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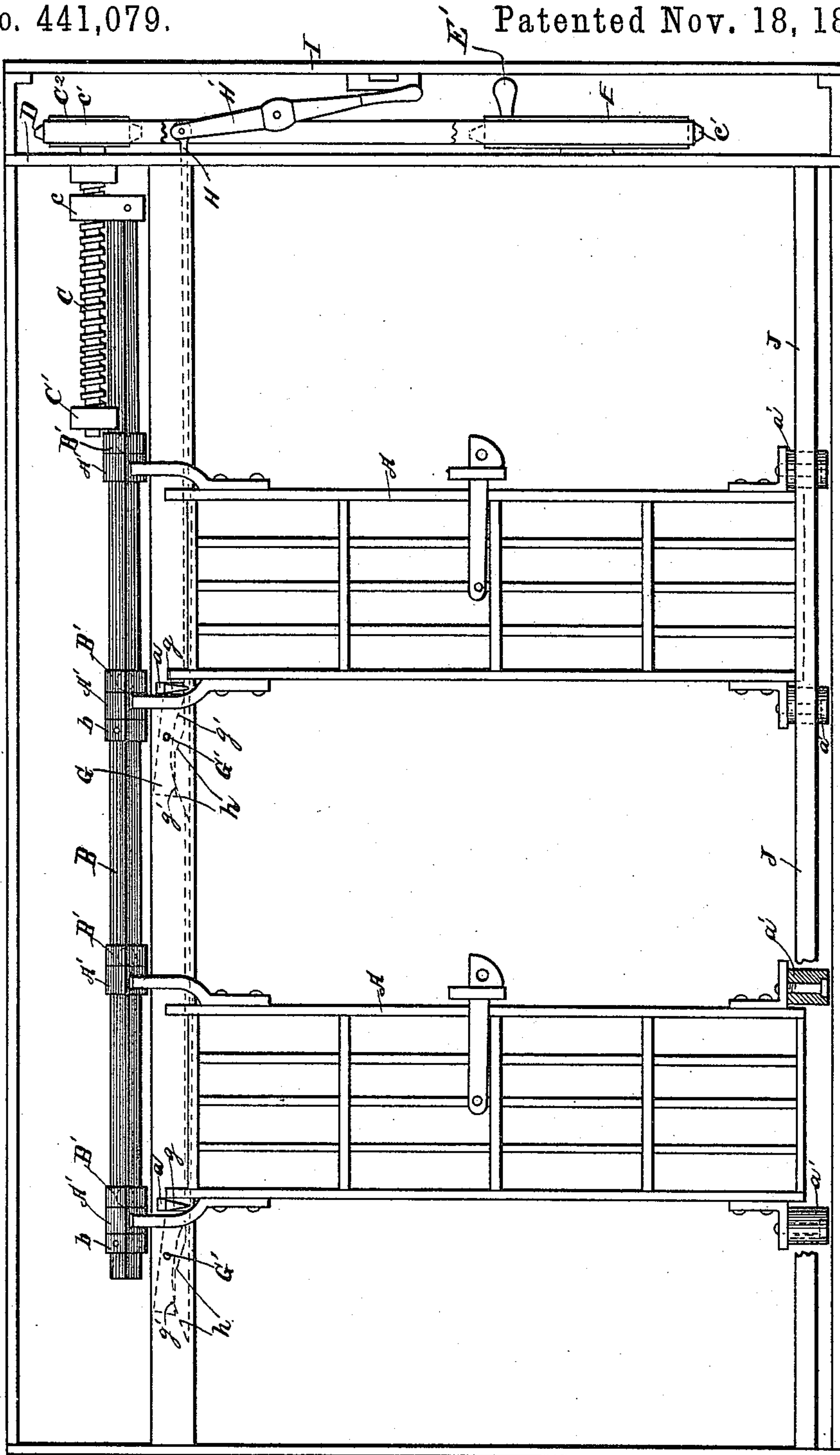
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J. H. VAN DORN.  
PRISON DOOR MECHANISM.

