No. 772,469. PATENTED OCT. 18, 1904.

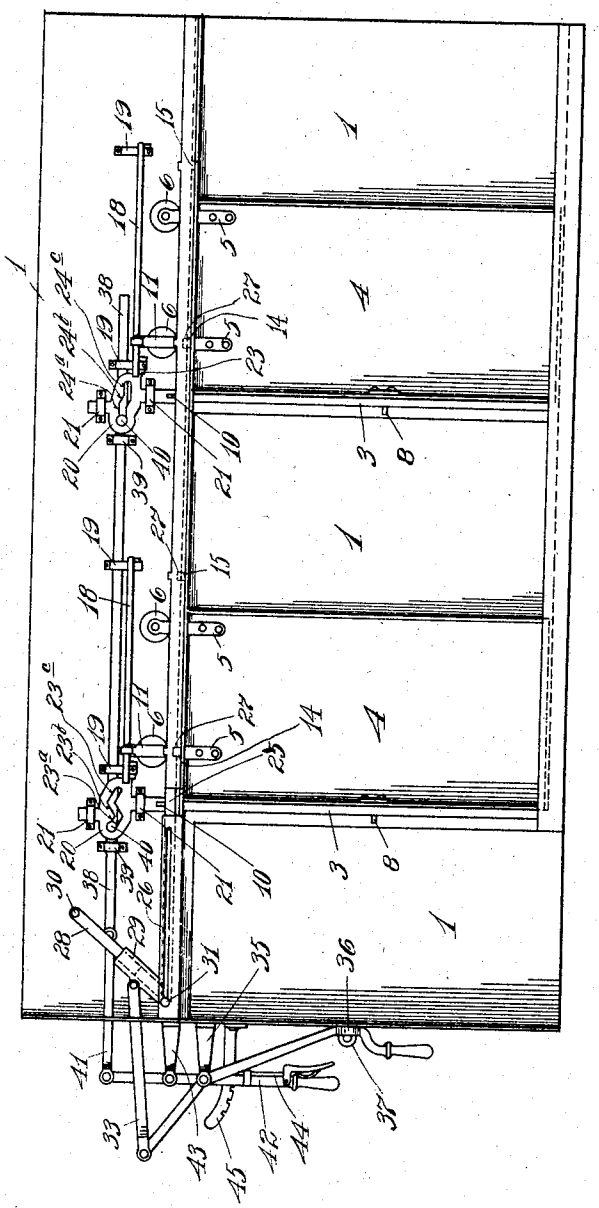
L. MAYER.

JAIL DOOR OPERATING DEVICE.

APPLICATION FILED MAY 24, 1904.

NO MODEL. 6 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
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By his Attorneys.
Williamson & Merchant

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NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2.

