Nov. 25, 1958 H. R. KIRSTEN 2,861,316

LOCK BUCKLE

Filed Aug. 31, 1955

Fig. 1.

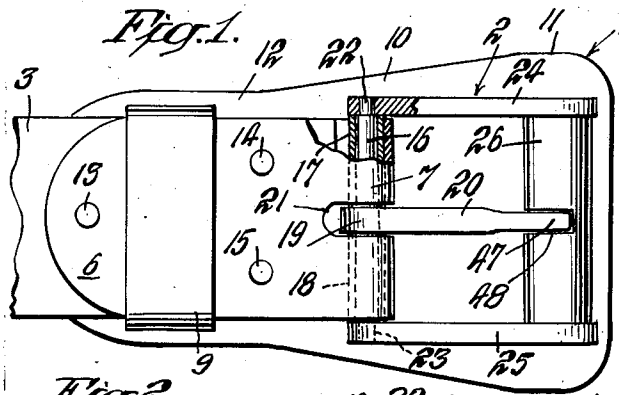


Fig. 2.

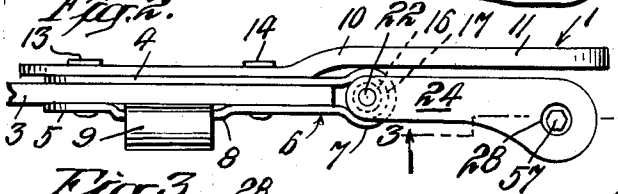


Fig. 3.

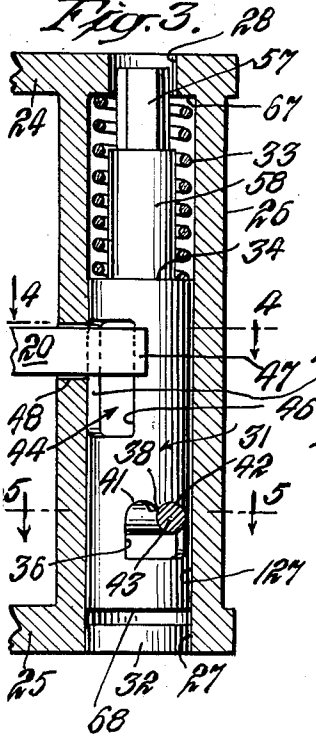


Fig. 4.

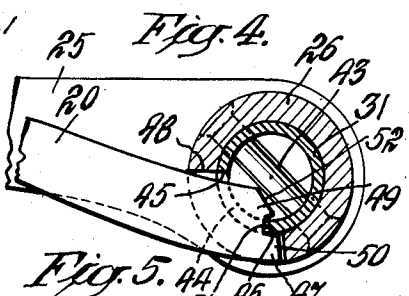


Fig. 5.

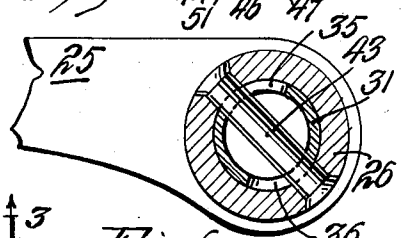


Fig. 6.

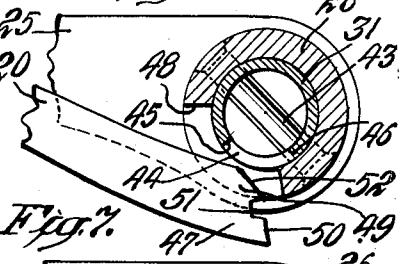


Fig. 7.

