W. W. DICKINSON, Jr.

METHOD FOR SETTING BRICKS MECHANICALLY IN SPACED RELATION AS IN KILNS AND THE LIKE.

APPLICATION FILED MAR. 25, 1918.

1,332,168.

Patented Feb. 24, 1920.

4 SHEETS—SHEET 1.

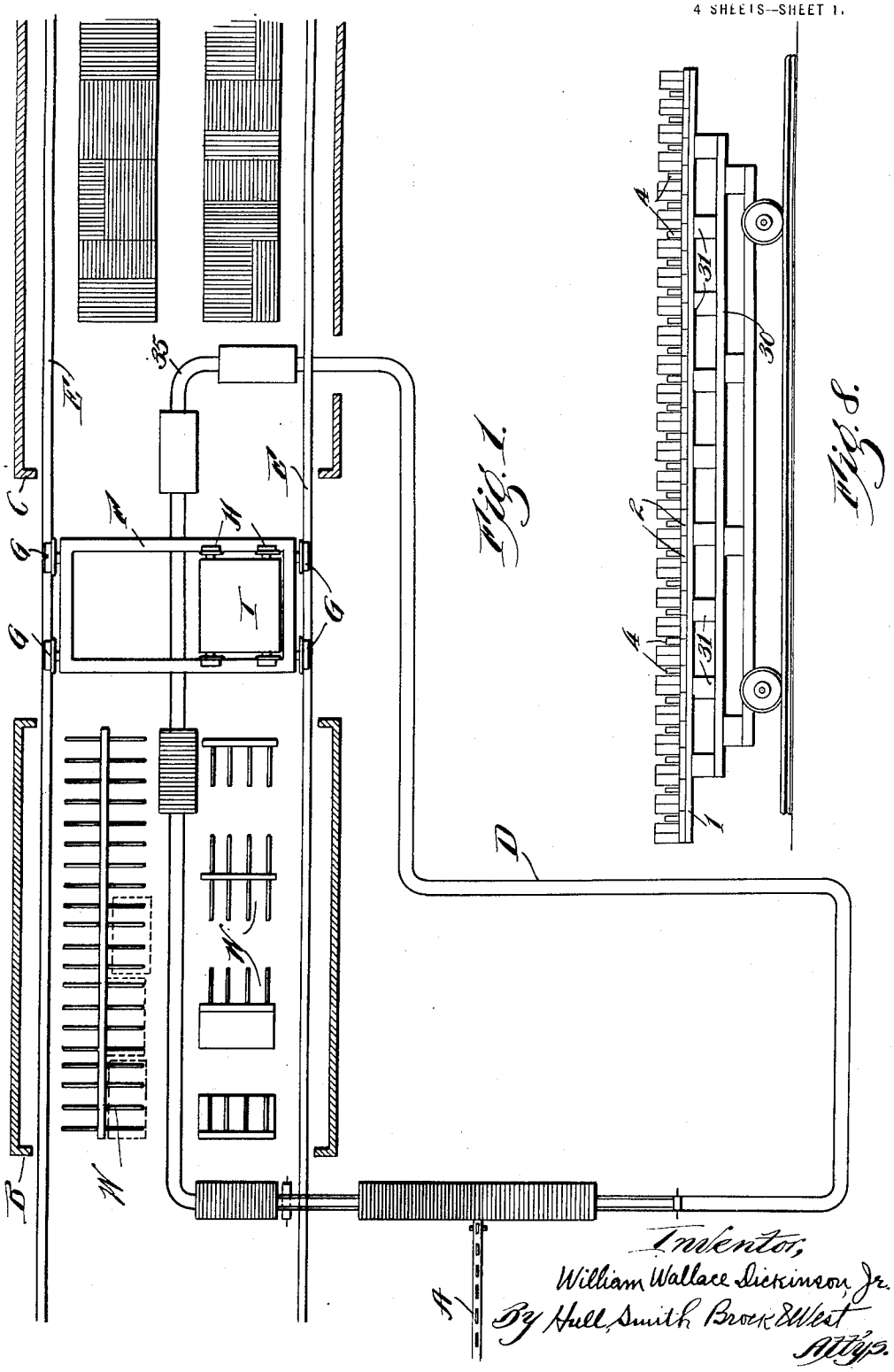


Fig. 1.

Fig. 2.

Inventor,
William Wallace Dickinson, Jr.
By Hull, Smith Brock & West
Attys.

