Jan. 16, 1934. O. F. PRESBREY 1,943,742

ARTICLE HANDLING DEVICE

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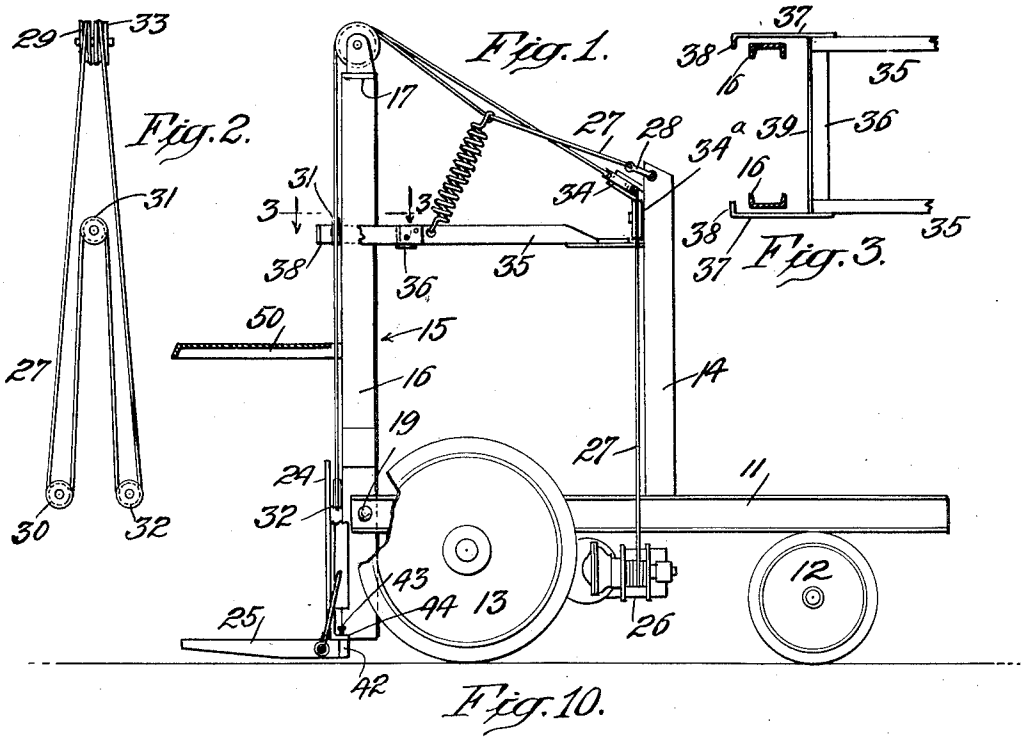


Fig. 2.

Fig. 1.

Fig. 3.

Fig. 10.

