

2 Sheets—Sheet 1.

MECHANISM FOR OPENING AND CLOSING JAIL DOORS.

Patented Sept. 6, 1892.

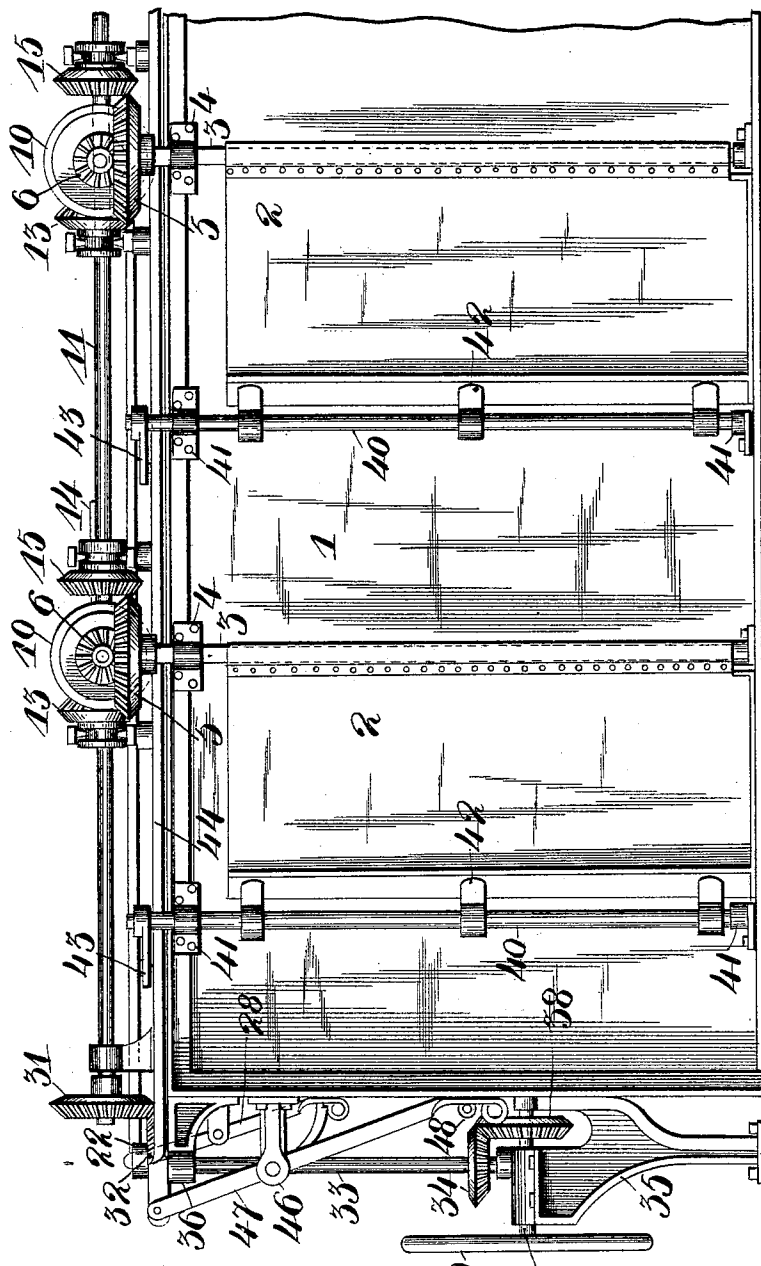


Fig. 1.

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By their Attorneys, *Higdon Higdon & Logan*