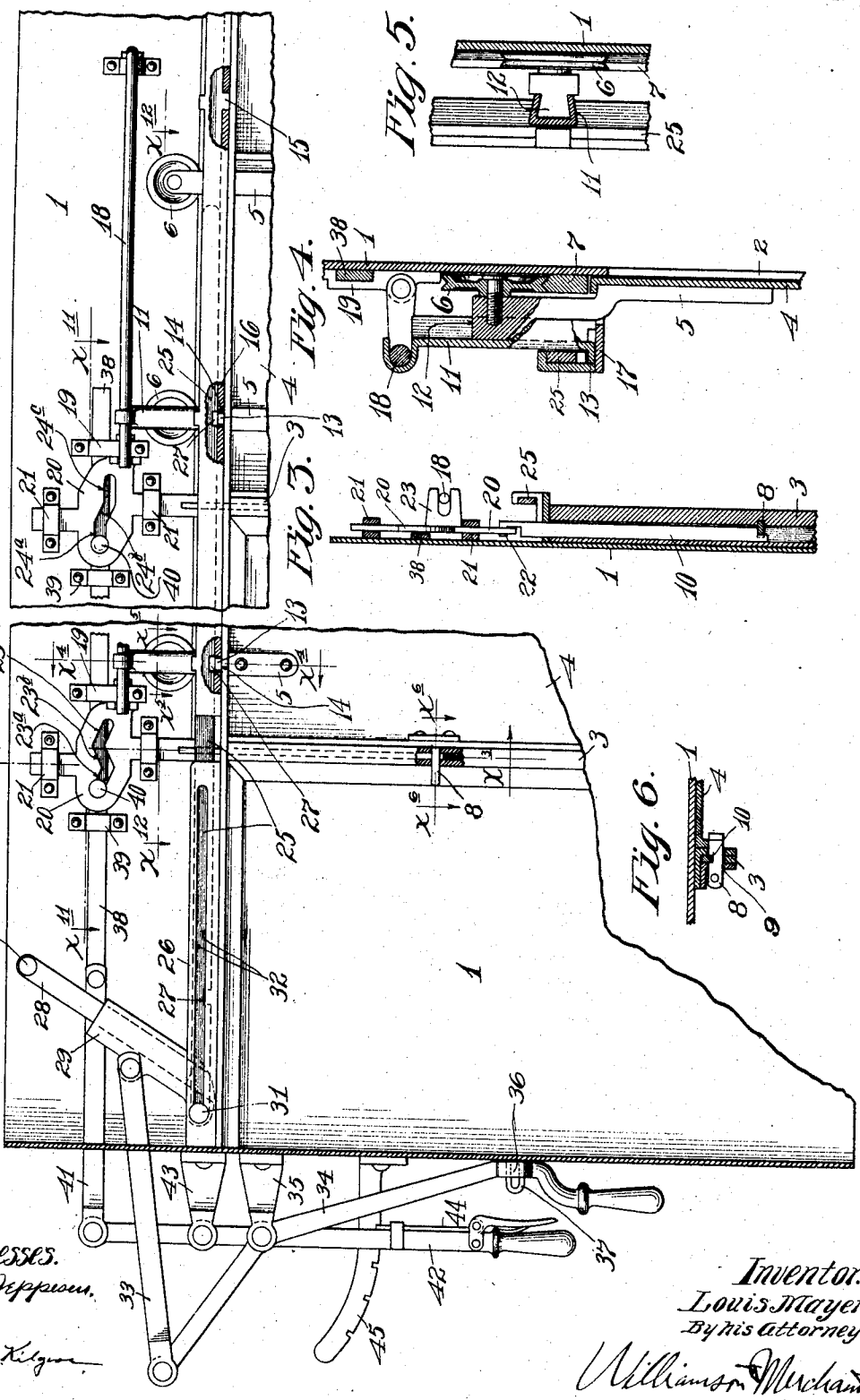


Fig. 5.

Fig. 4.

Fig. 3.

Fig. 6.

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NO MODEL.

6 SHEETS—SHEET 3.

Fig. 7.