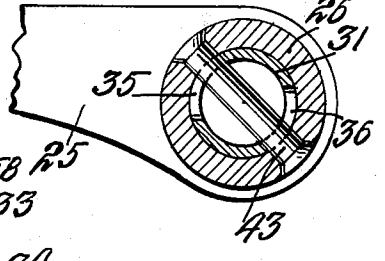
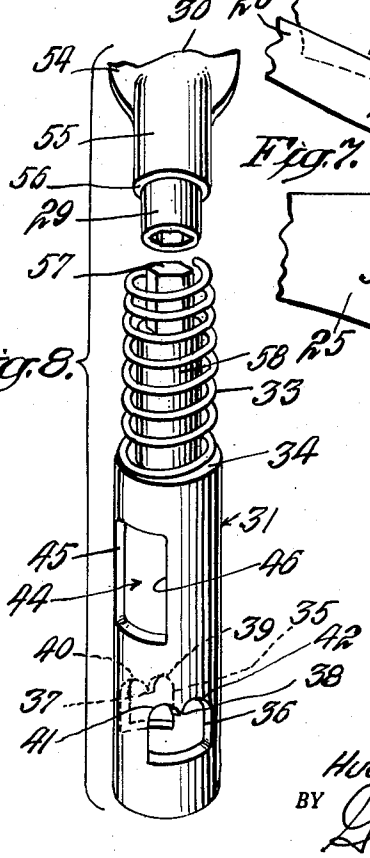


Fig. 8.



INVENTOR.
HUGO R. KIRSTEN
BY Gustav Drews
his ATTORNEY

United States Patent Office 2,861,316 Patented Nov. 25, 1958

2,861,316

LOCK BUCKLE

Hugo R. Kirsten, New York, N. Y.

Application August 31, 1955, Serial No. 531,775

3 Claims. (Cl. 24—167)

This invention relates to locks in general and more especially to locks for belt buckles such as used on belts or strait jackets for obstreperous and demented persons.

Among the objects of the present invention it is aimed to provide an improved lock particularly adapted for belt buckles such as disclosed in applicant's Reissue Patent No. 23,747, dated December 1, 1953, the parts of which lend themselves to mass production at a comparatively low cost, both with regard to manufacture of the parts, but also with regard to the assembly of the same, and which lock when equipped on a belt will have not only all of the advantages of applicant's earlier construction disclosed in the aforesaid patent, but also many additional advantages.

As an instance, while the construction disclosed in applicant's reissue patent was foolproof for all practical purposes, unless exceedingly heavy springs were used, it was found that the uncanny cunning of the occasional patient, with makeshift handmade gadgets, was nevertheless able to open these locks. With heavy springs on the other hand, it was also necessary to use specially heavy, strong key bits or blades. With this in mind, it is an object of the present invention to devise a combination which would have the advantage not only of the salient features of the lock disclosed in said reissue patent, but also of the effectiveness of the heavier springs, without the use of such heavier springs. To this end, it is also an object of the present invention to provide a construction whereby the key, made of comparatively light metal, is not required to compress a spring by an axially directed pressure. In other words, the spring in the present embodiment urges the barrel away from the key into locking or anchoring position, and the space between the cylinder and the key receiving projection is not large enough to enable a makeshift tool, knife, toothpick, or the like, other than the specially devised key, to grip the key receiving projection and pull it outward to clear the lock.

These and other features, capabilities and advantages of the present invention will appear from the subjoined detailed description of one specific embodiment thereof illustrated in the accompanying drawings, in which:

Fig. 1 is a plan, and Fig. 2 is a side elevation of a belt buckle equipped with the improved lock secured to a belt partly broken away.

Fig. 3 is an enlarged section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 3, showing the tongue in locking position.

Fig. 5 is a section on the line 5—5 of Fig. 3 showing the barrel in locked position.

Fig. 6 is a section similar to Fig. 4 showing the tongue clear of the barrel and the barrel in open position.

Fig. 7 is a section similar to Fig. 5 showing the barrel in open position.

Fig. 8 is a fragmental exploded view of the barrel, spring and key of the device.

In Figs. 1 and 2 the locks constituting the main feature

of the present invention is shown equipped on a belt buckle 2 connected to a belt 3 composed of leather or the like.

