G. M. BEERBOWER.

AUTOMATIC DOOR OPENING AND CLOSING APPARATUS.

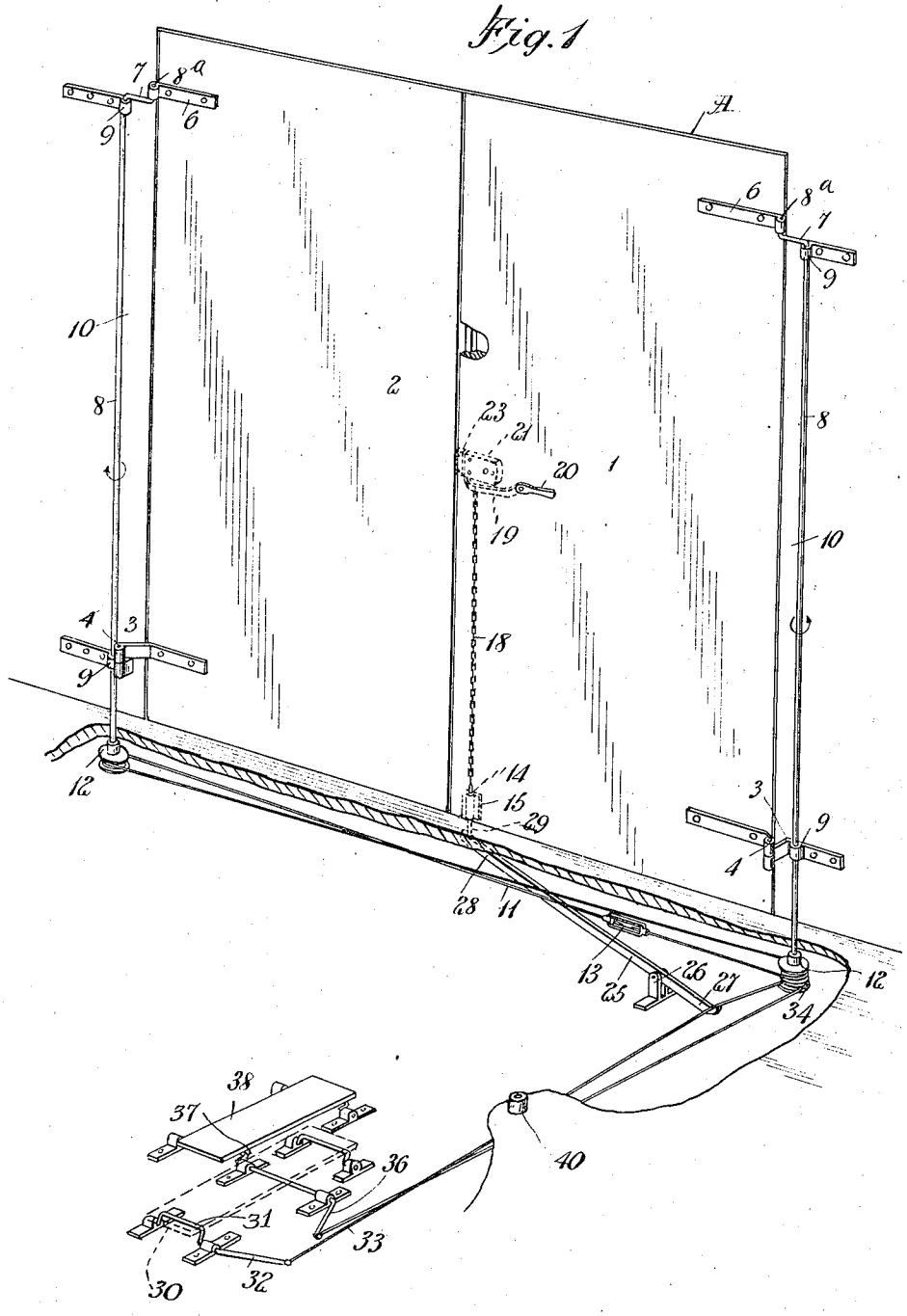
APPLICATION FILED NOV. 1, 1913.

1,134,810.

Patented Apr. 6, 1915.

3 SHEETS—SHEET 1.

Fig. 1



WITNESSES

F. D. Sweet.

A. Bradbury.

INVENTOR

George M. Beerbower

BY Munn & Co

ATTORNEYS

G. M. BEERBOWER.

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3 SHEETS—SHEET 2.

