Jan. 3, 1961 H. A. TOMPKINS 2,966,787

DOUBLE WINGED HINGED HANDCUFFS

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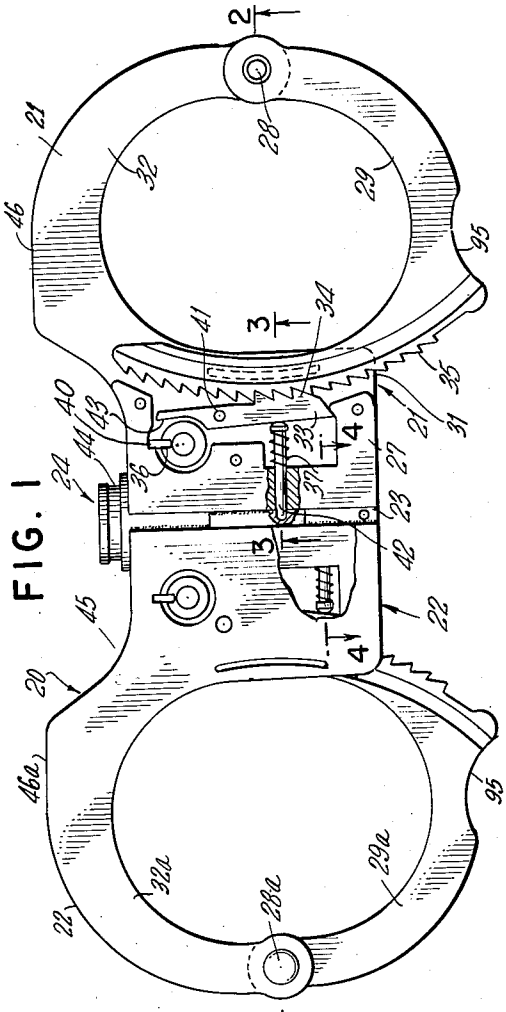


