Aug. 14, 1945. G. L. AUSTIN 2,381,858

HAND TRUCK

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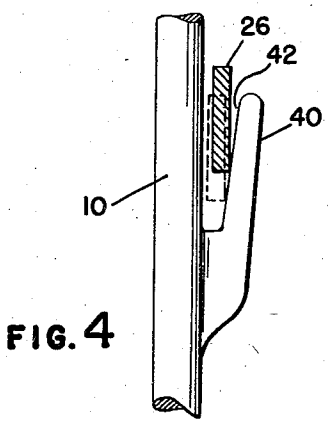


FIG. 4

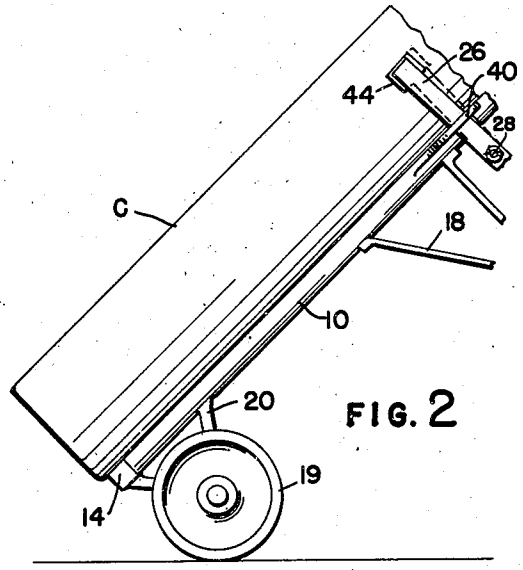


FIG. 2

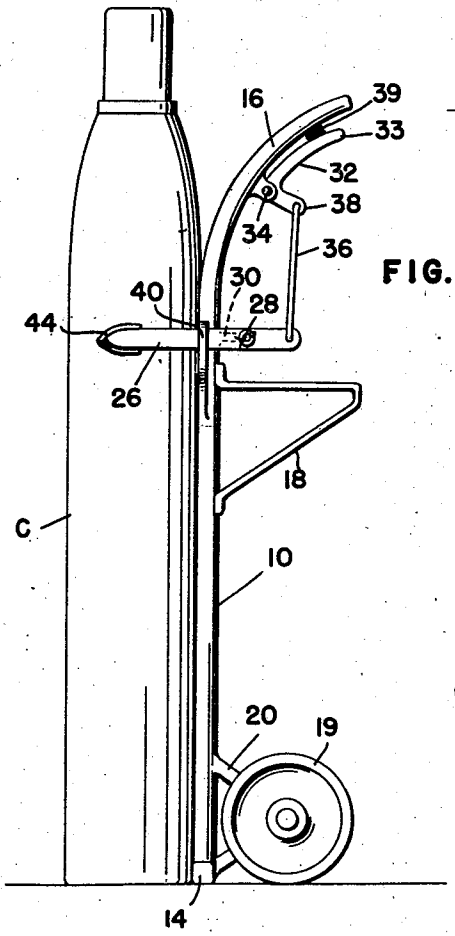
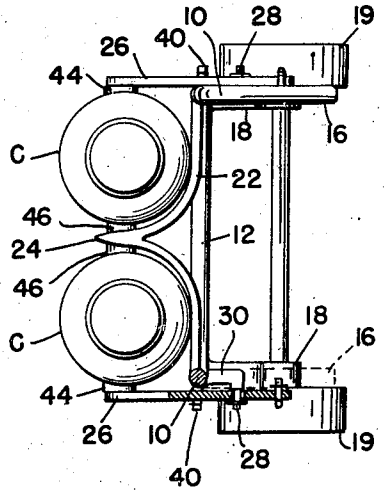


FIG. 1

FIG. 3



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HAND TRUCK

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3 Claims. (Cl. 214—65.4)

This invention relates to a hand truck and, more particularly, to a hand truck of the type having gripping means for engaging a cylindrical object to be transported.

