July 6, 1943. R. A. FONTAINE 2,323,810

BRICK GRAB

Filed Aug. 7, 1941 4 Sheets-Sheet 1

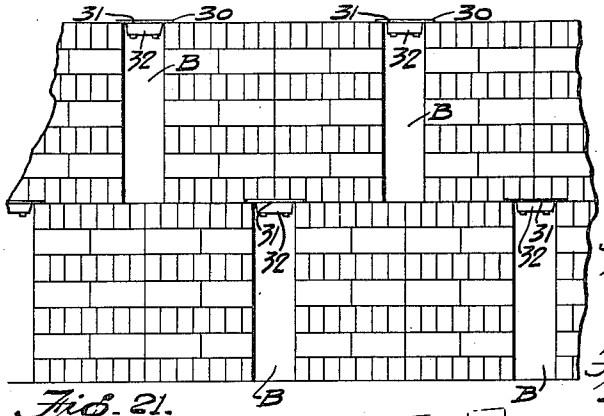


Fig. 21.

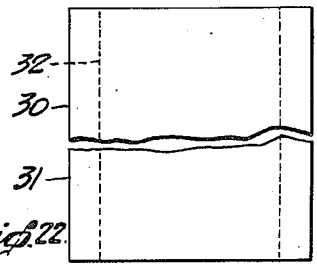


Fig. 22.

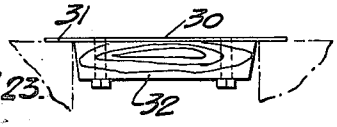


Fig. 23.

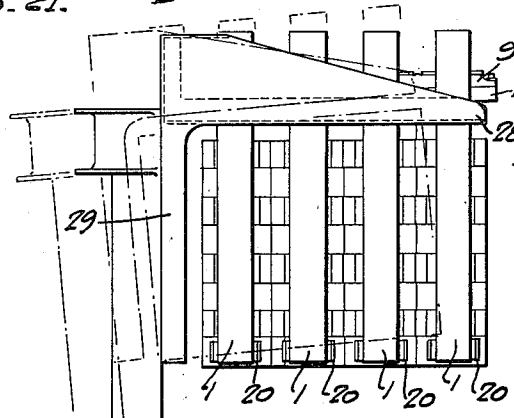


Fig. 1.

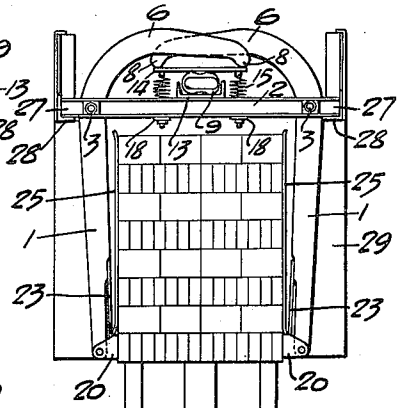
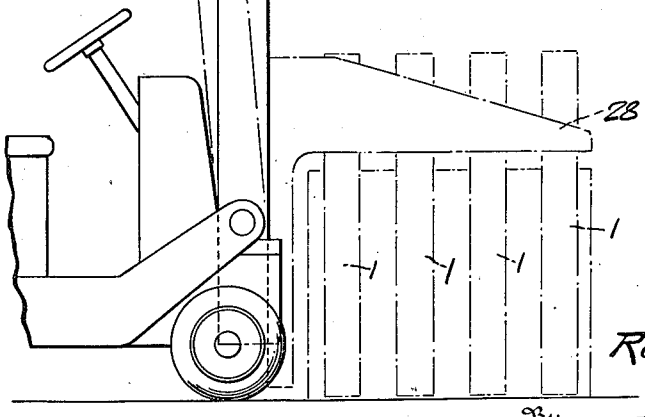


Fig. 2.



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Fig. 3.

