

June 7, 1955

H. A. EICHACKER

2,710,216

LATCH MECHANISM

Filed Nov. 10, 1952

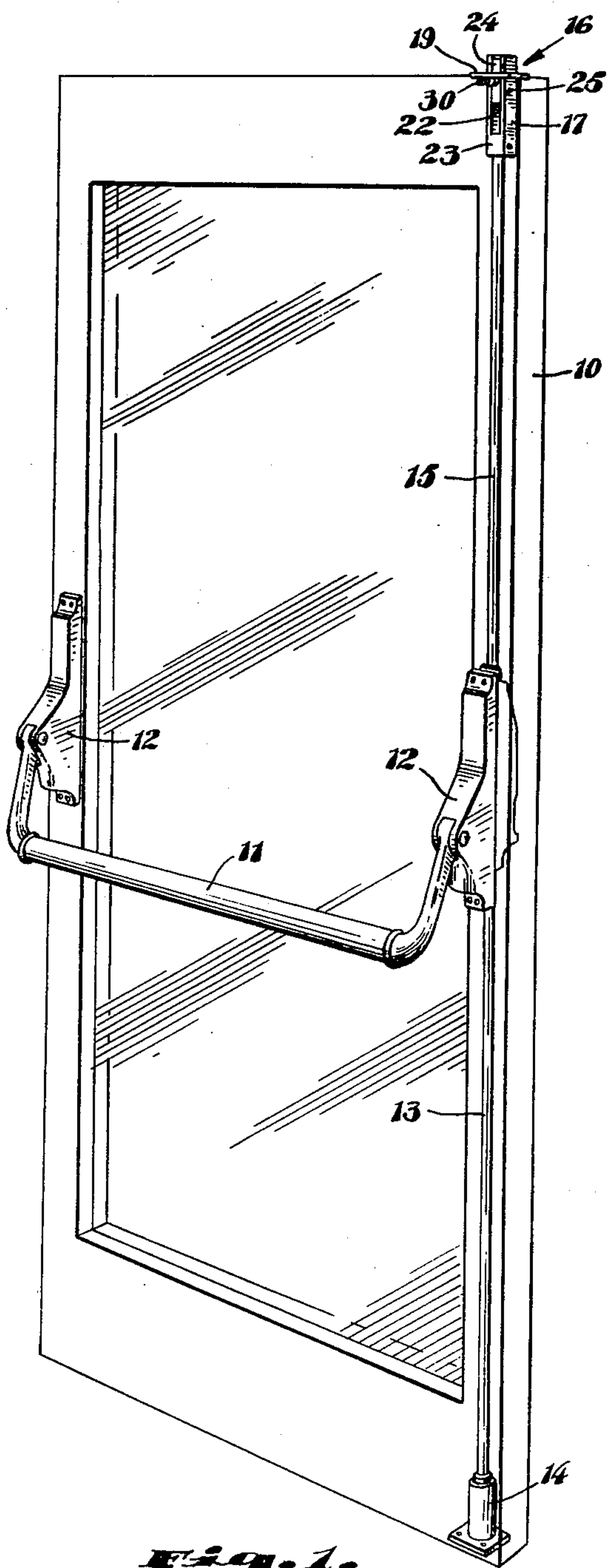


Fig. 1.

