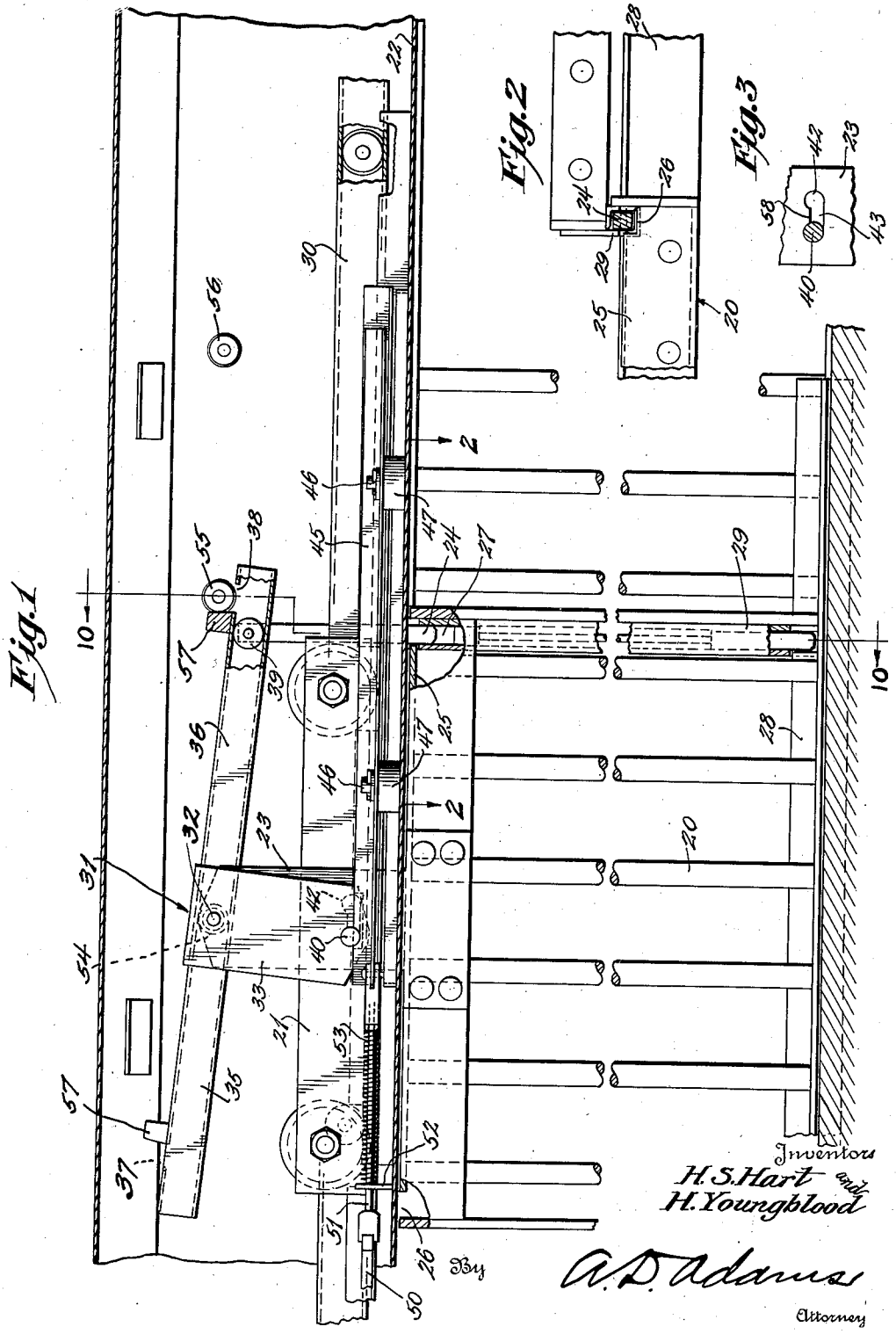
Nov. 11, 1941. H. S. HART ET AL 2,262,674