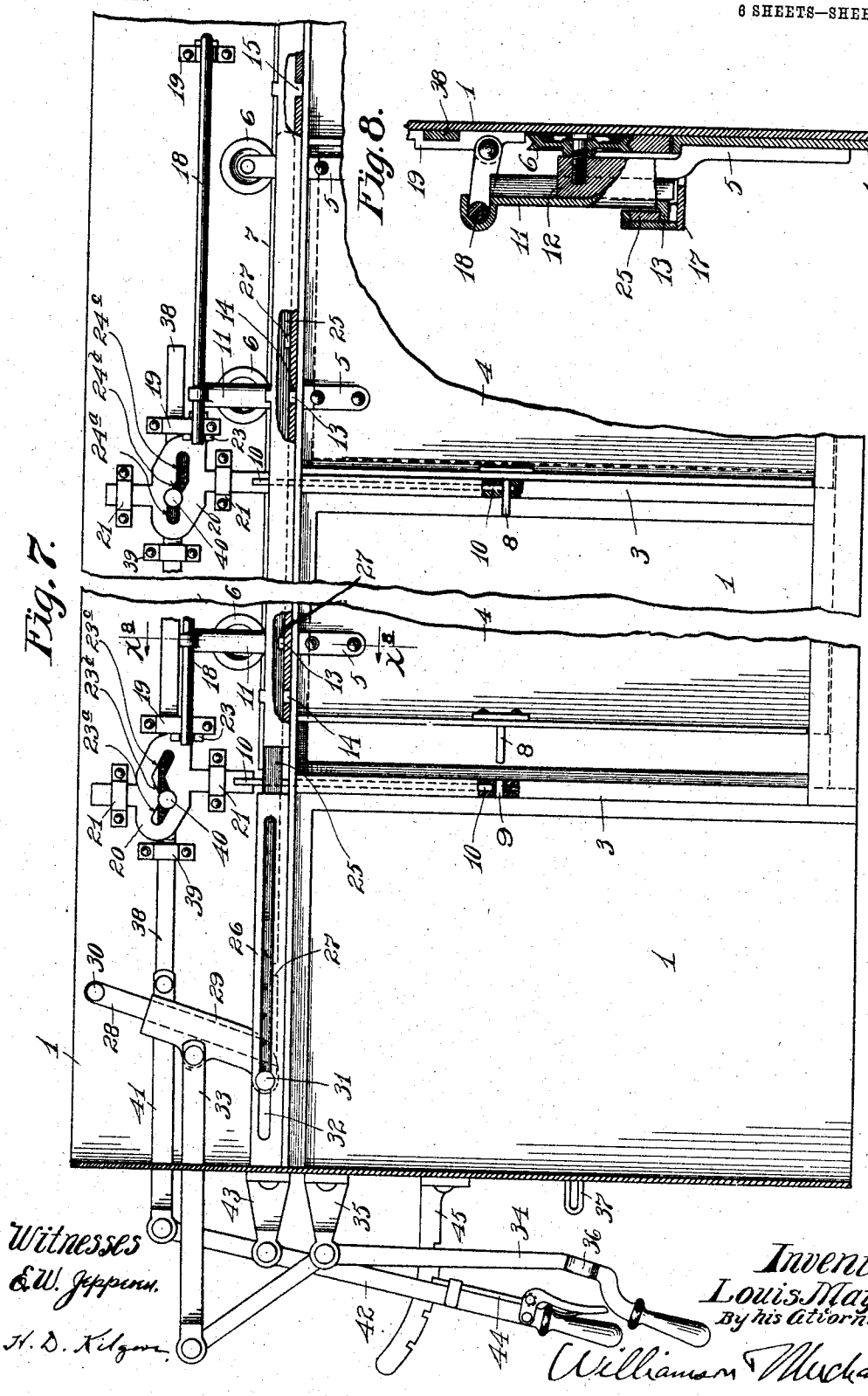


Fig. 8.

Witnesses
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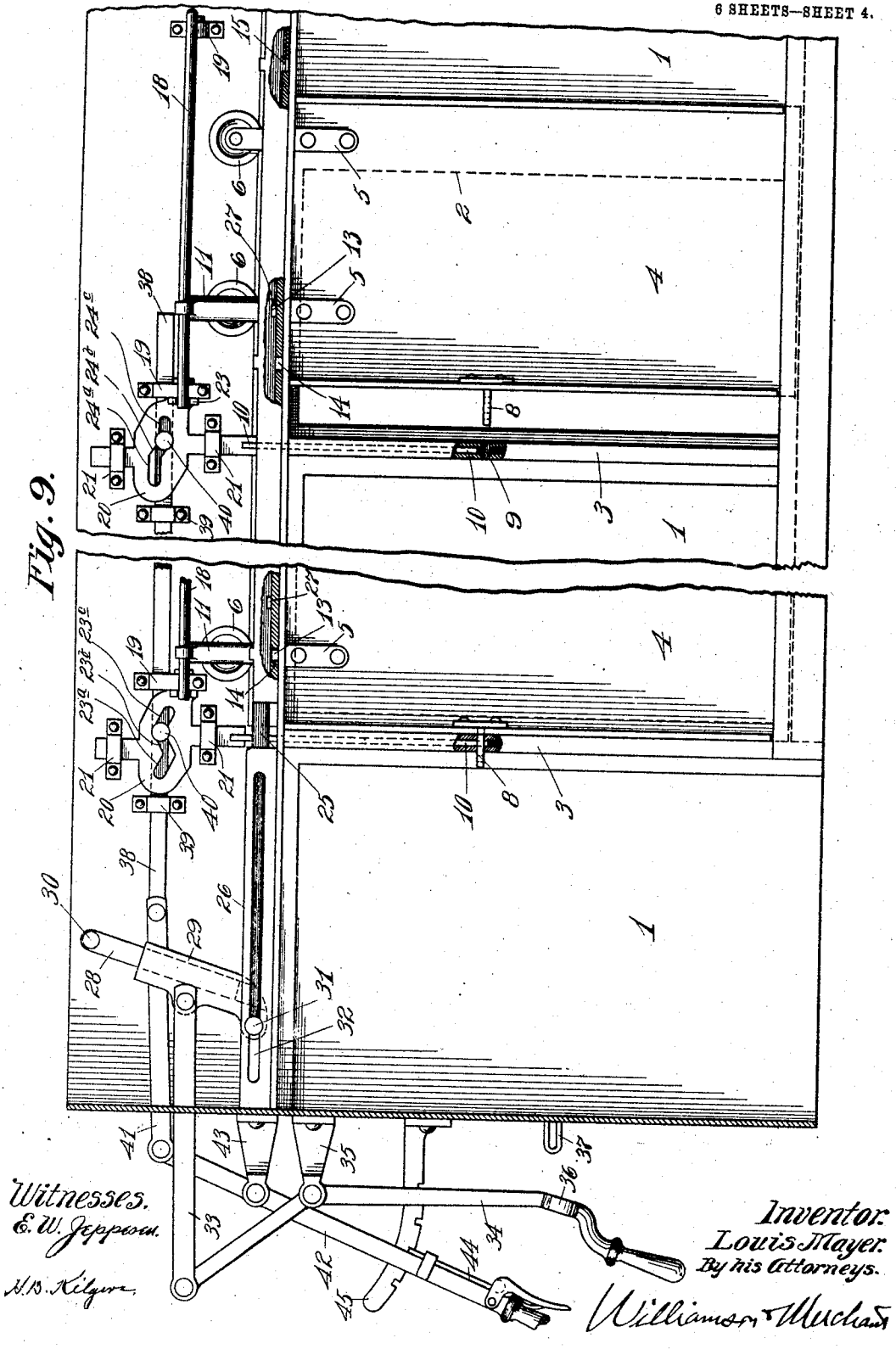
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NO MODEL. 6 SHEETS—SHEET 4.

Fig. 9.



