April 6, 1954 F. J. RUSSELL ET AL 2,674,481

DOOR LATCH CONSTRUCTION

Original Filed June 1, 1950

Fig. 1.

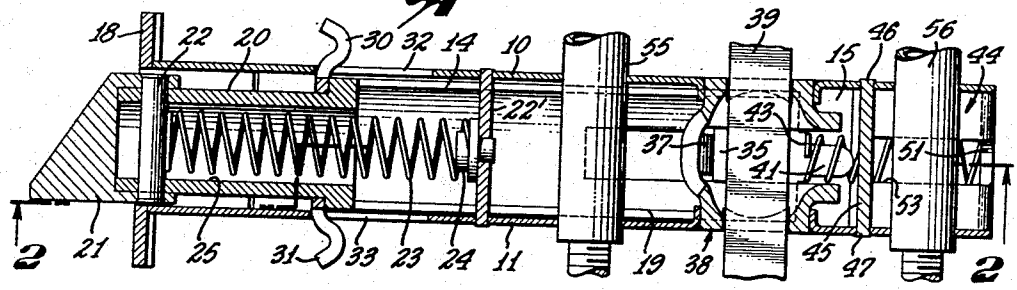


Fig. 2.

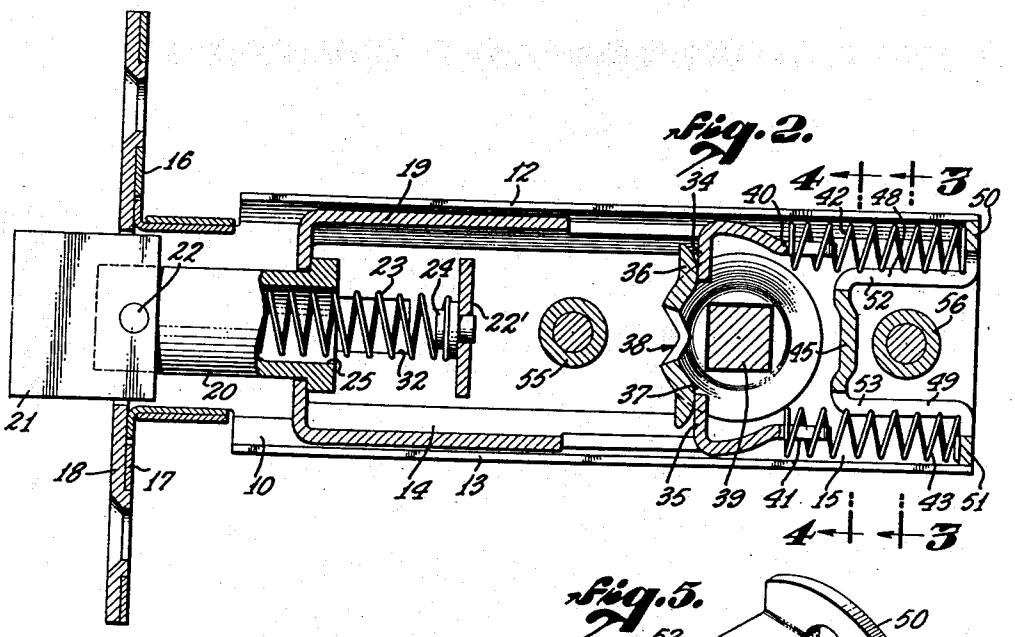


Fig. 5.

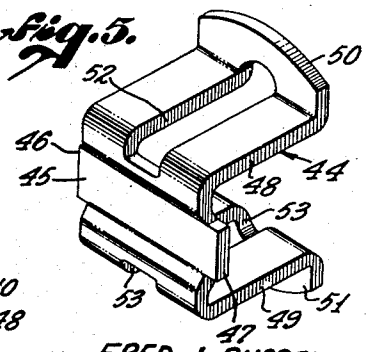


Fig. 3.

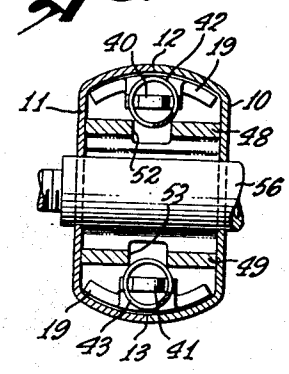
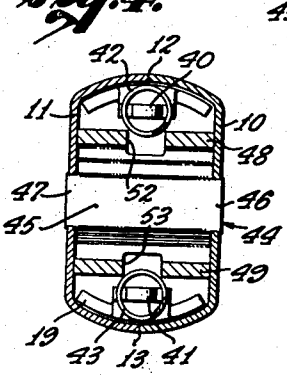


Fig. 4.



