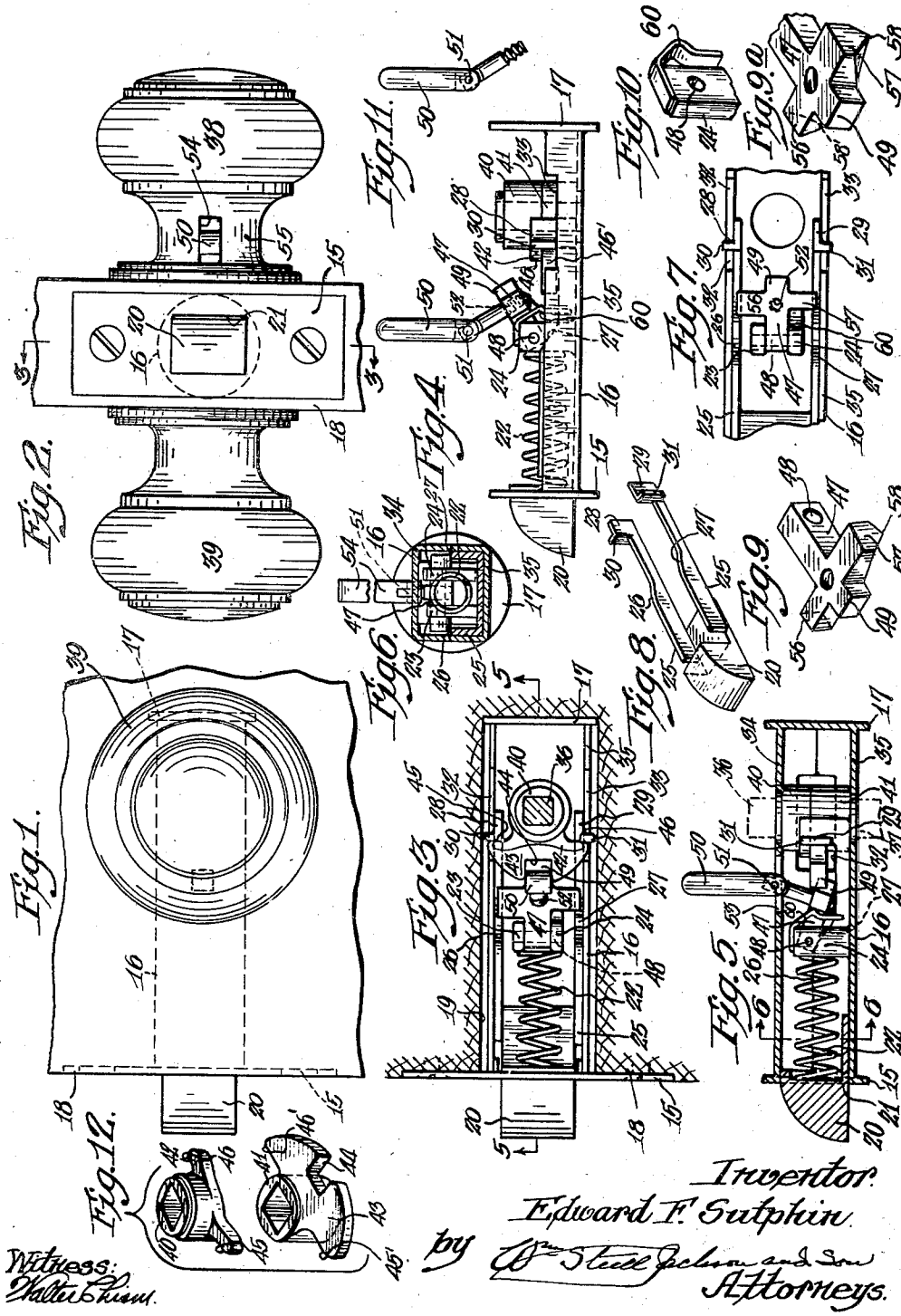
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TUBULAR LATCH

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TUBULAR LATCH

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My invention relates to what are called tubular latches, which are used to permit latching from the inside of a door which has been closed, and to maintain the latch against opening by the outside knob until the knob on the inside of the door is turned, at which time the latch is released and remains subject to operation by either knob.

The invention is intended for use with a split spindle latch which in itself is very old.

It is very common, for example, to use outer and inner knobs connected to outer and inner spindle sections of which the outer section can be held by a dead latch, released by a key. The spindle sections are capable of independent operation and the latch or bolt, except for the dead latch, can be operated by either spindle section. This separation of the spindle parts and separate control of the handle sections is subject to different control under my invention than that ordinarily in use.

