July 9, 1929. O. C. JOHNSON 1,720,554

LATCH FOR CLOSURE OPERATORS

Filed Dec. 9, 1927

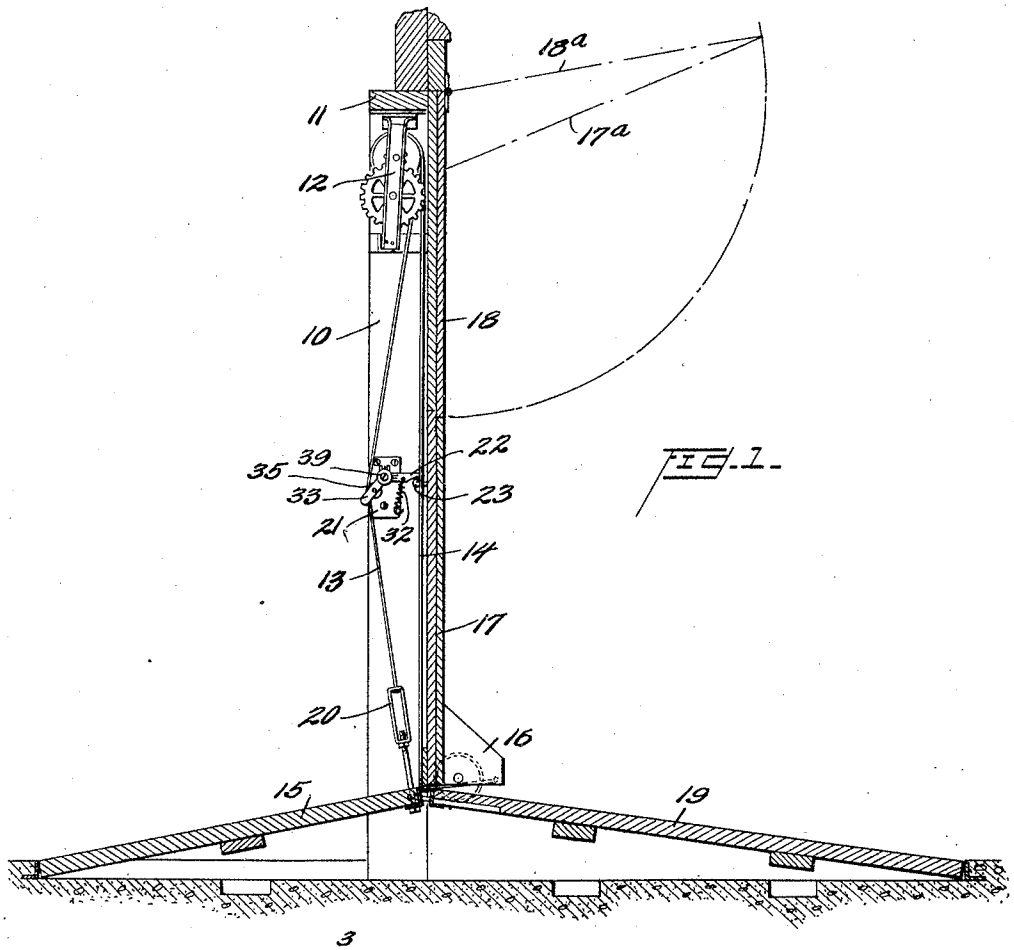


FIG. 1.

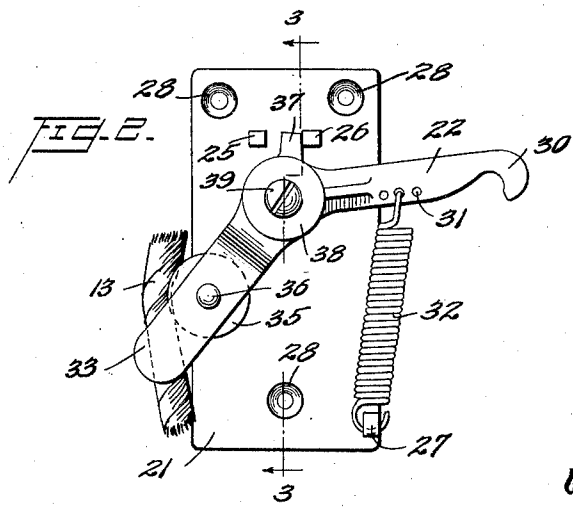


FIG. 2.

