June 16, 1925.

1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922 7 Sheets-Sheet 1

Fig. 1

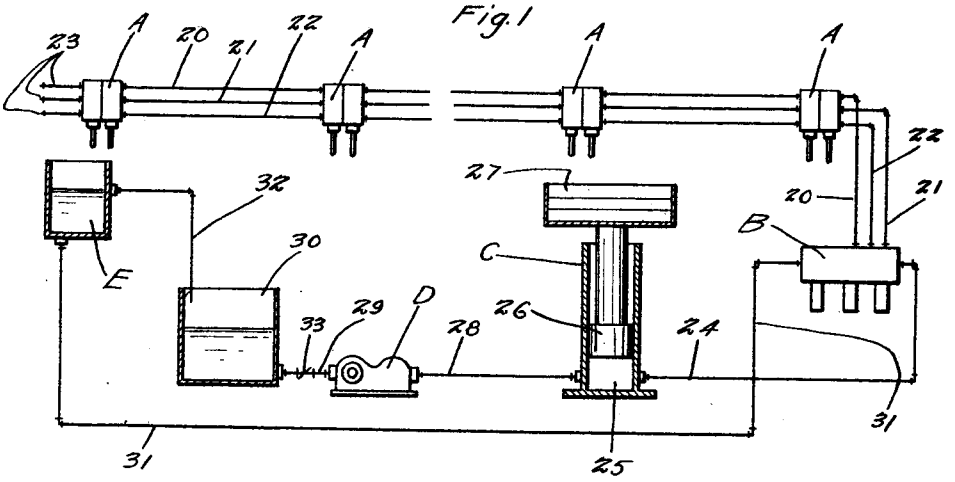
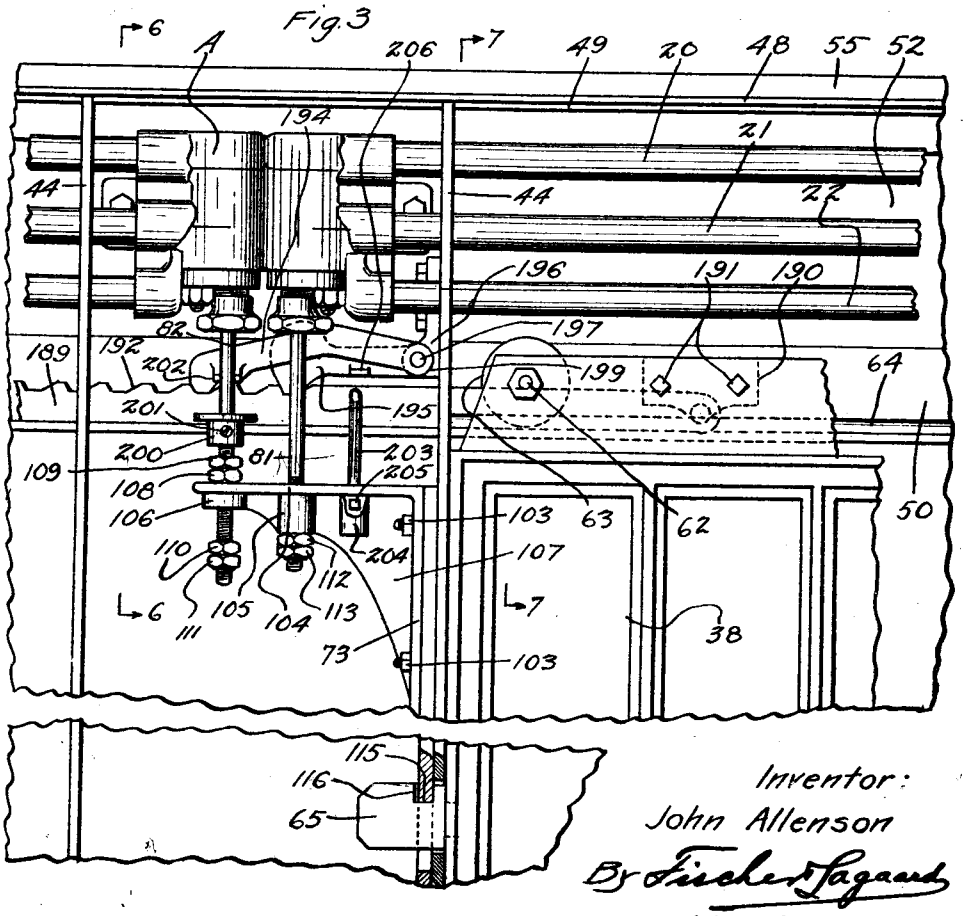


Fig. 3



Inventor:
John Allenson
By Fischer & Fagaard
his Attorneys.

June 16, 1925.

1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922 7 Sheets-Sheet 2

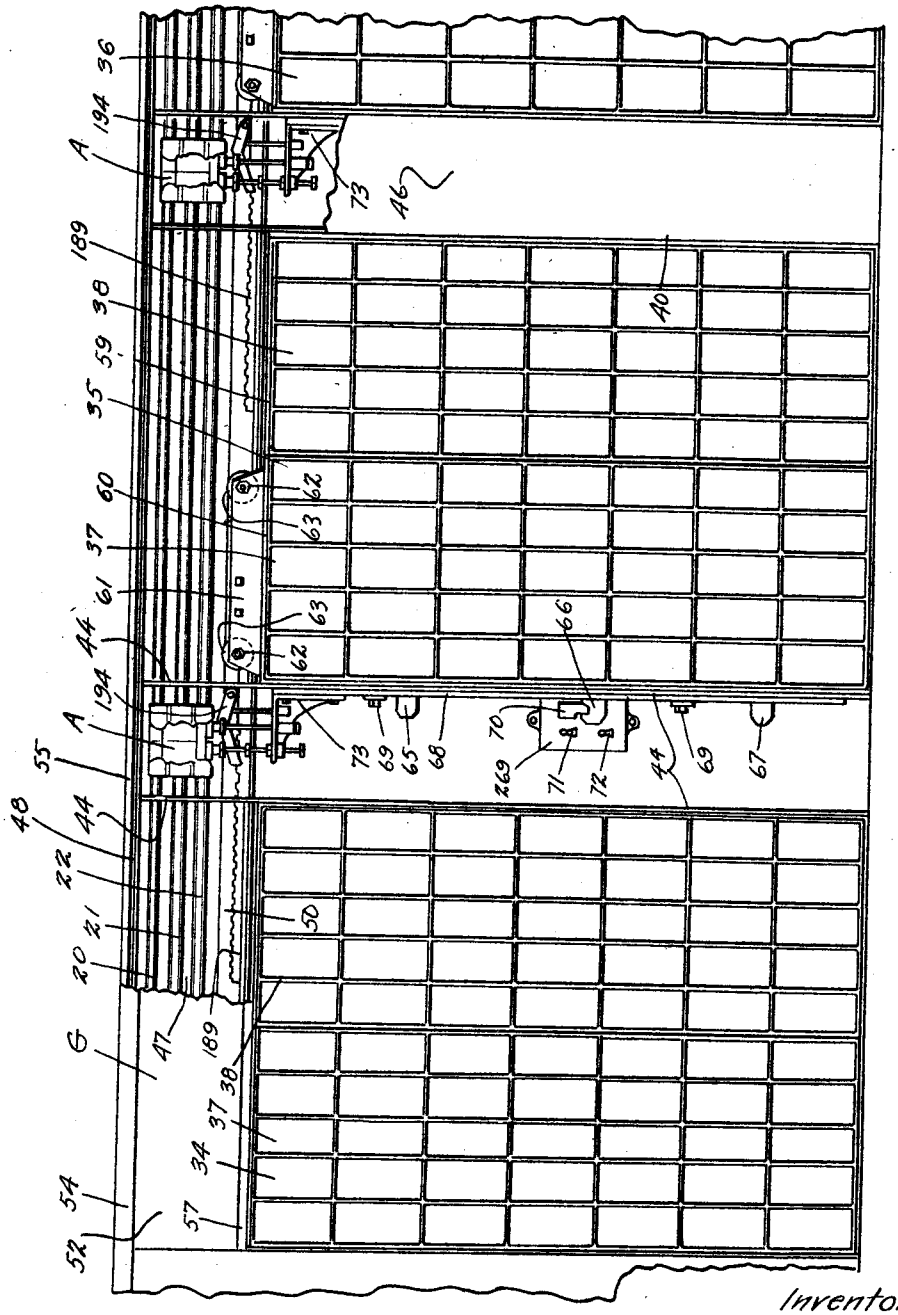


Fig. 2

Inventor:
John Allenson
By Fischer & Lagaard
his Attorneys.

