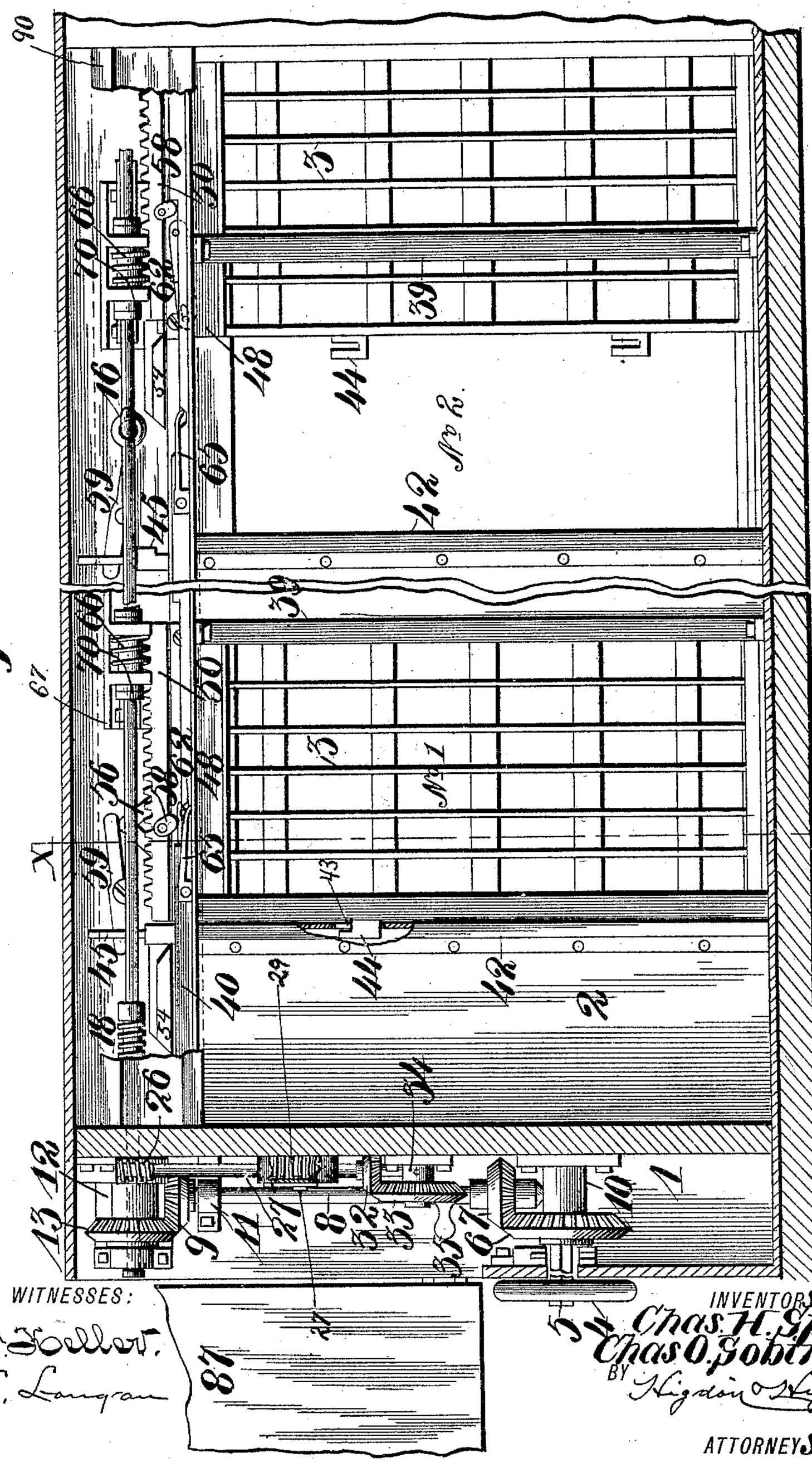
(No Model.) 4 Sheets—Sheet 1.

C. H. SPARKS & C. O. SOBINSKI.

MECHANISM FOR OPERATING AND LOCKING JAIL DOORS.

No. 464,947. Patented Dec. 8, 1891.

Fig. 1.



WITNESSES:

C. F. Fuller.

Ed. E. Langran

INVENTORS.

Chas. H. Sparks.

Chas O. Sobinski.

BY Higdon & Higdon

ATTORNEYS.

(No Model.) 4 Sheets—Sheet 2.

C. H. SPARKS & C. O. SOBINSKI.

MECHANISM FOR OPERATING AND LOCKING JAIL DOORS.

