

April 22, 1952

H. J. ABREU
BRICK UNIT FORM

2,593,954

Filed May 19, 1950

3 Sheets-Sheet 1

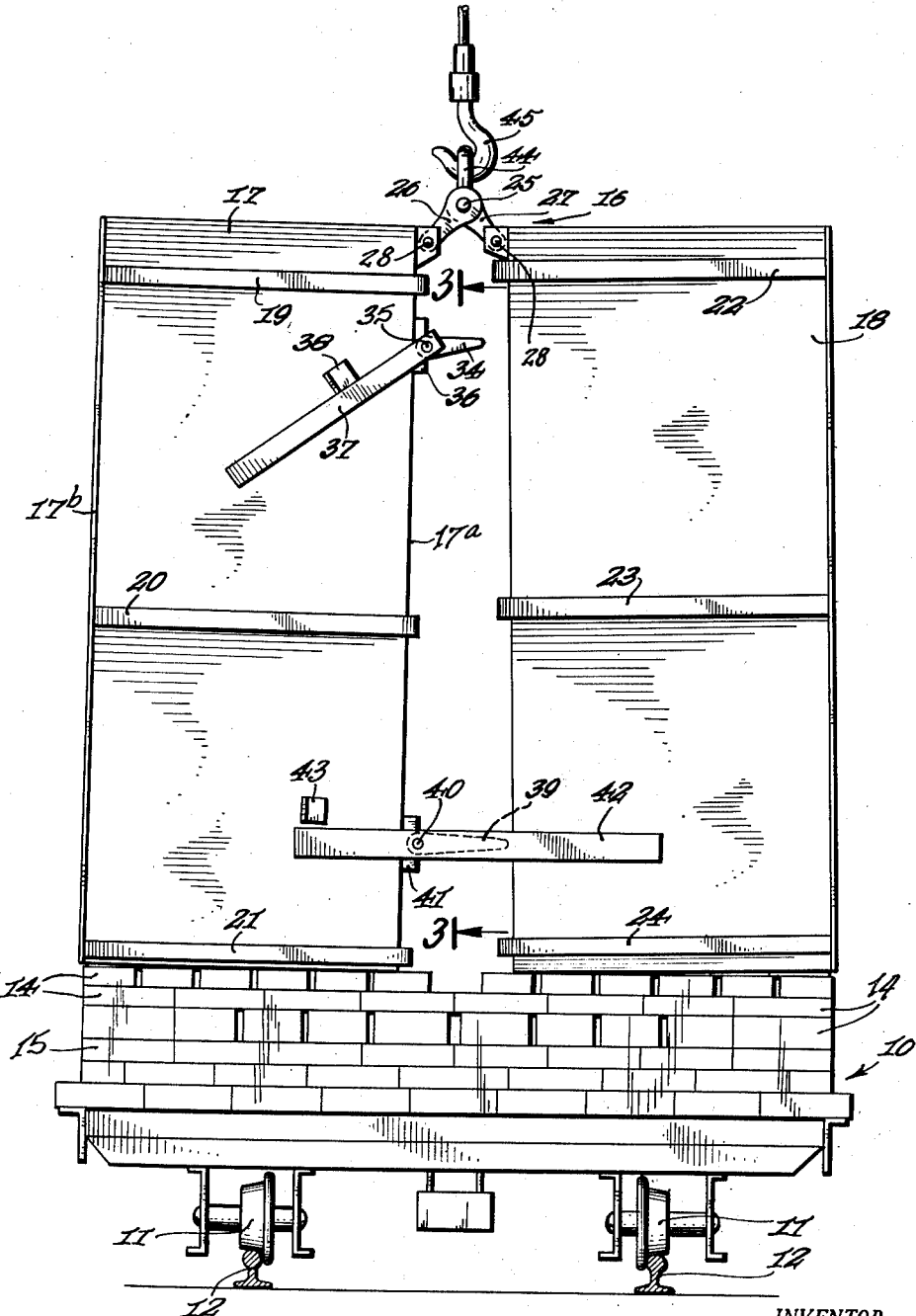


FIG. 1.