The main purpose of my invention is to lock the outer spindle section by a button accessible on the inside by swinging a locking stop, holding the stop in position by friction, and to releasing the stop by cam means movable with the latch.

A further purpose is to operate cams upon a yoke by the inner knob, and by the cams, to swing a stop angularly into locking engagement with one of the spindles. The stop is released when the inner knob is turned upon the latch.

A further purpose is to operate a latch by a yoke having longitudinal cams on the legs of the yoke and to use one or both of these cams to release a roll-back stop, swinging it up from the roll-back notch.

A further purpose is to hold a swinging stop for a roll-back by a spring check which prevents accidental release of the stop.

A further purpose is resiliently to hold a swinging stop for a roll-back against release movement.

A further purpose is to use a swinging cross-shaped stop for a roll-back, swinging the end of the cross at the end of the stop and operating the release of the stop by one or both of the side cross members one of which is engaged by a cam movable with the latch.

Further purposes will appear in the specification and in the claims.

I have preferred to illustrate my invention by one main form only, using a form which is practical, effective, simple and inexpensive and which at the same time well illustrates the principles involved.

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Figure 1 is a fragmentary view of a door and a knob.

Figure 2 is a front view of Figure 1, looking in the direction of the length of the latch.

Figure 3 is a fragmentary, longitudinal section on the line 3—3 of Figure 2, across one of the spindle sections, showing the latch largely in side elevation, with one of the casing parts removed and showing adjacent wood of the door.

Figure 4 is an edge elevation of the latch and the mechanism seen in Figure 3.

Figure 5 is a section upon line 5—5 of Figure 3 omitting the adjacent parts of the wooden door.

Figure 6 is a section taken upon lines 6—6 of Figure 5.

Figure 7 is a fragmentary view of part of Figure 3 omitting the hubs, roll backs, spindle and spring.

Figure 8 is a perspective view of the yoke, cams and projections of Figure 3.

Figure 9 is a perspective view of the pivoted stop.

Figure 9*a* is a fragmentary perspective, similar to Figure 9 but showing another form.

Figure 10 is a fragmentary perspective showing the upper part of a supporting post for the pivoted stop.

Figure 11 is a side elevation of a stop-setting mechanism seen in Figure 4.

Figure 12 is a perspective view of separated hub and roll-back parts.

In the drawing similar numerals indicate like parts.

The outer part of my latch includes a face plate or latch plate 15 and casing 16 attached to it, and a rear plate 17. The face plate is attached to the edge face of door 18 about the tubular opening 19 within which the outer case 16 is fitted. Because, conveniently, the opening can be cut by an auger, the opening 19 is commonly cylindrical in latches of this character and the outer casing may be of circular or of non-circular shape. Where it is non-circular, the latch is kept in position by the latch plate at the front and by the rear plate 17. In the present instance, for convenience, the cross-section of the outer casing is square.

Within the outer casing are carried a latch or bolt 20, of rectangular cross-section, fitting within an opening 21 of corresponding shape in the latch plate, by which plate the latch is guided and is supported against transverse forces. Within the casing a spring 22 resiliently forces the latch or bolt forward.

The spring at its front end engages and travels

with the latch and at the rear end anchors against posts 23, 24 which in the present instance perform supporting functions for bearings hereafter described.

Within the outer casing or shell 16 the latch or bolt is guided by yoke 25. At an intermediate point in the yoke length cams 26 aand 27 are located on opposite sides for latch release as later explained. At the ends of the yoke are located lugs 28, 29 which are engaged by roll-backs hereinafter described. The lugs 28 and 29 are conveniently guided against side movement by wings 30 and 31 on opposite sides of the yoke, engaging walls 32 and 33 of the casing.

For convenience the casing is made in what, because of their positions in Figure 6, will be called upper and lower shell sections 34 and 35.

Transversely of the casing, near the rear end thereof, extend the normal split spindle inner and outer spindle sections 36, 37 connected at their outer ends with inner and outer knobs 38, 39 and at their adjacent ends with hubs 40, 41. Each of the hubs carries a roll-back 42, 43, shown in Figures 3, 4 and 5, the roll-back connected with the outside handle being notched at 44 in order to permit it to be stopped or blocked or held selectively against turning, the intention being to release this blocking or stopping or holding by normal turning of the inner handle.

Each of the roll-backs has rocker arms 45, 46, 45', 46' which engage with the adjacent lugs so that with either direction of roll-back turning one or other of the rocker arms will engage with one or other of the lugs to open the latch.