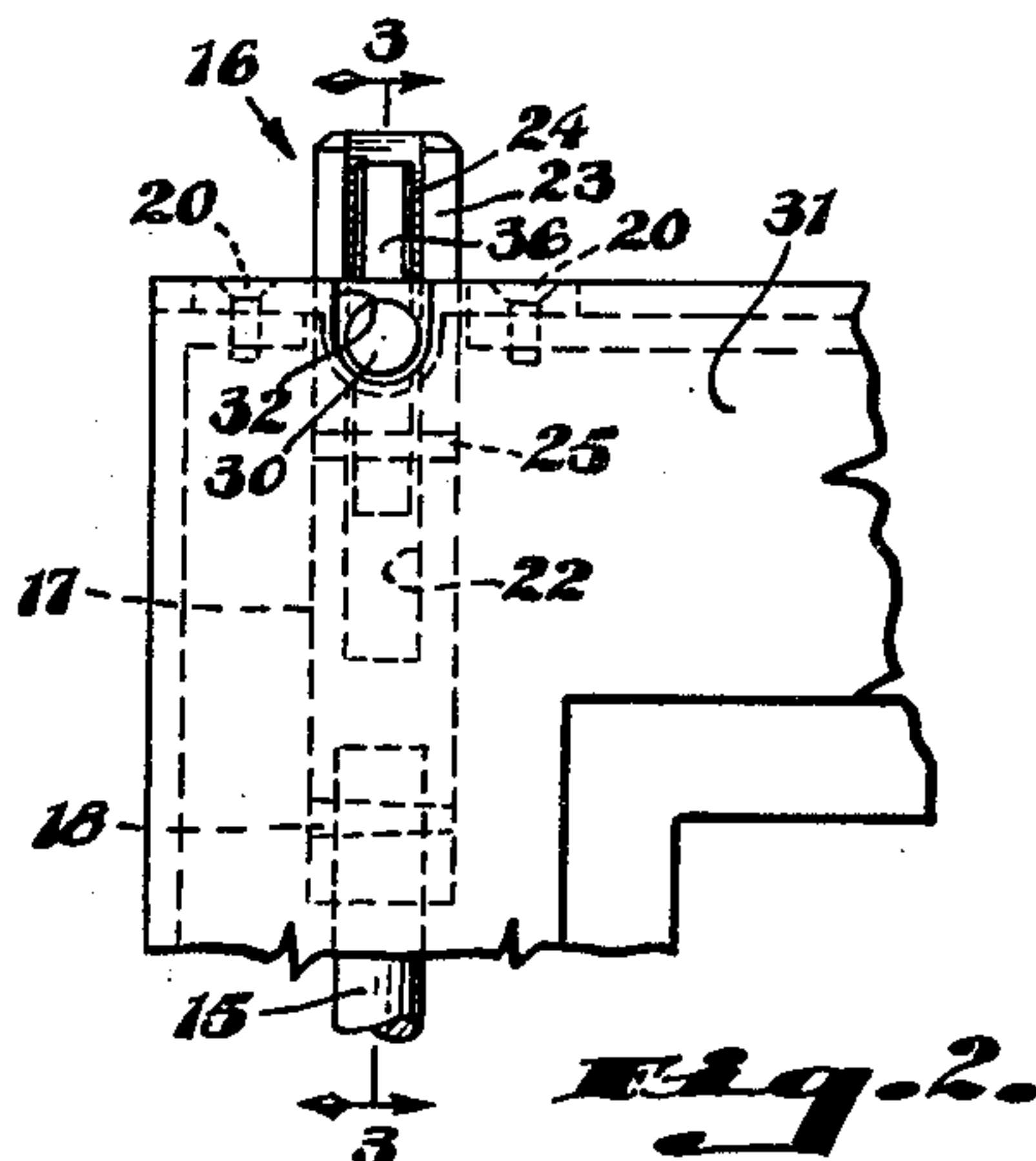


Fig-2.