June 16, 1925. 1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922 7 Sheets-Sheet 3

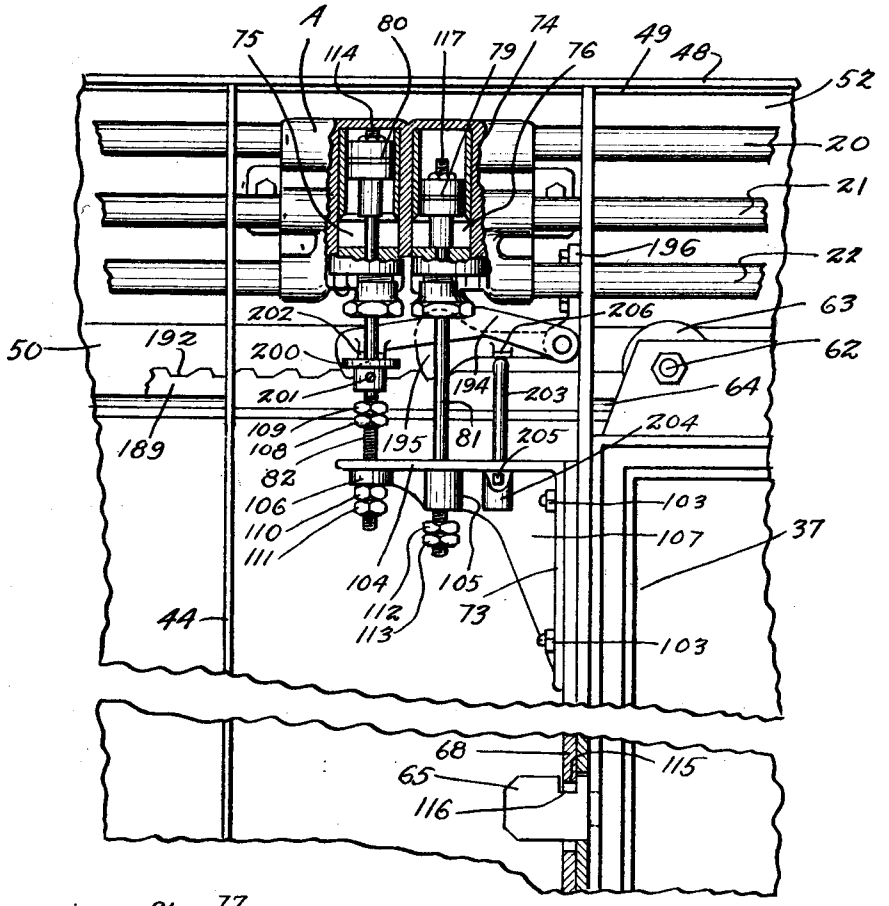


Fig. 4

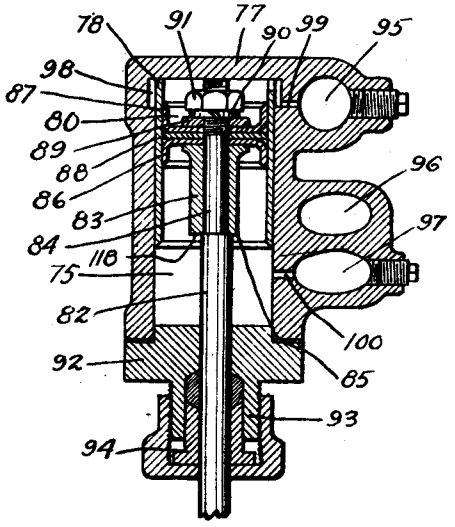


Fig. 8

Inventor:
John Allenson
By Fischer Hagaard
his Attorneys.

June 16, 1925. 1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922 7 Sheets-Sheet 4

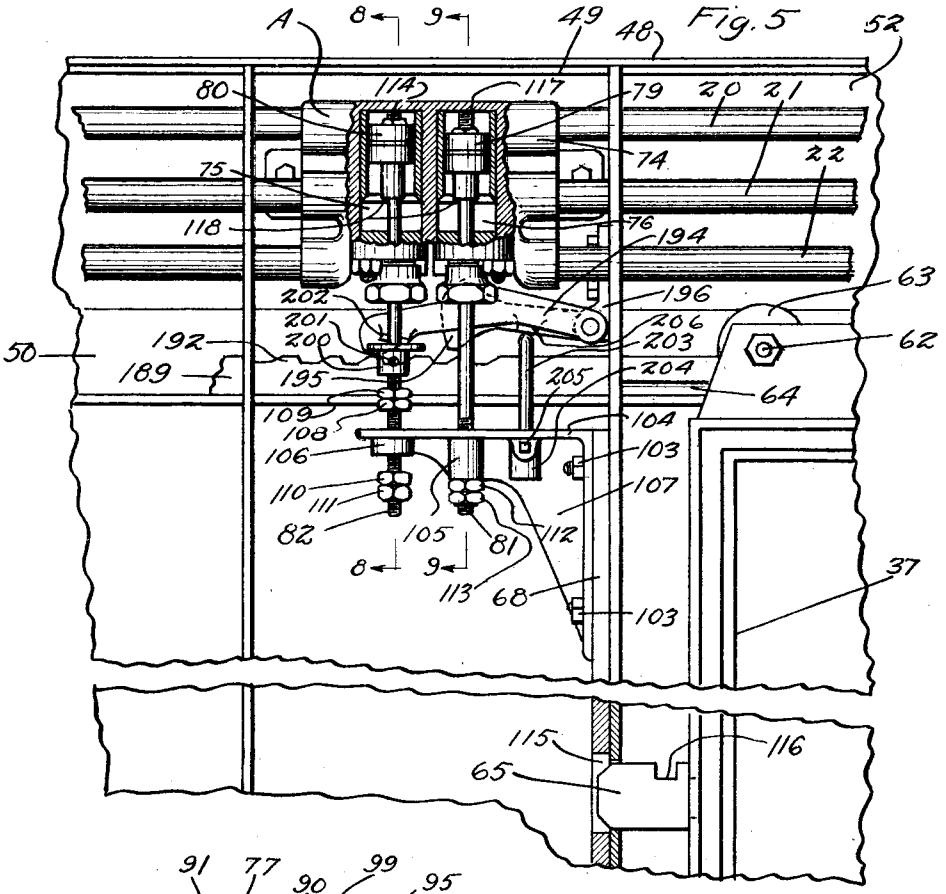


Fig. 5

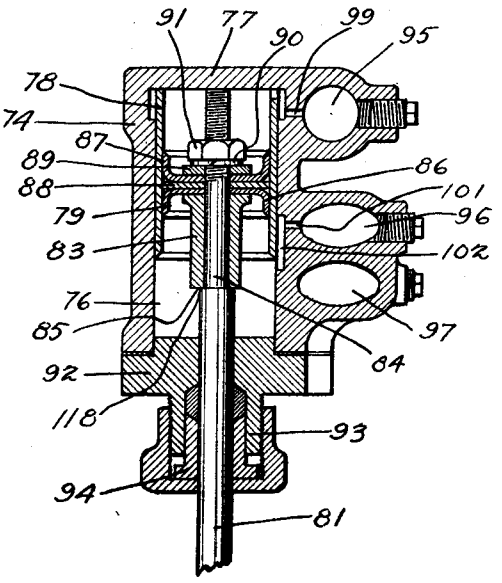


Fig. 9

Inventor:
John Allenson
By Fisher & Lagaard
his Attorneys.

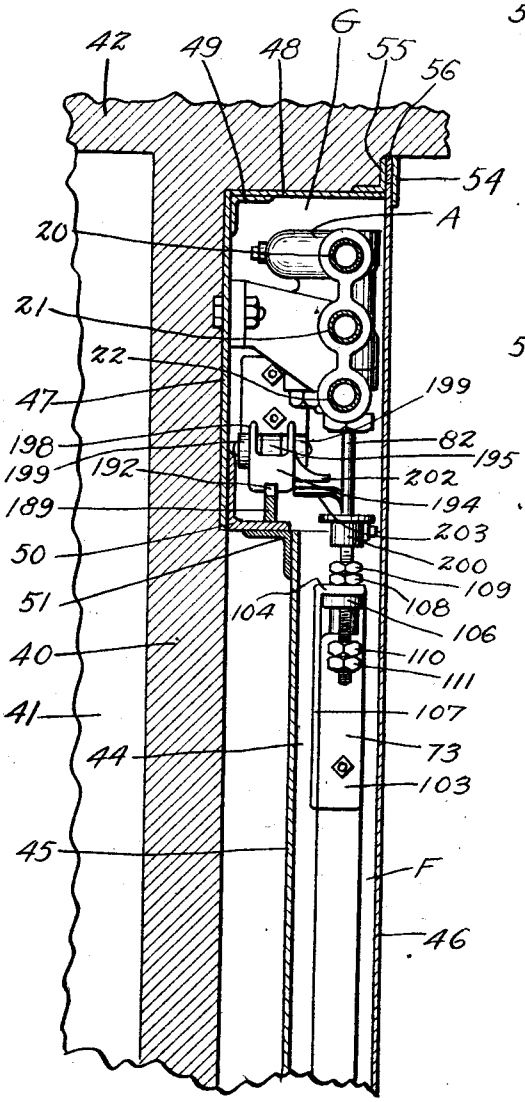
June 16, 1925. 1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922 7 Sheets-Sheet 5

