Dec. 15, 1931. L. J. WHITE ET AL 1,836,698

LOCK AND DOOR OPERATING MECHANISM

Filed March 4, 1931 2 Sheets-Sheet 1

Fig. 1

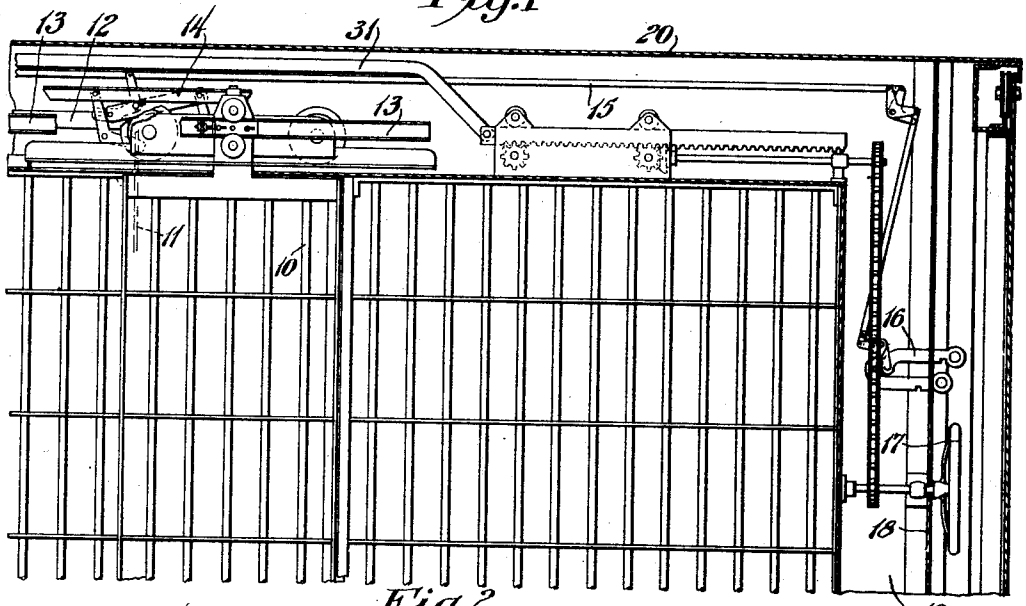


Fig. 2

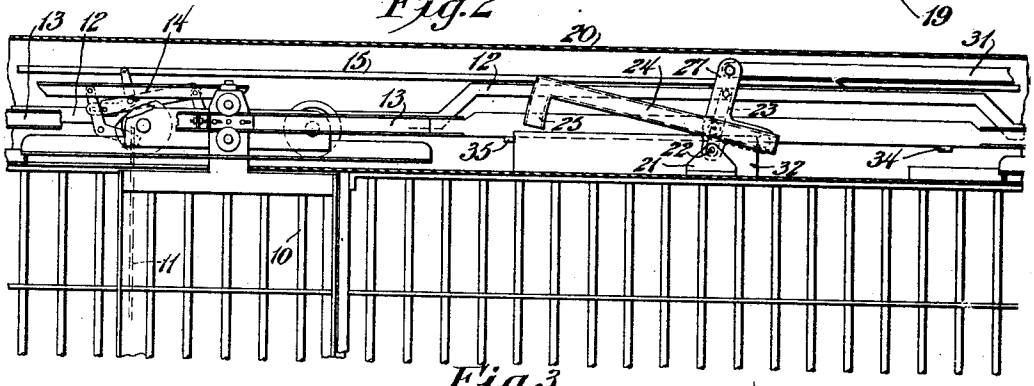
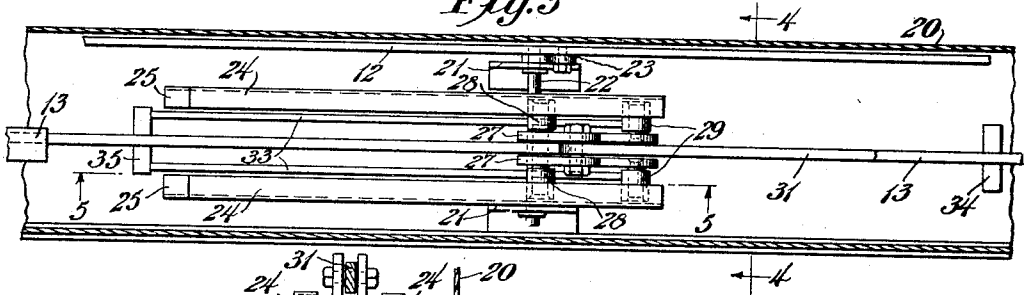


