Feb. 17, 1925. 1,526,993

G. E. LUCE

METHOD OF AND CURVED FINGERS FOR COMPENSATING DISCHARGE FOR BRICKSETTERS

Filed July 7, 1923 3 Sheets-Sheet 1

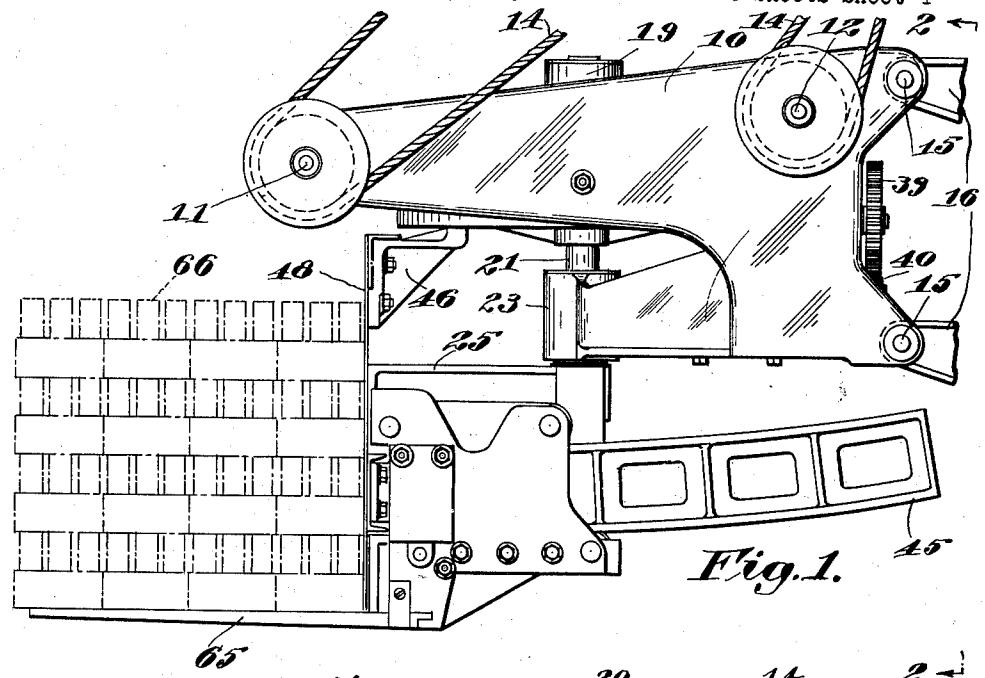


Fig. 1.