FIG. 1

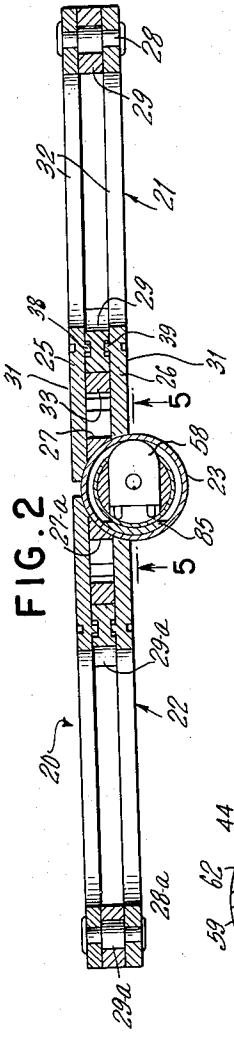


FIG. 2

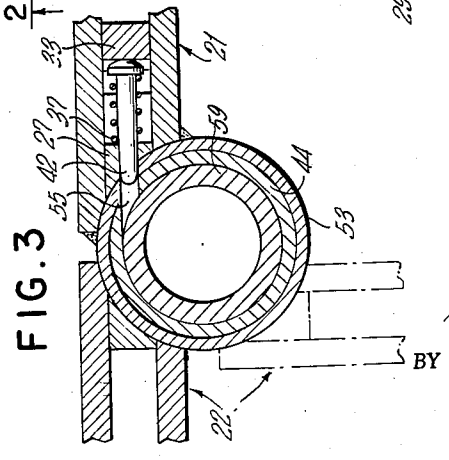


FIG. 3

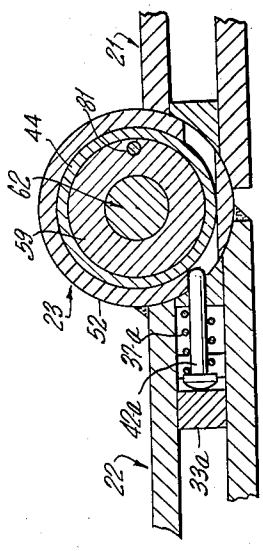


FIG. 4

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FIG. 7

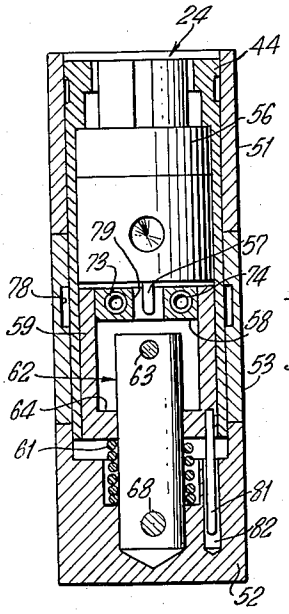



FIG. 6

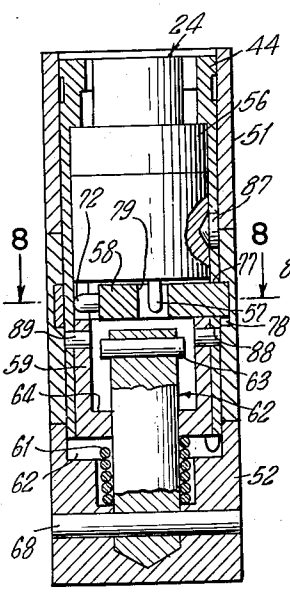
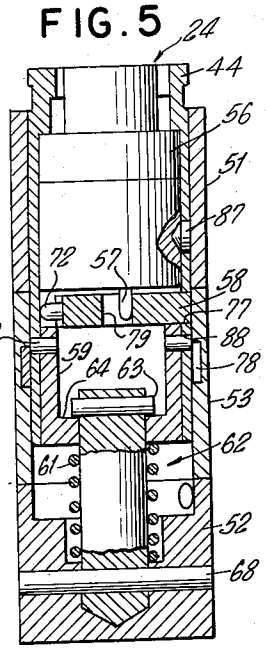



FIG. 5



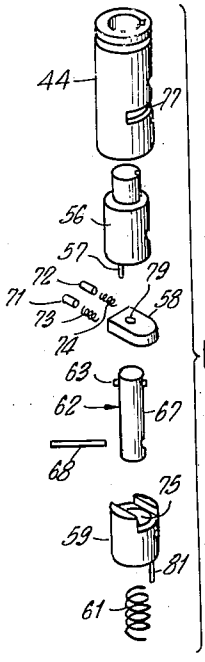
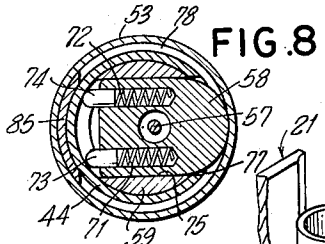




FIG. 10

FIG. 8



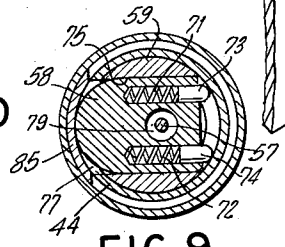




FIG. 9

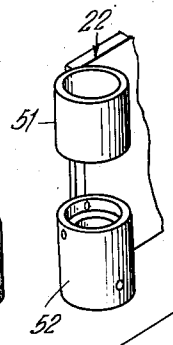



FIG. 11

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2,966,787

# DOUBLE WINGED HINGED HANDCUFFS

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8 Claims. (Cl. 70—16)

This invention relates to handcuffs, and is particularly directed to a novel form of hinged handcuff in which a novel locking assembly serves both as a hinge pin to hold the hinge in operative position and also to block and lock the individual shackles against undesired manipulation.

Among the objects of this invention are the following:

(1) To provide a double-locked handcuff;

(2) To provide a simple locking device and assembly for the handcuff;

(3) To provide a construction to permit quick application of the cuffs and immediate locking without an external key, with a simple arrangement for quickly restoring the cuffs to unlocked condition if they should become unintentionally locked during a struggle to apply them;

(4) To provide a hand guard during application;

(5) To facilitate one-hand tightening of an applied cuff;

(6) To provide a pick-proof cuff that will resist and frustrate gaffing or other manipulation to escape from the cuffs.

(7) To provide a cuff that may be used as a "twister" or "come-along";

(8) To provide a hand-cuff which holds the wrists of a prisoner in a manner to prevent angular wrist and arm movement to apply twisting forces to the cuffs.

The construction of the handcuff embodying this invention consists of two flap or wing sections, each provided with suitable hinge rings to form a hinge between the two wing sections, and a hinge pin assembly constituting the major control lock for the cuffs. The hinge pin lock assembly includes a cylindrical lock with a number of tumblers for controlling the operation of a transverse bolt for permitting or preventing axial movement of the lock assembly in the hinge. The bolt is operable by an external key or a by a built-in deflector or interceptor which serves to move the bolt to unlocking position when the cuffs are suitably operated by folding the two wing sections together around the hinge axis.

