March 18, 1952 J. ARCHER 2,589,654

GOODS ELEVATOR FOR VEHICLES

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FIG. 1

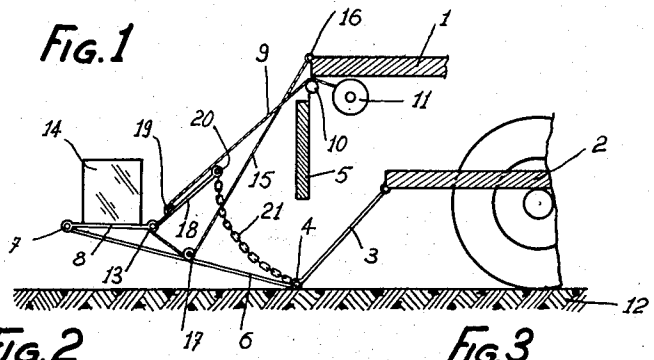


FIG. 2

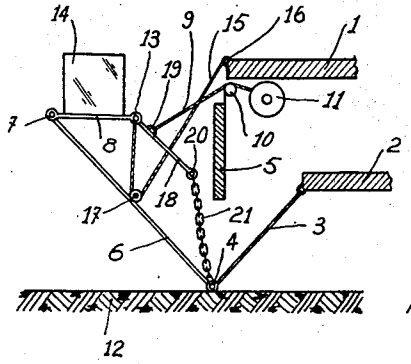


FIG. 3

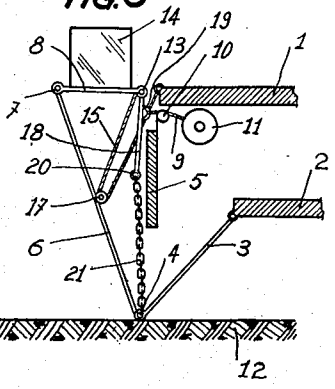


FIG. 4

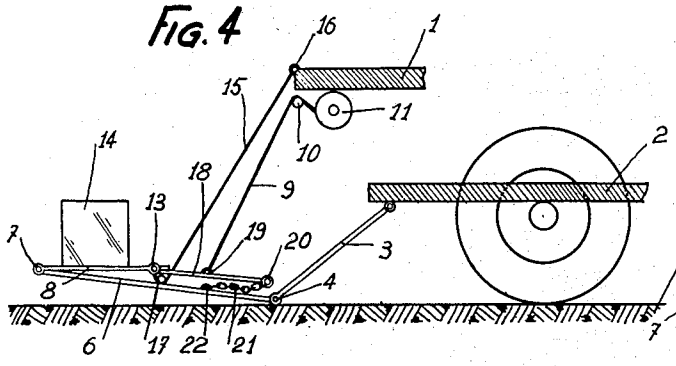


FIG. 5

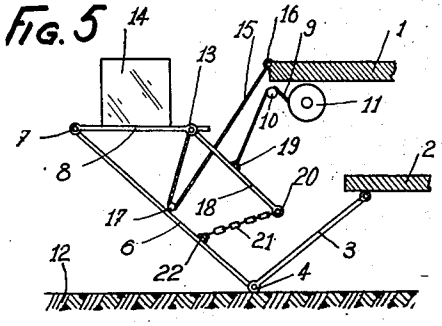
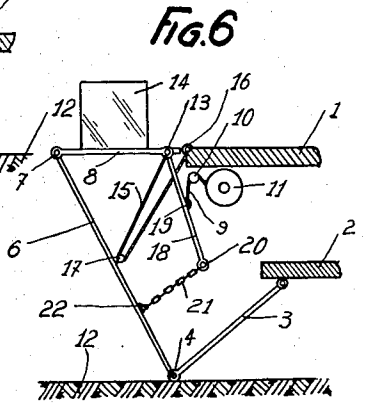


FIG. 6



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GOODS ELEVATOR FOR VEHICLES

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6 Claims. (Cl. 214—77)

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This invention has reference to an elevator for raising and/or lowering goods from one level to another and whilst being applicable to goods elevators generally, is particularly applicable to elevators for facilitating the loading of goods on to, and the unloading of goods from, the deck or floor of a vehicle such as a lorry or like motor road vehicle.