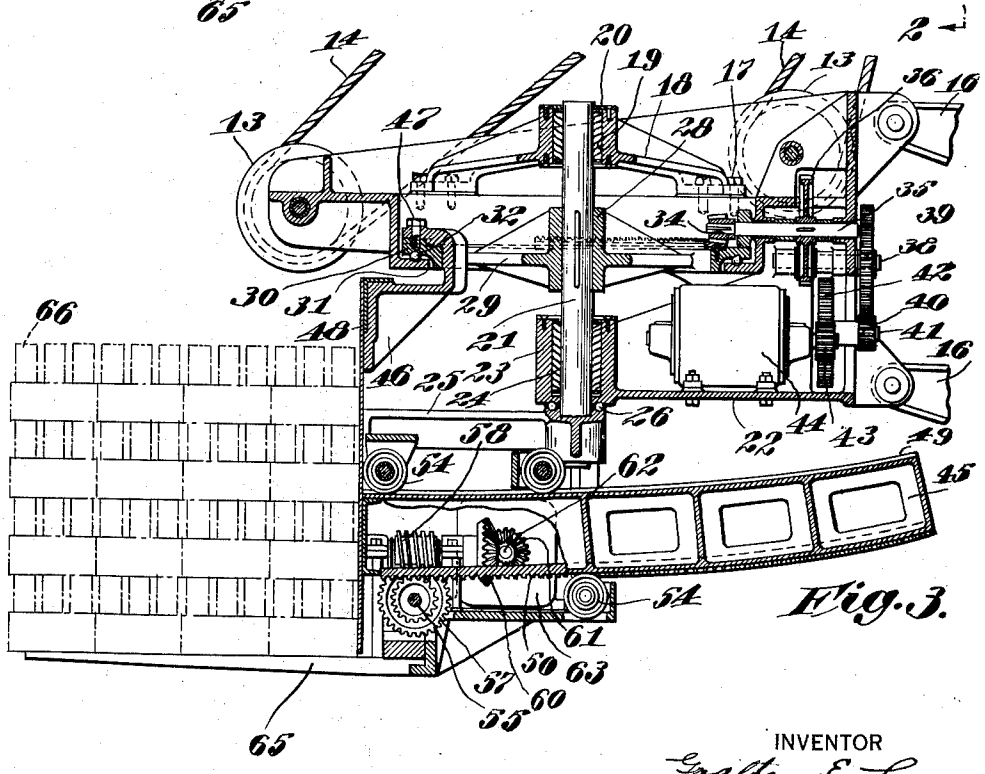


Fig. 3.

INVENTOR
Grafton E. Luce
BY
James R. Hodder
ATTORNEY

Feb. 17, 1925. 1,526,993

G. E. LUCE

METHOD OF AND CURVED FINGERS