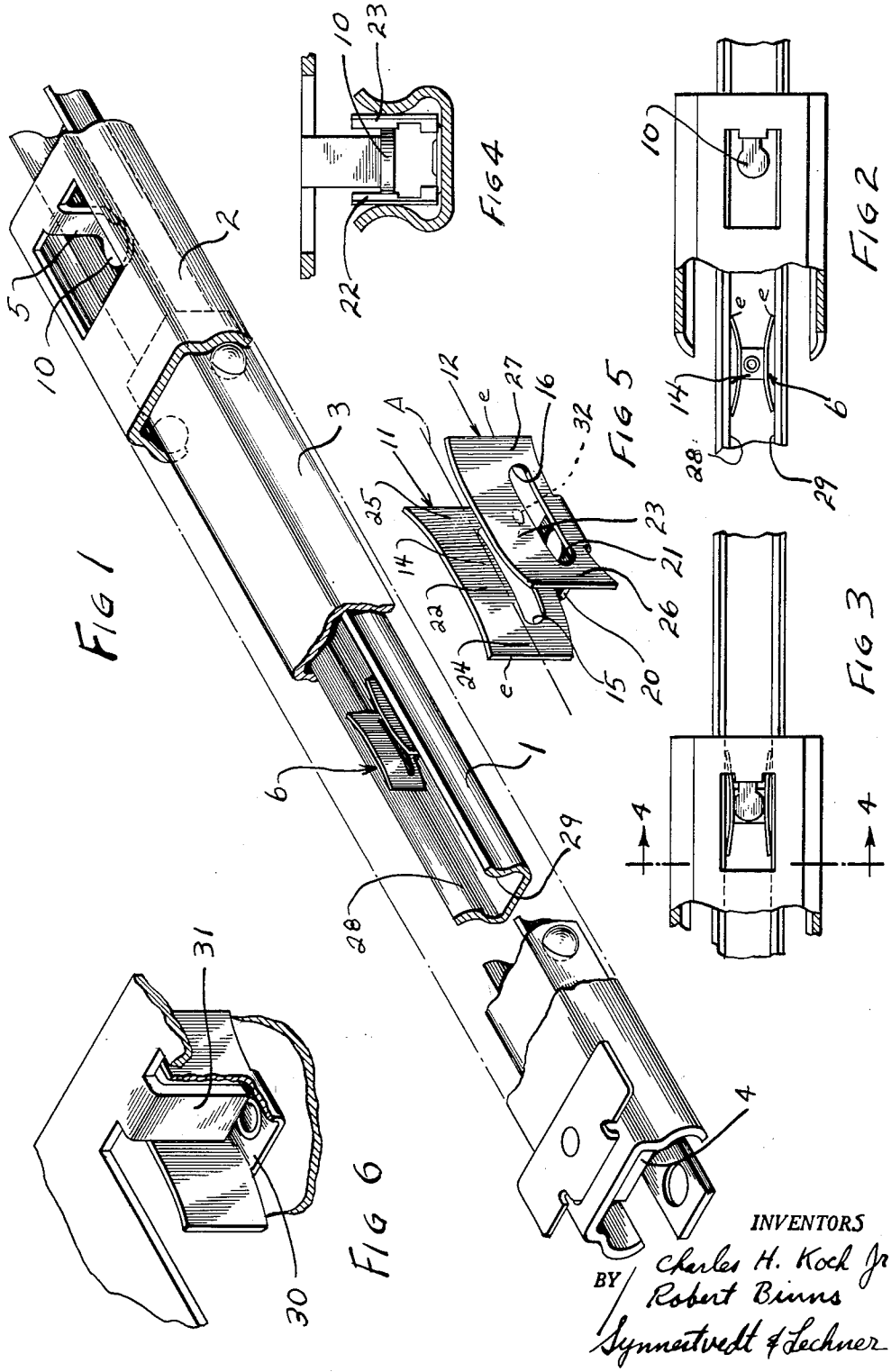
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HOLDING MECHANISM

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HOLDING MECHANISM

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This invention relates to apparatus for releasably locking two parts which are arranged to be slidable relative to one another.

The invention as disclosed herein is shown as embodied in a telescoping type drawer slide. However, it will be apparent that the invention is adaptable for use in other analogous organizations.

