

June 10, 1930.

J. A. AMENDOLARA

1,763,560

LOADING APPARATUS

Filed Nov. 26, 1927

4 Sheets-Sheet 2

Fig. 2.

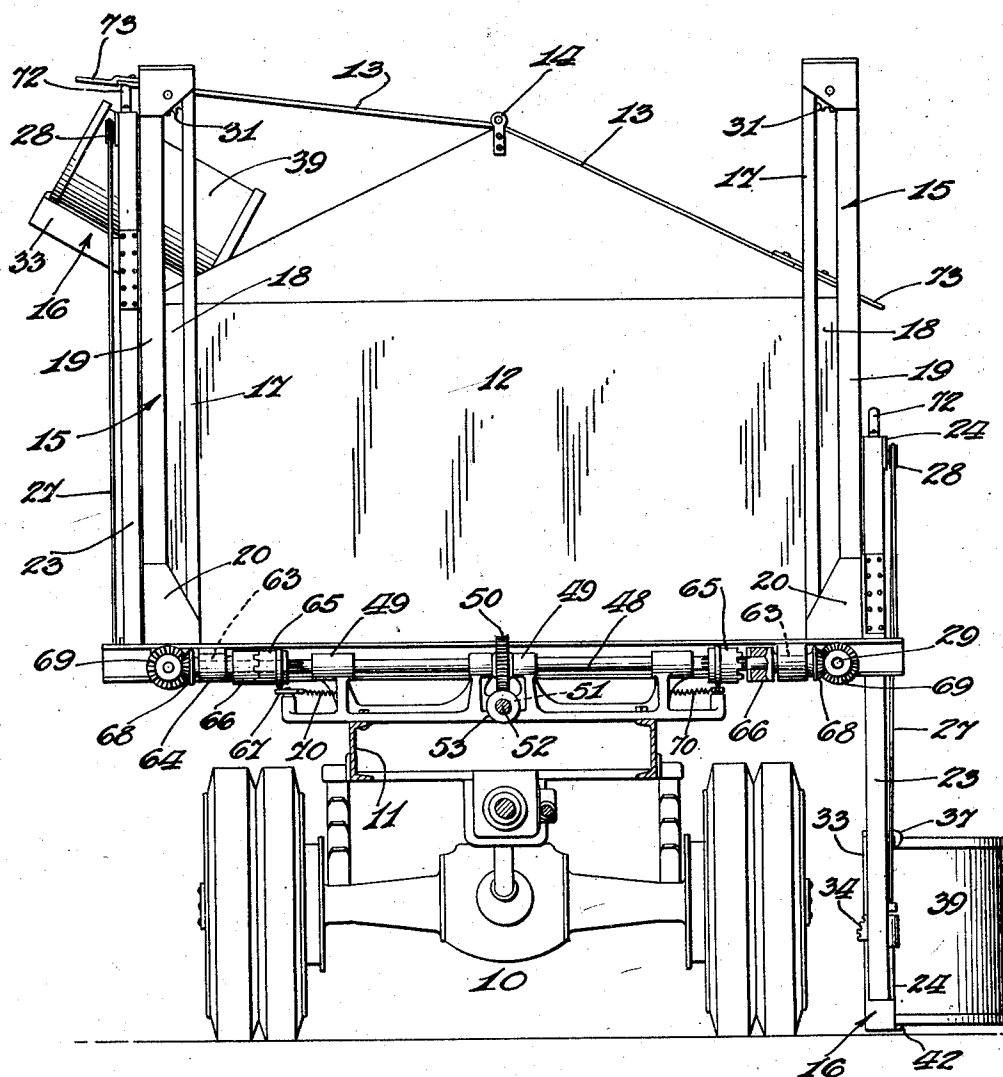
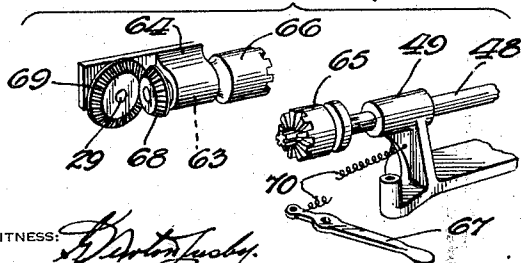


Fig. 8.



