W. B. LAHR, T. F. ZEALAND & R. E. BOYER.

GARAGE DOOR OPENING AND CLOSING DEVICE.

APPLICATION FILED JAN. 29, 1915.

1,174,258. Patented Mar. 7, 1916.

2 SHEETS—SHEET 1.

FIG. 1

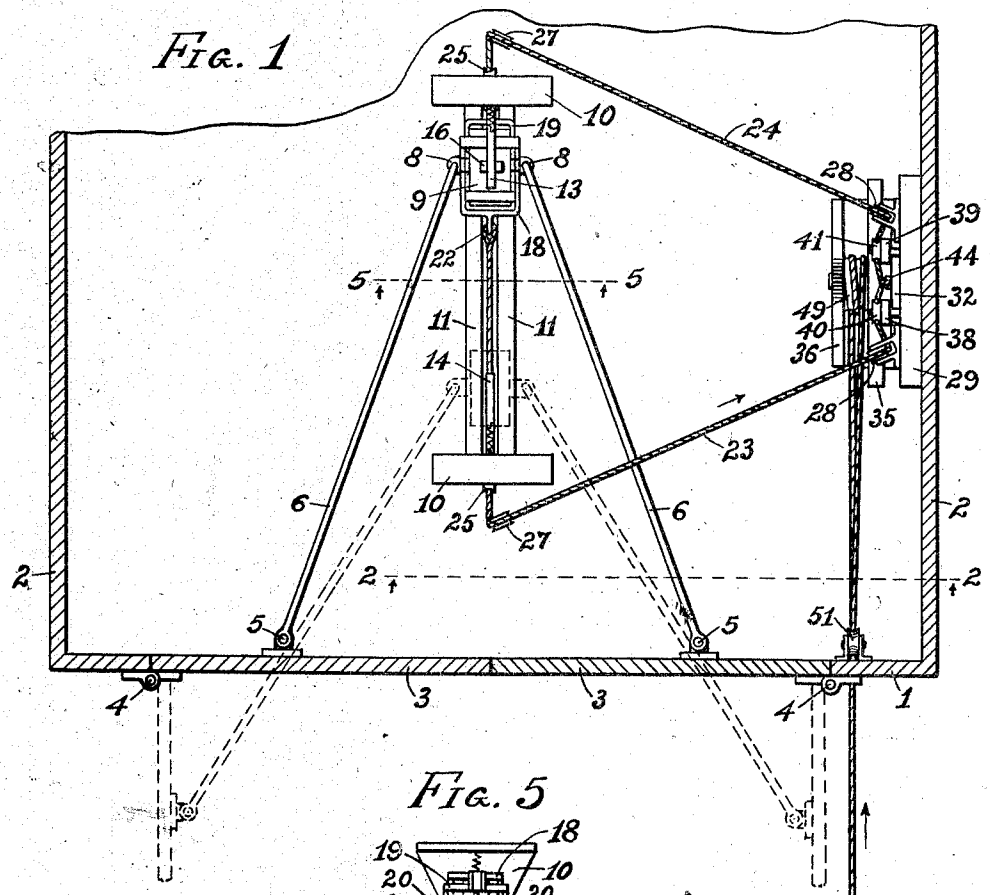


FIG. 5

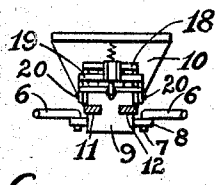


FIG. 6

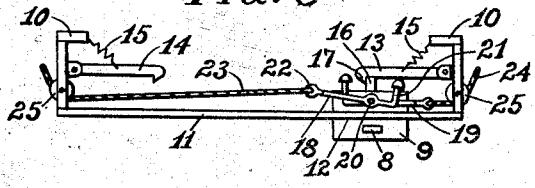
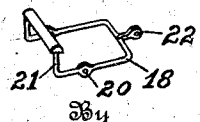


FIG. 7



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2 SHEETS—SHEET 2.