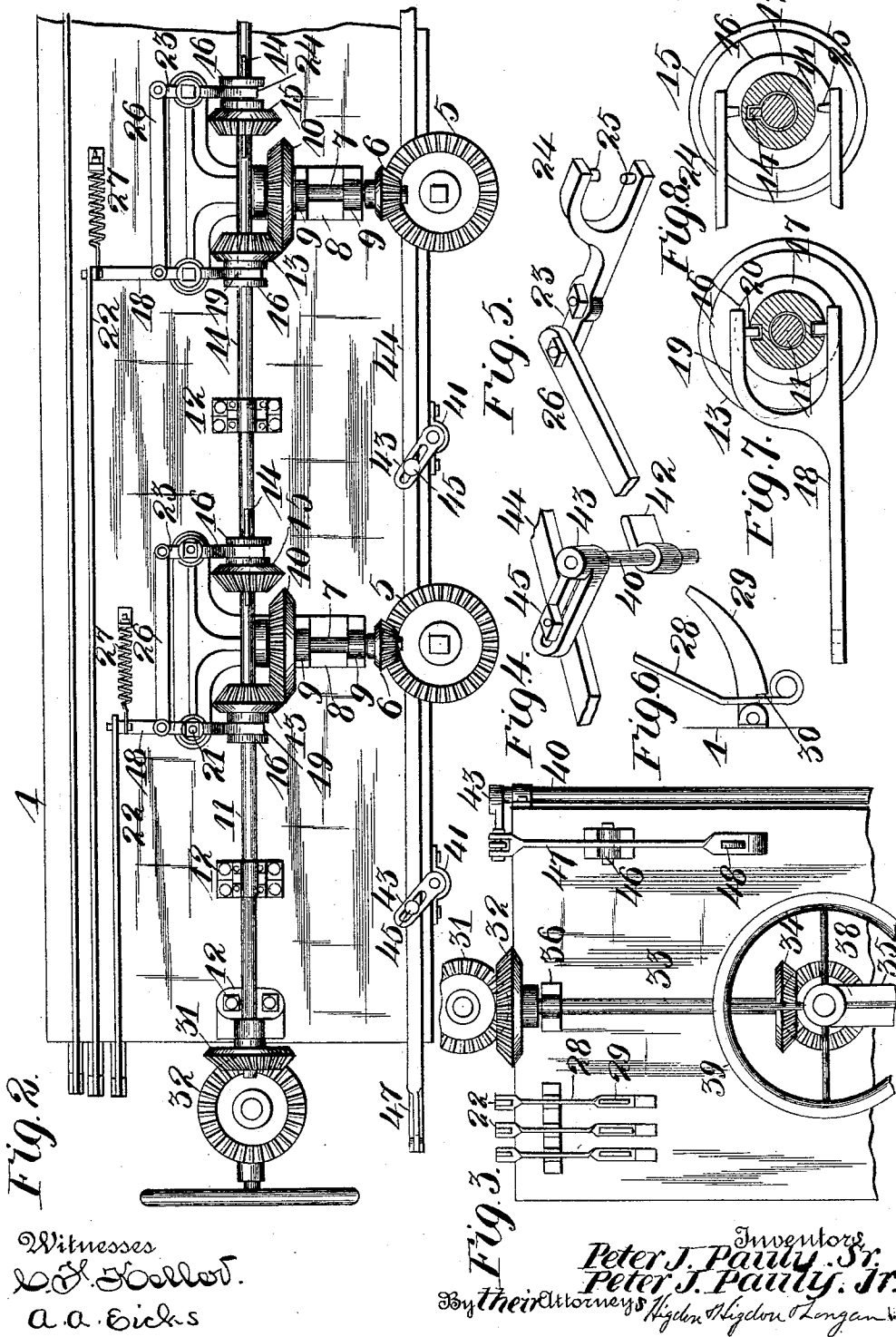
(No Model.)

2 Sheets—Sheet 2.

PETER J. PAULY, Sr. & PETER J. PAULY, Jr.
MECHANISM FOR OPENING AND CLOSING JAIL DOORS.

No. 482,316.

Patented Sept. 6, 1892.



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UNITED STATES PATENT OFFICE.

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OF SAME PLACE.

MECHANISM FOR OPENING AND CLOSING JAIL-DOORS.

SPECIFICATION forming part of Letters Patent No. 482,316, dated September 6, 1892.

Application filed March 15, 1892. Serial No. 425,042. (No model.)

To all whom it may concern:

Be it known that we, PETER J. PAULY, Sr., and PETER J. PAULY, Jr., of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Mechanism for Opening, Closing, and Locking Jail-Doors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to improvements in mechanism for opening, closing, and locking jail-doors; and it consists in the novel arrangement and combination of parts, as will be more fully hereinafter described, and designated in the claims.