WITNESS:

W. H. J. Juby

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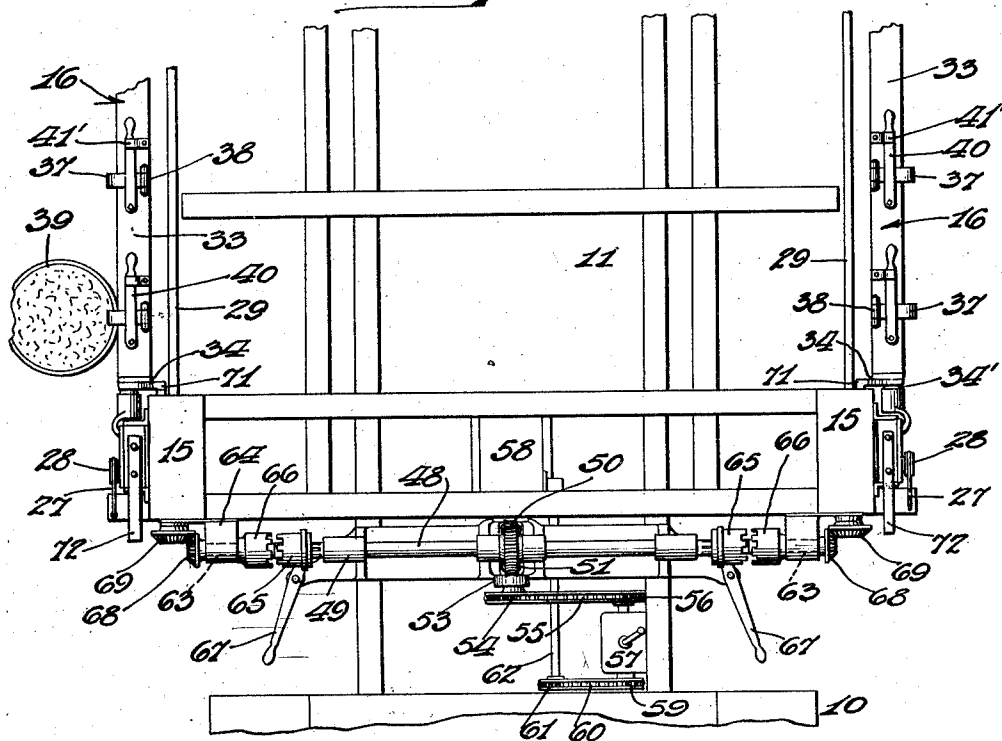
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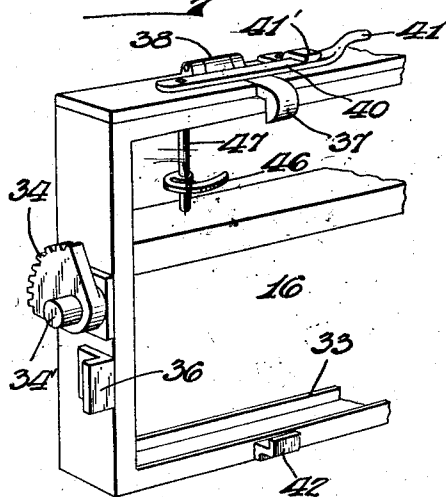
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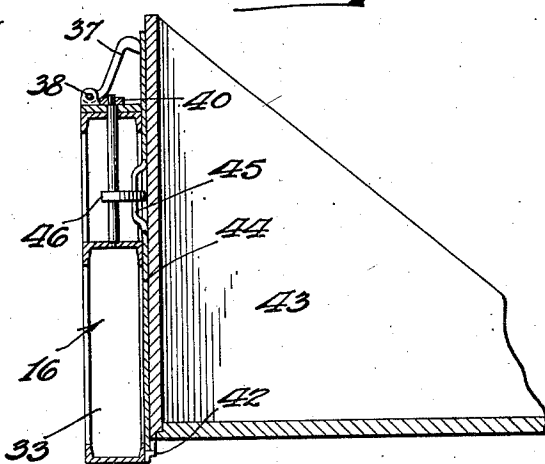
Fig. 3.