In one aspect the invention contemplates detent means to releasably lock a pair of relatively movable parts including a pair of arcuately-shaped, strip-like members made of resilient material mounted on one part and forming a channel for accepting a tab on the other part, the tab, when in the channel, expanding the same and the ends of the strips being confined in the direction of channel expansion but free to expand in a direction normal thereto so as to permit but resist expansion and thereby exert a force to hold the tab in the channel.

In another aspect the invention contemplates detent means to releasably lock a pair of relatively movable parts including a pair of generally arcuately-shaped, strip-like elements made of resilient material and mounted on one part in a manner to form an expansible channel, the expansion of the channel being effected by a tab on the other of the parts entering the channel and the expansion of the channel being resisted by virtue of the strips being confined so that the shape thereof becomes less arcuate and exerts a force for holding the tab in the channel.

In still another aspect the invention contemplates a detent device formed with elongated strip-like elements disposed adjacent one another and forming a flared channel for receiving a tab for expanding the channel and the outer portion of each element forming leaf-like springs, the ends of which are adapted to be confined to cause the elements to permit but resist channel expansion to produce a force for holding the tab in the channel.

In still another aspect the invention contemplates a detent spring which has two interconnected side pieces forming a channel adapted to be expanded by a detent tab entering the same together with leaf-like spring elements secured to the side pieces for use in resisting channel expansion so as to provide a force for holding the tab in the channel.

A preferred construction of the invention will be apparent from the following description and drawings wherein:

FIGURE 1 is an isometric view showing the invention embodied in a typical telescoping-type drawer slide;

FIGURE 2 is a fragmentary plan view illustrating the detent spring and tab;

FIGURE 3 is a view similar to FIGURE 1 showing the tab and spring in the holding position;

FIGURE 4 is a sectional view taken along the lines 4—4 of FIGURE 3;

FIGURE 5 is an enlarged isometric view of the preferred construction of the detent spring;

FIGURE 6 is an enlarged fragmentary isometric view of a modified spring and tab, the elements being shown in the closed position.

In FIGURE 1 we have shown apparatus for mounting two relatively movable parts, the apparatus taking the form of a pair of telescope-type drawer slides **1** and **2**. The slides are interconnected by an elongated bearing race **3** which permits the slides to be relatively movable.

When used for supporting a drawer or the like an arrangement such as shown is used on each side of the drawer with the slide **2** being attached to the frame or cabinet and the slide **1** being attached to the drawer per se. To define the extremities of motion of the slide **1**, the slide **2** is provided with tabs **4** and **5**, the tab **4** being engaged by the race when the slide **2** is moved all the way to the left and the tab **5** being engaged by the opposite edge of the race when the slide **1** is moved all the way to the right. Except for certain portions of the tab **5** which will be explained later, the above-mentioned elements are all of standard construction.

For preventing relative motion or releasably locking the two slides when the slide **1** is moved, say all the way to the left, we have provided a detent spring **6** which is adapted to be engaged by the part **10** of the tab **5**.

A preferred construction of the detent spring is shown in FIGURE 5 wherein it will be seen that the spring comprises a pair of elongated strip-like elements **11** and **12** which are generally arcuate in shape. The elements are disposed so as to form a channel **14**, the axis of which is generally indicated by A. The strips **11** and **12** have slots **15** and **16** which extend generally in the direction of the axis A. The two strips are interconnected by a bridge member **20** which has an aperture **21** by means of which the spring is connected to the part with which it is used. It will be noted that the slots **15** and **16** are spaced from the bridge **20**. It will be apparent that the two strips **11** and **12** are identical in construction and are mirror images of each other. Considering the details of construction of each strip, it will be seen that the strip **11** has a side section **22** and the strip **12** a side section **23**. The two side sections extend upwardly from the bottom or bridge **20**. The side section **22** has a pair of end sections **24** and **25** respectively connected to the opposite edges of the side section and extending angularly outwardly from the axis of the channel. The side section **23** has a pair of end sections **26** and **27** which also extend angularly outwardly from the axis of the channel. It will be observed that the slots **15** and **16** extend wholly through their respective side sections and substantially into the respective end sections. When the detent spring is mounted in the slide **1**, the edges *e* are engaged with the sides **28** and **29** of the slide.

The term "arcuate" as describing the shape of the strips **11** and **12** is used in the generic sense in that it is intended to apply to a shape which is defined as a part of a circle and to a strip of the shape such as shown in FIGURE 2. Further, it should be observed that the term "channel" as used herein contemplates that the channel be formed wholly by the side pieces **22** and **23** with the end pieces **24**, **25**, **26** and **27** operating to permit but resist channel expansion. Preferably, however, the channel comprises the end pieces **22** and **23** together with portions of the edge pieces adjacent the end pieces so that the channel in effect has flared ends. This makes for easy entry and exit of the tab.