Fig. 6



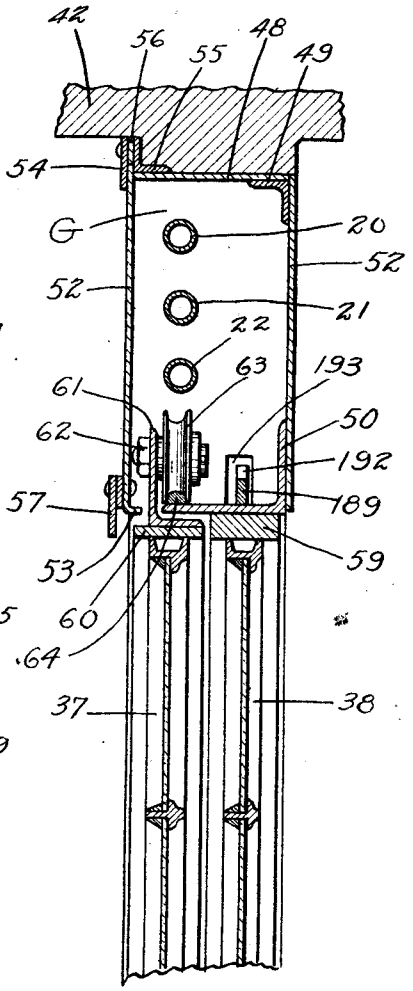


Fig. 7.

Inventor:
John Allenson
By Finch & Hogeland
his Attorney.

June 16, 1925.

1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922 7 Sheets-Sheet 6

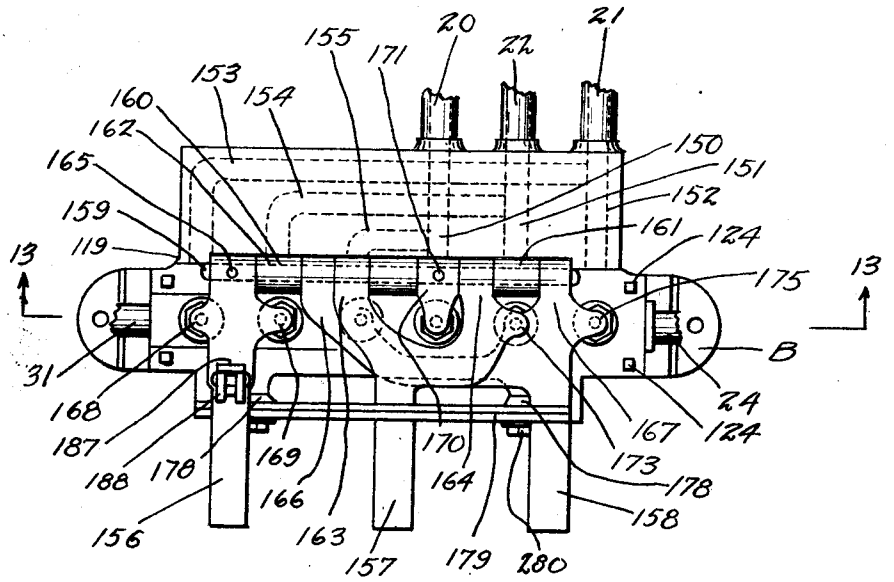


Fig. 10.

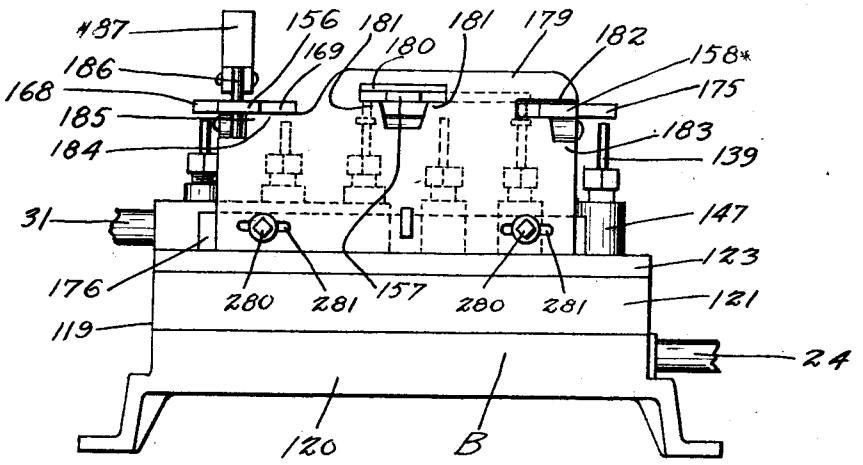


Fig. 11

Inventor:
John Allenson
By Fischer & Lagaard
his Attorneys.

June 16, 1925. 1,542,205

J. ALLENSON

JAIL LOCKING MECHANISM

Filed June 14, 1922. 7 Sheets-Sheet 7

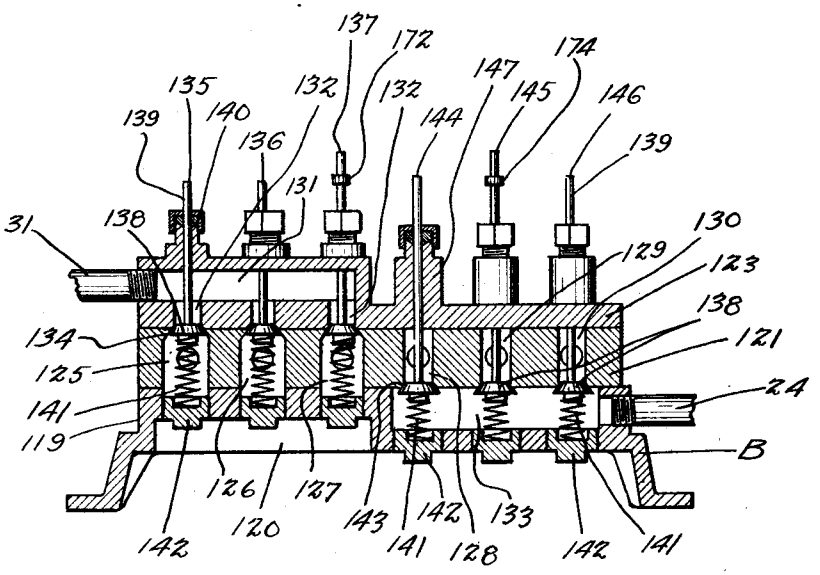


Fig. 13

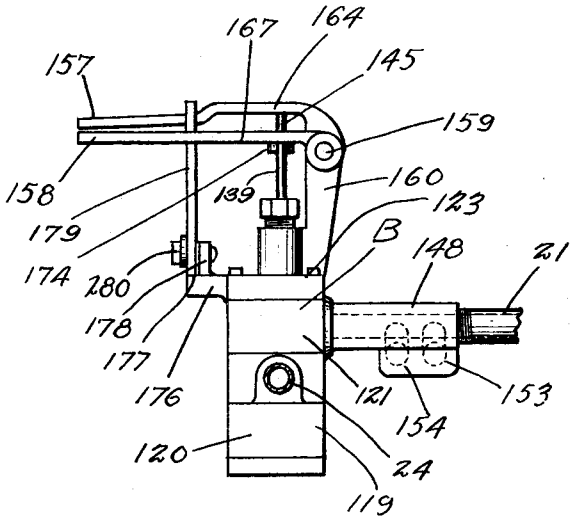


Fig. 12

Inventor:
John Allenson
By Fischer & Lagaard
his Attorneys.

Patented June 16, 1925. 1,542,205

UNITED STATES PATENT OFFICE.

JOHN ALLENSON, OF ST. PAUL, MINNESOTA, ASSIGNOR TO ST. PAUL FOUNDRY COMPANY, A CORPORATION OF MINNESOTA.

JAIL-LOCKING MECHANISM.

Application filed June 14, 1922. Serial No. 568,148.

To all whom it may concern:

Be it known that I, JOHN ALLENSON, of the city of St. Paul, county of Ramsey, and State of Minnesota, have invented a new and useful Improvement in Jail-Locking Mechanism, of which the following is a specification.

My invention relates to locking mechanisms for jails and has for its object to provide a locking mechanism in conjunction with the ordinary key controlled lock for each door by means of which the doors of the jail may be simultaneously locked by a device so that none of the doors can be opened by the key controlled locks.

A still further object is to provide a device for locking the doors in a half-locked position in which all of the doors are armorly locked but can be individually unlocked by means of the key and key controlled lock.

Another object is to provide means for permitting a door which is open when the locking mechanism is in the half-locked position to snap back into closing position.

A further object is to provide means for preventing the doors when the locking mechanism is in the aforementioned position from being further opened in the event that any of said doors may have been partially opened by the key controlled lock.