Witnesses.
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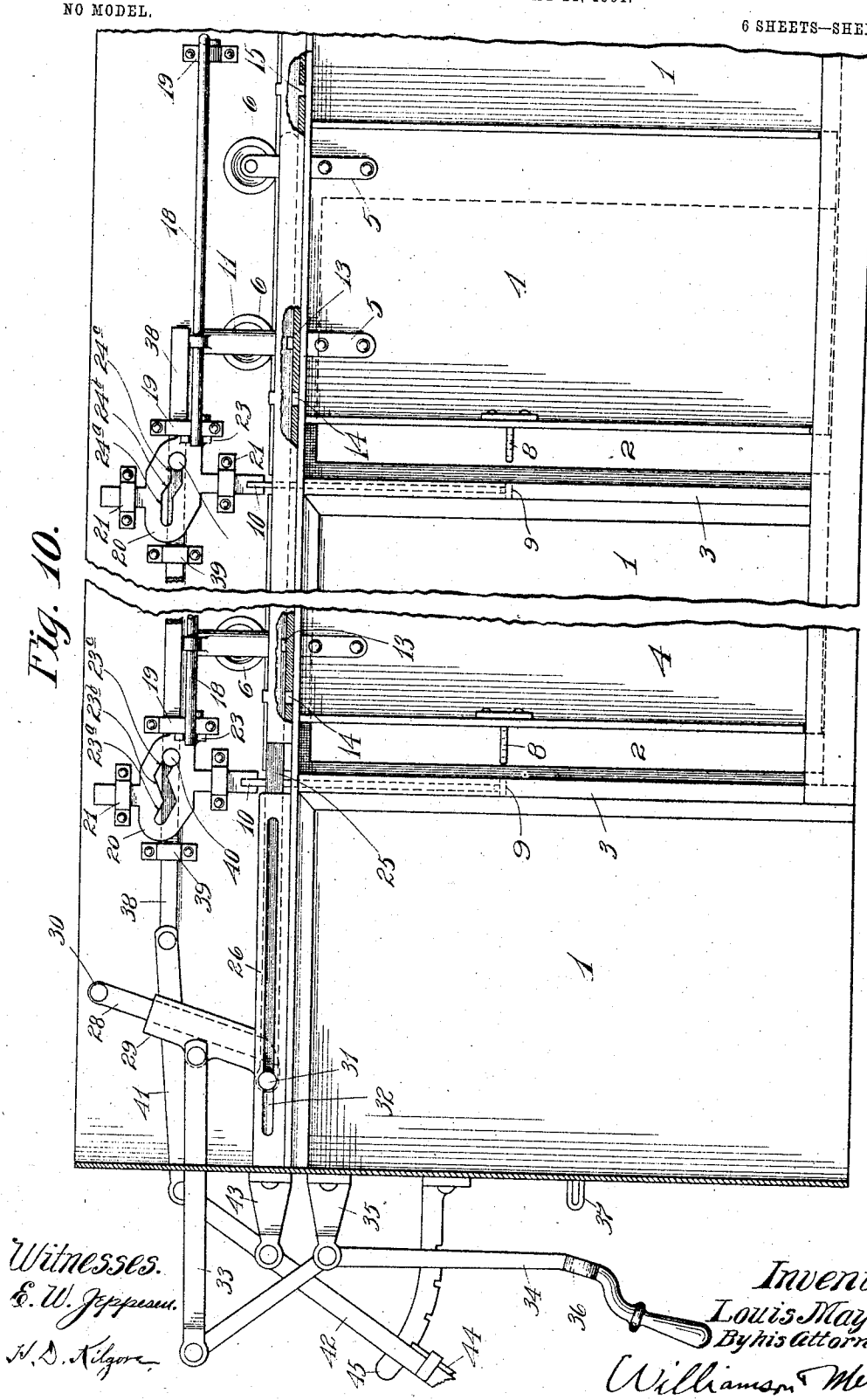
L. MAYER.

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APPLICATION FILED MAY 24, 1904.

NO MODEL. 6 SHEETS—SHEET 5.

Fig. 10.



Witnesses.
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APPLICATION FILED MAY 24, 1904.

NO MODEL. 6 SHEETS—SHEET 6.

Fig. 11.

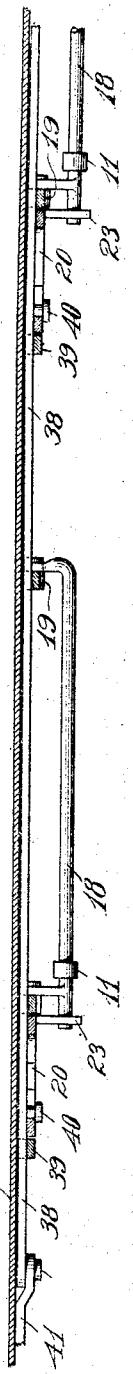


Fig. 12.