No. 464,947. Patented Dec. 8, 1891.

Fig. 3.

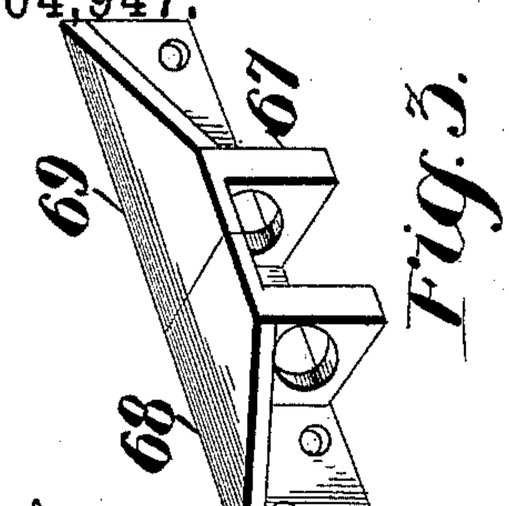


Fig. 15.

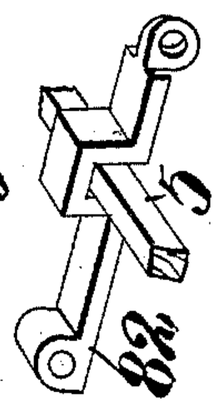


Fig. 2.

