

May 10, 1938.

A. J. A. CRESCENT ET AL

2,116,825

CONTAINER FOR THE TRANSPORT OF MERCHANDISE

Filed March 20, 1936

4 Sheets-Sheet 1

Fig. 1

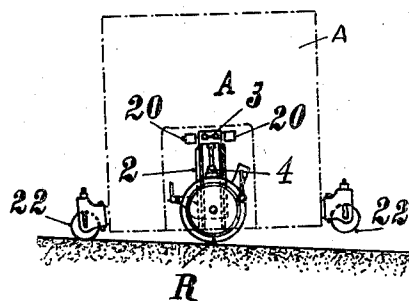


Fig. 2

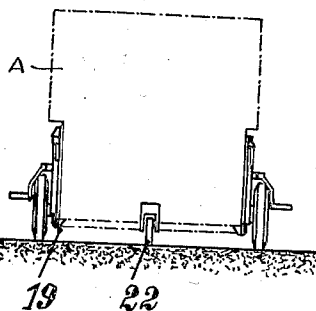
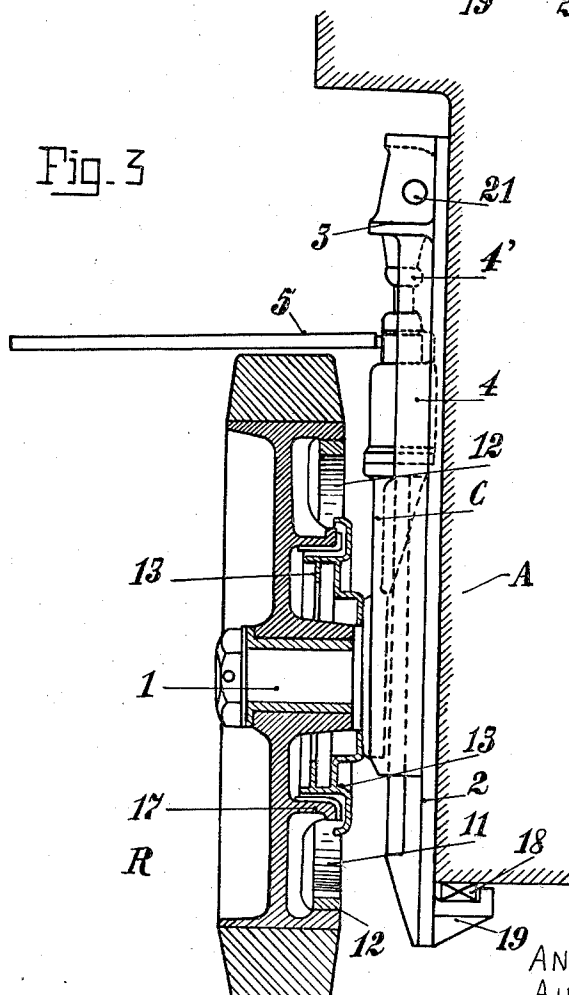