LOCKING AND OPERATING MECHANISM FOR CELL DOORS

Filed Aug. 27, 1940 5 Sheets-Sheet 1



Nov. 11, 1941. H. S. HART ET AL 2,262,674

LOCKING AND OPERATING MECHANISM FOR CELL DOORS

Filed Aug. 27, 1940 5 Sheets-Sheet 2

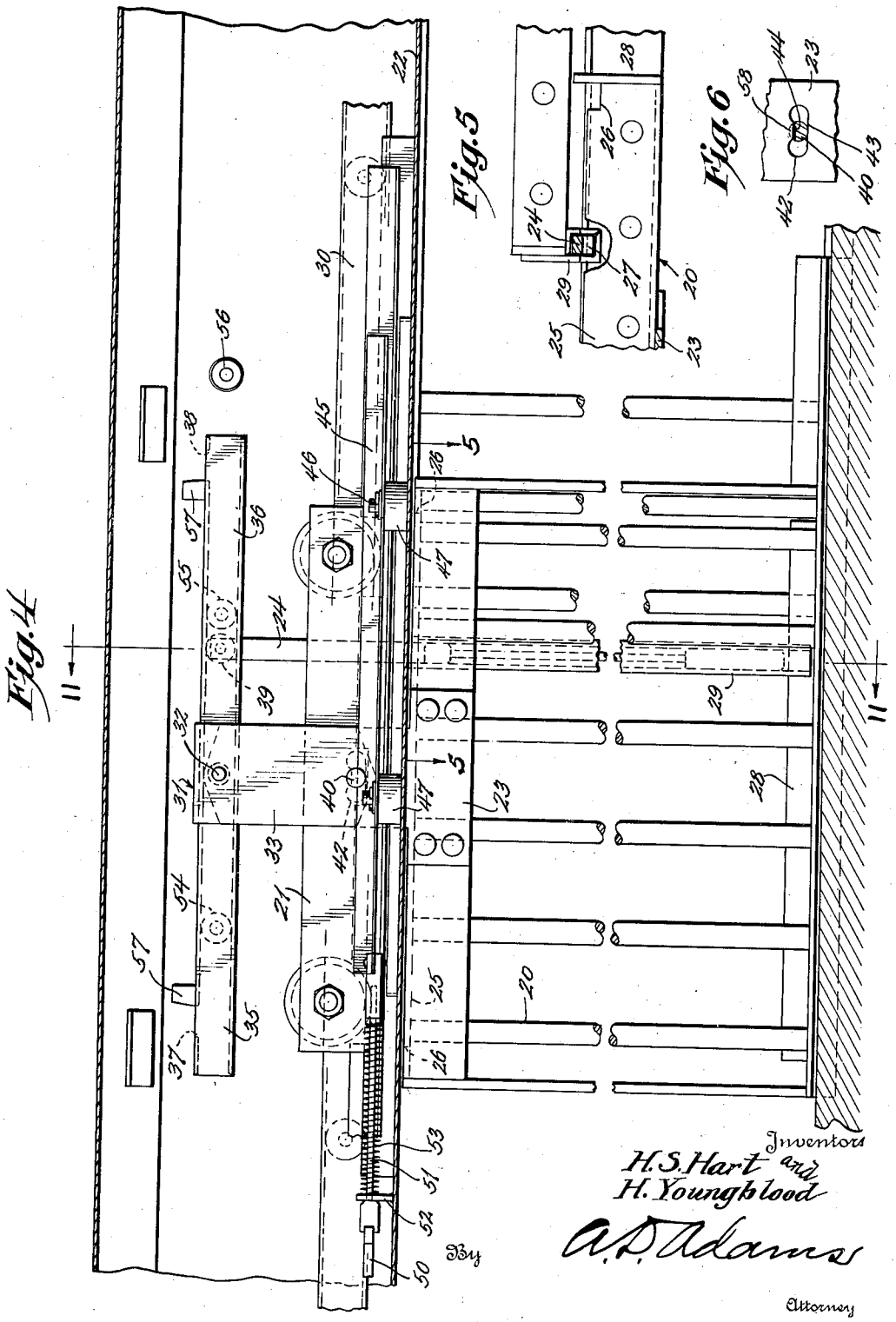


Fig. 4

Fig. 5

Fig. 6

Inventors
H. S. Hart and
H. Youngblood
By A. P. Adams
Attorney

Nov. 11, 1941. H. S. HART ET AL 2,262,674

LOCKING AND OPERATING MECHANISM FOR CELL DOORS

Filed Aug. 27, 1940 5 Sheets-Sheet 3

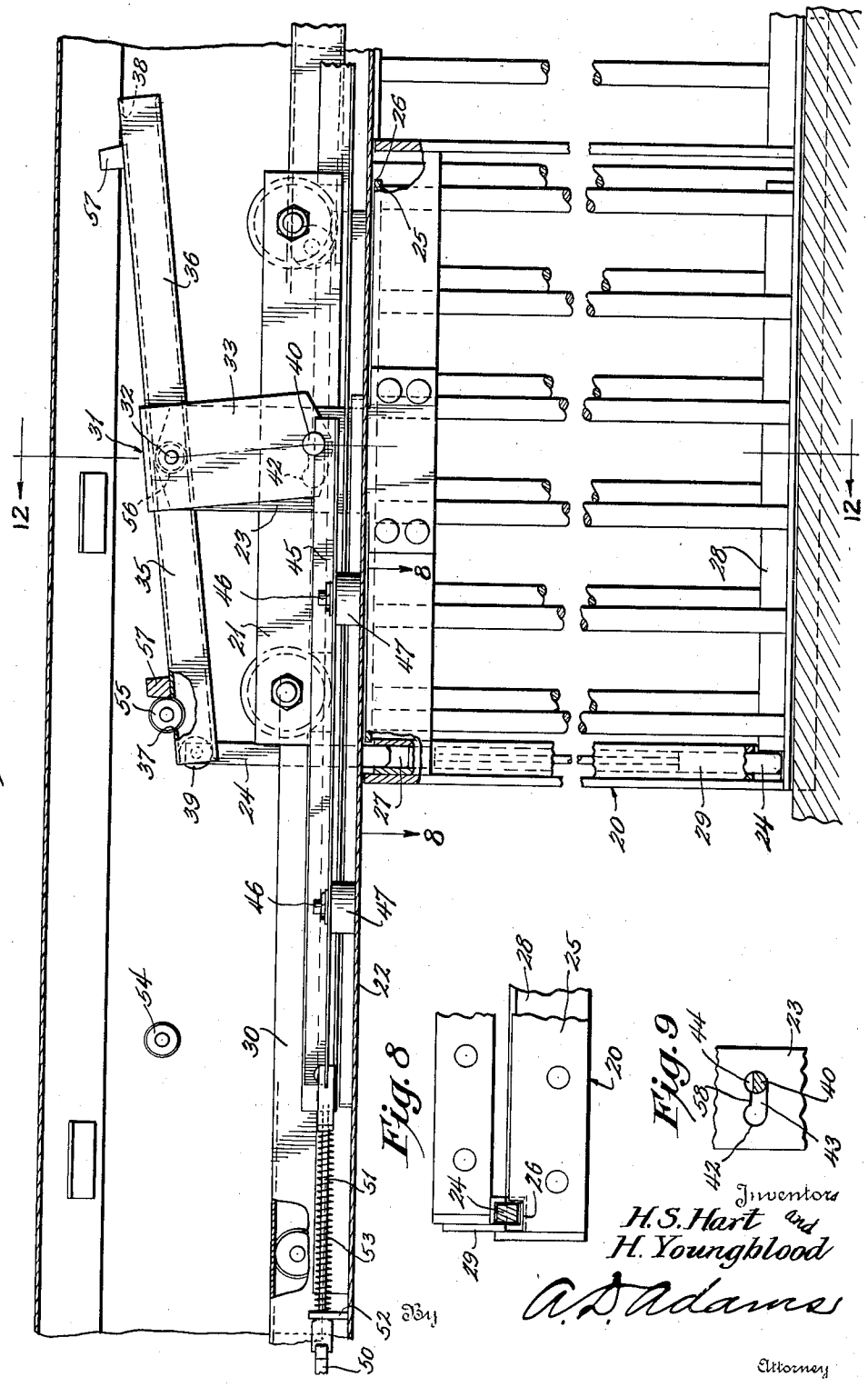


Fig. 7

Fig. 8

Fig. 9

Inventors
H. S. Hart and
H. Youngblood
By
A. D. Adams
Attorney

Nov. 11, 1941. H. S. HART ET AL 2,262,674

LOCKING AND OPERATING MECHANISM FOR CELL DOORS

Filed Aug. 27, 1940 5 Sheets-Sheet 4

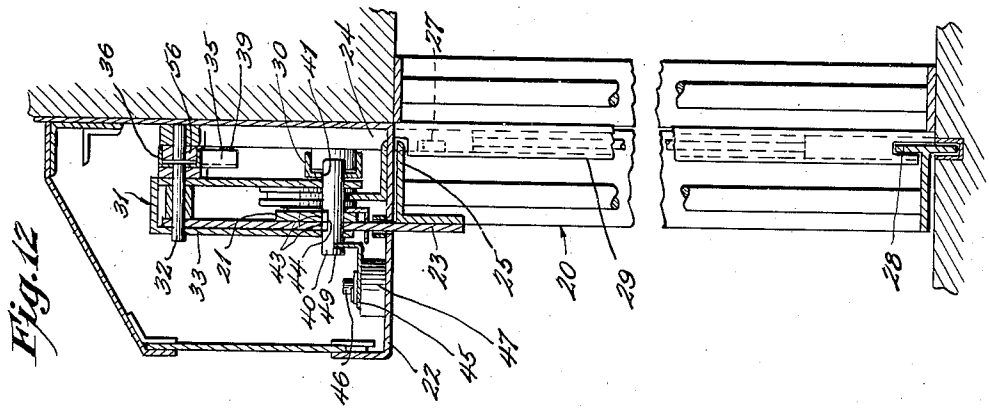


Fig. 12

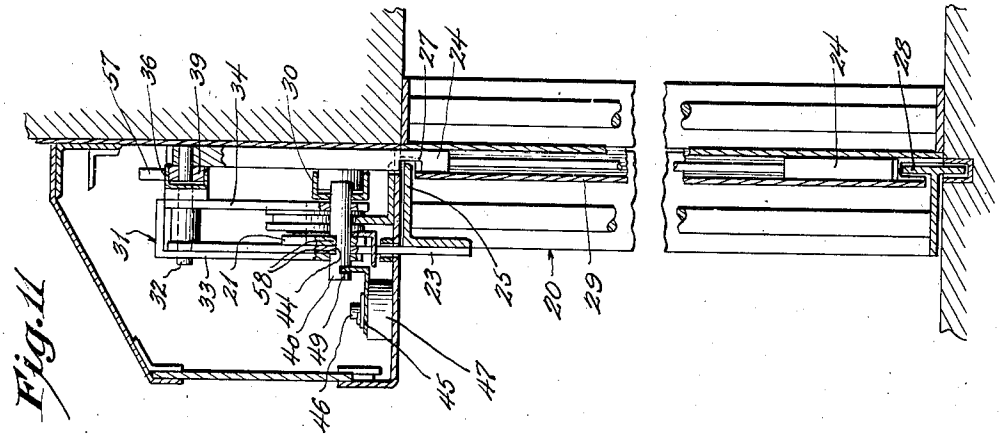


Fig. 11

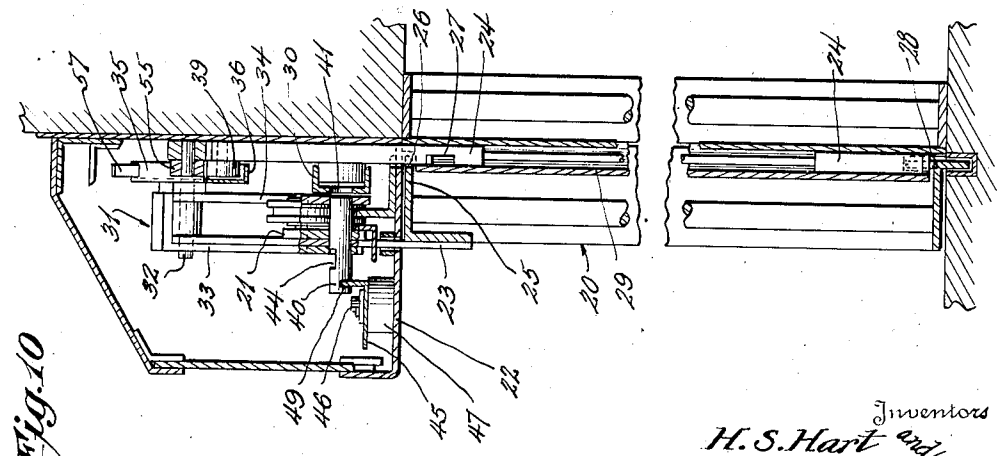


Fig. 10

Inventors
H. S. Hart and
H. Youngblood

By A. D. Adams

