to permit vertical and parallel movement of the platform with respect to the frame, the pivotal mounting of said means being parallel with and adjacent to the pivotal mounting of the boom.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GRAFTON E. LUCE.

Witnesses:
JAMES R. HODDER,
RACHAEL L. CLARK.