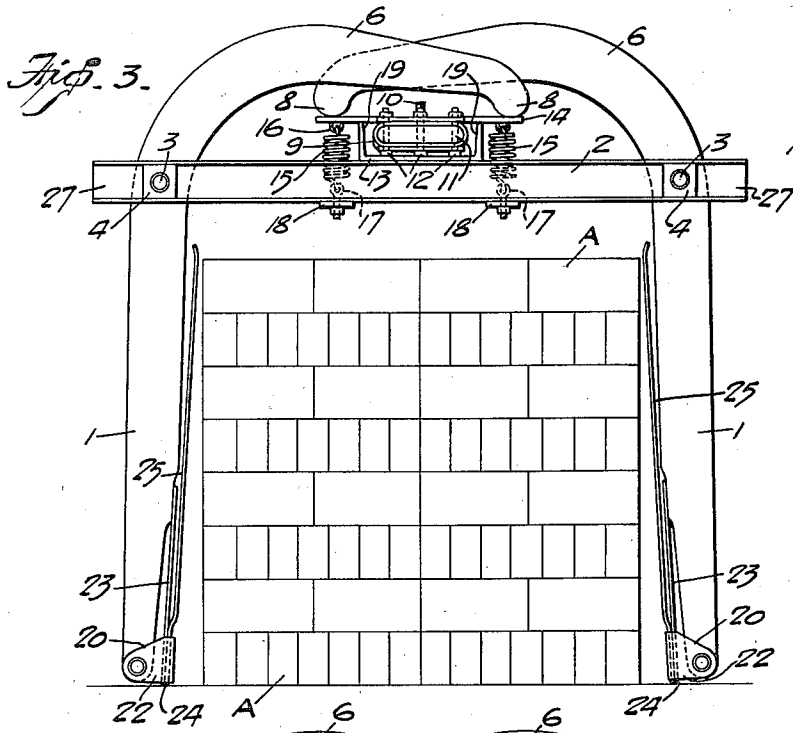


Fig. 10.

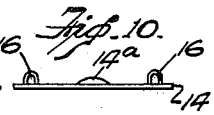


Fig. 11.

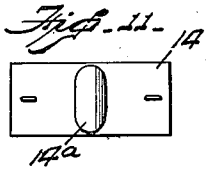


Fig. 7.

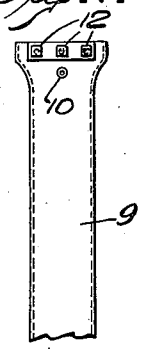


Fig. 4.

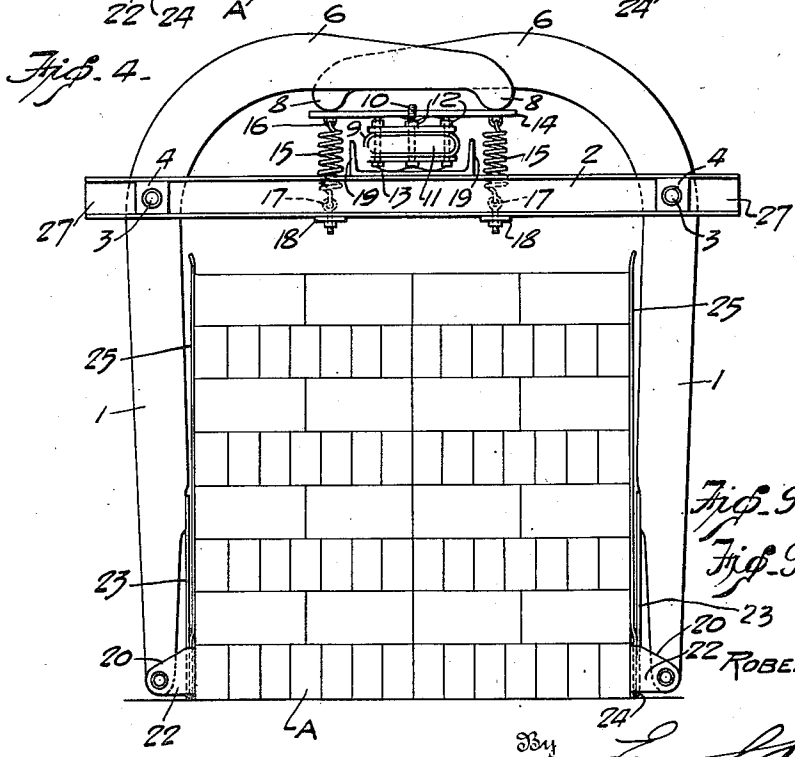


Fig. 8.



Fig. 9.

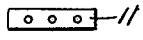
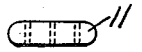


Fig. 9a.