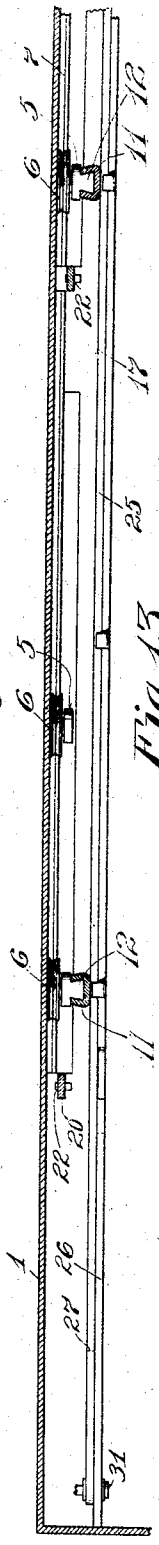
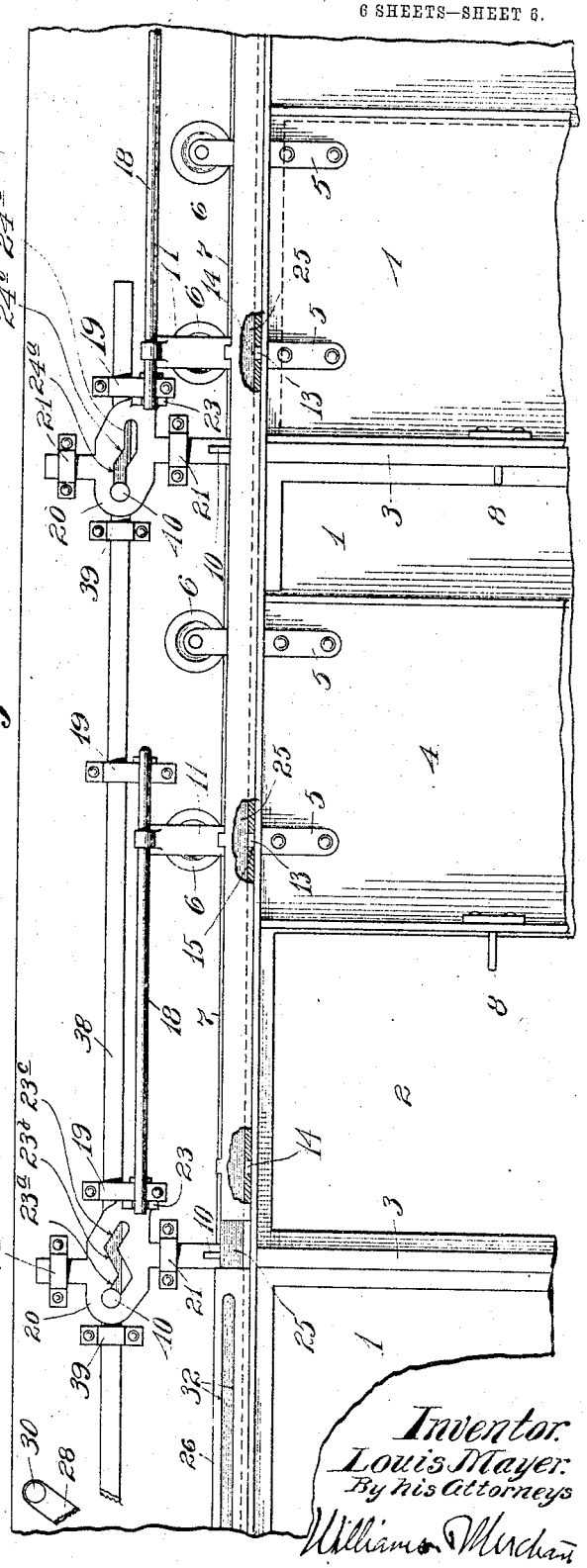


Fig. 13.



Witnesses.
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No. 772,469. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

LOUIS MAYER, OF MANKATO, MINNESOTA.

JAIL-DOOR-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 772,469, dated October 18, 1904.

Application filed May 24, 1904. Serial No. 209,572. (No model.)

To all whom it may concern:

Be it known that I, LOUIS MAYER, a citizen of the United States, residing at Mankato, in the county of Blue Earth and State of Minnesota, have invented certain new and useful Improvements in Jail-Door-Operating Devices; 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 appertains to make and use the same.

My invention relates to means for manipulating a plurality of sliding doors, and has for its especial object to provide improved mechanism for opening and closing and for locking and unlocking, either singly or all together, a number of cell-doors, such as used in jails, without requiring the operator to enter the corridor where the cells are located.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation, with some parts of the casing removed, illustrating my invention applied to the cell-doors of a jail looking at the same from the corridor. Fig. 2 is a view corresponding, in the direction in which it is viewed and in the positions of the parts, to Fig. 1, but showing the parts on a larger scale and with some portions sectioned and with others broken away. Fig. 3 is a vertical section on the line x^3 x^3 of Fig. 2. Fig. 4 is a section on the line x^4 x^4 of Fig. 2. Fig. 5 is a section on the line x^5 x^5 of Fig. 2. Fig. 6 is a section on the line x^6 x^6 of Fig. 2. Fig. 7 is a view corresponding to Fig. 2, but illustrating different positions of the parts. Fig. 8 is a vertical section taken approximately on the line x^8 x^8 of Fig. 7. Fig. 9 is still another view corresponding to Fig. 2, but illustrating still different positions of the parts. Fig. 10 is still another view corresponding to Fig. 2, but illustrating still other different positions of the parts. Fig. 11 is a horizontal section on the line x^{11} x^{11} of Fig. 2. Fig. 12 is a section taken approximately on the line x^{12} x^{12} of Fig. 2; and Fig. 13 is a view corresponding to Fig. 2, but illustrating positions of the parts not shown in the other view.

