Aug. 27, 1935. M. J. TRACY 2,012,327

OPERATING AND LOCKING MECHANISM FOR CELL DOORS

Filed Jan. 18, 1935 3 Sheets-Sheet 1

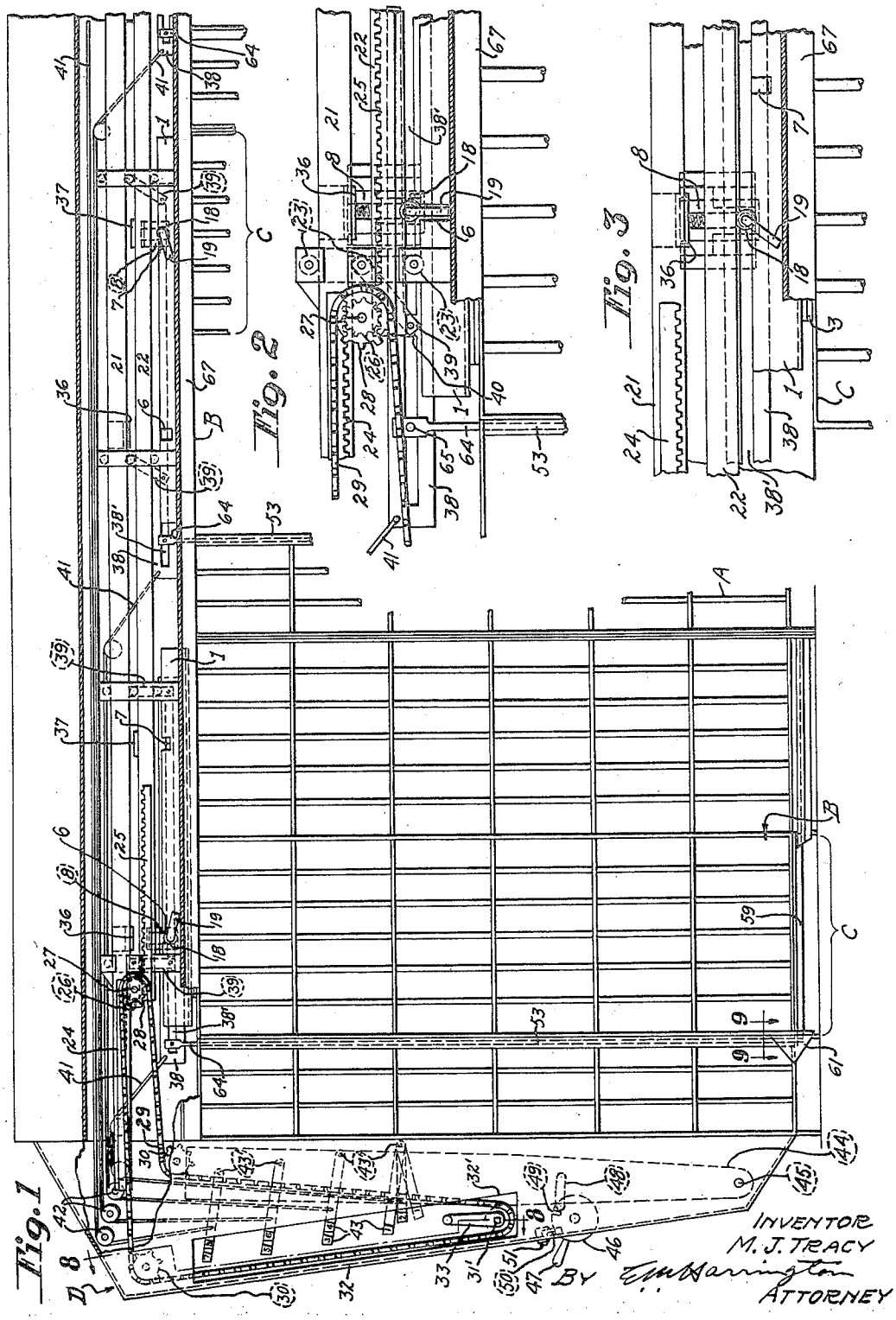


Fig. 1

Fig. 2

Fig. 3

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OPERATING AND LOCKING MECHANISM FOR CELL DOORS

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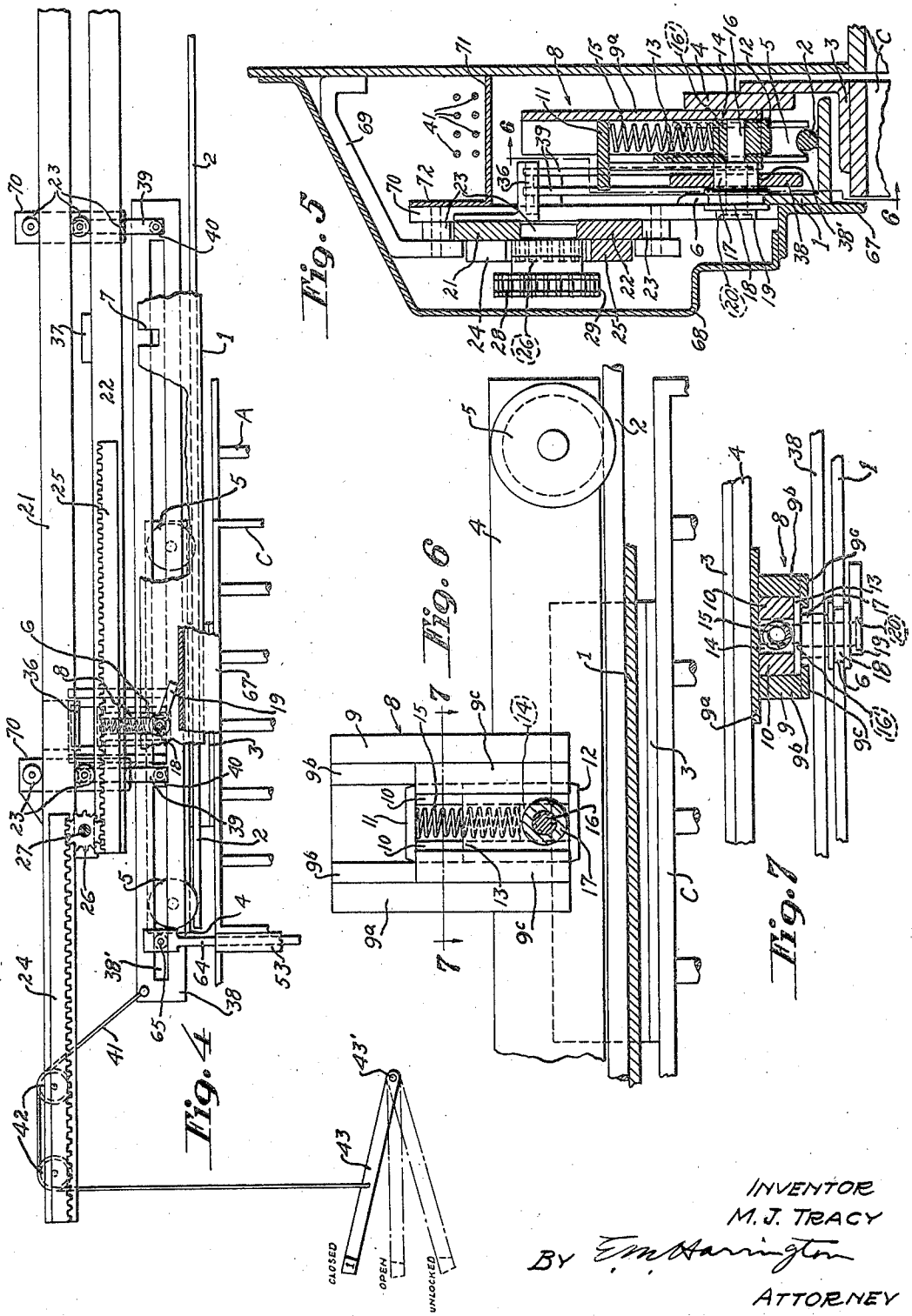


Fig. 4

Fig. 5

Fig. 6

Fig. 7

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OPERATING AND LOCKING MECHANISM FOR CELL DOORS

Filed Jan. 18, 1935 3 Sheets-Sheet 3

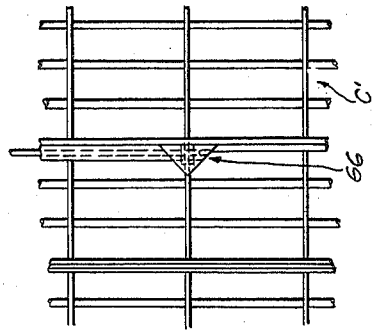


Fig. 11

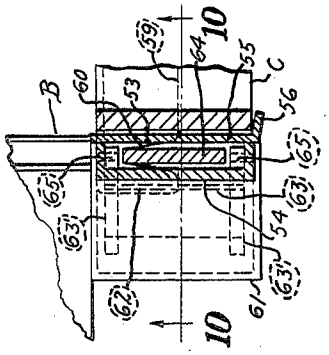


Fig. 9

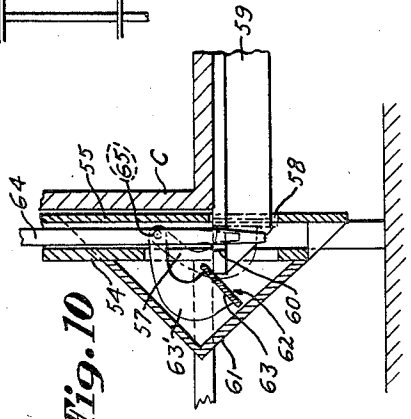


Fig. 10

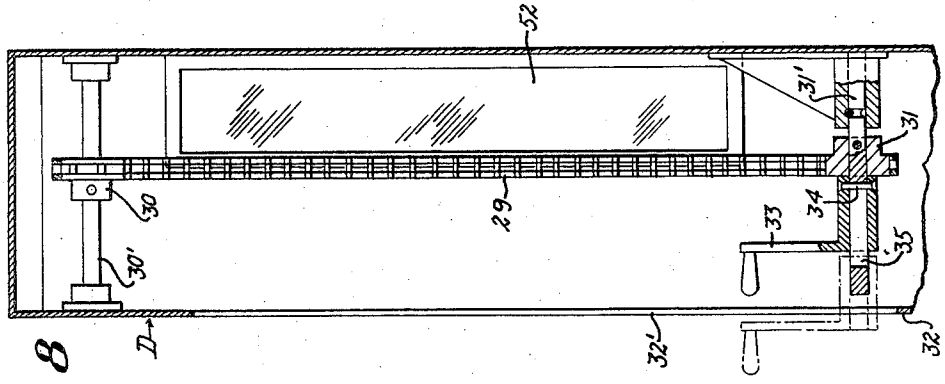


Fig. 8

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UNITED STATES PATENT OFFICE

2,012,327

OPERATING AND LOCKING MECHANISM FOR CELL DOORS

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Application January 18, 1935, Serial No. 2,450

20 Claims. (Cl. 189—7)

This invention relates generally to operating and locking mechanism for doors of cells of jails and prisons, and more specifically to mechanism of this type which is operable in such manner that doors of predetermined cells of a number of cells arranged in a row or tier may be selected for operation to open the selected doors, to close said selected doors, or to close some of the selected doors and at the same time and by the same operation of the mechanism open others thereof, the predominant object of the invention being to provide an improved mechanism of the type referred to which is capable of more efficient use than were the cell door operating and locking mechanisms heretofore known, inasmuch as the improved mechanism will not only move selected cell doors to locked open positions, or locked closed positions, but will move one or more selected cell doors to locked open positions while simultaneously moving one or more other selected cell doors to locked closed positions.