No. 441,079.

Patented Nov. 18, 1890.

Fig. 1



Witnesses  
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(No Model.)

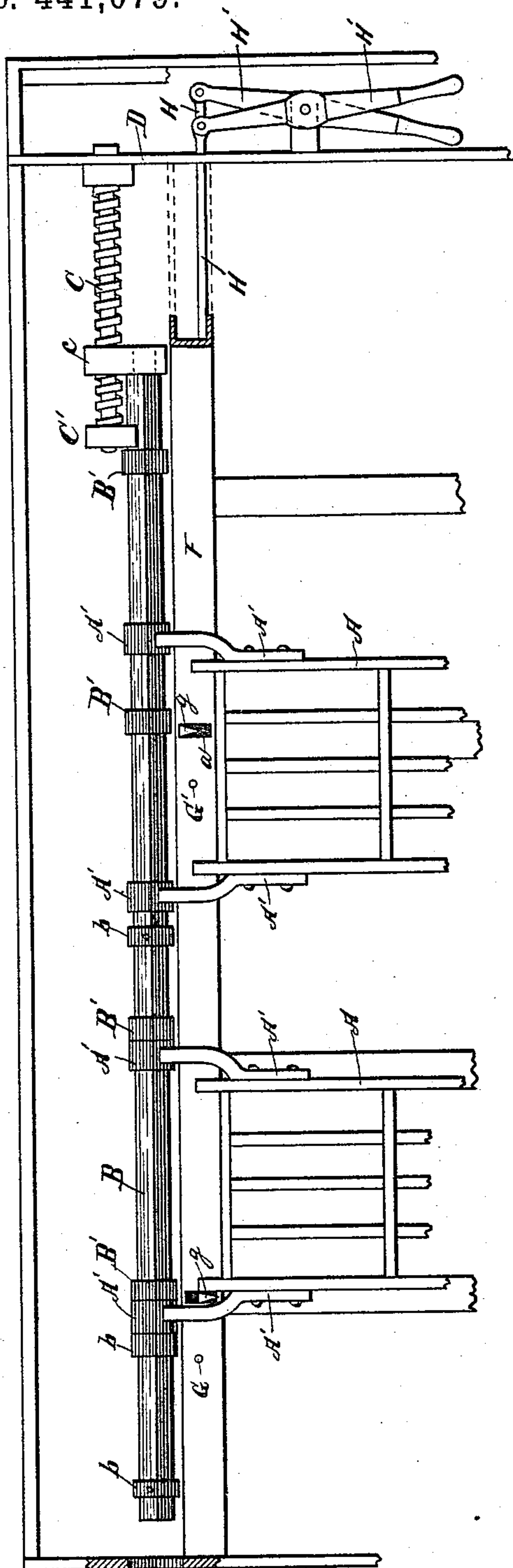
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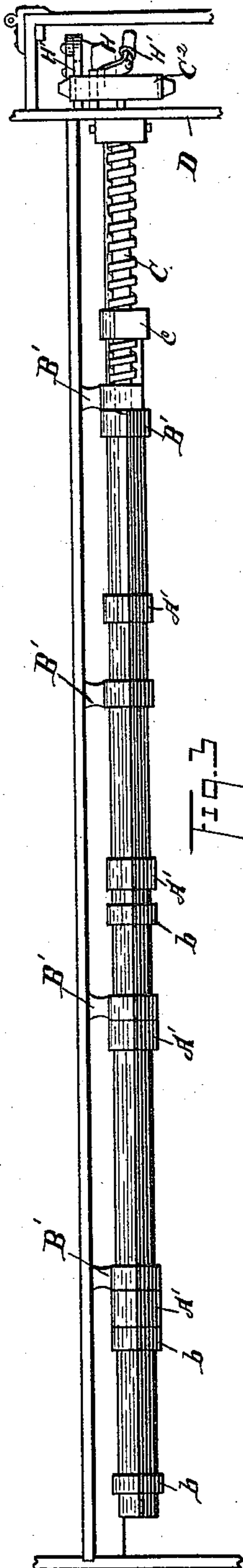
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Fig. 2