W. W. DICKINSON, Jr.

METHOD FOR SETTING BRICKS MECHANICALLY IN SPACED RELATION AS IN KILNS AND THE LIKE.

APPLICATION FILED MAR. 25, 1918.

1,332,168.

Patented Feb. 24, 1920.

4 SHEETS—SHEET 2.

Fig. 2.

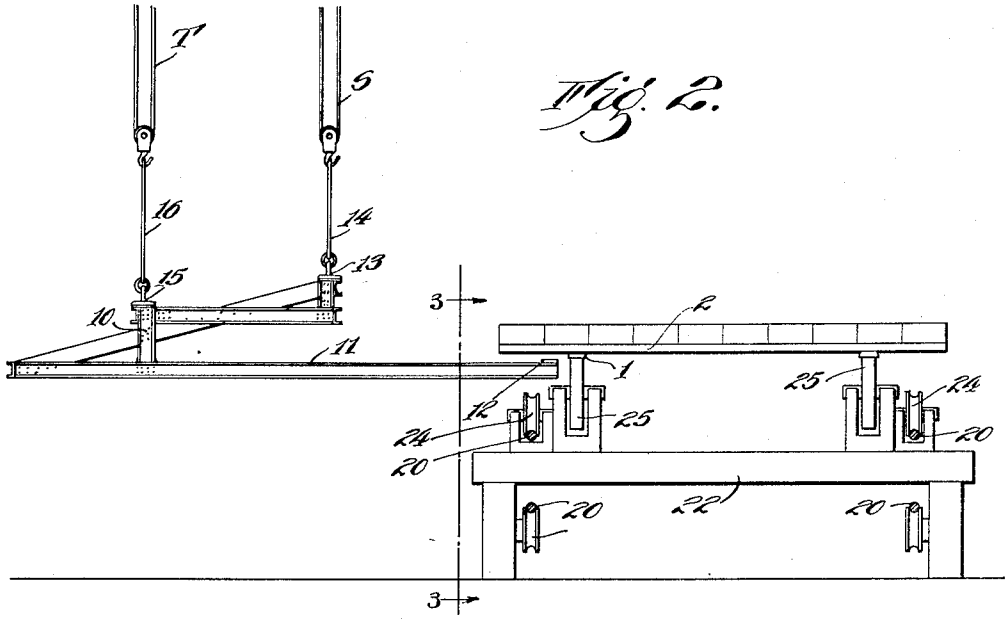
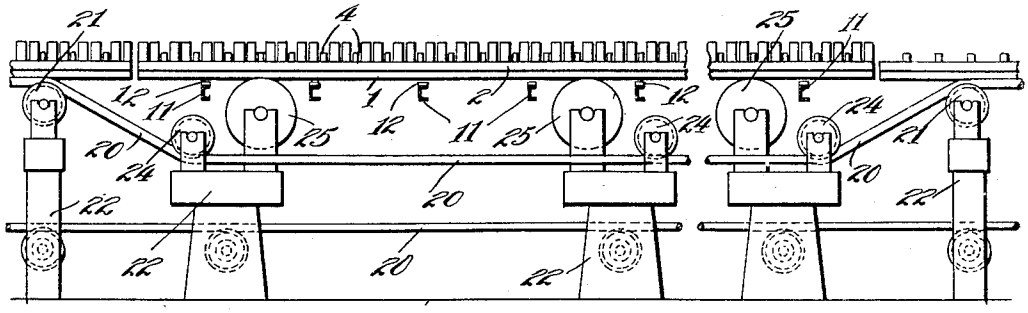


Fig. 3.



Inventor,
William Wallace Dickinson, Jr.
By Hull, Smith, Brock & West
Attys.

W. W. DICKINSON, Jr.

METHOD FOR SETTING BRICKS MECHANICALLY IN SPACED RELATION AS IN KILNS AND THE LIKE.

APPLICATION FILED MAR. 25, 1918.

1,332,168.

Patented Feb. 24, 1920.