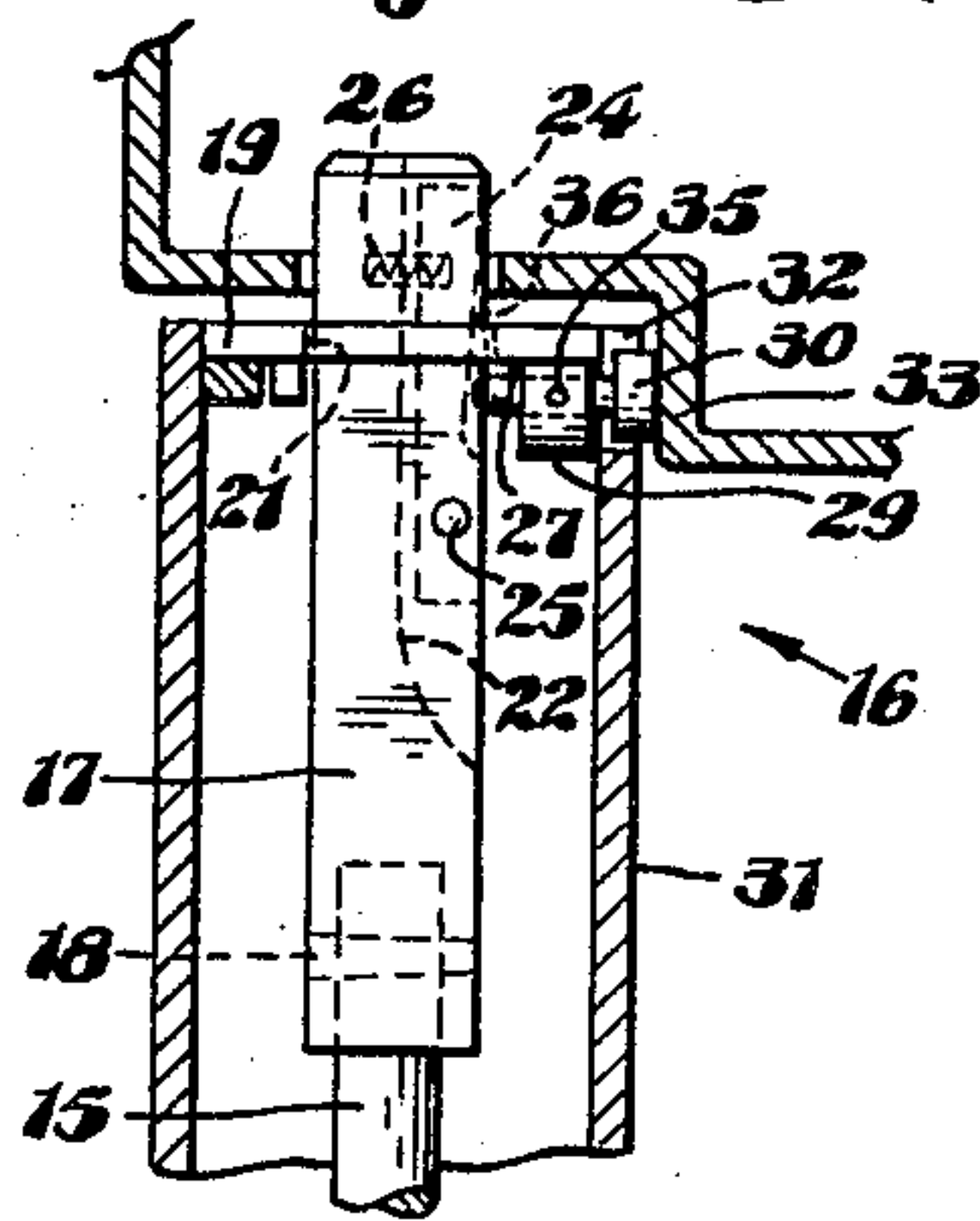


Fig. 3.