A still further object is to provide means whereby the locking mechanism for simultaneously locking the doors may be held inoperative so that all of the doors may be simultaneously opened or so that any particular door may be closed and held locked by the individual key and key controlled lock provided therefor.

Another object is to provide individual latch bars for each door for locking the same and to further provide individual fluid operated means for each door for forcing said latch bars into locking position or for holding the same unlatched as required.

Another object is to provide independent fluid operated members for raising and lowering said latch bars so that the same may be held from movement in either direction when the doors are in dead locked position.

Another object of the invention is to provide a ratchet bar in connection with each door and to employ a pair of pawls adapted to engage said ratchet bar to prevent the door from being opened, one of said pawls being adapted to be disengaged when the locking mechanism is adapted to be positioned in each locking position and the other being adapted to be engaged when the locking mechanism is wide open.

A still further object is to provide a pair of cylinders with pistons therein for each jail door, one of said pistons being adapted to raise the latch bar into half open position and the other of said pistons being adapted to further raise the latch bar into wide open position.

Another object is to provide three pipe lines, one connected with all of said cylinders above the pistons thereof adapted to force all of said pistons downwardly and to hold the latching mechanism in dead locked position, the other connected with the lower portion of said cylinders used in moving the latch bar to the half locked position and the rest of said lines being connected with remaining cylinders used for lifting the latch bar into wide open position.

Another object is to provide a pump and a valve chamber connected therewith and an exhaust reservoir and a valve chamber connected with the same, both of said chambers connecting through valves with said pipe line, said valves being manually operable to control the flow of fluid under pressure into the pipes or to permit the exhaust of the same at will so as to bring the latching mechanism of the doors into dead locked, half open, and wide open positions as required.

Another object consists in providing an arm through which the shaft loads of said fluid operating means are adapted to extend and to provide on said piston stops adapted to be engaged by the arm to cause said latch bars to take the required positions.

A still further object is to provide engaging members connected with said fluid operating device for releasing the pawls associated with said latch bars.

The full objects and advantages of my in-

vention will appear in connection with the detailed description thereof and are particularly pointed out in the claims.

In the drawings illustrating the application of my invention in one form:—

Fig. 1 is a diagrammatic view showing the installation of my invention.

Fig. 2 is a front elevational view of a number of cells of a jail including the doors connected therewith, showing my invention applied thereto.

Fig. 3 is a view similar to Figure 2 drawn to a larger scale showing operating mechanism associated with my invention in which the latching mechanism is in dead locked position.

Fig. 4 is a view similar to Figure 3 showing the latching mechanism in half-open position.

Fig. 5 is a view similar to Figure 4 showing the latching mechanism in wide open position and the door partly ajar.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 3.

Fig. 7 is a sectional view taken on line 7—7 of Figure 3.

Fig. 8 is a sectional view of the fluid operating mechanism taken on line 8—8 of Figure 5, and drawn to a larger scale.

Fig. 9 is a sectional view similar to Figure 8 taken on line 9—9 of Figure 5.

Fig. 10 is a plan view of the master controlling mechanism of my invention.

Fig. 11 is a front elevational view of the structure shown in Figure 10.

Fig. 12 is an end view of the device shown in Figures 10 and 11.

Fig. 13 is a sectional view of the master controlling mechanism taken on line 13—13 of Figure 10.

In Figure 1, I have shown the entire system used in connection with a jail having a number of cells each with individual doors. For each cell door I provide an operating unit A which is connected in multiple with three pipe lines 20, 21, and 22 which pipe lines connect at one end with a master valve indicated at B and are dead-ended at their other end as indicated at 23. The master valve B is connected by means of a pipe 24 to a pressure regulating device C which consists of a cylinder 25 having a plunger 26 movably mounted within the same, which plunger is adapted to receive a number of weights 27 at the upper end of the same. Pressure regulator C is connected by a pipe 28 to a pump D which may be a reciprocating or gear pump as desired. A pipe 29 connects pump D with a reservoir 30 in which the fluid for operating the system is stored. The master valve B is further connected by means of a pipe 31 to an over-flow tank E which again is connected by a pipe 32 to the reservoir 30. The operation of the system is as follows.

When the pump is set in action fluid from receiver D is pumped through the same and into the cylinder 25 of pressure regulator C. A check valve 33 interposed in the pipe 29 serves to prevent the fluid from backing up again into the said reservoir. As the pump D continues to operate the fluid is forced through the pipe 24 and into the master valve pressure counter and by manipulation of this valve the fluid may be caused to travel through any of the pipe lines 20, 21, and 22. With the proper manipulation of the master valve B the fluid pressure within pipes 20, 21, and 22 may be varied to cause the latching mechanism A to move the latch bars of the cell doors into a wide open, half-open, or dead locked position as desired. When the master valve B is operated so as to shift the position of the latching bars the pressure of fluid within the various pipes 20, 21, and 22 is altered to cause the various devices A to properly function. At times the pressure within the same is reduced permitting the fluid within the pipes to pass back again into the master valve B. From here the fluid is conducted through pipe 31 into the over-flow tank E where when the fluid reaches the depth required in the tank it passes through the pipe 32 and into the reservoir 30. This over-flow tank serves to provide sufficient back pressure on the exhaust side of the system so that a normally closed system is provided in which the fluid travels back and forth through the pipes 20, 21 and 22 as the pressure within the same is altered, as controlled by valve B. In the installation of the system all of the air is excluded therefrom so that by means of the over-flow tank E the system is kept constantly filled throughout, with the operating fluid.

In Figure 2, I have shown the installation of the operating units A to a jail having a number of cells 34, 35, and 36. Each of these cells is provided with a fixed front 38 and a movable door 37 which is adapted to slide by the fixed front 38 to provide an entrance into each cell. Sections through the entrance and pilaster adjacent the same shown in Figures 6 and 7 show the manner of supporting the doors. At the juncture of each of the walls 41 separating the cells I provide a pilaster 40 which supports two sealing structures 42 of the pawl. At the forward portion of the said pilaster the same is provided with a casing F which has two side walls 44 extending upwardly from the floor to the ceiling and a rear wall 45 connected to the same. A removable cover 46 is adapted to close the front of the casing F and to conceal the contents of the same from the exterior. It will be noted that the back 45 extends a portion of the distance from the floor to the ceiling. Above this back I provide a second casing G which is longitudinally positioned and which runs

along the ceiling connecting with all of the casings F throughout the entire series of cells. This casing consists of a back 47 and a top 48 which are connected together by means of an angle 49 running throughout the entire length of the structure. The casing G, as illustrated in Figure 6, is of a greater depth than the casing F. An angle 50, secured to the lower portion of the back 47, extends up to the back 45 and is connected thereto by means of another angle 51 which simply serves for the purpose of attaching these parts together and is of a length equal to the width of the said back 45 only. The angle 50, on the other hand, extends throughout the entire structure and forms a portion of the closure for the bottom of the casing G as will be presently described. At the front of the casing G, I provide a cover 52, which is formed with an inwardly turned lip 53 at the lower edge extending towards the lower flange of angle 50. At the upper end of the plate 52, I provide a narrow strip of metal 54, which together with a filler strip 56 is attached to an angle 55 supported on the member 48 of casing G. This provides a recess in which the upper portion of the plate or cover 52 may be supported to hold the same in place. A guard 57 attached to the lower portion of plate 52 serves to protect the opening between the lip 53 and the angle 50 when the door is in place. The front 38 is positioned within the opening afforded between the sides 44 of the pilaster F and between the angle 50 and the floor of the jail and is provided with a strip 59 which extends completely around the same being attached thereto, while the strip is secured to the angle 50 and the sides 44 previously referred to. The front 38 is set back towards the inner surface of the jail whereas the door 37 is positioned in front of the same so that the said door may slide in front of the front portion 38 when the cell is open. In a similar manner door 37 is provided with a strip 60 which extends completely around the same. This strip, however, is of a thickness somewhat less than the strip 59 so that the door 37 is movable within the door frame provided therefor. On the top of the strip 60 I provide an angle 61 which is substantially of the width of the door and which is positioned upon the same as shown in Figure 7. To the upper portions of the angles 61 on each of the doors 37, I attach by means of stub bolts 62, pulleys or sheaves 63. These sheaves are adapted to ride upon a half-round track 64 positioned on and attached to the extreme edge of the outlying flange of angle 50. By means of this structure the doors 37 may be rolled into closed or open position as desired.

For locking the doors 37 when in their closed position the same are provided with three latch lugs 65, 66, and 67 which are adapted to be simultaneously engaged for latching by a single vertically operable latch bar 68. This bar is held in sliding position against the wall 44 which forms a jam for the opening of the door 37 by means of a number of bolts 69 which pass through slotted holes in said bar not shown in the drawings, and are secured to the said walls 44. In addition to the said latch bar for engaging the lugs 65, 66, and 67, I provide an ordinary key controlled lock 269 which is provided with a latch member 70 and which is adapted to be operated through two key-holes 71 and 72. This lock being of ordinary construction such as are now used in jails has not been described in detail, but is of such a type that when the latch bar 68 is in half-locked position and the key inserted in key hole 71 latch member 70 together with the latch bar 68 may be simultaneously raised to permit any individual door for any particular cell to be independently opened.