Attorney

Nov. 11, 1941. H. S. HART ET AL 2,262,674

LOCKING AND OPERATING MECHANISM FOR CELL DOORS

Filed Aug. 27, 1940 5 Sheets-Sheet 5

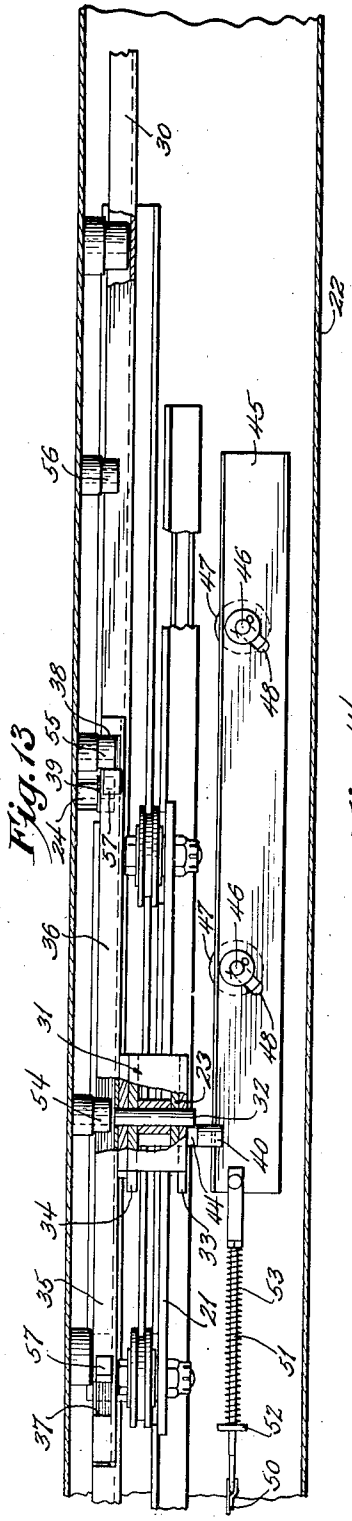


Fig. 13

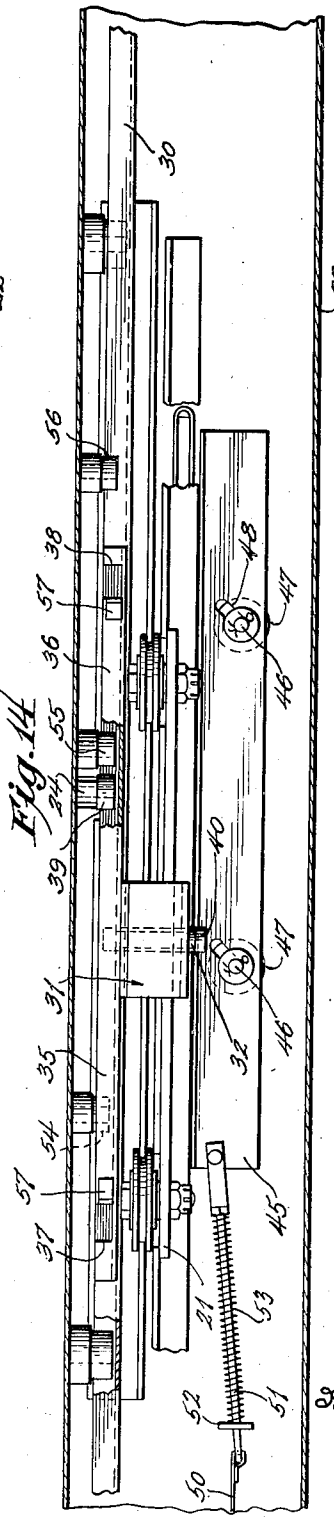


Fig. 14

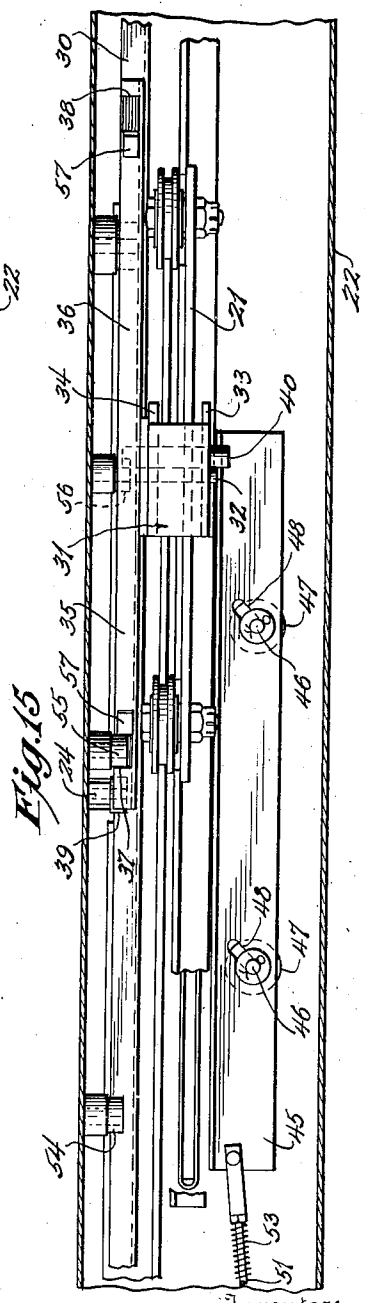


Fig. 15

Inventors
H. S. Hart and
H. Youngblood
By
A. D. Adams
Attorney

Patented Nov. 11, 1941 2,262,674

UNITED STATES PATENT OFFICE

2,262,674

LOCKING AND OPERATING MECHANISM FOR CELL DOORS

Herbert S. Hart and Hull Youngblood, San Antonio, Tex., assignors to Southern Prison Company, San Antonio, Tex., a corporation of Texas

Application August 27, 1940, Serial No. 354,458

13 Claims. (Cl. 189—7)

This invention relates to locking and operating mechanism for a plurality of sliding cell doors arranged in a row and, among other objects, aims to provide a greatly improved, simplified, easily operated and dependable control mechanism embodying