4 SHEETS—SHEET 3.

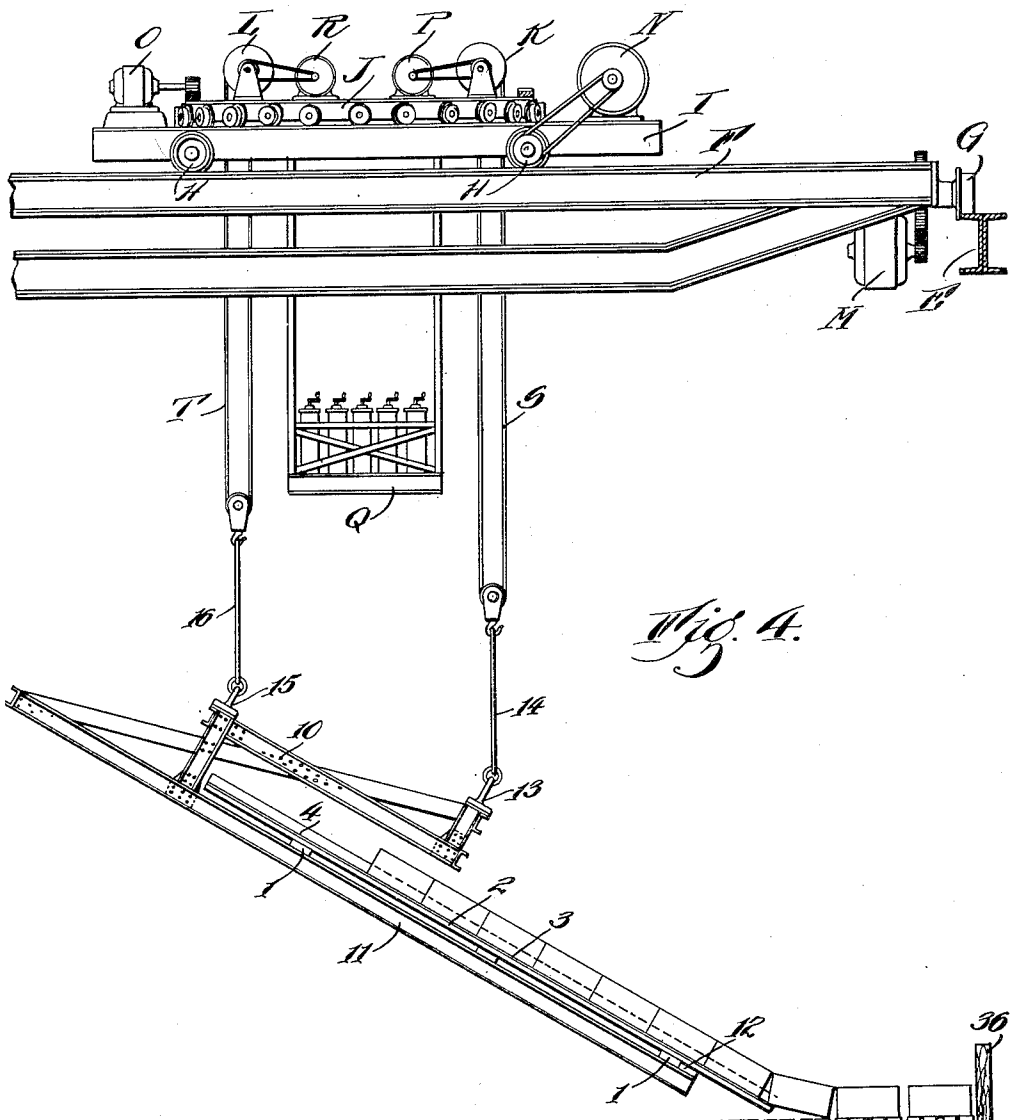


Fig. 4.

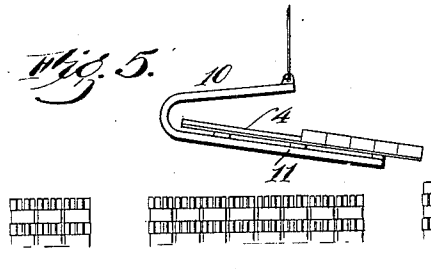


Fig. 5.

Inventor,
William Wallace Dickinson Jr.
By Hull Smith Brock & West
Attys.

W. W. DICKINSON, Jr.

METHOD FOR SETTING BRICKS MECHANICALLY IN SPACED RELATION AS IN KILNS AND THE LIKE.

APPLICATION FILED MAR. 25, 1918.

1,332,168. Patented Feb. 24, 1920.