The principal object of the present invention is to provide a new or improved goods elevator which is of simple and efficient construction, is inexpensive to manufacture and is easy to operate.

A further object of the invention is to provide a goods elevator which is capable of easy and speedy fitment to a motor road or other vehicle and of being stored below the deck or floor of the vehicle when not in use.

Another object of the invention is to ensure that a goods receiving platform incorporated in the elevator is maintained horizontal when raised and/or lowered although it is articulated to its supports.

Another object of the invention is to ensure that a tiltable goods receiving platform incorporated in the elevator is maintained horizontal at all times, in an entirely automatic manner.

Still another objects of the invention is to ensure that, although when being raised or lowered, the goods receiving platform of the elevator travels in a curved path, the speed of vertical movement of the said platform is not materially reduced when approaching or departing from its uppermost position.

These and other objects of the invention will be apparent from the following description particularly when the said description is read in conjunction with the accompanying drawings, wherein:

Figure 1 is a diagrammatic elevation of a goods elevator fitted to the rear end of a lorry or like road vehicle, showing the elevator erected ready for use and the goods receiving platform thereof close to the ground.

Figure 2 is a similar view to Figure 1, but shows the goods receiving platform in an intermediate position.

Figure 3 is another similar view to Figure 1 but shows the goods receiving platform raised to its maximum height.

Figures 4, 5 and 6 are similar views to Figures 1, 2 and 3 respectively, of an alternative or modified construction of elevator.

In Figures 1–3 of the said drawings, 1 is the deck or floor of a lorry having an ordinary tail

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board 5, whereas 2 indicates the chassis, or one of the longitudinal or main members of the chassis, of the vehicle.

One end of a prop 3 is articulated to the rear end of each chassis member 2 and, when the elevator is in use, the other end of the said prop rests or seats upon the ground 12.

To the ground-supported end of each prop there is articulated at 4 one end of a lever 6 which is itself articulated by its other end 7, to the rear edge of a platform 8 located rearwardly of the floor or deck 1.

The said platform is maintained (by means hereinafter described) constantly in a horizontal position.

For each prop 3 and lever 6, there is provided a link 18 which, at its one end, is articulated to the forward edge 13 of the platform 8 whereas its other end 20 is coupled to a chain 21 extending between the said link and the point of articulation 4 between the complementary lever 6 and prop 3.

Also connected to the said forward platform edge 13, is one end of a cable 15 which, after passing under a pulley 17 journalled to the complementary lever 6 intermediate, for example midway between, the ends of the said lever, is connected by its other end to the rear 16 of the floor or deck 1 of the vehicle.

A hoist 11, complementary to each prop, lever and link system, is carried below the said floor or deck 1 and the said hoist incorporates a drum (not shown) around which a cable 9 is wound. This cable extends over a pulley 10 which is journalled, for example, on the hinge pin of the tail board 5, and is connected to the complementary link 18 at a point 19 located between the ends of the said link.

When the elevator has been actuated to take the platform 8 to a lowered position such as shown in Figure 1, the cable 15 is taut; consequently, when a load, such as the package of goods 14, is placed upon the platform 8, the said cable 15 prevents the forward edge 13 from rising relatively to the rear edge 7 under the action of the increased tension created in the haulage cable 9. Further, since the haulage cable 9 is also taut, its connection 19 to the link 18 prevents the said forward edge from dipping relatively to the said rear edge. Hence, the platform is maintained in its horizontal position and there is no tendency for any load, such as the package of goods 14, carried upon the said platform, to slide rearwardly or forwardly.

To elevate the platform, the hoists 11 are driven to rotate the winding drums thereof in the appro-

priate direction for winding up the cables 9 and draw in the cable ends which are attached to the links 18. Each link therefore pulls upon the forward edge of the platform, which is still prevented from tilting upwardly by the taut cable 15, to lift the said platform and to cause the complementary lever 6 to swing upwardly about its point of articulation 4 to the complementary prop 3, thereby decreasing the relative angle of inclination of the levers 6 relatively to the props 4.