Fig. 3



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Fig. 4

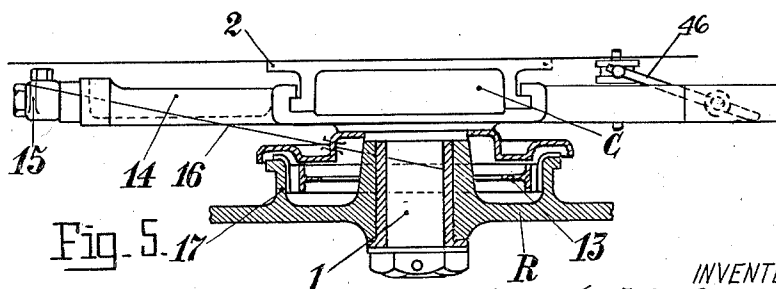
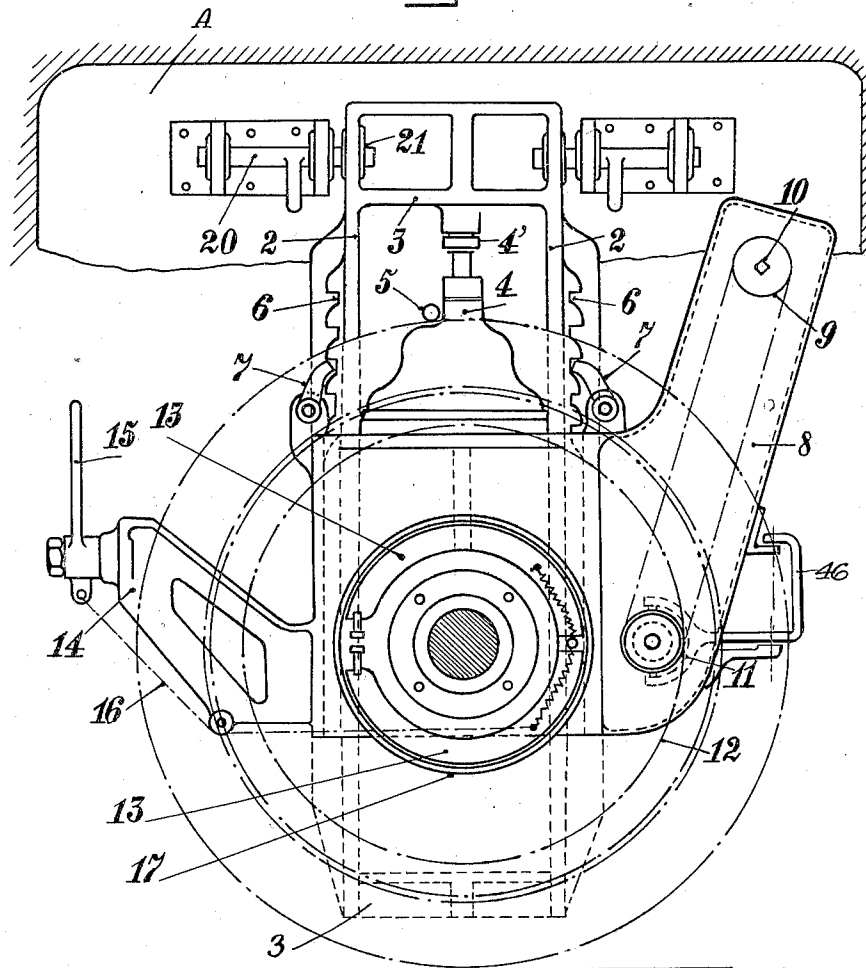


Fig. 5

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Fig. 6.

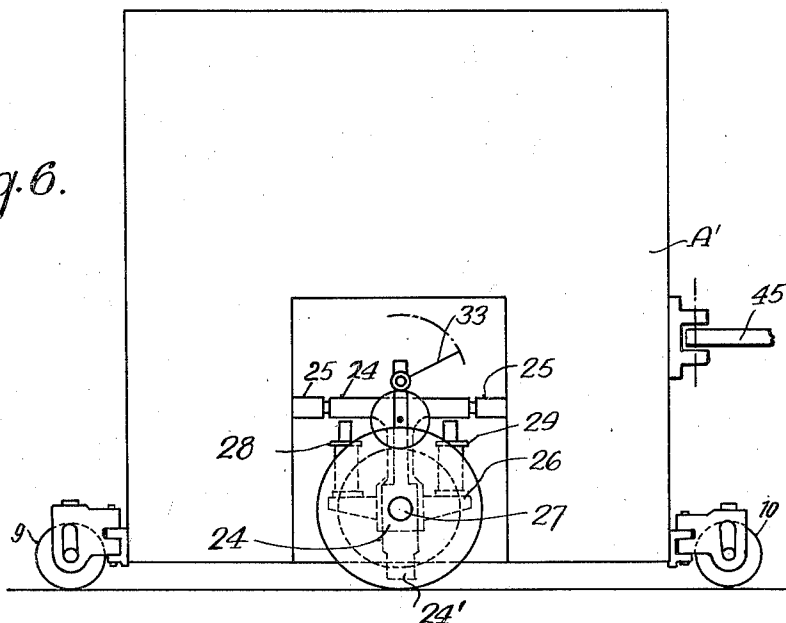


Fig. 7.