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BRICK GRAB

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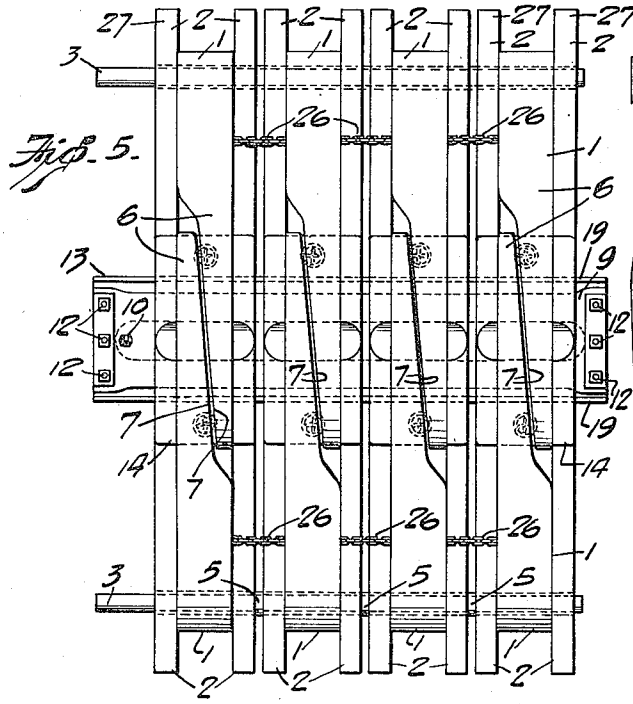


Fig. 5.

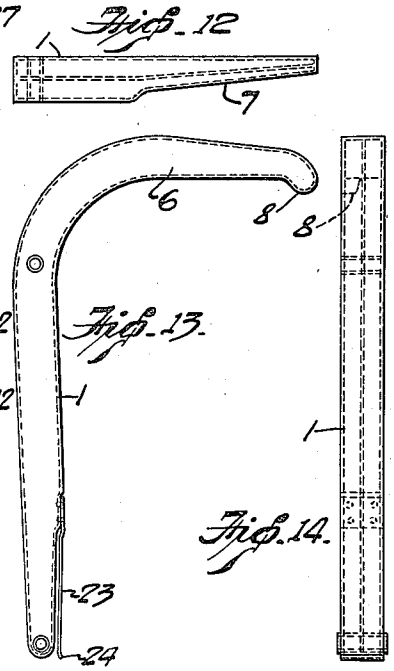


Fig. 12.

Fig. 13.

Fig. 14.

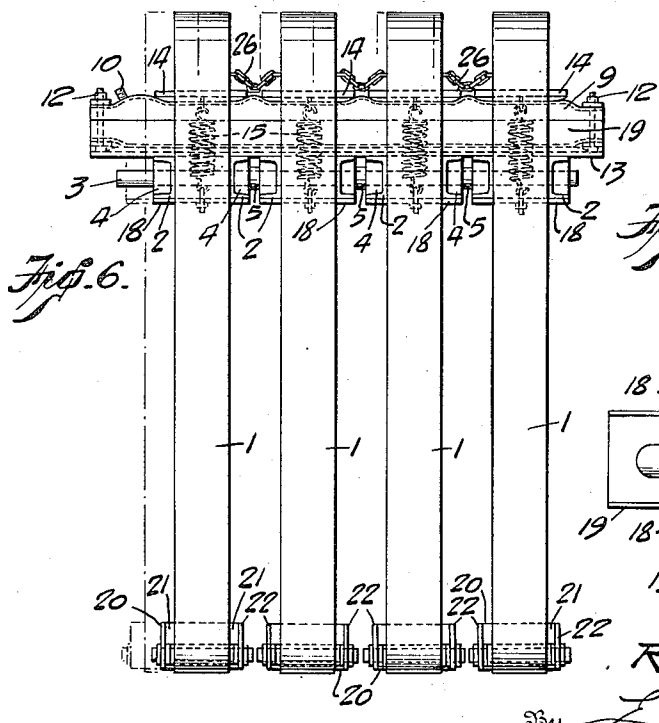


Fig. 6.

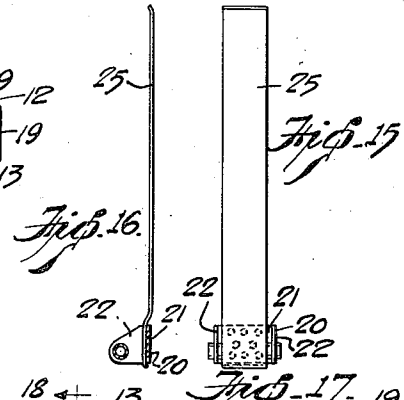


Fig. 15.

Fig. 16.

Fig. 17.

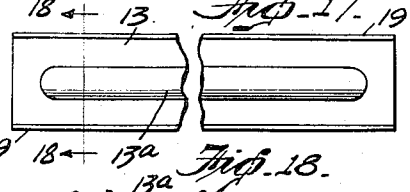


Fig. 18.

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BRICK GRAB

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Fig. 20.