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3 Sheets-Sheet 2

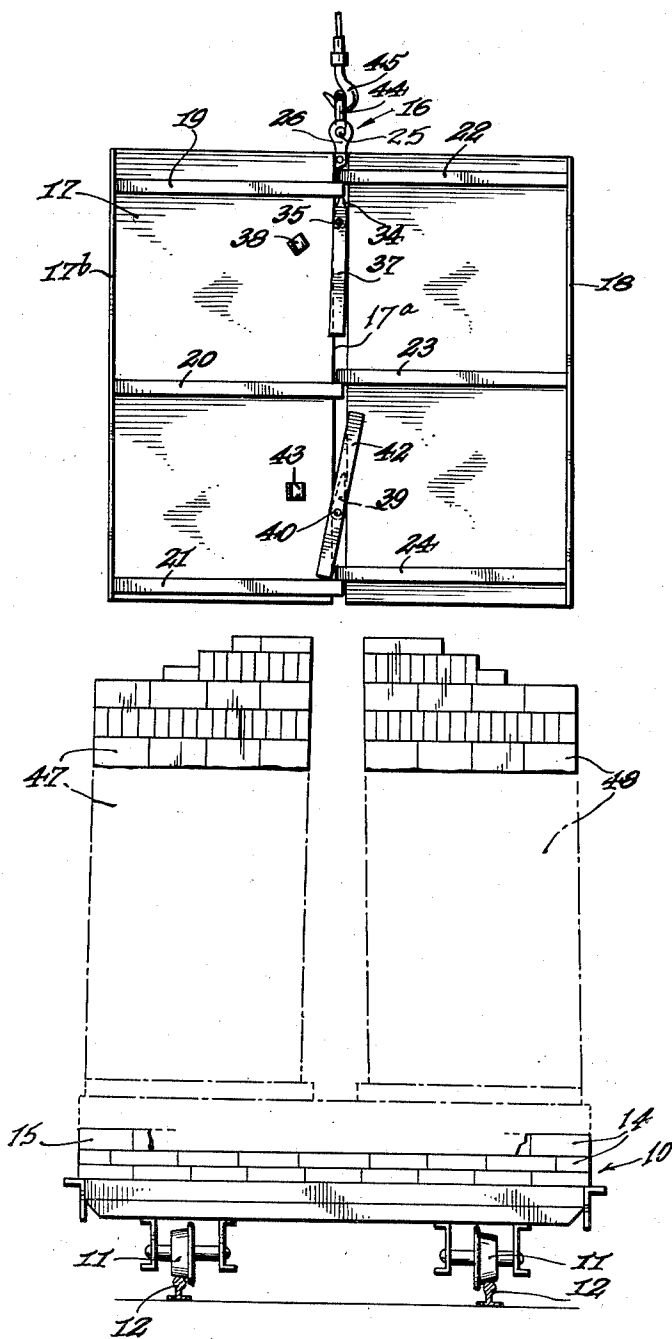


FIG. 2.