Prior to this invention, operating and locking mechanisms for cell doors have been in use which were capable of such operation that doors of certain predetermined cells might be selected for operation and moved to open or closed positions. One type of such mechanism was known commercially as the semi-selective type. In the operation of this type of mechanism a movable door-operating element was moved along a row of cell doors, and when the cell door selected for operation was reached by the movable operating element, engagement was effected between the cell door and the movable operating element by suitable means, and the selected cell door was moved to an open or closed position, depending on the original position of the cell door. In the operation of this type of cell door-operating mechanism only one cell door was operated at a time, and naturally each movement of a cell door to an open or closed position involved a separate and complete operation of the mechanism.

Another type of cell door operating mechanism heretofore known was the fully selective type, and in the operation of this type of mechanism a plurality of predetermined cell doors might be selected and moved simultaneously in one direction. In other words, in the operation of the fully selective type of cell door operating mechanism a number of doors of a row or tier of cells might be selected for operation and be moved at the same time to open positions, or a number of doors of a row or tier of cells might be selected for operation and be moved at the same time to closed positions. Thus, in the use of this type of door operating mechanism, the movements of the selected doors on any one operation of the mechanism were always in one direction; that is, either from closed to open positions, or from open to closed positions.

Realizing that the limitations present in the use of the two types of door-operating mechanisms referred to above, and in other types not mentioned herein, prevented them from attaining the high degree of efficiency desired in mechanisms of this sort, I have devised the superselective type of cell door operating mechanism disclosed herein, which is capable of far greater efficiency in use than were any of the cell door operating mechanisms heretofore known. The outstanding feature of the mechanism disclosed herein is that a plurality of doors of a row or tier of cells may be selected for movement during a single operation of the mechanism, and during such single operation of the mechanism certain of the selected doors may be moved from closed to open positions while others thereof may be moved from open to closed positions. Thus during any operation of the superselective type of cell door operating mechanism which is the subject-matter of this application, a cell door may be selected for operation and moved in either direction, that is, to an open or closed position, regardless of the direction of movement of other cell doors also selected for movement during such operation of the door operating mechanism. Because of the wider range of selectivity of the improved mechanism disclosed herein, cell doors controlled thereby may be handled with far greater facility and speed than heretofore, whereby the high degree of efficiency demanded in institutions where such mechanisms are used may be attained.

Fig. 1 is a fragmentary view, partly in elevation and partly in vertical section, of a pair of cells provided with my improved door operating and locking mechanism, the door of one cell being shown in an open position and the door of the other cell being shown in a closed position.

Fig. 2 is an enlarged, fragmentary view, partly in elevation and partly in vertical section, of a cell structure showing parts of the door operating and locking mechanism in positions different from the positions of such parts shown in Fig. 1.

Fig. 3 is a view similar to Fig. 2, but showing parts of the door operating and locking mechanism in positions different from the positions of such parts as illustrated in Figs. 1 and 2.

Fig. 4 is a more or less skeleton view illustrating on a larger scale than Fig. 1 parts of the

door operating and locking mechanism, and with certain parts of the mechanism in the positions shown in Fig. 1.

Fig. 5 is an enlarged cross-section taken through the door operating and locking mechanism and the housing thereof.

Fig. 6 is a section taken on line 6—6 of Fig. 5.

Fig. 7 is a horizontal section taken on line 7—7 of Fig. 6.

Fig. 8 is an enlarged section on line 8—8 of Fig. 1, looking in the direction of the arrow.

Fig. 9 is an enlarged horizontal section taken just above the lower door lock of the structure, approximately on the line 9—9 of Fig. 1.

Fig. 10 is a section on line 10—10 of Fig. 9.

Fig. 11 is a fragmentary, front elevation of a cell structure showing the door lock located at a point above the bottom portion of the door.

In the drawings, wherein are shown for the purpose of illustration, merely, two embodiments of the invention, A designates a barred wall structure which provides the front walls of a row or tier of jail or prison cells. The cells of which the barred wall structure A forms parts may be of any suitable construction, and the barred wall structure A may be supported and anchored in place in any one of a number of ways which would be obvious to persons familiar with the art to which this invention relates. Each of the cells illustrated in Fig. 1 is provided with a door opening B, and said cells are provided with suitably barred doors C which are adapted to close said door openings B.

Suitably supported in a fixed position above the door C of each cell is an angle bar 1 which is arranged in such position that one leg thereof is disposed vertically and the other leg horizontally (Fig. 5). The horizontal leg of the angle bar 1 associated with each door fixedly supports a rail 2 which may be of any desired cross-sectional shape, round, for instance, as shown in Fig. 5. At the top of each cell door C an angle bar 3 is fixed thereto. This angle bar extends longitudinally of the top frame element of the door and has fixed to it a plate 4, and this plate has rotatably mounted thereon a plurality of door-supporting rollers 5. The door-supporting rollers 5 are preferably provided with circumferential grooves which engage the rail 2 in rolling contact therewith, and in this manner the door of each cell is supported for sliding movement relative to the front wall of the cell of which the door forms a part. A separate rail 2 may be provided for each cell, or, if preferred, a single rail may be employed which extends throughout a row or tier of cells. The vertically disposed leg of each angle bar 1 is provided at its upper edge with a pair of notches 6 and 7. These notches, which are open at the top, are spaced apart longitudinally of the angle bar, and the notch 6 is slightly deeper than the notch 7.