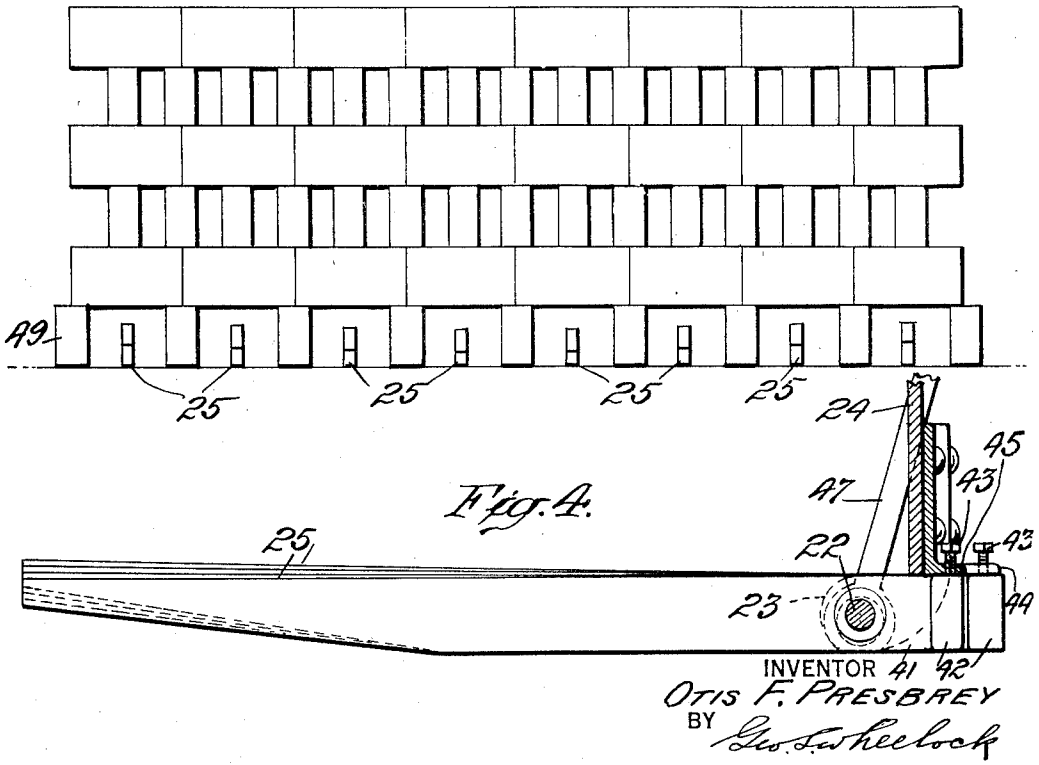


Fig. 4.

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Fig. 5.

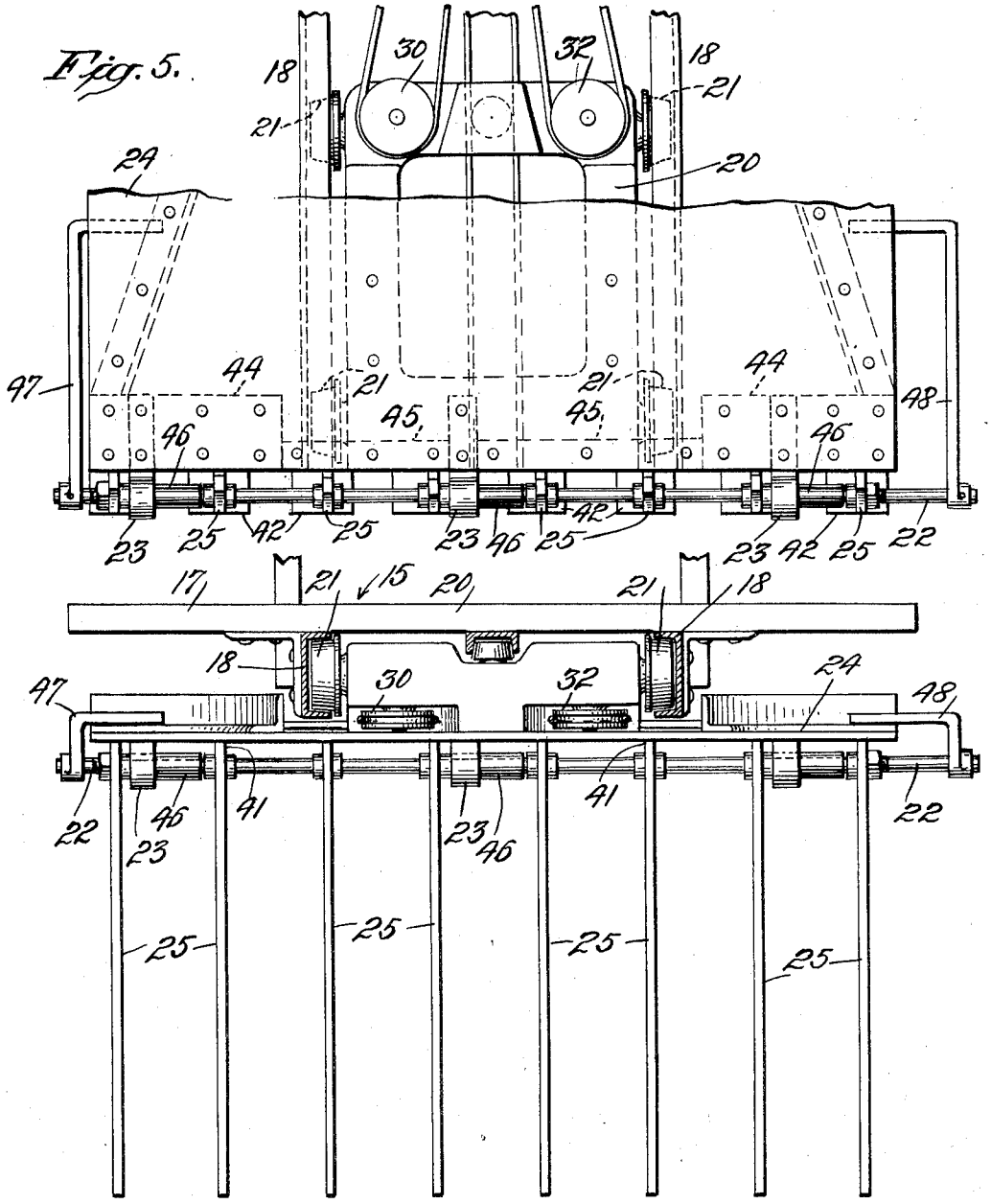


Fig. 7.