Fig. 2

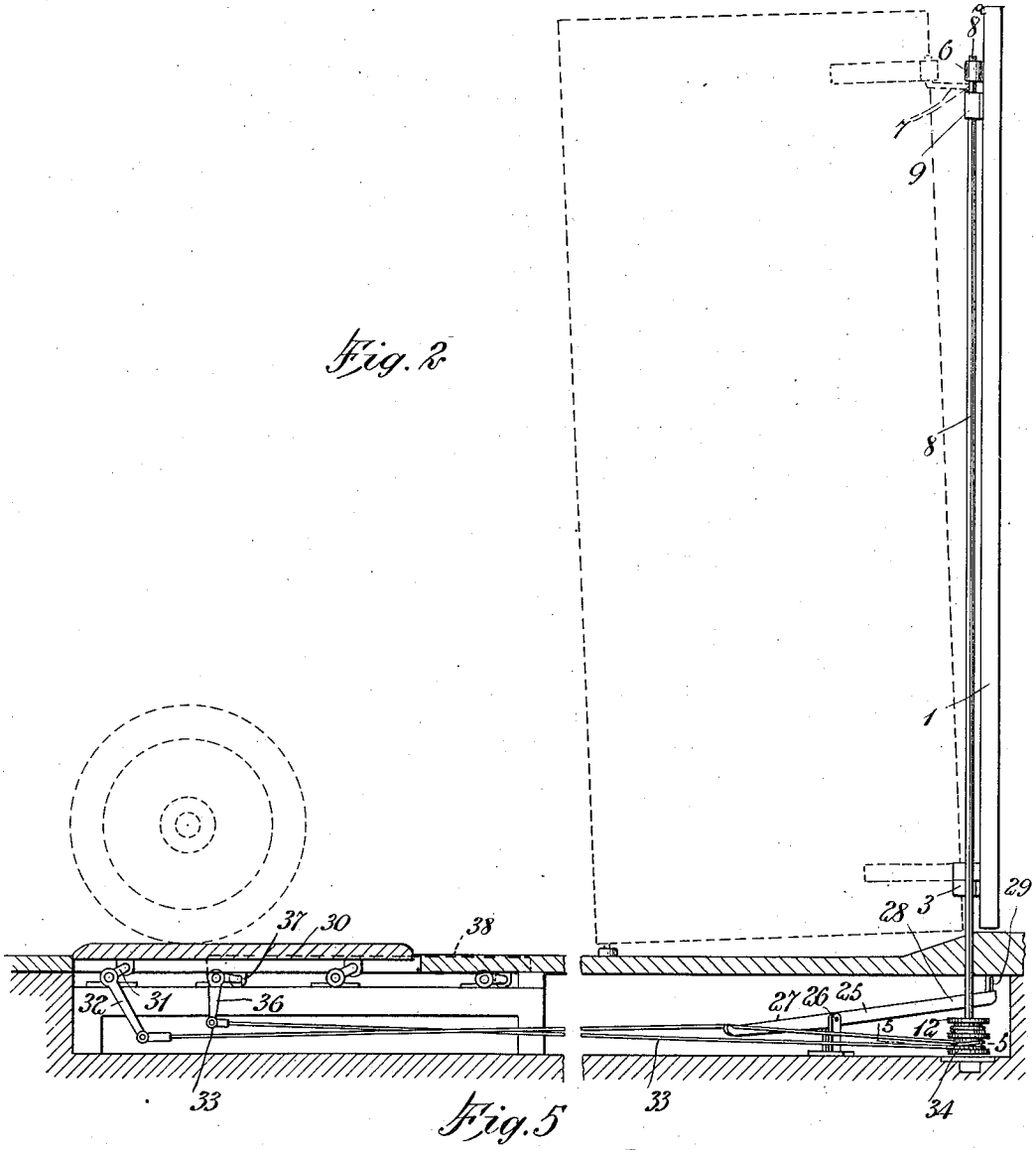
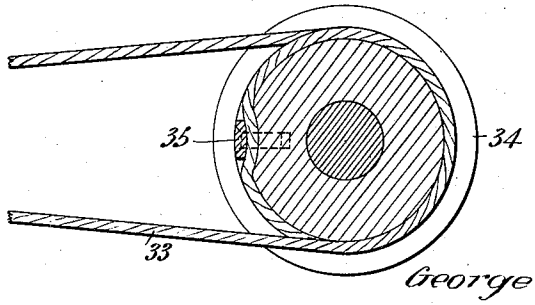


Fig. 5



WITNESSES

F. D. Swett.

C. Bradway.

INVENTOR

George M. Beerbower

BY Munn & Co

ATTORNEYS

G. M. BEERBOWER.

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3 SHEETS—SHEET 3.