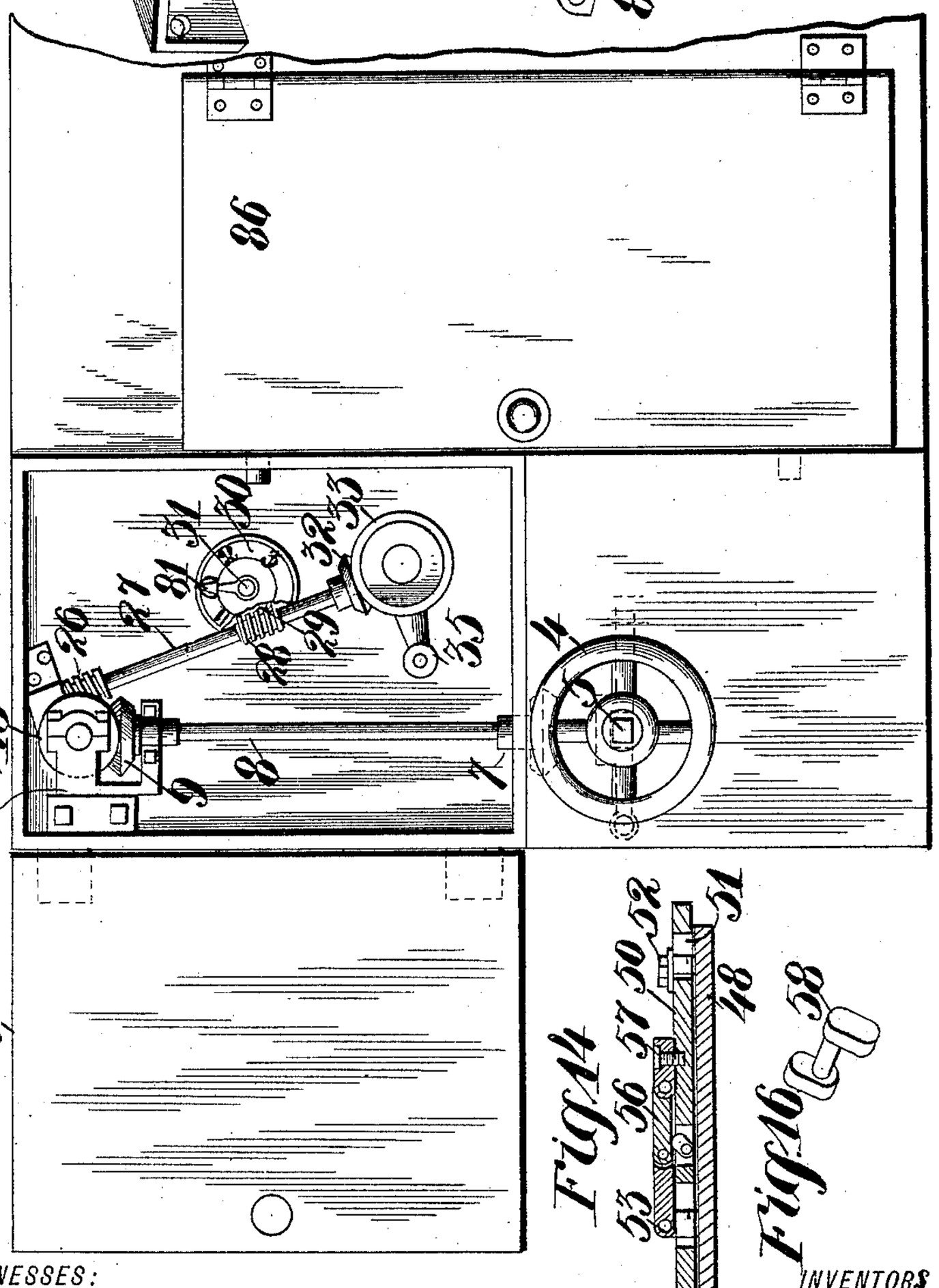


Fig. 14.

Fig. 16.

WITNESSES:

L. B. Hollon.
Ed. E. Langran

INVENTORS.
Chas. H. Sparks.
Chas. O. Sobinski.
BY Higdon & Higdon

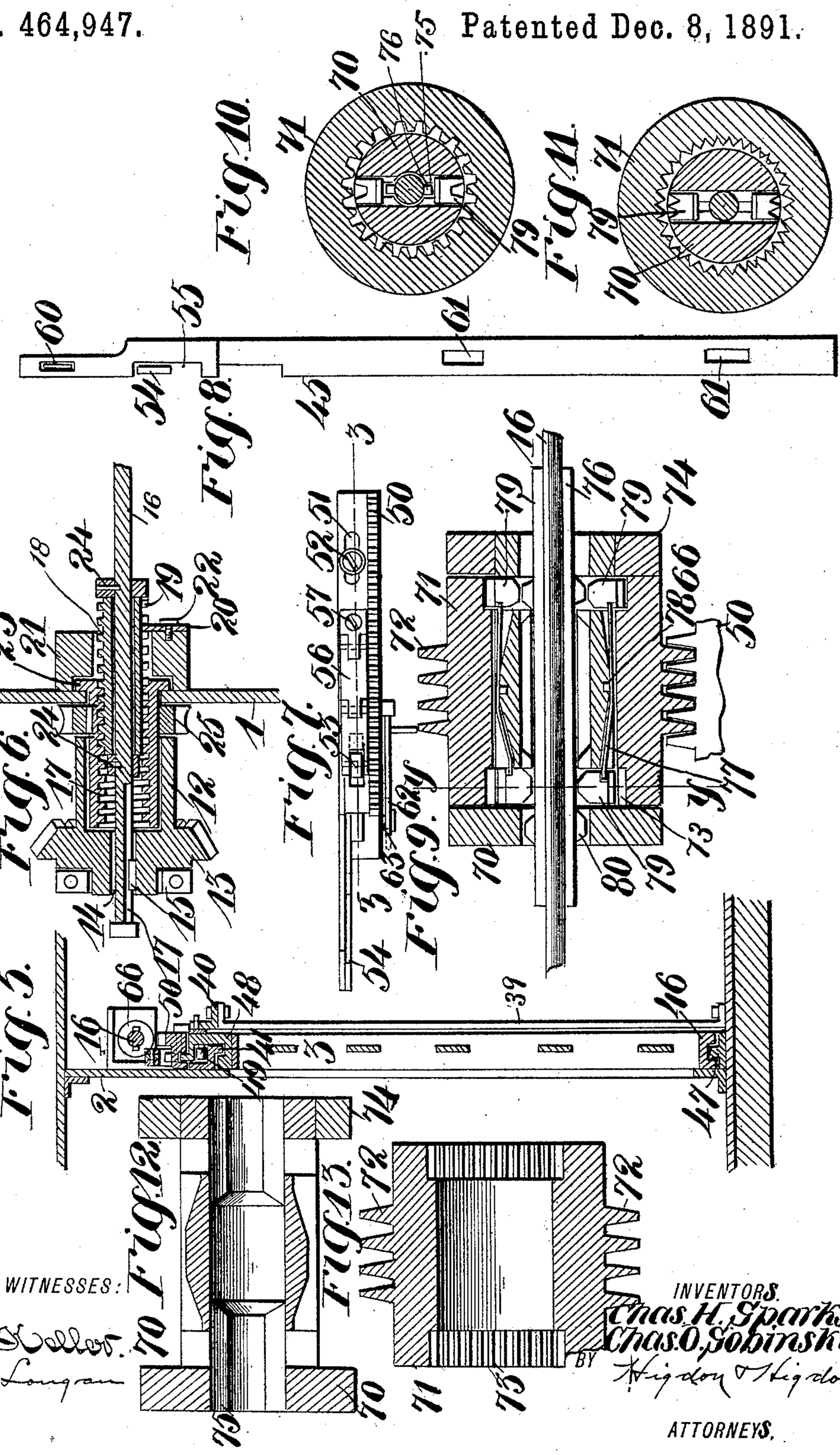
ATTORNEYS.