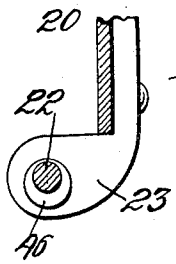


Fig. 6.

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Fig. 8.

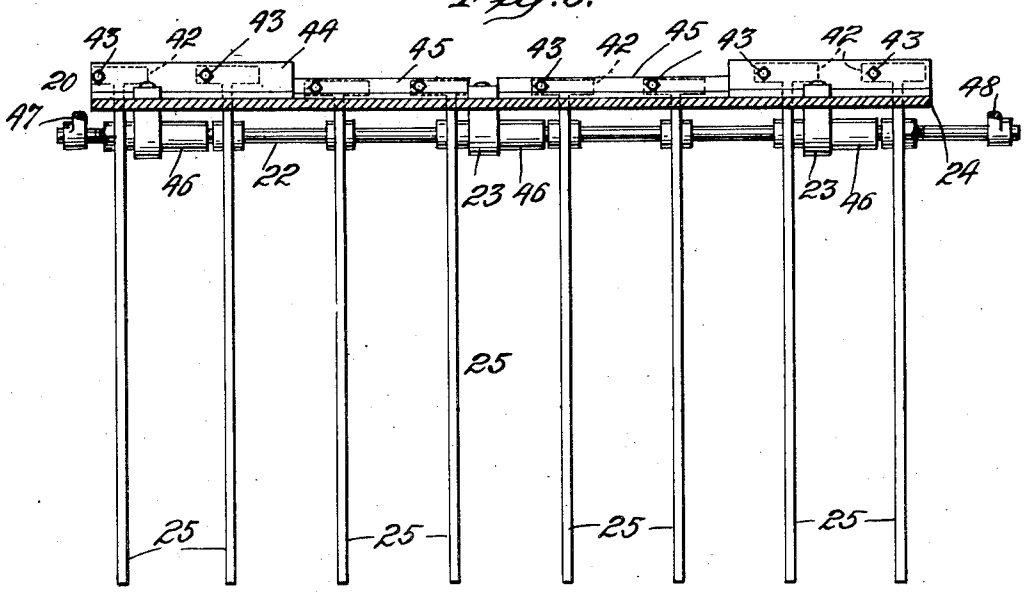
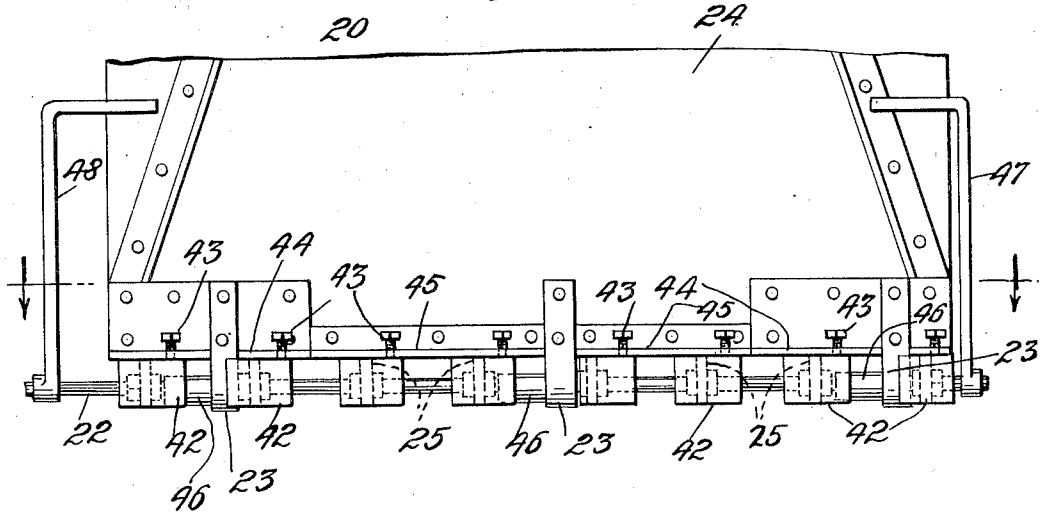


Fig. 9.