4 SHEETS—SHEET 4.

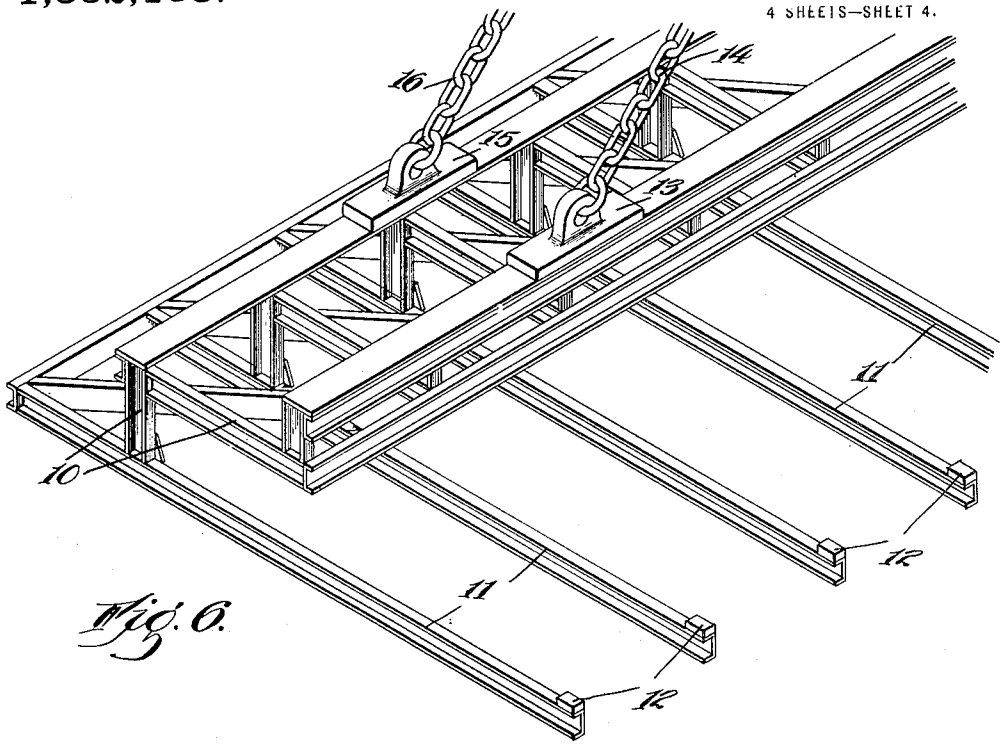


Fig. 6.

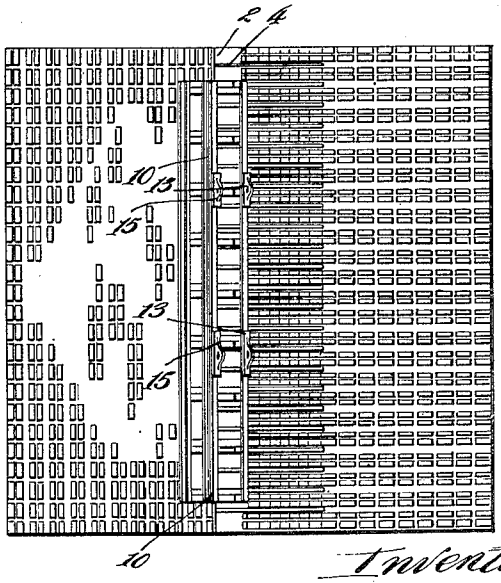


Fig. 7.

Inventor;
William Wallace Dickinson, Jr.,
By Hull Smith Brock & West
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM WALLACE DICKINSON, JR., OF LITTLE ROCK, ARKANSAS.

METHOD FOR SETTING BRICKS MECHANICALLY IN SPACED RELATION AS IN KILNS AND THE LIKE.

1,332,168. Specification of Letters Patent. Patented Feb. 24, 1920.

Application filed March 25, 1918. Serial No. 224,461.

To all whom it may concern:

Be it known that I, WILLIAM WALLACE DICKINSON, Jr., citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented a certain new and useful Improvement in Methods for Setting Bricks Mechanically in Spaced Regular Relation as in Kilns and the like, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to the manufacture of bricks and has for its general object to improve the methods and appliances for hauling the bricks between the time of their delivery by the brick machine to the time when they are set upon the conveyance whereby they are transported to the user.