The end of the belt 3 is positioned between the overlapping plate portions 4 and 5 of the metal plate 6, being rounded at 7, and outwardly expressed at 8 in the plate portion 5 to receive the ends of the leather loop 9, which ends are disposed between the belt 3 and the extension 8 of the plate portion 5. Preferably as shown, there is also provided a leather extension 10 with an enlargement 11 disposed under the buckle 2 and the narrow portion 12 positioned on the outer face of the plate portion 4 with rivets 13, 14 and 15 securing the narrow portion 12 and plate portions 4 and 5 to the end of the belt 3 and to one another, as shown in Figs. 1 and 2. The buckle 2 preferably has a chape or cross bar 16 extending through the rounded or looped portion 7 of the plate 6 with the sleeves 17 and 18 to either side of the enlargement 19 of the tongue 20, the enlargement 19 being pivotally mounted on the chape 16 between the sleeves 17 and 18. The enlargement 19 of the tongue 20 as shown in Fig. 1 is disposed on the chape 16 movable in the recess 21 formed in the metal plate 6. The ends of the chape 16 are diminished as shown at 22 and 23 to enter the openings in the side bars or arms 24 and 25 of the buckle 2, which arms 24 and 25 are preferably cast integral with the cylinder 26. The end of the cylinder 26 adjacent the arm 25 has a large opening 27 conforming in diameter to the main chamber 127 in the cylinder 26. The other end of the cylinder 26 has a cylindrical key receiving opening 28 conforming in outline to the outer periphery of the chambered blade portion, driving part or bit 29 of the key 30 and concentric to, but smaller in diameter than, the chamber 127, terminating in the annular shoulder 67 as an abutment. In the cylinder 26 there is rotatably and slidably mounted the locking barrel or bolt portion 31 which is resiliently urged toward the plug 32 fixed in the opening 27 of the cylinder 26 by the coil spring 33 disposed between the shoulder 34 of the bolt 31 and the shoulder 67 normally urging the end 68 of the bolt 31 toward the plug 32.

The bolt or barrel 31 in the present instance has two slots or anchoring openings 35 and 36 diametrically opposed to one another and extending axially inward from the end 68 of the bolt portion 31. The axially inner ends of the slots 35 and 36 have intermediate projections 37 and 38 formed by the pairs of concave inner ends 39, 40, and 41, 42, of the slots 35 and 36, respectively.

The cylinder 26, see Figs. 3 to 7 inclusive, has a pin 43 extending diametrically across the same and through the slots 35 and 36. When the spring 33 is in substantially neutral or slightly compressed position, due to the concave faces of the pairs of depressions 39, 40, and 41, 42, the pin 43 will either rest in the depression 39 of the recess 35, and the depression 41 of the recess 36 as shown in Fig. 7, or in the depression 40 of the recess 35 and the depression 42 of the recess 36 as shown in Figs. 3 and 6, the concave faces of the recesses 39, 40, and 41, 42, serving as cams on the pin 43.

As shown in Figs. 3, 4, 6 and 8, the bolt 31 also has a locking opening 44 having the axially extending shoulders, edges or lips 45 and 46 to cooperate with the end 47 of the tongue 20, the lip 45 constituting the first shoulder and the lip 46 constituting the second shoulder.

The opening 44 is predetermined in position relative to the slots 35 and 36, depending upon the path of movement of the end 47 of the tongue 20. The cylinder 26 has a slot 48 formed therein, in length in the present instance about a quadrant of the peripheral distance around the cylindrical wall of the cylinder 26 and in width conforming to the width of the end 47 of the tongue 20 so

that it will just clear the same, see the position of the tongue 20 in the slot or sleeve opening 48 in Figs. 1 and 4. The length of the slot 48 in turn similarly conforms to the conformation of the end 47 of the tongue 20 so that in locked position, see Fig. 4, the end 47 of the tongue 20 will just fill up the opening 48 both lengthwise and crosswise.