FOR COMPENSATING DISCHARGE FOR BRICKSETTERS

Filed July 7, 1923 3 Sheets-Sheet 2

Fig. 4.

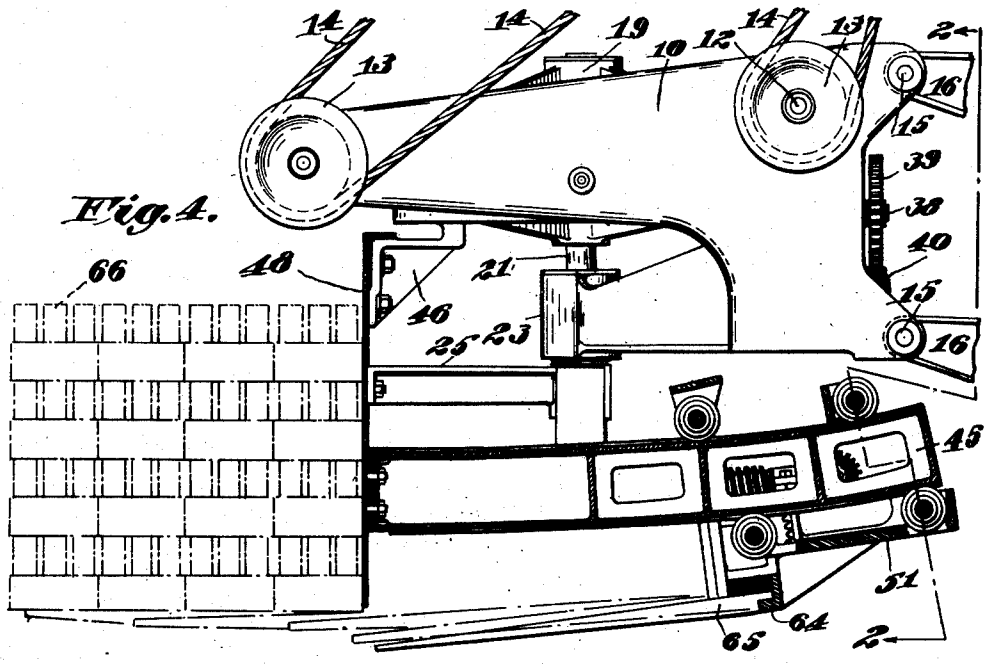
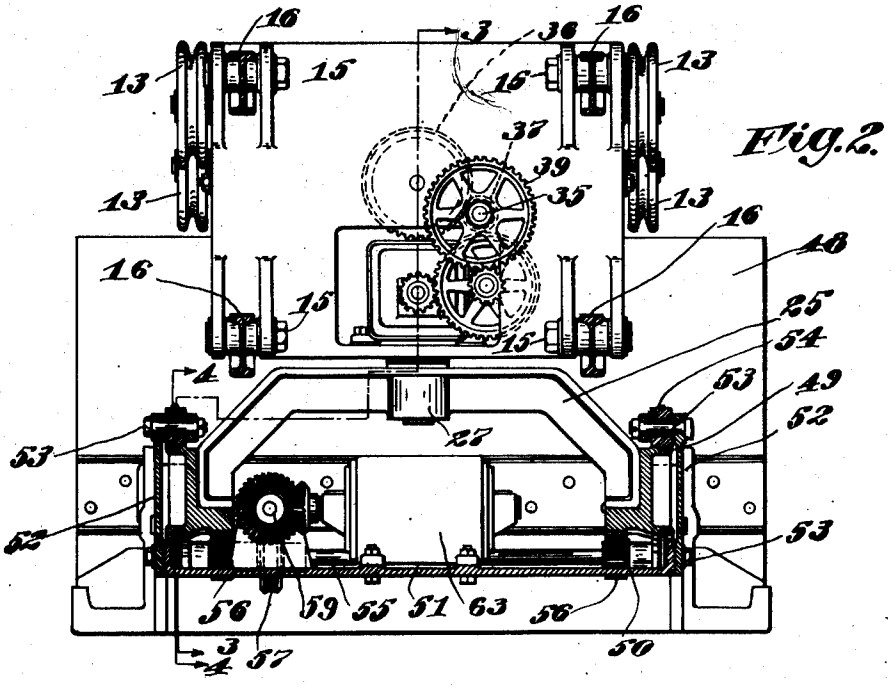