Πρόβ. 6.



Flies. 4.



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June 10, 1930.

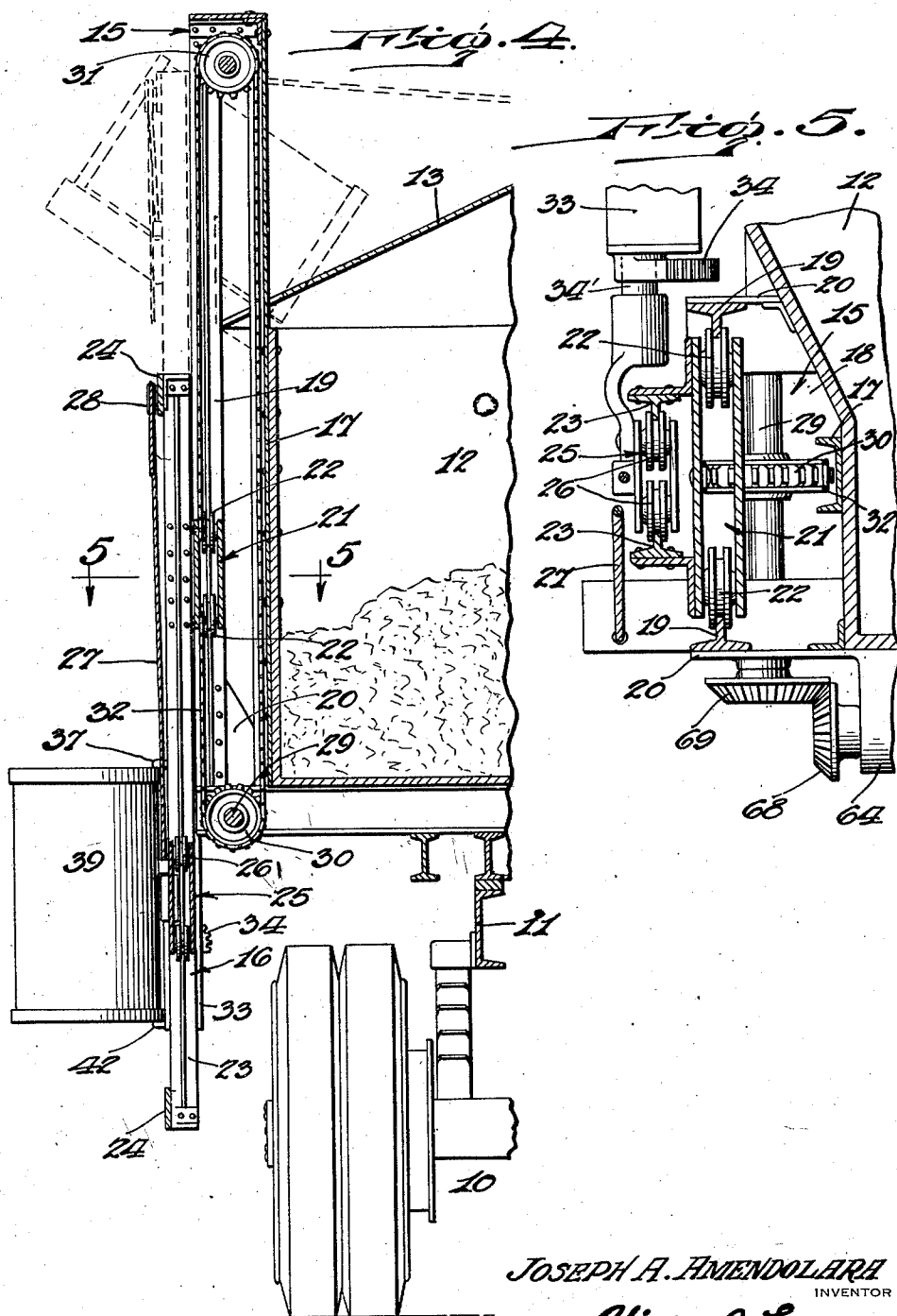
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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LOADING APPARATUS

Application filed November 26, 1927. Serial No. 235,955.