(No Model.) 4 Sheets—Sheet 3.

C. H. SPARKS & C. O. SOBINSKI.

MECHANISM FOR OPERATING AND LOCKING JAIL DOORS.

No. 464,947. Patented Dec. 8, 1891.



WITNESSES:

C. D. Keller.

Edw. E. Longan

INVENTORS.

Chas. H. Sparks.

Chas. O. Sobinski.

BY Higdon & Higdon

ATTORNEYS.

(No Model.) 4 Sheets—Sheet 4.

C. H. SPARKS & C. O. SOBINSKI.

MECHANISM FOR OPERATING AND LOCKING JAIL DOORS.

No. 464,947. Patented Dec. 8, 1891.

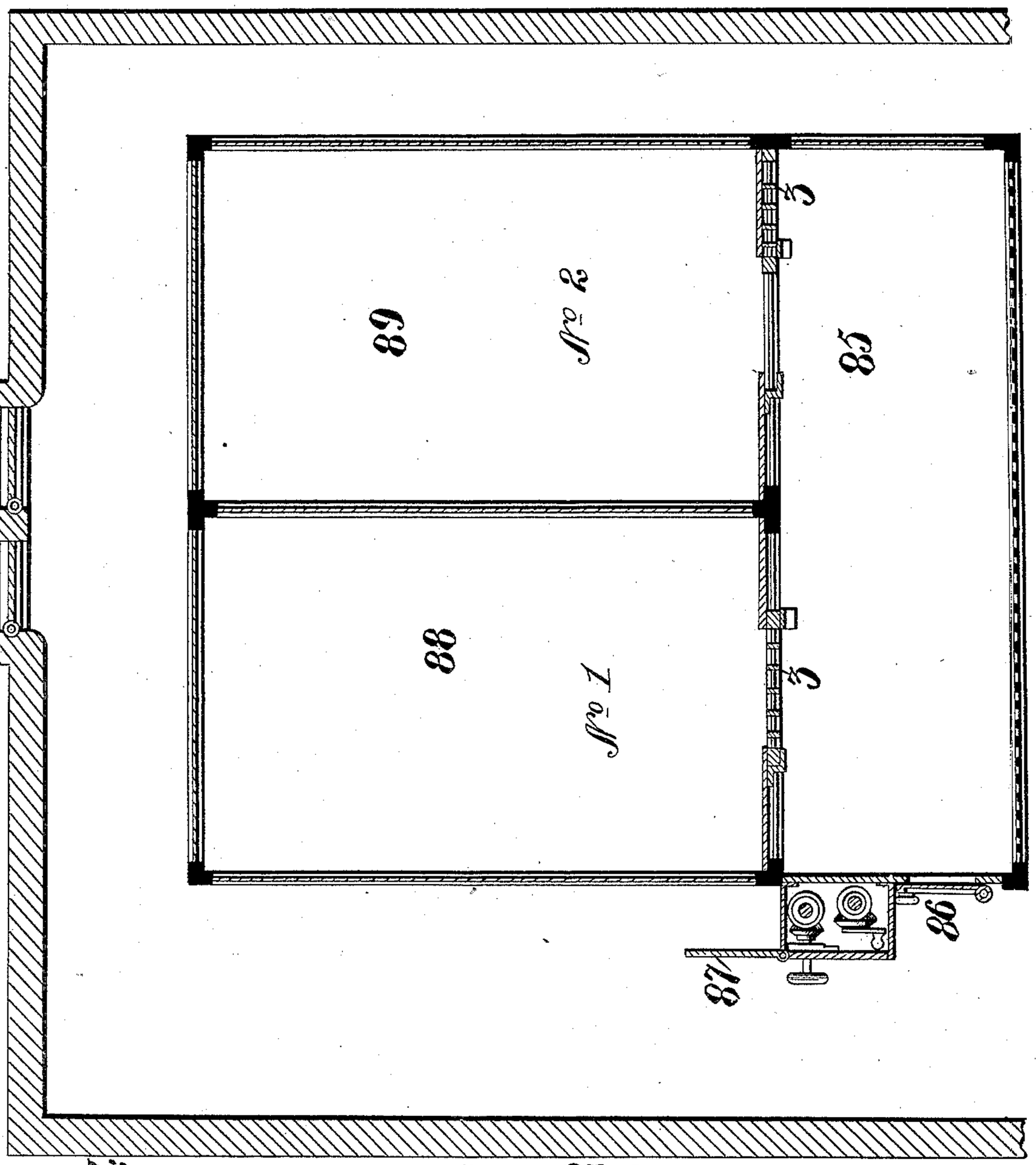


Fig. 1.