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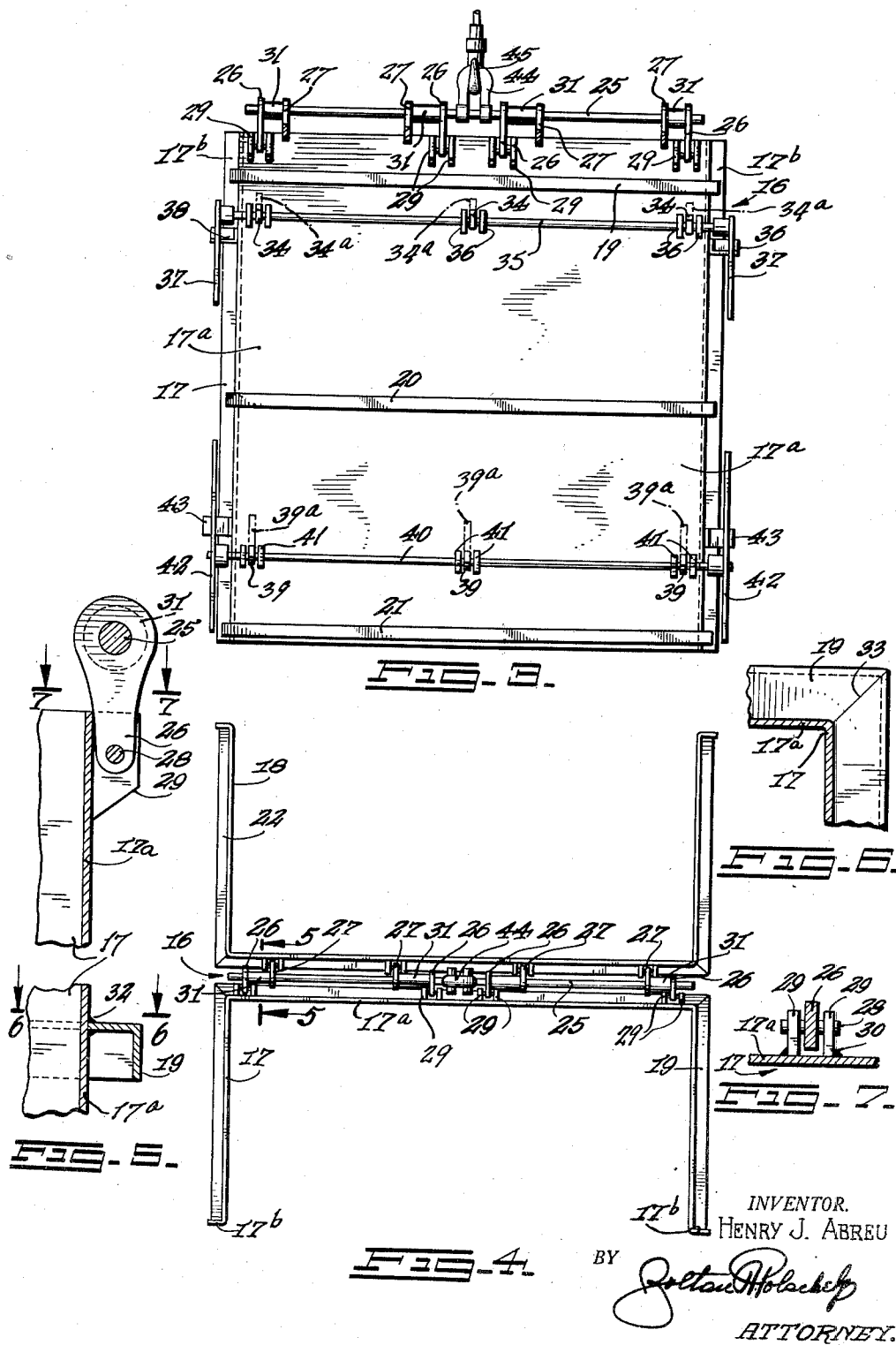
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UNITED STATES PATENT OFFICE

2,593,954

BRICK UNIT FORM

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Application May 19, 1950, Serial No. 162,867

5 Claims. (Cl. 25—2)

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This invention relates to new and useful improvements in brick handling apparatus, and, more particularly, the aim is to provide a novel and valuable auxiliary appliance for use in connection with a tunnel kiln car and for facilitating the hacking or setting of green bricks in unit formation.

Ordinarily, the green bricks are placed on tunnel kiln cars in units of about 1500 bricks to each unit, with two units on each car. These units are usually 6' high by 32" wide and 64" long; and their arrangement on the tunnel kiln car should be such that the two units are set back to back with a 7" space in between to afford the flue needed for upward travel of the heat. An overhead crane has been used for depositing the units on the deck of the tunnel kiln car. The bottoms of the units are thereby brought to rest atop a structure defining what is known as the deck of the car and comprising a plurality of brick courses, the bricks of which, called the finger bricks, are spaced in a way to permit entry of the fingers of the brick fork. On these fingers the bricks hacked or set to establish a unit are supported, until such unit is transferred to the deck of a tunnel kiln car consequent upon lowering the overhead crane which permanently carries the brick fork.