At the top of the latch bar 68, I attach a bracketed casting 73 with which the operating unit A is connected. The construction of this unit can best be seen in Figures 3, 4, 5, 8 and 9. A casting 74 is provided which is formed with two vertically positioned cylindrical bores 75 and 76. The cylinders thus formed are closed at the top by means of cylinder heads 77 formed integral with the casting 74. Within the cylinders 75 and 76 is placed a sleeve 78 which extends the length of the cylinder reaching to the top of the same. Movable within sleeves 78 are two pistons 79 and 80 which are attached to piston rods 81 and 82. Each of these pistons comprises a sleeve 83 which is positioned upon a reduced end 84 formed on the piston rods 81 and 82 and rests upon the shoulder 85 formed thereby. Upon the sleeve 83 is positioned two leather plunger members 86 and 87 which are separated from one another by a plate 88. The washer 89, lock washer 90 and the nut 91, secured to the reduced portion 84 of the said pistons serve to hold the plunger members 86 and 87 in place to form a fluid tight piston or plunger for reciprocation in either direction. The lower portions of the cylinders 75 and 76 are closed by a single casting 92 which is provided with stuffing boxes 93 through which the said piston rods 81 and 82 extend. By means of packing sleeves 94 positioned within the stuffing boxes 93 the said piston rods form a fluid tight joint so that pressure may be applied to either side of the said piston within the respective cylinders.

At the rear of the casting 74 the same is provided with three ducts 95, 96, and 97 which extend across the same and into which the pipes 20, 21 and 22 are connected. These

pipes extend through the transom space formed within the casing G and are clearly shown in Figure 2, and pass through the partitions 44 connecting with the various operating units A as indicated, communicating therewith through the passageways 95, 96 and 97. Along the upper portion of each of the cylinders 75 and 76 the same is provided with an annular passageway 98 extending completely around the same which communicates through a port 99 with the passageway 95. By this means the space above pistons 79 and 80 in both of the cylinders 75 and 76 is connected to the pipe line 20. In a similar manner the lower portion of the cylinder 75 below the piston 80 is connected by a port 100 to the passageway 97. In this case, however, only the one cylinder is connected to this port so that the pipe line 22 which communicates therewith communicates only with the lower portion of the cylinder 75. Passageway 96 as clearly shown in Figure 9 communicates by means of a port 101 and a recess 102 formed in the side of the cylinder wall extends below the piston 79 so that the same is independently connected with passageway 96 and pipe line 21 similar to the other cylinders. By this means it will be noted that by regulating the pressure of the fluid within the various pipe lines 20, 21 and 22 that both pistons may be simultaneously forced down or that either piston may be independently raised up.

The manner of connecting the piston rods 81 and 82 with the latching mechanism of the jail doors can best be seen in Figures 3, 4 and 5. The bracket 73 is previously referred to for operating the latch bars 68 is attached to the same by means of bolts 103. This bracket has a horizontal arm 104 extending outwardly therefrom which is positioned in the plane of the piston rods 81 and 82 of the operating mechanism A. The underside of the arm 104 is provided with two bosses 105 and 106 through which the said piston rods 81 and 82 are adapted to freely pass. These bosses are connected by a web 107 formed integral with the bracket 73. As is best visible in Figure 4, piston rod 82 is threaded for the greater portion of its length so that the threaded portion thereof extends above the arm 104 of bracket 73. Piston rod 81, on the other hand, is simply threaded at its lower end. Above bracket 104, I provide on piston rod 82 a nut 108 and a lock nut 109. Below the said bracket I provide another nut 110 and a lock nut 111. In a similar manner I provide another nut 112 and a lock 113 upon the end of the piston rod 81 below the boss 105. The operation of the device is as follows.

Nut 110 is adjusted so that when piston 80 is in its uppermost position with the extreme end 114 in engagement with its cylinder head that the latch bar 68 is raised into the half-locked position as shown in Figure 4 in which the latch notch in the said latch bar, which I have shown at 115, is half way out of the notch 116 in any of the latch lugs 65, 66, or 67. In this position the nut 108 is sufficiently above the top of the arm 104 so that the said arm may be raised independently of piston 80 into a position such as shown in Figure 5, which is a wide open position of the locking mechanism. For accomplishing this result the nut 112 in the end of the piston 81 is adjusted so that when the piston 79 is in its uppermost position the upper end 117 of the said piston rod 81 is in engagement with the cylinder head the nut 112 is in engagement with the underside of the boss 115 with the latch bar raised sufficiently so that the latch lugs 65, 66, and 67 may pass through the respective openings 115 in the latch bar 68. This boss is shown in Figure 5 in which the door 37 is shown as being partly ajar, latch lug 65 having just passed through the opening 115 in the said latch bar 68. When it is desired to have the latch bar 68 in deadlocked position so that all of the cells are simultaneously locked both of the pistons 79 and 80 are forced downwardly as shown in Figure 3 with shoulders 118 formed on the underside of the sleeves 83 in engagement with the upper surface of the cylinder head or plate 92. In this position the latch bar 68 is arranged with the notch 115 in full engagement with the notch 116 in the latch lug 65. In addition the nut 112 on piston rod 81 engages the underside of the boss 105. On the other hand nut 110 is free from the other side of boss 106 while the nut 108 engages the upper surface of the arm 104 holding the same downwardly. In this position it can readily be seen that bracket 73 and latch bar 68 are held from movement in either direction as long as the pistons are both held downwardly so that the latch bar 68 cannot be moved to open or close the cells by key controlled means.

For simultaneously controlling the operation of all the locking mechanisms I provide the master valve B indicated in Figure 1, which is clearly shown in detail in Figures 10, 11, 12, and 13. This device comprises a casing 119 which consists of a base 120, an intermediate section 121, and a head 123. These sections are all bolted together with bolts 124 to form a complete structure. Within the section 121 I form six valve chambers 125, 126, 127, 128, 129, and 130 which are shown in detail in Figure 13. An exhaust chamber 131 is formed in the head 123 which communicates through ports 132 with three valve chambers 125, 126, and 127. In a similar man-

ner a pressure chamber 133 is provided in the base 120 which directly communicates with the valve chambers 128, 129 and 130. The pressure line 24 previously referred to is directly connected with the chamber 133 in the pipe 31 and the exhaust line 31 connected with the chamber 131 so that a constant pressure can be maintained within either of these chambers. At the upper ends of the valve chambers 125, 126, and 127 in section 121, I form valve seats 134 against which are adapted to be seated valves 135, 136, and 137, which are formed with valve heads 138 and valve stems 139 adapted to pass through suitable stuffing boxes 140 formed on the upper portion of the head 123. A number of coil springs 141 positioned below the valve heads 138 are adapted to become seated in a number of plugs 142 screwed into the base 120 immediately below the respective valve chambers 125, 126, and 127. With this construction it can readily be seen that respective valves 135, 136, and 137 are adapted to be held seated so as to close communication from the valve chambers 125, 126, and 127 and the exhaust chamber 131. In a similar manner the lower portions of the valve chambers 128—130 in section 121 are formed with valve seats 143 which are adapted to be closed by valves 144, 145, and 146 having valve stems 139 and valve heads 138 similar to valves 135—137. These valve stems also pass through suitable stuffing boxes 147 and secured to the upper portion of the head 123, and are held seated by means of springs 141, which as in the case of the other valves, are held in place by means of the plugs 142 at the lower portion of the base 120. With these three valves communication is cut off between the valve chambers 128—130 and the pressure chamber 133.

To the rear of the section 121, I provide a port casing 148 to which the pipe lines 20, 21, and 22 shown in Figure 1 are connected. Within said casing I provide three ports 150, 151, and 152 which directly connect the valve chambers 128, 129, and 130 with the pipes 20, 22 and 21 respectively. In addition I provide three ports 153, 154 and 155 which connect the three valve chambers 125, 126 and 127 with the ports 152, 151, and 150 respectively so that the pipe line 20 is directly connected with valve chamber 127 and 128, pipe line 22 with valve chambers 126 and 129 and the pipe line 21 with valve chamber 125 and valve chamber 130. The ports are so arranged that the same, when closing, pass below each other so that communication is provided only as described. With this construction it can readily be seen that by depressing the valve stems 139 of any of the valves 135, 136, 137, 144, 145, and 146 that any of the three pipe lines 20, 21, and 22 may be independently placed under pressure or exhaust as required.