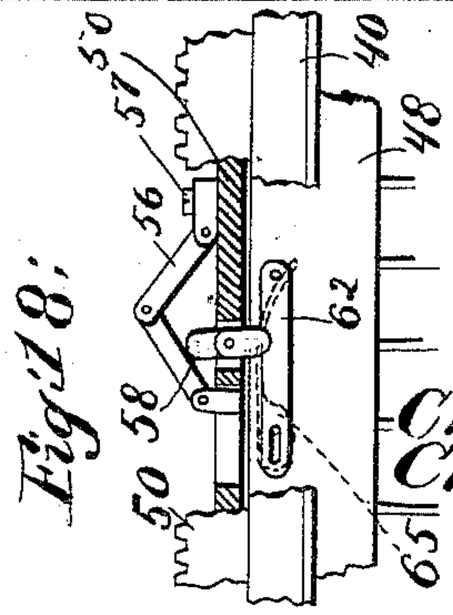


Fig. 8.

WITNESSES:

D. C. Keller.

Ed. E. Langan

INVENTORS,

Chas. H. Sparks.

Chas. O. Sobinski.

BY Higdon & Higdon

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES H. SPARKS AND CHARLES O. SOBINSKI, OF ST. LOUIS, MISSOURI;
SAID SOBINSKI ASSIGNOR TO SAID SPARKS.

MECHANISM FOR OPERATING AND LOCKING JAIL-DOORS.

SPECIFICATION forming part of Letters Patent No. 464,947, dated December 8, 1891.

Application filed May 14, 1891. Serial No. 392,775. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. SPARKS and CHARLES O. SOBINSKI, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Mechanism for Operating and Locking Doors of Jails, &c., 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 operating and locking doors, especially cell-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 sectional plan view of our complete invention as seen from the jail corridor, with the metallic casing that shields the actuating mechanism of the doors broken away. Fig. 2 is an end view of our complete invention. Fig. 3 is a perspective view of a peculiarly-constructed bearing for endless screws and the horizontal shaft which operates the same. Fig. 4 is a plan view of a horizontal shaft which we employ in carrying out our invention. Fig. 5 is a vertical section taken on the line *x x* of Fig. 1. Fig. 6 is a longitudinal section of the mechanism which operates and adjusts the horizontal shaft, as shown in Fig. 4. Fig. 7 is a top plan view of the cell-doors and the mechanism adjacent to the same. Fig. 8 is a side elevation of a vertical bar which locks the doors. Fig. 9 is a longitudinal section of an endless screw which communicates motion to the cell-doors, which we employ in carrying out our invention. Fig. 10 is a cross-section taken on the line *y y* of Fig. 9. Fig. 11 is a similar section showing a modification of gearing teeth. Fig. 12 is a longitudinal section of the core of the endless screw, as shown in Fig. 9. Fig. 13 is a similar section of the revoluble part of the endless screw, which is mounted on the core, as shown in Fig. 9. Fig. 14 is a vertical section taken on the line *z z* of Fig. 7. Fig. 15 is a detail perspective view of the mechanism for clamping the angular shaft against rotation. Fig. 16 is a perspective view of a crank-lever which we employ in carrying out our invention. Fig. 17 is a sectional plan view of the cells and corridor. Fig. 18 is a detailed side view of the mechanism for forcing the locking-bars downward.

The object of our invention is to construct a certain mechanism for operating and locking a series of doors, the same to be actuated or operated from the outside of the prison corridor by the sheriff and away from contact of the incarcerated victims, and to so construct and locate said mechanism that the prisoners, mobs, or confederates cannot manipulate the same. This object we accomplish by constructing and locating the mechanism or part of the same which operates and locks the doors in and protecting the same with an iron casing or box, so that the prisoners cannot injure the same or interfere with its functional operation. We also protect the mechanism which is designed to effect the above result by means of an iron room attached to the outside wall of the cells and which has a combination-lock upon its door for effecting entrance, the combination of the same being understood only by the sheriff or authorized party. By this construction the sheriff or authorized party while operating and locking all doors is protected from assaults by the prisoners, and by the construction, as will be more specifically hereinafter described, the sheriff or authorized person can operate any one of a series of doors independently of the others. He can also lock, unlock, close, or open any one of the series of doors independently of the whim or caprice of the prisoners to perform this service. He can also in any like manner operate the series of doors simultaneously, the operation of which will be more fully hereinafter described.