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UNITED STATES PATENT OFFICE

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ARTICLE HANDLING DEVICE

Otis F. Presbrey, Brooklyn, N. Y.

Application October 8, 1928, Serial No. 311,233
Renewed March 15, 1932

5 Claims. (Cl. 214—65)

This invention relates to improvements in article or material handling devices and machines shown, described and claimed in my co-pending applications Serial Nos. 178,690 and 305,225, respectively filed on March 26, 1927 and September 11, 1928, in that the present invention comprehends more particularly novel improvements adapted primarily for enabling the machine to handle brick in bulk, to which end the machine is provided with a brick lifting fork, although the invention has certain aspects which well adapts it for use in connection with handling other materials.

Furthermore a particular object of the present invention is to provide a lifting member, such as a brick fork, for example, which projects away from one end of the wheeled vehicle, on which the lifting member is preferably mounted, so that it may be brought to substantially the ground level, the vehicle being provided with means for changing the angle of projection of the lifting member or fork with respect to the longitudinal axis of the vehicle, so that when the load to be lifted is not normal to the longitudinal axis of the vehicle, that is when the position of the vehicle, with respect to the load to be lifted, would lift the member or fork above the base or bottom of the load, the angularity of the fork or member may be changed so that it may be entered under the load by the movement of the vehicle toward it. When the engagement of the lifting member or fork with the load is properly effectuated, the angular position thereof may again be changed so as to bring the member or fork into normal relation with the vehicle, whereby to enable it to lift the load in such way as to avoid danger of its toppling over away from the vehicle.

Other objects of the invention are to provide a lifting device so supported on the machine or vehicle as to be capable of a bodily lateral adjustment with respect to the vertical longitudinal plane of the machine or vehicle; to provide means for independently adjusting the arms or fingers of the lifting fork, more particularly with a view to producing a reverse camber along the upper edges of the arms, and generally to provide a reliable and efficient machine or vehicle for bodily lifting a load of brick without the necessity of employing a brick tray.

With these and other objects in view the invention consists of certain features of construction and combination of parts to be hereinafter described and then claimed with reference to the accompanying drawings illustrating a preferred embodiment of the invention, in which:

Figure 1 is a side elevation of a wheeled tractor vehicle showing generally the present improvements;

Fig. 2 is a detail view of the preferred hoisting cable mechanism;

Fig. 3 is a section on the line 3—3, Fig. 1, showing stop means for the swinging frame;

Fig. 4 is an enlarged sectional detail through the supports for the lifting fork, some of the arms or fingers of which are shown in side elevation;

Fig. 5 is a front elevation of the lower portion of the carriage which supports the lifting fork;

Fig. 6 is a sectional plan of the carriage and lifting fork;

Fig. 7 is a sectional detail showing one of the supporting brackets for the pivot of the lifting fork;

Fig. 8 is a sectional plan of the lifting fork and its concomitants to show more particularly means for individually adjusting the arms of the lifting fork;

Fig. 9 is a rear elevation of the carriage and lifting fork or device, and

Fig. 10 represents a pile of brick and shows how the improved lifting fork is engageable therewith to lift it bodily.

In Fig. 1 there is illustrated the chassis 11 of a power driven vehicle such as a tractor having wheels 12, 13, the chassis supporting a superstructure or main frame 14 constructed in any desirable and efficient manner. The rear end of the chassis 11 (Figs. 1 and 6) rigidly supports an upstanding main supporting frame 14 and an upright supplemental frame 15, comprising uprights 16 and a cross-bar 17. Rigidly fixed in upright position to the supplemental frame 15 is a pair of parallel guide rails 18. The frame 15 is supported on a pivot 19 which extends transversely of the vehicle and in turn is supported by the rear end of the chassis 11, as shown in Fig. 1, so that the supplemental frame 15 is swingable with respect to a transverse axis of the chassis or main frame of the vehicle.

