Aug. 9, 1955 J. MILLER 2,715,036

TUBULAR LATCH

Filed Aug. 9, 1952

Fig. 1.

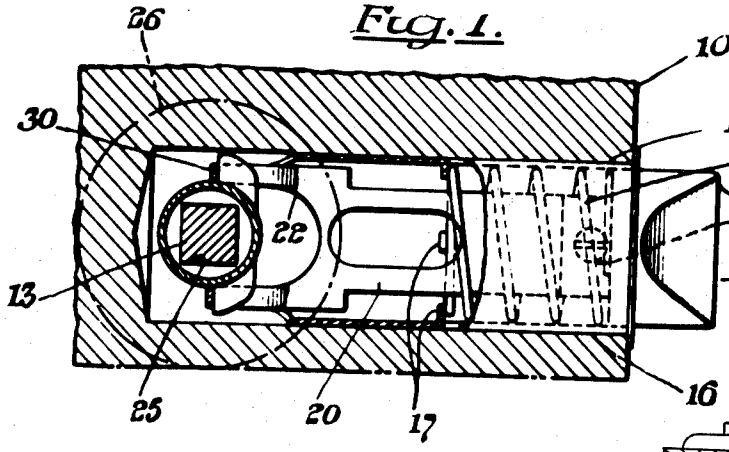


Fig 3a

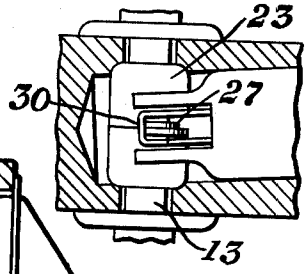


Fig. 2.

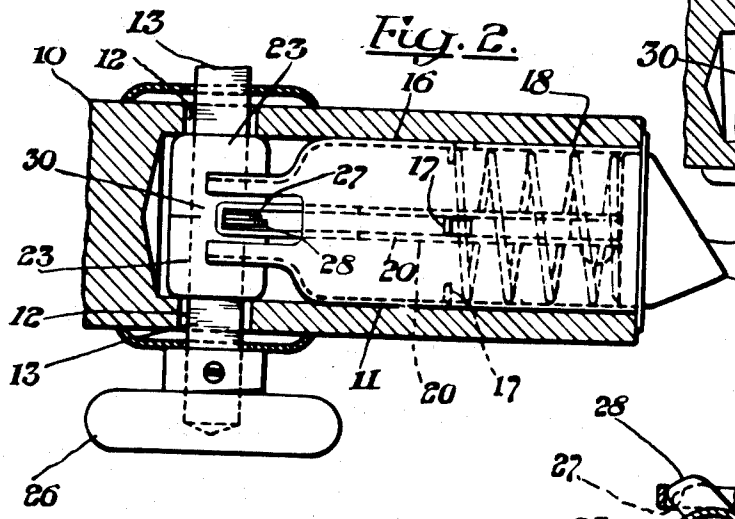


Fig. 4.

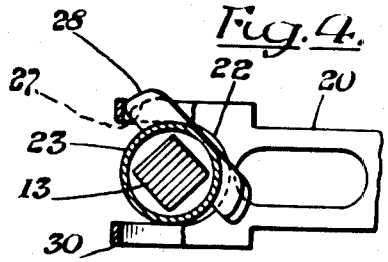


Fig. 3.

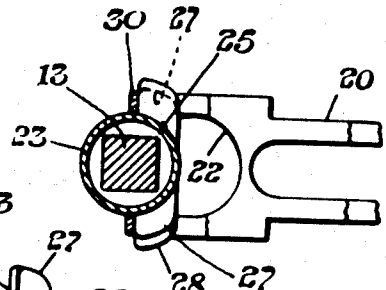
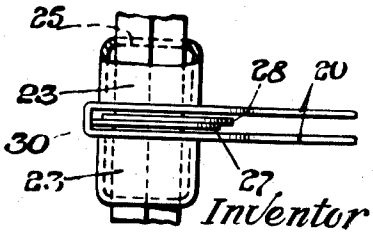


Fig. 5.