FIG. 2

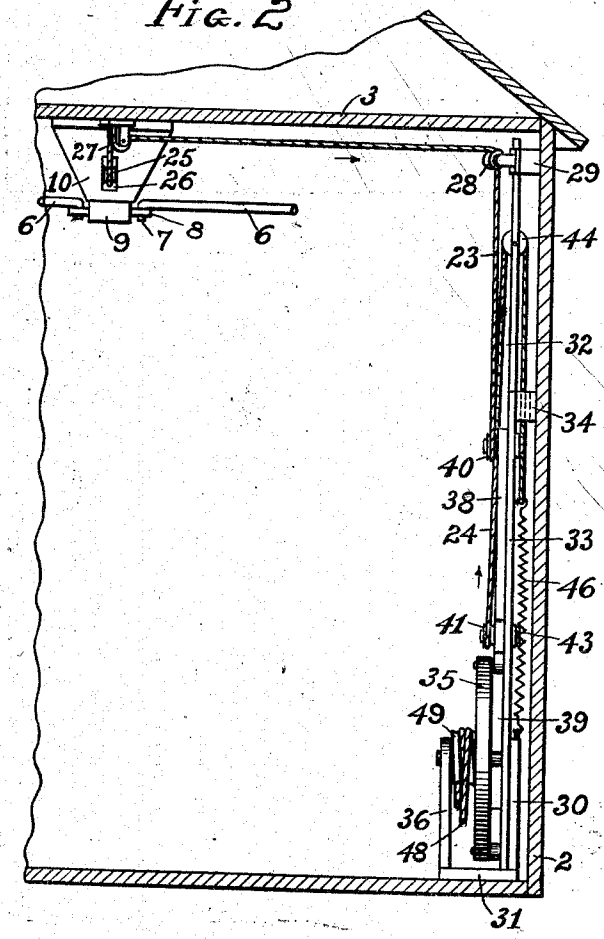


FIG. 3

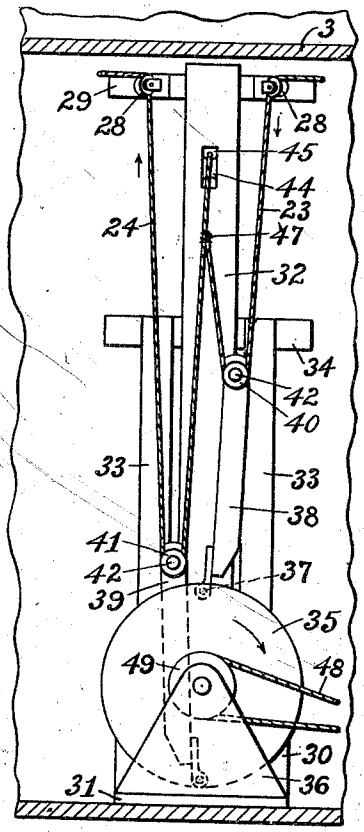
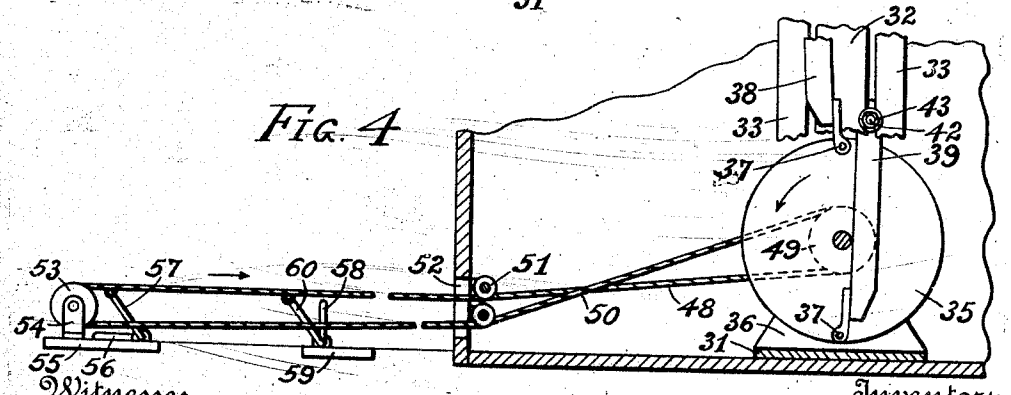


FIG. 4



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UNITED STATES PATENT OFFICE.

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GARAGE-DOOR OPENING AND CLOSING DEVICE.

1,174,258. Specification of Letters Patent. Patented Mar. 7, 1916.

Application filed January 29, 1915. Serial No. 5,013.

To all whom it may concern:

Be it known that we, WILLIAM B. LAHR, THOMAS F. ZEALAND, and ROLAND E. BOYER, citizens of the United States, all residing at Lakewood in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Garage-Door Opening and Closing Devices, of which the following is a specification.

This invention relates to devices for automatically opening and closing doors, gates and the like, through which vehicles pass.

The main object of the invention is to provide apparatus particularly adapted for garages, whereby an approaching automobile will open the doors to permit the entering of the machine, and after leaving the garage the doors will be closed in like manner by the automobile, thus making it unnecessary for the driver or other occupant of the automobile to demount for the purpose of opening or closing the garage doors. This is not only convenient, but also avoids the necessity of stopping and again starting the machine, thus saving time.