Fig. 2.



INVENTOR

Grafton E. Luce

BY

James R. Hodder

ATTORNEY

Feb. 17, 1925. 1,526,993

G. E. LUCE

METHOD OF AND CURVED FINGERS FOR COMPENSATING DISCHARGE FOR BRICKSETTERS

Filed July 7, 1923 3 Sheets-Sheet 3

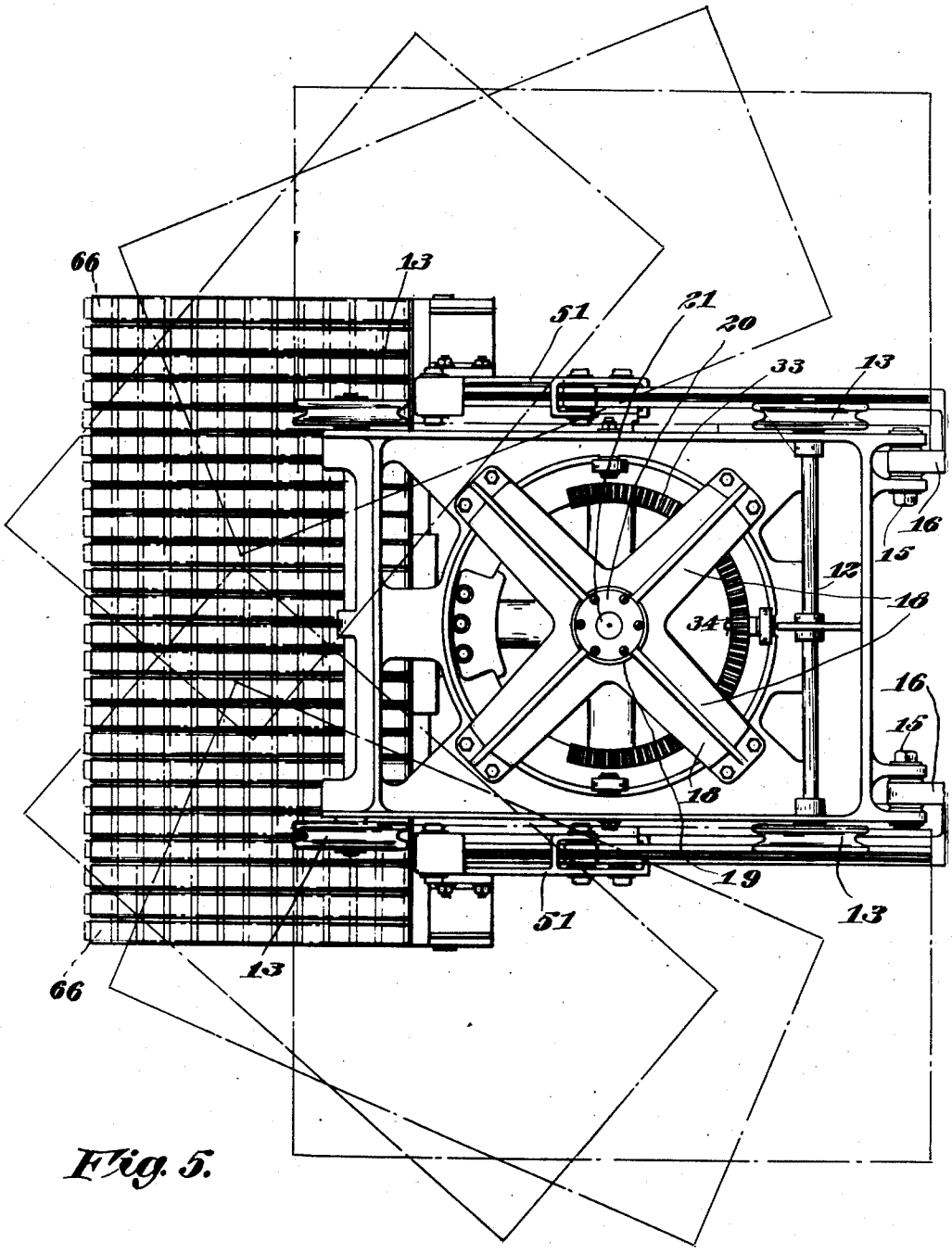


Fig. 5.

INVENTOR
Grafton E. Luce.
BY
James R. Hodder
ATTORNEY

Patented Feb. 17, 1925. 1,526,993

UNITED STATES PATENT OFFICE.

GRAFTON E. LUCE, OF CHICAGO, ILLINOIS.

METHOD OF AND CURVED FINGERS FOR COMPENSATING DISCHARGE FOR BRICK-SETTERS.

Application filed July 7, 1923. Serial No. 650,160.

To all whom it may concern:

Be it known that I, GRAFTON E. LUCE, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented an Improvement in Methods of and Curved Fingers for Compensating Discharge for Bricksetters, 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 a method of operating a brick setter and to an improved apparatus for practicing said method whereby the movement of the brick holding fingers in their forward and rearward motion with respect to a pile or stack of bricks is compensated for.

In my improved brick setting machine, described and claimed in my copending application, Serial No. 259,770, filed Oct. 26, 1918, I have described and claimed an improved apparatus for mechanically setting bricks arranged in piled or stacked relation in a kiln or withdrawing such piles or stacks from a kiln at the completion or the burning operation, and in connection with said brick setting apparatus I have utilized a suspension device for a brick setting crane, such crane being of new and novel construction and is described and claimed in detail in my copending application, Serial No. 636,675, filed May 4, 1923.

