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W. P. ISRAEL.
APPARATUS FOR HANDLING BRICKS, &c.
APPLICATION FILED APR. 29, 1904.

2 SHEETS—SHEET 1.

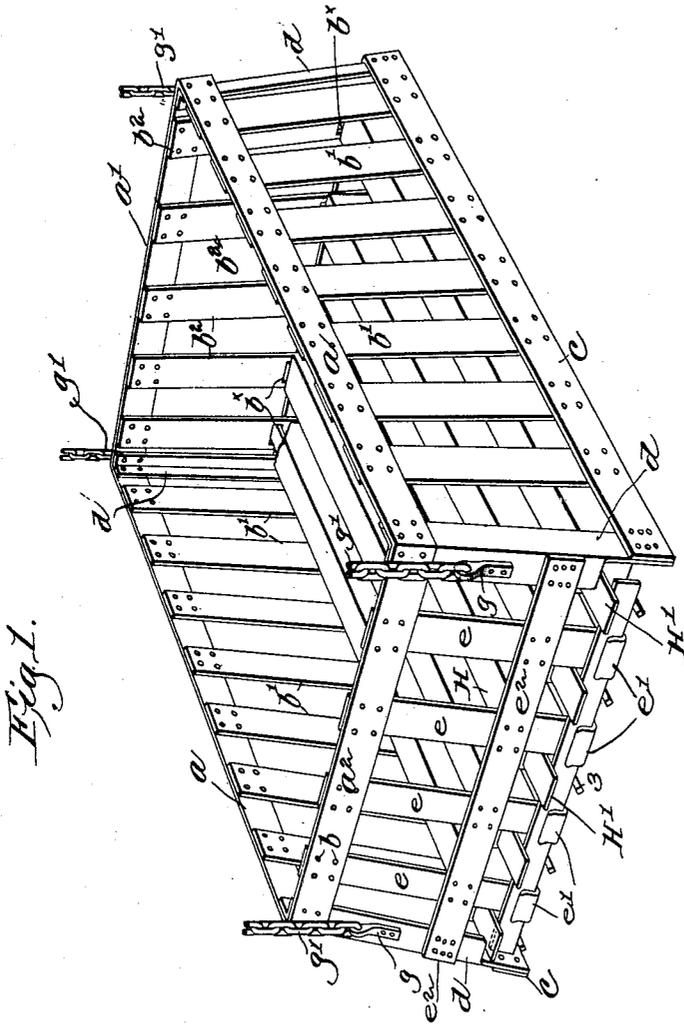


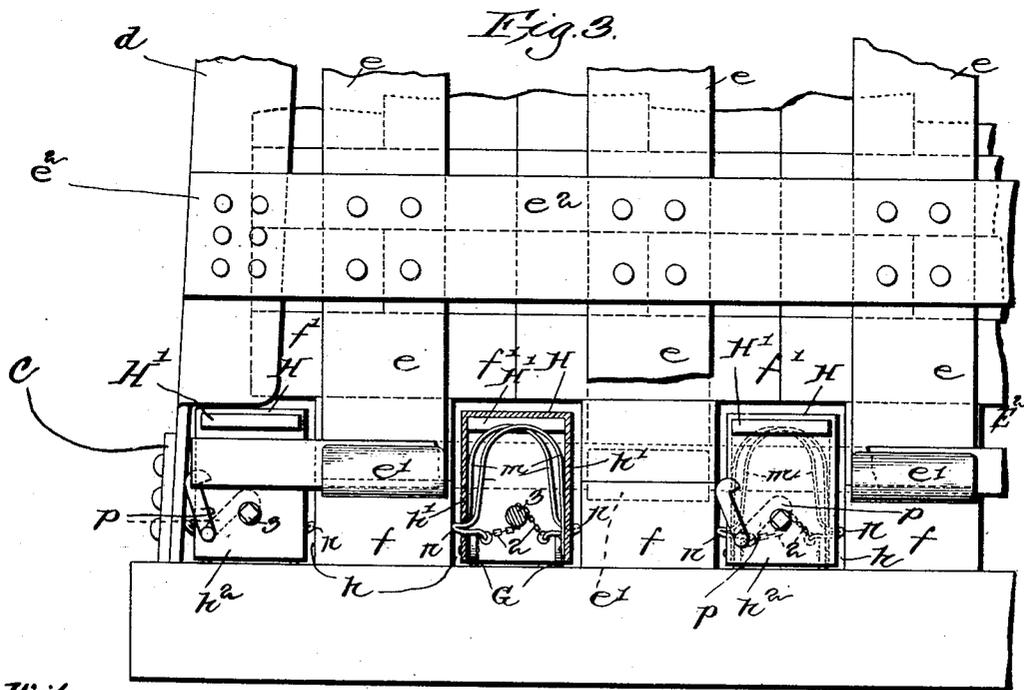
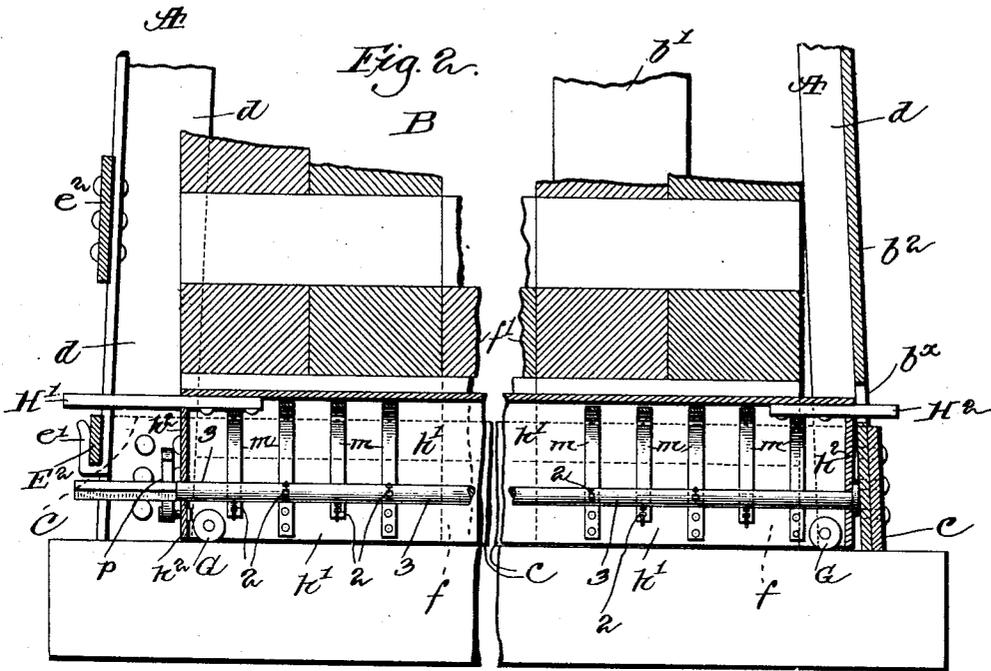
Fig. 1.

Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM P. ISRAEL, OF PORTSMOUTH, NEW HAMPSHIRE.

APPARATUS FOR HANDLING BRICKS, &c.

SPECIFICATION forming part of Letters Patent No. 782,853, dated February 21, 1905.

Application filed April 29, 1904. Serial No. 205,520.

To all whom it may concern:

Be it known that I, WILLIAM P. ISRAEL, a citizen of the United States, residing at Portsmouth, in the county of Rockingham and State of New Hampshire, have invented an Improvement in Apparatus for Handling Bricks, &c., of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

Bricks when removed from the kiln as now commonly practiced are tossed about four at a time from man to man, generally two or four men, on their way to a man stationed at a wheelbarrow, and when about eighty bricks have been piled on a wheelbarrow the load is wheeled to a storage-point, either a wharf or railway-station, where the bricks are piled awaiting shipment. Sometimes at a wharf, a vessel being in waiting, the wheelbarrows are wheeled onto the deck, and the bricks, if to be carried on deck, are picked off the wheelbarrow and piled on the deck, but if to go into the hold of the vessel usually ten bricks are deposited on a board, which is then slid into the hold on a plank, and said boards are taken one after the other by men in the hold and the bricks are carried to different parts of the hold, where they are piled in rotation. When removing bricks from the hold, the bricks are picked up several at a time and placed on other boards like those used when applying the bricks in the hold, and the boards, with the bricks thereon, are passed out of the hold of the vessel from stage to stage, a number of men being necessary, and finally they are delivered off the vessel to the "cap of the wharf." In this way of handling bricks very much manual labor is involved, the process is slow, many bricks are broken or chipped by careless handling, and the speed of loading and unloading is further hindered by the fact that it is customary to count the bricks, and in counting bricks in this way grave errors are liable to occur.

I have aimed to save not only time, but also expense in labor of handling bricks and to prevent loss of bricks due to careless handling, and at the same time I am enabled to

count them accurately, thus avoiding any errors as to quantity.