In those industries where bottled gas is used it is customary to employ heavy metallic cylinders designed to contain the gasses under pressure. The handling of such cylinders is normally a difficult operation due to the weight and unwieldiness of the cylinders but also due to the smoothness of their exteriors whereby there are few hand-holds or there is little means whereby they may be manually gripped for and during movement. In the prior art there are shown various attempts that have been made to solve this problem but the devices there disclosed fail in one or more respects to adequately meet the problem. Too often the prime criticism lies in the fact that either the gripping means employed are ineffective or they depend upon almost super-human strength in the operator to perform the job.

Having in mind the defects of the prior art, it is an important object of this invention to provide a hand truck adapted by and including gripping means for the engagement of a gas cylinder which means will effectively hold the same during transport without requiring the exertion of force by the operator to maintain the gripping effect.

It is another object of this invention to provide, in a hand truck of the type mentioned, gripping means that are actuated largely through the weight of the object being gripped.

A still further object of this invention is the provision, in an article-gripping hand truck, of simple and efficient means for gripping a cylinder and which are not deleteriously affected by hard usage.

The foregoing objects and other ancillary thereto I prefer to accomplish as follows:

According to a preferred embodiment of my invention, I mount gripping means upon a conventional type hand truck in which there is a frame having lower wheels and upper handles whereby the truck may be moved from the upright to the portable position as well as trundled over the floor. In one prime exception my truck varies from the conventional in that the usual foot plate to engage under the object to be transported is eliminated as being unnecessary. In that form of the truck designed for the transport of two gas cylinders at a time, a medial horn stands out on the front of the hand truck frame and on either side in opposition thereto is mounted a movable jaw which coacts with the horn to grip the object. Each such movable jaw is mounted to swing about a loose pivot and means are provided for manually moving the jaw. Alongside each such jaw is a cam faced member which causes, in downward movement of the gripping arm, inward movement toward the object being gripped. The horn as well as each of the gripping arms has a friction pad to frictionally engage a cylinder and produce a tendency to adhere thereto under certain circumstance to be more specifically described hereafter. Such being the case when a cylinder is engaged between the horn and one of the movable jaws the operator then moves the movable arm downward whereupon it is urged inward against the side of the cylinder into frictional contact by the action of the cam faced member. Next the hand truck is tipped back on its wheels and the tendency of the cylinder to slide along the frame is absorbed in the frictionally engaged jaw which is drawn farther downward to be urged tightly inward by the cam member. Thereafter the truck may be moved around in other than upright positions without the cylinder being dislodged. To free the cylinder and the truck all that need be done is to place the same to the upright position where the bottom of the cylinders are placed upon the floor surface again and the weight of the truck will tend to dislodge the cam pressed jaws from about the cylinder and the truck will come free.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing, in which

Figure 1 is a view in side elevation of my hand truck with a cylinder about to be engaged,

Figure 2 is a fragmentary view in side elevation illustrating the manner of gripping of a cylinder,

Figure 3 is a top view of the truck and two cylinders, and

Figure 4 is an enlarged detail view of the cam faced member illustrating the mode whereby it urged the movable arm into gripping position.

A hand truck to overcome the defects hereinbefore enumerated must have at least two totally distinct characteristics; it must be capable of gripping for lifting a smooth cylindrical surface with the minimum of labor on the part of an operator; and it must be operable to release the gripping action upon the return of the cyl-

inder to the upright largely without the aid of the operator. Accordingly, a preferred form of my invention, referring to Figures 1 and 3 of the drawing, is constituted by a hand truck upon which my gripping mechanism is mounted. The hand truck comprises the frame formed of two side members 10, 10 and a suitable number of intermediate cross members 12, as well as the foot member 14. The upper end of each side member 10 is curved rearwardly to form a handle, as 16, 16. The numeral 18 designates legs on the back side of the frame and wheels 19, 19, are journalled in suitable bearings mounted upon the lower leg members 20.

It is particularly to be noted that the frame does not have as usual a ledge or shelf on the lower edge customarily found in hand trucks and insertable under the load to be lifted since such is unnecessary in my device.