Referring now more particularly to Figs. 1, 2, 4, 5 and 6, the machine or vehicle comprises a carriage 20, substantially as in the prior applications referred to, which may be constructed in any suitable manner as a unit, it being provided at the sides with anti-friction rollers 21 which are adapted to travel on and between the guide-rails 18. A pivot shaft 22 extending transversely of the vehicle is supported in hanger brackets 23 rigidly fixed at the lower end of the front plate 24 of the carriage. Inasmuch as the pivoted

supplemental frame and the described carriage are located at the rear end of the tractor, arms or fingers 25 which are loosely mounted on the pivot shaft 22, will project rearwardly of the tractor and constitute a brick or other lifting fork of the lifting means comprising also the carriage, the arms or fingers 25 being suitably held so that they will extend in the desired rearward direction in spite of their being loosely mounted on the pivot shaft. The loose mounting of the fingers 25 on the pivot shaft 22 enables each finger to be separately adjusted laterally with respect to each other. The pivoting of the arms or fingers on the shaft 22 adapts them to be folded upwardly against the front plate 24 of the carriage whenever desired, and enables them to be adjusted in a manner to be hereinafter described. Although the arms or fingers 25 are independently movable, it will be obvious from the present invention that some features thereof may be used in connection with a form of lifting member other than a fork.

The chassis 11 supports a hoisting drum 26 for operating a cable 27 which, as shown in Fig. 1, is secured by an anchoring device 28 to the main supporting frame 14. This cable is guided over pulleys 29, 30, 31, 32, 33 and 34 and extends to the hoisting drum so as to be operable thereby. The pulleys 29, 33 are in a pair suitably supported at the upper end of the swingable supplemental frame 15. The pulleys 30, 32 are mounted upon the carriage 20 and the pulley 31 upon the frame 15, at a point between the pulleys 29, 33 and 30, 32, while the pulley 34 is mounted upon the main upright frame 14. Another guide pulley 34*a* is arranged adjacent the pulley 34 to properly guide the cable. When the cable is operated by the drum for the purpose of lifting the fork 25, the carriage 20 will be raised, and when the drum is operated reversely, the carriage and fork will be lowered.

Now referring more particularly to Figs. 1 and 3, it will be seen that the main upright frame 14 supports in any suitable manner rearwardly extending bars 35, these being in a stationary position. The outer ends of the bars 35 are connected by a cross-bar 36 of angle metal, the horizontal flange thereof being underneath the ends of the bars 35. Rigidly fixed to the bars 35 and extending rearwardly of the machine are metallic extensions or guides 37, the outer ends of which are bent inwardly to provide stops 38, the uprights 16 of the swingable frame being mounted for a pivotal movement between the stops 38 and the vertical flange 39 of the cross-bar 36, which flange also forms stops for the uprights 16. It will be seen that when the lifting member or fork 25 is at the approximate ground level, that if the vehicle should be tilted somewhat with respect to the load of brick or the like to be raised, the said lifting member will be normal to the longitudinal axis of the vehicle, so that it is likely that the lifting fork or member may not be engageable with the load to lift it, unless the angularity of the lifting member with respect to the longitudinal axis of the vehicle is changed. The desired change of angle may be accomplished by moving the swingable frame 15 bodily by hand after slackening the cable 27 from the upright position shown in Fig. 1 to a rearwardly inclined position against the stops 38, the lifting member 25 being then lowered sufficiently at its outer end in order to properly engage the load when the tractor is backed up to it. When the engagement of the fork or lifting member with the load is then effectuated, the frame 15 may be swung in the opposite direction against the stops provided by the flange 39, thus inclining the frame 15 forwardly from the upright position, shown in Fig. 1, and inclining the lifting member or fork 29 upwardly from its normal position, so that the lifting member and frame 15 are in favorable position for hoisting the load and carrying it safely, as in a cradle. In case it is not necessary to swing the frame 15 from its illustrated upright position, in order to effectuate an engagement of the lifting member with the load, it is clear that as soon as the hoisting drum is operated to raise the load, the tension on the cable 27 will cause the frame 16 to swing forwardly against the stops furnished by the flange 39.