Referring to the drawings, 1 indicates the corridor-walls, which are of the ordinary construction, and 2 indicates the cell-walls, which also embody the usual construction.

3 indicates the cell-doors, which embody the construction as will be more specifically hereinafter described.

Having called attention to the general outline of our invention, we will now proceed to describe the mechanism located in the iron room, as hereinbefore mentioned, which may

be rendered accessible only to the sheriff, jailor, or some authorized person.

4 indicates a hand-wheel mounted rigidly upon a shaft 5. Said shaft 5 is angular for the purpose hereinafter specified. The wheel 4 is only accessible to the sheriff, jailor, or some authorized person. Mounted on shaft 5 is a bevel-pinion 6, which engages or meshes with a similar bevel-pinion 7. Said bevel-pinion 7 is rigidly mounted upon a shaft 8, which shaft is provided on its upper extremity with a similar bevel-pinion 9. The lower extremity of shaft 8 is mounted in a stud 10, and the upper extremity of the same is mounted in a bearing 11, said bearing being secured to the corridor-wall 1 in any suitable and mechanical manner, preferably, however, as shown in the drawings. Bearing 11 also forms a bearing for a collar 12, the same being provided with a bevel-pinion 13, which is adapted to mesh with pinion 9. Pinion 13 is formed integrally with collar 12, and pinion 13 is provided with an internal bore 14, and located in said bore is a feather or projection 15, as can be readily perceived by referring to Fig. 6. Said collar is mounted on a horizontal shaft 16, the said shaft being provided on its terminal portion with a groove 17, in which the feather or projection 15 loosely fits, thereby permitting shaft 16 to be horizontally adjustable in its bearing. Said collar 12 is also mounted on an internally-screw-threaded thimble 17, in which an externally-screw-threaded thimble 18 is adapted to be inserted. Said external thimble 18 is provided with longitudinal groove 19, in which a key 20 is adapted to loosely fit. The function of said key is to prevent said thimble from rotating, yet it permits the same to move in a horizontal direction. Said key 20 is secured to a box 21 in any suitable and mechanical manner, preferably, however, by screw 22, as shown in the drawings. (See Fig. 6.) The internally-screw-threaded thimble 17 is provided with a shoulder 23, which fits against the interior surface of the corridor-wall 1. The externally-screw-threaded thimble 18 is interposed between collars 24, the same being rigidly secured to shaft 16 in any suitable and mechanical manner. The function of said collars is to prevent said thimble 18 from moving horizontally on shaft 16.

Rigidly mounted on the internally-screw-threaded thimble or cylinder 17 is an endless screw or worm-pinion 25, in which (referring to Fig. 1) an endless screw or worm 26, mounted upon a shaft 27, engages. Shaft 27 is provided in the region of its median portion with a worm 28, which engages with a worm-pinion 29. (See Fig. 2.) Said worm-pinion 29 is mounted in a box 30 on a shaft 31. Said box 30 is secured to the corridor-wall 1 in any suitable and mechanical manner. Said box 30 is provided with a graduated face, such as 0 1 2 3, &c., as shown in Fig. 2, the number of graduations corresponding with the number of cell-doors. For instance, if our invention is to be applied to operate two doors, the graduations on the box should be 0, 1, and 2; if to operate three doors, it should be graduated 0, 1, 2, and 3, and so on. It may be premised, however, in this connection that we describe our invention in connection with the operation of two cell-doors. However, the same principle may be extended to operate any number of doors.

To fully comprehend the operation of the mechanism embodied in our invention, we will state in this connection that the mechanism just described rotates shaft 16, and also horizontally adjusts the same, as we will now proceed to describe.

