

Jan. 31, 1933.

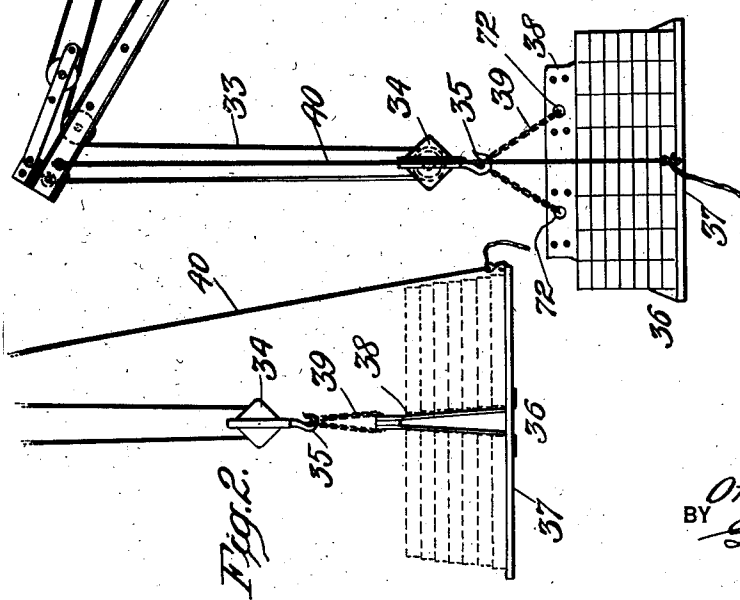
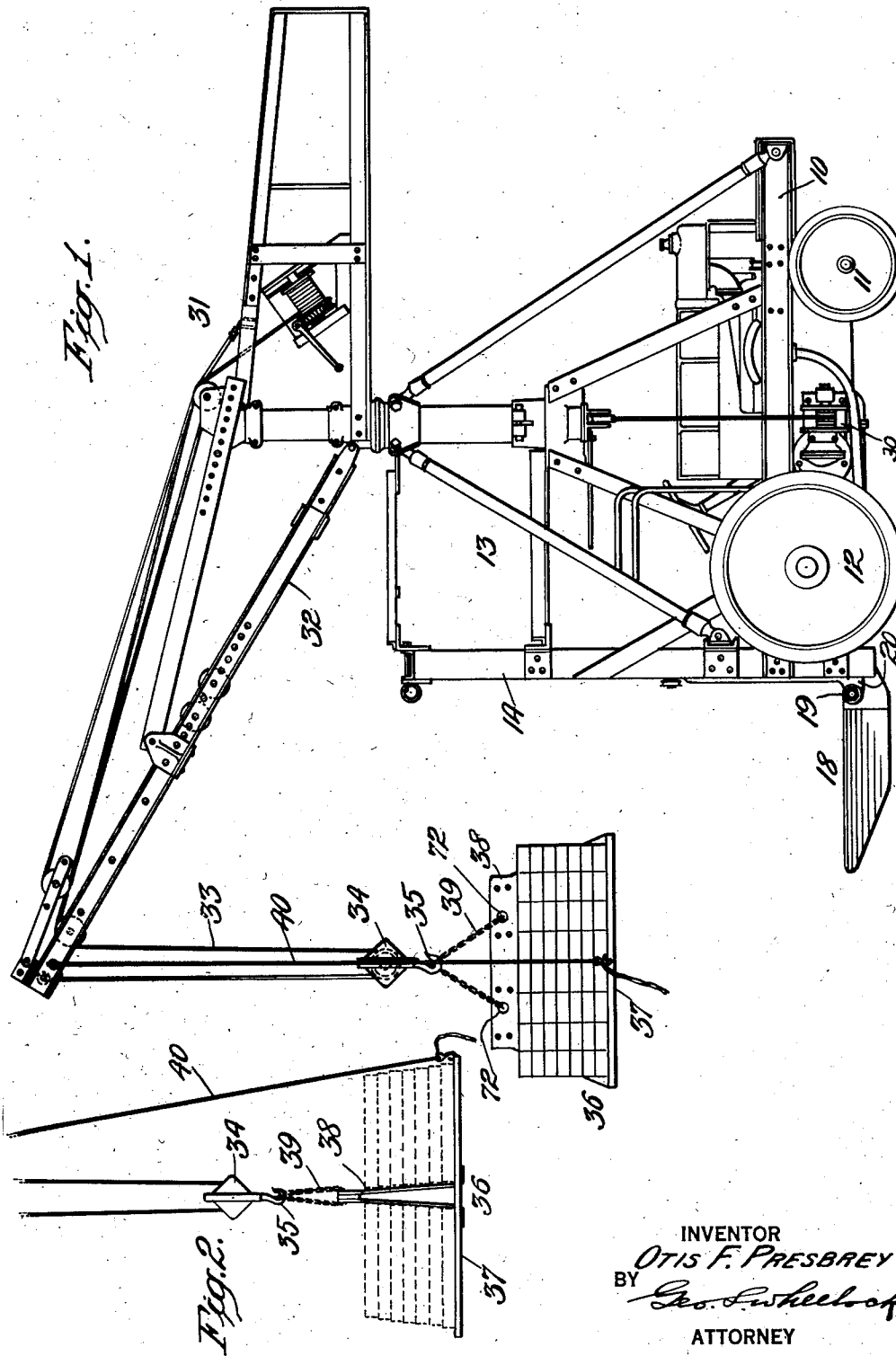
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1,895,939