a single master bar and selector means for connecting it to and disconnecting it from the respective doors, the arrangement being such that any selected door or doors may be unlocked, opened and locked open or unlocked, closed and locked closed by a continuous actuation of a single operating member. Another aim is to provide interconnected lock operating and door propelling means designed and arranged to make it impossible to jam the mechanism or to disconnect any selected door after it has been selected or moved. A further aim is to provide novel selector mechanism to index out or in any desired number of doors, leaving the remainder locked open or locked closed.

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 elevation, partly in section, of mechanism embodying the invention, showing it associated with a single door which is locked closed;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary detail view showing an operating plunger pin in a position corresponding with that shown in Fig. 1;

Fig. 4 is a view similar to Fig. 1 but showing the position of the parts when the door is partially open;

Fig. 5 is a fragmentary view taken on the line 5—5 of Fig. 4;

Fig. 6 is a view similar to Fig. 3 but showing the operating plunger in the position corresponding with that in Fig. 5;

Fig. 7 is another view similar to Fig. 1 but showing the door in its locked open position;

Fig. 8 is a sectional view taken on the line 8—8 of Fig. 7;

Fig. 9 is another view similar to Fig. 3 but showing the operating plunger in the position corresponding with that shown in Fig. 7;

Figs. 10, 11 and 12 are vertical sectional views taken on the lines 10—10, 11—11 and 12—12 of Figs. 1, 4 and 7, respectively; and

Figs. 13, 14 and 15 are top plan views partly in section showing the mechanism in the positions corresponding with those shown in Figs. 1, 4 and 7 respectively.