Associated with the door C of each cell of a row or tier of cells equipped with the improved superselective door operating and locking mechanism disclosed herein is a clutch 8. The clutch of each door is located immediately above the top of the door at the approximate horizontal center thereof, said clutch being supported by the plate 4 already referred to herein. The clutch 8 includes a guiding member 9 which comprises a back plate 9^a, which is welded or otherwise securely fixed to the plate 4, oppositely disposed, outstanding elements 9^b, and front plates 9^c which are fixed to the forward faces of the elements 9^b and extend inwardly beyond the inner faces thereof, as shown in Fig. 7, so as to provide a guideway between the back plate 9^a and said front plates 9^c.

Arranged for vertical sliding movement in the guideway referred to above is an engaging unit which comprises a pair of horizontally spaced, vertically extended bars 10, to which are fixed a top plate 11 and a bottom plate 12. The structure produced by the spaced bars 10 and the top and bottom plates 11 and 12 is capable of guided vertical movement relative to the elements 9^a, 9^b, and 9^c which provide the guideway in which said structure is mounted. As shown most clearly in Fig. 5, the top plate 11 extends outwardly beyond the spaced bars 10, and this arrangement is for a purpose to be hereinafter set forth. Located at the forward faces of the spaced bars 10 so that its opposite side edge portions are disposed between said spaced bars and the inner faces of the front plates 9^c is a plate 13, which is provided with a rearwardly projected extension 14. The extension 14 is extended between the spaced bars 10, and the plate 13 is of substantially less height than the spaced bars 10 so that the plate 13 and the extension 14 associated therewith may move upwardly relative to the bars 10 a considerable distance before the top edge of said plate 13 touches the top plate 11 at the upper ends of the spaced bars 10. Interposed between the extension 14 and the top plate 11 located at the upper ends of the spaced bars 10 is a coilspring 15, which connects together in a resilient manner the unit provided by the plate 13 and the extension 14, and the unit provided by the spaced bars 10 and the top and bottom plates 11 and 12.

From the foregoing it is plain that the unit produced by the spaced bars 10 and the top and bottom plates 11 and 12, and the unit produced by plate 13 and the extension 14, may move through the guideway which supports said units as a single unit and without relative movement between said units, the coilspring 15 during such movement being inactive. Also, it is obvious that if the unit produced by the spaced bars 10 and the top and bottom plates 11 and 12 is arrested during upward movement thereof by the top plate 11 coming into contact with an abutment, the plate 13 and extension 14 may continue its upward movement, the coilspring being compressed as said plate and extension move upwardly relative to the unit produced by the spaced bars 10 and the top and bottom plates 11 and 12.

Supported by the extension 14 of the clutch 8 is a shaft 16 (Fig. 5) which is preferably provided with an annular shoulder 16' that contacts with the outer face of the plate 13. This shaft extends outwardly beyond the plate 13 and has mounted thereon at a point immediately adjacent to said plate 13 a sleeve 17. Outwardly of the sleeve 17 the shaft 16 supports for rotation a circumferentially grooved roller 18, and at the extreme outer end of the shaft 16 an arm 19 is loosely attached thereto. The outer end of the shaft 16 is provided with an enlarged head portion 20, and the arm 19 is provided with an opening through which the shaft 16 extends, which opening is provided with a countersink that receives the enlarged head of the shaft. The shaft 16 is preferably driven into an opening formed in the extension 14, and the annular shoulder contacting with the plate 13 maintains sufficient looseness between the head 20 of the shaft and the face of the arm 19 at the base of

the countersink so as to permit said arm to move in a rotary manner relative to the shaft.

Arranged above the doors of a row or tier of cells equipped with the improved door operating and locking mechanism is a pair of bars 21 and 22. The bars 21 and 22 are arranged one above the other, as shown in Figs. 1 to 5 of the drawings, and said bars extend throughout the entire length of the row or tier of cells, said bars being made in sections which are suitably attached together when the length of the row or tier of cells requires this arrangement. As will presently appear herein, the bars 21 and 22 are moved longitudinally in opposite directions, and to facilitate such movement of the bars and to guide said movement they are mounted between suitable rollers 23 which are rotatably supported by fixed parts of the structure. The bars 21 and 22 have fixed thereto, preferably at points adjacent to ends of the bars, a pair of rack bars 24 and 25, the rack bar 24 being secured to the bar 21 and the rack bar 25 being secured to the bar 22.

Interposed between the rack bars 24 and 25 and arranged in mesh with the teeth of said rack bars is a pinion 26. This pinion is rotatably mounted on a shaft 27, which is suitably supported by a fixed part of the structure, and this shaft also supports for rotation a sprocket wheel 28 which rotates with the pinion 26. Operating over the sprocket wheel 28 is a sprocket chain 29 which passes over a pair of sprocket wheels 30 and passes around the under side of a sprocket wheel 31. The sprocket wheels 30 and 31 are arranged within the housing 32 of a control unit D of the mechanism, as shown clearly in Fig. 1, said housing 32 enclosing said sprocket wheels, a part of the sprocket chain 29, and other parts of the mechanism to be hereinafter referred to. The sprocket wheels 30 and 31 are mounted on suitably supported shafts 30' and 31', as shown in Fig. 8, and the shaft 31' has mounted thereon an operating handle 33 by which the shaft 31' and sprocket wheel 31 may be rotated so as to cause the sprocket chain 29 to travel and in this manner rotate the sprocket wheel 28 and the pinion 26, and thereby impart movement to the bars 21 and 22 in opposite directions. The operating handle 33 is slidably supported by the shaft 31', through the instrumentality of a pin 34 carried by the hub portion of the handle and a slot 35 formed in the shaft 31', whereby the handle may be moved to a position within the housing 32 when it is not being used, and may be drawn outwardly through an opening 32' in a wall of the housing 32, as shown by dotted lines in Fig. 8, when it is desired to rotate said handle.