ARTICLE HANDLING MACHINE

Filed Sept. 11, 1928

5 Sheets-Sheet 1



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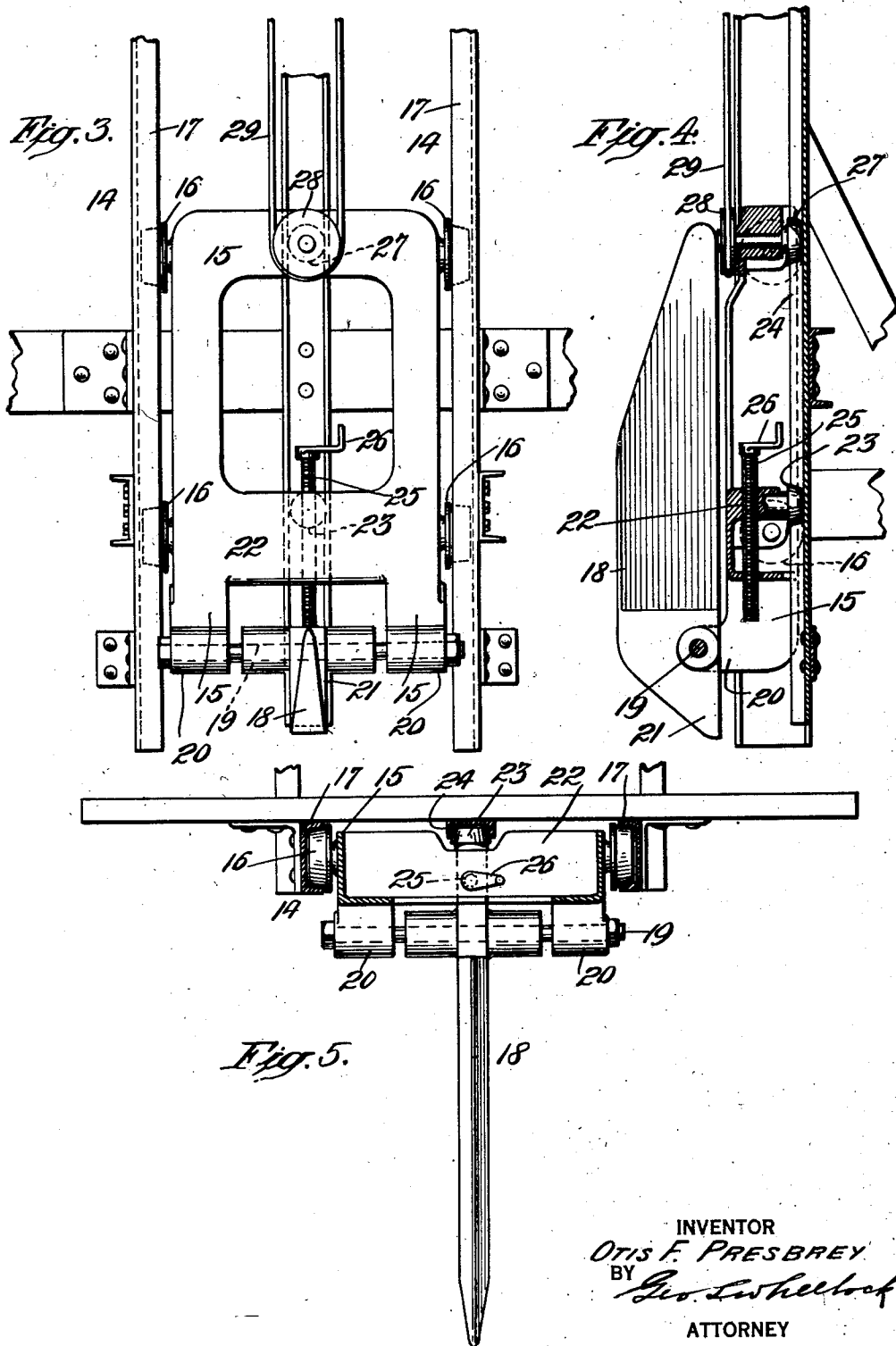
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5 Sheets-Sheet 2



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Fig. 6.

