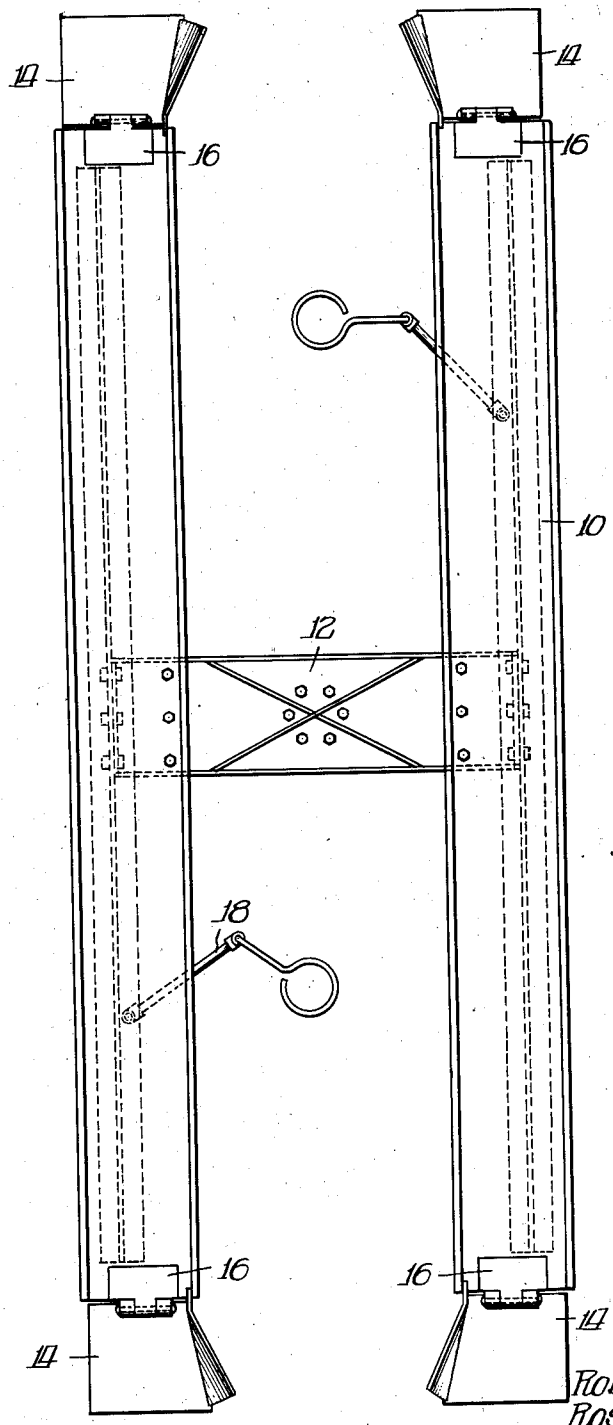
Dec. 25, 1934. R. J. JAUCH ET AL 1,985,732

LIFT

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Fig. 1.



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Fig. 2.