The end 47 of the tongue 20 is bifurcated having the two projections or fingers 49 and 50 forming the mouth 51. The outer face 52 of the finger 49 is bevelled or chamfered to form a cam face to cooperate with the edge 46 of the opening 44 to deflect it into the position shown in Fig. 6 against the tension of the spring 33, and then upon the continued inward pressure on the tongue 20 the edge 45 of the opening 44 will be engaged to return the bolt 31 into the locked position shown in Fig. 4 where the edge 46 will be positioned in the mouth 51 of the tongue 20.

When it is desired to unlock or free the tongue 20 it will only be necessary to rotate the bolt portion 31 in a counterclockwise direction against the tension of the spring 33 where the edge 45 will flip the tongue 20 outwardly into the position shown in Fig. 6. On the other hand, when the lock is in the open position shown in Fig. 6, and it is desired to lock the tongue 20, it is only necessary to press the tongue 20 against the edge 45 of the opening 44 and against the tension of the spring 33 until the pin 43 rides over the projections 37 and 38 into the position in the depressions 40 and 42 from the position in the depressions 39 and 41, as shown in Fig. 7. In order to angularly rotate the bolt portion 31, the chamfered bit or blade of a key, such as the bit or blade 29 of the key 30, will be used.

The key 30 is preferably provided with a flat finger engaging grip 54, a cylindrical shank 55 having the chamfered bit 29 defined from the shank 55 by the shoulder 56, the bit 29 being provided with an outer cylindrical face of less diameter than the diameter of the shank 55 and an inner multisided or polygonal face conformed to the multisided or polygonal face of the head 57 extending from the diminished cylindrical portion 58 of the bolt portion 31. Preferably in the interest of making the device tamper-proof, the width of the space between the opening 28 and the bit 29 is reduced to a minimum, that is, of just sufficient width to receive the bit 29, depending upon the strength of the metal used. The outer end of the head 57 limited by the cooperation of the pin 43 with the openings 35 and 36 will at all times be spaced from the outer end of the cylinder 26 adjacent the opening 28, so that the head 57 will always be safely out of reach of gripping engagement by the fingers of a patient. If the metal of the bit 29 is composed of hardened tool steel, the thickness adjacent the corners of its multisided face may be reduced to .010 of an inch. Since the weakest points of the wall of the bit 29 are at these corners, obviously the greater the number of sides to the inner face of the bit 29, the thinner may be the average width of the space between the inner face of the opening 28 and the outer face of the head 57.

In operation, the bit 29 of the key 30 would initially be placed in the recess 28 to receive the head 57, thereupon exercise an axial force on the key 30 to cause the projections 37 and 38 to ride over the pin 43 thereby causing the spring 33 to be compressed and the head 57 to slide axially into the bit 29, and then, if the tongue 20 is in the locked position shown in Fig. 4, actuate the bit 29 in a counter-clockwise direction to cause the recesses 39 and 40 to receive the pin 43 and the lip or edge 46 to recede into the position shown in Fig. 6 where the edge 45 will thrust the tongue 20 outwardly into the position shown in Fig. 6. In turn, when it is desired speedily to snap the tongue 20 into locked position, it is only necessary to press the tongue 20 on the edge or lip 45 should the bolt 31 be resiliently maintained in the open position shown in Fig. 6. On the other hand, should the bolt 31 initially be in the closed position shown in Fig. 4, then upon pressing the chamfered face 52 against the lip 46, it will first rotate the bolt 31 into the position shown in Fig. 4, cause the projections 37 and 38 to ride under the pin 43 and cause the pin recesses 40 and 42 to receive the pin 43 and enable the spring 33 to become effective resiliently to maintain the tongue 20 in the locked position.

