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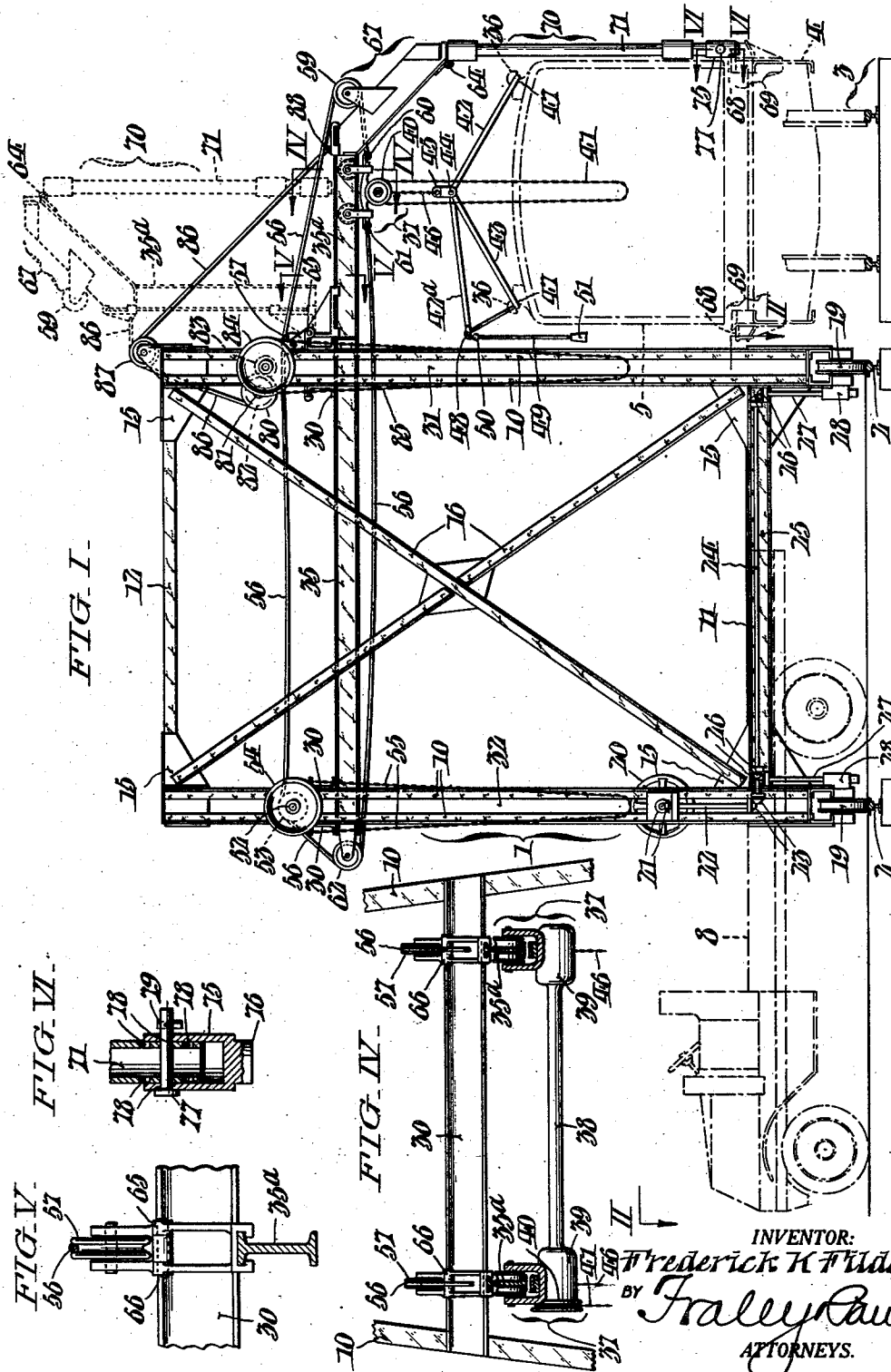
F. K. FILDES

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CONTAINER TRANSFER APPARATUS

Filed July 28, 1933

3 Sheets-Sheet 1



INVENTOR:
Frederick K Fildes,
BY *Friley Paul*
ATTORNEYS.

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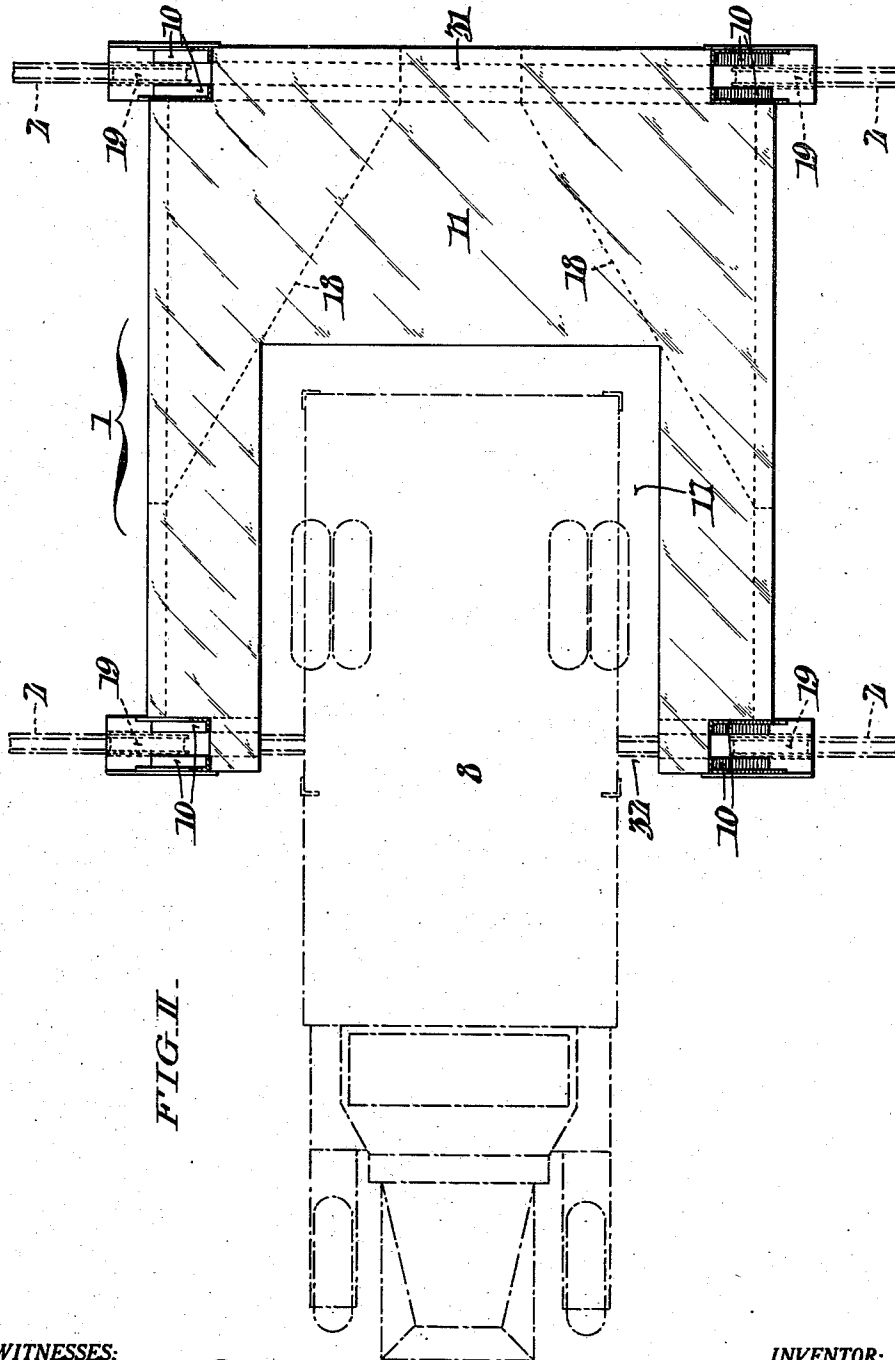
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3 Sheets-Sheet 2



WITNESSES:

Thomas W. Kerr, Jr.
William B. Lee, Jr.

INVENTOR:

Frederick K. Fildes,
BY Tracy & Paul
ATTORNEYS.

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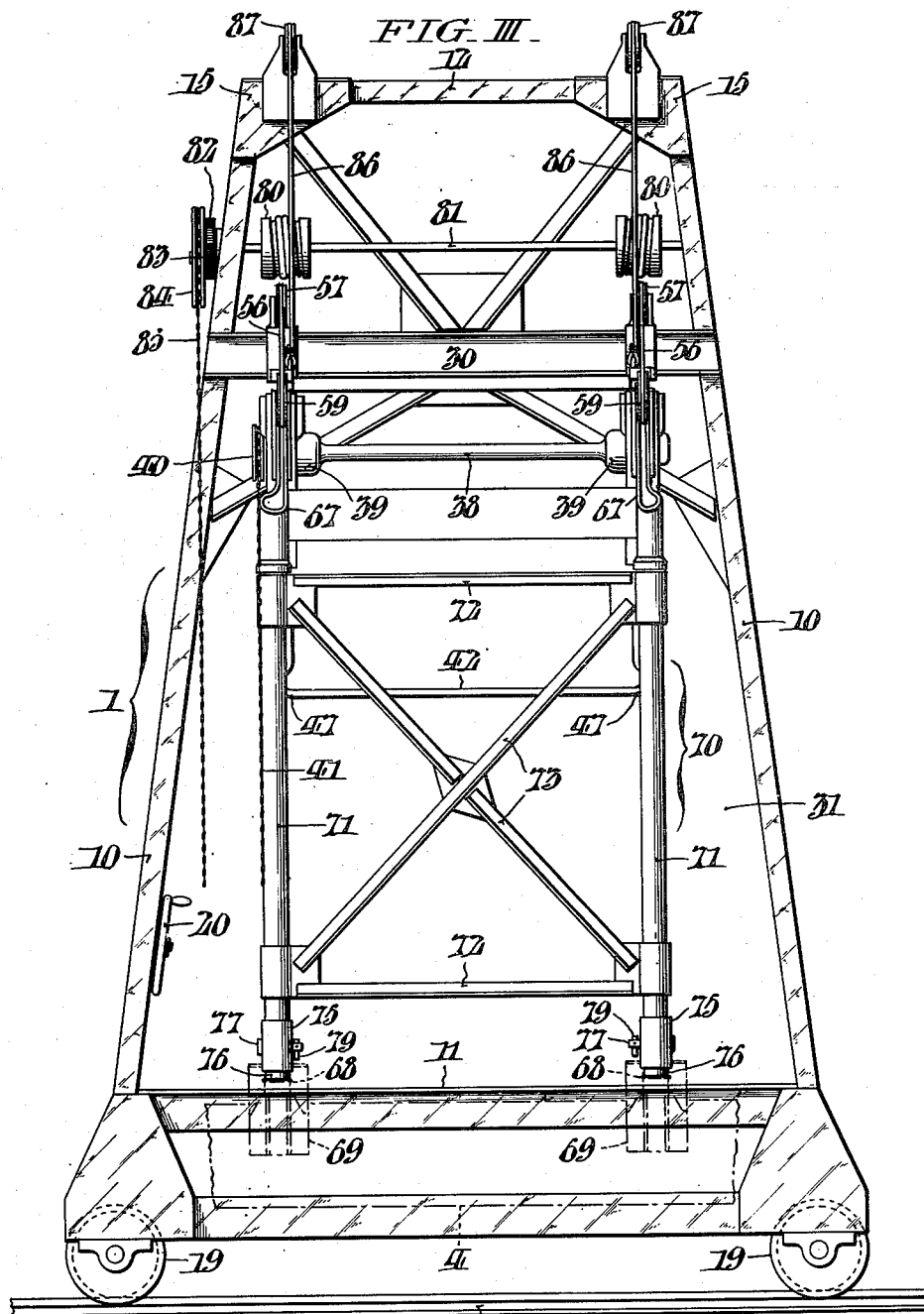
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3 Sheets-Sheet 3



WITNESSES:

Thomas W. Kere Jr.
William B. Lee, Jr.