Another object of this invention is to provide a device of the above character, which will lock the doors in either their closed or open position.

A further object of the invention is to provide a device that is practical, is inexpensive in construction, and is easily installed.

With the above and other objects in view as will be readily understood, the invention will be hereinafter fully described in connection with the accompanying drawings, which illustrate a preferred embodiment thereof, and the novel features of the invention will be distinctly pointed out in the appended claims.

In the drawings like characters of reference denote similar parts.

Figure 1 is a plan sectional view of a garage having a pair of swinging doors with our invention applied thereto, Fig. 2 is an elevational sectional view, taken on line 2—2 of Fig. 1, Fig. 3 is a front elevation of the operating mechanism installed at the side of the garage, Fig. 4 is a rear elevation of a portion of the mechanism shown in Fig. 3, Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 1, Fig. 6 is a side elevation of the carriage supporting frame, and Fig. 7 is a perspective view of one of the forked lever members.

Referring to the drawings, 1 represents the front end wall of a garage, 2 its side walls, and 3 the ceiling thereof. The usual swinging doors indicated by 3 are hinged to the front end wall as shown at 4 to swing outwardly. To each of the doors near the top is pivoted, in any suitable manner as at 5, a rod or arm 6, the inner free end of which is bent downwardly at 7 to pivotally engage eyes 8 extending laterally from a slidable block or carriage 9. A frame consisting of end brackets 10 carrying spaced guide bars 11, is arranged longitudinally of the garage and is fixed to the ceiling 3 thereof. The carriage 9 is grooved longitudinally at 12 to fit over the inner edges of the guide bars 11, whereby it is slidably supported from the ceiling by said frame.

When the garage doors are in their closed or fully open position, it is desirable to lock them against movement caused by wind. This is accomplished by means of pawls 13 and 14, which are pivoted to the frame and suitably suspended by springs 15. Said pawls are adapted to engage a central post 16 projecting from the top of the carriage 9, and their noses are beveled at 17 so that when the post strikes the same, the pawls will be raised to permit them to engage said post. In order to release the carriage, oppositely arranged forked lever members 18 and 19 are pivoted to the sides thereof at 20, and their upturned ends 21 are adapted to engage said pawls for lifting them out of engagement with said post as will be hereinafter explained.

Attached to the forward forked lever member 18 at 22 is a rope 23, and to the rear forked lever member 19 a rope 24, which ropes pass under sheaves 25 supported by the end brackets 10, through openings 26 thereof, and then over pulleys 27 carried by the ceiling. The ropes 23 and 24 extend toward one side of the garage and pass over pulley wheels 28 supported on a cross-bar 29, which is fastened to the side of the building. Fixed to this cross-bar and to the rear side 30 of a floor bracket 31 is a central vertical bar 32, and arranged at each side thereof in spaced parallel relation thereto are short vertical bars 33, which are securely fastened to the rear side of said bracket and also to a cross-piece 34. A large disk or wheel 35 is rotatably mounted between the rear side 30 and the front side 36 of said floor bracket, and to its rear side, as indi-

cated at 37, are pivoted pull-bars 38 and 39, which carry rollers 40 and 41 respectively at their upper ends. The pivot pins 42 of said rollers project through the spaces between the central bar 32 and the short bars 33 and are adapted to slide therein. Suitable washers and nuts on the ends of the pivot pins, as indicated at 43, retain the parts in place. One of the before mentioned ropes 24 after passing over the pulley wheel 28, passes under the roller 41, then extends upwardly and over a sheave 44, which is supported in an opening 45 of the vertical bar 32. The free end of this rope then leads downwardly back of said bar and is connected to a long coiled spring 46, which is attached to the rear side 30 of the floor bracket. The other rope 23, after passing over the pulley wheel 28, passes under the roller 40 and then upwardly, its free end being fastened at 47 to the other rope 24. The purpose of the coiled spring 46 is to prevent the suddenly closing or opening of the doors due to sudden tension upon said ropes.

The disk or wheel 35 is rotated by means of a continuous cable 48, which passes around a worm-reel 49 integral with the disk, is crossed as shown at 50, and after passing under pulleys 51, then through an opening 52 in the front wall of the garage, its outer end is carried by an idler pulley 53. A forked stand 54 supports said idler pulley upon a plate 55 embedded in the ground, and pivoted to this plate is a suitable trip 56 having an arm 57, to which is securely fixed the upper line of said cable. Another trip 58, similar to the trip 56, except that it is reversed, is pivoted to a plate 59, also embedded in the earth, and to its arm 60 is also fixed the upper line of the cable. One trip 58 stands vertically while the other trip 56 lies horizontal, and they are adapted to be actuated alternately by the wheels of an automobile for opening and closing the garage doors.

