Jan. 5, 1954 A. PUIG SALSAS 2,665,018

HAND TRUCK WITH AUTOMATIC LOAD SUPPORT ADJUSTMENT

Filed July 9, 1951

Fig. 1

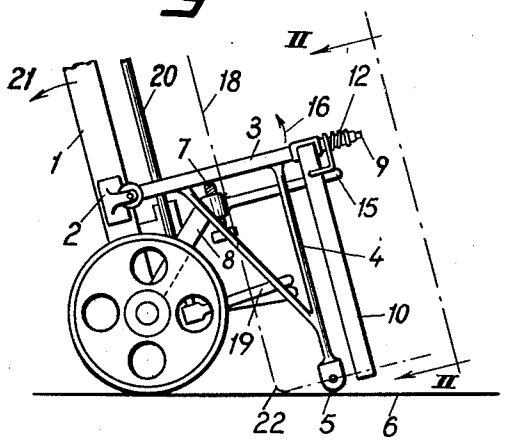
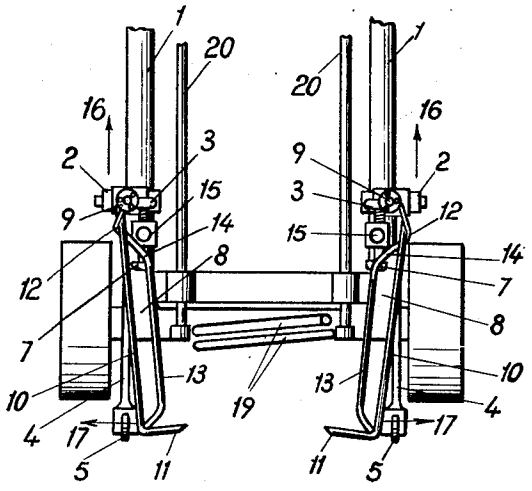


Fig. 2



INVENTOR.
Anastasio Puig Salsas
BY
Thenderoth, Lind & Ponack
Attorneys

Patented Jan. 5, 1954

2,665,018

UNITED STATES PATENT OFFICE

2,665,018

HAND TRUCK WITH AUTOMATIC LOAD SUPPORT ADJUSTMENT

Anastasio Puig Salsas, Badalona, Spain

Application July 9, 1951, Serial No. 235,720

Claims priority, application Spain August 7, 1950

1 Claim. (Cl. 214—371)

1

The present invention relates to a hand truck with automatic load support adjustment.

More concretely, the invention relates to the hand trucks of the class above defined wherein clamping of the object to be raised is performed by means of lateral arms adapted to be closed against the same under the action of other arms coming into engagement with the object referred to, when the truck is approached thereto for its raising.

In spite of the excellent services lent by the trucks of the class set forth they have the inconvenience that, due to the fact of having only lateral action arms for clamping and simultaneously raising the object, it is necessary that the said arms be provided with adequate fixtures in order to ensure a true seizing of the object in those cases wherein the same be unprovided of surface cavities or recesses to make the seizing easy, which fixtures, in all events, are of a doubtful efficiency.

The object of the present invention is to eliminate said inconvenience and to extend the usefulness of the hand trucks with automatic load support adjustment to make them adaptable for raising objects having any shape, by the combination of said lateral compressing action arms with an automatic device directly operated by means of suitable movements of the truck without assistance of any other auxiliar means capable of diverting the attention of the operator, as its working takes place in function of the positions occupied by original control means relative to the floor, said control means being connected to automatic clamping means of lateral action and supporting means for the weight of the object to be raised.

In the present invention, the approaching and tilting movements of the hand truck with respect to the object to be raised are combined in order to effect a previous tilting thereof by the combined action of said laterally clamping arms with a tilting movement of the truck, making the object tilt around its bottom edge nearest to said truck, said tilting movement of said object allowing the entrance of a supporting blade at each side thereunder. Said blades are the elements charged with supporting the object since now up to the moment the center of gravity of the same passes across the vertical line which comprises the tilting point of the object upon the floor, in which moment the handles of the truck result placed in the most convenient position for the transportation of the whole.

Accordingly with the invention, the control means consist of a rocking arm journaled at each side of the hand truck in the lower portion of the handles thereof, each arm having a depending portion connected substantially at right angles

2

thereto and extending along a suitable length to reach the floor, whereupon it eventually rests by means of a roller apt to allow the necessary translation movements of the lower end of said depending portion relative to the floor, which take place during the operation of the truck.

The automatic clamping means of lateral action consist of two arms, each one of them being rockingly arranged on a trunnion integral with the control means and related thereto by means of a spring which tends to oscillate them towards the center of the truck.

Each one of said arms carries respective driving means consisting of a guide member arranged longitudinally thereof and having an upper relieved portion cooperating with a stop fixed to a support integral with the truck frame said support moreover serving as supporting means for the weight of the object to be raised.

Said arms are further provided with supporting blades for the object to be raised formed by a lower end thereof suitably bent towards the center of the truck and having length enough to provide a substantial base for said weight.

In order to make the explanation more easy the present specification is accompanied by a preferred embodiment of the invention which, by way of example, is shown in the accompanying drawing in which:

Fig. 1 is a side view of the described means in connection with the lower portion of a hand truck whereto they are applied; and

Fig. 2 is a front view of said means according to the line II of Fig. 1.

The invention comprises the arrangement in a fixed manner, close to the lower end of each one of the handles 1 of a hand truck, of a journal 2 having connected thereto one of the ends of a rocking arm 3, said arm constituting the control means in combination with a depending portion 4 fixed substantially at right angles thereto and directed downwards. The lower end of the portion 4, is provided with a roller 5 adapted to roll over the floor 6.