In developing the brick setting apparatus of the above identified application, difficulty was experienced in successfully withdrawing the brick lifting fingers from, or inserting such fingers beneath, a pile or stack of brick, whether in the kiln or on the loading car, there being a pronounced tendency on the part of the fingers to drag on the lower surface of the brick with which the upper edge of the fingers came in contact; that is, in my improved brick setting apparatus above referred to, the brick lifting fingers are moved in a horiozntal plane beneath the pile or stack of bricks arranged in hacked relation until a push plate located on the lifting apparatus was brought into association with one side or end of the stack of bricks. Without very careful manipulation on the part of the operator, there was no preliminary or subsequent vertical movement of the fingers as a unit with respect to the pile or stack of brick with the result that, in inserting the fingers of the lifting device beneath a stack of brick, each brick was brought successively into contact with the fingers as they were pushed beneath the pile of brick and remained in such position and this operation was reversed after the pile of brick was positioned and the fingers withdrawn from beneath such pile or stack with the result that, where the lower courses of brick in the stack escaped injury, yet there was liability of the entire stack being disarranged because of the friction existing between the lower courses of brick and the fingers of the lifter.

To obviate the objectionable features above pointed out and to make it possible for the brick apparatus to be successfully operated by relatively unskilled labor, I have designed the subject matter of the present invention wherein I do not touch the bottom courses of brick in a pile or stack of brick arranged in hacked relation until ready to lift such pile or stack and also wherein the pile or stack, having been placed in position in a kiln or other situation, I immediately withdraw the lifting device out of engagement with the bottom courses of brick and this method of operation is successfully carried out by swinging a lifting device on a curved line into position beneath a stack of brick and reversing this operation when the lifting device is to be withdrawn.

The principal object of my invention, therefore, is an improved method of operating a brick setter.

Another object of my invention is an improved apparatus for operating the lifting fingers of a brick setter.

Other objects and features of the construction and arrangement of parts of my improved invention will be apparent as the description of the invention progresses.

In the accompanying drawings illustrating the preferred embodiment of my appa-

ratus and by means of which the improved method may be practiced.

Fig. 1 is a side elevation showing the fingers of the brick setter in normal position when supporting a load of bricks;

Fig. 2 is an end elevation of Fig. 1 on the line 2—2 of such figure;

Fig. 3 is a vertical sectional side elevation on the line 3—3 of Fig. 2;

Fig. 4 is a side elevation, partly in section, on the line 4—4 of Fig. 2, and

Fig. 5 is a plan view showing the various positions of the load in dot and dash lines.

Referring to the drawings, 10 designates a supporting frame structure provided front and rear with shafts 11 and 12 respectively, these shafts being provided on their outer ends with sheeves 13 over which run cables 14 from any suitable boom, such as that shown and described in my copending application, Serial No. 636,675, filed May 4, 1923, above referred to. The right hand end of this frame member 10 and at the top and bottom thereof is provided with short shafts 15 which act as pivotal mountings for the forward end of struts or supports 16 that form practically a four point suspension means for the frame 10 in the manner described in my copending application above referred to. On the top of the frame member 10 is secured by bolts 17 a spider 18 provided at its hub portion 19 with a roller bearing 20 which forms the top bearing for a vertical shaft 21. Formed integral with the frame member 10 and extending from the rear wall thereof outwardly to a point beneath the hub 19 of the spider 18 is a supporting plate 22 which has formed integral therewith and extending upwardly therefrom a hub portion 23 provided with a roller bearing 24 in vertical alinement with the roller bearing 20 and this roller bearing 24 forms the lower bearing for the vertical shaft 21. The shaft 21 extends to a point below the hub 24 and has secured to its lower end a frame structure 25, a thrust bearing 26 being formed between the lower portion of the hub 23 and the upper face of an enlargement 27 on the frame structure 25, as clearly shown in Fig. 3. Splined to the shaft 21 between the bearings 20 and 24 is a hub 28 having formed integral therewith radially extending arms 29 and on the end of the arms 29 is formed the rim 30. This rim is adapted to rotate adjacent a circular rim 31 formed in the frame member 10 and on the upper surface of the rim 31 is formed a ball race in operative relation to the corresponding ball race in the lower face of the rim 30 and between these two ball races is provided a plurality of antifriction balls 32. Secured to the upper face of the rim 30 is a circular rack 33, the length of this rack being greater than 180° or arc, and meshing with this circular rack 33 is a bevel pinion 34 secured to the inner end of a shaft 35 rotatably mounted in suitable bearings in the frame member 10. Secured to the shaft 35 intermediate its ends is a gear 36 that meshes in, and is driven by, a pinion 37 shown in dotted lines in Fig. 2, this bevel pinion being attached to a shaft 38 rotatably mounted in suitable bearings in the frame member 10 and parallel to the shaft 35. The shaft 38 has secured to its outer end a bevel gear 39 which meshes with, and is driven by, a bevel pinion 40 secured to the shaft 41 rotatably mounted parallel to the shafts 35 and 38 and in suitable bearings in the frame member 10, this shaft 41 having secured on its inner end a gear 42 that meshes with, and is driven by, a pinion 43 secured to the end of the drive shaft of a motor 44 secured to the platform 22 in any suitable manner. The train of gearing 43, 42, 40, 39, 37, 36 constitutes a reduction gearing between the bevel pinion 34 and the motor 44. Suitable wiring extending to control mechanism is provided for the motor 44, but as such wiring and control mechanism are not essential to the understanding of the present invention, they are not illustrated and will not be described.