Upon or within bearings in posts 23, 24, a locking lever 47 is pivoted at one end at 48. The locking lever carries a terminal tongue 49 which in one position of the lever fits within the notch 44 and holds against rotation the roll-back which is connected with the outer knob.

The locking lever 47 is pushed down into the notch by a control button 50 located closely adjacent the inner knob and accessible from the inside of the door. This control button is preferably not connected rigidly to the locking lever because it would then move over an unduly large arc. Instead the button is pivoted to a bracket 51 threaded into the lever at 52. The bracket or button or both pass through an opening 53 in the casing and through a corresponding opening 54 in the adjacent knob socket 55.

At a point intermediate the length of the locking lever, lateral extensions, arms 56 and 57 are provided which give the lever in its entirety a cross-like form in elevation, one end of the cross affording the pivotal mount, the other end acting as the locking tongue and the lateral arms performing two functions, one or both being engaged by one or both of the yoke cams and one of the arms engaging a spring curb, drag or brake which holds the locking lever in its locking position as set by the button.

I recognize that either of the cams can be made effective without the necessity for using the other, and that one drag or brake only is needed to hold the locking lever as set.

In Figure 9 the arms 56 and 57 extend laterally from the locking lever 47. The lower edge of one only of these arms may be engaged by one cam 27, as in Figure 9, to lift the locking lever about its pivot pin. The lower side of arm 57 comes to an edge at 58 in Figures 9 and 9a, so that this edge rides upon the cam surface 27, as the cam is shifted with movement of the latch, lifting the locking lever in each of these forms as the cam slides beneath an arm. In Figure 9, the lower edge of arm 56 is not engaged by the cam 26, the entire releasing action, to lift the locking lever, being effected by the cam 27 engaging the edge 58. However, in Figure 9a the lower edge 58' of the arm 56 is not engaged by cam 26.

In Figure 9 the arm 56 is made narrower lengthwise of the locking lever than is arm 57 to give room for a spring 60 attached to post 24, so that the spring may be engaged by the arm 56, and the spring acts as a brake against withdrawal of the locking lever 47 from engagement.

It will be evident that in Figure 9a the lower edges 58' and 58 of the arms 56 and 57 are both used for the release of the latch, both being engaged by the cams, whereas only one is used in Figure 9; and less room is provided for the location of the brake spring in Figure 9a than in Figure 9.

In Figure 10 the retarding spring 60 is fastened to the top of one of the posts, as 24, in order to hold the locking lever in position when set.

The upper and lower shell sections are separate during manufacture but, in order to avoid accidental displacement or loss of parts, the final step in manufacture is to weld the two sections of the casing together along some such line as 61.

In operation the door is closed to the right in Figure 2, both knobs being free to turn because as yet the button 50 has not been pressed to set the tongue of the locking lever within the notch of the roll-back controlling the outer knob. Until this button is pressed the door can be opened freely by either knob.

When the button 50 is pushed downwardly in Figure 2 the locking lever is swung about its pivot until the tongue (terminal) of the locking lever enters the slot 44 of the roll-back 43 stopping rotation of the outer knob though the inner knob is still free to turn because there is no lock for roll-back 42. The inner knob at all times is free to turn.

This setting assures privacy for the room controlled by the door in question, and this privacy continues until the occupant of this room turns the inner knob, turning the roll-back 42 which engages one or the other of the lugs 28, 29 (Figure 3) according to the direction in which the knob is turned and withdraws the latch 20. At the same time, through cams 26, 27, or the two cams coincidently, one or both of the arms 56 and 57 is or are lifted, raising the tongue 49 and freeing it from its "set" position within notch 44 of roll-back 43. This lifting action, by which the tongue is withdrawn from the notch, is against the friction of the retarding or braking means, such as is seen in Figure 10. Until the latch is re-set by pressing the button 50, the door can again be opened freely by turning the outer door lock.

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

1. In a tubular lock, a longitudinally divided casing, an apertured latch plate at the front of the casing, a bolt passing through the latch plate, a spring pressing the bolt forwardly, an anchorage against which the spring abuts, a yoke having side strips connected with the bolt and lugs at the edges of the strips, cams upon the side strips, a pair of hubs transverse to the casing, roll-backs upon the hubs, one of which is forwardly notched, divided spindle sections adapted

to operate the roll-backs, a swinging lever adapted to engage the notch in the roll-back, a pivotal mount for the lever and lateral arms from the swinging lever, one of which is engaged by a yoke cam to release the roll-back.