The numeral 1 indicates the metallic front plate or wall of the cell-compartment, which is provided with doorways 2, that open into the corridor and are provided on the corridor side of the wall with metallic casings or door-frames 3. The doorways 2 are adapted to be opened and closed by sliding metallic doors 4, shown as constructed of sheet-metal plates. These doors 4 are provided at their upper extremities with vertically-projecting hanger-brackets 5, to the upper ends of which are journaled grooved wheels 6, mounted to run freely over grooved rails 7, rigidly secured to the wall-plate 1 above the doorways. (See particularly Fig. 4.) The rail 7 so closely overlies the upper edges of the doors that the grooved wheels 6 cannot be forced laterally off from the said rail. The lower extremities of the doors are guided in the usual way by the lower portion of the casing 3.

At corresponding edges the doors 4 are shown as provided with notched projections 8, which are herein termed "lock-hooks." These lock-hooks 8 work completely through perforations 9, (see Figs. 6 and 7,) formed in the corresponding vertical portions of the door-casings 3, in which casings vertically-movable lock-bars 10 are mounted for coöperation with said lock-hooks to lock the doors in closed positions. As shown, the extreme lower ends of these lock-bars 10 are notched, so that when raised they will permit the free movements of said lock-hooks, and hence of course of the said doors. When the said lock-bars are lowered, however, while the doors are closed, they drop into the notches of the hooks 8, as shown in Figs. 3 and 6, and lock the doors in their closed positions. These lock-bars 10 will be hereinafter designated as the "primary" door-locks to distinguish them from another form of lock presently to be described and to be designated for distinction as "secondary" locks. For each door there is one of these so-called "secondary" locks, which is preferably afforded by a vertically-movable channel-like lock-piece 11, shown as having dovetailed engagement with a dove-

tailed flange 12, formed on one of the hanger-brackets 5 of the corresponding door. (See particularly Figs. 2, 4, 5, and 8.) The lower ends of the lock-pieces 11 are, as shown, reduced and turned laterally to form lock-lugs 13, which are adapted to engage with either of a pair of fixed detents afforded by notches 14 and 15, cut in a bar 16, shown as rigidly secured to a horizontally-extended channel-like guide 17, rigidly supported from the wall-plate 1. (See particularly Fig. 4.) The detent-notches 14 are so positioned that the lugs 13 of the lock-pieces 11 may engage therewith when the doors are closed and the said lock-pieces are lowered. On the other hand, the detent-notches 15 are so located that the said lock-lugs 13 of the lock-pieces 11 will be engaged therewith when the doors are open and the said lock-pieces are lowered. These lock-pieces or secondary locks, it will therefore be seen, will serve to lock the doors both in opened and in closed positions. The secondary locks 11 are mounted to travel with the doors; but at their upper ends they maintain constant engagement with the movable portions of corresponding bails 18, which bails extend in a horizontal plane and are pivotally attached to bearings 19, secured on the wall-plate 1. (See particularly Figs. 2, 4, and 11.)

For each door there is a vertically-movable "cam-head" 20, so called. These cam-heads, as shown, have vertically-extended portions, which work through bearings 21 on the wall-plate 1. (See particularly Figs. 2 and 3.) The depending portion of each cam-head 20 is connected to and, as shown, interlocks with the upper end of one of the primary locks or lock-bars 10. Such interlocking engagement is best shown at 22 in Fig. 3. Furthermore, each cam-head 20 is provided with a bifurcated projection 23, which, as shown, acts upon a projecting end of the corresponding bail 18. Hence vertically-upward movements of the cam-heads 20 will raise both the primary and secondary locks, thereby simultaneously rendering both of the said locks inoperative to lock the said doors. It will be further noted that the said bails will operate to lift the said secondary locks 11 regardless of the positions of the doors—that is, whether the said doors be in closed positions or in extreme open positions. The two cam-heads have differential cam surfaces or grooves of different arrangement and which bear a peculiar relation to each other, which will presently be noted and particularly set forth in the description of the operation. It should here be noted, however, that the left-hand or first cam-head 20 has a cam-groove constructed with alternately-reversed inclined cam-sections 23^a, 23^b, and 23^c, and that the right-hand or second cam-head 20 has a cam-groove formed with an upper horizontal section 24^a, an inclined intermediate section 24^b, and a lower horizontal section 24^c.