In the drawings, Figure 1 is a front elevation showing two cells which are constructed according to our invention, with the mechanism for operating and locking the same in its normal or locked position. Fig. 2 is a top plan view of the same, showing the mechanism in a similar position. Fig. 3 is an end view with parts broken away, showing more clearly the parts for operating the mechanism. Fig. 4 is a perspective view of a portion of the bar for operating the locking device for a cell and a portion of the mechanism attached thereto for operating the shaft which carries the locks. Fig. 5 is a perspective view of one of the levers for shifting the gearing with operating-bar attached thereto. Fig. 6 is a side elevation showing the lock for holding the operating-levers which are attached to the bars which lead to and are connected to the levers for shifting the gearing. Fig. 7 is a transverse section through the hub of the bevel gear-wheel, which is loosely keyed upon the operating-shaft. Fig. 8 is a transverse section through the hub of the adjacent gear-wheel, which is locked against rotation independent of the operating-shaft, showing the lever for operating the same in connection therewith.

The object of our invention is principally to do away or dispense with as much friction as possible, and, further, employ such mechanism as will quickly and effectually open and close one or more swinging cell-doors either singly or simultaneously.

Heretofore it has been the general practice to employ worm-pinions and worm segments or wheels in order to accomplish the desired results, which not only increases the friction, but necessarily employs a greater amount of labor in order to operate the same.

In the drawings we have shown only two cells, which is deemed to be a sufficient number in order to clearly present the improvements desired to be covered.

Referring to the drawings, 1 represents a casing, which embodies two cells, each cell of which is provided with a swinging door 2.

Before proceeding further with the description it would be well to state that the mechanism for operating the doors of the cell are similar in each instance and are adapted to be operated independent of one another or simultaneously, as may be desired.

3 represents a square shaft the lower end of which is suitably shaped and loosely mounted in a suitable bearing which is secured to the floor or any other portion of the cell on the outside of the same. To the front of the cells or casing 1, near the top of the same, is secured a bearing 4, which holds the said shaft in its proper position. To the said shaft is secured one edge of the door 2 in any suitable mechanical manner, whereby when the same is turned the said door will also be closed or opened, according to the position the same assumes before being operated.

5 represents a beveled gear-wheel, which is rigidly keyed to the upper end of the said shaft 3, the teeth of which are adapted to mesh with the teeth of the beveled pinion 6, keyed upon the short shaft 7, as better illustrated in Fig. 2.

8 represents a casting, which is so shaped and formed as to provide bearings for the various parts, as hereinafter more fully described. The said short shaft 7 is loosely mounted in the bearings 9, formed with the casting 8, and to the opposite end of said shaft is keyed a beveled gear-wheel 10, to which motion is imparted by the mechanism, as hereinafter described, when it is desired to open or close the door 2.

11 represents a horizontal operating-shaft, which preferably extends the entire length of

the cells and is loosely mounted in suitable bearings 12, secured to the top of the said cells, in a manner as clearly shown in Fig. 2.

13 represents a beveled pinion through which the operating-shaft 11 passes, which shaft serves to hold the same in its proper position; but said pinion is movable longitudinally independent of said shaft. The said beveled pinion 13 does not in any way rotate; but is adapted to be moved in a horizontal direction upon said shaft by the mechanism, as better illustrated in Fig. 7. The said operating-shaft 11 is provided with a feather 14, which is of sufficient length to compensate for the movement of the beveled pinion 15. The said pinion 15 is susceptible of two movements—one in relation to the length of the shaft or in a horizontal direction and the other a rotating motion which is imparted thereto by the said operating-shaft. The said beveled pinions 13 and 15 are each provided with hubs 16, and said hubs are provided with annular grooves 17, which provide means for attaching the shifting-levers, the construction of which we shall now proceed to describe.