Although this procedure has been in use for many years in brick plants, it has proved inefficient and unsatisfactory for various reasons. For one thing, it has been found that the brick fork, when used with green bricks, breaks too many bricks. Again, it is difficult to place the brick units on the tunnel kiln cars with an overhead crane and have an even space of 7" between the units. Furthermore, the decks of the tunnel kiln cars have varying slopes, and as the crane lowers a unit down to rest on the deck of a tunnel kiln car, the unit is frequently distorted out of shape, causing many bricks to break, and even, as often occurs, causing a wreck in the tunnel kiln.

In order to overcome these difficulties, there is provided by the present invention a pair of brick unit forms permanently connected in a particular way thereby to constitute the main structure of the new appliance. Each of the forms comprises an upright columnar housing having a back wall and also a pair of side walls, so that the housing is of U-shape in horizontal section. The housings are wholly open at their bottoms, for a reason to be made plain below; and they also may be and preferably are wholly open at their tops. The two forms are arranged back to back, and their

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back walls are hingedly connected near the tops thereof.

The hinging means just referred to is inclusive of a plurality of links which near their upper ends are pivotally attached to a horizontal bar by way of which the appliance as a whole is suspended from a suitable overhead support.

In combination with such hinging means, the new appliance also is provided with a special instrumentality, manually settable to one condition or another, and hereinbelow called the cam means; and, accordingly, the directly acting elements of the means last-named will below be called the cams. These cams are pivotally mounted members, each carried by one of the two forms, and all preferably carried by one of the forms. Said cams are interposed between the back walls of the two forms, and by way of said cam means the cams may be rocked to assume positions such that the two forms, while suspended as above, will be forced to become spread apart to give a greater spacing as between their back walls. Said cam means, however, may be at will operated to cause the cams to be rocked to assume positions such that the two forms will thereupon automatically close in on themselves, due to the action of said links, to give a much less spacing as between their back walls.

Pursuant to these arrangements, the new appliance may be lowered to have its two forms rest on their bottoms, on the deck of the tunnel kiln car, with the open front of each form parallel with and facing a different one of the two sides of the car, and so that the back walls of the forms are extended along parallel lines near and substantially parallel with the longitudinal centerline of the car.

With the two forms thus disposed on the deck of a tunnel kiln car, and with the said cams rocked to force the back walls of the forms to the already mentioned greater spacing thereof, it becomes possible, with men working on both sides of the car, and with the green bricks delivered to them by means of conveyor belts or rack cages, to have these men receive the bricks and with them hack or build up the brick units directly in the forms on the deck of the car. As soon as the brick units are completed, the cams are rocked to assume positions such that the forms will as above become automatically closed in on themselves to give a much less spacing as between their back walls, in response to the first imparting of an upward pull to the appliance. As a consequence, the appliance becomes free to be lifted easily and then to remove both forms loosely from

the brick units within the same, without disturbance of either brick unit; yet, when the forms are fully elevated, the 7" flue-affording space between the units is always properly provided for.

By the present invention, incidentally, the usual overhead crane crew of three men is dispensed with, which is an important saving of high-priced labor. An ordinary hoist, hung from above the hacking station for a tunnel kiln car, and operable manually, as by chain pull, is all that is required for lowering and raising the two-form appliance. Once the brick units are completed, and the two forms are raised to clear the tops of the brick units, the tunnel kiln car is ready to enter the pre-heating compartment.

Furthermore, by the present invention all the troubles caused by the brick fork as previously used are overcome. This is so because the system of the present invention obviates the use of the brick fork on green bricks; even though, it may be explained, it is contemplated that a brick fork or equivalent will be used, but only for picking up the brick units after they are burnt. Such picking up of the brick units is necessary, in order to empty the tunnel kiln car to make the car ready for reloading. Thus, while care will be taken to set the finger bricks above-mentioned to a spacing in agreement with a gauge whereby spaces between the finger bricks are provided for entry of the fingers or prongs of the brick fork, this according to practices well-known in the art, the procedure, in the case of the present invention, is merely to use such fork in connection with the brick units after they are burnt, to pick them up for shipment or storage.