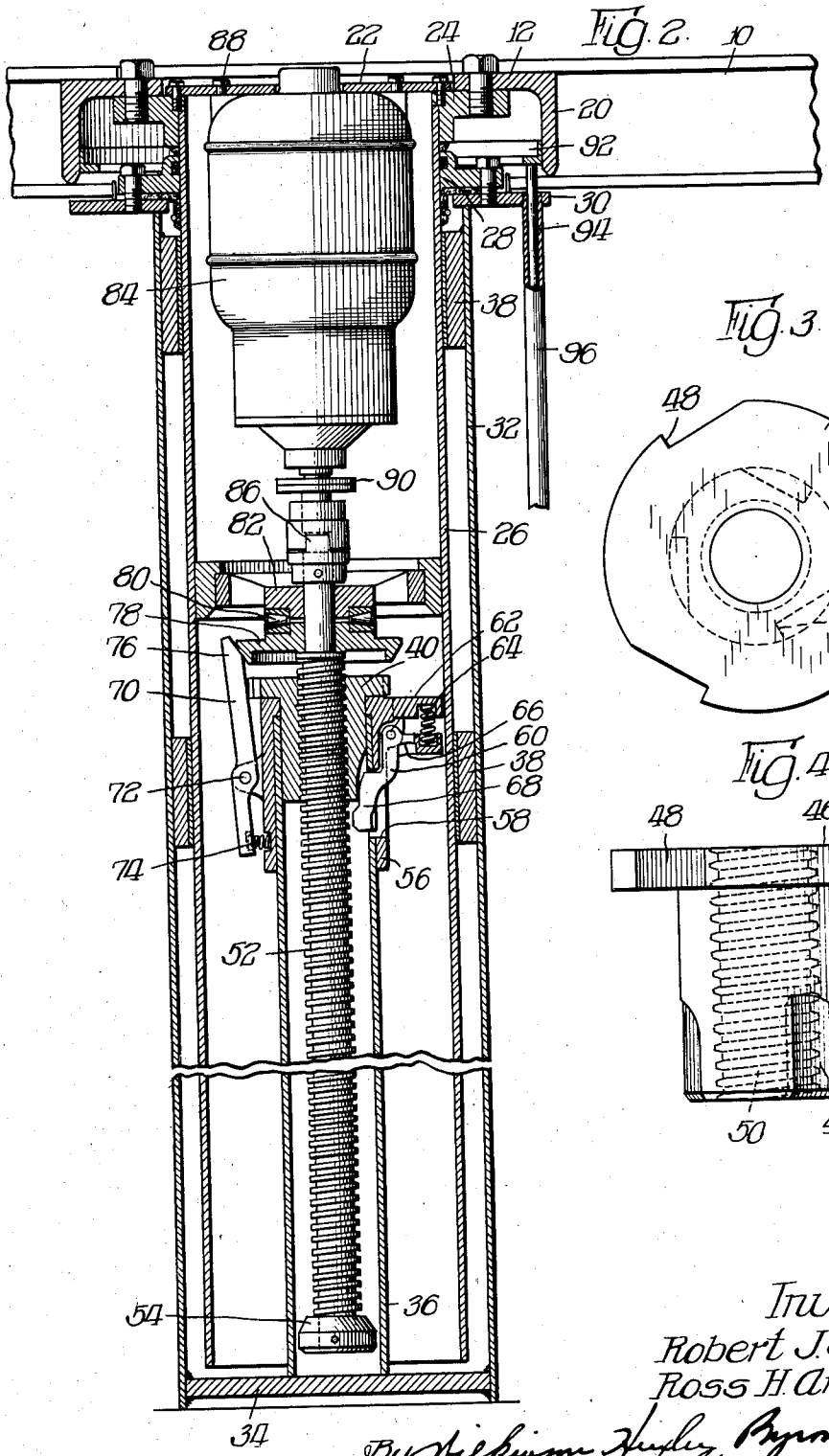


Fig. 3.

Fig. 4.

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LIFT

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17 Claims. (Cl. 254—92)

This invention relates to lifts, and more particularly to mechanically operated lifts for servicing vehicles such as automobiles.

It is an object of this invention to provide a mechanical lift which is positively operated to raised and lowered positions for permitting the ready servicing of vehicles such as automobiles.

Another object is to provide an electrically operated screw type hoist.

Still another object is to provide a hoist for servicing automobiles which is mechanically operated and which may be revolved to different positions to permit automobiles to be conveniently run on and off the lift.

A further object is to provide a mechanical lift which automatically ceases movement at predetermined positions.

A yet further object is to provide a mechanical lift which is readily operable, is inexpensive to make and maintain, and fulfills all requirements of manufacture and service.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate an embodiment of the device and wherein like reference characters are used to designate like parts—

Figure 1 is a top plan view of a lift embodying the invention;

Figure 2 is an enlarged fragmentary sectional elevation through the operating mechanism of the lift;

Figure 3 is a top plan view of the nut through which the operating screw is adapted to be threaded;

Figure 4 is a side elevation of the nut shown in Figure 3.