Also, it is pointed out that the preferred form of detent spring contemplates two end sections. However, in certain instances one pair of end sections may be eliminated. In such instances the detent spring may have the same form as shown in FIGURE 5 but with the ends **24** and **26** removed and the slots **15** and **16** extending only partially through the sides **22** and **23**.

Referring to FIGURE 2 it will be seen that the part **10** of the tab **5** is larger than the width of the channel **14**. Thus, when the parts are in the position as shown in FIGURE 3, the tab has expanded the channel or moved the sides **22** and **23** outwardly or away from the axis A. From a comparison of FIGURES 2 and 3 it will be seen that the shape of the strips in FIGURE 3 is somewhat less arcuate than the shape shown in FIGURE 2. This

is due to the fact that the edges *e* are confined (by the sides **28** and **29**) against movement in a direction the same as the direction of channel expansion but are free to move normal thereto or along the axis A. The end sections **24**, **25**, **26** and **27** being made of resilient material, act in the nature of leaf springs and tend to resist the outward movement of the side sections **22** and **23** or resist channel expansion. Thus a force is developed by the side sections **22** and **23** which is exerted on the tab **10** and acts to hold the tab within the channel so that the slides **1** and **2** are held immovable. From an inspection of FIGURE 4 it will be seen that the tab **10** engages the sides **22** and **23** at a point just above the slots **15** and **16**.

In FIGURE 6 we have shown a detent spring **30** which is identical in construction to the detent spring just described except for the absence of slots such as slots **15** and **16**. Also, it will be noted in FIGURE 6 that the tab **31** is of different construction than the tab **10**, being a generally rectangular piece oriented normal to the sides and bridge.

The tab **10** in plan is generally circular or disk-like in shape and it will be observed that the tab is oriented so that it is generally parallel to the bottom or bridge member **20**. This form of the tab is preferred because the area of metal of the tab in contact with the detent spring is held to a minimum and this is desirable from a standpoint of permitting longer spring life. Furthermore, the construction and orientation of the tab **10** is such that it practically eliminates the possibility of the tab engaging or hanging up on the edges *e* of the spring. Such contact or hang-up is undesirable because the same may tend to rip the spring out of its mount. Where greater holding area is desired, however, a construction as shown in FIGURE 6 may be employed.

It is desired that the side pieces **22** and **23** be substantially flat at least in the area of contact with the tab. This makes the detent more easily releasable although providing for desired holding force. Where a more positive lock is desired without substantially increasing the holding force, the pieces **22** and **23** may be provided with small apertures so that in the holding position small sections of opposite sides of the tab project into the apertures. A typical aperture for a side piece such as the side **23** is indicated by the dotted lines **32** in FIGURE 5.

The form of the detent spring shown in FIGURE 5, i.e., with slots **15** and **16**, is preferred because it greatly enhances spring life. We have found that with this construction the greater portion of the change in shape of the spring (from arcuate toward planar) takes place in the area above the slots. This, of course, has the effect of reducing bending strains at the joinder area between the bridge and sides **22** and **23**.

We claim:

1. In apparatus for mounting two relatively movable parts: a pair of slide members disposed adjacent one another; means interconnecting said members and providing for the members to be relatively movable; a tab on one member and detent spring means on the other member, the tab and spring, when interengaged, preventing said relative motion, said detent spring comprising a pair of strip-like elements made of resilient material and disposed with respect to one another to form a flared channel for receiving said tab, the tab being wider than the channel so as to expand the same upon entry; and means on the other member positioned to be slidably engaged by ends of said elements upon channel expansion and confining movement of said ends in the direction of channel expansion but providing for movement normal thereto so that channel expansion is resisted and a force developed to hold said tab.

2. In apparatus for mounting two relatively movable parts: a pair of slide members disposed adjacent one another; means interconnecting said members and providing for the members to be relatively movable; a tab on one member and detent spring means on the other member,

the tab and spring, when interengaged, preventing said relative motion, said detent spring comprising: a pair of elements made of resilient material at least one of which is arcuate in shape, the two elements being disposed to form a channel and the tab being wider than the channel so as to expand the same upon entering; and means on the other of said slides positioned to be engaged by the ends of said arcuate element upon channel expansion and confining movement of said ends in the direction of channel expansion but providing for movement normal thereto to cause the shape of the element to become less arcuate and thereby exert a force to resist channel expansion and to grip said tab.