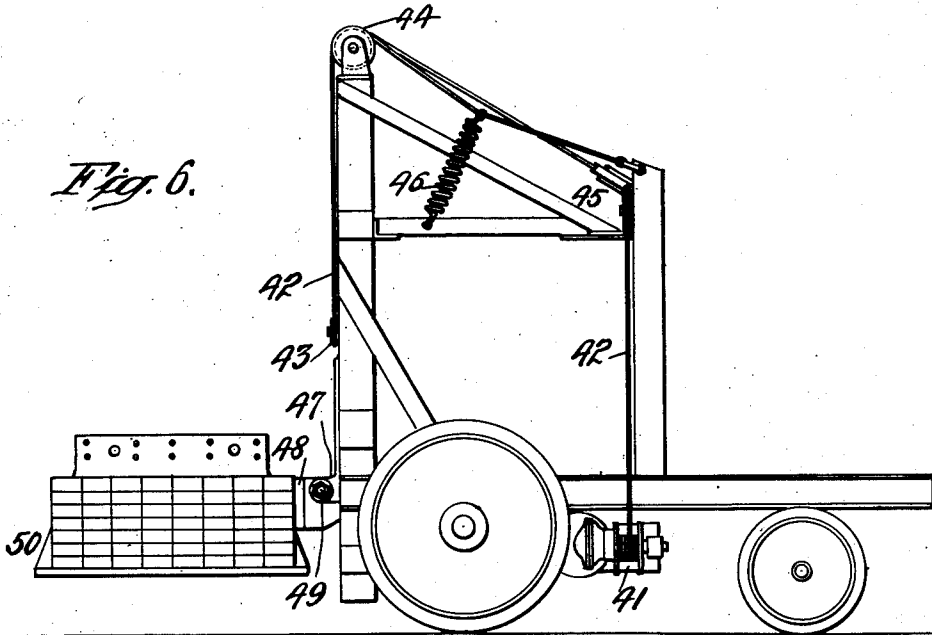


Fig. 7.

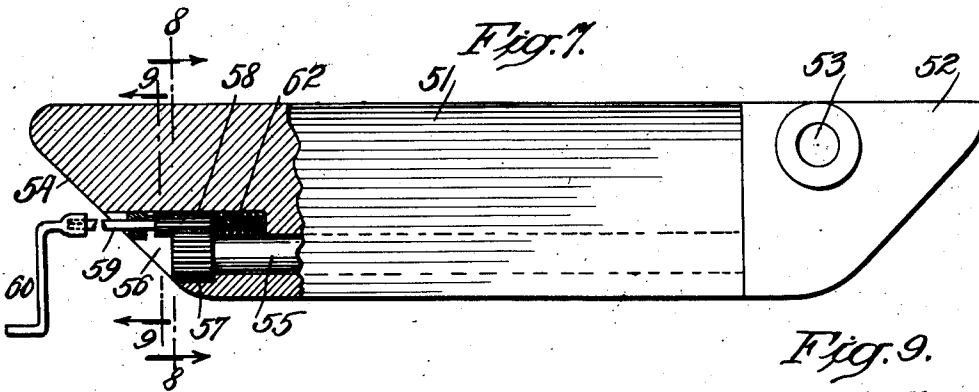


Fig. 8.

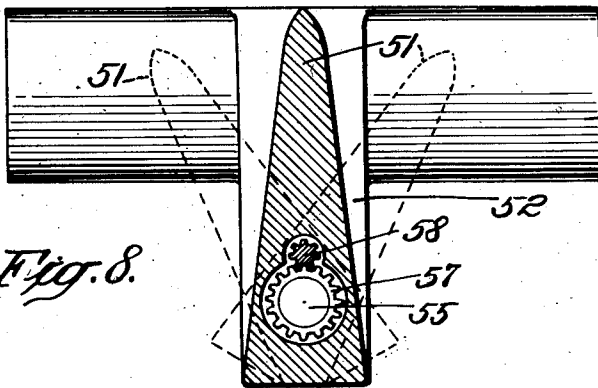
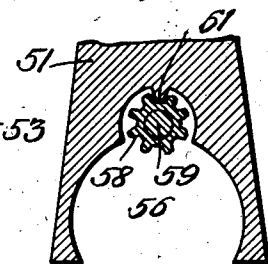


Fig. 9.



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Fig. 10.