For manipulating the various valves of the master valve I provide three operating levers 156, 157 and 158. Lever 156 is securely attached by a pin 165 to a shaft 159 journalled in a bracket 160 having two bearings 161 and 162 best shown in Figures 10 and 12. Lever 157 is formed with a forked portion having arms 163 and 164 which are journalled for oscillation upon the shaft 159. Lever 158 is similarly formed with arms 166 and 167 which pass below the arms 163 and 164 of lever 157 and are firmly journalled upon shaft 159, said levers and arms mounted thereon are so arranged that the same may be independently operated as required. Upon the lever 156 I provide two ears 168 and 169 which are positioned directly over the upper ends of valve stems 139 of valves 135 and 136. These ears operate to simultaneously depress both of the valves 135 and 136 when the said lever 156 is operated. In addition to the lever 156 an arm 170 is provided which is rigidly secured to shafts 159 by a pin 171. This arm protrudes over the end of valve stem 139 of the valve 144 and operates together with the lever 156 so that when the said lever is depressed all of the valves 135, 136, and 144 are simultaneously opened which places both of the pipe lines 22 and 21 in direct communication with the exhaust line 31 and the pipe line 20 in communication with the pressure line 24.

It will be noted in Figure 13 that the valve stem 139 of valve 137 is made somewhat longer than the stems of the valves 135 and 136. It can further be seen in Figure 12 that the arm 163 is somewhat elevated above the arm 166. This valve stem passes loosely through the arm 166 and extends upwardly beneath the arm 163 where the same may be engaged by a lever 157. Immediately below lever 166, I rigidly attach a collar 172 to the valve stem 139 of the valve 137 which collar is adapted to be engaged by the arm 166 when the lever 158 is depressed. In this manner the valve 137 may be independently depressed by either of the levers 157 or 158. In a similar manner valve stem 139 of valve 145 extends through the arm 167 of lever 158 and engages an ear 173 issuing outwardly from arm 164. A collar 174 attached to the valve stem 139 of valve 145 operates in a similar manner with the collar 172 so that the valve 145 may be operated by depressing either of the levers 157 or 158. In addition to the operation of valves 137 and 145 lever 158 is adapted to operate valve 139 by means of an ear 175 issuing outwardly therefrom. It can readily be seen that when lever 157 is depressed both of the valves 137 and 145 are opened plac-

ing pipe line 20 in communication with the exhaust chamber and pipe line 22 in communication with the pressure chamber. Similarly when lever 158 is depressed valves 137 and 145 and 146 are simultaneously operated placing both pipe lines 21 and 22 in communication with the pressure chamber and pipe line 20 in communication with the exhaust chamber.

The operation of the master valve with the controlling of the locking of the jail doors is as follows. When lever 156 is depressed both of the pipe lines 21 and 22 are placed in communication with the exhaust line of the system and the pipe line 20 placed in communication with the pressure line. By examining Figures 8 and 9 it can readily be comprehended that the upper portions of the cylinders 75 and 76 are placed under pressure and the lower portions thereof placed under exhaust. This has the effect of causing both of the piston rods 81 and 82 to travel downwardly the full extent and to remain in this position. When the pistons are in these positions the parts become so arranged as shown in Figure 3 in which nut 108 engages the upper portion of the bracket 73 to hold the same in a downward position with the latch bar 68 securely latched in the latch lugs 65, 66, and 67. As long as the pressure is on piston 80 within cylinder 75 latch bar 68 is held latched and the raising of the same prevented. At the same time when the pressure is on the top of piston 79 in cylinder 76 the sleeve 83 on piston rod 81 engages the piston head 92 and thereby prevents further downward movement of the latch bar 68. It can readily be comprehended that all of the latching mechanism on all of the jail doors are in a dead-locked position in which opening of any of the jail doors is absolutely prevented without the manipulation of the master valve.

When lever 157 is depressed the pipe line 22 is placed in communication with the pressure line 24 and the pipe line 20 is placed in communication with the exhaust. An inspection of Figure 8 discloses that in this position piston 80 is caused to be elevated as indicated in the said figure while the piston 79 remains in its lowermost position. This has the effect of raising the bracket 73 and the latch bar 68 attached thereto sufficiently so that the said latch portion 115 is partly raised from the notch 116 and the latch lugs 65, 66, and 67, so that the structure is in a half-locked position. The arrangement of the parts when the latching mechanism is in half-locked position is clearly shown in Figure 4 in which piston 80 is at the upper end of its stroke and the piston 79 remains at the lower end of its stroke. It can clearly be seen that boss 105 is moved upwardly away from nut 112 and that the nut 110 is engaged in the underside of boss 106 to raise the latch bar 68 the required amount. When the locking mechanism is in half-locked position the cells remain locked the same as in the dead-locked position excepting that by means of the key placed in the key hole 71 the latching member 70 may be raised to further raise the latch bar 68 so that the cell door for the particular cell may be independently opened. In this manner any individual cell may be opened by the individual key so that any certain prisoner may be first removed from his cell before allowing all of the remaining prisoners to be taken out.

When the lever 158 is depressed both of the pipe lines 22 and 21 are placed in communication with pressure line and pipe line 20 in communication with the exhaust. This places both of the pistons 79 and 80 under pressure and simultaneously exhausts the cylinders above the same, permitting both of the pistons to take their uppermost positions as shown in Fig. 5. When the lever 58 is depressed with the latching mechanism in half-open position piston 80 remains substantially in its uppermost position while piston 79 travels upwardly. As soon as the nut 112 engages the underside of boss 105 latch bar 68 is raised the required amount so that the openings 115 therein permits the latching lugs 65, 66, and 67 to pass out therethrough and the doors of the various cells to be simultaneously or individually opened as desired. When lever 158 is operated while the locking mechanism is in dead-locked position then the pistons 80 and 79 are both caused to simultaneously move upwardly. In so moving bracket 73 is moved upwardly together with the piston rods 81 and 82 until the end 117 of piston rod 81 engages the interior of the cylinder head. This terminates the movement of the latch bar 68 and from then on piston 80 continues to raise until the same is stopped by the end 114 of piston rod 82 which simply causes the nut 108 to be raised above the arm 104 of bracket 73 to the position shown in Figure 5. With the proper manipulation of levers 156, 157, and 158 it can readily be seen that the locking mechanism of all of the cells may be simultaneously placed under a dead-locked, half open, or fully opened position to permit the removal of the prisoners, from the cells in a manner as described.

To prevent depression of more than one of the levers 156, 157, and 158 at one time I provide a device best shown in Figures 11 and 12. Along the upper portion of the head 123 I provide a bracket 176 which is formed with a longitudinal seat 177 and a flange 178 positioned along the same immediately back of the seat 177. Along the

seat 177 is slidably mounted a plate 179 which is held in slidable position against the flange 178 by means of two screws 280 which are screwed into the flange 178 and which pass through a slotted hole 281 formed in the said plate. By these means the plate 179 is held in upright position and may be longitudinally operated in reference to levers 156, 157, and 158. Near the central portion of plate 179, I provide a T-shaped opening 180 through which the lever 157 is adapted to extend, which opening is formed with shoulders 181 adapted to engage beneath the said lever 157 as the plate is operated to prevent the depression of the same. In the one end of plate 179 I provide a longitudinal notch 182 into which lever 158 may extend when plate 179 is moved in position to engage the same. The notch 182 is formed with a shoulder 183 which is adapted to engage the underside of lever 158 similar to the shoulders 181. Said notch is of such a length as to permit the lever 158 to travel freely downwardly when the plate 179 is in its extreme position away from the said lever. The opposite end 184 of plate 179 is cut down to extend below the lever 156 and is formed with a shoulder 185 similar to the shoulder 183 which engages beneath the said lever 156 to hold the same from movement when the plate 179 is in its extreme position towards the lever 156. On the other hand, shoulder 185 is so positioned on the end 184 of plate 179 that when the said plate is moved to its extreme position away from lever 156 the same lever may be depressed as required. With this construction it can clearly be seen that when the plate 179 is in its intermediate position only lever 157 may be depressed and that while the said plate is in either of its extreme positions, either of the respective levers 156 and 158 only can be operated. With this device the operation of the system is rendered positive so that the depression of two or more levers at the same time is impossible and thus safe guarding the operating of the system.

When it is desired to maintain the locking system in dead-locked position for an extended period of time I provide a latching mechanism for lever 156 which is shown in Figures 10 and 11. This device consists of a rod 186 which is secured to the head 123 of the device and which passes upwardly through the lever 156. To this rod is pivoted at the upper end a handle 187 which is divided at its lower portion with cam surfaces 188 adapted to engage upon the upper surface of the said lever 156. When handle 187 is swung downwardly cam surfaces 188 are caused to bear upon the lever 156 and hold the same in a depressed position. It will be noted that the surfaces 188 are of such formation as to hold the lever 156 downwardly as required. In this manner all of the cells may be dead-locked for an extended period of time such as over-night, and the locking mechanism is constantly held by the pressure controlled cylinders in the desired dead-locked position. It can further be comprehended that with the pressure regulator 26 that any leakage in the system which might occur is compensated for thereby so that a prolonged closure of the locking mechanism will not affect the operation of the same.