In a conventional cuff, a pivoted shackle element is caught and held by a pivoted detent which is movable by a key to release the shackle. Such a detent may be susceptible to manipulation to release the shackle independently of the key.

In the cuff of this invention, the hinge lock also serves to impose a positive blocking action against the detent of each cuff in addition to the usual spring bias that holds the detent against the shackle.

The construction and manner of operation of the handcuff of this invention are described below in connection with the accompanying drawings, in which

Figure 1 is a front elevational view of the cuffs in open uni-planar position with parts broken away to show a shackle and detent and the positions of the blocking pins for the detents;



Figure 2 is a longitudinal sectional view along line 2—2 of Figure 1, looking upward;

Figure 3 is a sectional view along line 3—3 in Figure 1, looking upward;

Figure 4 is a sectional view along line 4—4 in Figure 1, looking downward;

Figure 5 is a front view, mainly in section and partly in elevation, of the hinge and lock assembly, with the lock in elevated or open position, as taken along line 5—5 of Figure 2;

Figure 6 is a view similar to Figure 5 with the lock in depressed or closed position;

Figure 7 is a similar view of Figure 6 shown rotated ninety degrees;

Figure 8 is a sectional view taken along line 8—8 in Figure 6, looking downward;

Figure 9 is a view of Figure 8 with the lock assembly rotated through a half-circle, to show the action of the interceptor against the lock bolt;

Figure 10 is an exploded view of the parts of the hinge lock to show their relative disposition in assembly; and

Figure 11 is an exploded view of the hinge rings to show their relation to the wing sections, only one plate of each wing being shown for simplicity.

As shown in Figures 1 and 2, a double handcuff **20** comprises two wing sections **21** and **22** held together by a hinge **23** containing a lock **24** serving also as the hinge pin. Each wing section is formed with a double wall case with a shackle hinged to be free to move through a complete circular angle of 360 degrees.

The wing section **21** comprises two walls **25** and **26** held apart by a flat spacer **27** and by the shank of a pivot pin **28** which pivotally supports a shackle **29**. The two walls **25** and **26** each have a rectangular portion **31** to fit over the spacer **27** and an arcuate bow portion **32**. The bow provides outboard bearing support for the pivot pin **28** for the shackle **29**. With the double wall spacing, the shackle **29** is free to move through the full circle, as previously mentioned in a forward or closing direction. Movement of the shackle **29** in a backward or opening direction is normally prevented by a detent or pawl **33** with teeth **34** to engage complementary teeth **35** on the rim edge of the shackle **29**. Such backward or release movement of the shackle may be permitted by retracting the detent **33** by an associated cam lock **36** against the force of a biasing spring **37**. The shackle **29** is held to its path by two guide bosses **38** and **39** formed on the inner surfaces of side walls **25** and **26**.

The detent **33** is pivotally supported on a pin **41** supported between the two walls **25** and **26**. The biasing spring **37** for the detent is supported on a rod **42** which presses the detent teeth forward normally. A tailpiece **43** on the detent is in the path of the cam lug **40** of lock **36**. When the lock **36** is turned by its key, the cam lug **40** presses the tail piece to turn the detent and its teeth away from the shackle teeth. That is possible, however, only when the hinge lock **24** is in open position, as will be explained below, such open position being indicated in Figure 1 by the lock sleeve **44** projecting above the top edge of the top hinge ring. In the closed position of the hinge lock, the top edge of the lock sleeve **44** will be below the top edge of the hinge **23**, as will be shown later.

The elements of both wing sections are functionally equivalent and are structurally similar except where directional disposition affects form. For simplicity and convenience, the same elements will be identified by the same numeral, those of wing section **22** carrying also the small-case letter *a*.

An important feature of the double cuff, as shown in

Figure 1, is the depressed region 45 at the hinge and below the top edges 46 and 46*a* of the two bows 32 and 32*a* to accommodate a hand. Thus, if a blow is struck at the hand of an officer while holding and applying the cuffs, the top edge 46 or 46*a* will deflect the blow over the top of the fingers gripping the cuffs in the hinge region.