While it has previously been proposed to employ brick unit forms, the forms proposed have always been single forms, and not in pairs, back to back, according to the principles of the present invention.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a view illustrating a tunnel kiln car in end elevation, and also showing placed on the deck of said car a now favored embodiment of the two-form appliance of the invention, with the forms thereof in the more widely spaced relation as between their back walls.

Fig. 2 is, on a reduced scale, a view similar to Fig. 1, but showing said two forms closed in toward each other at their back walls and the appliance raised to have the open bottoms of the forms clear the tops of the two brick units as hacked or set up within the forms while they were arranged as in Fig. 1, said two units being merely outlined in dot and dash lines at their lower portions, and the finger-brick-including deck of the car, such deck more fully shown in Fig. 1, being in this Fig. 2 merely outlined in broken lines.

Fig. 3 is a vertical section, taken approximately on the line 3—3 of Fig. 1; with this view also showing, in broken lines, the cams aforesaid as assumed to be arranged as in Fig. 2.

Fig. 4 is a top plan view of said appliance, but with the six cams and their appurtenances omitted, to simplify the drawing.

Fig. 5 is an enlarged fragmentary detail sectional view, taken on the line 5—5 of Fig. 4.

Fig. 6 is a similar view, taken on the line 6—6 of Fig. 5.

Fig. 7 is likewise a similar view, taken on the line 7—7 of Fig. 5.

Referring now more in detail to the drawings, at 10 is shown a tunnel kiln car, having wheels as at 11, for traveling along tracks 12. At 14 is illustrated the finger bricks portion of the deck 15 of the car.

The new hacking-facilitative appliance is as a whole marked 16, the same including a pair of brick unit forms 17 and 18. Each of these forms is substantially alike, and as illustrated they are of substantially U-shaped cross-section from top to bottom, so as to include back walls and side walls, and are open not only at their bottoms but also at their tops.

The form 17 only will be described in further detail, as in view of what has just been said and in view of the showings of the drawings, a description of the form 17 will suffice as a description of the form 18 except as otherwise below mentioned.

The back wall 17^a of the form 17 is so shaped relative to the two side walls of said form (which form may be bent up from fairly thin sheet metal) that the compartment provided within the form 17 is slightly tapered upwardly from the open bottom of the form and also slightly tapered inwardly from the open front to the back wall. Both these tapers may be of the order of 1/2" with the form made to allow for the hacking therein of a standard 1500-brick unit 6' high by 32" wide and 64" long. These tapers aid in insuring safe quick lifting up of the new appliance to raise the two forms 17 and 18 high enough to clear the tops of the hacked units.

The form 17 is given a high degree of rigidity in part by bending outwardly the vertically extending free marginal portions of the two side walls of said form, thereby to provide a pair of stiffener flanges 17^b; and in part by stiffener ribs of U-extension applied to the exteriors of the back wall 17^a and of the two side walls. The ends of these ribs, respectively designated 19, 20 and 21, are also abutted against the stiffener flanges 17^b. The corresponding stiffener ribs on the form 18 are respectively marked 22, 23 and 24; it being noted that all said ribs are of angle-iron shape, as shown in the case of the rib 19 in Figs. 5 and 6, but that the ribs are so placed on their forms that when the latter are coupled as in Figs. 1 and 2, the ribs 19, 20 and 21 are slightly staggered relative to the ribs 22, 23 and 24.

Such coupling of the forms 17 and 18 is effected by the hinging means already mentioned; this means including a horizontal rod 25, a plurality of hinge links 26 connecting said rod and the form 17 at and high up on the back wall thereof, and a plurality of hinge links 27 connecting said rod and the form 18 at and high up on the back wall thereof. As here shown, particularly in Fig. 4, four of the links 26 are present, and also four of the links 27.