This invention relates to loading apparatus and is an improvement over the apparatus shown and described in co-pending application Serial Number 154,155, filed December 11th, 1926.

The primary object of the invention resides in an apparatus for use upon motor trucks for lifting containers of rubbish, ashes or garbage from the surface to the top of the body where they are automatically upset to deposit their contents into the body, after which the empty containers are lowered to the ground and manually removed from engagement with loading apparatus.

Another object of the invention is to provide a loading apparatus for use upon motor dump trucks and in which the power for operating the same is taken from motor of the truck but which power transmitting means does not interfere with the dumping operation of the truck.

Another object is to eliminate the use of rack bars such as shown in my co-pending application which have proven unsatisfactory in that they extended well above the top of the body of the truck when the can carrier was in a raised position. In lieu thereof, I provide a novel arrangement of carriages, rails and cables by which the carriers may be lifted without any movement of parts above the top of the truck body.

With these and other objects in view, the invention resides in certain novel construction and combination and arrangement of parts, the essential features of which are hereinafter fully described, are particularly pointed out in the appended claims, and are illustrated in the accompanying drawing, in which:—

Figure 1 is a side elevation of my improved loading apparatus shown upon a dump truck.

Figure 2 is a vertical transverse sectional view on the line 2—2 of Figure 1.

Figure 3 is a fragmentary top plan view.

Figure 4 is a vertical sectional view on the line 4—4 of Figure 1.

Figure 5 is an enlarged horizontal sectional view on the line 5—5 of Figure 4.

Figure 6 is a fragmentary perspective view of one end of the carrier.

Figure 7 is a detail sectional view through the carrier showing the manner of attaching trash containers thereto.

Figure 8 is a detail perspective view showing part of the driving mechanism in a separated condition.

Referring more particularly to the drawings, the reference numeral 10 designates a motor truck including a chassis 11 for supporting a dump body 12 of the usual well-known construction. The open top of the body is closed by oppositely inclined covers 13 hinged at their meeting edges as at 14. Provided at each of the four corners of the body are hoisting and lowering mechanisms 15 for lifting and lowering receptacle carriers 16 extending along the opposite sides of the truck body. The hoisting mechanisms 15 on one side of the body serve to actuate the carrier on that particular side in a manner to be presently described.

Each hoisting and lowering mechanism includes a U-beam 17 which is fixed to the side wall of the truck body, which side wall is provided with a pocket 18 to accommodate the hoisting mechanism so that it will not project too far beyond the plane of the major portion of the side wall. The U-beam 17 projects above the side walls and constitutes part of a frame structure which includes spaced parallel side rails 19, 19, which are T-shape in cross section and which extend from the bottom of the truck to a point adjacent the top of the U-beam 17. The top and bottom of the rails and U-beam are rigidly held by brackets or bridge pieces 20.

Movable over the rails 19, 19 of each hoisting mechanism is a carriage 21 having sets of grooved rollers 22 for engagement with the said rails. The carriage is normally at the bottom of the rails 19, 19 and carries spaced parallel T-shaped rails 23, 23 which extend slightly above the carriage and well below the same as to terminate just short of the ground when the carriage 21 is in normal position as shown in Figure 1 of the drawings. The ends of the rails 23, 23 are connected by blocks 24 to prevent spreading of the rails. Movable over the rails 23, 23 is a second carriage 25 having grooved rollers 26

for engagement with the same. A cable 27 has one of its ends fixed to the carriage 25 while its other end is fixed to the body 12. The cable passes over a pulley 28 mounted on the outer face of the upper block 24 whereby upward movement of the carriage 21 will simultaneously cause upward movement to the carriage 25 over the rails 23, 23. The carriage 25 of the respective hoisting mechanisms, serves to support opposite ends of the carriers in a manner to be explained.