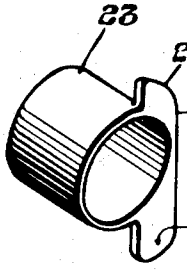


Fig. 6.

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TUBULAR LATCH

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6 Claims. (Cl. 292—169)

This invention relates to door latches, and specifically those known as tubular latches, in which the bolt element is contained within a tubular casing which is slid into a door through a hole bored therein.

Where tubular latch structures are used, they very often become jammed or out of repair, as a result of foreign matter or corrosion within the mechanism of the lock.

Presently known structures require that the entire lock be removed from the door, and very often completely disassembled or replaced in order to repair the said mechanism. Very often the lock is so constructed that it can only be assembled or disassembled at the factory, thereby involving the user in considerable expense for repairs.

A further difficulty with tubular latches, as presently known, is that the roll-back mechanism is incorporated within the latch member when it is manufactured, and can not be removed therefrom for the purpose of installing the latch. As a result of the usual construction, a substantially larger opening must be drilled in the door, before inserting the latch and the expense and time required for installation is greatly increased.

Accordingly, it is an object of the present invention to provide a tubular latch which may be assembled or disassembled with ease, and without specialized tools.

Another object of the present invention is to provide a tubular latch which may be serviced at the site.

A further object of the present invention is to provide a tubular latch which will require a minimum amount of installation time, and occupy a small space within the door.

The invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawings, forming a part hereof, is illustrated one form of embodiment of the invention, in which drawings similar reference characters designate corresponding parts, and in which:

Figure 1 is a vertical, sectional view of a complete embodiment of the present invention.

Figure 2 is a horizontal view in section of the tubular latch shown in Figure 1.

Figure 3 is a fragmentary view of a spindle and roll-back arm, assembled in accordance with the present invention.

Figure 3*a* is a view in horizontal section, somewhat reduced in scale, of a complete embodiment of the present invention, showing the compensating action of the hub.

Figure 4 is a fragmentary view of the spindle and roll-back arm assembled with the roll-back arms in the operative position.

Figure 5 is a fragmentary view in top plan of the showing in Figure 4.

Figure 6 is a view in perspective, showing the hub of the roll-back arm, made in accordance with the present invention.

Referring to the drawings, **10** indicates a door having a bore **11** therein, and a transverse opening **12** for the

purpose of receiving the door knob spindle **13** therethrough. A tubular latch **15**, which is inserted in the bore **11**, consists of a round shell **16** having inwardly pressed detents **17**, spaced from the front end thereof. A coil spring member **18** is disposed within the shell **16** with one end of said spring bearing against the front face of the detents **17**. The opposite end of the spring **18** is formed to fit against the rear of the bolt **19** of the latch mechanism. The bolt **19**, which is illustrated as a tapered member, best shown in Figure 2, for the purpose of preventing door rattling, is secured to a yoke **20**, which yoke extends within the shell **16**.

The yoke **20** in the present embodiment of the invention consists of a band of metal doubled back upon itself, to form a loop **30**, the free ends of which band are secured to the bolt **19**, as indicated at **21**. The yoke **20** is further cut away at the knob end thereof, as shown at **22**, for the purpose of receiving therein the hub **23** of the roll-back arm element **24**. The hub **23** is provided with a square opening **25** to receive therethrough the spindle **13** of the door knob **26**.

The roll-back arm, best shown in Figure 6, may be formed integral with the hub **23**, and consists of a member tangentially disposed upon the hub **23** and extending above and below the said hub. The roll-back arm extensions **27**, **28** are of unequal length. The hubs are disposed in face-to-face relationship, as shown in Figures 2 and 5, so that the smaller arm on each hub is disposed against the larger arm on the opposite hub. It will therefore be apparent that no matter which way the hubs **23**, **29** are rotated by the action of the door knob spindle **13**, a large roll-back arm will be available to retract the yoke **20** by means of the loops **30** therein.