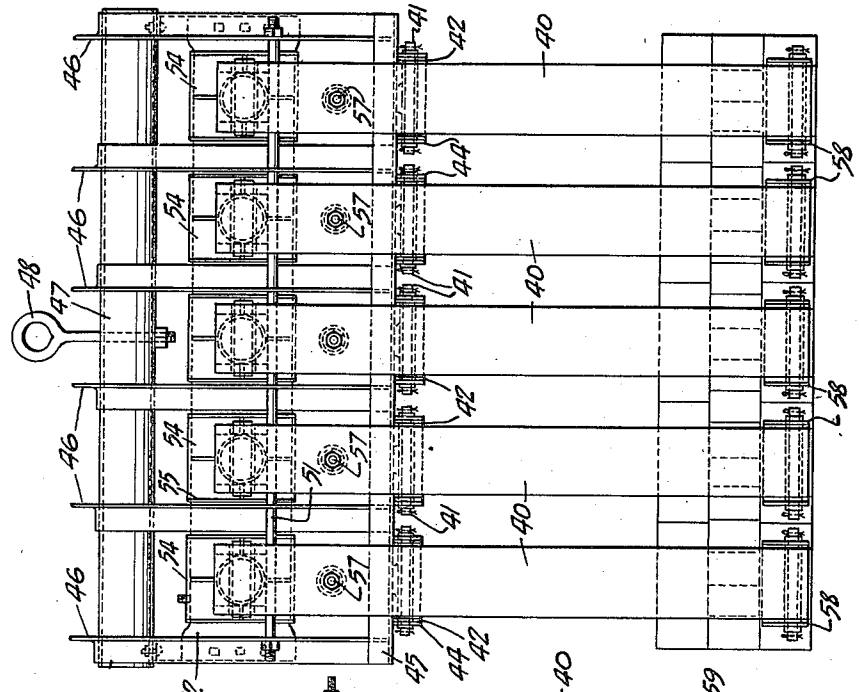
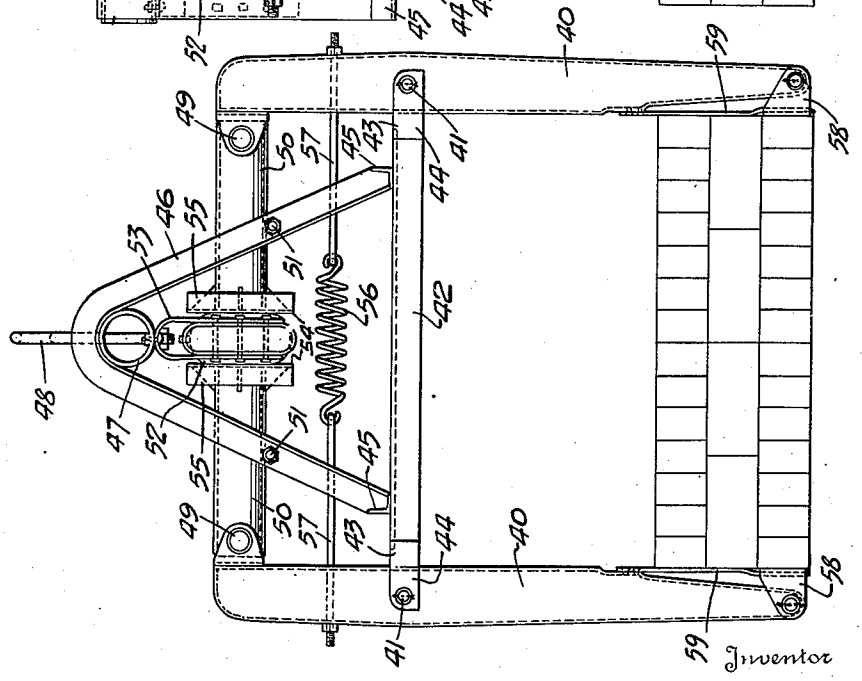


Fig. 19.



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Patented July 6, 1943 2,323,810

UNITED STATES PATENT OFFICE

2,323,810

BRICK GRAB

Robert A. Fontaine, Martinsville, Va.

Application August 7, 1941, Serial No. 405,859

19 Claims. (Cl. 214—65.2)

My invention relates to grabs for lifting and transporting stacks or ricks of bricks.

The principal object of the invention is to provide a simple brick grab whereby each bottom row or course of bricks in a stack may be individually gripped with substantially uniform pressure.

Another object of the invention is to provide a brick grab which may be readily lifted and transported independently of the mechanism by which the brick engaging members of the grab are operated.

A further object of the invention is to provide a brick grab which may be easily and quickly operated by fluid pressure.

Advantageous features of the invention residing in forms, combinations and relations of parts will hereinafter appear in the specification and be specifically pointed out in the claims.

In the drawings, illustrating preferred embodiments of the invention,

Figure 1 is a side elevational view showing one form of the brick grab supported in an elevated position by an industrial truck.

Figure 2 is a front elevational view of the grab and truck illustrated in Figure 1.

Figure 3 is an enlarged front elevational view of the form of grab illustrated in Figures 1 and 2 straddling a stack of bricks, the grab arms or tongs being shown in open or released position.

Figure 4 is a view similar to Figure 3 showing the grab arms or tongs in closed or brick engaging position.

Figures 5 and 6 are respectively plan and side views of the grab shown in Figures 1 to 4, inclusive.

Figure 7 is a fragmentary plan view of the fluid pressure expansible member of the grab shown in Figures 1 to 6, inclusive.

Figure 8 is a detail transverse sectional view of the expansible member shown in Figure 7.

Figure 9 and Figure 9a illustrate plan and side views respectively of blocks which are placed within opposite ends of the expansible member shown in Figure 7.

Figure 10 is a side elevational view of one of the plates which is interposed between the expansible member and the inner end of the grab arms or tongs.

Figure 11 is an under side view of the plate shown in Figure 10.

Figure 12 is a plan view of one of the grab arms or tongs.

Figure 13 is a side elevational view of one of the grab arms or tongs.

Figure 14 is an outside elevational view of one of the grab arms or tongs.

Figure 15 is a front view of one of the brick engaging plate spring members of the grab.

Figure 16 is a side elevational view of the construction illustrated in Figure 15.

Figure 17 is a plan view of the channel member for supporting the expansible member of the grab arm.

Figure 18 is a sectional view taken on line 18—18 of Figure 17.

Figure 19 is an end elevational view of another form of brick grab embodying the invention.

Figure 20 is a side elevational view of the grab shown in Figure 19.

Figure 21 is an end elevational view of a plurality of stacks of bricks showing one way in which the stacks handled by the grabs may be piled on top of each other.

Figure 22 is a plan view of one of the members shown in Figure 21 for tying together adjacent stacks of bricks.

Figure 23 is an end elevational view of the member shown in Figure 22.

Referring more particularly to the form of the invention shown in Figures 1 to 18, inclusive, illustrating a grab for use with an industrial truck, 1 indicates a plurality of pairs of arms or tongs which are arranged in alignment one behind the other. Although the grab is only shown with four pairs of arms, it is obvious that a greater or less number of pairs may be provided as desired, depending upon the number of rows of bricks in the stack to be handled. However, a stack consisting of four superimposed rows of bricks has been found to be most easily handled and it is for this reason that the grab as shown is provided with four pairs of arms, one pair for each of the four bottom rows of bricks.

Each arm of each pair is pivotally mounted intermediate its ends on a supporting frame which may advantageously consist of a plurality of pairs of opposed channel members 2 and two parallel rods 3 arranged adjacent opposite ends of the channel members 2, preferably extending therethrough. Each pair of arms 1 is interposed between each pair of channel members 2 and the rods 3 conveniently afford pivotal supports for the arms. Where the rods extend through the channels, suitable filler blocks 4 are preferably placed within the channels and ferrules or thimbles 5 encircle the rods between each pair of channels and by engaging the filler blocks 4 they maintain suitable spaces between the channels and, therefore, the arms 1.

The upper ends of the arms 1 of each pair have inwardly extending portions 6, the inner ends of which are arranged in vertical lapping relation. Where the arms overlap each other, they are of reduced width and the contiguous faces of the arms of each pair are preferably inclined as indicated at 7. The inwardly extending portion 6 of the arms preferably terminate in downwardly offset portions 8 to provide protuberances for engagement by the means whereby the arms are moved to closed position.

The means for actuating the arms preferably comprises an expansible tubular member 9 which may be conveniently formed of rubber or any other flexible air impervious material. The tubular member is provided with a suitable connection 10 whereby fluid under pressure may be admitted to it and released from it. The ends of the tube may be conveniently sealed by rubber blocks 11 which are inserted within the tube and may be advantageously secured thereto by bolts 12. The tube is preferably disposed within and supported by a channel 13 which extends transversely above the channels 4, being rigidly secured, as by welding or the like, to one pair of those channels. Interposed between the tube 9 and the inner ends 8 of each pair of arms 1 is a plate 14 which is movable upwardly when fluid under pressure is admitted to tube 9 to cause the arms 1 to move in opposite directions into brick engaging positions, as shown in Figure 4. The plates 14 may advantageously be formed with depressions 14a and channel 13 may be similarly provided with an upwardly projecting portion 13a so that extended areas of the tube 9 will engage these coacting parts of the device.