In a lift of the type shown, spaced rails 10 are connected by means of a crosshead 12, the rails being spaced apart a convenient distance to allow an automobile or other vehicle to be run on or off the rails. As shown, each of the rails is provided at each end thereof with the approach members 14 and the chocks 16 which may or may not be automatic. Convenient adjustable holders 18 may also be provided on each of the rails for accommodating a receptacle for receiving oil or other liquid or semi-liquid or waste drained or removed from the vehicle being serviced. The crosshead 12 may be built up by the spaced angles 20 and center plate 22 bolted or otherwise secured to the collar 24, which center plate may or may not be a part of said crosshead and is used as a motor support.

A central cylindrical slidable sleeve or plunger 26 is secured to said crosshead, open at its lower end and in sliding cooperation with the stuffing box or gland 28 provided on the upper plate 30 which is adapted to be disposed substantially flush with the ground or associated floor in which the lift mechanism is imbedded. The outer casing 32 is likewise secured to the plate 30 and is closed at its end by means of the lower closure plate 34, said lower closure plate having an upwardly extending inner casing or tubular member 36 secured thereto and concentric with the outer casing and the slidable sleeve. The outer casing is also provided with spaced positioning rings 38 with which the plunger 26 has sliding and guiding cooperation.

The nut 40 is provided at the upper end of the inner casing 36, said nut having a body portion 42 substantially cylindrical and journaled in the upper end of the casing 36. The cylindrical portion of the nut is provided with the spaced notches or shoulders 44 at the lower end thereof. The upper portion of the nut 40 is provided with the plate portion 46 which is likewise provided with the notches or shoulders 48 facing in an opposite direction to the shoulders 44.

The nut is centrally threaded as at 50 for the reception of the vertically disposed operating screw 52, the lower end of which is provided with the cam or ring member 54. Adjacent the upper end of the inner casing there is provided a housing 56 which is slotted as at 58, the slot being aligned with a corresponding slot in the casing 36, the housing being provided with the locking dog 60 pivoted thereto as at 62. The spring 64 is interposed between the housing and the leg 66 of the dog for urging the latching member 68 of said dog into engagement with the notches 44.

The housing is likewise provided with the external dog 70 pivoted thereto as at 72, the spring 74 being interposed between the lower end of the dog and the housing for normally urging the latching portion 76 of the dog toward engagement with the shoulders 48 of the nut. The upper end of the screw is provided with the cam or ring member 78, anti-friction bearings 80 being interposed between the cam and the thrust bearings 82 carried by the plunger 26.

The screw is coupled to the motor 84 through the coupling 86, the motor being directly secured as at 88 to the center plate 22 and preferably being provided with the torque coupling 90 which

serves to release the motor from the screw after a predetermined torque has been built up.

In some installations it is desirable to prevent rotation of the spaced tracks 10, in which case the ring 92 provided on the spaced angles 20 may be provided with a key or plunger 94 adapted to extend into a casing 96 disposed adjacent the casing 32 whereby rotation of the rails is effectively prevented. A latch or friction means may be interposed between the plunger 94 and angles 20 whereby it may be released or moved with respect to the rails to permit the rails to be revolved.

In operation of the device, assuming that the lift is in lowered position for reception of a vehicle from the adjacent ground, after the vehicle has been spotted on the spaced tracks, the motor is operated by the closing of a suitable switch (not shown). The rotation of the screw causes the spaced tracks to raise, the screw moving upwardly and the dog 60 preventing rotation of the nut 40 with respect to the inner casing 36. Of course the current may be shut off at any desired place.