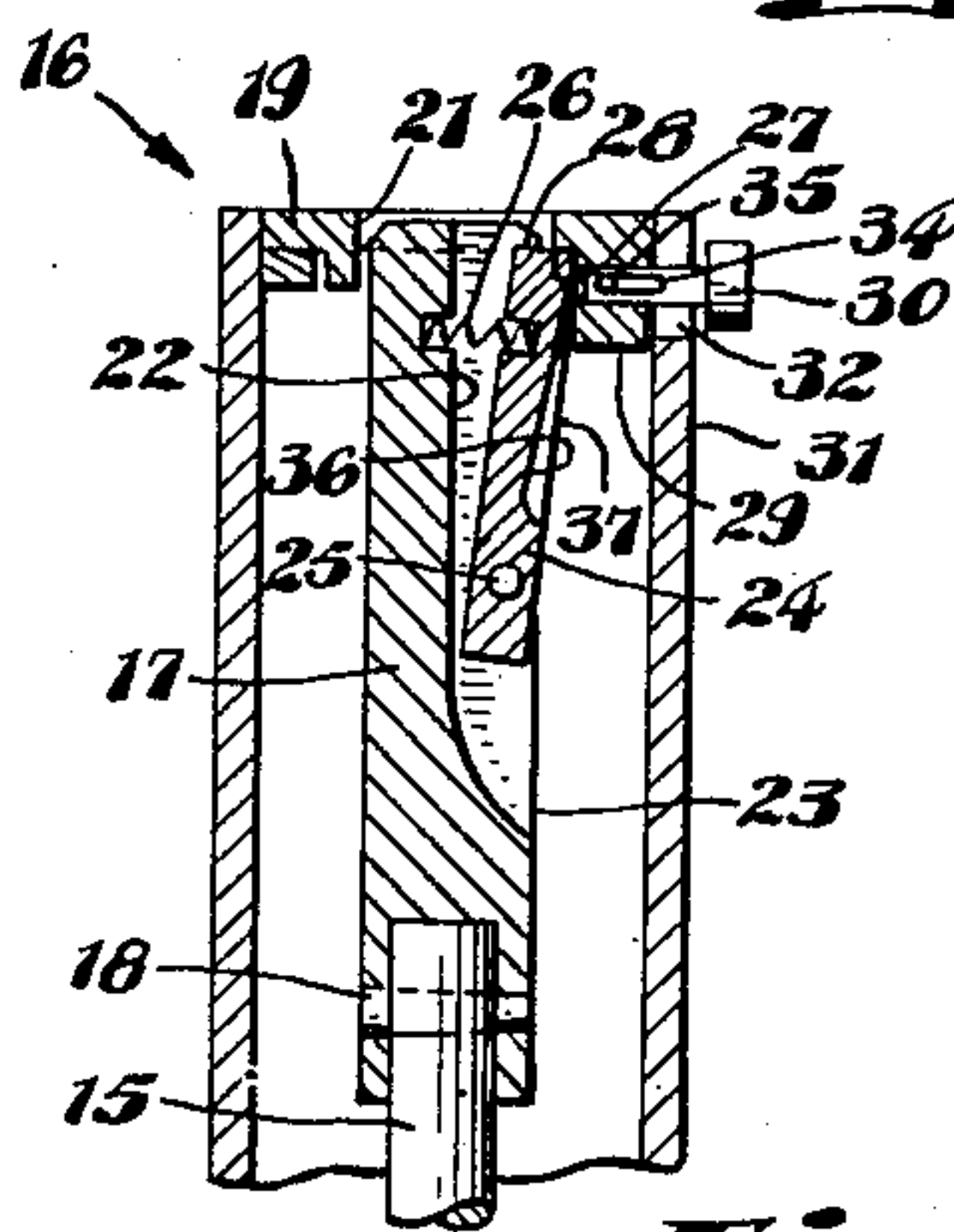


Fig. 4.

INVENTOR.

HOMER A. ETCHACKER,

BY:-

Harold B. Wood.

ATTORNEY.

1

2,710,216

LATCH MECHANISM

Homer A. Eichacker, Indianapolis, Ind., assignor to Vonnegut Hardware Company, Indianapolis, Ind., a corporation of Indiana

Application November 10, 1952, Serial No. 319,701

4 Claims. (Cl. 292—335)

The present invention relates to a latch for swinging closures, and is particularly concerned with the provision of means, extremely simple and inexpensive, and yet faithful in performance, for holding a latch bolt in retracted position during swinging movement of its associated closure, said means being of such character that the bolt is automatically released for projection when the closure is moved to a closed position.

Further objects will become apparent as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is a perspective, phantom view of a closure incorporating my invention;

Fig. 2 is an elevation of a corner of the closure of Fig. 1 showing my latch assembly associated therewith;

Fig. 3 is a longitudinal sectional view through the latch assembly of Fig. 2, substantially on line 3—3 thereof; and

Fig. 4 is a further sectional view similar to that of Fig. 3 but showing the latch bolt and associated parts in retracted position.