Although the area of the space between the opening 28 and the outer face of the head 57 may decrease as the number of sides increases without materially weakening the effective force that may be exercised by the bit 29 without injuring it, thereby in turn to increase the difficulty of tampering with the lock, and while a six-sided head 57 and a six-sided inner face for the bit 29 have given excellent tamper-proof results, it is obvious that if the sides of the head 57 were reduced to five or even to three, exceedingly satisfactory results would be achieved.

From the foregoing, as compared to applicant's reissue patent aforesaid, it will appear that the barrel 31 is resiliently movable toward the key 30 when releasing the tongue 20, instead of resiliently movable away from the key 30. This change increases the difficulty of tampering with the lock since an inward pressure on the head 57 by a toothpick or other lock-picking tool would only increase the difficulty of turning the head 57.

It is obvious that the present lock may be used to advantage not only with belts, but also with mail bags, ladies' hand bags, trunks and the like, without departing from the general spirit of the invention.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. In a buckle, the combination of a frame having two side bars, a cross bar connected at its ends to the rear ends of said side bars, a cylinder connected at its ends to the front ends of said side bars, said cylinder having a cylindrical chamber, a closure at the inner end of said cylinder, a first annular shoulder at the outer end of said cylinder having a round opening concentric with said cylindrical chamber and smaller in diameter than said cylindrical chamber, a barrel slidably mounted in said cylindrical chamber, said barrel having a main cylindrical wall conforming to the cylindrical chamber, a multi-sided extension, and a cylindrical extension less in diameter than the diameter of said cylindrical wall between said multi-sided extension and said cylindrical wall, said cylindrical extension being concentric to said cylindrical wall and defined from said cylindrical wall by a second annular shoulder, a coil spring tensed between said second annular shoulder and said first annular shoulder, said multi-sided extension extending into said round opening, a pair of anchoring openings in said cylindrical wall diametrically opposed to one another, a projection in said wall at the inner end of each of said anchoring openings, a pin connected to said cylinder and extending through said anchoring openings and maintained in cooperative engagement with said projections by said spring, said barrel having a locking opening with an axially extending first shoulder and a second axially extending shoulder, said cylinder having a slot registering with said locking opening, and a tongue pivotally mounted on said cross bar and having two jaw forming projections at its free end to receive said second axially extending shoulder when said pin engages one of the sides of said projections and said tongue clearing said second axially extending shoulder and in position to rest on said first axially extending shoulder when said barrel is turned to enable said pin to rest on the other sides of said projections, the overall combined length of said barrel and multi-sided extension being greater than the distance between the inner face of said first annular shoulder and

the inner face of said closure to insure spacing the outer end of said multi-sided extension from the outer end of said cylinder at all times.

2. The combination as set forth in claim 1 characterized by a key having a shank and a chambered bit with a cylindrical outer face conforming to said round opening and having a multi-sided inner face conforming to the multi-sided extension to receive the same to enable turning said barrel by said key.

3. In a buckle, the combination of a frame having a cross bar and a cylinder, said cylinder having a closure at its inner end and a key receiving opening defined by an outer annular shoulder at its outer end, a barrel slidably mounted in said cylinder, a pin extending through said barrel and connected to said cylinder to determine the outer movement of said barrel, an annular shoulder on said barrel, a spring tensed between said latter shoulder and said outer annular shoulder resiliently to urge said barrel into its innermost position, a key receiving extension on said barrel extending into said key receiving opening, a locking opening in said barrel having an axially extending shoulder, a slot in said cylinder registering with said locking opening, and a tongue pivotally mounted on said cross bar and having two jaw-forming projections at its free end to receive said axially extending shoulder when said barrel is in locking position in said cylinder, the overall length of said barrel and key receiving extension being greater than the distance between the inner face of said outer annular shoulder and the inner face of said closure to insure spacing the outer end of said extension from the outer end of said cylinder at all times.

References Cited in the file of this patent

UNITED STATES PATENTS

407,919	Blum	July 30, 1889
2,618,826	Kirsten	Nov. 25, 1952

FOREIGN PATENTS

536,576	Great Britain	May 20, 1941