Referring particularly to the drawings, the embodiment shown therein is applied to a prison cell system wherein a plurality of cells are arranged in a block or row, as usual, and the cell doors are of the sliding type. The doors are all adapted to be operated from a single control station or remote control box, not shown. Such systems are well known in the art. For the sake of simplicity, only one cell door 20 of a series is shown as being mounted on the usual door carriage 21 arranged within a cover box 22 above the whole line of doors. It is suspended from the carriage by means of a plate or hanger 23 projecting upwardly through a slot into the upper portion of the track box. Each door is adapted to be locked by an ordinary vertical locking bar 24 projecting upwardly into the cover box. The door has a horizontal locking flange 25 at the top provided with notches 26 which cooperate with the locking bar and the locking bar has a notch 27 to straddle the locking flange 25 and thus unlock the door. Also, the bar cooperates with a vertical notched flange 28 at the bottom to lock the door both at the top and the bottom in opened and closed positions. The locking bar as usual is concealed in a housing 29 at the front of the cell. It will be understood that the bar is adapted to be raised and lowered by mechanism within the cover box.

In this instance, the mechanism for operating the locking bar and moving the doors to open and closed positions embodies a single master operating bar 30 and each door has an individual selector adapted to be operated from the control box. The master bar 30 is adapted to be reciprocated by a hand wheel or lever (not shown) also arranged in the control box. It is connected to the mechanism over each door.

Referring first to the means for actuating the locking bar, there is shown a T-shaped rocker 31 pivoted on a pin or bolt 32 extending through the top of the door hanger 23. It has two depending front and rear plates 33 and 34, conveniently in the form of a wide vertical channel. Also, it has substantially horizontal arms 35 and 36 formed of a single piece of structural channel opening toward the rear of the cover box. The arms 35 and 36 present vertical notches 37 and 38 in the upper flange of the channel near their ends for a purpose hereinafter to be described. The locking bar projects upwardly through the cover box behind the rocker arm and has a forwardly projecting pin carrying a roller 39 guided on the channel, so that, when

the channel is rocked, it will raise or lower the locking bar.

The depending plates **33** and **34** straddle the hanger plate **23** and the back one, **34**, lies next to the front face of the master bar **30**. These plates have aligned openings to receive an operating plunger pin **40** adapted to be projected into an opening **41** in the master bar **30** or between a pair of flanges bolted to the bar. The pin also extends through a horizontal slot in both the hanger **23** and the carriage **21**. The slot has enlarged circular openings **42** at its opposite ends to accommodate the pin and the horizontal portion provides a restricted throat **43**, so that the plunger pin **40** when its cylindrical end portion passes through either circular end of the slot will be locked relative to the hanger and thus prevent the rocker from being moved or rocked. The plunger pin is shown as having a short notch **44** adapted to be moved into registry with the throat **43** so that it can move from one end of the slot to the other when the plunger pin is moved rearwardly to engage the master bar **30**.

The plunger pin is shown as being actuated by a flanged link member **45** adapted to be reciprocated on a pair of upstanding pins **46** carrying blocks or washer members **47** in the bottom of the cover box. The horizontal flange of the link has cam slots **48** engaging the pins so that when the link is reciprocated, it will move laterally or forwardly and rearwardly. The vertical flange of the link is connected to the plunger pin **40** by means of a notch **49** in the lower side of the front end of the pin. The link is adapted to be pulled to the left as viewed in Figs. 13 to 15, by means of a pull rod or cable **50** connected at its rear end to a rod **51** slidably mounted in a fixed abutment plate **52** and carrying a compression spring **53** which, when the pull rod is released, will force the link to the right. When the link is pulled to the left, as viewed in Fig. 13, for example, the plunger pin is projected forwardly so that it is disengaged from the master bar **30**, as best shown in Fig. 10. The spring **53** is then held under compression. It will be understood that the pull rod **50** may be operated by a selector button or lever, not shown, arranged in the control box and the lever may be locked in any convenient manner, for example, as shown in the White et al. Patent 1,836,696. When the pull rod is released and the link is moved to the position shown in Fig. 14, the plunger pin is projected into the openings in the master bar **30**, as shown in Fig. 11.

