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LOCKING MECHANISM FOR HANDCUFFS

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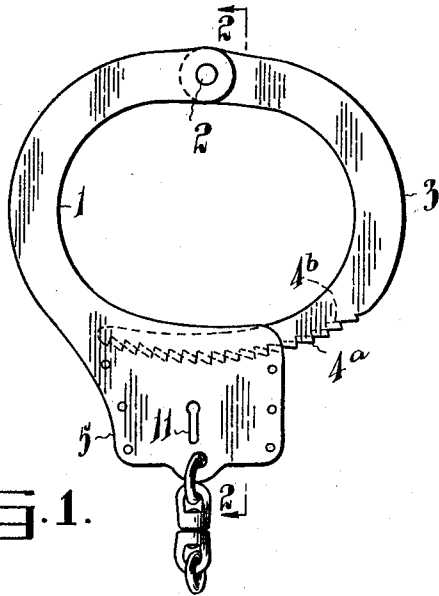


Fig. 1.

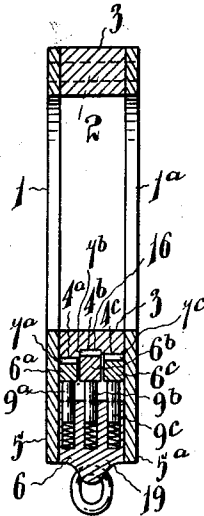


Fig. 2.

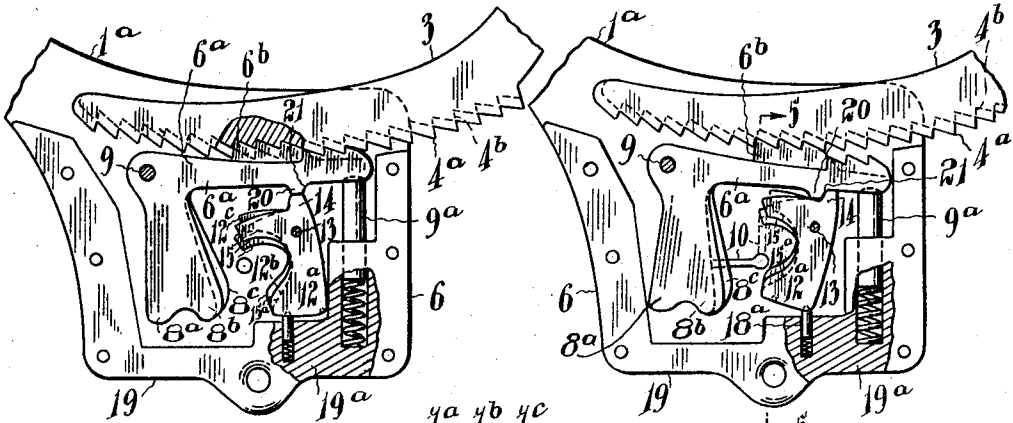
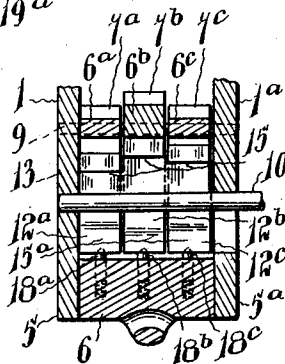


Fig. 3.

Fig. 4.

Fig. 5.



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LOCKING MECHANISM FOR HANDCUFFS

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This invention relates to locking mechanism for handcuffs, and is particularly adapted for use in connection with handcuffs provided with locks of the ratchet type such as shown and described in my prior Patent 1,775,727 dated Sept. 16, 1930.

The object of my invention is to provide a supplementary or double locking device of simplified construction, and I achieve my object by providing cam members operable by the key to engage the latch or latches and retain them in the locked position.

My invention is hereinafter more particularly described and illustrated in the accompanying drawing in which

Fig. 1 is a side elevation of a handcuff embodying my invention;

Fig. 2 is a vertical section on the line 2—2 in Fig. 1;

Fig. 3 is a side elevation of the lock casing with the side plate removed, showing the device locked;

Fig. 4 is a similar view showing the device unlocked; and

Fig. 5 is a vertical cross section on the line 5—5 in Fig. 4, showing the key in engagement with the cam in the position indicated in dotted lines in said Fig. 4.

In the drawing like numerals of reference indicate corresponding parts in the different figures.

The lock mounting arm comprises laterally spaced similarly curved arms 1 and 1^a pivotally secured by means of a pin 2 at one of their ends to another curved arm 3 which may be interposed between the laterally curved arms 1 and 1^a.

The other end of the curved arm 3 is provided with three sets 4^a, 4^b and 4^c of ratchet teeth arranged on the circumference thereof.

The outer sets 4^a and 4^c are preferably radially spaced from the set 4^b which is interposed therebetween, and there is thus formed a toothed groove 15 between the said outer sets of teeth.

The other ends of the arms 1 and 1^a terminate in side plates 5 and 5^a which with a U-plate 6 interposed between the edges thereof and secured thereto by rivets, form a lock case.

The lock case houses a lock including bell crank latches pivoted to plates 5 and 5^a by a pin 9 and having arms 6^a, 6^b and 6^c provided respectively with a series of teeth 7^a, 7^b and 7^c adapted to engage the sets of teeth 4^a, 4^b and 4^c respectively on the lockable arm 3. The other arms 8^a, 8^b and 8^c of the said latches are operable by a key to disengage said teeth and unlock the handcuffs, as hereinafter described.

A series of spring pins 9^a, 9^b and 9^c mounted in a spring block 19 within the lock casing engage the under side of the arms 6^a, 6^b and 6^c and keep the teeth 7^a, 7^b and 7^c normally in engagement with the teeth 4^a, 4^b and 4^c, respectively.

The angle between the bell crank arms of each latch is preferably varied, so that when the latches are in their locking position the key engaging edges or surfaces of the arms 8^a, 8^b and 8^c are in different relative positions and adapted to be actuated by a key 10 having wing sections of different lengths. The arms 8^a, 8^b and 8^c are, however, preferably of different widths so that the rear edges thereof are even or uniform, and when the latches are in their unlocked position these rear edges contact with the U-plate 6 maintaining the rear edges even and the front key engaging edges in the same relative position as when in the locking position. This makes it impossible to pick the lock with a key having a straight wing section, since each arm must be pressed back to its limit before the handcuff can be unlocked, and this can only be done by a key having wing sections of various lengths.

The key 10 which is insertable through the key hole 11 in the plate 5, has its wing notched so that it engages, when turned, all of the arms 8^a, 8^b and 8^c simultaneously and moves them outwardly against the pressure of the spring pins 9^a, 9^b and 9^c and moves the arms 6^a, 6^b and 6^c downwardly so that the sets of teeth 7^a, 7^b and 7^c are forced out of engagement with the sets of teeth 4^a, 4^b and 4^c and the lockable arm may then be withdrawn to open the handcuff.

So far the construction described is the

same as shown and described in my aforesaid prior United States patent.

To avoid picking of the lock or accidental opening thereof it is necessary to have a double locking device. One such is shown in my aforesaid patent, but this invention relates to an improved and simplified device.

A series of cams 12^a, 12^b and 12^c are pivotally mounted on a pin 13 within the lock casing at the opposite end thereof from the key engaging arms 8^a, 8^b and 8^c and adjacent the spring pins 9^a, 9^b and 9^c. The cams are each provided on their peripheries with a latch engaging surface 14 and key engaging surfaces 15 and 15^a. The underneath surface of the periphery of each cam is provided with two circumferentially spaced shallow depressions 17^a and 17^b engageable by one of a battery of three spring pins 18^a, 18^b and 18^c mounted in an extension 19^a of the spring block 19.

The tooth bearing arms 6^a, 6^b and 6^c of the latches are each provided in their under sides with an abutment or projection 20 engageable by the cam surface 14 and a depression 21 between the said abutment 20 and the end of the arm where the spring pins 9^a, 9^b and 9^c contact therewith.

The operation of the device is as follows: The lockable arm 3 is inserted between the parts 1 and 1^a of the lock mounting arm to the required distance. The springs 9^a, 9^b and 9^c force the latch arms 6^a, 6^b and 6^c upwardly so that the latch teeth 7^a, 7^b and 7^c engage with the ratchet teeth 4^a, 4^b and 4^c respectively on the lockable arm preventing its withdrawal. The cams 12^a, 12^b and 12^c are during this operation arranged with their latch engaging surfaces 14 coinciding with the depression 21 in the latch arms and out of contact therewith. They are held in this position by the engagement of the spring pins 18^a, 18^b and 18^c in the depression 17^b in each of the cams.

To lock the device the key 10 is inserted into the key hole 11 and is turned anti-clockwise engaging the surface 15^a of the cams causing them to rotate until their latch engaging surface 14 engages the abutment 20 on the latches, locking them. In this position the spring pins 18^a, 18^b and 18^c engage the shallow depressions 17^a in the cams retaining the cams in the locking position.

To unlock the device the key is turned further anti-clockwise engaging the surface 15 of the cams causing them to rotate so that the surface 14 once more coincides with the depression 21 in the latch arms. The rotation of the key is continued until it engages the key engaging arms 8^a, 8^b and 8^c, forcing the said arms back and the arms 6^a, 6^b and 6^c downwardly thus disengaging the series of teeth 7^a, 7^b and 7^c from the sets of teeth 4^a, 4^b and 4^c.

Although this invention has been de-

scribed for convenience in connection with a device having a series of three latches, any desired number of such latches may be used.

The handcuffs described are used in pairs and a lug 22 is provided on each lock casing, to which a chain 23 having a swivel 24 may be secured. This construction is considerably cheaper and simpler than the usual construction in which a swivel is mounted in each lock casing.

What I claim as my invention is:

1. In a handcuff including a lock mounting arm and a lockable arm pivotally connected with each other, a set of circumferentially arranged teeth on the lockable arm, and a lock on the lock mounting arm including a latch adapted for engagement and disengagement with the teeth on the lockable arm, locking mechanism comprising a cam engageable by a key and pivoted to the lock mounting arm and adapted to be turned into and out of engagement with the latch.

2. In a handcuff including a lock mounting arm and a lockable arm pivotally connected with each other, a set of circumferentially arranged teeth on the lockable arm, and a lock on the lock mounting arm including a latch adapted for engagement and disengagement with the teeth on the lockable arm, said latch having a depression therein, locking mechanism comprising a cam engageable by a key and pivoted to the lock mounting arm and adapted to be turned to engage the latch to retain it in a locked or tooth engaging position or to enter the depression and permit the latch to withdraw from the tooth engaging position.

3. In a handcuff including a lock mounting arm and a lockable arm pivotally connected with each other, a set of circumferentially arranged teeth on the lockable arm, and a lock on the lock mounting arm including a latch adapted for engagement and disengagement with the teeth on the lockable arm, locking mechanism comprising a cam engageable by a key and pivoted to the lock mounting arm and adapted to be turned into and out of engagement with the latch; and a spring pin adapted to co-operate with depressions in the cam to retain it either in or out of engagement with the latch.

4. In a handcuff including a lock mounting arm and a lockable arm pivotally connected with each other, a plurality of sets of circumferentially arranged teeth on the lockable arm, one set of teeth being radially spaced from another set, and a lock on the lock mounting arm including a plurality of latches each latch being adapted for engagement and disengagement with one of the sets of teeth on the lockable arm, locking mechanism comprising a plurality of cams engageable by a key and pivoted to the lock mounting arm and each adapted to be turned

into and out of engagement with one of the latches.

5 5. In a handcuff including a lock mounting arm and a lockable arm pivotally connected with each other, a plurality of sets of circumferentially arranged teeth on the lockable arm, and a lock on the lock mounting arm including a plurality of latches each latch being adapted for engagement and dis-
10 engagement with one of the sets of teeth on the lockable arm, locking mechanism comprising a plurality of cams engageable by a key and pivoted to the lock mounting arm and each adapted to be turned into and out
15 of engagement with one of the latches, the key engaging cam surfaces of each cam not being uniform with the corresponding surfaces on the other cams.

20 6. In a handcuff including a lock mounting arm and a lockable arm pivotally connected with each other, a set of circumferentially arranged teeth on the lockable arm, and a lock on the lock mounting arm including a bell-crank latch adapted for en-
25 gagement and disengagement with the teeth on the lockable arm, locking mechanism comprising a cam pivoted to the lock mounting arm and adapted to be turned into and out of engagement with the latch; and a spring
30 normally holding the latch in engagement with the teeth on the lockable arm, one of the arms of said bell-crank latch being engageable by a key to move the latch out of engagement with said teeth, and the cam being
35 engageable by said key to turn it into or out of engagement with the latch.

7. In a handcuff, including a lock mounting arm and a lockable arm pivotally connected with each other, a plurality of sets
40 of circumferentially arranged teeth on the lockable arm, and a lock on the lock mounting arm including a plurality of bell crank latches, one arm of each latch being adapted for engagement and disengagement with one
45 of the sets of teeth on the lockable arm and the other arm of each latch being engageable by a key, the key engaging edges or surfaces of said other arms being at various angles to the tooth engaging arms, whereby
50 they are engageable by a key having wing sections of different lengths, and the other edges of the said key engaging arms being uniform, and a stop which the said uniform edges of the latch arm are adapted to engage
55 when the latches are in their unlocked position to maintain the key engaging edges in the same relative positions as when in the locking position.

60 Signed at Toronto, Canada, this 26th day of March, 1932.

WILLIAM L. LATOU.