INVENTOR:

Frederick K. Fildes,
BY Tracy & Paul
ATTORNEYS.

UNITED STATES PATENT OFFICE

1,990,538

CONTAINER TRANSFER APPARATUS

Frederick K. Fildes, Altoona, Pa.

Application July 28, 1933, Serial No. 682,637

3 Claims. (Cl. 214—38)

This invention relates to apparatus for transferring railway containers or like objects from one platform to another, as from railway car to railway car, from car to truck, from car to stationary platform, or vice versa, the invention being particularly useful at stations where cranes or other container handling facilities are not available.

The principal object of the invention is to provide simple and inexpensive means for shifting a container from one platform to another, such transfer means being readily movable to the desired position alongside a container vehicle or a station platform, and constituting a unit complete in itself and not dependent for its operation upon special car truck, or station platform equipment.

Another object of the invention is to provide in container transfer apparatus characterized by a framework having an overhanging trackway adapted to extend outward over a container vehicle, novel means for insuring the stability of the framework when a load is carried on the overhanging trackway.

Other more specific objects and advantages characterizing my invention will become more fully apparent from the description hereinafter set forth of one embodiment or example thereof, the description having reference to the accompanying drawings. Of the drawings:

Fig. I represents a side elevation of transfer apparatus of my invention operating to shift containers between a railway car and a motor truck.

Fig. II represents a horizontal cross section of the apparatus, taken as indicated by the arrows II—II of Fig. I.

Fig. III represents an end elevation of the transfer apparatus.

Fig. IV represents a cross section of the transfer apparatus, taken as indicated by the arrows IV—IV of Fig. I.

Fig. V represents another cross section of the transfer apparatus, taken as indicated by the arrows V—V of Fig. I; and,

Fig. VI represents a cross section of the supporting frame member, taken as indicated by the arrows VI—VI of Fig. I.

With particular reference to Fig. I, there is represented in the drawings a typical transfer station arrangement to which my invention may be applied to advantage. The transfer apparatus is comprehensively designated at 1, and moves along a track formed of spaced parallel rails 2. Adjacent to the rails 2 and parallel therewith there is shown a railway track 3, and in dot-and-dash lines a car 4 thereon carrying shipping containers 5. At the opposite side of the rails 2 there

is also shown in dot-and-dash lines a conventional motor truck 8.

The transfer apparatus 1 comprises generally a framework rigidly tied and braced at the top, bottom and sides, and having large openings in each end thereof. The framework of the transfer apparatus includes corner posts 10 connected near their bottom ends by a base member 11, and joined at their upper ends by a rectangular frame 12. At the sides the transfer apparatus framework is reinforced by corner gussets 15 and diagonal braces 16. The reference herein to the "sides" and "ends" of the transfer apparatus is merely for the purpose of convenient designation, as the particular shape of the box framework admits of considerable variation.

As clearly shown in Fig. II, the base member 11 is of U-shaped formation defining a truck receiving space 17 and also affording an elevated platform partially surrounding the truck receiving space, and upon which the operator may move about freely within the framework. The platform height approximates that of a container car floor. To reinforce the base platform 11 large angle pieces 18 are desirably provided at the two corners remote from the entrance to the truck receiving space 17. The container transfer apparatus 1 has wheels 19 at the four corners of the bottom of the framework, these wheels being disposed transversely and flanged for engagement with the rails 2. As shown in Fig. I, the rails 2 are embedded beneath the ground level, thus permitting a truck, such as indicated at 8, to back into the framework without obstruction by the rails. Inasmuch as the framework of the container transfer apparatus 1 is movable along the ground, whether supported on rails or engaging the ground directly, as a unit independent of the container carrying vehicles, I conveniently designate the same as a "ground engaging" framework.