The heel extensions 41 of the arms or fingers of the lifting fork are provided with transversely widened heads 42, which are opposed by stop-screws 43 that are adjustable in ledges 44 and 45 at the lower end of the front plate 24 of the carriage, these ledges being behind said plate, so that by adjusting the stop screws 43 against the heads 42, the arms or fingers 25 may be individually adjusted vertically. The hanger brackets 23, preferably do not directly support the pivot shaft 22, but said shaft has fixed thereto eccentric sleeves 46 which are journalled in the bearings furnished by the brackets 23, whereby the pivot shaft is eccentric to the center of the bearing. By reason of this eccentric pivot connection between the fork arms 25 and the carriage, it is possible by the downward movement of crank arms 47, 48 fixed to the pivot shaft 22 to lower the pivot shaft with respect to the bearings, and thus to permit the arms or fingers 25 to incline downwardly from the position shown in Figs. 1 and 4, when that is necessary, in order to enable the arms or fingers to be engaged underneath a load. In this way a fine adjustment of the arms or fingers with reference to the vertical is obtainable as compared with the coarser adjustment obtainable through the rearward swinging of the frame 15. Also in order to provide a transverse camber effect at the upper edges of the arms or fingers, they are vertically adjustable relatively to each other by means of the individual adjustment provided by the adjustable stop screws 43 against which may abut the heads 42 at the inner ends of the arms or fingers of the fork. The adjustment of the stops 43 may be obtained after the bottom of the load is engaged, or afterward, but before the load is lifted. The camber furnished by the adjustment of the arms or fingers tends to centralize the load towards the middle finger of the fork, and to prevent the load from breaking up sidewise of the fork when being lifted.

Not only are the arms or fingers 25 of the fork individually adjustable laterally, that is horizontally, upon the pivot shaft 22, but the arms or fingers may be adjusted bodily in a gang, by a longitudinal adjustment of the pivot shaft 22. This may be accomplished through the medium of the handles 47, 48 which may be operated in the desired direction to pull or push the pivot shaft, and thus shift the fork laterally. In this connection it is clear that such lateral movement is permitted because the eccentric sleeves 46 fixed rigidly to the shaft are elongated, as in Figs. 5 and 6, sufficiently beyond the bearings therefor so as to permit a sliding movement of said eccentrics in the bearings of the brackets 23. In this connection it will also be observed that whether each arm or finger 25 is individually ad-

justed laterally, or the entire fork is adjusted laterally, the laterally enlarged heads 42 of the arms or fingers are always in position to abut against the stops 43 when they are adjusted to extend below the ledges 44, 45. It will be observed that when the crank arms 47, 48 are swung into the position shown in Figs. 5 and 6, the adjustment obtained by the stops 43 is not effected by the movement of the pivot shaft 22.

Referring to Fig. 10 a pile of brick is shown, which pile may be arranged in any desired manner, but it is here so arranged that there are spaces between the brick of the pile to be lifted, the pile being supported upon a lower tier of brick 49, in such way that the arms or fingers 25 of the fork of the machine may be entered into spaces between the brick of the tier 49, for engagement with the pile of brick and for lifting them by the machine. The various adjustments of the arms or fingers of the fork as described, enable the same to be properly entered into the spaces of the lower supporting tier of the pile of brick. In Fig. 1 there is shown a hood 50 to go over the pile of brick or other articles supported by the fork 25, and if desired this hood 50 may be vertically adjusted in any obvious way in order to directly engage with the top of the pile of articles before they are raised by the lifting member or fork.

Not only is it obvious that this invention is more particularly adapted for use in connection for the handling of brick by a brick fork, although not restricted thereto, but it is obvious that the invention may be variously modified within the skill of those skilled in the art, and still be within the invention as defined in the claims hereof. It is clear that features of the invention may be used even at the front end of a suitable machine if desired, and also that other articles than brick may be handled.

What I claim is:

1. In an article handling machine, the combination of a vehicle, a support mounted to swing with respect to a transverse axis of the frame of the vehicle, a lifting fork at the lower end of the support, and a stationary forward and a stationary rearward stop on the vehicle and located above the said axis for abutment of the said support.

2. In an article handling machine, the combination of a support having a bearing, a projecting lifting member, a pivot for the lifting member, and means for eccentrically mounting the pivot on the bearing with respect to the center of the bearing.

3. In an article handling machine, the combination of a support, bearing brackets thereon, a pivot shaft provided with eccentrics journaled in the bearings, a lifting member fixed on the shaft, and means for rocking the shaft to impart an eccentric pivotal movement to the lifting member.

4. In an article handling machine, the combination of a support, bearing brackets thereon, a pivot shaft provided with eccentrics journaled in the bearings, said eccentrics being prolonged beyond the bearings for receiving a longitudinal movement, a lifting member fixed on the shaft, and means for rocking the shaft to impart an eccentric pivotal movement to the lifting member, and for longitudinally shifting the shaft and the eccentrics.

5. In an article handling machine, the combination of a support, a lifting fork thereon comprising separately pivoted fingers having heels extending beyond the pivot, separate stops for the individual fingers, and means for supporting said stops for independent adjustment relatively to corresponding fingers, the heels adapted to abut the stops.

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