Fig. 3

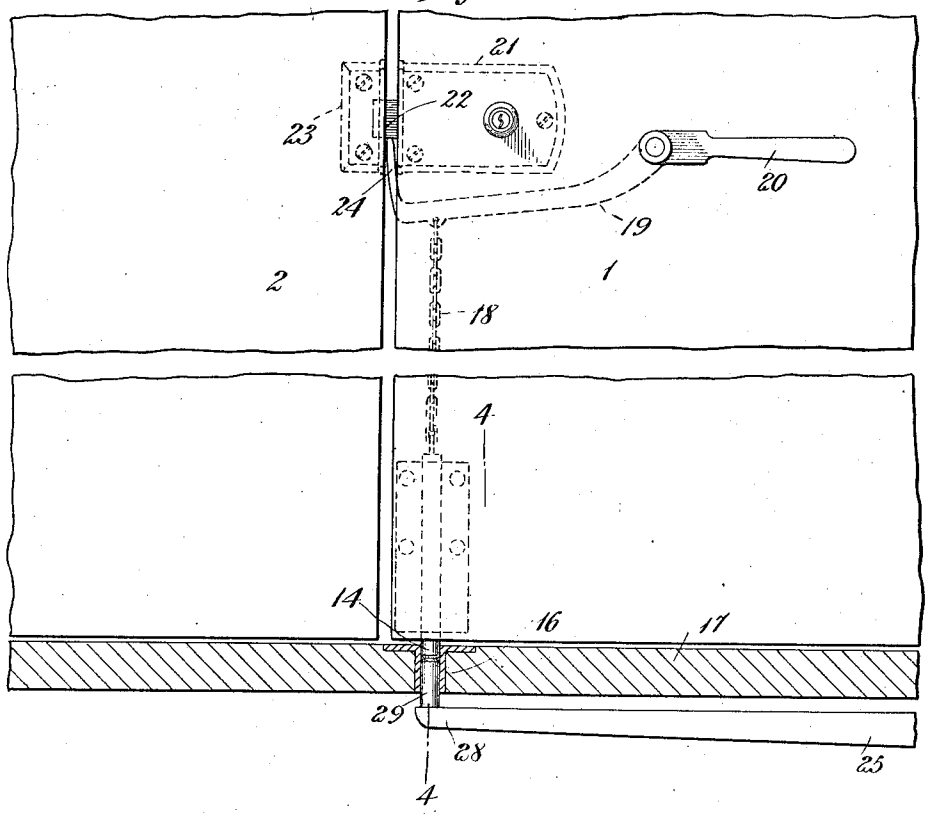
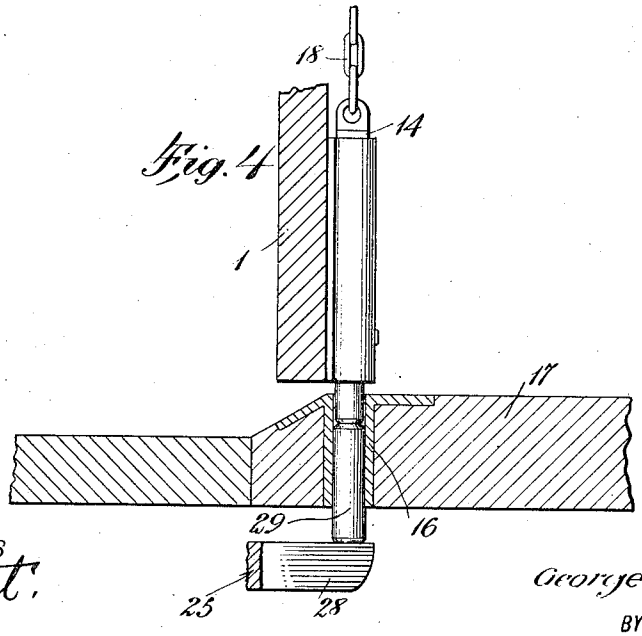


Fig. 4



WITNESSES

F. D. Lovett.

C. Bradway.

INVENTOR

George M. Beerbower

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE MARSHALL BEERBOWER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WILLIAM FOULKE JOHNES, OF PELHAMWOOD, NEW YORK.