It can be readily perceived from the construction as hereinbefore set forth that when wheel 4 is rotated a rotary motion is imparted to shaft 16; but in order to fully comprehend how said shaft is horizontally adjustable requires more minute description, as we will now proceed to set forth in detail, premising, however, that shaft 27 is provided at its lower extremity with a bevel-pinion 32, which meshes with a bevel-pinion 33, the same being revolubly mounted on a stud 34. The lower terminal extremity of shaft 27 has its bearing-stud 34. From this construction it can readily be perceived that when shaft 27 is rotated by the agency of bevel-pinion 33, the same being provided with a handle 35, a rotary motion will be communicated to the worm-pinion 25, which is rigidly mounted on the internally-screw-threaded cylinder 17, and said cylinder 17 (from the construction as hereinbefore described) communicates a motion in a horizontal direction to the externally-screw-threaded cylinder 18, mounted on shaft 16, and as said cylinder is prevented from moving on said shaft in a horizontal direction whenever said cylinder is moved it must impart to said shaft a corresponding motion in a corresponding direction. In other words, when the externally-screw-threaded cylinder 18 is moved in a horizontal direction shaft 16 will be moved correspondingly. It may be reiterated in this connection, for elucidation, that cylinder 18 is free to move in a horizontal direction, but cannot be rotated on shaft 16. It may be observed in this connection that when worm 26 is rotated in either direction it equally communicates motion to worm-pinion 25, and worm-pinion 25 moves through the agency of cylinder 17 and the externally-screw-threaded cylinder 18 in a horizontal direction, and consequently shaft 16.

Having described the mechanism which rotates and horizontally adjusts shaft 16, we will now proceed to describe the manner in which said shaft operates the cell-doors, or, in other words, how the rotary motion and horizontal adjustment of said shaft opens or closes the cell-doors and locks the same independently of each other or opens or closes and locks all the doors simultaneously. We will preface this latter description by describing the exact construction of the cell-

doors themselves. Premising, however, that the doors slide between the cell-wall 2 and upright pieces 39, said upright pieces are secured to the floor of the corridor and to a horizontal right-angle bar 40, (referring to Fig. 5.) Running parallel with said right-angle bar 40 is a crank-shaped bar 41, which answers as a stay on which the cell-doors, or, rather, top of the cell-doors, slide. Said bar 41 is secured to the exterior surface of the cell-wall 2. The cell-doors are adapted to move between bars 40 and 41.

42 indicates door-jambs, which are provided with cleats 43, the same being secured to the cell-wall 2. Said door-jambs are provided with elongated perforations of usual construction, through which the U-shaped catches 44, secured to the cell-doors, are adapted to pass. Said door-jambs 42 and cleats 43 form bearings for the vertical locking-bars 45. Said locking-bars 45 are free to move in a vertical direction in said bearings and are actuated as will be more fully hereinafter described. The cell-doors 3 are provided in their lower ends with grooves 46, in which a tongue 47 is normally located. The object of this construction is to hold said doors in proper adjustment relative to the actuating mechanism and also prevent any lateral movement of said doors by the prisoners.

Having described in general the construction of the cell-doors and the parts between which they move when operated, we will now proceed to describe the same in detail, referring to Figs. 5, 7, and 14 for illustration.

Secured to the top of the cell-doors is a peculiarly-shaped bar 48, as illustrated in Fig. 5. Said bar or bars, as the case may be, move over the horizontal stay-bar 41, the friction being lessened by means of friction-rollers 49, carried by said bars 48. Located on said bars 48 are racks 50. Each of said racks is provided with elongated perforations 51. Through one of said perforations a screw 52 passes and is screwed into bar 48, and through the other of said perforations a lug 53, formed on bar 48, protrudes. (See Fig. 7.) By this construction the racks 50 are secured to bars 48 and also are permitted to move on the same, the extent of said movement, however, being regulated by the length of slots 51. In other words, the racks 50 are permitted to move a limited distance, when the bars 48, and consequently the cell-doors which carry the same, remain still. Secured to racks 50 are wedge-shaped bars 54, the function of which is to elevate the vertical locking-bars 45 should the same fall when the cell-doors are open. Said wedge-shaped bars 54 move in the cut-away portion 55 of the vertical locking-bars 45.

56 indicates hinged knees, (see Fig. 14,) one end of the same secured to rack 50 by means of a screw 57 and the other end of the same being pivotally secured to the lug 53, formed on bars 48, or, in other words, one end of said hinged knee is pivotally secured to the top of the cell-doors, and the other end is likewise secured to the rack 50. Said knees 56 are broken by means of a small crank-lever 58, (see Figs. 16 and 18,) which is pivotally secured in the rack 50. Said knees 56 actuate levers 59, which are pivotally secured to the cell-wall 2, and said levers (one end of the same being normally located in perforations 60, formed in the vertical locking-bars 45) actuate the vertical locking-bars 45 by pushing the same downward, thereby locking the doors in a manner more fully hereinafter described. The vertical locking-bars 45 are provided with elongated perforations 61, through which catches 44 are adapted to pass. When said bars are lowered by the mechanism, as hereinbefore described, they will engage with said catches 44 and securely lock the cell-doors.