The length of the depending portion hereinbefore referred to is such that, during a forward tilting movement of the truck with the object loaded, the contact of said roller 5 with the floor 6 takes place after resting of the lower back edge of said object thereupon in order to allow the easy motion of the supporting blades 11 under said object.

Each one of the arms 3 cooperates with a screw stop 7 which serves for the adjustment of the control means and is threaded on a support 8 which, in its turn, is disposed integral with the corresponding handle of the truck, said stop providing for the extreme lower position of arm 3, which has the free end thereof provided with a

longitudinal trunnion 9, whereupon a lateral action automatic clamping means is connected in a rocking manner. Said clamping means comprises one arm 10 which has one end 11 suitably bent towards the center of the truck, thus constituting the supporting means for the object to be raised when moved thereunder in response to the action of springs 12.

The driving means for those clamping means consist of a guide 13 disposed alongside its corresponding arm 10, having a relieved upper portion 14 arranged to cooperate with a stop 15 integral with support 8. The stop 15 runs over the whole length of the guide 13 following the protruding and relieved portions thereon, thus separating or allowing the blades 11 to move underneath the object according to the different positions of the truck relative to the floor.

The described hand truck works as follows.

On putting the truck in a substantially vertical position such as to approach the same to the object to be raised, the roller 5 on the depending portion 4 comes into contact with the floor thus producing rocking of arm 3 which, in its turn, moves away from its stop 7 in the direction shown by the arrow 16, whereby the stop 15 acts upon the upper portion of guide 13 thus provoking the separation of arms 10 as indicated by the arrow 17 and allowing the object to enter therebetween.

The truck is now approached towards the object 18 until the arms 19 come into engagement therewith, which arms, as it is already known, are fixed to respective turning bars 20 adapted at their upper ends to embrace or engage the upper part of the object, by the provision of means which are well known.

When the truck is tilted in the direction indicated by the arrow 21, the object is made to oscillate around the edge 22 and the arm 3 with the other mechanisms coupled therewith oscillates on journal 2 due to its own weight in the direction contrary to that indicated by the arrow 16 until that, when the vertical line which comprises the gravity center of the object becomes close to the edge 22 thereof, the stop 15 runs over the relieved portion 14 of the guide 13 which rests stationary in respect of the floor 6 because the roller 5 of the depending portion 4 has entered into contact therewith, thus allowing the blades 11 of arms 10 to move underneath the object by means of the action of the springs 12.

Continuation of the tilting movement of the truck according to arrow 21 allows the arms 3 to come into contact with the stops 7, thus constituting a rigid whole with the truck frame, with relation to the contrary movement shown by the arrow 16, and then the blades 11 apply against the bottom of the object 18 thereby provoking, from this very moment, raising of the same until the position wherein the height of the handle ends is the most comfortable for the transportation of the truck with the object loaded.

In the operation of discharging the object the same phases take place but in the inverse order as hereinafter explained:

First, the object leans upon the floor with its edge 22, then, the blades 11 come out of engagement from the bottom of said object, due to the different turning radius of said blades relative to the object tilting arms and the points of the object which bear against said blades. Then, the stops 15 come into engagement with the protruding portions of the guide 13, thus provoking the separation of arms 10 in the direction shown by the arrow 17 as said stops follow the movement of the truck handles, whilst said guides 15 rest stationary in respect to the floor 6 due to the fact that the rollers 5 at the ends of prolongations 4 have entered into contact with said floor. Upon continuation of the tilting of the truck, the complete leaning of the object upon the floor is reached, whereby, when the retrocession of the truck starts the arms 19 allow the opening of those which embrace the upper portion of said object leaving it completely free.

It is thought that the invention and its advantages will be understood from the foregoing description and it is apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing its material advantages, the form herein described and illustrated in the drawings being merely a preferred embodiment thereof.

Having now fully described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim as new and desire to secure by Letters Patent is:

In a hand truck with an automatic load support adjustment, a wheeled truck frame provided with handles, means for embracing an object to be loaded to the truck being used, load support means to be urged under the said object depending on the relative position of the truck frame with respect to the floor, a gudgeon fixed to each of said handles in a substantially transverse direction to the truck and close to the lower ends of the handles, a fixed support on each of said handles, said fixed supports having adjustable stops, an oscillating arm journaled ahead of the truck, a depending portion on said oscillating arm extending towards the floor when the truck is placed in a substantially vertical position, contact means in the lower end of said depending portion to engage with the floor, both said oscillating arms and said depending portion being adapted to be supported by a corresponding adjustable stop when the truck is moved away from its substantially vertical position and to span the width of an object being loaded, each of said oscillating arms including a trunnion, a depending arm rockingly disposed on said trunnion, said depending arm having an in-turned lower end adapted to support the object to be loaded, a cam-shaped guide on said depending arm, an upper portion of said guide, elastic means operatively connected between said oscillating and depending arms to urge the latter towards the center of the truck, a strut fixed with respect to the truck frame, said strut being located to remain out of engagement with said guide to close the depending arms when the truck is tilted back and to come into engagement with said guide, thus oscillating laterally outwardly the said depending arms when the truck is moved to its vertical position.

ANASTASIO PUIG SALSAS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,419,184	Watson	June 13, 1922
1,694,343	Klein	Dec. 4, 1928
2,077,349	Hobbis	Apr. 13, 1937
2,123,669	Von Der Ohe	July 12, 1938
2,197,587	Miller	Apr. 16, 1940