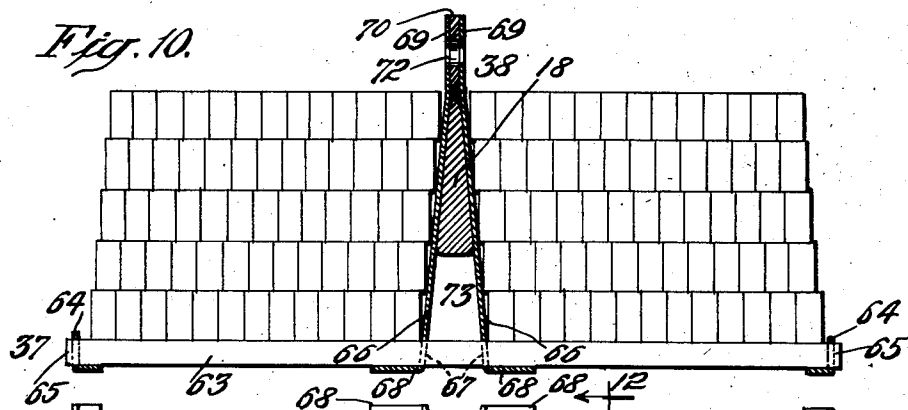


Fig. 11.

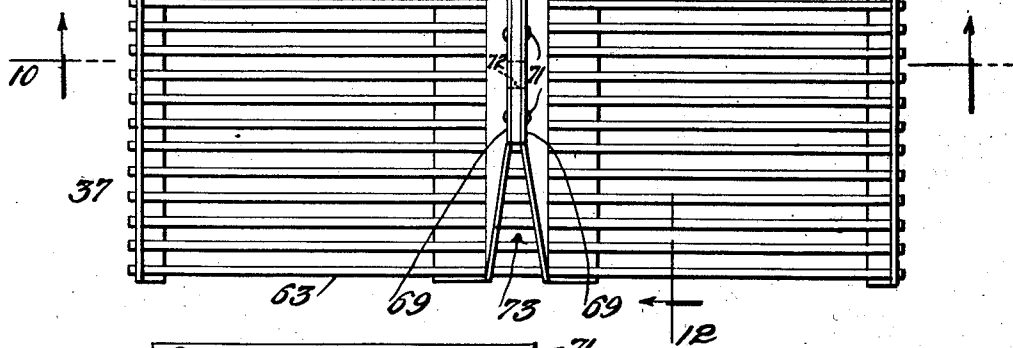
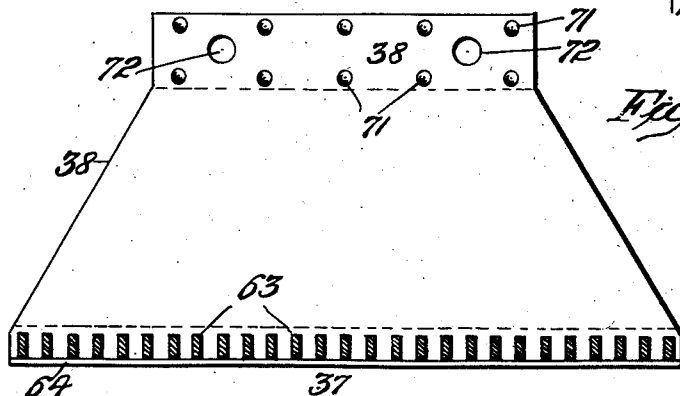


Fig. 12.



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Fig. 14.

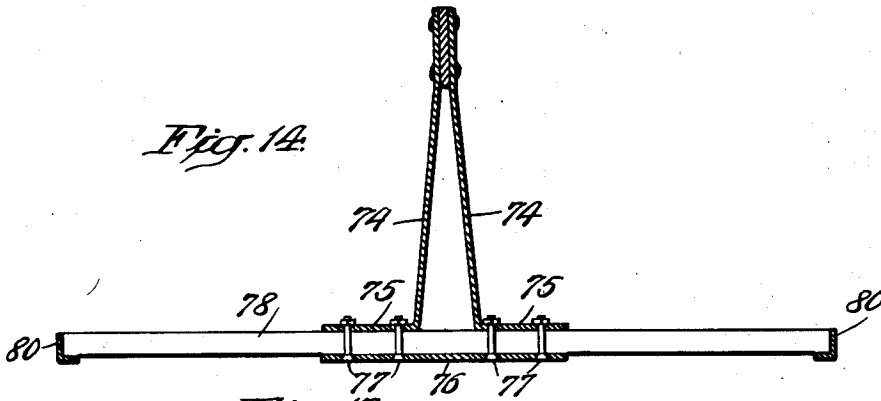


Fig. 13.