To prevent the prisoners from failure to fully close the doors of their cells at the time of dead-locking the same and reopening the doors at leisure, I provide a latch mechanism which is clearly shown in Figure 3, which when the locking pistons are in dead-locked position prevent the further opening of the doors whether the same be fully closed or partly open. This device consists of a latch bar 189 which is pivoted at one end to a casting 190, see Figure 3, attached to each of the cell doors 37 by bolts 191. This latch bar is formed with teeth 192 and passes through openings 193 formed in the partition members 44 of the cell structure illustrated in Figure 7. The said latch bars ride upon the lower leg of the angle 50 and are adapted to be engaged by two pawls 194 and 195 pivoted at 197 to a casting 196 which is attached to one of the partition walls 44 shown in Figure 3.

The construction of the pawls 194 and 195 is as follows. Pawl 194 is formed bifurcated at its end as indicated at 198 in Figure 6, and is made longer than the pawl 195. Between this bifurcated end is positioned the pawl 195 which is independently movable in relation thereto. Both of said pawls are pivoted on the pin 197, which is held in place in two ears 199 formed on the casings 196. In normal position both of the pawls 194 and 195 are adapted to engage the teeth 192 of latch bar 189 by gravity to prevent the moving of the cell doors to an open position. For disengaging the pawl 194 I provide a flanged member 200 which is adjustably secured to the piston rod 82 by means of the set screw 201. A lug 202 formed on pawl 194 is adapted to be engaged by the flange 200 when piston 80 is raised so that the said pawl is disengaged from engagement with the teeth 192 of latch bar 189. This operation can be clearly seen in Figure 4 in which the said pawl is in its disengaged position. With this construction it can readily be seen that when the locking mechanism is positioned in half-locked position as shown in Figure 4 the pawl 194 is disengaged while the pawl 195 still remains in engagement. For releasing this latter pawl I provide a bent finger 203 which is adjustably held in a boss 204 formed on bracket 73, by means of a set

screw 205. This finger engages a lug 206 formed on pawl 195 so that when the bracket 73 is raised the pawl 195 is also disengaged from action from the latch bar 189.

The operation of this device is as follows. When the device is in dead-locked position as shown in Figure 3 both of the pawls 194 and 195 are in engagement with latch bar 189 so that the opening of the cell doors is absolutely prevented even if the same should have been left slightly ajar when the locking mechanism is set in its dead-locked position. When the locking mechanism is moved to half-locked position pawl 194 is raised as shown in Figure 4 while the pawl 195 still holds the doors from being opened. If it is desired to conduct the prisoners from any individual cell a key for the same may be manipulated to raise the latch bar 68 as previously described, which causes fingers 203 to engage 206 and to disengage pawl 195 from engagement with the latch bar 189. When this has been accomplished the particular cell door in question may be opened. When the device is moved to full open position as shown in Figure 5 both of the pawls 194 and 195 are raised from engagement with the latch bar 189 permitting the door to be freely opened.

The advantages of my invention are manifest. A device is produced which can readily be used with extensive systems of jails where there are a great number of cells. Due to the fact that the locking mechanism is fluid actuated the friction encountered is not sufficient to effect the positive action of the locking mechanisms. The same can also be used to great advantage in circular or curved cells where mechanical latching or locking mechanisms would be impractical. The entire system is continuous so that should any leakage of the fluid occur the same passes through the exhaust portion of the apparatus and returns to the pump where it is again circulated as required. In this manner the system can be left in any of its positions for as long a period of time as required without becoming inoperative or losing any of its effectiveness to hold the locking parts in the desired positions. In the dead-locked position the latch bars are all held from movement in either direction by the two pistons so that the doors are absolutely held locked. In addition the two pawls operating upon the latch bar controlling the further opening of the doors prevent the same from being opened in case the said doors should be left ajar when the locking mechanism is closed irregardless of whether the locking mechanism is set in dead-lock or half-open position.

In accordance with the patent statutes I have described the principles of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the construction shown is only illustrative and that the invention can be carried out by other means and applied to uses other than those above set forth within the scope of the following claims.

I claim:—

1. A locking device for jails comprising a latch bar, a bracket secured thereto, means engaging said bracket for raising said latching bar and individual means for engaging said bracket for lowering said latch bar.

2. A locking device for jails comprising a latch bar, means cooperating with said latch bar for raising the same, and independent means cooperating with said latch bar for lowering the same.

3. A locking device for jails comprising a latch bar, fluid operated means cooperating with said latch bar for raising the same, and independent fluid operated means cooperating with said latch bar for lowering the same.

4. A locking device for jails comprising a latch bar, a member connected thereto, a pair of cylinders, pistons movable within said cylinders, and means connected with said pistons and cooperating with said member for raising and lowering said latch bar.

5. A locking device for jails comprising a latch bar, a member connected thereto, a pair of cylinders, pistons movable within said cylinders, piston rods secured to said pistons and cooperating with said member, engaging members formed on said piston rods engaging said member to raise and lower the latch bar.

6. A locking device for jails comprising a latch bar, a member secured thereto, a pair of cylinders, pistons within said cylinders, piston rods connected to said pistons and passing through said members, and stops formed on said piston rods for engaging said member to cause the latch bar to be raised and lowered.

7. A locking device for jails comprising a latch bar, a member secured thereto, fluid operated means for raising said latch bar into half-locked position, and independent fluid operated means for further raising said member and latch bar into wide open position.

8. A locking device for jails comprising a latch bar, a member secured thereto, fluid operated means engaging said member for raising said latch bar into half-locked position, said member being free to be raised farther, independent fluid operated means for further raising said member and latch bar into wide open position, and means associated with said second fluid operated means for forcibly holding said member and latch bar in dead-locked position.

9. A locking device for jails comprising a latch bar, a pair of cylinders having pistons therein for operating said latch bar, means for simultaneously forcing both of said pistons downwardly in the cylinders and independent means for selectively raising either of said pistons within the cylinders.

10. A locking device for jails comprising a latch bar, a pair of cylinders having pistons therein for operating said latch bar, a pipe line connecting both of the chambers of said cylinders above said pistons, a pipe line connecting one of the chambers within one of said cylinders below the piston, and another pipe line connecting the other of said chambers within said cylinders below the piston, and means for selectively placing said pipe lines under pressure or exhaust.

11. A locking device for jails comprising a latch mechanism, fluid operated means for operating the same, a plurality of pipe lines connected with said fluid operating means, a master control valve connected with said pipe lines, pressure and exhaust chambers formed within said master control valve, pairs of valve chambers leading from both said exhaust and pressure chambers to each of said pipe lines, valves within said valve chambers, and means for selectively and combinedly operating said valves to cause said fluid operated means to actuate the locking mechanism.

12. A locking device for jails comprising a latching mechanism, fluid operated mechanism connected therewith, pipe lines connected with said fluid operating mechanism, a master control valve connected with said pipe lines, a plurality of valve chambers formed within said master control valve, pressure and exhaust chambers formed within said master control valve communicating with said valve chambers, valves positioned within said valve chambers having valve stems extending through the master control valve and levers connected to said master control valve for simultaneously depressing several of said valve stems to cause the fluid operated mechanism to operate the locking device.

13. A locking device for jails comprising a latching mechanism, fluid operated mechanism therefor, pipe lines connected with said fluid operated mechanism, a master valve connected with said pipe lines, said master valve having a plurality of valve chambers arranged in alignment and connected with said pipe lines, valves positioned in said valve chambers having valve stems extending therethrough outwardly beyond said master control valve, pressure and exhaust chambers connected with said valve chambers, a rocking bar attached to said master control valve, levers pivoted to said rocking bar adapted to simultaneously engage a number of said valve stems to operate the valve, said levers being independently movable.

14. A locking device for jails comprising a latching mechanism, fluid operated mechanism therefor, pipe lines connected with said fluid operated mechanism, a master valve connected with said pipe lines, said master valve having a plurality of valve chambers arranged in alignment and connected with said pipe lines, valves positioned in said valve chambers having valve stems extending therethrough outwardly beyond said master control valve, pressure and exhaust chambers connected with said valve chambers, a rocking bar attached to said master control valve, levers pivoted to said rocking bar adapted to simultaneously engage a number of said valve stems to operate the valve, said levers being independently movable and means formed on some of said valve stems whereby the same valves may be independently operated by two levers.

15. In combination with a locking mechanism of a jail, a master control valve comprising a base, an intermediate section and a top section, a plurality of valve chambers arranged in alignment in said intermediate section, a pressure chamber positioned in said base and communicating with some of said valve chambers, an exhaust chamber positioned in said top section communicating with the others of said valve chambers, valves arranged within said valve chambers having valve stems extending upwardly through the top section, and means for selectively operating said valve stems.