The frame structure 25 extends outwardly and downwardly, as clearly shown in Fig. 2, from the enlargement 27, and secured to, or formed integral with, the downwardly and outwardly extending portions are guide frames 45, there being two of such guide frames 45 spaced apart from, and parallel to, each other and the forward end of the guide frames terminates in a vertical plane in which is also located a downwardly extending bracket 46 that is secured to the rim 34 by bolts 47. Secured to the front of the bracket 47 and to the front ends of the guide frames 45 and extending entirely across and beyond the sides of the frame member 10 is a plate 48, the dimensions of this plate being slightly greater than the dimensions of one wall of a stack or pile of bricks arranged in hacked relation. The guide frames 45 are slightly curved upwardly from the joining point thereof with the plate 48 to the other end, as clearly shown in Figs. 3 and 4, and on the top and bottom surface of such guide frames are formed tracks 49 for a purpose to be hereinafter described. Formed on the under side of each of the guide frames 45, parallel with each other and with the track 49, is a rack 50.

51 designates a plate having secured to either end thereof and outside of the guide frames 45 side plates 52 and in such side plates 52 at each end thereof and top and bottom are secured stub shafts 53 on which shafts are rotatably mounted the pulleys 54 which engage with the tracks 49 on the top and bottom surfaces of the guide frames 45. Rotatably mounted in suitable bearings

on the plate 51 and in alinement with the lower front stub shafts 53 is a shaft 55 near each end of which is secured a pinion 56 meshing with the racks 50 and secured to said shaft 55 adjacent the pinion 56 at the left hand side thereof, as viewed in Fig. 2, is a worm wheel 57 which meshes with, and is driven by, a worm 58 formed on the shaft 59 rotatably mounted in suitable bearings on the plate 51. Secured to the end of the shaft 55 is a bevel gear 60 which meshes with, and is driven by, a bevel pinion 61 secured to the end of the driving shaft 62 of a motor 63 that is secured on the top of the plate 51 in any suitable manner. The motor 63 is provided with suitable connections leading to a source of power and to a control device within reach of the operator, but as these form no part of the present invention, they have not been illustrated and will not be described.

Formed on the front end of the plate 51 and depending downwardly and forwardly therefrom is a member 64 to which is secured the rear end of a plurality of forwardly extending parallelly arranged lifting fingers 65 the length of which is slightly less than the width of a stack of bricks arranged in hacked relation as clearly shown in the drawings.