FRED J. RUSSELL,
RAYMOND W. DIETRICH &
GEORGE B. SOLOVIEFF,
INVENTORS.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY Vernon D. Beehler

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DOOR LATCH CONSTRUCTION

Fred J. Russell, Beverly Hills, Raymond W. Dietrich, Bell, and George B. Solovieff, South Gate, Calif., assignors to Weiser Company, South Gate, Calif., a corporation of California

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3 Claims. (Cl. 292—169)

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The invention relates to door latches and has particular reference to latches constructed along certain improved lines wherein the casing or housing for the operating parts is relatively small in size. The type of latch to which the invention is especially well adapted is a latch currently identified as a tubular latch.

In the construction of tubular latches the aim is to provide a latch casing which is as small in cross-sectional area as can be made commensurate with good operation, so that when the door is cut or recessed for reception of the casing, relatively small holes only are necessary. When a latch is designed with a casing of relatively small cross-sectional area the problem of designing the necessary working parts increases as the space provided for them becomes smaller. It therefore becomes highly advantageous to elongate the parts and to cause them wherever advisable to perform a double function.

It is therefore among the objects of the invention to provide a casing for a tubular latch mechanism which is substantially of a minimum size and wherein a spring actuating mechanism for the latch is built into the inner end of the casing in a manner such as to occupy as little room as possible.

Another object of the invention is to provide a casing for a tubular latch mechanism which includes a separator at the inner end of the casing so constructed that the removal of metal which lightens the weight of a certain portion of the construction serves to provide a recess opening up to receive a spring and at the same time serving as a guide for the spring during reciprocation of the part to which it is attached.

Another object of the invention is to provide a new and improved casing for a tubular latch mechanism wherein there is provided a spring for actuating the latch bolt mechanism and wherein there is further provided a guide for the spring supplied without the addition of any new part.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a longitudinal sectional view of a tubular latch mechanism wherein the section is taken on a horizontal plane.

Figure 2 is a longitudinal sectional view of the latch mechanism taken on a vertical plane.

Figure 3 is a cross-sectional view taken on the line 3—3 of Figure 2.

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Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a perspective view of a part incorporating material portions of the invention.

This is a division of co-pending application Serial No. 165,528, filed June 1, 1950, issued April 7, 1953, Patent No. 2,634,151.

The drawings illustrate a tubular latch mechanism and contain parts sufficient to operate a latch bolt.

As shown, the tubular latch mechanism comprises in the main a casing or housing made up of longitudinally divided mating parts 10 and 11. Upper and lower longitudinal dividing lines are identified at 12 and 13. The mating parts positioned as shown form a chamber consisting of a part 14 nearer the outer end of the casing and a part 15 nearer the inner end of the casing. At the outer end of the casing thus formed of the mating parts are portions of those parts forming bosses 16 and 17 upon which is mounted a base plate 18.

Within the casing and the chamber 14 is mounted a bolt actuating shell 19 so positioned that it is adapted to reciprocate lengthwise with respect to the chamber. Mounted on the actuating shell is a shank 20 of a latch bolt 21. The latch bolt is shown pinned to the shank by means of a pin 22.

In this particular embodiment of the invention there is provided a spacer 22' located with the ends extending into the oppositely disposed mating parts. A coil spring 23 retained by a keeper 24 is positioned to urge the latch bolt 21 outwardly by pressure against the pin 22. The shank is provided with a cylindrical aperture 25 for reception of the spring 23.

In this particular construction the shell which mounts the latch bolt is mounted so as to be able to reciprocate separately. Tabs 30 and 31 forming a part of the bolt actuating shell extend outwardly respectively in recesses 32 and 33 formed in the casing.

At the inner end the bolt actuating shell is provided with inwardly bent portions 34 and 35 so positioned that they are adapted to bear against cam projections 36 and 37 which are part of a stamped cam element 38 keyed to a square spindle 39.

Also at the inner end of the bolt actuating shell are projections 40 and 41 which serve as keepers for the outer ends of coiled springs 42 and 43. Although in the present embodiment two springs are shown, it will be appreciated that should less spring tension be desired only one spring need be employed at this point.

For effectively supporting and locating the coiled springs 42 and 43, there is provided a saddle indicated generally by the reference character 44 which in this special instance forms a spacer between the mating parts 10 and 11 forming the casing. Part of the saddle includes a spacing element 45 having ends 46 and 47 which extend outwardly through suitable apertures in the mating parts in which position they may, if desired, be riveted as illustrated in Figure 1.