The manner in which the blocking rods 42 and 42*a* prevent or permit release movement of the associated detent 33 may be considered upon reference to Figures 3 and 4. First, attention is directed to the hinge rings in Figure 11 and in Figure 1. The top and bottom hinge rings 51 and 52 are welded to the walls of wing section 22, and the middle hinge ring 53 is welded to the walls of the wing section 21. For simplicity, only one wall is shown of each wing section in Figure 11.

Now, referring back to Figure 3, based on the unlocked position of the hinge lock 24 as in Figure 1, the blocking rod 42 is biased by spring 37 against the detent 33. The point of rod 42 extends through the wall of hinge ring 53, and is aligned with an opening 55 in the sleeve 44 which carries the hinge lock 24 and which serves as a hinge pin or pintle to hold the three hinge rings together. The inner cylinder 59 is not yet identified and is not material to the function now being considered.

When the hinge lock is in the open upward position shown in Figures 1 and 3, the blocking rod 42 can move into the opening 55, and therefore the detent 33 may be pivoted away from the shackle by operation of the cam lock 36 by an external unlocking key. Conversely, when the hinge lock 24 is depressed, the opening 55 is lowered to a level below the level of the blocking rod 42, and only the solid wall of sleeve 44 is engaged by the point of rod 42. Consequently, the detent is not only biased against the shackle 29, but is physically and positively braced against the shackle by the blocking rod 42. Under such conditions the cam lock 36 cannot pivot the detent away from the shackle.

Thus, movement of the hinge lock to depressed or locking position creates an internal mechanical condition that positively prevents separation of the detent from the shackle by any external tool to permit escape.

Figure 4, although taken on line 4—4, is modified to show the lock sleeve in lowered or closed position where it blocks the blocking rod 42*a* against backward movement, to thereby prevent illegal releasing movement of the detent 33*a*. Other elements of Figure 4 will be better understood after reference to the subsequent figures.

The hinge lock assembly 24 of Figure 1 and the three hinge rings 51, 52 and 53 are shown in more detail in Figures 5, 6 and 7, and in Figure 10. The hinge lock assembly comprises a carrier sleeve 44, a tumbler lock 56 having an eccentric pin 57 to operate a bolt 58, a guide support 59 for the bolt, a compression bias spring 61 to urge the guide support 59 upward, and a stop pin assembly 62 to limit the upward movement of the guide support 59 by a cross pin 63 seating against the floor 64 of a well in the guide support 59. The cross pin 63 is anchored at the top of a pilot post 67 that is in turn anchored at its bottom end in the bottom hinge ring 52 by a through anchor pin 68.

The bolt 58 as shown in more detail in Figures 8 and 9 is provided with biasing springs 71 and 72 and reaction pressure pins 73 and 74 to tend to bias the bolt 58 outward along the top slot 75 of guide support 59 and into or through a window 77 in sleeve 44.

As shown in Figure 5, when the hinge lock 24 is open, the bolt 58 extends into window 77 and abuts against the inside wall surface of hinge ring 53. When the hinge lock 24 is depressed to closed position, the level of bolt 58 moves downward till the bolt 58 is opposite an internal peripheral slot 78 in hinge ring 53 and then bolt 58 moves into slot 78 under the force of the two springs 71 and 72, as indicated in the section in Figure 8.

At this point in the description, attention is directed to an important feature of this cuff. The hinge lock 24 may have been depressed intentionally or unintentionally due to a struggle between an arresting officer and the prisoner.



If the cuff has been intentionally locked by the officer, the locked cuff will be opened by a proper key located at a station house to which the prisoner is taken.

If the cuff has been unintentionally closed, it should be possible for the officer to open the cuff readily, on the spot, without a key.

Assuming intentional closing of the cuff, the relative position of the eccentric tumbler lock pin 57 will be as shown in Figure 5. When the hinge lock 24 is depressed, the bolt 58 will move to the right, away from pin 57 which is then located as shown in Figures 6 and 8. When the tumbler lock 56 is now operated to open position, eccentric pin 57 will be moved to the left in Figures 6 and 8 against the wall of the circular hole 79 in bolt 58 and will move the bolt 58 to the left and out of peripheral slot 78 in hinge ring 53, against the reaction biasing forces of springs 71 and 72.

When the bolt 58 is withdrawn from slot 78, the entire sleeve and lock assembly 24 is free to move upward in response to the lifting force of compression spring 61. Such upward movement carries bolt 58 upward to the previous position shown in Figure 5 and the hinge lock remains in open position. Such operation would be considered a normal functioning operation.