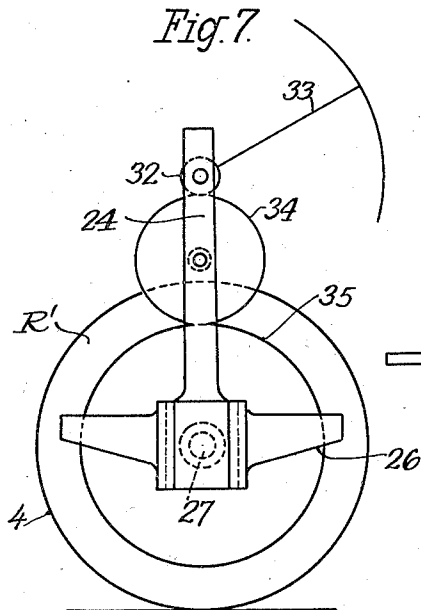
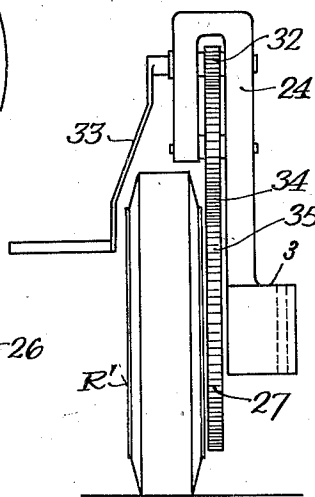


Fig. 8.



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Fig.9.

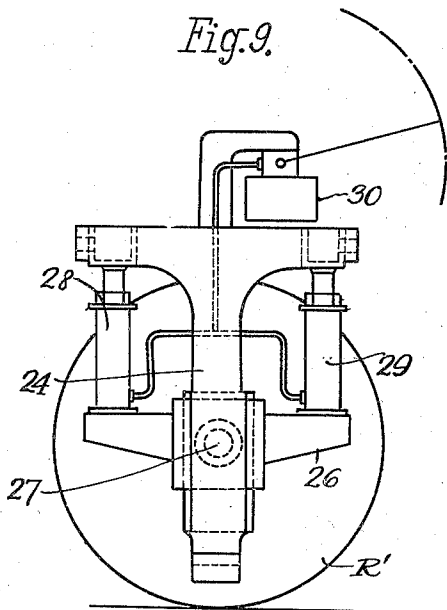


Fig.10.

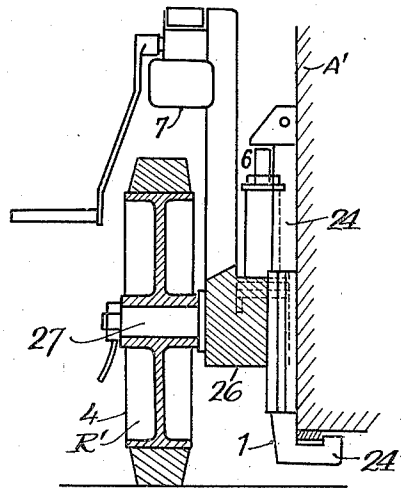
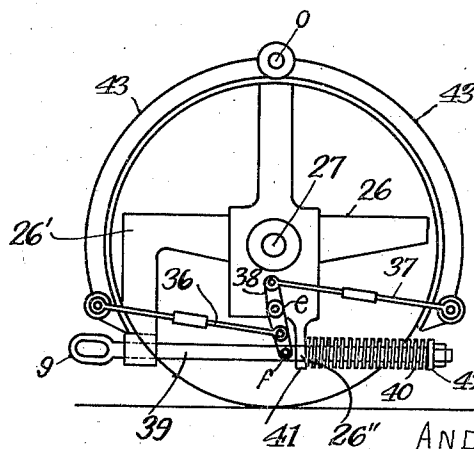


Fig.11.