Fig. 3



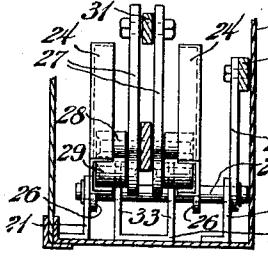


Fig. 4

INVENTORS
L. J. White and
D. F. Youngblood
BY
Siggers & Adams
ATTORNEYS.

Dec. 15, 1931. L. J. WHITE ET AL 1,836,698

LOCK AND DOOR OPERATING MECHANISM

Filed March 4, 1931 2 Sheets-Sheet 2

Fig. 5

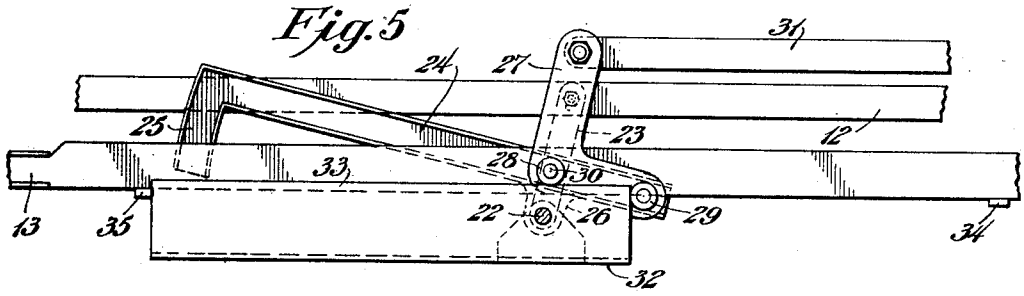


Fig. 6

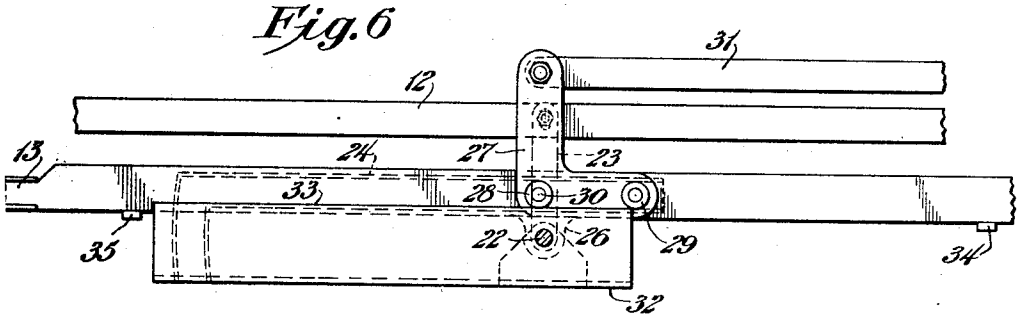


Fig. 7

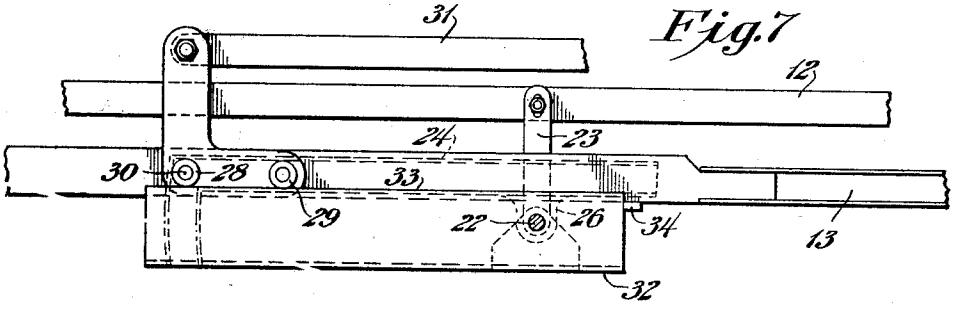
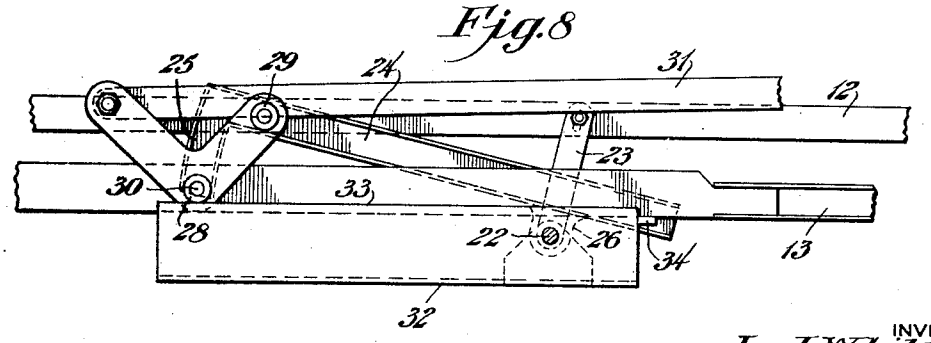


Fig. 8



INVENTORS
L. J. White and
D. E. Youngblood
BY
Siggers & Adams
ATTORNEYS

Patented Dec. 15, 1931 1,836,698

UNITED STATES PATENT OFFICE

LLOYD J. WHITE AND DAVID F. YOUNGBLOOD, OF SAN ANTONIO, TEXAS, ASSIGNORS TO SOUTHERN PRISON COMPANY, OF SAN ANTONIO, TEXAS, A CORPORATION OF TEXAS

LOCK AND DOOR OPERATING MECHANISM

Application filed March 4, 1931. Serial No. 520,120.

This invention relates to master actuating mechanisms for cell doors and locks and aims to provide certain important improvements in the mechanism shown in the copending application of L. J. White and G. L. Youngblood, Serial No. 451,142 filed May 9, 1930. The main idea is to provide improved mechanism for imparting movement in proper sequence to the bars which operate the locks and doors while power is applied continuously in one direction to the mechanism so as to reduce the number of operations necessary to be performed by the jailer or attendant.

Other aims and advantages of the invention will appear in the specification, when considered in connection with the accompanying drawings, wherein:—

Fig. 1 is a fragmentary, vertical sectional view showing master operating mechanism at one end of a row of cells;