When it is desired to assemble the tubular latch, made in accordance with the present disclosure, it is merely necessary to slip the coil spring **18** within the shell **16**, slide the yoke **20** through the spring **18** and within the shell **16**, until the loops **30** of the yoke appear beyond the shell. Thereafter, a roll-back arm hub may be slid within the cut-away portion **22** of the yoke, with its larger arm first.

By reason of the smaller arm on the hub, the said hub and roll-back arms may then be rotated through an arc of 90°, which will enable the smaller arm to clear the end of the loop on the yoke, thereby bringing the loop and the roll-back arms into the position shown in Figure 3.

The second hub and roll-back arm may be inserted in a similar manner, whereupon both hubs and roll-back arms will be engaged within the loop of the yoke, as shown in Figures 1, 2 and 3. The entire tubular latch is then assembled, and following its placement within the bore **11** provided in the door, the door knob spindle **13** may be slipped through the squared openings **25** in the hubs of the roll-back arm, whereupon, following the securing of the knobs **26** to the said spindles, the latch is in operative condition.

Disassembling the mechanism of the latch made in accordance with the present invention, is equally simple, and is done in a manner the exact reverse of that previously recited during the assembling operation.

It will be seen from the foregoing, that there has been provided a tubular latch structure which may be assembled or disassembled with great ease, for the purpose of installation or repair, and which assembling and disassembling facility is brought about by the specific construction of the roll-back arms, previously described.

The particular advantage of the hub construction made in accordance with the present invention may be seen by referring to Figure 3*a*. In that view the latch structure is shown as it might be installed by an unskilled or careless workman. The latch receiving hole which

is bored into the door **10** is out of line, with the result that the axis of the hubs **23**, **29**, is not normal to the face of the door **10**. Nevertheless, by reason of the structure set forth and described above, there is sufficient play for the shaft **13** of the door knob **26** to be slipped through the hubs, inasmuch as the hubs **23**, **29** are capable of longitudinal movement within the loops **30**. The latch mechanism will therefore operate in the desired manner, since the latch case does not surround the hub as it does in presently known structures. It is to be understood that the roll-back arms **27**, **28** have sufficient play within the loops **30** to permit free axial and rotational movement, as shown in the drawings.

Having thus fully described the invention, what is claimed as new and sought to be secured by Letters Patent of the United States, is:

1. A tubular latch comprising, a shell, a bolt slidably carried within the shell, a yoke secured to the rear of the bolt, said yoke being provided with spaced loops at the free end thereof, a coil spring disposed about the yoke, one end of said spring being supported within the shell and the opposite end of the spring bearing against the bolt so as to urge the end of said bolt out of the shell, a pair of hubs carried between the loops of the yoke, a roll-back arm on each hub, each of said arms being formed to provide unequal projections on opposite sides of the hub, the projections of opposed hubs being placed together and received within the spaced loops of the yoke in such manner that each loop embraces one large and one small arm projection, a door knob spindle, a spindle receiving opening in each hub and a knob for rotating the said spindle and retracting the bolt.

2. A tubular latch comprising, a shell, a bolt slidably carried within the shell, a yoke secured to the rear of the bolt, said yoke being formed of a single strip of metal doubled back upon itself to form spaced loops at the free end thereof, a coil spring disposed about the yoke, one end of said spring being supported within the shell and the opposite end of the spring bearing against the bolt so as to urge the end of said bolt out of the shell, a pair of hubs carried between the loops of the yoke, a roll-back arm on each hub, each of said arms being formed to provide unequal projections on opposite sides of the hub, the projections of opposed hubs being placed together and of a thickness which will cause them to be loosely received within the spaced loops of the yoke in such manner that the yoke may be moved in any direction with respect to the longitudinal axis of the assembly while each loop embraces one large and one small arm projection, a door knob spindle, a spindle receiving opening in each hub and a knob for rotating the said spindle and retracting the bolt.