In the illustrated example of my invention, one pair of wheels 19 is interconnected and propelled by hand operated mechanism readily accessible to an operator standing on the base platform 11. The propelling mechanism includes a hand wheel 20, mounted on one of the corner posts 10 some distance above the base platform 11, and driving through bevel gears 21 a vertical shaft 22. At the bottom end of the shaft 22 there are bevel gears 23 connecting the same to a horizontal shaft 24 which extends across the side of the framework, and which is preferably housed in and protected by a channel beam 25. Each end of the connecting shaft 24 has thereon bevel gears 26 driving vertical shafts 27 which extend downward

to the vicinity of the wheels 19 and connect therewith through suitable gearing, such gearing being located within gear casings designated at 28.

Extending horizontally and transversely across each end of the framework of the container transfer apparatus 1 near the top thereof, are cross beams 30 which desirably take the form of channel beams and which support container hoisting and carrying mechanism. The opening 31, defined at one end of the framework between the beam 30 and the base platform 11, is conveniently designated as a "container receiving" opening, for it is essentially of a size sufficient to permit a container to enter therethrough into the interior of the framework. The opening 32 at the opposite end of the framework, defined between the cross beam 30 and the ground, is conveniently designated as a "truck receiving" opening, for it is of sufficient size to permit a truck with a container thereon to back into the interior of the framework.

Suspended from the cross beams 30 there are two I-beams 35 which together constitute a trackway for the container hoisting and carrying mechanism. The I-beams 35 extend endwise across the top of the framework and lead from the vicinity of the opening 32 at one end of the framework through the opening 31 at the other end thereof. The I-beams 35 are spaced apart in parallel relation at a distance corresponding approximately to the center to center distance between each pair of lifting hooks 36 on the containers with which the apparatus is operated. Each I-beam 35 includes a hinged extension 35a adapted to overhang the railway track 3.

Supported on the base flange of each I-beam 35, or its extension 35a, there is a trolley 37. The two trolleys 37 are interconnected by a tubular casing 38 which houses at each end 39 suitable hoisting gear for elevating the containers. The hoisting gear at one end is connected to the hoisting gear at the other end by a shaft which extends through the tubular casing 38. To operate the hoist, there is provided an external sheave 40 with an operating chain 41 hanging down therefrom to within reach of a man standing within the framework, or on the container carrying vehicle alongside the framework.

The particular form of lifting coupler which is suspended from the hoist of the container transfer apparatus 1 forms the subject of my co-pending application for U. S. Letters Patent, Serial No. 682,635, filed July 28, 1933. It comprises two stirrup suspension arms 42, 43 which are pivoted at their ends about a shaft 44 and which are maintained in angular spread position with capacity for limited relative movement. The shaft 44 passes through and is supported at its ends by yokes 45 which are linked to the hoisting chains 46, one to each hoist. Associated with the U-shaped arm 42 there is an operating rod 42a constituting an extension of one end of the arm 42. At the end of the operating rod 42a there is an eye 48 through which passes a control line 49 in the form of a flexible cable. The control line 49 passes through the eye 48 of the operating rod 42a and leads to the heel 47 of the U-shaped arm 43. A stop 50 on the control line 49, of a size too large to pass through the eye 48, holds the U-shaped arms 42, 43 in spread position when they are not engaged with a container. At its end the control line 49 terminates in a weighted handle 51 which extends downward conveniently within reach of a man standing on the platform 11 of the transfer apparatus 1, or on the platform

of the container vehicle 4 alongside the transfer apparatus.