Fig. 2 is a continuation of Fig. 1 showing the preferred form of rocker mechanism for imparting movements to a pair of master bars;

Fig. 3 is an enlarged top plan view of the rocker mechanism shown at the right hand side of Fig. 2;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3;

Figs. 5 to 8 inclusive are detail sectional views taken on line 5—5 of Fig. 3 and showing different positions of the rocker mechanism to explain the sequence of operations.

Referring particularly to the drawings, the embodiment of the invention there shown constitutes a part of a master operating system wherein lock operating and door propelling movements are imparted in sequence to a pair of master bars arranged to be selectively connected to the doors. However, it will be apparent that the same type of mechanism may be used to actuate individual bars over the doors.

In this example, the improved mechanism is applied to a row of jail cells having sliding doors 10, vertically movable latch bars 11, a master locking bar 12 and a master door propelling bar 13. The connections between the bars and the individual locks and doors are controlled by suitable selector mechanism 14 over each door arranged to be operated by selector rods 15. The whole system is adapted to be manually operated by suitable selector levers 16 and a hand wheel 17, both projecting through a panel 18 of a master control box 19. The illustrated selector mechanism is fully disclosed in an application of D. F. Youngblood, Patent No. 1,785,471 dated December 16, 1930, and the master control box is the subject of another Youngblood Patent No. 1,785,469 dated December 16, 1930. Hence these features require no further description herein.