The special feature of this cuff is the permitted operation to quickly open the cuff hinge lock when it is depressed to locked position during a struggle with a prisoner. In such case, the cuff has not yet been applied to the wrists of the prisoner and is therefore free in the hands of the officer. To open the hinge lock quickly, the two wing sections are pivotally swung together around the hinge. This operation also moves the bolt 58 back out of the peripheral slot 78, whereupon the entire hinge lock assembly is propelled upward by compression spring 61.

Before analyzing this opening operation, one more construction detail will be described. Reciprocating movement of the entire hinge lock assembly 24 is achieved downward by pressing downward on the top end of sleeve 44 where it is exposed above top hinge ring 51, and is achieved upward by releasing the bolt 78 from its locking slot 58. In order to prevent angular movement of the hinge lock assembly 24, the guide support 59 for the bolt is provided with a long pin 81 that is free to move up and down in a vertical narrow well 82 in bottom hinge ring 52.

Consequently, when the two wing sections of the cuff are pivoted into facing relation, the hinge lock assembly including carrier sleeve 44, the bolt 58, the guide support 59 and the anti-rotation pin 81 are held in fixed position relative to top and bottom hinge rings 51 and 52. At the same time, hinge ring 53 is free to turn relative to carrier sleeve 44.

The resulting action may now be readily realized from Figures 6, 8 and 10.

In Figures 6 and 8, the bolt is in locking peripheral slot 78 in middle hinge ring 53. In this same slot 78, opposite the front end of bolt 58, is fixedly press-fitted an arcuate sector or interceptor 85 of the same radial depth as the peripheral slot 78. Consequently, when the two wing sections are folded and moved together, the bolt 58 is rotated 180 degrees to engage the interceptor 85. The bolt 58 is thereupon pressed out of the slot 78 to the locus of the internal surface of the middle hinge ring 53. With the bolt 58 thus retracted, the entire sleeve and lock assembly 24 is free to move upward under the force of compression spring 61.

The two wing sections may then be unfolded without affecting the open condition of the hinge lock.

The manner of assembly may be briefly noted. The barrel lock 56 is inserted from the bottom into sleeve 55, as in Figure 10. The lock 56 is then pinned in fixed

position by a key pin 87 through the wall of sleeve 44. The bolt 58 and its springs and pins 71 to 74 are pressed upward to a position with the bolt 58 extending out of window 77. The window 77 is then covered with a piece of tape to hold the edge face of the bolt 58 aligned with the outer cylindrical contour surface of the sleeve 44. A properly located pin hole for eccentric pin 57 is then drilled in the rotatable barrel of lock 56, according to Figure 5, and pin 57 is then pressed into place. The bolt guide 59 with its pilot post 67 in place with pin 63 is then inserted in sleeve 44 and pinned in place by two side pins 88 and 89, so the guide is integral with sleeve 44. The compression spring 61 is then assembled on post 67 from below and the hinge pin assembly is fitted into the hinge rings to the position in Figure 6 or Figure 7, at which the anchor pin 68 is applied.

The invention herein thus provides a hinged handcuff which positively prevents escape of a prisoner from a locked cuff by jiggling the detent by an external tool.

At the same time, an officer can use the cuffs in various ways to compel compliance, as for example by pressing on the gripping surface 95 of the shackle to tighten the shackle against an enfolded wrist. The depressed regions 45 in the two wing sections adjacent the top of the hinge and pin sleeve 44 also provide a better grip of the cuff by an officer's hand in applying the cuff. The particularly important feature, as described, is the ability to quickly break the locking action of the hinge lock when it becomes locked during a tussle with a prisoner.

A preferred form of the cuff structure has been illustrated. Various modifications may be made without departing from the functional principles of the invention.

What is claimed is:

1. A double handcuff comprising a pair of wing sections, respectively provided with co-operating aligned knuckles or hinge rings, each wing section having an integral bow with an internal arcuate guide recess at one end of the bow; a curved closure shackle having one end pivoted on the outer end of the bow and having its opposite free end shaped as an arcuate section having ratchet teeth on the outer edge thereof, said shackle being movable about its pivot to move its arcuate section into and through the arcuate guide recess in the bow; detent means in each wing section adjacent its guide recess; pivot support means for each said detent means; a spring to bias the detent means to engage the ratchet teeth of its associated shackle to permit motion of the shackle in locking direction only; means to move the detent means to release position to permit release motion of the shackle; and lock means having a locking position and a non-locking position, said means embodying a cylinder disposed within the hinge rings to serve as a hinge pintle, and said lock means including said cylinder being spring-biased to non-locking position and being manually movable to locking position and being operative in such position to block the detent means against movement.