AUTOMATIC DOOR OPENING AND CLOSING APPARATUS.

1,134,810. Specification of Letters Patent. Patented Apr. 6, 1915.

Application filed November 1, 1913. Serial No. 798,661.

To all whom it may concern:

Be it known that I, GEORGE M. BEERBOWER, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county and State of New York, have invented a new and Improved Automatic Door Opening and Closing Apparatus.

This invention relates to an opening and closing apparatus for doors or gates of that type whereby the door or gate automatically opens upon the approach of a vehicle and automatically closes upon the departure of the vehicle.

The invention has for its general objects to improve and simplify the construction and operation of apparatus of the character referred to so as to be reliable and efficient in use and comparatively inexpensive to manufacture and install.

More specifically the objects of the invention are the provision of a door opening and closing apparatus in which the door or doors will be automatically unlocked, automatically thrown open and automatically locked open merely by the depressing of a platform so located that the automobile or other vehicle will ride upon and depress the same, the closing of the door or doors being effected in substantially the same manner.

Another object of the invention is the employment of a novel means for unbolting the door before the door begins to swing open by a single platform.

A further object is to provide a manually-operated means for withdrawing the locking bolt of the door, such manual means being controlled by an ordinary key-actuated bolt-lock so that as long as the bolt of the latter is in projected or locking position the bolt for the door cannot be withdrawn.

With such objects in view, and others which will appear as the description proceeds, the invention comprises various novel features of construction and arrangement of parts which will be set forth with particularity in the following description and claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, and wherein similar characters of reference indicate corresponding parts in all the views, Figure 1 is an exterior view in perspective of the doors of a garage with the opening and closing mechanism therefor; Fig. 2 is a sectional view of the driveway showing the door-operating mechanism, the door being shown in closed position by the full lines and in open position by the dotted lines; Fig. 3 is an outside view of the doors showing the locking means therefor; Fig. 4 is an enlarged sectional view on the line 4—4, Fig. 3; and Fig. 5 is an enlarged sectional view on the line 5—5, Fig. 2.

While I have shown the invention applied to the doors of a garage, it is to be understood that it may be applied to other doors or gates, and hereafter the term "door" is used in a sense to cover a gate.

Referring to the drawings, A represents a doorway of a building which is adapted to be closed by one or more swinging doors 1 and 2 which swing outwardly in opposite directions to open position so as to permit an automobile to pass into or out of the garage. The lower hinge 3 for each door has an outstanding pintle 4, while the upper hinge consists of a leaf 6, and a crank arm 7 provided with a pivot 8^a engaging in the eye of the leaf 6 and having its axis of rotation arranged out of alinement with the pintle 4 of the lower hinge. The crank arm 7 is disposed on the upper end of a vertical shaft 8 which is journaled in bearings 9 fastened to the wall or doorway 10 of the garage. By this arrangement the opening or closing movement of the door is effected by gravity after the shaft 8 is rocked a quarter turn so as to throw the pintle 8^a of the upper hinge to one side or the other on a perpendicular line passing through the lower hinge. The shafts 8 for both doors operate simultaneously by suitable connecting means, such as a cross belt 11 which passes around pulleys 12 on the lower ends of the shafts, such cross belt including a turn buckle 13 so as to obtain the proper tension.

The locking means for the door comprises a vertically slidable bolt 14 arranged on the inner surface of the door 1, which latter laps at its free edge over the free edge of the door 2. The bolt 14 is slidable in a guide 15 and is adapted to enter a socket 16 set into the floor 17 of the garage. The bolt is connected by a chain or equivalent means 18 with an actuating lever 19 which is disposed at the inside of the door 1 and has a handle 20 on the outside of the door. This

operating lever 19 can be operated only when the door 1 is unlatched, as the door 1 is provided with a lock 21 that includes a key-actuated sliding bolt 22 movable into and out of engagement with the keeper 23 of the door 2. The lever 19 has a lug 24 which passes upwardly between the casing of the lock 21 and keeper 23, and this lug is adapted to engage the under side of the bolt or latch 22 when the latter is in projected position, as shown in Fig. 3. After the bolt 22 is retracted by the turning with the key inserted in the lock 21, the lever 19 can be raised by depressing the handle 20, and in so doing the door-holding foot bolt 14 is retracted. The doors can now be swung open by hand for ingress into or egress from the garage.