18 represents the lever, which is in engagement with the hub 16 of the pinion 13 and is provided with a forked end 19, and the inner surfaces of the said forked end provided with projections 20, which are adapted to be inserted in suitable openings formed in said hub about the annular groove 17. By this construction it will be seen that the said pinion is prevented from being rotated and acts as a clutch for locking the beveled gear-wheel 10 against rotation when the same is brought in contact therewith. The said lever 18 is movably attached to the casting 8 at a point, as shown at 21, and the remaining portion of said lever extends a sufficient distance rearward and to which is attached an operating-bar 22.

23 represents a similar lever, which is also movably attached to the casting 8 in a similar manner and is provided with a forked end 24 and said end provided with pins 25, which are adapted to be located in the annular groove 17, formed in the hub 16 of the pinion 15, allowing the same to be rotated independent of said lever. To the rear end of the said lever 23 is movably attached a plate 26, which leads and is connected to the lever 18, causing the said levers to be operated simultaneously and parallel with one another. Near one end of the lever 18 is attached one end of a coil-spring 27, and the opposite end of said spring is attached to a suitable plate or other device, which is fastened to the top of the cells.

When the device is in a locked position, as shown in Fig. 2, the pinion 13 will be in contact with the gear-wheel 10 and the beveled pinion 15 will be out of contact with the said gear-wheel 10, and while in this position the operating-shaft 11 may be operated or turned without in any way operating the doors of the cells. When the bar 22 is released from

its locked position and allowed to move by the tension of the spring 27, the stationary or non-rotating pinion 13 will be brought out of contact with the gear-wheel 10 and the beveled pinion 15 brought in contact with said gear-wheel, in which position when the operating-shaft 11 is turned or rotated motion will be imparted to the short shaft 7, beveled pinion 6, and beveled gear-wheel 5, opening or closing the door of the cell, as the case may be.

28 represents the operating-lever, which is movably secured in any desirable manner to one end of the cells intermediate of its length, and to the upper end of said lever is movably attached one end of the operating-bar 22. Near the lower end of said operating-lever and formed therein is an elongated opening, through which a curved arm 29 is adapted to be passed when it is desired to hold the beveled pinion 13 in the position as shown in Fig. 2. One end of the said arm 29 is loosely secured to that end of the cell to which the operating-lever 28 is secured, and formed in the said arm near its pivotal point is a depression 30, which serves to hold the said lever in a locked position until the said arm is elevated, when the door of the cell is desired to be operated, the construction of which can be better seen by referring to Fig. 6.

31 represents a beveled gear-wheel, which is keyed to one end of the operating-shaft 11, the teeth of which mesh with the teeth formed on the similar gear-wheel 32.

33 represents a vertical shaft, to the upper end of which is keyed the said gear-wheel 32, and to the lower end of said shaft is keyed a beveled gear-wheel 34. The lower end of the said shaft is mounted in a suitable bearing carried by the support 35 and the upper end in a bearing 36, secured to the end of the cell.

37 represents a short shaft, which has its bearings in the upper portion of the support 35, and keyed thereto is a beveled gear-wheel 38, the teeth of which mesh with the teeth formed on the beveled gear-wheel 34, whereby motion is imparted to the said vertical shaft 33.

To the projecting end of the shaft 37 is secured a hand-wheel 39 for imparting motion to said shaft and to the remaining portions or parts of the operating mechanism. Should the lever 28 be in the position as shown in the drawings, and consequently the beveled pinion 13 be in contact with the gear-wheel 10, there would be no motion imparted to the cell-door when the hand-wheel 39 is turned; but should the said levers 28 be released by the arm 29 the spring 27 would cause the beveled pinion 15 to be brought in contact with the beveled gear-wheel 10 and the beveled pinion 13 out of contact with said gear-wheel 10, in which position the doors would be opened or closed should motion be imparted to the said hand-wheel. Should it be desired to only open one door of one of the

cells, one operating-lever—such as 28—is operated or released from its locked position; but should it be desired to unlock two or any larger number of cell-doors two or more of the said levers are released, which operation has a like effect, and by rotating the hand-wheel two or more of the cell-doors can be operated simultaneously.

The mechanism hereinbefore described will lock the cell-doors when the mechanism is in the position as shown in the drawings; but in order to guard against any possibility of the prisoner gaining freedom from the cells we employ additional mechanism, as we shall now proceed to describe.