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CONTAINER FOR THE TRANSPORT OF
MERCHANDISE

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Application March 20, 1936, Serial No. 69,956
In France June 25, 1935

9 Claims. (Cl. 280—3)

This invention relates to containers for the transportation of merchandise.

The present invention has for its object improvements in coffers or crates used for the transportation of merchandise, known under the name "containers" and relates more particularly to containers adapted for transportation to residences.

These improvements relate to an equipment comprising the means necessary for applying to the containers, by manual operation, all the operations possible for loading on a wagon, lorry or trailer, for unloading and rolling on the ground.

This equipment consists of supporting wheel units which may be applied in a removable manner, very rapidly and very easily, on each side of the container and which are each provided with means for lifting them so as to render the wheel supporting, to set it in rotation for the purpose of moving the container, and for braking the same when this is necessary.

The supporting wheel unit comprises essentially a vertically movable guide which can be secured by hooking and locking on a lateral face of the container and a slide carrying the hub of the wheel as also the various operating members, that is to say:

An irreversible hydraulic jack of which the vertical piston rod bears against an upper transverse member of the guide and raises this together with the container relatively to the wheel carrying slide when the jack is operated.

A stub shaft provided with a square portion for operation by a crank actuates a pinion which transmits its movement by a sprocket chain to a second pinion which gears with a toothed flange on the wheel for setting the latter in rotation.

A brake of the self-tightening type, with expanding shoes, arranged concentrically to the hub on the body of the wheel, and acting on a brake drum with its hubs actuated by a lever and cable.

In order that the invention may be more clearly understood reference will now be made to the accompanying drawings which show by way of example a preferred form of construction of the invention.

In the drawings:—

Figs. 1 and 2 are views of the whole, showing respectively a side view and end view of a container equipped with its lateral wheel carrying units and guide rollers along its central longitudinal plane.

Fig. 3 shows a vertical section of the wheel carrying unit.

Fig. 4 shows in front view the assembly of the guide and the slide, the wheel, assumed removed, being simply shown in outline by chain dotted lines.

Fig. 5 shows a horizontal section through the axis of the hub, the wheel being in position.

Fig. 6 is a side elevational view of a modified form of the invention.

Fig. 7 is a partial diagrammatic view of the propulsion mechanism for one of the wheels of the device of Fig. 6.

Fig. 8 is a front view of a driving wheel and its actuating mechanism, corresponding to that diagrammatically shown in Fig. 7.

Fig. 9 is a detail view of the lifting assembly of the device of Fig. 6.

Fig. 10 is view partly in vertical section of the structure shown in Fig. 9.

Fig. 11 is a side elevational view of the brake mechanism applicable to both forms of the invention.

In the drawings like references designate the same or similar parts.

The wheel R is rotatably mounted on the hub 1 carried by the slide member C (Fig. 3) which moves on a vertical guide comprising two uprights 2, connected together by lower and upper cross members 3 (Fig. 3). As hereinafter described, the guide is attached to the container A for connecting the wheels to the said container 1. The upper cross member 3 serves as an abutment for the head 4' of the piston rod of an oil jack the body 4 of which is secured to the member C. When this jack is operated by its lever 5 (removable), it pushes the guide upwardly on the slide as a result of which, the guide being secured to the container as will be described hereinafter, the container is raised and rests on the two supporting wheels R (Figs. 1 and 2). One feature resides in the fact that the jack is of the irreversible type so that no operation is necessary for preventing its piston rod from descending immediately after being raised. In any case in order to prevent the jack from being subjected, during the rolling of the container, to shocks resulting therefrom, the guide 2 is provided with two racks 6 and the slide with two rocking pawls 7 which it is possible, after the raising movement, to engage with the teeth of the racks 6.