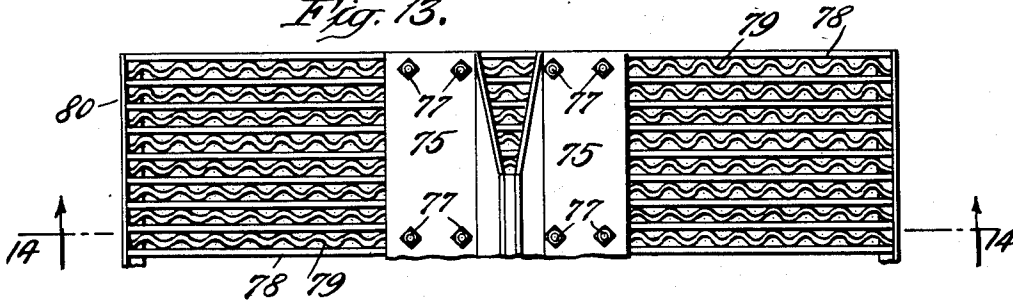


Fig. 16.

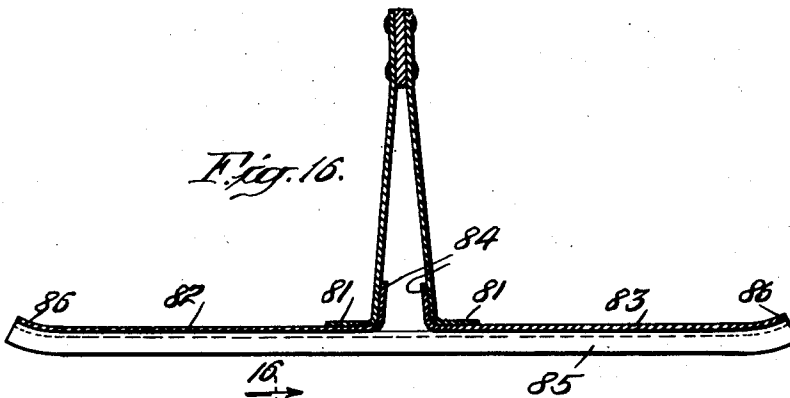
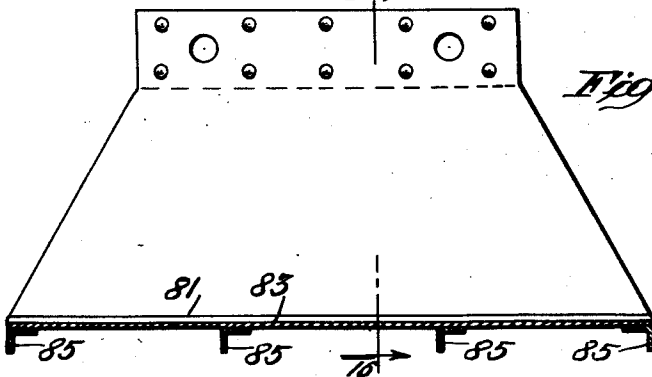


Fig. 15.



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UNITED STATES PATENT OFFICE

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ARTICLE HANDLING MACHINE

Application filed September 11, 1928. Serial No. 305,225.

This invention relates to improvements in article or material handling devices and machines and may include practically all of the novel mechanism shown, described and claimed in my co-pending application filed March 26, 1927, Serial No. 187,690, the present invention including improvements thereover, more particularly intended for adapting the machine for handling brick in a brick yard or elsewhere, although the invention is not restricted to that purpose. In my said previous application the disclosed invention is applied to a tractor, for example, as the well known "McCormick Deering" or "Fordson" tractors and the present invention may be likewise adapted to facilitate transporting or moving brick to or from the kiln, to trucks, cars, etc.

One of the objects of the present invention is to provide a rugged lifting arm or finger which is preferably pivoted to and forms part of an elevator or lifting mechanism, the said arm preferably being so proportioned as to be readily engageable with a brick or other carrier, for supporting and elevating the same in horizontal position.

Another object is to provide a special carrier or "pallet" for brick which may be either engaged by a lifting arm for raising or lowering, or may be raised from the arm and lowered by suitable hoisting apparatus which may be embodied in a crane, for example, preferably a full-circle swinging crane, such, for example, as disclosed in my aforesaid application.

Another object of the invention is to provide a lifting arm for supporting a brick or other carrier, which arm is tiltable to one side or the other so as to dump the material to either side of the arm.

Other objects of the invention are to provide a brick handling machine preferably comprising a motor truck or tractor, and which truck is provided with a lifting arm which may be moved down close to the ground or below its level so that the truck when backed up will quickly and properly engage with a carrier or brick, for the purpose of lifting the same to the desired height, and then if desired to tilt some of the brick in one

direction and some in an opposite direction, either by the arm or a separate hoist, into brick carrying trucks, for example; thereby providing a power machine which will tend to facility and economy of operation, particularly in a brick yard.