More particularly the object of this invention concerns the provision of a device whereby unburned brick can be set in predetermined spaced relation upon a kiln for the purpose of drying or burning the same, or whereby burned brick can be transported from place to place and deposited in predetermined piled relation without manual handling. In my accompanying application filed March 20, 1918, Serial No. 223,555, (identified as Case A) I have illustrated certain brick conveying pallets together with means for transporting those pallets from point to point and for loading the same with bricks arranged in ordered ranks; the present application concerns more particularly the method and means of discharging said bricks from said pallets so as to produce a kiln or other ordered pile without breaking or crushing the bricks themselves and without the necessity of manual handling; while the construction of the pallet itself and the carrier thereof is reserved for the subject matter of a third application.

In the drawings accompanying and forming a part of this application I have shown one of the many operative forms in which my invention may be embodied and performed; although it will be understood that these drawings are merely illustrative and not limiting of my invention. In these drawings Figure 1 is a diagrammatic view of my improved system; Fig. 2 is a detail view showing the method of removing the pallets from and restoring them to the transporting device; Fig. 3 is a sectional view on the line 3—3 of Fig. 2; Fig. 4 illustrates the method of discharging the bricks from the pallet and of setting the same in spaced relation as in building a kiln; Fig. 5 illustrates the method of forming the kiln-arches; Fig. 6 is a perspective view of a portion of the pallet carrier; Fig. 7 is a top plan view of the carrier and the pallet thereon at the instant of discharging the bricks therefrom; and Fig. 8 illustrates in side elevation a rail-car having a pallet thereon.

Describing the drawings with regard to the reference characters thereon, A represents a conveying belt or chute, B a dry house, and C a kiln shed or kiln yard. D represents a transporting system of any convenient or suitable type, such as cars running upon a track or an endless moving belt or cable. In the present embodiment I have shown the same as passing by the conveyer A so that the pallet thereon may receive the bricks delivered thereby either in the mode illustrated in my copending application, Serial No. 223,555, or in any other suitable manner; I have next shown the transporting device as passing through the dry house, so that the bricks on the pallets may be dried, either by passing the cars very slowly through that house, or by removing the pallets from the transporting mechanism and resting the same on shelves or brackets during the drying period; I have next shown the transporting systems as passing through into the kiln-shed, so as to deliver the pallets in close proximity to the kilns; and I have finally shown the transporting mechanism as returning to the starting point. As far as the present invention is concerned the origin of the bricks is wholly immaterial, as is also the mode of their disposition upon the pallets.

Traversing the kiln shed C I have shown the tracks E—E of a traveling crane, which in the present embodiment I have also shown as extending through the drying house C so that the same crane can be employed for moving the pallets from the transporter to the drying bracket, or from the transporter to the kilns, or from the drying brackets to the kilns. The crane preferably comprises a rectangular frame F supported by suitable wheels G—G upon the tracks E, and itself forming a transverse track for the wheels H—H of the car I. Mounted upon the car I is the rotary turn table J carrying the hoisting drums K and

L. The frame F is driven along the rail C by the motor M; the car I is driven along the frame F by the motor N; the turn-table J is rotated by the motor O; the drum K is operated by the motor P; and the drum L is operated by the motor R; these motors are governed by suitable controllers located in the operator's cage Q which depends from the car I as usual in traveling cranes. Depending from the drum K are the falls S, and depending from the drum L are the falls T. It will be understood that the foregoing crane construction is illustrative merely and that numerous other conveying expedients can be employed within the scope of my invention.

The carrying device herein shown consists of a large, flat, rectangular tray or pallet preferably provided with spaced transverse strips defining brick receiving channels, the length and width of the pallet being sufficient to hold the desired number of bricks. Preferably, in case the pallet is to be used in kiln-building, its length is equal to (or at least commensurable with) the width of the body of the kiln which is to be built therefrom, in the present embodiment shown at thirty feet; while its width depends upon the width of the tram-way or conveyer or upon the width of the passage ways through which the same must pass. In the present embodiment I have shown a pallet having a width of eight feet, thereby holding ten bricks of ordinary size arranged end to end.

Each of the brick carriers or pallets herein shown comprises a pair of longitudinal wood stringers 1, 1, upon which are secured transverse planks 2, 2, surmounted by a thin steel plate 3 which covers the whole device and upon the top of which are screwed or bolted the transverse strips 4—4. These strips are spaced apart a distance necessary to receive whatever number of bricks are to be introduced between them. In the present case I have shown the bricks as delivered in pairs, that being one common mode of delivering bricks from brick machines and building the same into kilns at the present day, although other arrangement can be employed within the scope of my invention. A thirty foot pallet so arranged presents seventy grooves, so that its load is fourteen hundred bricks and the total weight of bricks and pallet is about three tons. Of course the pallet could be made considerably smaller or somewhat larger if desired.