If the current is not shut off, the cam member 54 will, at the top of the stroke of the screw, engage the leg 68 to release said locking dog 60 from the shoulders 44 of the nut whereby continued rotation of the screw will merely cause the nut to rotate with the screw, it being seen that the shoulders 48 are faced in an opposite direction from the shoulders 44 so that there will merely be a warning noise of the dog 70 falling into the shoulders 48 on the nut.

When it is desired to lower the lift after servicing of the vehicle has been completed, rotation of the motor in an opposite direction will of course cause the proper movement of the screw with respect to the nut to lower the lift, the nut being retained from rotation in an opposite direction by engagement of the dog 70 with the shoulders 48. At its lowermost position the cam 78 will engage the lock-legs 76 of the dog 70 to move it out of engagement with the shoulders 48, and continued rotation or over-travel of the screw will merely cause a warning noise of the dog 60 falling into the shoulders 44 of the nut.

The clutch 90 is interposed between the motor and the screw so that after a predetermined torque is built up, as for example if the spaced rails should strike an object left under the rails, there would be a slippage between the motor and screw to prevent heating of the screw or injury to any of the parts. It is of course to be understood that a clutch of the torque or friction type might be inserted in place of the nut and locking dogs for permitting over-travel at the top and bottom strokes, as well as after a predetermined torque is built up.

While a drive-on type of lift is shown, it is of course contemplated that other forms such as the free wheel type may be used, and it is to be understood that we do not wish to be limited by the exact embodiment of the device shown, which is merely by way of illustration and not limitation, as various and other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

We claim:

1. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, an inner fixed casing member secured to said casing and extending into and substantially concentric with said plunger, an internally threaded nut journalled for rotation in said casing member and provided with shoulders disposed inwardly and outwardly of said casing member, a motor carried by said crosshead, a screw operated by said motor and extending through the threaded portion of said nut, locking dogs normally cooperating with said shoulders, and means on said screw for releasing one of said dogs at a limit of said screw for permitting over-travel of said motor.

2. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, an inner fixed casing member secured to said casing and extending into and substantially concentric with said plunger, an internally threaded nut journalled for rotation in said casing member and provided with shoulders disposed inwardly and outwardly of said casing member, a motor carried by said crosshead, a screw operated by said motor and extending through the threaded portion of said nut, locking dogs normally cooperating with said shoulders, means on said screw for releasing one of said dogs at a limit of said screw for permitting over-travel of said motor, and a coupling interposed between said screw and motor and adapted to release said screw from said motor after a predetermined torque has been built up.

3. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor, a screw operated by said motor, a rotatable nut through which said screw extends, means normally preventing rotation of said nut with respect to said screw, and members carried by said screw for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor.

4. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor, a screw operated by said motor, a rotatable nut through

which said screw extends, means normally preventing rotation of said nut with respect to said screw, members carried by said screw for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor, and a coupling interposed between said screw and motor and adapted to release said screw from said motor after a predetermined torque has been built up.

5. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor, a screw operated by said motor, a rotatable nut through which said screw extends, means normally preventing rotation of said nut with respect to said screw, and members for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor.

6. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor, a screw operated by said motor, a rotatable nut through which said screw extends, means normally preventing rotation of said nut with respect to said screw, members for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor, and a coupling interposed between said screw and motor and adapted to release said screw from said motor after a predetermined torque has been built up.

7. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, an inner fixed casing member secured to said casing and extending into and substantially concentric with said plunger, an internally threaded nut journalled for rotation in said casing member and provided with shoulders disposed inwardly and outwardly of said casing member, a motor carried by said crosshead, a screw operated by said motor and extending through the threaded portion of said nut, and locking dogs normally cooperating with said shoulders.

8. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor carried by said crosshead, a screw operated by said motor, a rotatable nut through which said screw extends, said nut being carried by said casing, means normally preventing rotation of said nut with respect to said screw, and members carried by said screw for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor.

9. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor carried by said crosshead a screw operated by said motor, a rotatable nut through which said screw extends, said nut being carried by said casing, means normally preventing rotation of said nut with respect to said screw, and members for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor.

10. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor carried by said crosshead, a screw operated by said motor, a rotatable nut through which said screw extends, said nut being carried by said casing, means normally preventing rotation of said nut with respect to said screw, members carried by said screw for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor, and a coupling interposed between said screw and motor and adapted to release said screw from said motor after a predetermined torque has been built up.

11. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, an inner fixed casing member secured to said casing and extending into and substantially concentric with said plunger, an internally threaded nut journalled for rotation in said casing member and provided with shoulders disposed inwardly and outwardly of said casing member, a motor carried by said crosshead, a screw operated by said motor and extending through the threaded portion of said nut, a thrust bearing interposed between said screw and motor and carried by said

plunger, locking dogs normally cooperating with said shoulders, and means on said screw for releasing one of said dogs at a limit of said screw for permitting over-travel of said motor.

12. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, an inner fixed casing member secured to said casing and extending into and substantially concentric with said plunger, an internally threaded nut journalled for rotation in said casing member and provided with shoulders disposed inwardly and outwardly of said casing member, a motor carried by said crosshead, a screw operated by said motor and extending through the threaded portion of said nut, a thrust bearing interposed between said screw and motor and carried by said plunger, locking dogs normally cooperating with said shoulders, means on said screw for releasing one of said dogs at a limit of said screw for permitting over-travel of said motor, and a coupling interposed between said screw and motor and adapted to release said screw from said motor after a predetermined torque has been built up.

13. In a lift, the combination of an outer casing adapted to be imbedded in the ground, a stuffing box disposed at the upper end of said casing, a hollow plunger mounted for sliding movement in said casing and embraced by said stuffing box, the bottom of said plunger being open, the upper end of said plunger being provided with a crosshead fixed thereto, spaced vehicle carrying rails carried by said crosshead and disposed to be at ground level when said plunger is in lowered position, operating means for said plunger including a motor, a screw operated by said motor, a thrust bearing interposed between said motor and screw, a rotatable nut through which said screw extends, means normally preventing rotation of said nut with respect to said screw, and members for releasing said means at the upper and lower positions of said plunger to permit over-travel of said motor.

14. In a lift, a support member, a load carrying member, operating means for moving said load carrying member relative to said support member, said means including a motor associated with one of said members, a screw operated thereby, a rotatable nut associated with the other of said members through which said screw extends, means normally preventing rotation of said nut with respect to said screw in one direction, means normally preventing rotation of said nut with respect to said screw in the other direction, and means on said screw for releasing one of said means after a predetermined movement of said load carrying member for permitting over-travel of said motor.

15. In a lift, a support member, a load carrying member, operating means for moving said load carrying member relative to said support member, said means including a motor associated with one of said members, a screw operated thereby, a rotatable nut associated with the other of said members through which said screw extends and provided with shoulders, locking dogs normally cooperating with said shoulders, and means on said screw for releasing one of said dogs at a limit of said screw for permitting over-travel of said motor.

16. In a lift, a hollow support member, a load carrying member, operating means for moving said load carrying member relative to said support member, said means including a motor associated with one of said members, a screw operated thereby and disposed in said hollow support member, a rotatable nut mounted in said hollow support member through which said screw extends, means disposed inwardly and outwardly of said support member normally preventing rotation of said nut with respect to said screw, and means on said screw for releasing said means after predetermined movements of said load carrying member in respect to said support member in either of two directions.

17. In a lift, a hollow support member, a load carrying member, operating means for moving said load carrying member relative to said support member, said means including a motor associated with one of said members, a screw operated thereby and disposed in said hollow support member, a rotatable nut mounted in said hollow support member through which said screw extends, dogs disposed inwardly and outwardly of said support member normally preventing rotation of said nut with respect to said screw, and means on said screw for releasing one of said dogs after a predetermined movement of said load carrying member relative to said support for permitting over-travel of said motor.

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