Referring again to Fig. 1, wherein the door is locked closed, it is necessary first to raise the locking bar **29** to unlock the door and then to impart propelling movement to it. The selector pull rod **50** is released so that the plunger pin is projected rearwardly to the position shown in Fig. 11, engaging the master bar **30**. The notch **44** in the upper side of the pin **40** will then register with the throat **43** of the elongated slot freeing the depending plates **33—34** or stem of the T-shaped rocker to swing on the upper pin **32**. The first movement of the master bar **30** to the right, as viewed in Fig. 1, will swing the rocker counterclockwise to a horizontal position. To confine it to remain in that position and guide it to move horizontally with the door hanger, there are shown three rollers **54**, **55** and **56**, mounted on horizontal and stationary pins projecting forwardly from the rear wall of the cover box in the same horizontal plane as the rocker pin **32**. The roller **55** is immediately above the slot **38** in the arm **36**, Fig. 1, while the roller **54** is in the channel behind the pivot pin **32**, so that, when the rocker is swung to the horizontal position, these rollers will lie in the channel and prevent swinging movement of the rocker. When the rocker is thus swung to its horizontal position, the plunger pin will be in the position shown in Fig. 6 intermediate the ends of the slot. When the master bar **30** is further moved to the right, the arms of the rocker are confined to travel horizontally as shown in Fig. 4 and it is guided on all of the rollers **54**, **55** and **56**. When the door is fully opened or reaches the position shown in Fig. 7, the slot **37** in the left hand end of the channel arm **35** registers with the roller **55** and thus frees the rocker to swing counterclockwise upon final movement of the master bar **30**. In this position, the locking bar **24** is lowered to its locking position. If it is desired to leave the door open and locked open while other doors are to be closed, the selector rod or pull element **50** is moved to the left to pull out the plunger **40** and free it from the master bar. At the same time, the cylindrical part of the pin is moved forwardly so that it locks or is confined in the right hand circular end **42** of the slot and cannot pass through the restricted throat **43**. Thus, the rocker is automatically locked, making it impossible for anyone to raise the locking bar **24** when it is left in locked position and not selected.

To prevent the rocker arm from becoming jammed, below the roller **55**, and to guide the roller into the slots **37** and **38**, the upper flange of the channel is shown as having upstanding guiding abutments or lugs **57** against which the roller **55** contacts when the rocker swings to either of its locking positions. The faces of these abutments hold the roller in registry with one or the other of the slots **37** and **38** in the channel arms.

It will be understood that the operation of the mechanism to close and lock the door is the reverse of that explained in connection with the opening and locking movements. The rocker is also automatically locked against swinging movement when the selector plunger is released from its engagement with the master bar **30** and the door is locked closed. Due to the compression spring in the pull element **50** which operates the link and plunger pin, it will be apparent that operation of the selector lever or button cannot jam the plunger when it is not aligned with the opening in the master bar. It will ride on the vertical web of the master bar until it registers with the opening and then it will snap into operating engagement. Thus, it is impossible for a keeper to jam any of the mechanism. Moreover, since the plunger is confined in the throat **43** of the slot when the door is in transit (Figs. 4, 6 and 11), the keeper cannot even operate the selector mechanism to disengage the door from the master bar because the back side of the slot **44** in the plunger engages the lip or projection **58** forming the restricted throat **43**. The selector means cannot be operated to pull out the plunger until the door is either fully opened or fully closed and the plunger pin lies in one of the circular ends **42** of the slot.

From the foregoing description, it will be seen that the mechanism is extremely simple and easy to install. It is absolutely reliable in operation and has no parts which require frequent adjust-

ments. No special skill on the part of a keeper is necessary to operate the locks and doors. A single master bar extending the entire length of the cell block serves to actuate all of the locks and doors. No additional deadlocking mechanism is necessary because the locking mechanism is automatically locked when the doors are locked in either open or closed position and it is practically impossible for a prisoner or keeper to jam any of the doors in an intermediate position.

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 is claimed is:

1. In a master operating and locking system for a plurality of sliding cell doors each having a door engaging vertical locking bar for locking it either in its open or closed position, a single master operating member for all of the locking bars and doors; a rocker member pivotally mounted on each door carriage and connected to operate the locking bar; and selector means for directly connecting each rocker to said master member to impart locking and unlocking movement to the locking bar during both the initial and final movements of said master member and also to open and close the door.

2. In a master operating and locking system for a plurality of sliding cell doors each having a door engaging vertical locking bar for locking it either in its open or closed position, a single master operating bar for all the locking bars and doors; a rocker member on each door carriage connected to operate the locking bar; and selector means including a plunger for directly connecting each rocker member to said master bar, whereby the locking bar is operated by the rocker member during the initial and final movements of the master bar in proper sequence.

3. In an operating and locking system for a plurality of sliding cell doors, a single vertically movable locking bar for locking each door in open or closed position; a master operating bar; selector means for connecting any selected door to be operated by said master bar; and a combined lock operating and door propelling member on the door and associated with the selector means to unlock or lock the door and also impart opening or closing movements to the door as the master bar is operated in one direction.

4. In an operating and locking system for a plurality of sliding cell doors, a single vertically movable locking bar for locking each door in open or closed position; a master operating bar; selector means for connecting any selected door to be operated by said master bar; and means pivoted on the door connected to operate the locking bar and forming a part of the selective connection between the door and the master bar, whereby the master bar imparts unlocking, door propelling and locking movements in proper sequence during a continuous actuation of the master bar in either direction.