To insure that the plates 14 will quickly return to inoperative positions, corresponding to that shown in Figure 3, upon the release of fluid pressure from the tube 9 and thus enable the arms 1 to promptly move under the influence of gravity from engagement with the brick stack, coil springs 15 are preferably employed. These springs are connected at one end to eyes or the like 16 which may be conveniently formed on the under side of the plates 14 and at their opposite ends they are respectively connected by eye bolts 17 to plates 18 secured to the under sides of the channels 2. These springs are under some initial tension so that they normally restrain upward movement of the plates 14. It will thus be appreciated that immediately upon the release of the fluid pressure from the tubular member 9, the plates 14 will be drawn downwardly by the springs 15 to quickly expel the fluid from the tube 9 and thereby enable the arms 1 to promptly move from brick engaging position. The upper ends of the legs 19 of the channel 13 in which the tube 9 is disposed affords a support for the plates 14 and prevents them from moving downwardly sufficiently to pinch and thereby possibly rupture the tube 9.

As is clearly shown in the drawings, the arms 1 of each pair are adapted to depend downwardly on opposite sides of a stack of bricks designated A and pivotally mounted on the lower end of each arm is a brick cooperating shoe 20. Each of these shoes may advantageously be of substantially channel shape having a web portion 21 and rearwardly extending legs 22 which are pivotally connected in any suitable manner to the associated arm. Operatively interposed between each of the arms and its pivoted shoe is a spring 23 for maintaining the shoes in such positions that they will properly engage the intended bricks in the brick stack when the arms are moved to brick engaging position. The springs 23 are preferably in the form of plates and each is secured to the arms 1 by welding or the like and its lower end which is offset slightly, as indicated at 24, to afford a supporting ledge or shoulder extends downwardly through the shoe and exerts pressure against the inner face of the web 21 thereof.

Interposed between the lower end of the spring 24 and the web 21 of each shoe and secured to the latter by means such as welding is another plate spring member 25 which, upon movement of the arms into brick engaging position, are caused to engage and yieldably bear against the end bricks of each row of bricks in the stack superimposed on the bottom rows engaged by the shoes 20. By having yieldable members, such as the plate springs 25 carried by the pivotally mounted shoes 20, it will be apparent that, when the shoes are brought into engagement with the bottom rows of bricks, the bricks in the rows superimposed upon the bottom row will be firmly held in place.

To enable the grab to handle stacks of bricks composed of bricks of varying lengths, each pair of arms is shiftable relatively with respect to every other pair along the rods 3. In Figure 6, the dot and dash lines adjacent the upper portion of the figure represent the extreme positions the pairs of arms may assume with respect to each other, chains 26 being provided for limiting the extent of lateral shifting of the arms. It will thus be seen that the grab arms may be quickly adjusted so that the grab may be used in handling brick stacks respectively formed of bricks of different lengths.

To enable the grab to be easily lifted and transported from one location to another by an industrial truck, the ends of the channels 2 project beyond the adjacent portions of the arms 1 to form rigid extensions 27 which are easily adapted to be engaged by angularly shaped prongs 28 of a vertically movable fork 29 of an industrial truck similar to the type frequently used in handling stacks of bricks, the only difference between that type of truck and the one shown in the drawings being that the fork has been inverted so that, instead of the prongs being adjacent the ground when the fork of the truck is in its lowermost position so that they may extend beneath the pallet on which the bricks have heretofore been customarily stacked, the prongs are located sufficiently above the ground when the fork is in its lowermost position so as to be disposed just slightly below the extensions 27 of the channels 2 of the grab. With the prongs 28 arranged in this manner, they may be easily brought into cooperative engagement with the extensions 27 of the channels 2 of the supporting frame of the grab and the grab may, therefore, be easily lifted and transported from one location to another.

For the grab to handle stacks of bricks which are piled one on the other, suitable spaces must be left between adjoining stacks, as indicated by the letter B in Figure 21, into which the arms 1 of the grab may extend in order to engage each lower row of bricks in a stack. To enable the stacks to be piled continuously on one another without regard to the spaces between them, supporting members 30 may be conveniently employed. Each of the supporting members comprises a top plate member 31 which is wide enough to span the space between adjoining stacks and to overlap a substantial part of the adjacent top

bricks of adjoining stacks. Bolted or otherwise secured to the under side of plate 31 is a wooden board 32 which preferably extends for the entire length of the plate and serves to prevent lateral shifting of the plate as well as of the bricks overlapped by the plate. By employing supporting members of the type described, it will be appreciated that the stacks of bricks are effectively tied together and, in arranging one stack on another, no regard need be had for the manner in which one stack lines up with the one of which it is placed.