When the pallet is arranged for the purpose of building a kiln, as illustrated herein, the width of the strips is such as to afford the desired lateral spacing of the bricks in that kiln. In case the carrying device is to be used for the purpose of building other structures than kilns or of loading, or transferring, or piling burned bricks, its construction and size will naturally be changed according to the work in view and the amount of movement necessary.

In order to discharge the bricks from the carrying device the same is first conveyed to the point where the bricks are to be set down, then inclined to such an angle that the bricks will slide easily and smoothly therefrom and finally drawn slowly rearwardly, while maintaining its lower edge closely adjacent to the supporting surface on which the bricks are to be laid, whereupon the bricks will slide gently and uniformly from their channels and be set down in exactly the predetermined relation. For the purpose of building a kiln this method offers peculiar and unusual advantages; for not only are the bricks spaced apart laterally by the width of the strips 4, 4, but the mode of their ejection from the pallet causes them to assume relatively angular positions at the moment of leaving the same, as shown in Fig. 4, which wedges the adjacent bricks apart, and produces a uniform longitudinal separation. The result is that by laying adjacent courses at right angles to each other (which is easily effected by rotating the turn-table J) a perfectly uniform regular porous pile can be constructed. In building a kiln directly from the pallet it is desirable that only one layer of bricks be placed upon the pallet at a time, since plural layers interfere with each other and do not produce equal spacing, but it is entirely feasible to transport and discharge a plurality of layers simultaneously, especially if the inclination of discharge be decreased and pushing means employed to assist the same.

For handling pallets I prefer the construction shown in Figs. 2, 6 and 7 consisting of a carrier adapted to hang substantially horizontal when suspended from the crane, and capable of being tilted in such a way as to afford the pallet the necessary inclination. This carrier comprises a rigid metal frame 10, preferably of trussed construction, adapted to overlie the pallet and having at one side a depending portion to which are secured a plurality of stiff metal arms 11, 11, adapted to underlie the pallets in supporting relation. These arms extend parallel to each other parallel to the strips 4 on the pallets and are provided with projections 12 adapted to engage suitable abutments on the pallets, such as the side of one of the stringers 1, and prevent the pallet from slipping. The frame is provided at the point nearest the free ends of the arms 11 with anchorage 13 for a cable 14 to which are attached the falls S; and the rearward part of the frame is provided with another anchorage 15 for a cable 16 to which are attached the falls T. Each anchorage is preferably made double and the

corresponding cable attached in the familiar V fashion so as to diminish side sway or teetering of the carrier; and the forward anchorage 13 is located at such a point as always to lie forward of the center of gravity of the carrier and pallet even when the entire load is confined to the forward edge of that pallet. The other anchorage 15 is located upon the opposite side of the center of gravity so that by suitable relative movement of the falls the carrier and pallet can be given any desired inclination within wide limits.

In order to permit the insertion of the carrier-arms beneath the pallets, the latter are supported in such wise upon the transporting device as to afford the necessary space therebeneath. Thus, in the case of the cable conveyer shown in Figs. 2 and 3, the ropes of cables 20 which ordinarily pass over the tops of suitable rollers 21 carried on suitable standards 22, may be abruptly depressed and caused to pass beneath the pulleys, 24, 24, additional idle rollers 25, 25, being provided for the reception of the pallets and affording sufficient space beneath those pallets for the insertion of the arms 11 as clearly shown in Fig. 3. In case a car is employed as shown in Fig. 8, the top or floor 30 of the car is preferably provided with spaced blocks 31, 31 so spaced and of such height that the arms can be inserted therebetween. The width of the carrier depends upon the length of the pallet, and the spacing of the fingers 11 upon the strength and stiffness of that pallet. I prefer to locate the same between three and four feet apart.