Journalled in brackets provided on the chassis frame are rotatable shafts 29, one adjacent each side of the chassis and which operate the respective sets of hoisting mechanisms. Each shaft 29 has sprockets 30 thereon for the hoisting mechanisms on each side while each of the sets of the rails 19, 19 support a shaft on which a sprocket 31 is mounted in alignment with its co-acting sprocket 30 on the shaft 29. A sprocket chain 32 passes over each set of sprockets 30 and 31 whereby rotation of the shaft 29 will simultaneously impart movement to the sprocket chains 32 on one side of the truck body. Each carriage 21 is fixedly connected to the sprocket chain 32 of each hoisting mechanism so as to move with the chain during hoisting and lowering of the apparatus.

Each carrier 16 comprises a rectangular frame 33 having gear segments 34 at opposite ends thereof and which have pintles 34' extending therefrom to pivot in bearings on the carriages 25 of the hoisting mechanism on that particular side. The carrier has pivotal movement in one direction for tilting the same to dump the containers held thereby while movement in an opposite direction is limited by an arm 35 extending from each carriage 25 in the path of a lug 36 extending from the end of the carrier frame.

One of the longitudinal bars of each carrier frame is provided with hooks 37 pivoted thereon as at 38 and which are arranged in suitable spaced relation thereon for engagement with the top peripheral edge of the containers or cans 39. The hook members have their bills extending beyond the edge of the carrier frame to allow the sides of the can to rest against said frame while the bodies of the hooks when in a clamped position are flush with the side bar to allow locking levers 40 which are pivoted to the carrier frame to swing over the hooks to hold them down against swinging. The levers when swung to a locked position engage keepers 41' to prevent accidental swinging of the same. The longitudinal bar of the carrier frame opposite to the one on which the hooks are mounted is provided with rests 42 disposed directly opposite the respective hooks and which engage the lower peripheral flange of the cans. It will be seen that when the cans are placed upon the respective rests 42 and the hooks locked against the open edge of the

cans, the same will be firmly held upon the carrier for dumping.

In lieu of cans, it might be desired to use boxes for trash and for such purpose, I have shown a box 43 in Figure 7 of the drawings having a metal strap 44 on one of its vertical sides and which extends below the bottom of the box for engagement by one of the rests 42. The strap is offset from the side of the box as at 45 to accommodate any one of a plurality of hooks 46 mounted on shafts 47 journalled in the carrier frame. The hooks 46 are swung to engage the strap at the offset portions to securely hold the boxes upon the carrier for dumping.

For the purpose of imparting power to the shafts 29, I provide a power driven shaft 48 journalled in bearings 49 mounted on the chassis structure forward of the body 12. The shaft 48 is disposed at right angle to the axis of the shafts 29 and carries a gear 50 centrally thereof for meshing engagement with a worm 51 fixed to a driven rotatable shaft 52 journalled in a bearing 53. The free end of the shaft 52 carries a sprocket wheel 54 driven by a sprocket chain 55 passing over the wheel 54 and over a sprocket wheel 56 of an auxiliary transmission 57 which receives its power from the main transmission 58 of the motor vehicle. The transmission 57 receives its power through a sprocket wheel 59 on the driven shaft of the transmission which has a sprocket chain 60 passing thereover and over a sprocket wheel 61 on a counter shaft 62 operatively connected to the driven shaft of the transmission 58. The auxiliary transmission 57 is adapted to control the forward and reverse movements of the driving shaft 48 during the hoisting and lowering of the loading apparatus.

The shaft 48 terminates short of the sides of the body for coupling with stub shafts 63 journalled in bearings 64 mounted on the truck body for movement therewith during the dumping of the body. The ends of the shaft 48 carry clutch elements 65 which are splined thereon for sliding movement into co-acting clutch elements 66 fixed to the inner ends of the stub shafts 63. The sliding clutch elements 65 are operable by shifting levers 67 pivoted to the chassis structure and by which the shafts 63 may be operatively connected with the main driving shaft 48. The outer ends of the stub shafts 63 carry bevel gears 68 for constant meshing engagement with bevel gears 69 fixed to the front ends of the sprocket wheel shafts 29. Springs 70 connected to the levers 67 and to an adjacent stationary part tend to normally hold the levers in position with the clutch elements disengaged which requires the manual holding of the levers to engage the clutch elements during the dumping operation. However, some means may be pro-

vided for holding the levers back against the tension of the springs should it be desired.