Referring more particularly to the drawings, it will be seen that I have illustrated, in phantom outline, a closure 10. A panic-type latch actuator 11 is mounted on the door in suitable brackets 12—12. The actuator, through suitable mechanism (not shown) is designed to reciprocate the actuator rod 13, connected to the lower latch 14; and to reciprocate the actuator rod 15, connected to the upper latch assembly 16, now to be described.

A latch bolt 17 is solidly fixed to the end of rod 15, by means of the pin connection 18, or the like. A guide plate 19 is suitably fixed to the upper edge of closure 10 by means of screws 20, or the like and is formed with an aperture 21 for the guided reception therein of the free end of latch bolt 17.

Latch bolt 17 is formed to provide a socket 22 in the surface 23 thereof facing the direction of closure-closing movement. Said socket is elongated in the direction of reciprocation of latch bolt 17 and, in the illustrated embodiment, opens through the free end of bolt 17.

Nested in socket 22 is an elongated dog 24. A pin 25 is carried by latch bolt 17 and spans the socket 22 upon an axis transverse to the longitudinal dimension of said socket. Dog 24 has the end thereof, remote from the free end of bolt 17, pivotally journaled on pin 25 for oscillation of the opposite end 28 of said dog about pin 25 between a position below the bolt surface 23 and a position above said surface, the two said positions being illustrated respectively in Figs. 3 and 4. A coiled compression spring 26 urges the dog end 28 toward its second said position.

The guide plate 19 is recessed as at 27 to provide a

2

shoulder, and as the rod 15 is moved downward by movement of actuator 11, latch bolt 17 is moved from its position illustrated in Fig. 3 toward its position illustrated in Fig. 4. The moment dog end 28 drops beneath the shoulder 27, spring 26 shifts end 28 behind said shoulder, thereby securely holding latch bolt 17 in its retracted position. Projection of the bolt can thereafter be accomplished only by disengagement of dog end 28 from behind shoulder 27.

To this end I provide a lug 29 depending from guide plate 19 adjacent bolt face 23. A pin 30 is reciprocally received in a bore therein for reciprocation along an axis substantially normal to the axis of reciprocation of latch bolt 17. The face 31 of the closure is apertured, as at 32, to permit the projection of pin 30 slightly beyond the surface of closure 10. In the present installation, with which my latch is intended primarily for use, the axial length of the pin is slightly greater than the distance between closure face 31 and surface 23 of latch bolt 17.

As closure 10 moves toward its closed position, the end of pin 30 strikes the closure stop 33 an instant before the closure reaches its closed position. Pin 10 is shifted toward latch bolt 17 and the opposite end thereof engages with the swinging end of dog 24, swinging said dog about pin 25 and moving the end 28 thereof from behind shoulder 27. Spring mechanism (not shown) then shifts latch bolt 17 to its projected position shown in Fig. 3.

To prevent accidental displacement of pin 30 from its position in lug 29, I prefer, in one instance, to provide a slot 34 through pin 30, and a pin 35 carried in lug 29 and projecting through slot 34. Other means for retaining pin 30 could obviously be employed.

Actual installations of this type cannot, from a practical standpoint, be held to theoretical tolerances. Each installation will differ somewhat in, for instance, the clearance between the face 31 of closure 10 and the closure stop 33. For this reason, pin 30 must be made sufficiently long to operate when there is a relatively large clearance. But a pin of the same length would jam where the clearance was held to a minimum. To overcome this difficulty, I form the dog 24 with a recess 36 in the surface 37 thereof facing the pin 30, and elongated in the direction of latch bolt reciprocation. The floor of said recess retreats away from dog surface 37 from the end 28 toward the pivot pin 25.

By the use of such construction, the end of pin 30 can extend, once the door has been closed and upward movement of the latch bolt has been initiated, below the dog surface 37 where the closure clearance is small, thus preventing binding between the pin and dog 24, which, in some instances, would be so severe as to prevent projection of latch bolt 17.