When the doors are closed, the other parts of the mechanism are as shown, and it will be particularly noted that the pawl 13 engages the post 17 to lock the carriage 9 in position, and the tension being off the rope 23, the heavier weight of the upwardly turned end portion 21 of the forked lever member 18 will cause its other end to be thrown upwardly. As an automobile approaches the garage, its wheels will pass over the first trip 56, but when its forward wheel strikes the vertical trip 58, this last trip throws its arm toward the garage, thereby moving the upper line of the cable 48 in the direction of the arrow. This will rotate the disk 35 in the direction indicated by the arrow thereon, and the pull-bar 38 is forced downwardly. As soon as said pull-bar begins to move, the roller 40 exerts a downward pull upon the rope 23, which action causes the forked lever member 18 to rock upon its pivots and take the horizontal position. The pawl 13 is thereby lifted out of engagement with the post 17, and the carriage 9 is pulled forwardly, thus forcing the rods or arms 6 to push the doors open, as indicated by dotted lines. It will be noted that the pull-bar 39 will have been forced upwardly, thus giving slack to the rope 24, and the trip 56 will have assumed the vertical position, while the trip 58 will have taken the horizontal position during the opening of the doors.

The doors are closed by the automobile when leaving the garage, by its forward wheel striking the trip 56 throwing it in a direction away from the garage. This moves the cable 48 in the opposite direction to the arrow, and the pull-bar 39 exerts a downward pull upon the rope 24. This brings the forked lever member 19 to its horizontal position, the pawl 14 is disengaged, and the carriage forced to slide rearwardly, thereby pulling the doors closed.

As will be understood, the doors may be closed or opened by stepping upon the trips, or they may be manually swung open or shut. Also that slight changes in the details of construction and arrangement of parts may be made within the scope of the claims.

Having fully described our invention, what we claim is:—

1. In a device for operating doors, the combination of rods pivoted to the doors, a movable carriage, the rods being pivotally connected to the carriage, a disk, pull-bars having one of their ends pivoted to the disk, means for guiding the other ends of the pull-bars, ropes connecting the pull-bars to the carriage, and means adapted to be actuated by a wheel of a vehicle for rotating said disk to operate the doors, substantially as described.

2. In a device for operating doors, the combination of rods pivoted to the doors, a movable carriage, the rods being pivotally connected to the carriage, a disk, pull-bars having one of their ends pivoted to the disk, means for guiding the other ends of the pull-bars, rollers carried by the pull-bars, pulley-wheel arranged above each roller, a sheave located above the rollers, a rope connected to one end of the carriage, the rope passing over one of said pulley-wheels, then under one of said rollers and over said sheave, then extending downwardly and having its free end connected to an anchored coiled spring, a second rope connected to the other end of the carriage, the second rope passing over the other of said pulley-wheels, then the other of said rollers and having its free end fastened to the first mentioned rope at a point above its roller and below said sheave,

and means adapted to be actuated by a wheel of a vehicle for rotating said disk to operate the doors, substantially as described.

3. In a device for operating doors, the combination of rods pivoted to the doors, a movable carriage, the rods being pivotally connected to the carriage, means for locking the carriage in its extreme positions, means for disengaging the locking means carried by the carriage, means adapted to be actuated by a wheel of a vehicle for moving the carriage, and ropes connecting the last mentioned means to said disengaging means whereby the tension of the ropes will cause the disengaging means to act upon the locking means for releasing the carriage, substantially as described.

4. In a device for operating doors, the combination of rods pivoted to the doors, a movable carriage, the rods being pivotally connected to the carriage, pawls for engaging the carriage when at its extreme positions, lever members pivoted to the carriage and adapted to be normally in a tilted position, means adapted to be actuated by a wheel of a vehicle for moving the carriage, and ropes connecting the last mentioned means to the lever members whereby the tension of the ropes will cause the lever members to take a horizontal position and disengage the pawls to release the carriage, substantially as described.

5. In a device for operating doors, the combination of rods pivoted to the doors, a movable carriage, the rods being pivotally connected to the carriage, a disk, pull-bars having one of their ends pivoted to the disk, means for guiding the other ends of the pull-bars, ropes connecting the pull-bars to the carriage, a worm-reel integral with said disk, an idler pulley, a continuous cable passing around the worm-reel and carried by the idler pulley, and a right and left trip adapted to be actuated by a wheel of a vehicle for moving the cable to cause rotation of the disk and thereby operate the doors, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM B. LAHR.
THOMAS F. ZEALAND.
ROLAND E. BOYER.

Witnesses:
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