The upward movement of the platform 8 and links 13 also has the effect of tensioning the chains 21 which are slack when the platform is in a lowered position such as shown in Figure 1. Any continuation of the upward movement of the platform subsequent to the tensioning of the said chains, therefore causes the links 13 to swing clockwise about their ends which are articulated to the forward platform edge 13, the link ends which are connected to the chains being constrained to move in an arcuate path of which the radius is equal to the length of the chains and the centre is located at the point of articulation 4 between the complementary lever 6 and prop 3.

The tensioning of the chains 21 transfers the control of the forward platform edge from the cables 15 to the said links and chains so that, once the said chains are taut, they prevent the said forward edge from raising relatively to the rear edge 7 and tilting the platform backwardly; therefore, the length of the cables 15, the tautness of which progressively decreases to zero as the platform is raised, is of such a length that the said zero value is attained at the same time as the chains 21 are made taut and there is no longer any danger of the said forward edge rising above the level of the said rear edge.

Also the tensioning of the chains and the subsequent swinging of the links 13 and chains 21 ensures that the speed at which the platform rises is not progressively decreased as would be the case if the levers 6 were to be swung at a uniform speed about the points of articulation 4 since the swinging of the said links and chains superimposes on the platform-lifting movement of the lever, an additional movement which compensates the said decrease in the speed at which the platform rises.

The lengths of the levers 6, links 18 and chains 21 are such that the horizontally located platform may be raised, at least, to the position shown in Figure 3, that is to say to a position wherein it is level with and closely adjacent to the rear end of the lorry floor or deck 1, so that the transfer of the load 14 from the platform to the lorry is a comparatively simple matter. When the platform reaches the position shown in Figure 3, the drive imparted to the hoist drums is terminated and the haulage cable 9 retains the platform in its raised position.

It will be appreciated that, when it is desired to unload goods from the lorry, the platform is first raised to the position shown in Figure 3, the goods are transferred from the floor or deck 1 to the said platform, and the hoists are then operated to drive their drums in the reverse direction to lower the platform to or, if desired, beyond, the lowered position shown in Figure 1.

In the modified or alternative construction of elevator shown in Figures 4–6, each platform-supporting lever 6 is provided with two pulleys 23 and 24 which are spaced apart along the length of the said lever and under both of which the control cable 15 passes. Also, instead of connecting each of the chains 21 to the point of articulation 4 between the complementary lever 6 and prop 3, the said chain is connected to an anchorage 22 provided at any suitable position along the length of the said lever.

Although the invention has been described by reference to the two specific hoists illustrated diagrammatically, it is to be understood that various additional modifications may be made without departing from the spirit or scope of the invention. Thus, for example, when the vehicle is in motion and/or when it is not desired to use the elevator, the props 3 may be made capable of folding flat or substantially flat on to the levers 6 to enable the whole assembly to be collapsed and slid under the floor or deck 1 into and stored in channels permanently installed below the said floor or deck. Also the chains 21 may be replaced by rigid rods each being articulated by its respective ends to and between the complementary link 18 and any desired and suitable position along the length of the complementary lever 6. Again, the elevator, instead of being arranged for erection outwardly of the rear edge of a lorry or other road vehicle, may be arranged for assembly at any other desired position relatively to some other type of vehicle or it may even be capable of erection for use in raising and/or lowering goods from one fixed floor or deck to another fixed floor or deck at a different level.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In an elevator for facilitating the loading of goods on to and the unloading of goods from a vehicle, a horizontally disposed platform located rearwardly of the vehicle, at least one lever articulated by one end to the rear of the said platform, the other end of the said lever being articulated to one end of a prop, the other end of the said prop being articulated to the rear of the vehicle chassis, and the articulated ends of the said lever and prop being supported upon the ground rearwardly of the vehicle when the elevator is in use, a link articulated to the forward end of said platform, a flexible connection between said link and said lever, a pulley journalled upon said lever intermediate its ends, a cable passing round said pulley and connected by its ends to the forward edge of the said platform and to the vehicle respectively, to prevent upward movement of the said front edge relatively to the rear edge of said platform, and means connected to said link for swinging the said lever about its articulation to the said prop for imparting vertical movements to the said platform.