The arrangement and construction of the kilns as shown at C is entirely independent of the present invention, although I prefer to construct and arrange them as illustrated, described and claimed in my copending application filed March 18, 1918, Serial No. 223,026. The transporting device C is preferably arranged to make a right-angular turn at some point within the travel of the crane, such as shown at 35 in Fig. 1, so that the orientation of the pallet will depend upon whether it is picked up at one side or the other side of that turn. Also the dry house, when used, preferably has its shelves or brackets arranged at right angles to each other as shown at W, so as to allow the pallets to be set thereon in either position. This expedient diminishes the necessity of swinging the pallets in mid-air, although this is entirely possible if desired; however, I prefer to use the turn table chiefly for the purpose of changing the relative position of the falls since the rotation of the entire pallet, particularly when loaded, tends to set up violent torsional vibrations.

In the use of the apparatus and the performance of the method here disclosed, the pallet loaded in any suitable manner having been brought beneath the crane the carrier is inserted beneath the pallet and the latter raised, the falls being operated simultaneously so as to maintain the arms and pallet substantially horizontal. Upon arrival at the place of discharge, the falls S are lowered, and the falls T are raised so as to incline the pallet and to present it closely to the receiving surface as shown in Fig. 5, after which the appropriate motor M or N is set in operation so as to draw the pallet horizontally across the receiving surface in a direction opposite to that in which the pallet is inclined. In starting a new layer of bricks in an exposed position, a suitable guide is preferably employed, such as a plank 36, held in place by workmen until the first brick of the series has been deposited. If it is desired to build only a narrow pile, for example such a pile as exists between the adjacent arches at the bottom of the kiln, it is possible to stop the discharge of bricks at any moment merely by elevating the falls S and releasing the falls T, as shown in Fig. 4; in such a case the transverse courses are constructed, either by loading the pallet originally only as to certain grooves (which may conveniently be marked with paint or the like) or by preventing discharge in certain of the grooves by suitable gates or obstructions. For this reason the device is useful for a great many purposes other than building kilns; and even in kiln building, it is customary to inclose the interior of the kiln with hand-laid walls after the middle part has been laid as illustrated herein; and for the delivery of the necessary bricks to the workmen, I preferably employ the same discharging arrangement, piling the bricks upon the ground along the side of the kiln in any desired order and arrangement by means of my improved apparatus.

The rapidity of laying the kilns depend upon the nature of the clay and its condition when delivered thereto; some clays can be built into the kiln immediately upon pressing and without any drying whatever, provided not too many courses be laid in any one day; in such a case three or four courses may be laid over a large number of kilns, and additional courses may be deposited thereon on succeeding days. Other clays are necessarily dried before handling after which they may be built into kilns as rapidly as desired. When a drying house is used, its construction is largely immaterial; for example the bricks may be dried on small pallets or singly and placed upon the large pallets herein described after the drying is completed; or the large pallets can be loaded previously, and the bricks dried thereon, either by passing said pallets slowly in a continuous manner through a heated chamber, or by setting said pallets off on

to brackets or shelves and leaving them for the requisite time. For the purposes of this invention the method of loading and conveying the pallets is not important since the loading may be done either by hand or machine, and the conveying by push-car, cable-car, cable-carriers, or animal-drawn vehicles.

It will be understood that the ejection of the bricks may be assisted by pushing means if desired, in which case a smaller inclination of the carrying device relatively to the horizontal will be sufficient, and that the chutes or grooves along which the bricks are slid can vary in inclination from point to point, as by beveling off the discharging edge of the carrying device, provided only that a suitable inclination is produced at the moment of leaving the pallet or other support. Also it will be understood that the invention is not necessarily limited to a device presenting a large number of grooves or chutes, or to any specific type of pallet, carrier, crane, or other device except as distinctly specified in the claims.

Having thus described my invention, what I claim is:—

1. The method of setting a row of bricks upon a horizontal surface in longitudinally separated relation which consists in feeding said bricks down an inclined support upon said horizontal surface while moving said support horizontally along said surface and guiding said bricks during their passage over the support.

2. The method of setting a row of bricks upon a horizontal surface in longitudinally separated relation which consists in feeding the bricks in longitudinally abutting relation along a chute supported adjacent to said horizontal surface while moving said chute horizontally along said surface in a direction opposite to the direction in which the bricks are discharged therefrom.

3. The method of setting bricks in laterally and longitudinally separated relation upon a horizontal surface which consists in simultaneously feeding a plurality of laterally separated rows of longitudinally abutting bricks down an inclined support held adjacent to said horizontal surface while moving said support horizontally along said surface in a direction opposite to the direction in which said bricks are discharged.