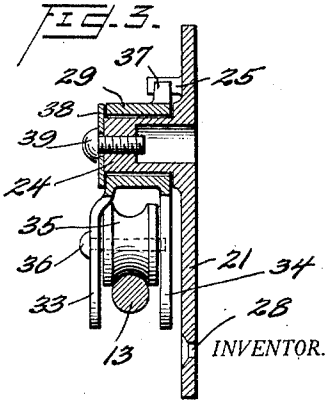


FIG. 3.

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UNITED STATES PATENT OFFICE.

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LATCH FOR CLOSURE OPERATORS.

Application filed December 9, 1927. Serial No. 238,867.

This invention relates to latches for closure operators, and more particularly to such a latch adapted to be actuated automatically in the operation of a door of an automobile garage. The latch is one specially designed for use in connection with the automatically operated door described and claimed in my patent numbered 1,445,692 dated February 20, 1923, and is an improvement upon the latch shown in the said patent.

The object of the invention is to produce a simple and effective latch for automatically operated garage doors, one which will not be operated except when an automobile is entering or leaving the garage. Another object of the invention is the provision in such a latch of limiting stops and of a spring whose effective tension can be adjusted to different weights of cars.

Other objects and advantages of the invention will hereinafter appear in the description which follows and the novel features thereof will be particularly pointed out in the appended claims.

Like reference characters indicate like parts throughout the several figures of the drawing, in which

Figure 1 is a vertical section through an automatically operated garage door showing the special application of the latch thereto,

Figure 2 is an enlarged elevation of the latch itself, and

Figure 3 is a vertical section through the latch taken upon the line 3—3 of Figure 2.

While the latch has been particularly designed for use in connection with an automatically operated garage door, it will be appreciated that its usefulness is not so limited; and it will be further appreciated that certain details of the latch as well as certain subcombinations of elements thereof will be useful in latches generally. Except as required by the spirit and language of the appended claims, the invention is not to be considered as limited in scope.

In Figure 1 is shown certain parts of a garage door in connection with which the latch of this invention is used. The jamb 10 in conjunction with the upper frame member 11 supports a suitable hoist mechanism 12 comprising two drums or their equivalents for the power cable 13 and the lifting cable 14. The drums are intergeared, as more fully described in my said patent, so that a very limited unwinding of the power cable will produce a considerable winding of the lifting cable. At its lower end the power cable is attached to the depressible platform 15 upon the inside of the garage, while the lower end of the lifting cable is attached to the wheel support 16 carried by the lower portion of a door section 17. The door is made of two hingedly connected sections, the upper section 18 carrying the lower section 17. A depressible platform 19 on the outside of the garage is connected to the platform 15 in such a manner that the adjacent edges of the two rise and fall together. A turnbuckle 20 in the power cable enables the platforms to be adjusted so that their adjacent edges lie in substantial contact with the lower edge of the door in closed position. The dotted lines 17^a and 18^a illustrate the position of the door sections when the door is in open condition.

All of these parts have been more fully described in my patent hereinbefore referred to, to which reference is now had for a complete disclosure as well as a full recital of the operation of the parts.

On the jamb 10 is mounted a plate 21 carrying a hook 22 of the latch, while on the door section 17 is mounted any suitable form of keeper 23, which acts with the hook in fastening the door.

The plate 21 is formed with a projection 24 constituting a pivot for the hook 22. It is likewise provided with limiting stops 25 and 26 designed to limit the movement of the hook member to rather narrow limits. An apertured lug 27 at the lower end of the plate is the means of attachment for one end of a spring, while apertures 28 are employed to receive screws to fasten the plate upon the door jamb.

The hook member 22 is formed with a barrel 29 between its ends, fitting upon the pivot projection 24. The latch arm projects forwardly from the barrel and is formed at its end into a bill 30, to engage the keeper 23 on the door section 17. A series of apertures 31 have been provided in the latch arm, in any one of which the upper end of the spring 32 engages, while the lower end of the spring engages the aperture in the lug 27.