In the middle of the frame and at an upper point thereon I mount a fixed horn 25 formed upon a cross bar 22 that spans the two side members adjacent the handle portions 16. On either side of fixed horn and along the side of the frame is swingably mounted the gripping arm or jaw 26, 26. The pins 28 form a loose pivot for each of the arms 26 and are supported by an offset arm 30 carried by the frame.

On the underside of each handle 16 is pivotally mounted a bell-crank lever 32 one arm 33 of which lies close to the handle 16 and the other stands out slightly to the rear from the pivot 34. A rigid link 36 connects the lower arm 38 of the bell-crank to the rear of arm 26. A spring 39 between arm 33 and handle 13 resiliently holds the two apart and applies slight downward pressure upon the link 36 and the arm 26.

On the frame side members 10 and alongside of the arms 26 is a hook or clip 40 having a camface 42 against which the arm 26 is forced in downward movement to the gripping position.

The ends of arms 26, 26 and horn 24 are pointed to permit easy insertion of those members between closely stacked banks of cylinders whereby paired cylinders would be forced apart.

In using the truck to grip a pair of cylinders *c*, *c* the operator runs the truck up to the cylinders and tips it upright whereupon it stands upon the lower face of foot bar 14 in an upright position alongside the cylinders. Each cylinder will engage one side of the fixed horn and the other side of each cylinder will be contacted by a movable arm 26. Initially this contact will be but loose and there will be no gripping of the cylinders until the operator grasps arms 33 of the bell-crank actuator levers 32 and draws upon the links 36 to lift the rear end of arm 26 and force the friction pads 44, one of which is on each arm 26, against the face of the cylinder. At that moment the cylinder is gripped fairly tightly due to the inward forcing action produced by the cam face 42 upon arm 26 as shown in Figure 4. In moving the cylinders it is normal next to tip the hand truck from the position of Figure 1 to that shown in Figure 2 and, when that is done, the cylinder will shift slightly downward as indicated in the drawing by reference to the relative position of the bottom of the cylinders and the bottom of cross bar 14. This downward shift drags the frictionally engaged arms 26 downward a greater degree against the cam face 42 than is normally convenient by hand. The result is a firm grip of each cylinder *c* between its adjacent arm 26 and the horn 24 which latter member also has pads 46.

While the cylinder is thus gripped the truck may be freely trundled as desired without fear that the cylinders will become dislodged. When the cylinders are to be set down and the truck released therefrom, the operator merely erects the cylinders and truck to the upright position. It will be observed that the bottom of the truck is slightly above the floor since the tightly gripping jaws 26 will hold it there until slight additional force is applied to force the truck down relative the cylinders. When that is down the downward movement of pivot 28 will cause the arm 26 to swing relative the horn 40 and the arms 26 will be freed from the cylinders and the truck may be moved away.

It will be apparent that the device works equally well with one cylinder as with two and it should be obvious that a truck may be designed embodying the principles of this invention but to accommodate only a single cylinder at a time. In the latter case one arm 26 and a fixed arm as 24 is all that is needed to produce the effective gripping means. Although I have shown and described certain specific embodiments of my invention, I am fully aware that many modifications thereof are possible.

I claim:

1. A hand truck, comprising: a frame having lower wheels and upper handle means, fixed means on said frame to engage a side of an object to be transported, an arm disposed fore and aft on said frame in opposition to said fixed means and to engage the other side of such an object, said arm being pivoted to said frame, a cam surface on said frame operable upon the forward part of said arm when the latter is moved downward to urge the same inward into gripping engagement upon such an object side, and means adjacent the handle means of said frame to urge the arm downward.

2. A hand truck, comprising: a frame having lower wheels and upper handle means, a horn on said frame to engage one side of an object to be transported by said truck, an arm disposed fore and aft in opposition to said horn to engage the other side of such an object, said arm being pivoted to said frame, and cam means between said frame and arm and operable upon downward pivotal movement of the forward part of said arm to swing the same toward the horn in gripping action upon an object therebetween.

3. In a hand truck, a two-wheeled frame having a pivoted fore and aft arm to lie alongside an object to be moved upon the truck, and a cam surface on said frame operable upon the forward portion of said arm when the latter is moved downward to urge the same inward into gripping engagement upon such an object side.

GEORGE L. AUSTIN.