2. A handcuff as in claim 1, in which the lock means within the hinge rings includes a key-rotatable element, an ecccntric controllable by the rotatable element upon operation by an external key, a retractable bolt, bias springs to bias the bolt to advanced locking position and the bolt being retractable to non-locking position by the eccentric; and an interception piece anchored to an internal wall of one hinge ring to force the bolt back to retracted positon when the lock means is rotated relative to said one hinge ring by folding the wing sections together.

3. A hinged double handcuff, comprising two independent shackle cuff asesmblies, each assembly including a housing and a bow secured thereon and extending outwardly to a free end, a shackle having one end pivotally mounted on the free end of the bow and having the other end shaped as an arcuate section having an outer edge with ratchet teeth on said outer edge and said outer edge being movable through a predetermined path;



a detent disposed adjacent said predetermined path;

means biasing the detent to engagement with the teeth on the shackle, said means including a blocking rod and a bias spring;

one or more hinge rings on each housing and co-operative to constitute a hinge to join the two cuff assemblies for angular movement about the axis of such hinge, one ring on each housing having a perforation to provide a recess into which the back end of the associated blocking rod may enter for limited backward movement;

locking means disposed in the hinge rings, said locking means embodying a supporting cylinder axially movable within the hinge rings between two terminal positions representing open position and locking position, said cylinder serving as a pintle for the hinge constituted by the rings, said cylinder having two recesses respectively aligned with the perforation in each hinge ring to permit limited backward movement of the back end of the associated blocking rod by its detent while the associated shackle is moving to locking position, and while the cylinder is in open position, the wall of the cylinder when depressed and in locking position being in the way of the back end of the blocking rod and engaging such back end of the blocking rod to brace the blocking rod positively against the detent to lock the shackle against movement.

4. A hinged double handcuff, as in claim 3, in which the locking means includes a key-rotatable element and a bolt actuable thereby;

a guide support to carry the key-rotatable element and the bolt; and

a bias spring for supporting and moving the guide support within a limited permitted distance within the hinge.

5. A hinged double handcuff, as in claim 4, in which the spring-biased guide support tends to move the locking means to release position beyond the upper end limit of the hinge where the locking means will be accessible for external thumb pressure to be depressed back into the hinge.

6. A double handcuff comprising two cuff assemblies, each having a case, a bow integral therewith, a shackle pivoted on the bow and movable into the case, a detent to engage and hold the shackle against backward motion from the case, and a hinge ring on the case;

a hinge lock assembly to fit into the hinge rings on the two cuff cases, said hinge lock assembly including a lock-carrying cylinder axially movable between open and closed terminal positions in the hinge formed by the hinge rings;

a biasing spring in the hinge to bias the hinge lock assembly axially toward open raised terminal position and above the hinge, to be accessible for manual operation;

a spring-biased locking bolt constituting a part of the hinge lock assembly and operable to lock said assembly in locked terminal position when the hinge lock assembly is manually depressed;

and said lock asesmbly also including means for retracting the locking bolt to release the hinge lock assembly so said lock assembly may move to raised open terminal position.

7. A double handcuff, as in claim 6, comprising an auxiliary retracting means for the locking bolt, said auxiliary retracting means consisting of an interceptor element fixed in one hinge ring to be in the path of movement of said locking bolt when said cuffs are moved toward each other about the hinge axis.

8. A double handcuff, as in claim 7, in which the lock-carrying cylinder has a window to guide the lock bolt, and one hinge ring has an inner peripheral slot to receive the lock bolt extending through said window when the hinge lock assembly is depressed to locking position, whereby the bolt is held against axial movement but is free to turn angularly in said slot around the hinge axis, and

the interceptor element is fixed in said slot at an angle from the bolt position when the two cuffs are in extended

co-planar position, whereby angular movement of the two cuffs to parallel position causes the bolt to ride up on the interceptor element and out of the blocking slot to be free to move axially with the hinge lock assembly in response to the force of the biasing spring, whereby the entire hinge lock assembly is moved to open terminal position.




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