These being among the objects of the present invention, the same will now be described with reference to the accompanying drawings showing preferred embodiments of the invention, wherein

Figure 1 is a side elevation of the improved machine provided with a full-circle swinging crane;

Fig. 2 is a detail view of parts of the hoisting mechanism operated from the crane;

Fig. 3 is a rear elevation of a portion of the machine, showing only the elevator or lifter mechanism;

Fig. 4 is a sectional side elevation of Fig. 3, showing the pivoted arm swung up out of use;

Fig. 5 is a transverse section of Fig. 3;

Fig. 6 is a side elevation of a modified form of improved machine in which the crane is omitted;

Fig. 7 is a sectional side elevation of a modified form of lifting arm;

Fig. 8 is an enlarged vertical, transverse, section thereof on the line 8-8, Fig. 7, viewed in the direction of the arrows, the dotted lines indicating that the lifting arm has been tilted to either side;

Fig. 9 is an enlarged section on the line 9-9, Fig. 7, viewed in the direction of the arrows;

Fig. 10 is an elevation, partly in section on line 10-10, Fig. 11, of the preferred construction of article carrier or pallet;

Fig. 11 is a top plan thereof;

Fig. 12 is a section on the line 12-12, Fig. 11;

Fig. 13 is a plan of a portion of a modified or grating form of carrier;

Fig. 14 is a section on the line 14-14, Fig. 13;

Fig. 15 is a side elevation, partly in section, of still another modification of the article carrier; and

Fig. 16 is a section on the line 16—16, Fig. 15.

Referring to Fig. 1, the chassis 10 of a power driven vehicle such as a tractor is supported on wheels 11, 12, and it supports a superstructure or main frame 13 of any preferred construction. Referring to Figs. 1, 3, 4 and 5, the rear end of the chassis 10 firmly supports a vertical guide frame comprising uprights 14 between which there is adapted to be raised or lowered the carriage 15 of an elevator or lifting means, having wheels 16 running on rails 17 of the uprights 14. The uprights 14 are also firmly fixed to and really form a part of the superstructure or main frame 13.

As distinguished from the invention of my prior application above mentioned, the carriage 15 supports a rugged arm 18 which in using position extends from the lower end of the carriage rearwardly of the machine. This arm 18 is of strong construction and of suitable length, being specially designed and adapted to engage with a brick or other carrier, close to the ground or somewhat into it, and lift the carrier with facility. This arm may be compared with the blade of a semaphore signal in that it is sleeved onto pivot 19 journaled in brackets 20, which are rigid with the lower end of the carriage, the pivot being at right angles to the arm, so that the arm may be swung down to project rearwardly from the machine in a substantially horizontal direction as shown in Figs. 1 and 5, and be swung up to the position shown in Fig. 4 when not in use.

The rearwardly projecting arm 18 is provided with a heel 21 which extends below the carriage and inwardly of the pivot 19 when the arm is in using position, the carriage being provided with a rigid, horizontal, cross-bar 22 which supports a roller 23 guided by a fixed upright rail 24 which is located immediately of the rails 17 and is parallel therewith. Adjustable in the cross-bar 22 is a vertical screw-spindle 25 provided at its upper end with a crank handle 26 for turning it and adjusting it so as to set the lower end of the screw spindle 25 in such position relatively to the arm 18 that it will form a stop or abutment, inwardly of the pivot 19, for the heel 21 of the arm when the arm is in substantially horizontal position. Or, the arm may thereby be set to a somewhat inclined position, as occasion may require. When the arm is in use the thrust of the weight carried by it will be taken by the impingement of the heel 21 on the stop furnished by the lower end of the screw 25, and these parts should therefore be of strong and durable construction.

In Figs. 3 and 5 spaces are left between the sleeves of the arm and the brackets 20, which permit of the arm being shifted and adjusted laterally, more or less.

At the top of the carriage is a roller 27

which also travels on the rail 24, and there is also at the front of the carriage a suitable sheave 28 over which is trained a lifting cable 29. This cable may be operated from a hoisting drum 30, shown in Fig. 1.

In Fig. 1 there is shown a full circle swinging crane 31 of any suitable construction, which may be used for raising the carriage, preferably as disclosed in my said previous application, the crane having a boom 32 and being provided with a hoisting cable 33 carrying a block 34 provided with a hook 35, the cable being operated in any suitable manner as from a hoisting drum on the crane. The lifting arm 18 or the hook 35 of block 34 are adapted to connect with a suitable article or material carrier 36, as for bricks, for example, this carrier being designed preferably to support as many as a thousand bricks. The carrier comprises a platform 37 and a top portion or saddle 38, the arm 18 being adapted to engage within the saddle, and the hook 35 to engage a chain 39 which is passed through suitable holes in the saddle 38. The boom 32 supports a sustaining line or carrier leveling cable 40, which keeps the articles from being dumped, except when desired, that is when the article carrier is operated from the crane 31.