The form of brick grab illustrated in Figures 19 and 20 is provided with a plurality of pairs of grab arms or tongs 40, each of which is pivotally mounted intermediate its ends on a pin or the like 41 supported at its opposite ends in a pair of transversely extending members 42 which form a part of a supporting frame of the grab. Each of the members 42 is of generally angular shape, having horizontal and vertical flanges, but the horizontal flanges terminate inwardly of the ends of the member as indicated at 43 and the end portions of the vertical flanges may be conveniently reinforced by additional plates 44 welded to their outer face.

The horizontal flanges of each pair of members 42 project toward each other and they are each rigidly connected in any suitable manner to a pair of longitudinally extending angularly shaped members 45. Welded or otherwise secured to the angles 45 are a plurality of upwardly extending substantially V-shaped members 46 which straddle and are rigidly secured to a longitudinally extending tubular member 47. This tubular member affords a convenient means for the connection of an eye bolt or other suitable means whereby the grab may be lifted by an overhead crane and transported thereby from one location to another.

Pivotally connected as at 49 to the upper ends of each pair of arms 40 are a pair of inwardly extending links 50 which are supported in substantially horizontal positions by rods 51 carried by the V-shaped members 46. Interposed between the inner ends of the links 50 is an elongated expansible member 52, similar to the expansible tube 9 of the other form of grab heretofore described, which is adapted to simultaneously cause the lower ends of grab arms 40 to move toward each other into brick engaging position by forcing the upper ends of the arms apart.

The expansible member is preferably supported at its ends by U-shaped members 53 which are secured to and depend from the cylindrical member 47 of the frame. In order that a substantial portion of the links 50 will engage the expansible member 52, the inner end of each link is provided with a plate portion 54, the side edges of which are curved rearwardly, as indicated at 55, so as not to pinch the tube 52. Upon the release of fluid pressure from the expansible tube 52, the arms 40 are caused to move from brick engaging position by tension springs 56 which are connected by rods 57 to the arms above their pivot points 41.

The lower end of each arm 40 is provided with a brick cooperating shoe 58 of the same construction as the shoes 20 of the other form of grab and it is similarly maintained in brick cooperating position by a plate spring 59 like the spring 23 of the grab previously described.

From the foregoing, it will be readily perceived that a brick grab embodying my invention may be easily and quickly operated and transported with facility from one location to another. Various changes and modifications may be made in detail parts of the structure described without departing from the spirit and scope of the invention as defined in the appended claims.

What I claim is:

1. A brick grab comprising a supporting frame, a pair of grab arms pivotally mounted on said frame, fluid pressure means for moving said arms into brick engaging position, said arms being automatically movable from brick engaging position upon release of the fluid pressure from said fluid pressure operated means, and means independent of said fluid pressure operated means and connected with said frame whereby the grab may be lifted and transported from one location to another.

2. A brick grab comprising a supporting frame, a plurality of pairs of grab arms pivotally mounted on said frame, and mechanism including fluid pressure operated means for simultaneously actuating each pair of grab arms, said frame being provided with means independent of said mechanism for enabling the grab to be lifted and transported from one location to another.

3. A brick grab comprising a supporting frame having a plurality of transversely extending members, a plurality of pairs of grab arms pivotally connected intermediate their ends to said members, fluid pressure operated means for simultaneously closing said pairs of grab arms, and means independent of said fluid pressure operated means and connected with one or more of said transversely extending members enabling the grab to be lifted and transported from one location to another.

4. A brick grab comprising a supporting frame, a plurality of pairs of grab arms pivotally carried by said frame, and an elongated member responsive to fluid pressure for simultaneously actuating said pairs of arms, said member being carried by said supporting frame and extending longitudially of the pivotal axes of said arms.

5. A brick grab comprising a supporting frame, a plurality of pairs of grab arms pivotally connected intermediate their ends to said frame, an expansible tubular member responsive to fluid pressure for simultaneously actuating said pairs of grab arms, means carried by said frame for supporting said member, and means independent of said member whereby the grab may be lifted and transported from one location to another.

6. A brick grab comprising a supporting frame, a pair of arms pivotally mounted on said frame, means for actuating said arms, and members rigid with said frame respectively projecting outwardly therefrom beyond said arms affording means by which the grab may be lifted and transported from one location to another.