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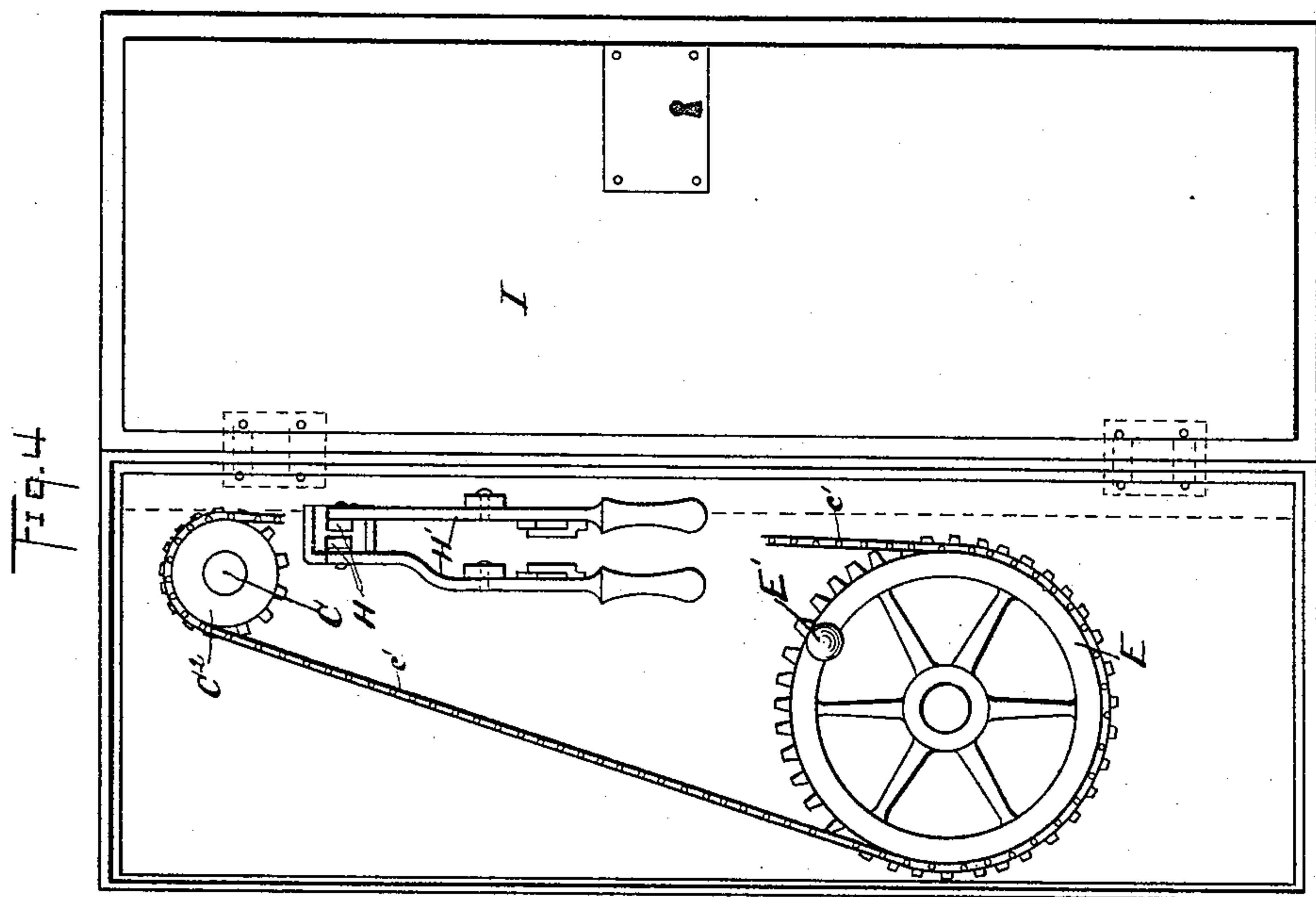
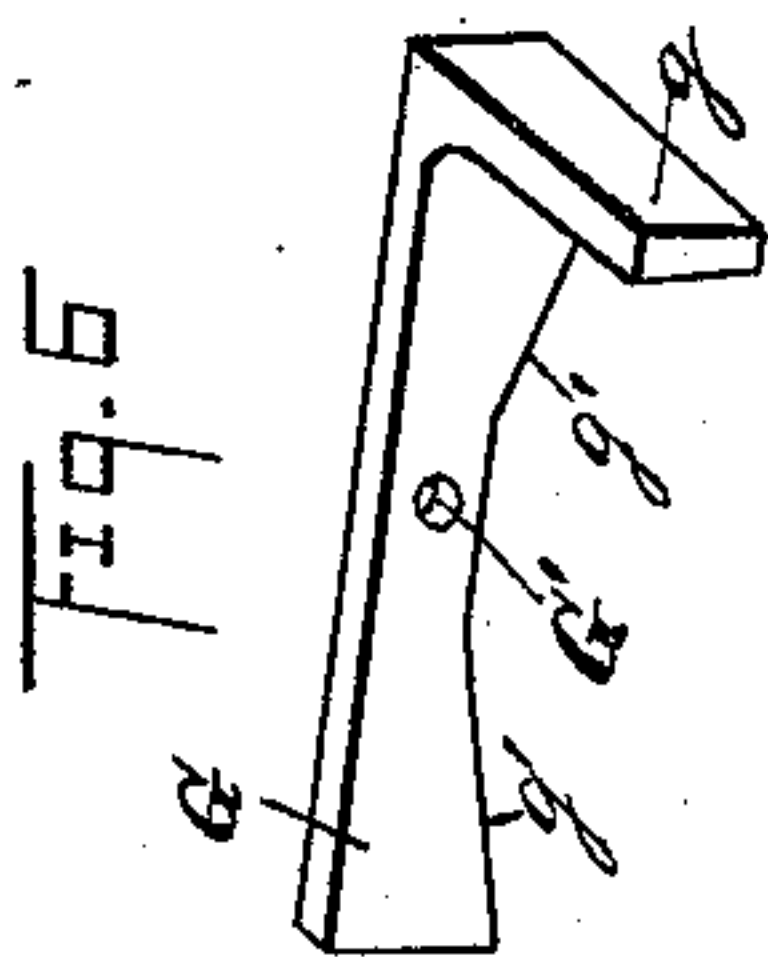