For the purpose of tilting the carriers as they near the limit of their upward movement during the hoisting operation, I provide rack bars 71 mounted on the inner rails 19 and which rack bars are in alignment with the respective gear segments 34 fixed to the carriers and which gears mesh with the teeth on the rack bar to cause an inward tilting of the carriers as shown in Figure 2 of the drawings. After the carrier has been tilted to dump the contents of the cans into the body of the truck, the carrier is lowered by reversing the driving mechanism, whereupon the co-acting gear segments and rack bars return the carriers to their normal position. It might be here stated that the hinged covers 13 of the body automatically lift up as the carriers near the end of the upward movement which is caused by arms 72 which are fixed to the carriers 24 coming in contact with arms 73 projecting over the sides of the covers and carried thereby and disposed in the path of the arms 72.

From the foregoing description, it will be apparent that by actuating either of the levers 67 to throw the respective clutch 65 into engagement with its co-acting clutch element 66, the hoisting and lowering mechanism may be thrown into operation. During the raising of the carrier, the carriers 21 begin to move upward causing the shortening of the lead of the cables 27 between the pulleys 28 and their connection with the carriers 26 which starts the carriers 16 on their upward movement. By the time the carriers 21 reach the limit of their upward movements, the carriers 25 are on an even plane with them as the lead in the cables has been considerably shortened. As before stated, the carrier is tilted as it reaches the limit of its upward movement. For lowering the carrier, the driving mechanism is reversed, thus causing movements of the parts in an opposite direction.

While I have described what I deem to be the most desirable embodiment of my invention, it is obvious that many of the details may be varied without in any way departing from the spirit of my invention, and I therefore do not limit myself to the exact details of construction herein set forth nor to anything less than the whole of my invention limited only by the appended claims.

What is claimed as new is:—

1. In a loading apparatus, the combination with the body of a truck, stationary vertical tracks mounted on said body in spaced relation, carriages movable over the respective tracks and having pulleys thereon, vertical tracks carried by said carriages and movable therewith, second carriages movable over said last mentioned tracks, a carrier turnably

mounted in said last mentioned carriages, lifting and lowering means to which said first carriages are connected, and cables passing over said pulleys on the first mentioned carriages and having their ends respectively connected to said body and to the other carriages.

2. In a loading apparatus, the combination with a truck having a body, of stationary vertical tracks mounted on said body in spaced relation, carriages movable over the respective tracks, rotatable elements mounted on said carriages, vertical tracks carried by said carriages and movable therewith, second carriages movable over said last mentioned tracks, a carrier turnably mounted in said last mentioned carriages, means for preventing turning movement of said carrier in one direction, lifting and lowering means to which said first carriages are connected, and cables passing over the rotatable elements on the first mentioned carriages and having their ends respectively connected to said body and to the other carriages, and means automatically operable for turning said carrier when the same nears the limit of its upward movement.

3. In a loading apparatus, a driven rotatable shaft, sprockets mounted on said shaft, endless chains driven by said sprockets, stationary tracks parallel to said chains, carriages movable over said tracks and fixed to said chains, tracks fixed to said carriages and movable therewith, carriages movable over said last mentioned tracks, pulleys mounted on said first carriages, cables passing over said pulleys and having their ends connected to said last mentioned carriages and to a stationary part respectively, and a carrier turnably mounted in said last mentioned carriages.

4. In a loading apparatus, a driven rotatable shaft, rotatory elements mounted on said shaft, endless flexible elements driven by said rotatory elements, stationary tracks parallel to said flexible elements, carriages movable over said tracks and fixed to said flexible elements, tracks fixed to said carriages and movable therewith, carriages movable over said last mentioned tracks, rotatory elements mounted on said first mentioned carriages, flexible elements passing over said last mentioned rotatory elements and having their ends respectively connected to said last mentioned carriages and to a fixed part of the loading apparatus, and a carrier turnably mounted in said last mentioned carriages.

In testimony whereof I hereby affix my signature.

JOSEPH A. AMENDOLARA.