A long horizontally-extended door-operating bar 25 is mounted to slide through a keeper-guide 26 on the wall-plate 1 and is guided by the channel-like support 17 heretofore noted, and is thus held in position immediately overlying the lock-lugs 13 of the secondary locks 11. This door-operating bar 25 is provided with detents or notches 27, which in the normal position of the parts (shown in Fig. 2) immediately overlie and aline with the lock-lugs 13 of the secondary locks 11. The left-hand end of the bar 25, as viewed in Fig. 2, is pivotally attached to the lower end of an extensible oscillating lever made up of telescoping sections 28 29. The upper lever-section 28 is pivoted at 30 to the wall-plate 1, and the pivotal connection between the lever-section 29 and the bar 25 is made by a stud 31, which works in a slot 32 of the keeper-guide 26. The intermediate portion of the member 29 is connected by a link 33 to an operating-lever 34, located outside the corridor and, as shown, pivoted to a bearing 35 on the wall-plate 1. Near its free depending end the lever 34 is perforated at 36 to pass therethrough a staple 37, rigidly secured, as shown, to the left-hand extremity of the wall-plate 1. A padlock (not shown) is adapted to be applied to this staple 37 to lock the lever 34 in normal position. (Indicated in Fig. 2.) Attention is here also called to the fact (see particularly Fig. 6) that the lock-hook 8, which is carried by each door, as shown, is perforated at its outer end so as to permit of the application thereto of a padlock to lock the door closed with additional security.

A lock-actuating bar 38 is mounted to slide horizontally through bearings 39 and through the bearings 19 heretofore noted, which bearings are rigidly secured to the wall-plate 1. This bar 38 is provided with cam-pins 40, which work in the cam-grooves of the cam-heads 20. At its left-hand end the sliding bar 38 is connected by a link 41 to an operating-lever 42, located outside of the corridor and, as shown, pivoted to a bearing 43, secured to the adjacent extremity of the wall-plate 1. The lever 42 has a latch 44, which coöperates with the notched latch-segment 45, rigidly secured to the adjacent extremity of the wall-plate 1.

In the construction illustrated only two sliding doors are shown as arranged to be moved by the sliding bar 25 and to be locked and unlocked under the control of the sliding bar 38, although in practice a larger number of doors may be controlled thereby. With the said arrangement described the lock-actuating bar 38 is adapted to be set in four different positions to accomplish four different results, and hence the lock-segment 45 is provided with four lock-notches, adapted to cooperate with the latch 44 and lever 42 to lock the said bar 38 in any one of the said four positions.

In the normal positions of the parts shown

in Figs. 1, 2, 3, and 4 the doors are closed and are locked both by the primary and the secondary lock 10 and 11, respectively, which locks are then lowered. This normal position of the lock-actuating bar 38 will be turned to its first position, and in such position, it will be noted, that the left-hand cam 40 engages the left-hand extremity of the cam-section 23^a, while the right-hand cam-pin 40 engages the left-hand extremity of the horizontal slot-section 24^a. By these engagements the primary lock-bars 10 are positively held down in interlocking engagement with the lock-hooks 8 of the doors, and the secondary locks 11 are positively held down with their lock-lugs 13, engaged with the detent-notches 14 of the bar 16. Fig. 7 illustrates the second position of the lock-actuating bar 38, and in this position of the parts it will be seen that the left-hand cam-pin 40, acting on the inclined cam-slot section 23^a, has raised the left-hand cam-head 20 and the said cam-head has raised the left-hand primary lock-bar 10 into an inoperative position, and through the left-hand bail 18 has raised the left-hand secondary lock 11 into such position that its lock-lug 13 has been carried out of engagement with the stationary detent 14 and into engagement with the overlying lock-notch 27 of the door-actuating bar 25. By the above-noted action the left-hand door is unlocked from the door-casing and stationary supports and is coupled or locked to the door-actuating bar 25. The first step of movement of the lock-actuating bar 38, above noted, carries the right-hand cam-stud 40 to the right-hand extremity of the horizontal slot-section 24^a without imparting movement to the right-hand cam-head 20. Hence when the said bar 38 is moved to its second position the right-hand door still remains locked in its closed position. If now the door-actuating bar 25 be moved toward the right by means of the lever 34, the left-hand door alone will be carried with the said bar 25. Referring now to Fig. 9, which illustrates the third position of lock-actuating bar 38, it will be noted that the left-hand cam-stud 40, acting on the cam-groove section 23^b, has again forced downward the left-hand cam-head 20, and hence has forced downward the left-hand primary and secondary lock and locked the left-hand door in its closed position, while, on the other hand, the right-hand cam-stud 40, acting on the cam-section 24^b of the right-hand cam-head 20, has positively raised said right-hand cam-head and raised the right-hand primary and secondary locks, thus unlocking the right-hand door from its fixed supports and locking or coupling the same to the door-actuating bar 25. If now the door-actuating bar 25 be moved toward the right, the said right-hand door will be moved therewith into or toward an open position, and the left-hand door will remain locked in a closed position. Fig. 10 indicates the fourth position of the lock-actuating bar 38, by reference to which it will be seen that both of the cam-heads 20 are positively held in raised positions, so that both of the primary and both of the secondary locks are raised, thereby unlocking both of the doors from their fixed supports and locking or coupling the same to the door-actuating bar 25. Hence if the said bar 25 be now moved toward the right both doors will be moved therewith into or toward extreme open positions. From what has been said it will be of course clear that when the doors are moved from their closed to their open positions the secondary locks 11 move therewith and slide over the bails 18 into positions in which the lock-lugs 13 of said locks directly overlie the detent-notches 15. Hence it is evident that if, while both doors are in their extreme open positions, the lock-actuating bar 38 be moved back to its normal position, as indicated in Fig. 13, both doors will, by the so-called "secondary" locks, be locked in their open positions. Furthermore, if the said lock-actuating bar be moved back to its normal or first position while one of the doors is open and the other is closed the said doors will be locked in such positions—to wit, the one in an open position and the other in its closed position.