Referring to Figs. 1 and 2, the doors 10 are arranged to slide to the left to open. Likewise, the master bars 12 and 13 move to the left to unlock and to open the selected doors. As shown, all doors are locked closed. When one or more doors are selected to be opened by manipulating the appropriate selector levers 16, it is necessary first to move the locking bar 12 a short distance to the left to unlock the doors and then to move the door propelling bar 13 to the left to open the unlocked doors. If the opened doors are to be locked open, it is next necessary to move the locking bar to the right or back to its locking position while the propelling bar remains stationary. These operations must be reversed to unlock, close and relock the doors. Now, this invention has to do with improved mechanism whereby the hand wheel 17 or other actuating means, either electrical or mechanical, may be moved continuously in one direction to impart both lock and door operating movements to the bars.

In the present example, the mechanism for imparting the operating movements to the bars is located in the usual housing 20 above the doors and adjacent to the bars 12 and 13. In Fig. 4 a pair of spaced brackets 21 are shown as being secured to the bottom of the housing 20 to provide journal bearings for a transverse shaft 22 below the bars. Fixed on one end of this shaft is an upstanding lever arm 23 (Figs. 2, 3 and 4) which is pivotally connected at its upper end to the locking bar 12, having a slotted connection to permit the bar to move longitudinally while the lever

swings or rocks with the shaft 22. The arrangement is such that turning movement imparted to the shaft 22 will move the locking bar to its unlocking or locking position.

On the shaft 22 between the bearing brackets 21 and on opposite sides of the door propelling bar 13 is secured a pair of similar, parallel, channel-shaped rocker arms 24 with their channels facing each other and having arcuate, downwardly projecting end portions 25 so that they are substantially L-shaped. These rocker members are shown as having ears 26 on their lower edges and a short distance from their right ends are rigidly secured to the shaft 22. The arrangement is such that rocking movement is imparted to the shaft 22 through these rocker members by means of a pair of spaced bell cranks 27 pivoted at the junction of their arms to the master bar 13 and each having spaced, laterally projecting rollers 28 and 29 on one arm extending into the parallel channels of the rockers, the front pair of rollers 28 being preferably mounted on the pivot pin 30 through the bell cranks and bar 13. The operating arms of the bell cranks straddle the bar 13 and are pivotally secured at their upper ends to a master actuating rod or link 31 which is connected to the hand wheel 17 by suitable gearing, such as shown in the aforesaid application of L. J. White and G. L. Youngblood, to be moved longitudinally in either direction upon turning the hand wheel 17 (Fig. 1).

When the parts are in the position shown in Figs. 1 to 5 inclusive, the front pair of rollers on the bell crank arms are above the shaft 22 and the rear pair of rollers 29 are near the rear ends of the rocker channels. When the link or rod initially moves to the left, the rollers will therefore swing the rockers to the left, until they reach a horizontal position when the arcuate ends will strike the web 32 of a channel beam secured to the bottom wall of the housing 20 and having its flanges 33 extending upwardly under the rollers 28 and 29 to provide tracks therefor so as to take the downward thrust thereof. This initial rocking movement imparted to the rocker members is sufficient to move the locking bar 12 through the crank arm 23 to its unlocking position, as shown in Fig. 6, and all selected doors are unlocked.

After the rocker members have been rocked to the position shown in Fig. 6, and the actuating rod or link 31 continues to move to the left, the bell cranks move bodily to the left carrying the propelling bar 13 with them while the rollers 28 and 29 ride in the parallel channels of the rockers 24 which are now parallel with said bar, the rear rollers 29 on their stub shafts preventing further rocking movement of the bell crank arms. The longitudinal movement of the bell cranks and the bar 13, propelling the selected doors to their open position, continues until the parts reach the position shown in Fig. 7. A transverse stop member 34 on the bar 13 limits the movement of the bar by striking the right end of the channel flanges 33. The forward pair of rollers 28 then register with the arcuate channels in the projections or arms 25 of the rockers. The selected doors are now unlocked and opened.

Still further movement of the actuating link or rod 31 to the left will now impart rocking or pivotal movement to the bell cranks, about the pivot pin 30, causing the forward rollers 28 to engage the arcuate channels 25 of the rocker members while the rear rollers 29 remain in the forward end portions of the straight channels and tilt the rockers to the position shown in Fig. 8. The rocker members have thus imparted locking movement to the locking bar 12 through the shaft 22 and the crank arm 23 while the propelling bar 13 remains stationary.