The slide is provided with a lateral extension 8 which carries a pinion 9 keyed to a stub shaft 10 with a square end for a crank and a pinion 11 gearing with an internal toothed flange 12 of the wheel. The two pinions 9 and 11 are connected

together by a chain located between the flanges of the extension 8 of the slide. By turning the square portion of 10 by means of a removable crank it is thus possible to drive the supporting wheel R in one direction or the other.

The slide is also provided with extensible shoes 13 of a brake of the self-tightening type mounted concentrically with the hub 1. Brake shoe actuating means (not shown) are carried by said slide. A brake lever 15 is carried by an extension 14 and is connected by a cable 16 to the brake proper of which the shoes 13 act on the brake drum 17 of the wheel R. It is thus possible, the container being carried by its wheels R, to brake the movement either on both sides at once or on one side only. It will be seen readily that if desired, there may be provided a device for locking the brake in various positions, for example by a toothed sector co-operating with the brake lever.

The assembly consisting of the slide, the guide and the wheel thus forms a removable unit complete in itself and independent which can be mounted on the container or removed therefrom. For this purpose the container A is provided, underneath, with a portion slightly raised from the bottom thereof, a projection 18 being located therein under which can be engaged the lifting nose 19 of the slide. Two slide bolts 20 are provided on the side walls of container A as shown in Figs. 1 and 4. These bolts are adapted to enter corresponding holes or seats 21 in the uprights 2 of the guide.

The mounting of the wheel carrying unit is thus very simple and rapid. The whole apparatus is brought against the container. The guide, consisting of the uprights 2 and cross members 3, is hooked on at 18 to the lower portion of the container, and then by pushing the slide bolts 20 it is locked in position.

In order that the overall width of the container on the wheels does not exceed the maximum prescribed by regulations and for obtaining at the same time the maximum useful capacity the lateral wall of the container is provided with a retracted portion serving as a housing for the wheel carrying unit.

The container is also provided at the front and at the rear and along its central plane with two guide rollers 22 which can be raised or lowered by a screw device or the like.

The devices described make it possible for only two men to effect, within reduced periods of time, all the desired operations of management. If for example it is desired to move a container resting on the ground or a transporting platform there are first of all placed in position on each side the wheel carrying units, then the container is raised by means of the slide on the wheels R which become supporting members. There is also raised the front guide roller (Fig. 1). By then acting on the shafts 10 by means of cranks there may be effected all the necessary moving operations desired. When the two wheels are rotated in the same direction and at the same speed the container moves forward along a straight line; at different speeds it moves around a curve. When they are turned in opposite directions and at the same speed it turns about itself.

When the container descends a ramp or a slope on the ground it is possible to brake at will one or other or both the wheels by the brake levers 15. When the container has reached its destination it may be placed in position by lowering it

to the ground by means of the jacks and guides and there can then be removed instantaneously the wheel carrying units and then nothing whatever projects at the sides of the container.

For certain transports on the road it may be desirable to avoid loading on a lorry or trailer and all the necessary operations for this purpose by rolling the container directly on its supporting wheels R on the ground.

For rolling the container on its supporting wheels, by traction by means of a horse or a tractor, there are provided on the front face of the container devices 45 for removably hooking it to a shaft or to a drawbar. Since, in such cases, the hand driven mechanism for the wheels R is unnecessary, it is advisable to provide means 46 for declutching each wheel from its hand drive.

For hooking to the shaft or to the drawbar, any suitable device 45 may be employed, such as straps, lugs, hinged shaft, and so forth, secured to the container. For declutching the wheel it is possible, for example, to slidably mount on its shaft the pinion 11 which gears with the toothed flange of the wheel. This pinion is then shifted by clutch control 46.

