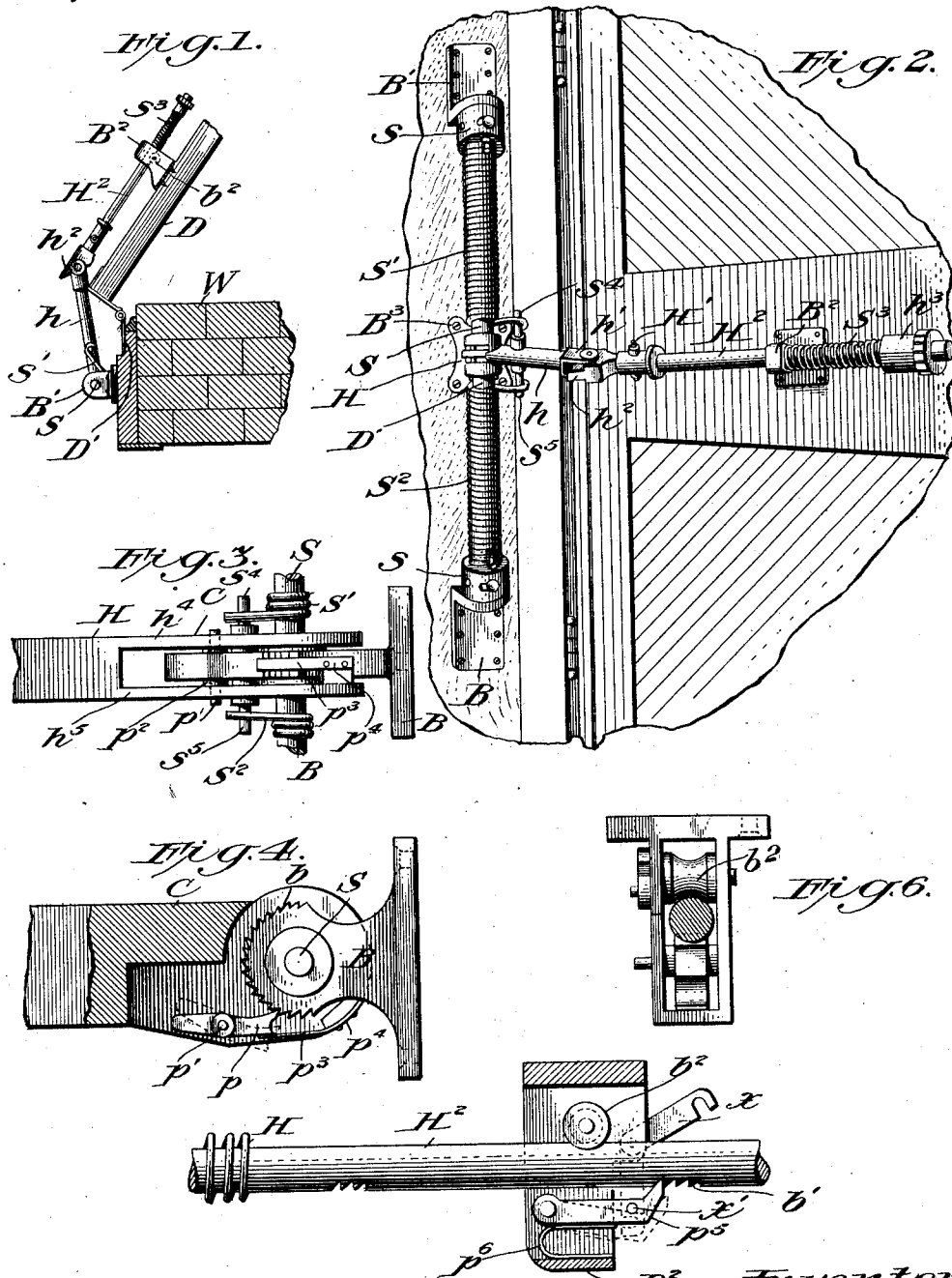


G. B. CLAY.
DOOR OPENING DEVICE.
APPLICATION FILED AUG. 9, 1909.

998,324.

Patented July 18, 1911.



Witnesses:
O. O. Edelin,
James H. Marr

Inventor:
George B. Clay,
Charles F. Newkirk
Attys.
By

UNITED STATES PATENT OFFICE.

GEORGE B. CLAY, OF JENKINTOWN, PENNSYLVANIA.

DOOR-OPENING DEVICE.

998,324.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed August 9, 1909. Serial No. 512,100.

To all whom it may concern:

Be it known that I, GEORGE B. CLAY, a citizen of the United States, residing at Jenkintown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Door-Opening Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to door openers for engine houses and the like and has for its object the provision of means for opening a door to its fullest extent, and then holding it in open position until released, against wind pressure or other forces.

Briefly stated, my invention comprises a jointed lever arm working from an elongated spindle carrying coiled springs, and provided with ratchet mechanism for locking it when in extreme open position.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a horizontal section of a portion of a wall, door jamb, and door, with my opener shown in plan attached to the same. Fig. 2 is a side view of the same parts. Figs. 3 and 4 are details of the locking ratchet adapted to the opener of Figs. 1 and 2. Figs. 5 and 6 are similar detail views of a modified form of lock attached to the lever arm instead of the spindle.