Projecting from the barrel 24 are supporting arms 33 and 34, between which is rotatably mounted a roller 35 by means of the pivot bolt 36. The ends of the supporting arms extend beyond the roller 35 to act as

holding guides for the cable 13. The teat 37 integral with the barrel extends into the space between the stops 25 and 26. These elements will permit only a limited movement of the hook 22, while the spring 32 will normally hold the hook in the position shown in Figure 2 with the teat 37 in contact with the stop 26. The barrel 29 is held upon the pivot projection 24 by means of the washer 38, the machine screw 39 fitting an aperture in the end of the projection 24 holding the washer in place.

From the foregoing description of the parts, their individual functions will be apparent. There remains to complete a full disclosure a recital of the mechanical cooperation of the parts with each other during the operation of the door.

It will be noted that the power cable passes through the latch in extending from the hoist mechanism to the turnbuckle, which causes it to be deflected out of a straight line. As shown the cable passes over the roller 35 and between the supporting arms 33 and 34. It will be further noted that the supporting arms project from the barrel at an angle, placing the roller below a horizontal line passing through the barrel and to the rear of a vertical line passing through the barrel. The spring 32 acts to move the roller 35 upwardly and rearwardly to increase the deviation of the power cable from a true vertical line. The tension of the spring is sufficient to lift the adjacent ends of the platforms and to support upon said platforms any weight substantially less than the weight of the car to be housed in the garage. The provision of the apertures 31 in the latch arm will enable an adjustment of the position of the spring end to produce a greater or less tension upon the power cable.

When a car is driven upon either of the platforms, the power cable is given a downward pull. As the door is latched and therefore cannot move, the initial pull on the power cable will cause the hook to be oscillated to release the bill 30 from the keeper. The door having been unlatched will rise into the position shown by the dotted lines; and immediately upon the unlatching of the door the spring 32 will lift the roller, whereby tension of the spring will be added to the weight of the car in producing the initial door movement.

When the door is in open position, the latch will maintain a release position so long as the weight of the car remains on the platform. As the car leaves the platform, the door will drop, the platforms rise and the latch assume a latched position. But provision has been made in the hoist mechanism for preventing too rapid falling of the door (this feature not being shown in this application). The door falls, however, with sufficient force so that the keeper will act to raise the latch arm against the tension of the spring 32, whereby this spring will act as a shock absorber for the closing door. It will therefore be appreciated that the tension of the spring must be selected with relation to the weight of the car to be housed, the weight of the doors and the construction of the hoist mechanism, in order that an easy and satisfactory closing of the door may be accomplished.

If it is desired to open the door without the aid of the automobile, one may from the inside of the garage stand on the platform and successively push on the projection 33 of the latches at each side of the door, when the latches will be released. A push outward on the door will cause it to open sufficiently to make it safe to start the automobile engine. The door may be fully opened by pulling upward on the lower door section, and it may be held in its open position by inserting a nail between meshing cogs of the hoist mechanism.

What is claimed is:

1. In a door closing mechanism comprising a depressible platform, a door, a hoist mechanism, a power cable and a lifting cable connecting said hoist mechanism with said platform and said door, respectively, and a keeper on the door, a latch comprising a supporting plate adapted to be secured to the door jamb, a hook member pivoted to the jamb and coacting with the keeper on the door, tension means between the hook member and the plate, and means on the hook member for engaging the power cable to normally press it out of vertical alignment.

2. The combination of claim 1 wherein limiting stops are provided on the plate and a teat on the hook member to limit the movements of the hook member.

3. In a latch, a supporting plate adapted to be secured to a door jamb or the like, said plate being provided with a pivot projection, a lug and limiting stops; a hook member provided with a barrel mounted on said pivot projection, a latch arm having a series of apertures therein, a pair of supporting arms carrying a roller, and a teat coacting with the limiting stops; a spring secured in one of the apertures in the latch arm and to the lug on the plate, and a washer and holding screw therefor for maintaining said barrel on said pivot projection.

In testimony whereof I affix my signature.

ORVILLE C. JOHNSON.