3. A tubular latch comprising, a shell, a bolt slidably carried within the shell, a yoke secured to the rear of the bolt, said yoke being formed of a single strip of metal doubled back upon itself to form spaced loops at the free end thereof, a cut-away portion in said yoke between the loops, a coil spring disposed about the yoke, one end of said spring being supported within the shell and the opposite end of the spring bearing against the bolt so as to urge the end of said bolt out of the shell, a pair of hubs carried within the cut-away portion between the loops of the yoke, a roll-back arm on each hub, each of said arms being formed to provide unequal projections on opposite sides of the hub, the projections of opposed hubs being placed together and of a thickness which will cause them to be loosely received within the spaced loops of the yoke in such manner that the yoke may be moved in any direction with respect to the longitudinal axis of the assembly while each loop embraces one large and one small arm projection, a door knob spindle, a spindle receiving opening in each hub and a knob for rotating the said spindle and retracting the bolt.

4. A tubular latch comprising, a shell, inwardly bent detents in the wall of the shell spaced from the front end thereof, a bolt slidably carried within the shell, a yoke secured to the rear of the bolt, said yoke being provided with spaced loops at the free end thereof, a coil spring disposed about the yoke, one end of said spring being supported upon the detents within the shell and the opposite end of the spring bearing against the bolt so as to urge the end of said bolt out of the shell, a pair of hubs carried between the loops of the yoke, a roll-back arm on each hub, each of said arms being formed to provide unequal projections on opposite sides of the hub, the projections of opposed hubs being placed together and of a thickness which will cause them to be loosely received within the spaced loops of the yoke in such manner that the yoke may be moved in any direction with respect to the longitudinal axis of the assembly while each loop embraces one large and one small arm projection, a door knob spindle, a spindle receiving opening in each hub and a knob for rotating the said spindle and retracting the bolt.

5. A tubular latch comprising, a shell, a bolt slidably carried within the shell, a yoke secured to the rear of the bolt, said yoke being formed of a single strip of metal doubled back upon itself to form spaced loops at the free end thereof, a cut-away portion in said yoke between the loops, a coil spring disposed about the yoke, one end of said spring being supported within the shell and the opposite end of the spring bearing against the bolt so as to urge the end of said bolt out of the shell, a pair of hubs carried within the cut-away portion between the loops of the yoke, a roll-back arm tangentially mounted on each hub, each of said arms being formed to provide unequal projections on opposite sides of the hub, the projections of opposed hubs being placed together and of a thickness which will cause them to be loosely received within the spaced loops of the yoke in such manner that the yoke may be moved in any direction with respect to the longitudinal axis of the assembly while each loop embraces one large and one small arm projection, a door knob spindle, a spindle receiving opening in each hub and a knob for rotating the said spindle and retracting the bolt.

6. A tubular latch comprising, a shell, inwardly bent detents in the wall of the shell spaced from the front end thereof, a bolt slidably carried within the shell, a yoke secured to the rear of the bolt, said yoke being formed of a single strip of metal doubled back upon itself to form spaced loops at the free end thereof, a cut-away portion in said yoke between the loops, a coil spring disposed about the yoke, one end of said spring being supported upon the detents within the shell and the opposite end of the spring bearing against the bolt so as to urge the end of said bolt out of the shell, a pair of hubs carried within the cut-away portion between the loops of the yoke, a roll-back arm tangentially mounted on each hub, each of said arms being formed to provide unequal projections on opposite sides of the hub, the projections of opposed hubs being placed together and of a thickness which will cause them to be received within the spaced loops of the yoke in such manner that the yoke may be moved in any direction with respect to the longitudinal axis of the assembly while each loop embraces one large and one small arm projection, a door knob spindle, a spindle receiving opening in each hub and a knob for rotating the said spindle and retracting the bolt.

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