Throughout all of the foregoing operations the master actuating rod was moved continuously to the left and the operator did not have to work separate mechanisms. After selecting the doors to be opened, he turned the hand wheel 17 until it has reached the limit of its movement or until the parts are in the position shown in Fig. 8. Further, he can unlock, close and relock the doors by turning the hand wheel back to its starting position or to the limit of its reverse movement, all of the foregoing operations of the rocker mechanism and bars being reversed. Incidentally, another transverse stop member 35 on the propelling bar 13 limits the movement of the bar and rocker mechanism to the right, thus also limiting the reverse movement of the hand wheel.

From the foregoing description, it will be observed that all parts of the improved rocker mechanism are relatively simple and easy to install in any system employing door operating and locking bars. Many of the parts may be made of standard structural elements at a relatively low cost. Moreover, the arrangement is such that no undue twisting or torsional strains are applied to the rocker members and the mechanism will never become jammed. There are no delicate and complex parts that are likely to break or get out of order. The mechanism is sturdy, reliable and avoids the necessity for a jailer or attendant to perform a series of more or less complex operations in order to open and close the cell doors.

Obviously, the present invention is not restricted to the particular embodiment thereof herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and sub-combinations.

What we claim is:—

1. In a master lock and door operating system for a series of cell doors having operating bars arranged to be selectively connected to the locks and doors; rocker members adjacent to the bars; an actuating connection between the rocker members and the lock operating bars; bell crank arms pivoted on the door operating bar and connected initially to impart rocking movement to the rocker members to actuate the selected door locks and subsequently to impart door propelling movement to the door operating bar; and means to impart continuous movement in one direction to the bell crank arms.

2. In a master lock and door operating system for a series of cell doors having operating bars arranged to be selectively connected to the locks and doors; rocker members adjacent to the bars; a pair of spaced channel-shaped rocker members arranged below said bars; a crank arm associated with the rocker members and connected to actuate the locking bar; a bell crank pivotally connected to the door operating bar; connections between the bell crank and the channel-shaped rocker members whereby pivotal movement of the bell crank will actuate the rocker members and the connected locking bar independently of the door operating bar, said connections between the bell crank and rocker members permitting the bell crank to impart door propelling movement to the door operating bar after the rocker members have actuated the locking bar; and a single master actuating member connected to impart continuous movement in one direction to the bell crank while a selected door is being unlocked and opened or closed and re-locked.

3. In a master lock and door operating system for a series of cell doors having operating bars arranged to be selectively connected to the locks and doors, rocker members adjacent to the bars; a crank arm secured to rock with the rocker members and pivotally connected to the locking bar; bell crank arms on the door operating bar and connected initially to impart rocking movement to the rocker members to actuate the selected door locks and subsequenty to impart door propelling movement to the door operating bar; and means to impart continuous movement to the bell crank arms.

4. In a master lock and door operating system for a series of cell doors having operating bars arranged to be selectively connected to the locks and doors, rocker members adjacent to the bars; a pair of spaced channel-shaped rocker members arranged below said bars; means associated with the rocker members connected to actuate the locking bar incident to rocking movement; a bell crank pivotally connected to the door operating bar; connections between the bell crank and the channel-shaped rocker members whereby pivotal movement of the bell crank will actuate the rocker members and the connected locking bar independently of the door operating bar, said connections between the bell crank and rocker members permitting the bell crank to impart door propelling movement to the door operating bar after the rocker members have actuated the locking bar; and a single master actuating member connected to impart continuous movement in one direction to the bell crank while a selected door is being unlocked and opened or closed and re-locked.

5. In a master lock operating and door propelling system for a series of cell doors wherein a master lock operating bar and a master door propelling bar are arranged in a housing above the series of doors, selector mechanism adapted to connect selected locks and doors to the respective bars; common actuated mechanism for the bars including a pair of channel-shaped rocker members pivoted within the housing and having an actuating arm connected to the master lock operating bar; a bell crank lever pivotally connected to the master door propelling bar and adapted to move bodily therewith; operative connections between said bell crank lever and said rocker members arranged to impart rocking movement thereto when the bell crank lever is pivotally actuated; means for limiting the pivotal movement of said bell crank lever; and a single operating member connected to said bell crank lever to impart actuating movements to said master bars in the proper sequence.