From the foregoing description and statements made it is evident that by the manipulation of the two levers 34 and 42 the doors may be locked and unlocked and opened and closed in any desired order, and, furthermore, that when locked in closed positions they are locked with great security, both by the primary and by the secondary locks. The extensible link or lever connection 28 29, as is evident, multiplies the movemement of the link 33 nearly two to one and, furthermore, is easily operated, is of simple construction, and is strong and durable.

Where more than two doors are to be operated by a common door-actuating bar and by a common lock-actuating bar, it is of course evident that the cam-surfaces of the several cam-heads 20 or equivalent devices, while constructed on the same plan, as herein illustrated, must be carried out or continued in several instances.

The construction illustrated has been built and tried and has proved extremely satisfactory for the purposes had in view.

From what has been said it will of course be understood that the mechanism described is capable of modification within the scope of my invention, as herein set forth and claimed. It will also be understood that many of the terms herein used—such, for instance, as "door-actuating bar," "lock-actuating bar," "primary lock," "secondary lock," &c.—are

used in a broad sense and not in a sense in any wise tending to limit the said devices to the specific construction shown.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a device for manipulating a plurality of sliding doors, the combination with a sliding-door-actuating bar and a sliding lock-actuating bar, of locks for locking said doors in closed positions, lock-actuating cam-heads for the several door-locks, having differential cam grooves or surfaces, and cam projections on said lock-actuating bar, coöperating with said cam grooves or surfaces, said cam grooves or surfaces operating to release said locks under different movements of said lock-actuating bar, substantially as described.

2. The combination with a plurality of sliding doors, of door-actuating mechanism comprising a door-actuating bar, a lock-actuating bar, a lock movable to lock said door to its fixed support and to said door-actuating bar, in alternate order, a cam-head connected to each lock, the several cam-heads having differential cam grooves or surfaces, and cam projections on said lock-actuating bar, coöperating with said differential cam-grooves, to shift said locks from positions in which they lock said doors closed, into positions in which they unlock said doors and couple the same to said door-actuating bar, substantially as described.

3. The combination with a plurality of sliding doors, of door-actuating mechanism comprising a door-actuating bar, a lock-actuating bar, a lock for each door mounted to travel with the respective doors, detents with which said locks engage to lock said doors, both in open and in closed positions, detents on said door-actuating bar, with which said locks engage, to couple said doors thereto, and cam-heads having differential cam-surfaces subject to said lock-actuating bar and having connections to said locks, to move the same under different movements of said lock-actuating bar, substantially as described.

4. The combination with a plurality of sliding doors, of door-actuating bar, a lock-actuating bar, locks for the said several doors, mounted to travel therewith, fixed detents with which said locks engage to lock said doors, both in closed and in open position, detents on said door-actuating bar with which said locks engage to couple the doors to said bar, vertically-movable horizontally-extended bails, having continuous engagement with said locks, and cam-heads connected to said bails and having differential cam-grooves coöperating with cam projections on said lock-actuating bar, to move the said locks under different movements of the said latter bar, substantially as described.

5. The combination with a plurality of sliding doors, of primary locks for locking the same in closed positions, secondary locks for locking said doors both in closed and in open positions, which secondary locks are mounted to travel with said doors, a door-actuating bar with which said secondary locks engage to couple said doors thereto, cam-heads operatively connected to said primary and secondary locks, arranged to cause the latter to couple said doors to said door-actuating bar, simultaneously with the unlocking of the doors, said cam-heads having differential cam-grooves, and a lock-actuating bar having cam projections coöperating with said differential cam-grooves, to operate the locks of the given door under different movements of said lock-actuating bar, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS MAYER.

Witnesses:
ELIZABETH SCHMIDT,
GEO. HODAPP, JR.