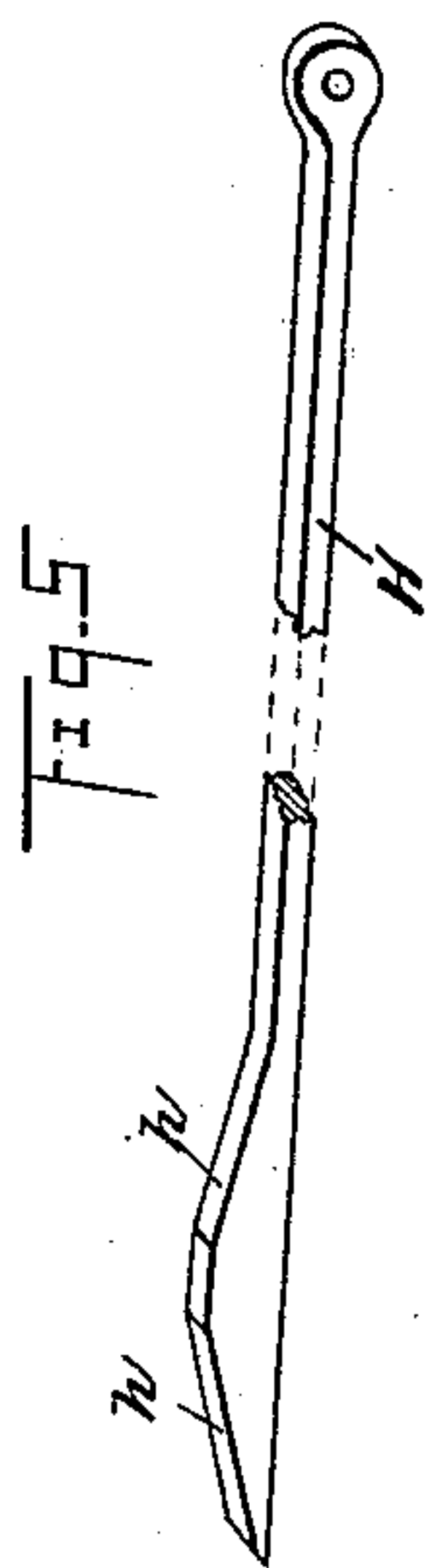
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# UNITED STATES PATENT OFFICE.