6. In a master lock operating and door propelling system for a series of cell doors wherein a master lock operating bar and a master door propelling bar are arranged in a housing above the series of doors, selector mechanism adapted to connect selected locks and doors to the respective bars; common actuating mechanism for the bars including a pair of substantially L-shaped rocker members pivoted within the housing and having an associated actuating arm connected to the master lock operating bar; a pair of spaced bell crank levers pivotally connected to the master door propelling bar and adapted to move bodily therewith; operative connections between said bell crank levers and one arm of said L-shaped rocker member arranged to impart rocking movement thereto when the bell crank levers are pivotally actuated; and master actuating means connected to said bell crank levers first to impart pivotal movement thereto and thereafter to impart bodily longitudinal movement thereto whereby to transmit actuating movements to said master bars in the proper sequence.

7. In a master lock operating and door propelling system for a series of cell doors wherein a master lock operating bar and a master door propelling bar are arranged in a housing above the series of doors, selector

mechanism adapted to connect selected locks and doors to the respective bars; common actuating mechanism for the bars including a pair of substantially L-shaped rocker members pivoted within the housing and having an actuating arm connected to the master lock operating bar; a bell crank lever pivotally connected to the master door propelling bar and adapted to move bodily therewith; spaced roller connections between said bell crank lever and said L-shaped rocker members arranged to impart rocking movement thereto when the bell crank lever is pivotally actuated; and a single actuating member connected to impart both pivotal and bodily longitudinal movement to said bell crank whereby to transmit actuating movements to the respective master bars in the proper sequence.

8. In a master lock operating and door propelling system for a series of cell doors wherein a master lock operating bar and a master door propelling bar are arranged within a housing above the doors, selector mechanism for selectively connecting any of the locks and doors to said bars; fixed bearing brackets within the housing; L-shaped rocker members pivoted to said fixed brackets and having an associated arm pivotally connected to the master lock operating bar; said L-shaped rocker members presenting open channels; adjacent bell crank levers pivotally connected at the junctions of their arms to the master door propelling member and arranged to move bodily therewith; spaced laterally projecting rollers on said bell cranks guided in said open channels; and a single actuating device connected to said bell crank lever whereby to effect sequential actuation of the selected locks and doors.

9. In a master lock operating and door propelling system for a series of cell doors wherein a master lock operating bar and a master door propelling bar are arranged within a housing above the doors, means for selectively connecting any of the locks and doors to said bars; a pair of bell crank levers pivotally connected to the master propelling bar and arranged to move bodily therewith; a pair of pivoted rocker arms connected to impart lock actuating movements to said master lock operating bar; operative connections between said bell crank lever and said pivoted arms whereby movement is imparted to the master lock operating bar when said bell crank lever is pivotally moved; means to limit the rocking movement of said arms; and a single actuating device operatively connected to said bell crank lever first to impart swinging movement to it and then to move it bodily with said master door propelling bar.

10. In a master lock operating and door propelling system for a series of cell doors wherein a master lock operating bar and a master door propelling bar are arranged within a housing above the doors, selector mechanism for selectively connecting any of the locks and doors to said bars; fixed brackets within the housing, channel-shaped rockers pivotally connected to said fixed brackets and having an associated arm connected to the master lock operating bar; an actuating lever connected to the master door propelling bar; roller connections between said actuating lever and said channel-shaped rocker members whereby to transmit lock actuating movements to said master lock operating bar; and a single manually operable device located at a master control station operatively connected to said actuating lever and arranged to be moved in one direction successively to impart lock actuating and door propelling movements to said master bars.