In accordance with my improved method, which preferably commences at the kiln and ends at the point of destination of the bricks, I have provided an apparatus comprising, as I have herein chosen to illustrate my invention in one of the best forms now known to me, a cage that may be lowered about the pile of bricks to be handled *en masse*—as, for instance, a thousand or more instead of eighty, as by the wheelbarrow plan referred to. The bricks are so piled as to leave a series of through-spaces at the bottom of the pile and extending from one to the opposite end thereof. In these spaces I insert a series of lifting-bars, which are coupled, locked, or connected in any suitable manner to the cage after the latter has been lowered over the pile of brick—as, for instance, by a locking device, shown as a cross-bar, sustained from the end of the cage and coacting with tongues or projections at the ends of the lifting-bars, so that when the cage is lifted the cross-bar will engage the tongues of the lifting-bars and lift the same to contact with the lowermost full layer of bricks at the bottom of the pile, raise the bricks *en masse*, and retain the lifting-bars within the cage while the cage is being taken to any point where the bricks are to be deposited.

When piling bricks to be handled *en masse*, as herein provided for, I first lay parallel rows of foundation-bricks, preferably with their flat sides down, making each row two bricks deep, the length of the bricks being preferably in the direction of the length of the pile to be built. The rows of foundation-bricks are separated one from the other for a distance about half the length of each brick—say four inches, more or less. On these foundation-bricks I lay as many layers of brick as are required for the size of the pile, and the bricks of these layers will rest on the foundation-bricks across the space between the parallel rows of said foundation-bricks. The second layer of bricks will be laid, preferably, at right angles to the first layer, and so on. The lifting-bars have combined with them means

for engaging and picking up the foundation-bricks of the pile.

The apparatus herein to be described may be employed to transfer a pile of bricks from the point where they are made or first piled onto a car or the cap of a wharf or from the cap of a wharf or a car onto a vessel or from a vessel onto the cap of a wharf, a car, a cart, or other vehicle employed for transporting the bricks to the point where they are to be used.

By means of the apparatus herein to be described it is possible to handle bricks in piles of a thousand and upward at one operation and without danger of breaking the same, and consequently very much time is saved in loading and unloading, wharf charges, &c.

Figure 1, in perspective, shows one of my cages and lifting-bars free of bricks. Fig. 2 is a much enlarged sectional view in the line x , Fig. 3, with part of the cage, the lifting-bar, and pile of brick broken out crosswise the length of the pile, the lifting-bar, shown in longitudinal section, being illustrated as having been inserted into a space at the bottom of the pile of brick and the cross-bar about ready to contact with the lifting-bars preparatory to starting the cage in its upward movement. Fig. 3 is a detail showing part of the front end of the cage and parts of a cross-bar and three lifting-bars, two in end view and one in cross-section.

In the drawings, A represents a cage, which may be of sheet metal or of any strong material shaped to present side and end walls to embrace a pile B of bricks. The cage shown comprises a bar bent to form the sides a and ends a' . The sides a and rear end a' of the bar have connected thereto by suitable rivets a series of depending bars b' . The lower ends of the bars b' are connected by a bar c , the ends of which are riveted to the angle-iron corners d of the cage. The bar c constitutes the foot of the cage and when the cage devoid of the lifting-bars is lowered over the pile of brick to be taken up by the cage contacts with whatever supports the foundation-bricks of the pile. The depending bars b' stand in line with the spaces between the foundation-bricks f and at points about opposite the under side of the lowermost layer f' of bricks of the pile. Said bars b' have openings b^x . The front end a^2 of the top part of the cage has a connected series of depending bars e , represented as presenting upturned hooks e' . Preferably the bars e are connected together and to the angle-iron corners by a strong metallic cleat e^2 . The hooks are shown as occupying a position in line with rows of foundation-bricks f . The opposite ends of the cage have connected with them at suitable points in any desired manner eyes g , to which may be joined chains, ropes, or cables g' or any suitable means for lifting the cage, I prefer-

ably employing chains g' for strength, the chains being led upwardly above the center of the cage and connected in any suitable manner with any hoisting mechanism commonly used for hoisting heavy loads.