Fixed to the bar 21 are socket elements or keeps 36, and fixed to the bar 22 are similar socket elements or keeps 37, said socket elements or keeps being adapted to receive the top plates 11 of the clutches 8 when said clutches are elevated in a manner to be hereinafter set forth. When the door operating and locking mechanism is in its normal condition, the keeps 36 attached to the bar 21 are located immediately above the notches 8 formed in the angle bars 1, while the keeps 37 attached to the bar 22 are located immediately above the notches 7 formed in said angle bars 1. Also, when the mechanism is normally situated each vertically alined keep 36 and notch 8 is in vertical alinement with the horizontal center of the associated cell door when said cell door is in a closed position, while each vertically alined keep 37 and notch 7 is in vertical alinement with the horizontal center of the position the associated cell door assumes when said cell door is moved to an open position. The keeps 36 and 37 are provided with downturned flanges at their opposite sides, whereby the top plates 11 of the clutches will be engaged by said keeps when the clutches are elevated.

Arranged above the door of each cell of a row or tier of cells is a parallel lift 38 which comprises an elongated bar element which is provided with an opening 38' which extends longitudinally thereof substantially from end to end. The bar element providing each parallel lift 38 is suspended from fixed parts of the structure by pairs of hangers 39 which are pivoted at their upper ends to fixed parts of the structure, and are pivoted at their lower ends to the parallel lift. In this connection it will be noted that one pair of hangers of each parallel lift is pivoted at their lower ends to inserts 40 welded or otherwise secured in the opening 38' of the lift, while the other pair of hangers is pivoted to the parallel lift at a point beyond an end of the opening 38' (Fig. 4). Preferably the parallel lift is pivotally supported between the hangers of each associated pair of hangers, as shown in Fig. 5. Because of the manner of supporting the parallel lifts 38 they may swing from the upper pivot points of the hangers 39 upwardly in an arc of a circle, and while so moving they are maintained at all times in the same horizontal position which they assume when at rest in their lowered positions. In other words, when the parallel lifts are in their lowered position or are swinging upwardly from or downwardly toward such lowered position, the top and bottom edges of the parallel lift and the top and bottom walls of the longitudinal opening 38' thereof are always disposed horizontally.

The shaft 16 of the clutch 8 of the door of each cell of a row or tier of cells is extended through the opening 38' of the parallel lift 38 co-operatively associated with said cell door, so that the sleeve 17 on said shaft is disposed within said opening 38'. Because of this arrangement upwardly swinging movement of the parallel lift about the upper pivot points of its hangers 39 will cause parts of the clutch to be elevated, and downward movement of the clutch parts so elevated will cause the parallel lift to move downwardly with said clutch parts. In order to swing the parallel lift bars 38 upwardly when it is desired to elevate certain parts of the clutches 8, I attach to each parallel lift bar a cable 41 which passes over suitable supporting pulleys 42 to the interior of the housing 32 of the control unit D. Within the housing 32 a plurality of indexing arms 43 are pivotally supported at 43', there being one of these indexing arms for the parallel lift 38 associated with the door of each cell of a row or tier of cells, and the cable 41 which is attached to each parallel lift at its opposite end being attached to the indexing arm related to said parallel lift. From the foregoing, it is obvious that any parallel lift of the mechanism may be swung upwardly by simply drawing downwardly the outer end of the indexing arm 43 related to the desired parallel lift. It is equally plain that when this is done certain parts of the clutch 8 of the cell door associated with the operated parallel lift will be elevated by the parallel lift, and the top plate 11 of said clutch will enter the keep 36 or 37 which is positioned to receive said top plate.

Access may be had to the indexing arms 43 so that they may be operated to elevate the parallel lifts 38, through the opening 32' formed in a wall of the housing 32 of the control unit D, and in order to close this opening to prevent unauthorized manipulation of the indexing arms I provide a plate 44. This plate is located within the housing 32 in contact with the inner face of the wall in which the opening 32' is formed, and said plate is pivoted to said wall at its lower end as indicated at 45 in Fig. 1. Rotatably supported within the housing 32 is a disk 46, a portion of said disk being extended through an opening formed through the outer end wall of the housing and the extended portion of said disk having a grip or handle 47 fixed thereto. Within the housing 32 a link 48 is pivotally attached at one end to the disk and at its opposite end to the plate 44, so that when the disk is rotated from without the housing 32 the plate will be drawn to a position where it closes the opening 32'. In order to secure the plate 44 in its position where it closes the opening 32', the disk is provided with a notch 49 which receives a locking element 50 of a suitable key-operated lock 51. Thus only an authorized person having the proper key may have access to the indexing arms 43, and such person may unlock the disk 46 and by rotating same may move the plate 44 to its open position, when access may be had to the interior of the housing 32 through the opening 32'. A panel of bullet-proof glass 52 (Fig. 8) is provided in the outer end wall of the housing 32 so that the positions of the indexing arms may be viewed without the necessity of unlocking and moving the plate 44 to its open position.

At one side of the door opening B of each cell of a row or tier of cells a hollow structure 53 is provided which extends from the top to the bottom of said door opening. This hollow structure is illustrated in detail in Figs. 9 and 10, wherein it is shown as being secured to the outer wall of a cell and at one side of the door opening B. The structure 53 includes an elongated channel element 54 which extends from top to bottom of the structure, and an elongated plate 55 which extends longitudinally of and closes the open side of the channel element 54. The plate 55 is provided with an elongated, inclined flange 56 at the outer edge thereof which serves to aline the door C when it is moved to a closed position. The channel element 54 is provided with an opening 57 formed through the web thereof, and the plate 55 is provided with an opening 58 which is of less height than the opening 57 and is alined horizontally therewith. Each cell door is provided at its bottom with an angle bar 59, the end portion of which, when the door is moved to a closed position, moves through said openings 57 and 58 as shown in Fig. 10, said angle bar 59 being provided with a tapered notch 60.