5. In an operating and locking system for a plurality of sliding cell doors, a single vertically movable locking bar for locking each door in open or closed position; a master operating bar; selector means for connecting any selected door to be operated by said master bar; and combined lock-operating and propelling mechanism associated with the door and including a rocker member adapted to be directly operable by said master bar when it is moved in either direction to unlock the door, propel the door to opened or closed position and lock the door, said rocker member being connected to raise and lower said locking bar.

6. In an operating and locking system for a plurality of sliding cell doors, a single vertically movable locking bar for locking each door in open or closed position; a master operating bar; a rocker member pivoted on the top of the door connected to actuate the locking bar; a plunger slidably carried by said rocker member and adapted to engage the master bar; and selector means for operating said plunger to impart unlocking, door propelling and locking movements as the master bar is moved in either direction.

7. In an operating and locking system for a plurality of sliding cell doors, a single vertically movable locking bar for locking each door in open or closed position; a master operating bar; a rocker member pivoted on the top of the door connected to actuate the locking bar; a plunger slidably carried by said rocker member and adapted to engage the master bar; selector means for operating said plunger to impart unlocking, door propelling and locking movements as the master bar is moved in either direction; and means to prevent the plunger from being disengaged from the master bar while the door is unlocked or in transit.

8. In an operating and locking system for a plurality of sliding cell doors, a single vertically movable locking bar for locking each door in open or closed position; a master operating bar; a rocker member pivoted on the top of the door connected to actuate the locking bar; a plunger slidably carried by said rocker member and adapted to engage the master bar; selector means for operating said plunger to impart unlocking, door propelling and locking movements as the master bar is moved in either direction; and coacting means on the plunger and the door to hold the locking bar in its locking position when the plunger is disengaged from the master bar.

9. In an operating and locking system for a plurality of sliding cell doors, a vertically movable locking bar for locking each door in open or closed position; a master operating bar; a rocker member pivoted on the top of the door connected to actuate the locking bar; a plunger slidably carried by said rocker member and adapted to engage the master bar; selector means for operating said plunger to impart unlocking, door propelling and locking movements as the master bar is moved in either direction; the door hanger having an elongated slot presenting enlarged openings at its ends through which the plunger projects; and the plunger having a transverse notch permitting it to slide through the restricted throat of said slot only when the plunger engages said master bar and thereby prevent actuation of the selector means when the door is unlocked or in transit.

10. In an operating and locking system for a plurality of sliding cell doors, a vertically movable locking bar for locking each door in open or closed position; a master operating bar; a rocker member pivoted on the top of the door connected to actuate the locking bar; a plunger slidably carried by said rocker member and adapted to engage the master bar; selector means for operating said plunger to impart unlocking, door propelling and locking movements as the master bar is moved in either direction; the door

hanger having an elongated slot presenting enlarged openings at its ends through which the plunger projects; and the plunger having a transverse notch permitting it to slide through the restricted throat of said slot only when the plunger engages said master bar and thereby prevent actuation of the selector means when the door is unlocked or in transit, said selector means including a flanged reciprocating link connected to actuate said plunger; and a pull member carrying a spring yieldably urging said plunger toward its master bar engaging position.

11. In a master operating and locking system for a plurality of sliding cell doors, a single master operating member for all of the locks and doors; a rocker on each door including a pivoted channel member having its flanges extending laterally; a lock having a member confined between the flanges of the channel member to impart operating movement to the lock; and selector means for connecting each rocker to the master bar to impart actuating movements to lock and propel the door in proper sequence as the bar is moved in either direction.

12. In an operating and locking system for a plurality of sliding cell doors, a cover box above the doors; a hanger on each door in the cover box; a vertical locking bar for locking each door opened or closed and also projecting into the cover box; a T-shaped rocker pivoted to the top of the door hanger and slidably engaging the upper end of the locking bar; a single master bar in the cover box; a plunger slidably mounted in the stem portion of each rocker and adapted to be projected into engagement with the master bar; coacting means on the plunger and hanger to lock the rocker relative to the hanger when the door is locked and the plunger is disengaged from the master bar; and selector means for engaging the plunger with the master bar to impart actuating movements to locks and doors.

13. In an operating and locking system for a plurality of sliding cell doors, a cover box above the doors; a hanger on each door in the cover box; a vertical locking bar for locking each door opened or closed and also projecting into the cover box; a T-shaped rocker including a substantially horizontal channel member constituting the arms and pivoted to said hanger with the channel opening rearwardly in the cover box; a roller on the upper end of the locking bar confined in said channel so that rocking movement will raise and lower the locking bar; a longitudinally movable master bar in the cover box; a selector operated plunger for connecting the stem portion of the rocker to the master bar; guide rollers in the cover box arranged to engage the channel member and arrest it in its door unlocking position and confine it to move horizontally with the door; the upper flange of the channel member having notches near its opposite end to permit the channel to rock and a roller to pass therethrough only when the door is fully opened or closed and thereby impart locking movement to the locking bar.

HERBERT S. HART.
HULL YOUNGBLOOD.