When piling the bricks to be handled *en masse*, I first lay a series of parallel rows of bricks, as f , preferably two high or one on top of the other, at suitable distances apart to leave spaces h , in which may be inserted at the desired times the lifting-bars H to be described. Having laid the series of "foundation-bricks" f , as I shall designate them, I then lay thereupon a series of bricks f' , they being laid crosswise on the foundation-bricks, and thereafter row after row of bricks are laid, preferably at right angles to each other or in any other suitable manner, until the pile of bricks is of the desired height. Having laid the pile of the desired size, I lower the cage over the pile of bricks, and in so doing the hooks e' descend below the uppermost bricks f of the foundation-rows, as in Fig. 3, at opposite sides of the spaces h . I then insert in the spaces h the lifting-bars H. These bars, as I have herein chosen to illustrate them, are supposed to be made of sheet metal bent to present a top, two sides h' , and two end walls h^2 . The end walls h^2 have slots to receive each the ends of tongues H' H^2 , each of said tongues being suitably connected with the bar, as by rivets, said tongues being extended beyond the ends of said bars for such distances that when the bars are in working position in the spaces h the ends of the tongues project outside the cage, as shown in Fig. 2. The depth and width of the lifting-bars H is less than the depth and width of the spaces h . When the lifting-bars are inserted in the spaces h , the cage having been lowered about the pile of bricks, the tongue H^2 , projecting from the leading end of the bar, is made to enter easily a hole b^x , the end of the bar abutting, or substantially so, the inner side of the cage and leaving the end of the tongue H' , as shown in Fig. 2, the under side of said tongue not contacting, however, with the lower end of the hole b^x . Thereafter I cause the tongues H' to be engaged by a suitable cross-bar E, sustained by the end of the cage, said cross-bar being laid in the hooks at the front of the cage under the tongues H' , extending from the ends of the lifting-bars. This cross-bar not only serves to finally couple the lifting-bars in their operative relation to the cage, but also prevents any longitudinal movement of said lifting-bars in said cage, it being possible to remove the lifting-bars from the cage only after the removal of the independent cross-bar. In this condition the tops or upper sides of the lifting-bars are out of contact with the lower sides of the bricks of the pile, the tongues H^2 are a little below the top walls of the openings b^x , and the cross-bar E occupies a po-

sition out of contact with the under sides of the tongues H'. The under sides of the lifting-bars will preferably have a series of antifric-tion-rollers G, which will roll over whatever foundation the bricks are piled upon. The cage is shown as having its wall tapered out-wardly from its top toward its bottom, such form of cage being very desirable, as it enables the open bottom of the cage to be applied more readily to the top of the pile of bricks, thus greatly facilitating the applica-tion of the cage to the pile of bricks. When the cage is hoisted, the lower end walls of the openings b^x and the cross-bar meet the under sides of the tongues H' H² of and start up-wardly the lifting-bars with the cage, caus-ing the upper or top sides of said bars to contact with the under sides of the bricks f' of the pile. I have provided the lifting-bars with a series of grabs or lifting devices, shown as springs m, suitably connected with the bars and having outturned ends n. The extremi-ties of these grabs have each connected with them suitable chains 2, that are led to a shaft 3, suitably sustained by the ends h² of the lifting-bars, said chains being so connected with said shaft that when the latter is turned in one direction the chains will be wound thereon to retract the projecting portions n of the grabs within the side walls h' suffi-ciently to prevent them from engaging the bricks, such portions being normally held re-tracted and the chains wound on the shafts by means of a locking-catch p, it at such time occupying its dotted-line position, said catch when locking the shaft engaging the squared end thereof. This shaft may be turned by the application to the squared front end thereof of any usual wrench. After the lift-ing-bars have been inserted in the spaces under the pile the operator will turn back the locking-catches from their dotted into their full line position, and immediately the spring-grabs will be thrown outwardly, as indicated in Fig. 3, and grab the sides of the lower-most foundation-bricks f. These grabs are located sufficiently close together so that prefer-ably each lower brick of the foundation-tier will be acted upon by four grabs, two at each edge, the grabs as the cage is lifted firmly en-gaging the foundation-bricks and lifting them in unison with the pile of bricks after the up-per sides of the lifting-bars shall have come in contact with the lower sides of the bottom layer of bricks of the pile. By using these grabs, as is preferable, all the bricks laid in the pile and counted may be removed. The outturned ends of the outermost grabs of the lifting-bars nearest the sides of the cage contact with the cage, as shown at the left, Fig. 3, while the lifting-bars are raised to contact with the bricks f'.

The cage may be of any desired dimensions, according to the number of bricks it is de-

sired to handle at one time and the strength of the hoisting apparatus used.