I claim as my invention:

1. For use with a swinging closure seatable in a frame against stop means carried by said frame, a latch assembly comprising a guide plate supported on an edge of said closure adjacent said frame and having an aperture there-through, a latch-bolt guided for reciprocation through said aperture between a position in which one end projects beyond said edge of said closure and a position in which said end lies entirely beneath said edge of said closure, said latch-bolt having a socket therein opening through the surface thereof facing the direction of closure-closing movement and elongated in the direction of reciprocation of said latch-bolt, an elongated dog nested in said socket and pivoted to said latch-bolt at a point remote from the projectible end of said latch-bolt, the free end of said dog being swingable about the pivotal axis of said dog from a position beneath said latch-bolt surface to a position above said latch-bolt surface said free end terminating short of the projectible end of said latch-bolt, said guide plate being formed to provide a shoulder adjacent said latch-

3

bolt surface, means for resiliently urging the said free end of said dog toward its second said position for engagement of said free end behind said shoulder when said latch-bolt is moved to its retracted position, and further means supported from said closure in the path of swing of said dog and in a position to be struck and moved against said dog by said closure stop means as said closure approaches its closed position to shift said dog end from behind said shoulder to permit movement of said latch-bolt to its projected position.

2. The device of claim 1 in which said further means comprises a pin supported on said guide plate for axial reciprocation along an axis substantially normal to the axis of reciprocation of said latch-bolt and in the plane of swing of said dog, the axial extent of said pin being slightly greater than the distance between the surface of said closure on the side thereof facing the direction of closure-closing movement and the adjacent surface of said latch-bolt.

3. The device of claim 2 in which the surface of said dog facing the direction of closure-closing movement is formed to provide a recess elongated in the direction of reciprocation of said latch-bolt, the floor of said recess retreating from said surface of said dog from a point near the said free end thereof to a point near said pivotal axis thereof.

4. For use with a swinging closure seatable in a frame against stop means carried by said frame, a latch assembly comprising a guide plate supported on an edge of said closure adjacent said frame and having an aperture there-through, a latch-bolt guided for reciprocation through the aperture in said guide plate from a position in which one end thereof projects beyond said edge of said closure and a position in which said end lies entirely beneath said edge of said closure, said latch-bolt having a socket therein opening through the surface thereof facing the direction of closure-closing movement and elongated in the direction of reciprocation of said latch-bolt, an elongated dog nested in said socket, pivot means carried by said latch-bolt and supporting the end of said dog remote from the projectile end of said latch-bolt for swinging movement

4

of said dog about said pivot means substantially in a plane normal to said latch-bolt surface, the opposite end of said dog being swingable from a position beneath said latch-bolt surface to a position above said latch-bolt surface and terminating short of the projectile end of said latch-bolt, said guide plate being formed to provide a shoulder adjacent said latch-bolt surface and facing away from said edge of said closure, spring means confined between said latch-bolt and said dog to urge said opposite end of said dog toward its second said position for engagement of said opposite end behind said shoulder when said latch-bolt is moved to its retracted position, the surface of said dog facing the direction of closure-closing movement being formed to provide a recess elongated in the direction of reciprocation of said latch-bolt, the floor of said recess retreating from said surface of said dog from a point near said opposite end of said dog to a point near the first said end of said dog, and a pin supported on said guide plate for axial reciprocation along an axis substantially normal to the axis of reciprocation of said latch-bolt and in the plane of swing of said dog, said pin being engageable at one end with said dog near said opposite end thereof, and engageable at the opposite end with said closure stop means as said closure approaches its closed position, to shift said opposite end of said dog from behind said shoulder to permit movement of said latch-bolt to its projected position, the length of said pin being slightly greater than the distance between said closure stop means and the adjacent surface of said latch-bolt, when said closure is in its closed position, said one end of said pin lying within said recess in said dog when said bolt is moved to its fully projected position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,140,343	Arens	May 18, 1915
1,306,560	Page	June 10, 1919
1,591,476	Dorneth	July 6, 1926
2,241,872	VanNote	May 13, 1941
2,344,451	Pankhurst	Mar. 14, 1944