For the purpose of propelling the trolleys 37 simultaneously along the I-beams 35, there is provided a transverse actuating shaft 52 having winding drums 53 spaced thereon above the I-beams 35. The winding drums 53 and actuating shaft 52 are turned by means of a sheave 54 and a hand operated chain 55 which hangs downward within the framework to a position within reach of a man standing on the platform 11. Attached to each winding drum 53 there is a continuous cable 56 which extends over a sheave 57 at the container receiving end of the framework, and then outward over a sheave 59 near the end of the I-beam extension 35a. The cable 56 then extends beneath the I-beam extension 35a to one end 60 of the trolley 37. From the opposite end 61 of the trolley 37, the cable 56 passes longitudinally beneath the I beam 35 to the end thereof at the truck receiving opening of the framework, where it passes over a sheave 62 and extends upward back to the winding drum 53. In an obvious manner movement of the hand operated chain 55, through the winding drums 53 and cables 56, causes the trolleys 37 to be propelled together along the I-beams 35.

The I-beam extensions 35a are supported in alignment with the I-beams 35 by hinges 65 having pintles 66, as shown most clearly in Fig. V. The ends of the I-beam extensions 35a are cross connected by a downwardly and outwardly inclined frame 67, rigidly spacing the I-beam extensions and terminating at a point directly over the stake pockets 68 associated with the container seating abutments 69 on the container car 4. At the lower end of the frame 67 there are hinges 64 joined to supporting means for the overhanging portion of the trackway. Such supporting means comprise a trussed frame 70 spaced in advance of the container receiving opening 31 and including vertical members 71, cross bars 72, and diagonal bars 73. Accordingly, the vertical members 71 are rigidly spaced apart and cross braced.

At the base of the trussed frame 70 the vertical members 71 extend downward and are rendered extensible by means of adjustable sleeves 75 having feet 76 of such size as to fit within the stake pockets 68 of the railway car 4. The sleeves 75 are secured in place by means of locking pins 77 which pass through holes 78 spaced vertically along the members 71, as clearly shown in Fig. VI. The locking pins 77 are in turn held in place by hinged keepers 79. By the above construction the supporting frame 70 is rendered adjustable to suit varying heights of car sills.

Mounted at the container receiving end of the framework above the cross beam 30, there is a shaft 81 having thereon winding drums 80 and operated, through a gear 82 and pinion 83, by a sheave 84 with a depending hand chain 85. The hand chain 85 extends downward to within convenient reach of a man standing on the base platform 11 of the framework. To the winding drums 80 there are attached cables 86 which lead upward over sheaves 87 at the top of the framework and then downward to the top of the extension frame 67 where they are attached as indicated at 88. In an obvious manner the hand chain 85, through the winding drums 80 and cables 86, may be operated to cause the I-beam extensions 35a to be raised to the position indicated in dotted lines in Fig. I. With the I-beam extensions 35a raised to the position thus indicated, the supporting frame 70 is caused to swing

about its hinges 64 and to be maintained in a vertical position clear of the container receiving opening.

A typical example of the operation of the container transfer apparatus 1 is as follows: In the event that it is desired to transfer a container 5 from a car 4 standing on the track 3 to a truck 8 disposed at the other side of the rails 2, the container transfer apparatus 1 is first moved along the rails 2 to a position abreast of the particular container 5 which it is desired to shift. This movement is accomplished by the operator turning the operating wheel 20 which, through the mechanism hereinbefore described, propels the wheels 19 and drives the transfer apparatus 1. With the container transfer apparatus in position, abreast of the container to be transferred, the operator standing on the base platform 11 actuates the hand chain 85 to lower the trackway extension and the supporting frame 70 over the container car. The supporting legs are then adjusted, if necessary, and positioned in the stake pockets 68, care being taken to insure that the I-beam extensions 35a are in a level position. The operator then proceeds to actuate the hand chain 55 to bring the hoisting mechanism to a point above the container. If there is no container adjacent the one to be transferred, the operator may step over onto the car floor to operate the hoisting chain 41; or, if there is a container in that position, the chain 41 will hang over the side of that container and be accessible from the platform 11.