JAMES H. VAN DORN, OF CLEVELAND, OHIO.

## PRISON-DOOR MECHANISM.

SPECIFICATION forming part of Letters Patent No. 441,079, dated November 18, 1890.

Application filed January 23, 1890. Serial No. 337,804. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. VAN DORN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and  
5 useful Improvements in Prison-Door Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make  
10 and use the same.

My invention relates to improvements in prison-door mechanism for automatically opening, closing, locking, and unlocking, for instance, the doors of a row of cells, and com-  
15 prising, first and primarily, mechanism for simultaneously and at one operation unlocking and opening or simultaneously and at one operation closing and locking a series of sliding cell-doors, and, secondly, my invention  
20 comprises counter-locking mechanism operated from a given station for locking and unlocking the doors separately and independent of the primary mechanism aforesaid.

My invention also relates to details of construction hereinafter described, and pointed  
25 out in the claims.

In the accompanying drawings, Figures 1 and 2 are side elevations, the former showing the doors in position closed and the latter  
30 showing one of the doors partly open. Fig. 3 is a plan. Fig. 4 is an end elevation. Figs. 5 and 6 are details, hereinafter described.

As is well known, the cells of a jail or prison are usually arranged in rows, different rows  
35 being arranged in tiers, the one above the other, the cells of each row opening onto a corridor, and the doors of a row of cells are supposed to be alike. In Figs. 1 and 2 are shown two sliding doors A A for closing two cells of  
40 a row of cells, the doors in Fig. 1 being shown closed and locked. In Fig. 2 one of the doors is shown partly open.

The primary mechanism for simultaneously unlocking and opening the series of doors at  
45 one operation and for simultaneously closing and locking the series of doors at one other operation is preferably as follows: B is a heavy metal locking and carrying bar extending the entire length of the row of cells, this  
50 bar being preferably square in cross-section, and preferably set edgewise. However, the shape of the bar is not very important, and a

round bar, for instance, would answer the purpose. This bar is supported by a series of brackets B', the latter projecting from the  
55 walls, usually some little distance above the line of the cell-doorways. The doors are suspended from bar B by means of hangers A', secured to the edges of the door near the top of the latter, as shown, the heads of these  
60 hangers embracing bar B with an easy fit, so that the hangers may slide on the bar, if need be. The relative positions of brackets B' and hangers A' are such that the hangers abut the brackets, and thereby serve  
65 as stops for the door in closing the latter. Bar B is provided with a series of collars b or other projecting members, secured in position on the bar to respectively engage the rear or, as shown, left-hand hanger  
70 in closing and holding the door closed and locked. With such construction the doors are supported entirely by bar B, and hence any of the doors that are not locked by other means or otherwise fastened will travel with  
75 bar B, and the bar having been moved endwise in the direction to open the doors, such of the doors as were otherwise locked at the time by means of counter-locking mechanism, hereinafter described, will remain closed; but  
80 if afterward unlocked such doors may afterward be opened by hand, and any open door at any time may be closed and opened by hand—for instance, at the pleasure of the prisoners or other person—the hangers in  
85 such case sliding on bar B.