16. In combination with a locking mechanism of a jail, a master control valve comprising a base, an intermediate section and a top section, a plurality of valve chambers arranged in alignment in said intermediate section, a pressure chamber positioned in said base and communicating with some of said valve chambers, an exhaust chamber positioned in said top section communicating with the others of said valve chambers, valves arranged within said valve chambers having valve stems extending upwardly through the top section, a rocking bar pivoted to said top section, a plurality of levers connected with said rocking bar and extending over said valve stems and ears formed in said levers for operating said valve stems.

17. A locking mechanism for jails comprising a latch bar, a member secured to said latch bar, a cylinder having a piston therein, a piston rod attached to said cylinder and adapted to engage said member to raise the latch bar in half-locked position, a

second cylinder having a piston therein, a piston rod secured thereto, means on said second piston for further raising said latch bar into wide open position, means on said second rod for holding the latch bar in dead-locked position, a pipe line connecting the upper portions of both of said cylinders, a second pipe line conne ting the upper portions of both of said cylinders for raising the latching mechanism in half-locked position, a third pipe line connecting the lower portion of a cylinder for raising the latching mechanism in wide open position, and a master valve having pressure and exhaust chambers, a plurality of valve chambers connected with said exhaust chamber and separately connected with said pipe lines, a plurality of valve chambers connected with said exhaust chamber and also separately connected with said pipe lines, and means for operating said valves to control the flow of fluid through said pipe lines to selectively cause the latching mechanism to assume a dead-locked, half-locked, or wide open position as required.

18. A locking mechanism for jails comprising a latch bar, a member secured to said latch bar, a cylinder having a piston therein, a piston rod attached to said cylinder and adapted to engage said member to raise the latch bar in half-locked position, a second cylinder having a piston therein, a piston rod secured thereto, means on said second piston for further raising said latch bar into wide open position, means on said second piston rod for holding latch bar in dead-locked position, a pipe line connecting the upper portions of both of said cylinders, a second pipe line connecting the lower portion of the cylinders for raising the latching mechanism in half-locked position, a third pipe line connecting the lower portion of a cylinder for raising the latching mechanism in wide open position, and a master valve having pressure and exhaust chambers, a plurality of valve chambers connected with said exhaust chamber and separately connected with said pipe lines, a plurality of valve chambers connected with said exhaust chamber and also separately connected with said pipe lines, valves within said valve chambers having valve stems extending through said master valve, valve operating means for simultaneously depressing the valves for placing the first named pipe line under pressure and exhausting the other two pipe lines to place the locking mechanism in dead-locked position, valve operating means for simultaneously depressing the valves to bring the third named pipe line under pressure and the third pipe line under exhaust, to bring the locking mechanism into half-locked position and the valve operating means for simultaneously controlling the valves to bring the second or third pipe line under pressure and the first pipe line under exhaust to cause the locking mechanism to assume a wide open position.

19. In combination with a jail door, a locking device therefor, comprising a latch bar, means for raising said latch bar from dead-lock position into half-opened or full open position, and means for holding said door from being further opened when said door has been partly opened and the latching mechanism is in half-locked position.

20. In combination with a jail door, a locking device therefor, comprising a latch bar, means for raising said latch bar from dead-lock position into half opened or full open position, another latch bar connected with said door, a pair of pawls engaging said latch bar, means for disengaging one of said pawls when the latching means is raised into half-locked position and means for raising the other of said pawls when the latching mechanism is raised to wide open position.

21. A locking device for jails, comprising a latch bar, a pair of fluid operated cylinders, means for connecting said cylinders with said latch bar and fluid pressure, means adapted to operate said cylinders, independently or collectively, to move said latch bar into half locked position, open position and dead lock position

22. A locking device for jails, including means associated with each cell door, adapted to operate the latch bars of each cell, simultaneously, said operating means including a pair of cylinders and a source of fluid pressure, in which a master control valve is interposed, to direct the fluid pressure to operate the cylinders in pairs, collectively or individually, to position the latch bars into open or dead locked position, for the purposes specified.

23. A locking device for jails, including latch bars for each cell, a pair of operating cylinders for each latch bar, means for connecting said cylinder to said bars, and a source of pressure connected with said cylinders in a manner to hold under pressure, said bars into dead lock position or to operate said pairs of cylinders collectively, or each of the pair separate to move said bars into half open or wide open position.

24. A locking device for jail doors, including a pressure system, having means for retaining a constant pressure, a master valve, having an inlet port connected with said source of constant pressure, outlet openings in said master valve, pairs of cylinders, means for connecting said cylinder with said master valve in a manner to permit the cylinder of each pair to be operated in unison and the pairs of cylinders to be operated simultaneously and to operate one cylinder of each pair separately of the other cylinder,

but in unison with the same cylinder of each pair, in a manner to operate the latch bar of a series of cells, into position, to lock or unlock the same.

25. A jail locking device, including a source of pressure, a master valve, a series of pairs of cylinders, means for connecting said cylinders with said valve, in a manner to maintain a constant pressure in said cylinders, to hold the locking bars of a series of cells, in dead locked position or open position under pressure, and to operate one of each pair of cylinders in a manner to hold the locking bar in half open position with the operating cylinder, under the maximum pressure.

26. A jail locking device, including a source of constant pressure, a master valve, a series of pairs of cylinders, means for connecting said cylinders through said master valve in a manner to cause the same to move the locking bars into open position, with maximum pressure in the said cylinders, and to hold the locking bars into dead lock position, under the maximum force of said pressure, by the operation of said master valve.

27. A locking device for jail cell doors, comprising latch bars, a pair of cylinders for each cell, means for connecting the cylinders to said latch bars, a source of constant pressure, a master valve interposed between said source of pressure and said cylinder and means adapted to connect said cylinders to direct the maximum pressure of the source of supply, to either side of the pistons in said cylinders, selectively, to hold the pistons of the cylinders, under maximum pressure, into positions to dead lock, half lock or wide open positions of said latch bars, under the maximum source of said pressure.

28. A locking device for jails, including a source of pressure, latch bars for each of a series of cells, a pair of cylinders for each cell, means for connecting said cylinders to said latch bars, means for connecting said cylinders to said source of pressure, including a master valve interposed between the said source of pressure and said cylinders, said connecting means including a series of valves in said master valve and operating means whereby force can be directed from said source of pressure to either side of the pistons in said cylinders, to operate latch bars of each of the cells, collectively into open, half open and dead lock position, in a manner to direct maximum pressure of said source of supply against the piston of the operating cylinder, to move the same a complete stroke at each operation, to insure a positive positioning of the latch bars, at each operation of the cylinder.

29. A locking device for jails, including means for operating the latch bars of a series of cells, said latch bar operating means comprising a pair of cylinders, means for connecting the cylinder pistons to the cell latch bars, means for adjusting the length of stroke of the pistons, a source of pressure connected with said cylinders, a master valve for controlling the pressure to direct the same against either side of the pistons of said cylinders, to selectively operate the pistons of the cylinders in either direction, to operate the latch bars of the cells and means for by-passing the exhaust from either side of the cylinders, through the operating valve to a reservoir connected with the source of pressure.

30. A locking device for jail doors, adapted to operate the latch bars, including cylinders, means connecting the cylinders with the latch bars, a rack bar connected with each door of each cell, a pair of operating pawls, adapted to engage said latch bar and means for successively engaging said pawls to release the same from the rack, separately, whereby one of said pawls is adapted to engage with the rack bar when the latch bar is in half open position.

31. A locking device for jails, comprising a latch bar, means engaging said latch bar adapted to raise the same, said means permitting the latch bar to travel freely upwardly relative thereto, and a second means for raising said latch bar above the upper position to which said latch bar may be raised by said first named means, and means for selectively operating either of said raising means.

32. A locking device for jails comprising a latch bar having a member protruding therefrom, a pair of rods slidable relative to said member, a lug formed on one of said rods on the bottom thereof, adapted to engage said member, a pair of lugs formed on the other of said rods, one on each side of said member, adapted to engage the same and means for selectively raising and lowering said rods to cause the latch bar to remain in half lock position, full open or dead lock position.

33. A master valve for jails comprising a casing, having two chambers therein, a series of valves communicating with one of said chambers, a second series of valves communicating with the other of said chambers, said valves being arranged in alinement, a series of pipes having branches connected to pairs of said valves in each of said chambers and means for simultaneously depressing a number of said valves to control the flow of fluid through said pipes.

34. A master valve comprising a casing, a plurality of valves mounted in alinement along said casing, said valves having valve stems protruding therethrough, a shaft positioned rearwardly of said valve stems,

a plurality of levers pivoted to said shaft having lugs issuing therefrom and adapted to engage said valve stems.

35. A master valve comprising a casing, a plurality of valves mounted in alinement along said casing, said valves having valve stems protruding therethrough, a shaft positioned rearwardly of said valve stems, a plurality of levers pivoted to said shaft having lugs issuing therefrom and adapted to engage said valve stems and means for holding certain of said levers from movement.

JOHN ALLENSON.