2. In an elevator for facilitating the loading of goods on to and the unloading of goods from a vehicle, a platform, at least one pair of relatively inclined and relatively articulated levers connected between the edge of the said platform remote from the vehicle and the vehicle, the point of articulation between the said levers being supported on the ground when the elevator is in use, a link articulated to the platform edge adjacent the vehicle, a flexible connection between said link and the point of articulation between the said levers, a pulley journalled on and between the ends of the lever connected to the said platform, a cable passing under the said pulley and connected by its ends to the platform edge adjacent the vehicle and to the vehicle respectively, a hoist mounted on the vehicle, and cable wound around a rotatable drum incorporated in the said hoist, the said

cable being connected to the said link intermediate the ends of the link.

3. In an elevator for facilitating the loading of goods on to and the unloading of goods from a vehicle, a platform, at least one pair of relatively inclined and relatively articulated levers connected between the edge of the said platform remote from the vehicle and the vehicle, the point of articulation between the said levers being supported on the ground when the elevator is in use, a link articulated to the platform edge adjacent the vehicle, a flexible connection between said link and a point on the lever connected to the said platform in the vicinity of the point of articulation between the said levers, a pulley journalled on and between the ends of the said lever which is connected to the platform, a cable passing under the said pulley and connected by its ends to the platform edge adjacent the vehicle and to the vehicle respectively, a hoist mounted on the vehicle and a cable wound around a rotatable drum incorporated in the said hoist, the said cable being connected to the said link intermediate the ends of the link.

4. In an elevator for facilitating the loading of goods onto, and the unloading of goods from a vehicle, a platform, at least one pair of relatively inclined and relatively articulated levers connected between the edge of the said platform remote from the vehicle and the vehicle, the point of articulation between the said levers being supported on the ground when the elevator is in use, a link articulated to the platform edge adjacent the vehicle, a flexible connection between the said link and the point of articulation between the said levers, two pulleys journalled on the lever connected to the said platform the said pulleys being spaced apart lengthwise of the said lever, a cable passing under both the said pulleys and connected by its ends to the platform edge adjacent the vehicle and to the vehicle respectively, a hoist mounted on the vehicle, and a cable wound around a rotatable drum incorporated in the said hoist, the said cable being connected to the said link intermediate the ends of the link.

5. In an elevator for facilitating the loading of goods on to and the unloading of goods from a vehicle, a platform, at least one pair of relatively inclined levers connected between the edge of the said platform remote from the vehicle and

the vehicle, the point of articulation between the said levers being supported on the ground when the elevator is in use, a link articulated to the platform edge adjacent the vehicle, a flexible connection between the said link and a point on the lever connected to the said platform in the vicinity of the point of articulation between the said levers, two pulleys journalled on the lever connected to the said platform, the said pulleys being spaced apart lengthwise of the lever, a cable passing under the said pulleys and connected by its ends to the platform edge adjacent the vehicle and the vehicle respectively, a hoist mounted on the vehicle and a cable wound around a rotatable drum incorporated in the said hoist, and connected to the said link intermediate the ends of the link.

6. In a goods elevator, a horizontal platform located outwardly of a raised deck to be loaded with the goods, relatively inclined and interconnected levers having a variable angle of inclination, connecting the said platform to the said deck, the points of interconnection between the said levers bearing on the ground, links articulated to the platform edge adjacent the said deck, flexible connections between the said points of interconnection of the said levers, haulage cables connected to the said links intermediate the ends of the latter, hoists on the deck for winding and unwinding the said cables, and flexible connections of constant length between the adjacent edges of the platform and deck and, the said connections of constant length passing under pulleys on the said levers.

JEAN ARCHER.

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