At the lower end of the structure 53 of the door opening of each cell a triangular-shaped housing 61 is provided, which encloses the opening 57 formed through the web of the channel element 54, this triangular-shaped housing being welded or otherwise secured in place. Arranged partially within the housing 61 and partially within the structure 53 is a closure 62 for the opening 58 in the plate 55. The closure 62 comprises a plate 63 to which is fixed a pair of arms 63', said arms being pivoted at their upper ends, as indicated at 65 in Fig. 9, to the opposed flanges of the channel bar 54. When the door C is moved to an open position the plate 63 will swing downwardly in an arc of a circle about the pivot points 65 until it contacts with the inner face of the plate 55, and in such position said plate will close the opening 58 in said plate 55. The plate 63 is locked in this position in a manner to be hereinafter explained, and therefore persons are prevented from tampering with the opening in attempting to render the door lock inoperative.

Associated with the parallel lift associated with the door of each cell of a row or tier of cells is a door locking bar 64 which is attached to the parallel lift 38 by an element 65 fixed to the top of the locking bar which is extended into the opening 38' formed in the parallel lift. The locking bar passes downwardly through the hollow structure 53 to a point adjacent to the openings 57 and 58 at the lower end thereof, and said locking bar is tapered lightly at its lower end as shown in Fig. 10. Because each locking bar is attached to the associated parallel lift, said locking bar is elevated when the parallel lift is raised and is lowered when the parallel lift is moved downwardly.

In Fig. 11 I illustrate a modified form of the invention wherein the locking mechanism 66 of a cell door C' is arranged at a point substantially above the bottom portion of the door, at the vertical center thereof, for instance.

Fixed to the angle bars 1 associated with the cell doors of a row or tier of cells is an angle bar 67 (Fig. 5) which extends throughout the length of the row or tier of cells. The angle bars 67 may be made in sections suitably connected together when the length of the row or tier of cells requires this arrangement, and said angle bar supports the lower end of a housing 68 which encloses the parts of the door operating and locking mechanism which are located above the cell doors. At its upper end the housing 68 is supported by a plurality of frame elements 69 which are spaced longitudinally within the housing. Associated with the frame elements 69 are vertically extended bars 70 which at their lower ends are welded or otherwise secured to the angle bars 1 and the angle bar 67. The vertical bars 70 support the rollers 23, which guide the movements of the bars 21 and 22, as well as the pivots at the upper ends of the hangers 39 of the parallel lifts 38. The lower ends of the arms 19 which are loosely suspended from the shafts 16 of the clutches 8 ride on the horizontal leg of the angle bar 67, as shown in Figs. 1, 2, 3, and 4.

By preference I arrange a longitudinally extended, horizontal wall 71 within the housing 68, and associate with this horizontal wall a vertically extended wall 72, as shown in Fig. 5. This provides a compartment in which the cables 41 are arranged, so that said cables may be maintained separate from the other parts of the mechanism.

In describing the operation of the mechanism, it will be assumed that the doors of all of the cells of a row or tier of cells are closed and locked, and that an authorized attendant desires to open certain of said doors, the doors of the first, third, sixth, and eighth cells, for instance. The attendant will unlock the lock 51 and move the plate 44 of the housing of the control unit D to uncover the opening 32' of said housing. He would then draw downwardly the outer ends of the indexing arms 43 which are associated with the doors to be opened, these arms being provided with numbers or other designations which indicate to what doors the various arms relate. When the indexing arms are drawn downwardly as described, the

parallel lifts 38 associated with the arms so actuated will be drawn upwardly by the cables 41, and as a result the slidable parts of the clutches 8 of the selected doors will be moved upwardly to cause the top plates 11 of said clutches to move into sockets or keeps 36 fixed to the bar 21. When the clutch parts are moved upwardly as described, the rollers 18 of said clutches are drawn upwardly out of the notches 6, but immediately before the rollers 18 clear the notches the top plates enter the keeps 36 and continued upward movement of the clutch parts moves the top plates completely up into the keeps and clears the rollers 18 of the notches. When the slidable clutch parts reach the limit of their upward movement the arms 19 forming parts of the clutches swing about the shafts 16 of the clutches, and assume the vertical position shown in Fig. 2, with the bottom edges of said arms in contact with the horizontal leg of the angle bar 67. This supports the slidable clutch parts and the parallel lifts in their elevated condition. When the parallel lifts 38 were elevated as described to move the slidable clutch parts upwardly, the locking bars 64 were also lifted by said parallel lifts to withdraw the lower portions of said locking bars from the notches 60 in the bars 59 of the cell doors.

The attendant then draws the slidably supported handle 33 outwardly beyond the opening 32' in the wall of the control housing 32 and turns said handle. This causes the pinion 26 to move the bar 21 toward the right and the bar 22 toward the left when said bars are viewed from in front of the cells, as illustrated in Figs. 1, 2, 3 and 4. As soon as movement of the bar 21 imparts like movement to the cell doors engaged therewith, the arms 19 are moved off of dead center and the grooved rollers 18 drop onto the upper edge of the angle bars 4, the arms 19 assuming the position illustrated in Fig. 3. During continued movement of the cell doors in the manner described, the grooved rollers 18 will ride along the top edges of the angle bars 4 until the doors reach their opened positions, when the grooved rollers 18 will drop into the notches 7 in the angle bars 4. This causes the parallel lifts 38 to move downwardly a slight distance, with the result that the indexing arms 23 and the locking bars 54 associated with said parallel lifts will likewise be lowered. When the doors start their movement to open positions the plates 63 within the triangular housings 61 move on an arc of a circle to positions where said plates contact with the inner faces of the plates 55 so as to cover the openings 58, and when the locking bars move downwardly as the grooved rollers 18 of the clutches drop into the notches 7, their lower end portions move behind the plates 63 and lock them in their opening-covering position, as indicated by dotted lines in Fig. 10. It is to be noted that when the doors reach their open positions and the grooved rollers drop into the notches 27, the doors are positively locked in such open positions.