11. In a master lock and door operating system for a series of cell doors having a lock operating bar and a door propelling bar; means to select the doors to be actuated; a pair of bearing brackets below the door propelling bar; a transverse rocker shaft mounted in said bearing brackets; duplicate, channel-shaped rocker members secured to said shaft and arranged to rock in paths on opposite sides of the door propelling bar, the channels being parallel with each other and providing guideways; channel-shaped, arcuate arms on the rocker members acting as combined guideways and stops to limit the rocking movement of the rocker members; means connecting the rocker members to actuate said lock operating bar; bell cranks pivotally connected to the opposite sides of said door propelling bar; spaced rollers on one arm of each bell crank guided in the channel guideways of said rocker members; and actuating means connected to the other arms of said bell cranks arranged initially to impart rocking movement to the bell cranks and rocker members so as to actuate the locking bar and, and, thereafter, to impart bodily longitudinal movement to the bell cranks and the door propelling bar while the rocker members are inactive, said arcuate channel-shaped arms being so arranged as to permit the bell cranks to impart rocking movement to the rocker members at the end of the door propelling movement.

12. In a master lock and door operating system for a series of cell doors having a lock operating bar and a door propelling bar; means to select the doors to be actuated; a pair of bearing brackets below the door propelling bar; a transverse rocker shaft mounted in said bearing brackets; duplicate, channel-shaped rocker members secured to said shaft and arranged to rock in paths on opposite sides of the door propelling bar, the channels being parallel with each other and providing guideways; means connecting the rocker members to actuate said lock operating bar; bell cranks pivotally connected to

the opposite sides of said door propelling bar; spaced rollers on one arm of each bell crank guided in the channel guideways of said rocker members; stationary tracks for the rollers; means initially to impart rocking movement to the bell cranks and the rocker members and thereafter to impart bodily longitudinal movement to the bell crank and the door propelling bar and stop means to limit the movement of the door propelling bar.

13. In a master lock and door operating system for a series of cell doors having a lock operating bar and a door propelling bar; means to select the doors to be actuated; a pair of bearing brackets below the door propelling bar; a transverse rocker shaft mounted in said bearing brackets; duplicate, channel-shaped rocker members secured to said shaft and arranged to rock in paths on opposite sides of the door propelling bar, the channels being parallel with each other and providing guideways; means connecting the rocker members to actuate said lock operating bar; bell cranks pivotally connected to the opposite sides of said door propelling bar; spaced rollers on one arm of each bell crank guided in the channel guideways of said rocker members; a stationary channel section having flanges providing horizontal tracks for said rollers; and master actuating means connected to the bell cranks to impart successive actuating movements to the bars.

14. In a master lock and door operating system for a series of cell doors having a lock operating bar and a door propelling bar; means to select the doors to be actuated; a pair of bearing brackets below the door propelling bar; a transverse rocker shaft mounted in said bearing brackets; duplicate, channel-shaped rocker members secured to said shaft and arranged to rock in paths on opposite sides of the door propelling bar, the channels being parallel with each other and providing guideways; means connecting the rocker members to actuate said lock operating bar; bell cranks pivotally connected to the opposite sides of said door propelling bar, spaced rollers on one arm of each bell crank guided in the channel guideways of said rocker members; a stationary channel section having flanges providing horizontal tracks for said rollers; stops on the door propelling bar arranged to strike the ends of the channel section and limit the movement of said bar in either direction; and a single master actuating device connected to said bell cranks to impart movements in proper sequence to said bars.

15. In a master lock and door operating system for a series of cell doors having a lock operating bar and a door propelling bar; means to select the doors to be actuated; a pair of bearing brackets below the door propelling bar; a transverse rocker shaft mounted in said bearing brackets; duplicate, channel-shaped rocker members secured to said shaft and arranged to rock in paths on opposite sides of the door propelling bar, the channels being parallel with each other and providing guideways; means to limit the rocking movement of the rocker members; a bell crank pivotally connected at the junction of its arms to the door propelling bar; spaced laterally projecting members on the bell crank extending into said guideways and arranged to impart rocking movement to the rocker members and to be confined by said guideways to permit the bell crank to be moved bodily longitudinally to actuate the door propelling bar; and master actuating mechanism connected to the bell crank and to move continuously in one direction to impart successive and independent movements to the bars.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures.

L. J. WHITE.
DAVID F. YOUNGBLOOD.