The saddle 44 includes in this particular embodiment legs 48 and 49. The legs as shown have outwardly bent portions 50 and 51 which, when assembled as illustrated in Figure 2, form for all practical purposes an inner end of the casing.

Both legs in this embodiment where two legs are shown are provided with longitudinally extending recesses 52 and 53 having a breadth slightly less than the outside diameters of the respective coiled springs 42 and 43.

As particularly illustrated in Figures 2, 3 and 4, the recess 52, for example, receives a portion of the outer circumference of the coiled spring 42. One end of the coiled spring is mounted over the spring keeper 40 forming part of the bolt actuating shell. The other end of the spring 42 is mounted upon the inside surface of the bent portion 50 of the saddle. The spring 42, as better illustrated in Figures 3 and 4, lies within the recess 52 in a position where the exterior circumference of the spring is adapted to bear upon the upper edges of the recess. Mounted in this manner the recess portion of the leg 48 serves not only to provide space for mounting the coiled spring 42 in a position which would not otherwise be possible, but also provides a guide for the turns of the spring which operates to guide the spring and prevent it from kinking when the coiled spring is compressed.

Coiled spring 43 is similarly mounted in the recess 53. Thus mounted the coiled springs are especially well guided in that the outer end of the springs in each case is firmly guided by the spring keeper 40 or 41, as the case may be, and the remaining portion of the spring not guided thereby is, however, guided by the outer edges of the respective recesses 52 and 53. It therefore becomes unnecessary to supply an additional spring keeper for the ends of the spring adjacent the innermost end of the casing.

The arrangement permits posts 55 and 56 to be mounted in the positions shown without interfering in any manner with the working parts of the latch mechanism.

There has therefore been provided a very simplified construction wherein a spacer is made to serve and function as a spacer, as an inner end for the casing, and also as a guide for springs operating the latch bolt mechanism under circumstances where the provision of the guiding surfaces serves also to enlarge an aperture adapted to the reception of springs of adequate size which would otherwise be too small.

While we have herein shown and described our invention in what we have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of our invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described our invention, what we claim as new and desired to secure by Letters Patent is:

1. In a tubular latch mechanism a casing comprising longitudinally divided mating parts forming a chamber, latch bolt means reciprocably mounted therein, a spring keeper at the inner end of the chamber having a leg thereof parallel to and spaced from a side wall of the chamber, a coiled compression spring having the circumference of coils thereof lying between the keeper and the inner wall of the chamber acting between the latch bolt means and the inner end of the casing adapted to urge said latch bolt means outwardly, said leg having a longitudinally disposed recess therein narrower in width than the outside diameter of the spring and adapted to receive and guide the spring.

2. In a tubular latch mechanism adapted for post indexing a casing comprising longitudinally divided mating parts forming a chamber, latch bolt means reciprocably mounted therein comprising a bolt actuating shell slidable on the inside wall of the casing, said casing having a spindle aperture therethrough and post indexing means spaced on longitudinally opposite sides of said spindle aperture, a spacer for the mating parts at the inner end of the chamber having a leg thereof between said post indexing means and the adjacent wall of the casing, said leg being parallel to and having a face thereof spaced from the inner wall of the casing and forming a spring chamber therebetween, said spacer comprising a part of the casing at the inner end thereof, a coiled compression spring of external diameter greater than the width of the chamber between the inner wall and said leg and acting between the shell and the inner end of the casing, said spring being adapted to urge said shell and said latch bolt means outwardly, said leg having a longitudinally disposed recess therein narrower in width than the outside diameter of the spring and adapted to receive and guide the spring throughout its length between edges of the recess and said inner wall during reciprocation of the latch bolt means.

3. In a tubular latch mechanism adapted for post indexing a casing comprising longitudinally divided mating parts forming a chamber, latch bolt means reciprocably mounted therein, said casing having a spindle aperture therethrough and post indexing means on opposite sides of said spindle aperture on a longitudinal axis, a spring keeper secured at the inner end of the chamber between the mating parts having a leg thereof parallel to and spaced from a side wall of the chamber and lying between the adjacent post indexing means and the adjacent inside wall of the casing, a bent portion on the leg forming part of the inner end of the chamber, a coiled compression spring acting between the latch bolt means and the bent portion adapted to urge said latch bolt means outwardly, said leg having a longitudinally disposed recess therein narrower in width than the outside diameter of the spring and forming with the adjacent inner wall of the casing a receptacle for the spring slightly greater than the outside diameter of the spring, said receptacle being adapted to receive and guide the spring during reciprocation of the latch bolt means.

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