For actuating-bar B endwise in opening and closing the doors, I provide, preferably, as follows: C is a heavy screw-rod supported  
90 at the one end by bracket C', the other end of the rod extending through a hole in the wall D, the latter being supposed to be the end wall of the row of cells and corridor. Outside this wall a sprocket-wheel C<sup>2</sup> is  
95 mounted on rod C. The screw-rod is provided with nut c, the latter being rigidly connected with bar B. Hence by turning rod C on its axis bar B is actuated endwise. Sprocket-wheel C<sup>2</sup> may be connected by means of end-  
100 less chain c' with sprocket-wheel E, the latter being provided with hand-crank E' within easy reach of the operator standing on the floor, and by operating this crank screw-rod C and bar B are actuated.



The secondary or counter-locking mechanism for locking and unlocking the doors separately and independent of the action of bar B may be as follows: F is a channel-bar secured  
 5 with its flanged face to the walls opposite the top of doors A, this channel-bar extending the length of the row of cells and of course inclosing a long chamber therein, in which chamber operates a series of latches G and a  
 10 corresponding series of rods H and their attached inclines for tilting the respective latches. Latches G are pivoted at G', and the free ends *g* of the latches are bent approximately at right angles to the body of  
 15 the latches, members *g* projecting forward, respectively, through slots in the channel-bar, these latches being located, respectively, in position to engage notches *a* of the different doors when the latter are in position  
 20 closed. Notches *a* are preferably formed, as shown, at the junction of the left-hand hangers with the door-frames. Latches G on either side of the fulcrum thereof are provided with inclines *g' g'*, set in the reverse order shown.  
 25 The respective rods H are provided with corresponding inclines *h h* for engaging inclines *g' g'* of the latches for tilting these latches both in locking and unlocking the doors, these inclines holding the latches in either  
 30 position open or closed. Rods H extend through holes in wall D, each rod having attached a depending lever H' for operating the same, the handles of these levers being within easy reach of the operator.  
 35 In operating the device, if all of the cell-doors are to be opened latches G are all raised so as to unlock these doors so far as the counter locking is concerned, after which all of the doors will open and close and be simulta-  
 40 neously unlocked and locked by the movements of bar B. In jails it is customary to allow a few of the prisoners at a time to come out of the cells into the corridor for exercise, and with the construction shown any cells that  
 45 are to be opened are first unlocked by raising latches G of these cells, after which such unlocked doors are operated by the movements of rod B; but any cell or cells that are to remain closed, the levers G belonging to such  
 50 cell or cells are left in position locking these cell-doors, and hence the shifting of rod B does not affect such door.

The sprocket-wheels and levers H' are inclosed in a metal closet, the door I of which is of  
 55 course locked over night and locked at other times when necessary.

The bottom of doors A operate in a channel made between the wall and angle-iron J, the latter usually being secured to the floor out-  
 60 side the row of cells, so that the doors cannot be swung forward, and preferably the doors are provided with a roller *a'* for engaging member J, so that the doors may move with little friction and at the same time have no  
 65 lateral play between the doors and members J.

In place of angle-iron, channel bar or bars of other form may be employed for holding

the bottom of the doors, and instead of being bolted to the floor they may be blocked away from and secured to the front walls of the  
 70 cells.

In addition to my improved mechanism for locking and counter locking and shifting the doors, the latter may be provided, as heretofore, at the central portion thereof with any  
 75 hand latching or locking devices desired.

I have sometimes employed two bars B, the second bar being located at the bottom of the doors, with screw mechanism for operating the two bars in unison, in which case the  
 80 channel in which the bottom of the doors is shown to operate can be dispensed with, as the lower bar will hold the bottom of the doors from being sprung away from the wall. This last-mentioned construction, having two slid-  
 85 ing bars, is considerably more expensive, and hence I prefer the mechanism as shown. Besides, the lower sliding bar soon becomes smeared with dirt from the feet of the passing  
 90 prisoners, in which case this bar operates badly in the bearings thereof.