2. In a tubular lock, a latch casing having an apertured front latch plate and a rear plate, a bolt movable in the front latch plate, side rearwardly extending cam yoke members movable with the bolt, an abutment, a spring engaging the bolt and the abutment to project the bolt, hubs extending transversely with respect to the casing, roll-backs carried by the hubs, one of the roll-backs being notched, lugs upon the yoke sides adapted to be engaged by both roll-backs, divided spindle sections adapted to operate the respective hubs, a swinging stop released by one of the cams, adapted to enter the notch in the roll-back, a post carried by the swinging stop and a button pivotally connected with the post and by which the swinging stop is set in operative position.

3. In a tubular latch, a casing, a latch movable lengthwise of the casing, inner and outer spindle sections transverse to the latch, roll-backs carried by the spindle sections, the roll-back for the outer section having a notch in its face, a transverse support generally parallel to the spindles, a pivoted stop carried by the support, adapted to fit into the notch, means for setting the stop, and cam means carried by the latch, whereby with movement of the latch the cam means and the stop react to throw the stop out of the notch.

4. In a tubular latch, a casing, inner and outer spindle sections, inner and outer handles upon exposed ends of said sections, roll-backs carried by the inner ends of the two sections, a bolt, a yoke connected with the bolt, cams on the yoke, lugs on the yoke and engaged by both roll-backs, supports within the casing forming an abutment for the rear of a spring, a first spring urging the bolt away from the abutment, a pin held by the supports, a lever pivoted upon the pin, rearwardly directed and having a stop to engage with a notch in the roll-back for the outside handle, arms upon the sides of the pivoted lever, one of which arms is adapted to be engaged by a yoke cam and a second spring carried by the supports engaging the other of said arms to retard releasing movement of the pivoted lever.

5. In a tubular lock, a casing, a bolt guided within the casing, a spring pressing the bolt forwardly, an anchorage against which the spring abuts, a yoke having side strips connected with the bolt and having lugs at the rear ends of the strips, cams upon the side strips, a pair of hubs transverse to the casing, rollbacks upon the hubs, one of which roll-backs is forwardly notched, divided spindle sections adapted to operate the roll-backs, a swinging lever adapted to engage the notch in the roll-back, a pivotal mount for the lever, lateral arms from the swinging lever, one of which arms is engaged by a yoke cam to release the roll-back and spring means engaged by the other of said arms and adapted to hold the swinging lever in its operative position.

6. In a tubular latch, a casing, inner and outer spindle sections, inner and outer handles upon otherwise exposed ends of said sections, roll-backs carried by the inner ends of the two sections, a bolt, a yoke connected with the bolt and having lugs engaged by both roll-backs, bearings extending transversely of the casing, a pivoted stop mounted in the bearings, a spring carried by the bearings and operative to hold the pivoted stop in its operative position, means, accessible from the exterior of the casing, for setting the stop, and cam means upon the yoke for engaging the stop at an intermediate point and releasing the stop.

7. In a tubular latch, a casing, inner and outer spindle sections, inner and outer handles upon otherwise exposed ends of said sections, roll-backs carried by the inner ends of the two sections, a bolt, a yoke connected with the bolt, lugs on the bolt, engaged by both roll-backs, a pivoted stop adapted to hold the roll-back connected with the outer knob, a cam carried by the yoke, an arm upon the stop engaged by the cam to swing the stop to release position, and fixed spring means for holding the stop in operative position.

8. In a tubular latch, a casing, a latch movable lengthwise of the casing, inner and outer spindle sections transverse to the latch, roll-backs carried by the spindle sections, the roll-back for the outer section having a notch in its face, a pivoted stop adapted to fit into the notch, a support for the stop guiding the stop to swing in planes lengthwise of the path of latch movement, means accessible outside of the latch for setting the stop, and positive cam means carried by the latch whereby with movement of the latch the cam means and stop react to throw the stop out of the notch.

9. In a tubular latch, a casing, a latch movable lengthwise of the casing, inner and outer spindle sections transverse to the latch, roll-backs carried by the spindle sections, the roll-back for the outer section having a notch in its face, a pivoted stop adapted to fit into the notch, a support for the stop, guiding the stop to swing in planes lengthwise of the path of latch movement, means accessible outside of the latch for setting the stop, a yoke carried by the latch, and cams upon the sides of the yoke engaging the stop in its set position and moving it to a released position.

10. In a tubular latch, a spring-pressed latch, a pair of knobs, swivelled spindles connected to the knobs, a pair of roll-backs connected, one with each spindle, the one connected with the outside knob having a notch in its roll-back surface, operating connections between the roll-backs and the latch, a pivoted stop engaging in the notch and setting means for the stop including a pivotal, jointed push button rod adapted to swivel at the joint with swinging movement of the stop so as to maintain an end of the push button rod accessible for stop setting movement.

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