7. A brick grab comprising a supporting frame, a pair of arms pivotally mounted on said frame, and means for actuating said arms, said frame having portions independent of said means and respectively projecting laterally of said arms affording means by which the grab may be lifted and transported from one location to another.

8. A brick grab comprising a supporting frame having a transversely extending member, a pair of grab arms pivotally connected intermediate their ends to said member, and means for actuating said arms, said transversely extending member being rigidly provided with oppositely projecting portions affording means by which the grab may be lifted and transported from one location to another.

9. A brick grab comprising a supporting frame, a plurality of aligned pairs of arms pivotally mounted on said frame, said pairs of arms being relatively shiftable laterally with respect to each other so that the distances between them may be varied, and fluid pressure responsive means for actuating said arms.

10. A brick grab comprising a supporting frame provided with a plurality of aligned transversely extending members, parallel rods respectively extending through opposite ends of said members, a plurality of pairs of arms pivotally mounted on said rods, said pairs of arms being relatively shiftable with respect to each other along said rods, and means for actuating said arms.

11. A brick grab comprising a supporting frame having a transversely extending member, a pair of grab arms pivotally connected intermediate their ends to said member, said arms respectively having inwardly extending portions spaced above said transversely extending member, fluid pressure means underlying said inwardly extending portions of said arms and cooperable therewith for actuating the arms, and means connected with said frame whereby the grab may be lifted and transported from one location to another.

12. A brick grab comprising a supporting frame, a pair of arms pivotally mounted on said frame and respectively having offset portions projecting toward each other, fluid pressure operated means for moving the arms to brick engaging position, said means including an expansible member and a plate-like member movable by the expansible member and engageable with the offset portions of said arms for actuating the latter, and spring means normally resisting movement of said plate-like member for causing the latter to assume a position enabling said arms to move from brick engaging position upon release of said fluid pressure.

13. A brick grab comprising a supporting frame, a pair of arms pivotally mounted on said frame intermediate their ends, substantially horizontally disposed links pivotally connected to the upper ends of said arms, fluid pressure operated means interposed between the inner ends of said links for moving said arms in opposite directions into brick engaging positions, and means on the frame independent of said fluid pressure operated means whereby the grab may be lifted and transported from one location to another.

14. A brick grab comprising a supporting frame, a pair of arms pivotally mounted intermediate their ends on said frame, oppositely extending links respectively pivotally connected to the upper ends of said arms, fluid pressure means interposed between the inner ends of said links for moving said arms in opposite directions into brick engaging positions, and spring means for moving said arms from brick engaging position upon release of said fluid pressure.

15. A brick grab comprising a supporting frame, a pair of arms pivotally mounted intermediate their ends on said frame, substantially horizontally disposed links pivotally connected to the upper ends of said arms, and fluid pressure operated means located between the inner ends of said links for moving said arms in opposite directions into brick engaging positions, the inner end of each of said links being provided with a plate-like portion engageable with said fluid pressure operated means.

16. A brick grab comprising a supporting frame, a pair of grab arms pivotally mounted on said frame, said arms being movable in opposite directions into brick engaging position, the lower end of at least one of said arms having a pivotally mounted brick cooperating shoe, the pivotal axis of said shoe being substantially parallel with the pivotal axes of said arms, and leaf spring means operatively interposed between said shoe and its associated arm for maintaining the shoe in brick cooperating position.

17. A brick grab comprising a supporting frame, a pair of grab arms pivotally mounted intermediate their ends on said frame, the lower ends of said arms being movable toward each other into brick engaging position and being respectively provided with pivotally mounted brick cooperating shoes, the pivotal axis of each shoe being substantially parallel with the pivotal axes of said arms, and spring means mounted on each of said arms for normally maintaining said shoes in brick cooperating position.

18. A brick grab comprising a supporting frame, a pair of grab arms pivotally mounted on said frame, the lower end of at least one of said arms having a brick cooperating shoe, said shoe being of substantially U-shape and having a web portion and laterally spaced legs pivotally connected to the arm on which it is mounted, and a leaf spring secured to the latter arm and cooperable with the web of the shoe for normally maintaining the shoe in brick cooperating position.

19. A grab for a stack of bricks arranged in superimposed rows, said grab comprising a supporting frame, a pair of grab arms pivotally mounted on said frame for engaging the end bricks of a bottom row of the stack of bricks, the lower end of each of said arms having a pivotally mounted brick cooperating shoe, and plate-like spring members respectively secured to said shoes and extending upwardly therefrom for engaging the end bricks of each row of bricks superimposed on said bottom row.

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