40 represents a vertical shaft, which is loosely mounted in suitable bearings 41, secured to the front of the cell, and is parallel with and at a suitable distance from the edge of the cell-door 2. Secured to the said shaft in radius with the door is any suitable number of plates 42, one end of which is provided with openings through which the said shaft 40 passes. To the upper or projecting end of the said shaft 40 and keyed thereto is a slotted arm 43, which is movably attached to an operating-bar 44 by means of a bolt 45, passing through said slot and into said bar, the said slot compensating for the longitudinal movement of the said bar, the construction of which is better shown in Fig. 4.

46 represents a bearing, which is secured to the end of the cell near the top thereof, and movably attached thereto is an operating-lever 47. The upper end of the said lever is movably attached to one end of the operating-bar 44 and the lower end of the same is provided with an opening through which a staple 48 is adapted to pass when the same is in the position, as shown in the drawings, for locking the door of the cell. When the operating-lever 47 is in said position, a pin or other device is passed through said staple, holding the same in a locked position; but when it is desired to rotate or turn the shaft 40 and bring the plates out of contact with the cell-door the lower end of said lever is moved from the end of the cell.

It will be understood that the number of shafts 40 employed depends upon the number of jail-doors used, and that the additional ones are attached to the operating-bar 44 in a like manner, and all operated simultaneously and independent of the mechanism for operating and closing the said doors.

The latter construction is intended to be used entirely for swinging cell-doors, and when the gear-wheels are made of the proper dimensions one revolution of the hand-wheel 39 will entirely open or close the said doors.

Having fully described our invention, what we claim is—

1. Mechanism for opening, closing, and locking cell-doors, consisting of a hinged door, a gear-wheel rigidly secured to the same, a shaft mounted in suitable bearings secured to the top of the cell, a pinion keyed to one end of

said shaft, adapted to mesh with said gear-wheel, a gear-wheel keyed to the opposite end of the said shaft, an operating-shaft journaled in suitable bearings and adapted to be turned by suitable mechanism, and pinions movable upon said operating-shaft and adapted to be successively brought in contact with the last-named gear-wheel for locking the door or operating the same when the said operating-shaft is rotated, substantially as described.

2. Mechanism for opening, closing, and locking cell-doors, consisting of a hinged door, a shaft rigidly secured to the same, a beveled gear-wheel fixed to said shaft, a shaft, such as 7, mounted in suitable bearings secured to the top of the cell, a pinion keyed to one end of the said shaft and adapted to mesh with said gear-wheel, a beveled gear-wheel 10, keyed to the opposite end of said shaft, an operating-shaft, and beveled pinions movable upon said shaft, one of which is locked against rotation and the other adapted to be rotated by said shaft, both of which are adapted to be successively brought into contact with the said beveled gear-wheel 10, substantially as described.

3. Mechanism for opening, closing, and locking cell-doors, consisting of a hinged door, a beveled gear-wheel fixed to the same, a pinion adapted to mesh with the said gear-wheel, a gear-wheel, such as 10, adapted to impart motion to the said pinion, an operating-shaft 11, beveled pinions loosely mounted upon said shaft and adapted to be successively brought in contact with the said gear-wheel 10, levers attached to the said pinions, a plate, such as 26, attached to the said levers, a bar, such as 22, attached to one of the said levers, and a lever adapted to be attached to the cell, to which one end of the said bar is loosely attached for operating the said pinions independent of the said shaft, substantially as described.

4. A device for opening, closing, and locking cell-doors, consisting of a rotating shaft, such as 3, to which the cell-door is attached, a beveled gear-wheel fixed to the upper end of the said shaft, suitable gearing in connection with said gear-wheel, and an operating-shaft, such as 11, beveled pinions, such as 13 and 15, adapted to be moved in a horizontal direction upon the same, one of which is adapted to be rotated by the said shaft, levers for operating said pinions successively, a spring attached to one of the said levers, a bar attached to the lever to which the spring is attached, and a lever attached to the cell, to which one end of the bar is attached, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

PETER J. PAULY, SR.
PETER J. PAULY, JR.

Witnesses:

C. F. KELLER,
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