4. The method of setting bricks in laterally and longitudinally separated relation upon a horizontal surface which consists in first applying to a supporting device a plurality of laterally separated rows of longitudinally abutting bricks, second, inclining said supporting device in a direction parallel to said rows while holding the same above and adjacent to said surface, and, third, discharging all said rows simultaneously from said supporting device while moving said device horizontally along said surface in a direction opposite to its direction of inclination.

5. The method of building a brick kiln which comprises the steps of first arranging the bricks in lengthwise rows upon a support of a nature to permit lengthwise sliding of the same; second, transporting said support bodily to a point above said kiln; third, inclining said support in a direction lengthwise of the bricks thereon and presenting its lower edge close to the receiving surface; and, fourth drawing said support horizontally along said surface in a direction opposite to its inclination while discharging the bricks therefrom. whereby the angular relation of the discharging bricks may cause them to become separated longitudinally.

6. The method of setting bricks upon a kiln in longitudinally and laterally separated relation, which consists in, first, placing upon a support a plurality of laterally separated rows of longitudinally abutting bricks, second, transferring said support to a position above the kiln, third, inclining said support in a direction parallel to said rows, and fourth discharging said rows longitudinally while moving said support horizontally in the opposite direction.

7. The method of stacking bricks in superposed courses, the bricks in each course being laterally and longitudinally separated and the bricks in successive courses being laid perpendicularly to each other, which consists in feeding a plurality of laterally separated rows of longitudinally abutting bricks down a support held at an oblique angle to the receiving surface while moving said support parallel to that surface in a direction opposite to the direction of brick-discharge, and thereafter feeding upon the top of said first bricks a plurality of laterally separated rows of longitudinally abutting bricks down a support held at an oblique angle to the receiving surface while moving said support in a direction at right angles to its former direction of movement.

8. The method of setting bricks mechanically in separated relation which consists in simultaneously discharging a plurality of rows of longitudinally abutting brick in single layers down a support upon a receiving surface with which said support makes an oblique angle while moving said support along that surface in a direction opposite to the direction of the brick discharge.

9. The method of setting bricks mechanically in separated relation which consists in guiding a plurality of longitudinal rows of endwise abutting bricks down an inclined support onto a receiving surface and simultaneously moving said support along said surface in the opposite direction.

10. The method of setting bricks mechanically in piled relation which consists in

simultaneously discharging a plurality of rows of longitudinally abutting bricks down an inclined support upon a receiving surface, and simultaneously withdrawing said support from beneath the bricks until the desired number have been deposited, and then reducing the inclination of said support.

11. The method of setting bricks in a loose pile which consists in depositing successive single layers of longitudinally abutting brick in alternate rectangular positions, one upon the other by discharging each layer lengthwise down a support which is inclined relatively to a receiving surface while shifting said support along such surface.

12. The method of setting bricks in orderly rows upon a receiving surface which consists in simultaneously feeding a plurality of laterally separated rows of longitudinally abutting bricks from a support held slightly above said surface, and simultaneously moving said support in a direction opposite to the direction in which the bricks are discharged therefrom whereby each brick at the instant of its discharge may become inclined relatively to the preceding and succeeding bricks and the same thereby wedged apart.

13. The method of setting bricks in orderly rows upon a receiving surface which consists in first applying to a supporting device a plurality of laterally separated rows of longitudinally abutting bricks, next presenting said device above and close to said receiving surface, and finally withdrawing said device from beneath the bricks by moving the same in a horizontal direction parallel to the direction of said rows while preventing the bricks from moving horizontally with said carrying device.

14. The method of setting bricks in perpendicularly piled relation which consists in first applying to a supporting device a plurality of parallel rows of longitudinally arranged bricks, next presenting said device above a receiving surface, third withdrawing said device in a direction parallel to the rows and to the receiving surface while holding the bricks against moving with said device, changing by 90° the relative position of said supporting device and receiving surface, and, finally withdrawing said device from beneath the bricks thereon so as to deposit the same perpendicularly of the rows previously deposited.

15. The method of setting bricks upon a receiving surface which consists of, first, loading the bricks in the desired relation upon a carrying device, second, moving said device to a position above and close to the receiving surface, and inclined in the direction of discharge, and, finally drawing said device past the receiving surface in a direction opposite to its inclination, while preventing said bricks from accompanying said device whereby they will be deposited upon said surface.

In testimony whereof, I hereunto affix my signature.

WILLIAM WALLACE DICKINSON JR.