Provision is made for automatically releasing the foot bolt 14 by means of the automatic door-opening device or platform. The lever 25 is set into the ground or driveway with its fulcrum 26 near the outer end of the lever 27, the inner end of the lever 28 being disposed in line with and under the foot bolt 14. In the socket 16 is a slidable follower 29 which rests on the end 28 of the lever 25, such end 28 of the lever being normally held in lowered position by overbalancing the end 27. When the end 27 is depressed the end 28 is raised to cause the follower 29 to shift the bolt 14 upwardly out of the socket 16, so that the door can swing open. The door opening means operates first on the bolt releasing lever 25 and then turns the shafts 8 so as to throw the cranks 7 of the upper hinges outwardly at right-angles to the wall 10, whereupon the doors will gravitate to open position. This door-operating means comprises a platform or depressible element 30 located in the driveway at a point suitably distanced from the door. This platform is supported on the upper arm 31 of a bell-crank lever which has its lower arm 32 connected with one end of a cable 33, which cable passes around a pulley 34 secured to the lower end of the shaft 8 of the door 1. The cable is secured by a fastening 35 to the pulley 34 and extends forwardly from this pulley to the lower arm 36 of the bell-crank lever, the upper arm 37 of which supports another platform 38 that is disposed out of line longitudinally with the platform 30. The approaching vehicle depresses the platform 30 and simultaneously the platform 38 rises, but during the depression of the platform 30 a draft is exerted on the cable 33, so that the right shaft 8, Fig. 1, is turned anti-clockwise, while the left shaft 8 is turned clockwise, whereby the cranks 7 on such shafts move outwardly and thereby cause the doors to gravitate to open position. The end 27 of the bolt-releasing lever 25 engages under the portion of the cable 33 lying between the pulley 34 and the end connected with the platform 30, and this lever holds the cable raised at an intermediate portion, and consequently when a draft is exerted on the cable the end 27 of the lever is depressed to effect the raising of the end 28 for the purpose of releasing the foot bolt of the door. This releasing of the bolt takes place before the shafts 8 are turned. As the doors swing open, the foot bolt 14 on the door 1 will finally encounter a socket 40 and engages therewith automatically so as to hold the door 1 open against the force of the wind. A bolt may be provided on the door 2 to engage with a socket similar to the socket 40 of the opposite side of the driveway. As the vehicle leaves the garage its wheels will pass into engagement with the platform 38, which will be in raised position as long as the doors are opened. In encountering this raised platform 38 the cable 33 will be pulled in the opposite direction so as to throw the cranks 7 of the shafts 8 back to normal position or parallel with the wall of the garage. This changes the center of gravity of the doors so that they automatically swing to closed position. The swinging of the doors being so timed that the door 2 swings closed slightly before the door 1. As the cranks 7 on the shafts 8 are turned back to normal position by the depressing of the platform 38 the bolt 14 disengages automatically from the socket 40 so that the door can swing closed, and finally, when the door is closed the bolt 14 will automatically engage in the socket 16, whereby the door is locked.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the construction and method of operation will be readily understood by those skilled in the art to which the invention appertains, and while I have described the principle of operation, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of a door, a depressible platform, a door-operating means including a cable normally slack when the door is closed and connected with the platform and the door for throwing the latter open, a bolt normally locking the door in closed position, and bolt-operating means including a part normally supporting the bolt in locking position and taking up the slack of the cable while the platform is in raised position, whereby the cable operates the said

part to release the bolt as the slackness of the cable is removed and before the cable throws the door open.

2. The combination of a door, a vehicle-depressed platform, door-operating means including a cable normally slack when the door is closed and connected with the said platform and said door to throw the latter open, a bolt normally locking the door closed, and a lever engaging the cable and normally taking up the slack thereof while said platform is raised and moved by the cable when the platform is depressed for throwing the said bolt to unlocking position.

3. The combination of a pair of doors, hinges for the lower portions of the doors and vertically disposed shafts, cranks on the upper ends of the shafts, hinged connections between the cranks and doors respectively, said hinge connections being out of vertical alinement with the axis of the lower hinges, connections between the shafts for causing simultaneous movement, oppositely-movable vertically-depressed platforms, bell-crank levers actuated by the platforms, a cable connected with the bell-crank levers, a drum on one of the said shafts around which the cable winds, a locking bolt for the doors, and a lever arranged to release the bolt and operatively related with the said cable whereby the initial movement of the cable moves the lever to release the bolt preparatory to the turning of the said shafts.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE MARSHALL BEERBOWER.

Witnesses:

ISABELLE EUELL,

EDNA HOPFE.