The operator then proceeds by means of the hoisting mechanism to lower the lifting coupler onto the top of the container to be transferred to a point where the heels 47 of the arms 42, 43 rest on the surfaces adjacent to the container hooks 36. By manipulation of the control line 49, the arms 42, 43 may be caused to come to rest within the bight of each hook 36. With the container in readiness for hoisting, the hand chain 41 is operated to lift the container clear of its seat members 69 on the railway car 4. The operator then shifts his position to the truck receiving end of the framework and manipulates the hand chain 55 to bring the container into the interior of the framework.

With the container positioned within the framework of the transfer apparatus, the entire apparatus may, if necessary, be moved along the rails 2 to a position abreast of the truck runway. The motor truck 8 which has come to receive the container is then backed into the truck receiving space 17 of the framework to receive the container, and the operator proceeds to lower the container by means of the hoisting mechanism onto the platform of the motor truck 8, and then to uncouple the container. For the purpose of uncoupling, when the hoisting mechanism has been operated to lower the container onto the truck platform, the arms 42, 43 of the lifting coupler are caused to be spread and to disengage the hooks 36. Before again raising the lifting coupler, the operator pulls the handle 51 of the control line 49 and holds the handle with one hand while raising the lifting coupler by means of the hoisting operating chains 41 with the other hand. In this manner the lifting coupler clears the container hooks and is readily disengaged.

It will be observed that the trackway extension and its supporting trussed frame 70 serve to bridge the container vehicle, so that incident to the raising of the container the transfer appa-

ratus is maintained in stability even though the container may have therein a very heavy load. Moreover, when the transfer apparatus is not in use, it may still be positioned on the rails 2 adjacent the track 3 without danger of obstructing passing vehicles, by swinging upward the trackway extension and its supporting frame 70 and maintaining these elements in the raised position.

While I have described one particular form which the container transfer apparatus of this invention may take, it will be apparent to those skilled in the art that many changes may be made in the apparatus without departing from the spirit of my invention as defined in the annexed claims.

Having thus described my invention, I claim:

1. Transfer apparatus for railway containers or the like comprising a movable ground-engaging framework adapted to house a container, said framework being open at each end, a trackway extending endwise across the top of the framework through the opening at one end thereof and having a hinged extension overhanging beyond said opening, container hoisting and carrying mechanism movable on said trackway, supporting means for said trackway extension swingably attached to the end thereof, said supporting means being adapted for supporting attachment to the side of a container vehicle, and means for lifting said hinged extension together with said supporting means upward and clear of traffic over the railway tracks served by the transfer apparatus.

2. Transfer apparatus for railway containers or the like comprising in combination with a container vehicle having stake pockets at the sides thereof, a movable ground engaging framework adapted to house a container, and positioned alongside said container vehicle, said framework being open at each end, a trackway extending endwise across the top of the framework through the opening at one end thereof and overhanging the container vehicle, container hoisting and carrying mechanism movable on said trackway, and supporting means extending downward from the overhanging portion of said trackway in advance of the opening aforesaid, said supporting means being in the form of a trussed frame having extensible bottom legs fitting in the stake pockets of the container vehicle.

3. Transfer apparatus for railway containers or the like comprising in combination with a container vehicle having stake pockets at the sides thereof, a trackway running parallel to the railway tracks to be served, a movable framework having wheels for engagement with said trackway, said framework being adapted to house a container and open at each end, a trackway extending endwise across the top of the framework through the opening at one end thereof and overhanging the container vehicle to be served, container hoisting and carrying mechanism movable on said trackway, supporting means extending downward from the overhanging portion of said trackway in advance of the opening aforesaid and adapted to fit into the stake pockets of the container vehicle, means for adjustment of the length of said supporting means, and means for progressing said framework along said trackway said means having capacity for fine adjustments in seating said supporting means in said stake pockets.

FREDERICK K. FIELDS.