To recapitulate, the primary mechanism, including bar B and its attachments and the counter-locking mechanism, including latches G, are entirely separate and operate independ-  
 95 ently of each other, the one operating alike simultaneously on all the doors of the series and the other operating on the doors separately, and either or both may be used at the option of the operator by first raising all the  
 100 latches G, so as to unlock all of the doors, so far as the counterlocking is concerned. After this all of the doors can be operated simultaneously by bar B, one movement of this bar unlocking and opening all of the doors, and  
 105 the reverse movement of the bar closing and locking all of the doors. If, however, it is desired to open only a certain number of the doors, leaving the other doors fastened, in such cases latches G are raised for releasing  
 110 such of the doors as are to be opened and the remainder of latches G are allowed to remain, locking the doors that are to remain closed, after which such of the doors as may have been unlocked by the counter-locking mech-  
 115 anism may be opened and closed at pleasure by means of bar B, and such doors having once been unfastened by backing off bar B such doors may afterward be closed and opened as often as it is desired by hand by  
 120 the prisoners themselves. Hence any cell or cells that may be vacant or may contain dangerous persons, such cell or cells may, if preferred, remain closed and locked by means of the counter-locking mechanism for any  
 125 length of time. Meanwhile the remainder of the cells may be opened and closed as aforesaid.

I will here remark that the power applied by means of the screw to the doors—for in-  
 130 stance, in closing the latter—is such that the prisoners cannot successfully resist such closing of the doors, and provided a prisoner should thrust some hard substance that he



might have in his possession in between the door and door-frame, whereby the door could not be closed within an inch or two, more or less, the doors in such partially-closed position would be effectually and securely locked by means of bar B and collars b.

The details of construction may be varied almost indefinitely without departing from the purpose or spirit of my invention. For instance, other mechanism than the screw could be substituted for operating-bar B. The screw, however, is simple, cheap, and effective, and hence is preferred to more complicated mechanism for the purpose; also, the arrangement of latches and inclines for raising the latches could be varied indefinitely and still perform the same service; also, upright shaft and beveled gearing could be substituted for the sprocket-wheels and chain shown.

What I claim is--

1. The combination, with a row of cells, of a sliding bar and rigid stops or abutments thereon for holding the doors closed when the bar is at one extreme of its movement and for limiting the movements of the doors when the bar is at the other extreme.

2. The combination, with carrying-bars and doors suspended therefrom and adapted to move with or slide on the carrying-bars, and collars mounted on the carrying-bars in position to hold the doors closed or to limit the movement of the doors, of a screw-rod for actuating the carrying-bars, such screw-rod having a nut connected with the carrying-bar, substantially as set forth.

3. The combination, with a reciprocating carrying-bar and doors suspended from such carrying-bar so as to move with or slide on the latter, of gravity-latches adapted, respectively,

to engage notches in the doors for locking the doors in closed position, inclines for lifting such latches in unlocking the doors, and one or more rods for operating such inclines, such rod or rods extending outside of the cell inclosure, substantially as set forth.

4. The combination, with a reciprocating carrying-bar and means for operating the same, and a series of sliding doors suspended from such carrying-bars, of gravity-latches adapted to engage notches in the respective door mechanism for locking the doors in closed position, an incline for tilting each gravity-latch in unlocking the door, and a rod connected with each incline for operating the latter, such rod having attached a lever for operating the rods, substantially as set forth.

5. The combination, with a series of sliding doors, of primary and counter locking mechanism operating independent of each other, the primary locking mechanism comprising a locking-bar adapted to simultaneously unlock and open and to simultaneously close and lock the doors of the series by reverse movements of the locking-bar, the counter-locking devices comprising latches or bolts for locking and unlocking each door separately, and suitable connecting mechanism, substantially as shown, for operating the different latches or bolts of the counter-locking mechanism from a given station, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 11th day of December, 1889.

JAMES H. VAN DORN.

Witnesses:

CHAS. H. DORER,

WILL B. SAGE.