The links 26 and 27 are all loosely pivotally in engagement with the rod 25; and, to describe now the pivotal mountings of the links 26 relative to the form 17, each of said links 26 is thus mounted on a pivot pin 28 suitably carried by a pair of brackets 29 fixedly carried, as by the aid of welding as at 30 in Fig. 7, by the back wall 17^a of the form 17. As shown in Fig. 4, elements similar to the elements 28 and 29 are carried by the back wall of the form 18, for pivotal connection.

tion to said wall of the links 27. Also as shown in Fig. 4, spacing sleeves 31 are desirably carried by the rod 25.

Reverting to the stiffener rib 19, and it being recalled that this rib and also the ribs 20, 21, 22, 23 and 24 are all of angle-iron shape, it is further to be noted that the construction and manner of attachment of all these ribs are the same. Therefore, it will suffice to describe further in detail merely the rib 19; and with particular reference now to Figs. 5 and 6, it will be observed that the rib 19 is placed so that one of its flanges is horizontal and the other thereof is vertically dependent and that said horizontal flange along its edge laid against and around the form 17 is at intervals welded to the form, as indicated at 32. To permit square bending of the rib around the corners established by the meeting lines of the back wall 17^a and the side walls of the form 17, the said horizontal flange, after being suitably notched out at the locus of any such bending, and then bent as shown in Fig. 6, is welded along the line 32.

The special instrumentality already mentioned, and called the cam means, includes, also as already stated, directly acting pivotally mounted members, called the cams; and this means is provided for manual actuation, either to maintain spread apart the back walls of the two forms 17 and 18 as in Fig. 1, or to condition these forms for becoming drawn together as in Fig. 2 incidental to upward pull from the hook 45 or an equivalent.

Most desirably, there are a plurality of upper cams and also a plurality of lower cams. As illustrated herein, three upper cams 34 are provided, with these all alike and all carried by the form 17 adjacent to its back wall 17^a. These cams 34 when swung up as in Fig. 2 are positioned as indicated in broken lines at 34^a in Fig. 3. In order that all three cams 34 will move in unison, they are all alignedly welded to a rod 35; and adjacent to each of said cams the rod 35 rotatively passes through a pair of journaling brackets 36 all welded to said back wall 17^a. For fractionally rotating said rod in one direction or the other, to throw the cams 34 either to the positions shown in Fig. 1 or to the positions shown in Fig. 2, either of a pair of actuating arms 37 may be manually used. These arms are welded to the outer ends of the rod 35, and so placed that one of the arms is at either side of the form 17. Stops for limiting swing of said arms may be provided as indicated at 38.

Also as illustrated, three lower cams 39 are provided, with these all alike and all also carried by the form 17 adjacent to its back wall 17^a. The cams 39 are substantially of the same shape as the cams 34, except that, as will be noted, the cams 39 at their maximum dimension are longer than the cams 34 at their maximum dimension, so that when all six cams are extended as in Fig. 1, the space between the back walls of the forms 17 and 18 will be tapered upwardly, as somewhat exaggeratedly illustrated in that view. The mountings of the cams 39, and the nature of the parts associated with these cams, are, however, precisely as described in connection with the cams 34; it being noted that the rod 40 corresponds to the rod 35, the brackets 41 correspond to the brackets 36, and the parts 42 and 43 correspond respectively to the parts 37 and 38, with the arms 42 and the cams 39 all welded to the rod 40 and the brackets 41 all welded to the back wall 17^a of the form 17.

Thus, as will now be understood, when tension is off the hook 45, following full lowering of the appliance 16 and preparatory setting of the cams 34 and 39 to the positions shown in Fig. 1, the bottom edges of the forms 17 and 18 will be free to conform themselves to varying slopes of the tunnel car decks, due to the link action provided by the hinging means including the elements 25, 26 and 27. When, however, the hacking is completed, the 7" flue is absolutely certainly established, yet quick and safe removal of the appliance 16 is always insured, without disturbance of any part of the brick units 47 and 48, when, preparatory to upward pull by the hook 45, the cams 34 and 39 are set to the positions shown in Fig. 2.