Finally, this construction may be applied very easily to all types of containers, even constructed without a seat for the supporting wheels.

In the second embodiment, shown in Figs. 6 to 11, the guide 24 has a nose 24' engaging under the lower edge of the container and has its upper part secured to the sides of the container by means of two latches 25 or any other suitable means.

A slide 26 is mounted on the guide 24 for relative vertical sliding movement. Slide 26 carries an axle 27 on which wheel R' is rotatably mounted. This wheel is provided with an ordinary tire or a pneumatic tire, the radius of which must be great enough in order that the rolling resistance to forward movement remains small in spite of the unevennesses or the poor condition of the ground at the loading and unloading place.

In mounting this mechanical assembly, it is, of course, necessary that the wheel is out of contact with the ground. It is then necessary not only to let the wheel fall again once it has been mounted, but also to lift or raise the container A' relative to the wheels in order that the base of the container is sufficiently free from the ground to allow it to be moved.

For this purpose, there has been inserted between the guide 24 integral or rigidly connected with the container and the slide a lifting device shown in Figs. 6 and 9 as two jacks 28 and 29 fed by a pump 30 and provided with holding nuts such as 31.

Obviously, the said lifting device can be of any other type according to the strains and the strokes to be considered, without departing from the scope of the invention.

In order to facilitate the mounting of the above described devices it is well to use light alloys and to construct the wheel dismountable on its axle in order to limit the weight of each indivisible assembly to such an amount that it may be carried by two men.

Thus the wheel is mounted by simply slipping it onto the axle-journal and clamping it by means of a nut provided with an actuating handle and having a high pitch.

The above described devices which consequently comprise rolling parts and lifting parts also comprise propulsion parts. The latter may be

supplied by several kinds of energy such as compressed air, electricity and the like, without departing from the character of the invention.

In Figs. 7 and 8 there is shown a purely mechanical device formed of a toothed pinion 32 driven by a crank 33 and engaging an idler gear 34 for reasons of space required which, in turn, engages a toothed ring 35 integral or rigidly connected with the wheel R'.

Once the device is mounted and the container lifted on the jacks, two workmen each grasping the crank of one of the two side carriages can move a load of three tons. The reducing gear ratio is such that on a good ground and for a container loaded with three tons a translation speed of 500 meters per hour can be obtained without any difficulty.

The device also embodies a braking system formed of two brake shoes which engage the tire of the wheel R'.

Of this braking system a plurality of embodiments are possible according to the result to be obtained. Fig. 11 shows a construction having a sufficiently powerful braking action for retaining the container in the case of breakage or slacking up of the traction or towing ropes or cables during the moving of a load up an inclined plane, the inclination of which is of the order of 20%.

Both brake shoes 43 are pivotally mounted about a fixed axis O. On the other hand, they are actuated through the rods 36 and 37 which are controlled by the lever 38, the latter being pivotally mounted about a fixed point e.

This lever is actuated at its end f by a tube 39 on which slides a powerful coil spring 40. A traction or towing cable is fastened to tube 39 at g. This spring is inserted between a fixed stop 41 and an adjustable stop 42 on the tube.

When the tube 39 is pulled against the action of spring 40, lever 38 is actuated to release the brake shoes from braking engagement with the brake drum. Upon ceasing to pull tube 39 against spring 40, the latter displaces the tube to the right (Fig. 11) and the lever 38 is actuated to apply the brake shoes on the drum to effect the braking action. By adjusting the position of stop 42 on tube 39, the compression of spring 40 may be varied.

The brake device of Fig. 11 is without difficulty applicable to the construction represented in Figs. 6-10. As clearly shown in Fig. 11, it suffices for this purpose to modify one of the arms of the slide 26 to form the downwardly extending projection 26' and provide the end with a guide for the tube 39. Correspondingly, the body of the slide 26 may be provided with a lug 26'', which forms a second guide for the tube 39.