Referring to Figs. 1 and 2, W is a portion of a wall of an engine house or ambulance station, carrying the casing or jamb D' and the door D hinged thereto. In wagon houses generally such doors are made double, and the figures would therefore represent only one-half of the complete equipment. This however is deemed sufficient to illustrate the invention. Inside the hinge of the door and on a line parallel with the hinge line thereof are mounted the fixed brackets B and B', which receive the ends of a spindle S carrying the two strong helical springs S' and S². Each of these springs is secured at one end to a housing s, adjustable upon its respective bracket.

Mounted upon the center portion of the spindle is a split hub H, carrying a stub arm h with a forked end h' in which is pivoted a socket piece H' carrying the lever arm H² and having a projecting stop h² which limits the pivotal motion and maintains the joint rigid while the door is being forced open. The lever H² passes through an arch on the

bracket B² fastened to the inner face of the door and over a friction roller b² journaled beneath the arch. Outside of this arch it is provided with a helical spring S³ and an adjustable head nut h³ forming an abutment for the same, so that when the door has reached the limit of movement of the lever h, it may swing farther by breaking the joint, as shown in Fig. 1, and will finally be checked without shock by the cushioned resistance of this compression spring S³.

On the hub H which is split as stated, I mount a pawl, and on the bracket B³ I mount a cooperating ratchet, these parts being best shown in Figs. 3 and 4. The bracket B has a flat extension or web which lies between the two plates h⁴ and h⁵ of the hub H. Around the periphery of this extension I form ratchet teeth b, while through the center an opening is formed for the passage of the spindle S. On the hub, and cooperating with the ratchet is a pawl p, turning on a pivot pin p' which passes through the two plates h⁴ and h⁵, spacing rings p² being interposed between the pawl and the side plates to prevent undue friction. The pawl is normally held in engagement with the ratchet by spring p³ secured at p⁴ to an upstanding lug formed on the plate p⁵. In Fig. 3 the ends of the springs S' and S² are shown engaging studs s⁴ and s⁵ respectively on the hub.

The operation of my device will now be apparent. Assuming the door D to be closed, the levers h and H² are in a straight line, the springs S' and S² are under tension, and the spring S³ is free from compression. If now the bolt of the door be shot back, the arms being under tension from the springs S' and S², pressure of the arm H² on the roller b² will force the door outwardly, until it reaches a position with the lever h against its inner edge which is protected by an iron angle plate. The motion of the door then continues, but the joint in the lever breaks and as the pivot remains stationary, and is at some distance from the hinge line of the door, the further movement of the latter will result in compression of the spring S² whereby it is finally checked in the position shown in full lines in Fig. 1. As the levers swing outwardly the pawl p in the hub is carried around over the ratchet teeth and locks the lever h in its extreme position, thereby locking the door by pressure of the lever end against the iron angle plate.

In Figs. 5 and 6 I have shown a lock which may be used either by itself or as auxiliary to that shown in Figs. 3 and 4. This comprises ratchet teeth b' formed on the lever arm H^2 , adjacent to the arch on the bracket B^2 . A pawl p^5 is pivoted on the bracket and normally pressed against the lever by a spring p^6 . The operation of this device depends upon the reciprocating motion of the lever in the bracket. As the door opens the toothed portion of the lever passes forward beneath the ratchet which prevents its return until released by hand. In order to maintain this pawl out of engagement with the ratchet when desired, a link or hook x is provided pivoted on the bracket and coöperating with a pin x' on the pawl.

The gist of my invention lies in the combination with the spring door opener of a locking means of the general character described. I do not wish to limit myself therefore to the specific form of spring opener which I have herein described, nor to the single specific locking device, as both of these may be varied somewhat without departing from the scope of the invention. It is to be understood therefore that non-essential changes in form or arrangement are included within the scope of my claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is—

1. A door opener comprising a spindle, a lever arm extending substantially at right angles to the spindle, spring actuating means for the lever, a jointed connection between the lever and door, and an automatic lock for the lever, substantially as described.

2. A door opener comprising a spindle supported in brackets with its axis parallel to the hinge line of the door, a pair of coiled springs on the spindle, a hub intermediate of the springs, and an arm carried by the hub at right angles to the spindle, with an operating connection between the springs and arm, a jointed connecting device between the arm and the door, and an automatic lock for the arm becoming operative when the door is open, substantially as described.

3. A door opener comprising a spring actuated jointed pressure arm having a fixed connection with a door frame or casing and a yielding connection with the door, and an automatic lock associated with the fixed connection, substantially as described.

4. A door opener comprising a spring actuated jointed pressure arm with one joint fitted to rotate upon a fixed support and the other joint yieldingly connected to the door, and means for automatically locking the movable joint to prevent return movement of the door when open.

5. A door opener comprising a spring actuated jointed pressure arm with one joint fitted to rotate upon a fixed support and the other joint yieldingly connected to the door, and automatic means associated with each joint, whereby the door will be opened to its fullest extent and positively locked against any return movement, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE B. CLAY.

Witnesses:

HERVEY J. SHERER,
HEPNER F. VAN HORN.