Should it be desired to dump the brick which are at the offside of the carrier, away from the cable 40, the block 34 is lowered, and this effects an inclination of the carrier from the point of support provided by cable 40, and the dumping of those brick, the other brick between the saddle and the said cable remaining on the carrier. Should it be desired, to dump such other brick, the block 34 is raised sufficiently to incline the carrier in the opposite direction. When two chains are used, one to pass from the hook 35 to one side and the other to the other side, one of the chains may be disengaged from the hook, so as to discharge all of the brick on the carrier at one time.

Referring to Fig. 6, there is shown a modification of the machine, which omits the crane. In this modification a hoisting drum 41 is mounted on the truck, and is for the operation of a cable 42 and is trained over a sheave 43 of the lifting means, such as shown in Figs. 3, 4 and 5. This cable 42 is also trained over sheaves 44, 45 so that by the use of the hoisting drum 41 the lifting means may be operated. Connected with the cable 42 is a yielding connection 46 so that the cable may be run more smoothly. In Fig. 6 the bracket 47 of the carriage is shown together with the lifting arm 48, which is mounted on the bracket 47 by means of a pivot 49. The article carrier 50 is shown supported on the arm 48 carrying a load of brick.

Referring to Figs. 7, 8 and 9, there is shown a modified construction of lifting arm 51 and heel portion 52 thereof. The heel portion 52

of the arm has a hole 53 for the pivot support for the arm, which arm may be tilted sidewise with respect to the heel portion. In both forms of lifting arm, that is the arm 18 of Fig. 1 and the arm 51, the same is formed in the nature of an elongated heavy blade, set edge uppermost, that is to say the arm tapers transversely, its thicker portion being at the bottom and its thinner or edge portion at the top. The outer portion of the arm has its lower edge 54 inclined, so that the end of the arm is formed more or less as a tapering toe, to more readily engage with the article carrier, especially if the arm has to dig somewhat into the ground. In Fig. 1 the arm is somewhat similarly formed, although the inclination is less abrupt.

A rigid shaft or core 55 extends from the heel portion 52 of the arm, as clearly shown in Fig. 7, and the arm 51 is provided with a longitudinal bore which receives the rigid shaft 55, so that by suitable means the arm 51 may be transversely tilted in one direction or the other with respect to heel portion 52 as indicated by dotted lines in Fig. 8. The outer end of the shaft 55 extends into a recess 56 formed in the outer end of the arm 51, said recess forming a housing for a toothed gear 57 which is fixed rigidly on the shaft 55. There is a pinion 58, the teeth of which are in constant mesh with those of the gear 57, and which is fixed on a small shaft 59 supported in a suitable bearing and that may be turned by means of a removable hand crank 60. A lug 61, Fig. 9, projects from the arm, into the recess 56, in the region of the pinion 58, so that it may be caused to be engaged by the teeth of the pinion, when the pinion is shifted by an expansion spring 62, the tendency of which is to urge the pinion 58 outwardly and to cause the teeth thereof to engage with and be locked by the lug 61. The pinion 58 cannot be rotated while it is locked by the lug 61, and hence the arm 51 is locked against a tilting movement upon the shaft 55. However, when it is desired to tilt the arm the crank 60 is engaged with the shaft 59 and the pinion pushed inwardly so as to depress the spring 62 until the pinion disengages from the lug 61, whereupon the pinion may be turned by the hand crank, its teeth meshing with the teeth of the gear 57, causing a travel of the pinion in an arc around the gear 57, thus causing the arm 51 to tilt laterally. It is obvious that such lateral tilting of the arm with respect to its heel portion 52 will result in a tilting of the article carrier engaged by the arm, so that the material supported by the carrier may be dumped to either side of the arm.

The article carrier has been briefly referred to, but not described in detail. In Figs. 10, 11 and 12 the preferred construction of article carrier is illustrated. It comprises spaced metal slats or bars 63 which with side bars

64 of angle metal form the platform 37 of the article carrier. The vertical flanges of the angle bars 64 are provided with holes 65 with which the ends of the slats 63 are engaged, the horizontal flanges of the angle-bars being in engagement with the lower edges of the slats 63. These parts may be rigidly connected in any suitable manner as is obvious. The saddle or top portion 38 of the article carrier is preferably constructed of metallic side plates 66 which diverge toward their lower edges in the form of an inverted V, and through holes 67 in these plates 66 there pass the slats 63, so that a firm and rigid connection of the saddle with the slats is provided, especially when bottom flanges 68 of the saddle are engaged with the under edges of the slats 63 and welded or otherwise secured thereto. The saddle plates 66 converge and their upper portions form webs 69 between which there is received a metal filler strip 70, which may be firmly attached to the saddle plates as by rivets 71 passing through the filler strip 70 and the web portions 69. Holes 72 are formed in the upper portion of the saddle so as to provide for the reception of chains or the like, whereby the article carrier may be lifted from the top thereof, as by means of the block 34, 35 of Fig. 1.