3. In apparatus for mounting two relatively movable parts: a pair of slide members disposed adjacent one another; means interconnecting said members and providing for the members to be relatively movable; a tab on one of said members and a detent spring on the other of said members, the tab and spring, when interengaged, preventing said relative motion, said detent spring comprising: a bridge section mounting the spring, a pair of side sections each extending upwardly from said bridge, the bridge and the sides forming a channel for receiving said tab, a pair of end sections respectively connected to the opposite edges of one of said side sections and extending angularly outwardly from the axis of the channel, a second pair of end sections respectively connected to the opposite edges of the other of said side sections and extending angularly outwardly from the axis of said channel, said tab being wider than said channel so as to expand the same upon entry; and means on said other member positioned to be engaged by the edges of said end sections and confining movement of said edges in the direction of channel expansion but providing for movement normal thereto whereby the end sections permit but resist channel expansion and develop a force to hold said tab.

4. A construction in accordance with claim 3 wherein said tab is disk-like in shape and is oriented to extend generally parallel to said bridge.

5. In apparatus for mounting two relatively movable parts: a pair of slide members disposed adjacent one another; means interconnecting said members and providing for the members to be relatively movable; a tab on one of said members and a detent spring on the other of said members, the tab and spring, when interengaged, preventing said relative motion, said detent spring comprising: a bridge section mounting the spring, a pair of side sections each extending upwardly from said bridge and forming at least part of a channel, a pair of end sections connected to said side sections and forming part of said channel, the end sections extending angularly outwardly from the axis of the channel, the end and side sections each being formed with a slot extending along the axis of said channel and being spaced from said bridge and said tab being disk-like in shape and oriented to extend generally parallel said bridge and being wider than said channel so as to expand the same upon entering; and means on said other member positioned to be engaged by edges of said end sections and confining movement of said edges in the direction of channel expansion but providing for movement normal thereto whereby the end sections permit but resist channel expansion and develop a force to hold said tab.

6. A detent spring or the like comprising: a pair of elongated strip-like elements made of resilient material, each element formed in a generally arcuate shape and each element comprising a planar side section and a pair of end sections respectively connected to the opposite edges of the side sections and projecting away from the side sections, the elements being disposed with respect to one another to form a flared channel for receiving a part to be gripped between said side sections; and a bridge member disposed centrally of the elements and extending

across said channel between and fixedly connected to said side sections and free from said end sections.

7. A detent spring or the like comprising: a pair of elongated strip-like elements made of resilient material, each element formed in a generally arcuate shape and each element comprising a planar side section and a pair of end sections respectively connected to the opposite edges of the side sections and projecting away from the side sections, the elements being disposed with respect to one another to form a flared channel for receiving a part to be gripped between said side sections; and a bridge member disposed centrally of the elements and extending across said channel between and fixedly connected to said side sections and free from said end sections and each said element being formed with an elongated slot spaced from said bridge member and extending through the side and edge sections in a direction generally along the axis of said channel.

8. A detent spring or the like comprising: a bridge section for use in mounting the spring; a pair of side sections each extending upwardly from said bridge, the bridge and the sides forming a channel for receiving a part to be gripped; a pair of end sections respectively connected to the opposite edges of one of said side sections and extending generally angularly outwardly from the axis of said channel; and a second pair of end sections respectively connected to the opposite edges of the other of said side

sections and extending angularly outwardly from the axis of said channel.

9. A detent spring or the like comprising: a bridge section for use in mounting the spring; a pair of side sections each extending upwardly from said bridge, the bridge and the sides forming a channel for receiving a part to be gripped; a pair of end sections respectively connected to the opposite edges of one of said side sections and extending generally angularly outwardly from the axis of the channel; and a second pair of end sections respectively connected to the opposite edges of the other of said side sections and extending angularly outwardly from the axis of said channel and each said side and end sections being formed with a slot extending along the axis of said channel and spaced from said bridge.

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CERTIFICATE OF CORRECTION

Patent No. 3,039,838 June 19, 1962

Charles H. Koch, Jr., et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the grant, lines 2 and 3, and line 12, and in the heading to the printed specification, line 4, name of assignee, for "Industrial Corporation", each occurrence, read -- Novo Industrial Corporation --.

Signed and sealed this 23rd day of October 1962.

SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents