July 21, 1953 C. W. KELLY 2,645,924

LOCK AND BOLT OPERATING MECHANISM FOR PSYCHIATRIC SCREENS

Filed July 24, 1950 2 Sheets-Sheet 1

FIG.1.

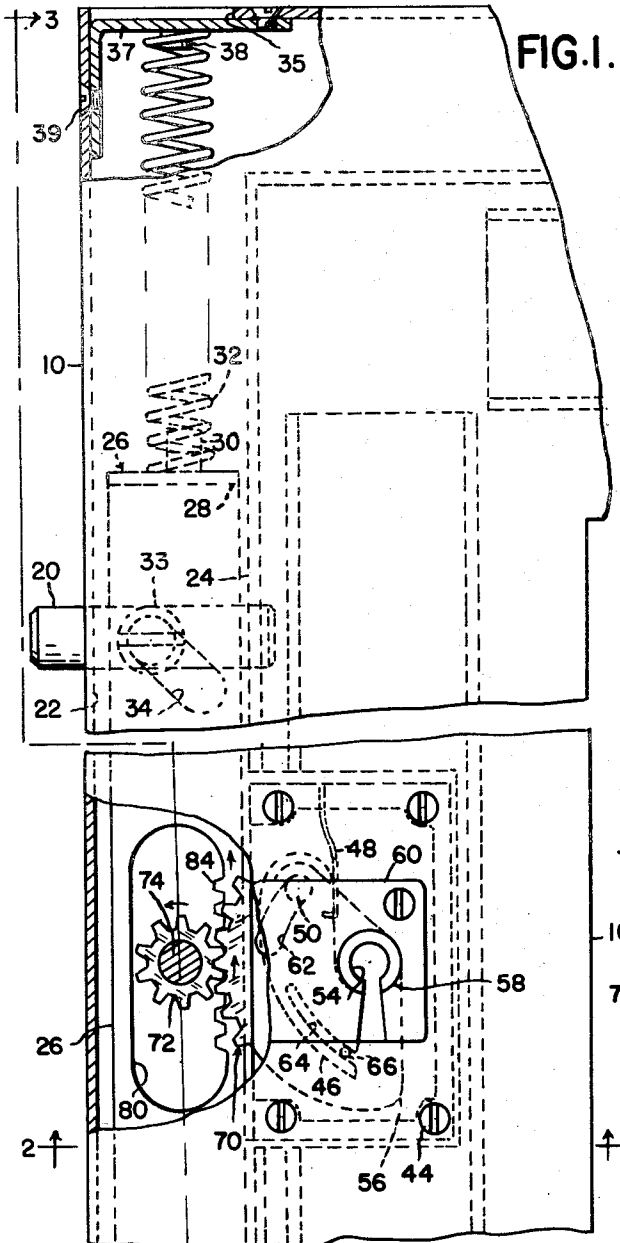


FIG.3.

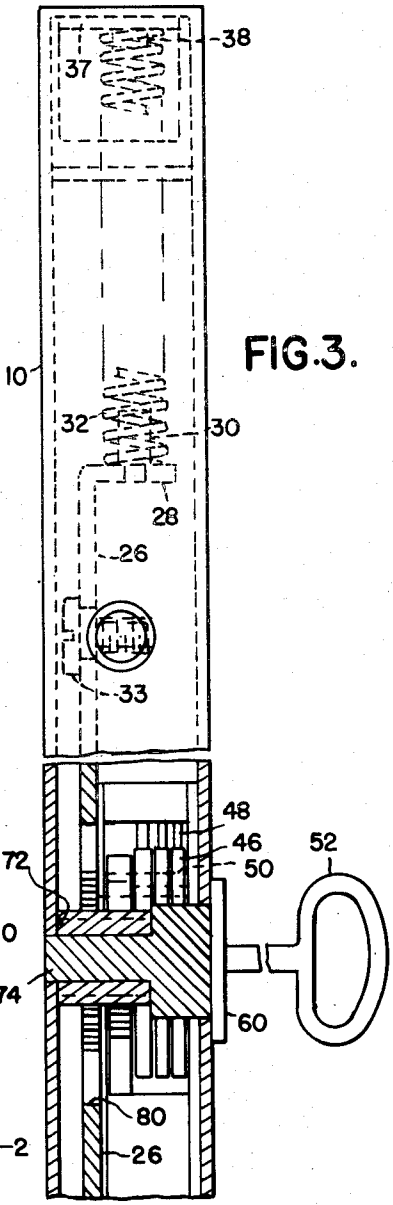


FIG.2.

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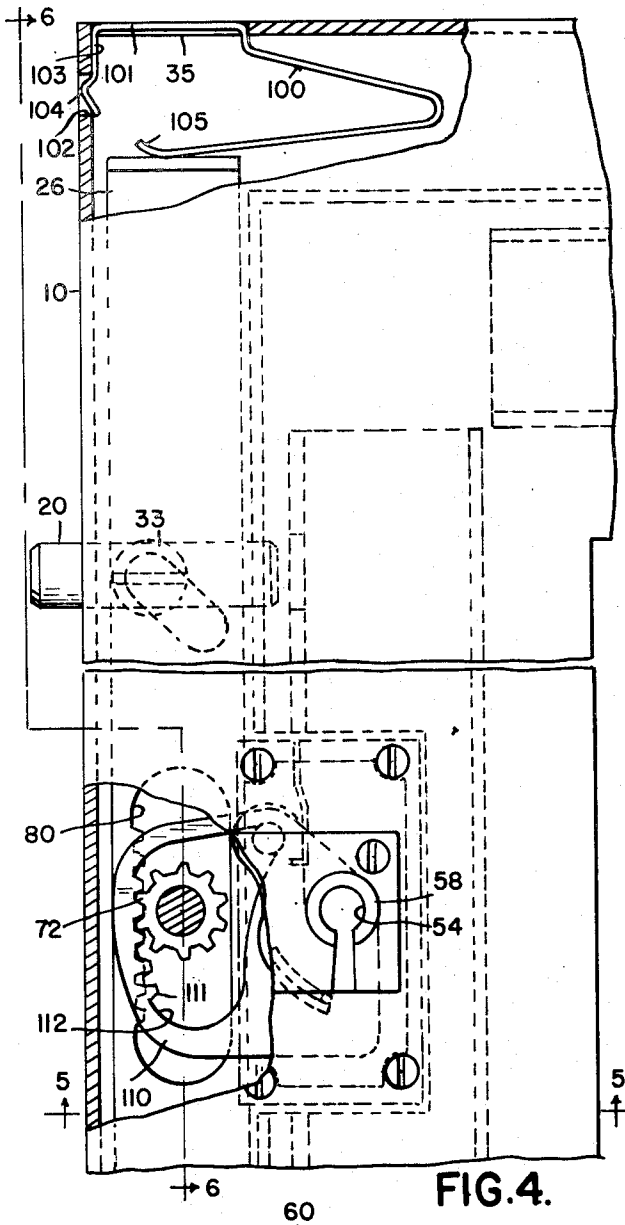


FIG.4.

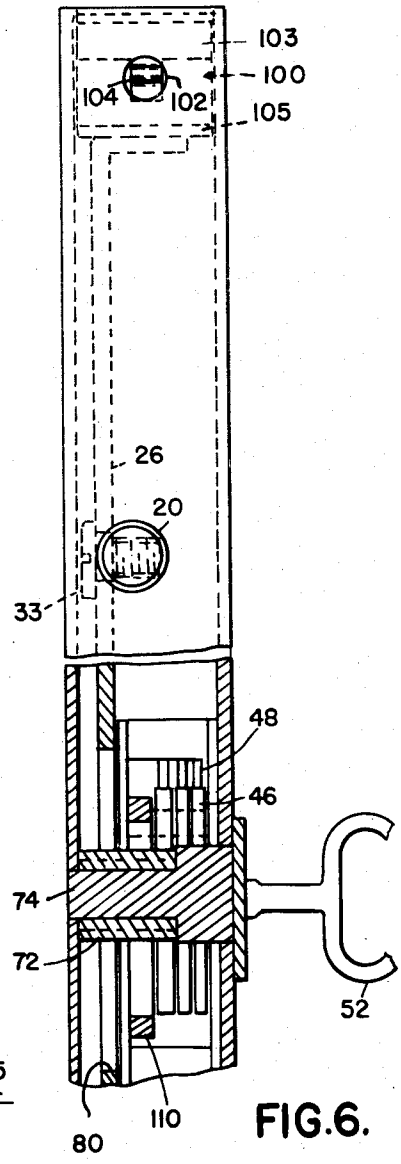


FIG.6.

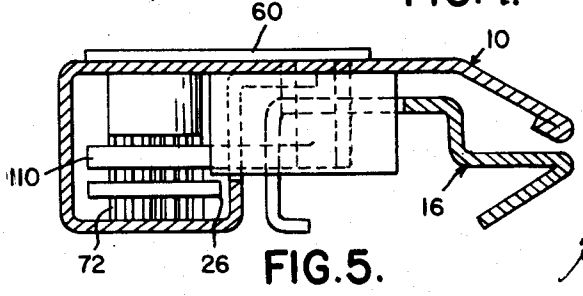


FIG.5.

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LOCK AND BOLT OPERATING MECHANISM FOR PSYCHIATRIC SCREENS

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7 Claims. (Cl. 70—144)

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The present invention relates to lock and bolt operating mechanism for psychiatric screen.

The term "psychiatric screen" is applied to screens used in penitentiaries, mental wards, and the like, in which relatively heavy screen cloth is resiliently supported at its edges so as to prevent the escape of inmates while at the same time preventing damage to the screen which might result from pounding on the screen or the like. Screens of this type are normally placed at the room side of the window and thus protect the glass of the window from the inmate. Obviously, screens of this type must be provided with effective locking means and in particular, in is desirable to provide for a plurality of bolts along the free side of the screen so as to prevent prying the screen open adjacent an unlocked corner.

With the foregoing general remarks in mind it is an object of the present invention to provide locking means for detention screens or similar devices having a plurality of locking bolts and a single key lock associated therewith whereby rotation of the key in the lock will effect simultaneous withdrawal or projection of the bolts.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings wherein:

Figure 1 is a fragmentary front elevation of a portion of a frame bar with which the locking mechanism is associated, with parts broken away.

Figure 2 is a section on the line 2—2, Figure 1.

Figure 3 is a section on the line 3—3, Figure 1.

Figure 4 is a fragmentary front elevation of a modified construction with parts broken away.

Figure 5 is a section on the line 5—5, Figure 4.

Figure 6 is a section on the line 6—6, Figure 4.

Referring now to the drawings, the detention screen is composed of a plurality of border bars 10 interconnected at their corners to form a rigid screen frame. As best illustrated in Figure 2, the border bar is composed of sheet metal having one edge reversely turned as indicated at 12 to provide a hollow portion 14. Movably associated with the frame border bars 10 are resiliently mounted screen supporting members 16, the screen cloth being attached thereto at the surface 18 or otherwise as desired. The members 16 are resiliently connected to the bars 10 by suitable springs (not shown).

The screen frames are hinged in the window opening along one side and suitable lock mecha-

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nism illustrated herein is provided in association with the border bar at the free or swinging side of the frame. The lock mechanism comprises essentially a plurality of bolts 20 which may be several in number although for purposes of illustration only one of the bolts is illustrated in the fragmentary view of Figure 1. As well illustrated in Figure 1, the bolts 20 extend through the outer wall 22 and the inner wall 24 of the hollow portion 14. An elongated actuator 26 is received within the hollow portion 14 for vertical longitudinal movement therein. The actuator 26 as best illustrated in Figure 3, is in the form of a flat metal bar having its upper end turned to provide a flange 28 which carries a spring locating pin 30. A compression spring 32 is located in the hollow portion 14 and bears at its upper end against the inner wall of the transverse frame bar, thus biasing the actuator 26 downwardly.

Specifically, the frame includes an opening 35 through which the elongated actuator 26 is inserted with the spring 32 located therein by means of a locating pin 30. To close the opening and retain the upper end of the spring 32 in position it is provided with an angle plate 37 which may be inserted through the opening 35. The angle plate 37 includes a centering lug 38 over which the upper end of the spring 32 seats. The plate 37 is retained in position within the frame and the opening 35 is closed by suitable fastening elements such as the screws illustrated at 39.

Each of the bolts 20 is provided with a headed screw 33 or the like, a reduced portion of which extends through an inclined cam slot 34 provided in the actuator 26. The arrangement is such that upward movement of the actuator results in retraction of the bolts 20 and downward movement of the actuator 26 results in projection of the bolts 20 into locking position. The compression spring 32 urges the actuator 26 downwardly in which direction it results in outward projected movement of the bolt.

A key lock device 40 is associated with the frame bar 10 and is illustrated attached to a flange 42 of the frame bar by a plurality of fastening screws 44. As best seen in Figures 1 and 3, the lock mechanism includes a plurality of tumbers 46, each of which is provided with a spring 48. The tumblers 46 are mounted for rotation about a stationary pivot pin 50 and operate to allow only the appropriate key 52 to turn clockwise when inserted in the keyhole 54. Included in the lock is a toothed sector 56 having an elongated collar 58 extending through a re-

movable escutcheon plate 60. The collar 58 secures the sector 56 for rotation about the axis of the keyhole 54. The sector 56 is provided with an arcuate slot 62 concentric with the axis of the keyhole 54 through which the pin 50 extends, thereby permitting rocking movement of the sector 56 about the axis of the keyhole. The tumblers 46 each include an arcuate slot 64 into which a pin 66 carried by the sector 56 may move when the tumblers are properly positioned. The slots 64 are so designed that upon simultaneous rocking movement of the tumblers 46 about the axis of the pin 50, and rocking movement of the sector 56 about the axis of the keyhole 54, the pin 66 will move freely in the slots 64. This movement may be effected only by the appropriate key 52 which differentially moves tumblers 46 to align slots 64. The toothed portion 70 of the sector 56 extends into the hollow portion 14 of the frame bar 10 and there meshes with an elongated pinion 72 which is rotatable on a supporting shaft 74. Opposite ends of the supporting shaft 74 are received within openings from the walls 76 and 78 of the hollow portion 14 of the frame bar and the assembly is retained in place by attachment of the escutcheon plate 60 as is apparent from an inspection of Figure 2.

The elongated actuator 26 is provided with an elongated slot 80 through which the pinion 72 extends. Rack teeth 84 are provided on an inner edge of the slot 80 and are in mesh with the teeth of the pinion 72.

The arrangement is such that when a key is inserted in the keyhole 54 and rotated clockwise as seen in Figure 1, the tumblers 46 and sector 56 are both rotated in a clockwise direction, movement of the tumblers permitting movement of the sector by the key. Movement of the sector 56 in a clockwise direction causes counterclockwise rotation of the pinion 72 which in turn causes upward movement of the actuator 26, thus camming the bolts 20 to their retracted or unlocked position. This action takes place against the force of the spring 32 which is so designed that upon release of the key 52 the parts return to the locked position illustrated in Figure 1, springs 48 returning tumblers 36.

By providing a plurality of bolts 20 as for example, one adjacent the top, one adjacent the bottom, and one intermediate the top and bottom at one side of the screen frame, a secure locking action is obtained which will effectively prevent an inmate from prying the frame loose adjacent a corner thereof. At the same time a simple construction is provided adapted to cooperate with the particular shape of the frame bar 10, the shape of which is dictated by considerations relating to the suspension of the screen tensioning members 16.

The modification of Figures 4–6 is very similar to that previously described and the description thereof will be limited to the points of difference.

In this modification the opening 35 in the frame consisting of hollow border bars 10, is closed by a resilient leaf spring 100 having a portion 101 shaped to be located in and to close the opening 35 in the frame bar. The frame is also provided with an opening 102 and the leaf spring 100 has a downwardly extending portion 103 provided with a detent 104 adapted to seat within the opening 102. The spring 100 includes a laterally extending U-shaped portion which terminates in an upwardly curved end 105 adjacent which the spring bears against the upper end of the actuator 26.

In the present modification a toothed sector 110 is mounted for rocking movement about the collar 58 and has a series of teeth 111 disposed concentric to the axis of the keyhole 54. The teeth 111 are located at the inside of an enlarged opening 112 which receives the pinion 72 and meshes therewith at the opposite side of the pinion from the keyhole 54. This is to be contrasted with the construction illustrated in Figure 1 in which the sector 56 meshes with the pinion at the same side as the keyhole 54. The construction of Figures 4–6 thus permits location of the keyhole closer to the edge of the frame without sacrificing mechanical advantage. In the modified construction the elongated actuator 26 is provided with the elongated opening 80 as in the previous construction, but in this case the opening 80 is provided with teeth 114 which engage the pinion 72 at its side opposite to the keyhole 54.

The drawings and the foregoing specification constitute a description of the improved lock and bolt operating mechanism for psychiatric screen in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. A detention screen frame comprising hollow border frame bars, an outer wall of an end frame bar having an opening therein in line with the hollow portion of a side frame bar, an elongated bolt actuator within said hollow portion such having been inserted through said opening, a lock bolt carried by said side bar and movable by said actuator, a key lock carried by said side bar including a member for moving said actuator vertically in said bar, a closure closing said opening, and spring means between said closure and actuator biasing said actuator away from said opening.

2. Structure as defined in claim 1 in which said closure and spring means is an integral leaf spring having a closure portion seated in said opening and a generally U-shaped spring portion extending therefrom, the free end of said spring portion bearing against the adjacent end of said actuator.

3. Structure as defined in claim 1 in which said closure is an angle plate which has been inserted through said opening, and which is seated against the inner surface of the outer walls of the side and end frame bars at their intersection, and said spring means is a coil compression spring seated between said angle plate and said actuator.

4. A detention screen frame comprising hollow border frame bars, an outer wall of an end frame bar having an opening therein in line with the hollow portion of a side frame bar, an elongated bolt actuator and biasing spring within said hollow portion such having been inserted through said opening, a lock bolt carried by said side bar and movable by said actuator, a key lock carried by said side bar including a member for moving said actuator vertically in said bar, a closure closing said opening, said biasing spring being operatively connected to said bolt actuator and engaged with said closure to bias said bolt actuator for vertical movement in one direction.

5. A detention screen frame comprising hollow border frame bars, an outer wall of an end frame bar having an opening therein in line with the hollow portion of a side frame bar, an elongated bolt actuator within said hollow portion

such having been inserted through said opening, a lock bolt carried by said side bar and movable by said actuator, manually operable means carried by said side bar including means operatively engaging said actuator for moving said actuator vertically in said bar, a closure closing said opening, and spring means between said closure and actuator biasing said actuator away from said opening.

6. A detention screen frame comprising hollow border frame bars, an outer wall of an end frame bar having an opening therein in line with the hollow portion of a side frame bar, an elongated bolt actuator and biasing spring within said hollow portion such having been inserted through said opening, a lock bolt carried by said side bar and movable by said actuator, manually operable means carried by said side bar including means operatively engaging said actuator for moving said actuator vertically in said bar, a closure closing said opening, said biasing spring being operatively connected to said bolt actuator and engaged with said closure to bias said bolt actuator for vertical movement in one direction.

7. A detention screen frame comprising hollow border frame bars interconnected at their ends, an outer wall of an end frame bar having

an opening therein in line with the hollow portion of a side frame bar, a locking bolt carried by said side frame bar, an elongated bolt actuator within said hollow portion such having been inserted through said opening, means operatively connecting said bolt and bolt actuator to effect movement of said bolt transversely of said side bar upon movement of said bolt actuator longitudinally of said side bar, manually operable means carried by said side bar operatively connected to said bolt actuator for moving said bolt actuator longitudinally of said side bar, and a closure closing said opening removable to permit insertion of said bolt actuator.

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