When it is desired to close certain cell doors which have already been opened, the attendant draws the proper indexing arms 43 downwardly from the "open" position of said arms to the "unlocked" position thereof (Fig. 4). This will elevate the associated parallel lifts 38 and will raise the slidable parts of the clutches of the selected cell doors to cause the top plates 11 thereof to enter the sockets or keeps 37 of the bar 22, the arms 19 of the clutches assuming their vertical positions and holding the elevated clutch parts in their raised positions. At this time also the locking bars 64 will be elevated to free the plate 63 within the housings 61. The handle 33 is then turned to move the engaged doors to their closed positions, the arms 19 being tipped from their vertical positions and being drawn along by the moving doors with the lower ends of said arms riding on the horizontal leg of the angle bar 67, as suggested in Fig. 4. When the doors reach the closed positions the grooved rollers drop into the notches 6 and the locking bars drop downwardly, so that the lower end portions thereof enter the notches 60 in the angle bars 59 of the cell doors to lock the doors.

It is important to note that when the grooved rollers 18 of the clutches of cell doors are in the notches 7 and the sliding parts of the clutches are moved upwardly to engage the top plates 11 of the clutches with the keeps 37 of the lower bar 22, the degree of movement necessary is much less than when the slidable clutch parts are moved upwardly out of the notches 6 to engage the keeps 36 of the upper bar 21. It is in this situation that the coilsprings 15 of the clutches are brought into play, inasmuch as when the top plates 11 of the clutches move into and are arrested by the keeps 37 said coilsprings, by compressing, permit the plates 13 and the extensions 14 to continue to move upwardly to the proper elevation to clear the grooved rollers of the clutches from the notches 7.

It has now been described how selected cell doors may be opened or closed in the use of the improved mechanism, but the predominant feature of the invention is not in connection with these movements of the cell doors. Instead it relates to the fact that certain selected cell doors may be opened simultaneously with the closing of other selected cell doors and during the same operation of the mechanism. It is perfectly obvious that the slidable parts of clutches of open doors may be elevated to engage the keep 37 of the lower bar 22, while the slidable parts of the clutches of closed doors are elevated to engage keeps 36 of the upper bar 21. This results from the fact that each door is independently indexed by operating the proper indexing arm 43. It follows, therefore, that when certain closed doors are clutched to the bar 21 and certain other open doors are clutched to the bar 22, the bar 21 will open the closed door and the bar 22 will close the open doors upon a single operation of the mechanism. Because of this fact the mechanism disclosed herein is capable of much wider field of selectivity and is able to perform its function in a much more efficient manner than were similar mechanisms heretofore known.

It will be noted that an attendant may determine the positions of the cell doors by merely viewing the positions of the indexing arms 43 through the glass panel 52, said arms taking different positions when the doors are "closed", "open", and "unlocked", as shown in Fig. 4. It is also important to note that the cell doors are never out of control of the mechanism, that is, free to be moved by hand, as they are never freed from the notches 6 and 7 until they are engaged by the keeps 36 and 37 and are never freed from the keeps until they are engaged by the notches.

I claim:

1. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of door moving means movable simultaneously in substantially horizontal opposite directions, shiftable means for connecting

said cell doors to one or the other of said pair of door moving means, selector means for causing said shiftable means to connect predetermined cell doors to one or the other of said pair of door moving means, and operating means common to both of said pair of door moving means for imparting simultaneous movement to said pair of door moving means in opposite directions.

2. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of door moving means movable simultaneously in substantially horizontal opposite directions, shiftable means for connecting said cell doors to one or the other of said pair of door moving means, selector means for causing said shiftable means to connect predetermined cell doors to one or the other of said pair of door moving means, and operating means common to both of said pair of door moving means for imparting simultaneous movement to said pair of door moving means in opposite directions, said operating means including racks associated with said pair of door moving means, a pinion cooperatively associated with said racks, a rotatable handle, and means for transmitting rotary motion from said rotatable handle to said pinion whereby said pair of door moving means are moved in opposite directions during rotation of said handle in a single direction.

3. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of elements movable simultaneously in substantially horizontal opposite directions, means carried by each of said cell doors including a shiftable member for engaging one or the other of said pair of elements, selector means for causing said shiftable members carried by the cell doors to engage one or the other of said pair of elements, and means common to both of said pair of elements for imparting simultaneous movement to said pair of elements in opposite directions.

4. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of traveling elements movable simultaneously in substantially horizontal opposite directions, means carried by each of said cell doors including a shiftable member for engaging one or the other of said pair of traveling elements, means fixed to said traveling elements for receiving in engagement therewith said shiftable members, means including an element associated with each of said cell doors adapted to be raised and lowered for selectively causing the shiftable member carried by the cell door to engage a fixed receiving means of one or the other of said pair of traveling elements, and means common to both of said pair of traveling elements for imparting simultaneous movement to said pair of traveling elements in opposite directions.

5. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of traveling elements movable simultaneously in substantially horizontal opposite directions, means carried by each of said cell doors including a shiftable member for engaging one or the other of said pair of traveling elements, means fixed to said traveling elements for receiving in engagement therewith said shiftable members, means including a lifting element associated with each of said cell doors for selectively causing the shiftable member carried by the cell door to engage a fixed receiving means of one or the other of said pair of traveling elements, said lifting element being supported for swinging movement upwardly and downwardly, and means common to both of said pair of traveling elements for imparting simultaneous movement to said pair of traveling elements in opposite directions.

6. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and having the shiftable means of the associated cell door movably connected thereto, and means for imparting simultaneous movement to said pair of bars in opposite directions.

7. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and being provided with an elongated opening through which a portion of the shiftable means of the associated cell door extends so as to movably connect said shiftable means to said element, and means for imparting simultaneous movement to said pair of bars in opposite directions.

8. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being suspended for maintained horizontal movement upwardly and downwardly and being provided with an elongated opening through which a portion of the shiftable means of the associated door extends so as to movably connect said shiftable means to said element, and means for imparting simultaneous movement to said pair of bars in opposite directions.

9. In combination with a plurality of cell doors, a mechanism for operating said cell doors, com-

prising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being suspended by pivotally supported hangers for maintained horizontal movement upwardly and downwardly and being provided with an elongated opening through which a portion of the shiftable means of the associated door extends so as to movably connect said shiftable means to said element, and means for imparting simultaneous movement to said pair of bars in opposite directions.

10. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and having the shiftable means of the associated cell door movably connected thereto, means for selectively imparting movement to said elements associated with the various cell doors, and means for imparting simultaneous movement to said pair of bars in opposite directions.

11. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and having the shiftable means of the associated cell door movably connected thereto, means including indexing arms for selectively imparting movement to said elements associated with the various cell doors, and means for imparting simultaneous movement to said pair of bars in opposite directions.

12. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and having the shiftable means of the associated cell door movably connected thereto, means including indexing arms for selectively imparting movement to said elements associated with the various cell doors, connecting means for connecting said indexing arms to said elements, and means for imparting simultaneous movement to said pair of bars in opposite directions.

13. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and having the shiftable means of the associated cell door movably connected thereto, a locking bar loosely connected to the element associated with each cell door and movable therewith to lock and unlock the associated cell door, and means for imparting simultaneous movement to said pair of bars in opposite directions.

14. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, shiftable means carried by said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith said shiftable means, a fixed member associated with each cell door and provided with openings adapted to receive parts of said shiftable means to maintain the cell doors in fixed positions, means including an element associated with each of said cell doors for causing the shiftable means carried by the associated cell door to engage a fixed receiving means of one or the other of said pair of bars, said element being supported for upward and downward swinging movement and having the shiftable means of the associated cell door movably connected thereto, a locking bar loosely connected to the element associated with each cell door and movable therewith to lock and unlock the associated cell door, means for guiding said locking bars for vertical movement, and means for imparting simultaneous movement to said pair of bars in opposite directions.

15. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, a clutch carried by each of said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith parts of said

clutches, each of said clutches comprising a guiding element fixed to a part of the associated cell door, and a shiftable unit supported for movement by said guiding element and movable into engagement with the fixed means of said pair of bars, and means for imparting simultaneous movement to said pair of bars in opposite directions.

16. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, a clutch carried by each of said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith parts of said clutches, each of said clutches comprising a guiding element fixed to a part of the associated cell door, a pair of units supported for movement by said guiding element, and a resilient element associated with said units in such manner that they may move as a single unit or one thereof may move relative to the other, and means for imparting simultaneous movement to said pair of bars in opposite directions.

17. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, a clutch carried by each of said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith parts of said clutches, each of said clutches comprising a guiding element fixed to a part of the associated cell door, a unit supported for movement by said guiding element which includes a pair of spaced members and a top plate, a second unit comprising a plate provided with an extension which is extended between said spaced members of the first-mentioned unit, and a resilient element interposed between said top plate and said extension whereby said first and second-mentioned units may move as a single unit or one thereof may move relative to the other, and means for imparting simultaneous movement to said pair of bars in opposite directions.

18. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, a clutch carried by each of said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith parts of said clutches, a horizontally maintained element associated with each cell door and movable upwardly to move a part of the clutch of the associated cell door into engagement with fixed receiving means of one or the other of said pair of bars, said horizontally maintained elements being each provided with an elongated opening through which a part of the associated clutch passes to loosely connect the clutch of each cell door to the horizontally maintained element associated with said cell door, a fixed member associated with each door and provided with notches, a roller asscciated with each of said clutches, said roller being adapted to ride on the upper edge of the associated fixed member and move downwardly into the notches thereof to lock the cell door in fixed positions, and means for imparting simultaneous movement to said pair of bars in opposite directions.

19. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, a clutch carried by each of said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith parts of said clutches, a horizontally maintained element associated with each cell door and movable upwardly to move a part of the clutch of the associated cell door into engagement with fixed receiving means of one or the other of said pair of bars, said horizontally maintained elements being each provided with an elongated opening through which a part of the associated clutch passes to loosely connect the clutch of each cell door to the horizontally maintained element associated with said cell door, a fixed member associated with each door and provided with notches, a roller associated with each of said clutches, said roller being adapted to ride on the upper edge of the associated fixed member and move downwardly into the notches thereof to lock the cell door in fixed positions, an arm forming a part of each clutch for maintaining the clutch in an elevated position out of a notch from which the clutch has been raised, a fixed bar with which said arm contacts, and means for imparting simultaneous movement to said pair of bars in opposite directions.

20. In combination with a plurality of cell doors, a mechanism for operating said cell doors, comprising a pair of bars movable simultaneously in opposite directions, a clutch carried by each of said cell doors for engaging one or the other of said pair of bars, means fixed to said bars for receiving in engagement therewith parts of said clutches, a horizontally maintained element associated with each cell door and movable upwardly to move a part of the clutch of the associated cell door into engagement with fixed receiving means of one or the other of said pair of bars, said horizontally maintained elements being each provided with an elongated opening through which a part of the associated clutch passes to loosely connect the clutch of each cell door to the horizontally maintained element associated with said cell door, a fixed member associated with each door and provided with notches, a roller associated with each of said clutches, said roller being adapted to ride on the upper edge of the associated fixed member and move downwardly into the notches thereof to lock the cell door in fixed positions, an arm forming a loosely suspended part of each clutch for maintaining the clutch in an elevated position out of a notch from which the clutch has been raised, a fixed bar with which said arm contacts, and means for imparting simultaneous movement to said pair of bars in opposite directions.

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