The saddle 38 is hollow and provides a recess 73 in the middle of the carrier, and which transversely is complementary in taper to the taper of the lifting arm, which when in proper position may be moved longitudinally into the lower part of the recess 73, and then as the lifting means is operated the arm 18 will first be raised to snugly and firmly engage with the upper portion of the saddle, and then to lift the brick or other material which may be supported upon the platform 37 of the carrier.

Figs. 13 and 14 illustrate a modification of the article carrier, in which the metallic side plates 74 of the saddle are provided with bottom flanges 75 beneath which is a bottom plate 76, which with the bottom flanges 75 are, by means of bolts 77, rigidly held to the opposite edges of metallic slats 78 which pass between the flanges 75 and plates 76. These slats 78 run parallel and are separated by means of strips 79 of corrugated metal, to form a grating and for strengthening the construction, the ends of the slats and strips being rigidly secured to angle side-bars 80 which form opposite side edges of the platform of the carrier.

A still further modification of the article carrier is illustrated in Figs. 15 and 16, wherein the bottom flanges 81 of the saddle are welded or otherwise rigidly secured to adjacent inner portions of metallic platform plates 82, 83, one of which extends away from one side of the saddle and the other of which extends away from the other side

of the saddle. The platform plates 82, 83 are formed with integral upturned flanges 84 which are welded or otherwise secured to the inner faces of the saddle side plates. To reinforce and strengthen the platform plates 82, 83 metal angle bars 85 are welded or otherwise secured transversely to the under sides thereof, extending from the extreme edge of one platform plate to the extreme edge of the other platform plate. Furthermore the outer edges of the platform plates may be turned up as at 86 in order to more reliably hold the articles to be placed upon the platform.

It is obvious that under the present invention, a number of lifting arms instead of one arm may be employed, and that when more than one is used, not only may brick be raised or lowered bodily, but stone, etc., and without requiring the use of a special carrier.

What I claim as new, is:

1. In an article handling machine, the combination of an upright frame, a carriage guided thereon, an arm including a blade having an axial swivel connection with the carriage, for engaging a support for carrying articles the thinner edge of the blade presented upwards and the swivel connection being below such edge, and means for moving the carriage to lift the articles.

2. In an article handling machine, the combination of a supporting frame, lifting means guided thereon and comprising a projecting arm, and a removable article carrier formed with an upwardly extending recessed top portion for receiving the arm in the recess, the recess opening downwardly and being intermediate of carrying side portions, forming a platform at each side of the top portion.

3. In an article handling machine, the combination of a supporting frame, lifting means guided thereon and comprising a projecting arm, and a removable article carrier formed with an upper, horizontally elongated, deep, recess for receiving and fitting the arm, whereby the load may be supported as on a saddle slung over the arm.

4. In an article handling machine, the combination of a supporting frame, lifting means guided thereon and comprising a projecting arm which is of tapering cross section, and a removable article carrier having a platform and a recessed portion above the platform having a substantially corresponding tapering cross-section, with which portion the arm may be engaged to lift the carrier and the articles thereon.

5. In an article handling machine, the combination of a frame, a carriage guided thereon, an arm pivoted to the carriage, for engaging a support for carrying articles, and having a heel extending inwardly of the pivot when the arm is lowered to operative position, and means for moving the carriage to lift the articles, and an adjustable stop on the carriage, for the abutment of the heel.

6. In an article handling machine, the combination of a frame, a carriage guided thereon, an arm pivoted to the carriage, for engaging a support for carrying articles, and means for moving the carriage to lift the articles, the arm having a heel extending inwardly of the pivot, and an adjustable stop on the carriage, and located inward of the pivot, for the abutment of the heel.

7. In an article handling machine, the combination of a frame, lifting means guided thereon and comprising a horizontal pivot supported on the lifting means, an arm having its inner end mounted on the pivot for movement upwardly from a depressed position, and abutment means inwardly of the pivot for defining the depressed position of the arm, a part of such means on the arm and a part on the lifting means, said arm being laterally adjustable with respect to the length of the pivot.

8. In an article handling machine, the combination of a wheeled vehicle, and lifting means guided thereon, with its lower end extending downwardly below and outside of the axles of all the wheels, and having an arm pivoted to such lower end of the lifting means at a point also outside of and below the axles of the wheels, the arm extending outwardly away from the so located pivot so as to lift articles, and means for adjusting the arm for an upward or downward inclination with respect to its pivot.

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