By properly controlling the motor 44, the shaft 21 and all parts carried thereby may be rotated through an angle of approximately 180° with respect to the frame 10, as clearly indicated by the dot and dash rectangles in Fig. 5, which dotted rectangles show various positions into which a pile or stack of bricks arranged in hacked relation and designated by the numeral 66 may be moved. By properly controlling the crane mechanism, the frame member 10 with the rotatable shaft may be positioned in desired position relative to a pile or stack of bricks 66 with the plate 48 positioned firmly against a side or end wall of such stack or pile of brick and by properly controlling the motor 63, the plurality of parallelly arranged fingers 65 may be moved into or out of position with respect to such stack of bricks, as indicated by the plurality of dotted outlines of such fingers 65 in Fig. 4, and it will be noted that, assuming the plate 51 carrying the lifting fingers 65 is to be moved into the position shown in either of the Figs. 1 or 3 from the position shown in Fig. 4, such lifting fingers are never in engagement with the lower courses of brick of such pile or stack 66 until the forward end of the plate 51 comes into engagement with the rear face of the plate 48 and that, if the above sequence of operations is reversed, immediately the plate 51 with associated parts moves to the right from the position shown in either Fig. 1 or 3, and that the upward end of the lifting fingers drops away from engagement with the lower courses of brick so that such lifting fingers are entirely disengaged from the brick through practically the entire withdrawing operation.

While I have necessarily shown and described the preferred embodiment of my invention somewhat in detail, it is to be understood that I may vary the size, shape, and arrangement of parts comprising my invention within wide limits without departing from the spirit of the invention.

Having thus described my invention, what I claim as new is:

1. The improved method of setting brick arranged in piles or stacks which consists in taking a stack or pile of brick, placing the same in position in a kiln or other situation by lifting means, freeing the bottom of the stack from all lifting means and retaining the stack in position by pressure on its side or end wall until the lifting device has been entirely removed from beneath the stack.

2. An improved lifting and setting apparatus for bricks comprising a support, an upwardly extending curved track thereon, a carriage mounted for movement on said tracks, and a plurality of lifting fingers carried by said carriage.

3. An improved lifting and setting apparatus for bricks comprising a support, an upwardly extending curved track thereon, a carriage mounted for movement on said tracks, a plurality of lifting fingers carried by said carriage, and means for moving said carriage and attached lifting fingers longitudinally of said tracks.

4. In an improved lifting and setting apparatus, the combination of a support, a frame suspended from and rotatably mounted on said support, an upwardly extending curved track mounted on said frame, a carriage mouted for movement on said tracks, a plurality of forwardly extending fingers attached to said carriage, and means for moving said carriage and lifting fingers on said tracks whereby the ends of the fingers describe a curved path.

5. In an improved lifting and setting apparatus, the combination of a support, a frame suspended from and pivotally mounted on said support, an alining plate secured to the front of said frame, a pair of upwardly extending curved tracks mounted on either side of said frame and extending from the alining plate rearwardly, a carriage mounted for movement on said tracks, a plurality of forwardly extending fingers secured to the front under side of said carriage, said carriage, when in its foremost position, holding said fingers horizontal and with the major portion thereof extending forward of the alining plate, and means for moving said carriage and attached fingers

on said tracks whereby the extreme forward end of said fingers in their rearward movement describe a curved path.

6. In an improved lifting and setting apparatus, the combination of a support, a frame suspended from and rotatably mounted on, said support, an alining plate secured to the front end of said support, a plurality of parallelly arranged lifting fingers arranged beneath, and normally extending forward from, said alining plate, the top surface of said lifting fingers lying in a plane at right angles to the plane of the alining plate, means for maintaining the lifting fingers in their last named position, and means for moving said lifting fingers simultaneously out of said plane and rearwardly, said means also holding said alining plates out of said first named plane during the entire rearward movement of the fingers.

In testimony whereof, I have signed my name to this specification.

GRAFTON E. LUCE.