The operation of the device is now as follows.

Operation on the ground.—Normally the spring 40 should not be compressed. When it is desired to apply the brake, the spring is compressed and the compression stress of the same is transmitted to the system of lever and brake shoes.

Braking during lifting.—The spring 40 is initially compressed and the traction rope or cable is hooked up at the end g of the tube 39. The tension of the cable tends to overcome the action of the spring 40 and loosens the shoes 43, thus allowing the container to start as soon as the stress in the cable reaches and exceeds the initial tension of the spring.

This initial tension is a function of the lifting slope. Thus the brake must be so calculated that its efficiency should be sufficient for a compression stress on the spring which does not exceed a certain fraction of the traction force.

From the above given description it will be realized that this brake is automatic since, in case of a breakage or slacking up of the traction cable or cables, the spring 40 instantaneously operates for energetically braking the container.

We claim:

1. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a gear fixed to said wheel, a lateral extension carried by said slide, a pinion carried by said extension and meshing with the gear on said wheel, means carried by said extension for rotating said pinion to rotate said wheel, and a jack for moving said slide downwardly on said guide.

2. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a brake drum mounted on said wheel, brake shoes carried by said slide, means for manually actuating the brake shoes on said drum to brake said wheel in order to brake and guide the container during movement and a jack for moving said slide downwardly on said guide.

3. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a gear fixed to said wheel, a lateral extension carried by said slide, a pinion carried by said extension and meshing with the gear on said wheel, means carried by said extension for rotating said pinion to rotate said wheel, a brake drum mounted on said wheel, brake shoes carried by said slide, means for actuating said brake shoes to brake said wheel, and a jack for moving said slide downwardly on said guide.

4. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a gear fixed to said wheel, a lateral extension carried by said slide, a pinion carried by said extension and meshing with the gear on said wheel, means carried by said extension for rotating said pinion to rotate said wheel, a jack for moving said slide downwardly on said guide, and means for shifting said driving pinion out of mesh with the gear on the wheel.

5. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a ring gear fixed to said wheel, a lateral extension carried by said slide, a pinion carried by said extension, means for transmitting rotary motion from said pinion to said ring gear, means carried by said extension for rotating said pinion to rotate said wheel, and a jack for moving said slide downwardly on said guide.

6. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of

large diameter carried by said slide, a rubber tire on said wheel, a ring gear fixed to said wheel, a lateral extension carried by said slide, a pinion carried by said extension, gears for transmitting rotary motion from said pinion to said ring gear, means carried by said extension for rotating said pinion to rotate said wheel, and a jack for moving said slide downwardly on said guide.

7. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a ring gear fixed to said wheel, a lateral extension carried by said slide, a sprocket wheel carried by the extension, means including a chain for transmitting rotary motion from said sprocket to the ring gear, means for rotating said sprocket to turn said wheel, means carried by said extension for rotating said pinion to rotate said wheel, and a jack for moving said slide downwardly on said guide.

8. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a ring gear fixed to said wheel, a

lateral extension carried by said slide, a sprocket wheel carried by the extension, means including a chain for transmitting rotary motion from said sprocket to the ring gear, means for rotating said sprocket to turn said wheel, a brake drum mounted on said wheel, brake shoes carried by said slide, means for manually actuating the brake shoes to brake said wheel in order to brake and guide said container during movement, and a double jack for moving said slide downwardly on said guide.

9. A rolling attachment for containers, comprising a vertical guide adapted to be detachably secured on opposite side walls of a container, a slide slidably mounted on each guide, a wheel of large diameter carried by said slide, a rubber tire on said wheel, a ring gear fixed to said wheel, a lateral extension carried by said slide, a pinion carried by said extension, means for transmitting rotary motion from said pinion to said ring gear, means carried by said extension for rotating said pinion to rotate said wheel, a jack for moving said slide downwardly on said guide, means for declutching said ring gear from said driving pinion, and means on said container for pulling the container.

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