It is to be understood that any means, such, for instance, as a means incorporating a knuckle-joint or bell-crank structure, and actuable to function in a manner to give a cam motion corresponding to that afforded by the cams 34 and 39, is within the invention.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. An appliance for use as described in connection with a tunnel kiln car, comprising a pair of brick unit forms having adjacent back walls, coupling means for hingedly connecting said forms back to back and near their upper ends, said means including a horizontal rod extended parallel to said back walls above the top edges thereof and a plurality of links all pivotally connected to said rod near their upper ends, near their lower ends some of said links being pivotally connected to the top edge of the back wall of one form and others pivotally connected to the top edge of the back wall of the other form, and manually actuable means between said back walls below their top edges and operable to perform a cam motion thereby to hold the backs of said forms to a predetermined maximum spacing so that such spacing may be maintained during building of a pair of brick units in said forms while they rest on the deck of said car, said links being of such lengths and so rotatively connected to said rod and also to said forms that incidental to a lowering of the appliance to the top of said car thereby to relieve tension on said links the bottoms of the forms are free to conform themselves to the slope peculiar to the deck of said car.

2. An appliance for use as described in connection with a tunnel kiln car, comprising a pair of brick unit forms, coupling means for hingedly connecting said forms back to back and near their upper ends, said means including a horizontal rod and a plurality of links all pivotally connected to said rod near their upper ends, near their lower ends some of said links being pivotally connected to one form and others pivotally connected to the other form, and manually actuable means operable to perform a cam motion thereby to hold the backs of said forms to a predetermined maximum spacing so that such spacing may be maintained during building of a pair of brick units in said forms while they rest on the deck of said car, the means last-named in-

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cluding a plurality of horizontally spaced cams.

3. An appliance for use as described in connection with a tunnel kiln car, comprising a pair of brick unit forms, coupling means for hingedly connecting said forms back to back and near their upper ends, said means including a horizontal rod and a plurality of links all pivotally connected to said rod near their upper ends, near lower ends some of said links being pivotally connected to one form and others pivotally connected to the other form, and manually actuable means operable to perform a cam motion thereby to hold the backs of said forms to a predetermined maximum spacing so that such spacing may be maintained during building of a pair of brick units in said forms while they rest on the deck of said car, the means last-named including a plurality of horizontally spaced cams arranged in vertically spaced groups.

4. An appliance for use as described in connection with a tunnel kiln car, comprising a pair of brick unit forms, coupling means for hingedly connecting said forms back to back and near their upper ends, said means including a horizontal rod and a plurality of links all pivotally connected to said rod near their upper ends, near their lower ends some of said links being pivotally connected to one form and others pivotally connected to the other form, and manually actuable means operable to perform a cam motion thereby to hold the backs of said forms to a predetermined maximum spacing so that such spacing may be maintained during building of a pair of brick units in said forms while they rest on the deck of said car, the means last-named including a plurality of horizontally spaced cams

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arranged in vertically spaced groups, the lower cams being of greater working length than the upper cams.

5. An appliance for use as described in connection with a tunnel kiln car, comprising a pair of brick unit forms, coupling means for hingedly connecting said forms back to back and near their upper ends, said means including a horizontal rod and a plurality of links all pivotally connected to said rod near their upper ends, near their lower ends some of said links being pivotally connected to one form and others pivotally connected to the other form, and manually actuable means operable to perform a cam motion thereby to hold the backs of said forms to a predetermined maximum spacing so that such spacing may be maintained during building of a pair of brick units in said forms while they rest on the deck of said car, the means last-named including a plurality of horizontally spaced cams arranged in vertically spaced groups, the lower cams being of greater working length than the upper cams, each of said forms including a back wall and a pair of side walls and being open at its bottom and also between said side walls all along the heights thereof at the limits thereof remote from the back wall.

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The following references are of record in the file of this patent:

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