This invention is not limited to the particu-lar shape of the lifting-bars, as I consider within the scope of my invention any form of lifting-bar that may be inserted under a pile of bricks and be engaged with the cage, so that when the cage is lifted the bars will be moved with the cage and the bars contact after the cage is started with the pile of bricks to be lifted.

I believe that I am the first to devise a sys-tem such as described for handling *en masse* bricks or other articles capable of being piled and handled as described and keeping them *en masse*.

It will be readily understood that a great saving may be made by laying a mass of bricks or other articles in a pile and handling the pile at one operation, and this is especially of great advantage in handling bricks, as they may be kept in pile form from the first piling after leaving the kiln to the point where the piles are delivered on a wharf or whatever may be used to convey the bricks in piles to the point where they are to be used, or, in other words, the bricks can go with one piling from the kiln to the job.

Whereas for the greatest effectiveness it will be apparent that the first piling of the bricks in large masses should be at the kiln and that the piled bricks be delivered in piled condition at their point of destination, yet my invention would possess great utility even were the first actual piling of the bricks to take place at the cap of the wharf previous to lowering the cage about the pile prepara-tory to lowering the cage and brick into the hold.

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

1. In apparatus for handling bricks and the like in a pile, a cage adapted to surround the pile to be moved, means connected with said cage at its corners to be engaged to lift the cage and prevent the same from being tipped, a series of lifting-bars adapted to be passed at intervals under the pile to be lifted, said bars having a tongue to enter freely spaces in said cage, said cage after it has been started up-wardly meeting said tongues and taking with it the lifting-bars, causing the latter in their rising movement to contact with and lift the pile.

2. In apparatus for handling bricks and the like in a pile, a cage adapted to surround a pile of bricks to be moved, a series of lifting-bars having tongues at their opposite ends and adapted to be passed under the pile at intervals, means sustained by said cage and in-dependent of said lifting-bars to couple said lifting-bars to said cage and prevent longitu-dinal movement of said lifting-bars in said

cage, said cage when lifted meeting the bars and causing the same to be started upwardly to contact with the bricks of and lift the pile to follow with the cage.

5 3. In apparatus for handling bricks and the like *en masse*, a cage tapered interiorly that it may be readily lowered over a pile of bricks, a series of lifting-bars adapted to be passed under the pile of bricks at intervals and to be
10 engaged and lifted by said cage when the latter is raised, the cage as it is started upwardly causing the lifting-bars to contact with the pile of brick and take the pile with the cage.

4. In apparatus for handling bricks and the
15 like, a cage to be lowered over a pile of bricks, a series of Π -shaped, sheet-metal lifting-bars adapted to be inserted in spaces at the bottom of the pile, and means to connect the opposite
20 ends of said lifting-bars with the cage preparatory to lifting the latter, the bars contacting with the pile of bricks after the cage is started upwardly, the bars lifting the pile of bricks and retaining them in the cage as
25 the position of the cage is changed from one point to another.

5. In an apparatus for handling bricks, a cage having at one end a series of openings and at its other end a series of hooks, a series
30 of lifting-bars adapted to be inserted in spaces at the base of a pile, and a locking device, the latter insuring the retention of the lifting-bars in the cage that they may contact with and lift the pile of bricks with the cage.

6. In apparatus for handling brick, a cage,
35 a series of lifting-bars adapted to be connected with the cage after the latter has been lowered over a pile of brick, and means carried

by said bars to engage the foundation-bricks of the pile that they may be taken with the bricks of the pile when the cage is moved
40 from one spot to another.

7. In apparatus of the class described, a series of lifting-bars having grabs, means acting normally to retain said grabs in their in-
45 operative position, said grabs when released meeting and firmly engaging the foundation-bricks of a pile.

8. In apparatus of the class described, a cage, a series of lifting-bars adapted to be connected therewith and to be inserted in spaces
50 at the bottom of a pile of bricks, said lifting-bars having rollers to roll over the bed sustaining the pile of bricks as the lifting-bars are being put in operative position in said
55 cage.

9. In apparatus of the class described, a cage having at one end a series of holes and at its opposite end a series of hooks, the holes and hooks being out of line, a series of lifting-
60 bars having tongues at both ends, the tongue at one end of said bars entering said holes, and a cross-bar sustained by said hooks and crossing under the tongues at one end of said lifting-bar, said cross-bar crossing the
65 outer ends of said lifting-bar and preventing the latter from being removed from the cage until after the removal of the cross-bar.

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

WILLIAM P. ISRAEL.

Witnesses:

GEO. W. GREGORY,
EDITH M. STODDARD.