62 indicates levers which actuate the crank-levers 58. Said levers 62 are pivotally secured to bars 48, which are secured to cell-doors. Said levers 62 are provided with elongated slots, (shown in dotted lines in Fig. 7 and full lines in Fig. 18,) in which lugs 63, formed on bars 48, are adapted to be inserted. In other words, said levers 62 are susceptible of lost motion. Said levers 62 are elevated by means of springs 65, the same being rigidly secured in a horizontal right-angle piece or bar 40. When said levers 62 are elevated, they actuate the crank-levers 58, which crank-levers break the hinged knees 56, as hereinbefore described.

Having described the construction of the doors, we will now proceed to describe the mechanism which communicates motion to the same.

Motion is communicated to the doors by means of worms 66, which are mounted on shaft 16 and located in bearings 67. Said bearings are made of two parts—namely, 68 and 69 (see Fig. 3)—so that they can be readily inserted on said worms. Said bearings are secured to cell-wall 2 in any suitable and mechanical manner. The worms 66, which engage with the racks 50 and communicate motion to the cell-doors, are composed of a core 70 (see Fig. 12) and a rotary portion 71, which revolves on said core. (See Figs. 12, 13, and 9.) Said rotary portion 71 (see Fig. 13) is provided with worm-threads 72, which engage with the rack, and is also provided at both ends with internal cogs or gearing-teeth 73.

74 indicates a collar which is adapted to slip over the end of core 71, the function of which is to hold the rotary portion 71 securely on said core. It may be premised in this connection that the core 70 is provided with a bore through which shaft 16 may be inserted. The bore formed in the core 70 is provided with grooves 75, in which feather 76 of shaft 16 loosely fits. By this construction whenever shaft 16 is rotated the core 70 will be simultaneously rotated, although said shaft is adjustable in a horizontal direction

to said core 70. Secured to said core are two springs 77, situated diametrically opposite each other. Said springs are secured to said core by means of pins 78 or in any other suitable and mechanical manner. Secured to the ends of said springs in any suitable and mechanical manner, preferably as shown in the drawings, are dogs 79, which are adapted to engage with teeth 73. Said dogs 79 have small grooves formed in them, in which the ends of said springs are adapted to be inserted, and are also provided with teeth adapted to engage with teeth 73. The core 70 has perforations formed in it, which communicate with its bore, in which perforations dogs 79 are adapted to be inserted and to be protruded, thereby coming in contact with lugs 80, formed on feathers 76 of the shaft 16.

Referring to Fig. 9 for illustration, it can be readily perceived that when lugs 80 come in contact with dogs 79 said dogs will be pressed outwardly and engage with teeth 73 of the rotary portion of the worm, and when said lugs and dogs are not in contact core 70 of the worm may be rotated independently of the rotary portion 71 of the worm; or, in other words, the rotary portion 71 of the worm is rotated by the agency of shaft 16 only when dogs 79 are acted upon and pressed outwardly by lugs 80. It may be premised in this connection that the number of lugs 80 correspond to the number of dogs 79, and, moreover, that each worm is provided with two pairs of dogs located diametrically opposite each other, and also that the feather 76, located in the region of each worm, is provided with two pairs of lugs situated diametrically opposite each other.

The relative distance apart of the lugs 80 can only be ascertained by experiment, but should be so located that they will actuate or engage the dogs 79 of the worm, which communicates motion to one door independently of the mechanism which communicates motion to the other doors, or that the engagement of the dogs of all the worms throughout the series of doors may be engaged simultaneously.

The shaft 16 may be continuous or composed of sections and connected together as shown in Fig. 1.

As has been before stated, we will simply describe our invention to the operation of two cell-doors. Such mechanism will then include two worms such as described, and the shaft 16 will be provided with four feathers and each feather with two lugs.

It has been found by experiment that the lugs 80, which actuate the dogs located in the first worm, are farther apart than the lugs which actuate the dogs in the second worm.

Referring to Fig. 1, the first door is on the left of said figure and the second door to the right.

Having described the mechanical parts of our invention, we will now describe, briefly, the operation of the same. For instance, if the operator desires to open cell-door No. 1 independently of cell-door No. 2, he will rotate the bevel-pinion 34 until the pointer 81 points to No. 1 on the graduated box 30. This operation will adjust the shaft 16 in a horizontal direction, which horizontal movement (in accordance with the construction hereinbefore described) will engage dogs 79 of the worm which is located above the first door with teeth 73, and then by turning the wheel 4, which operation will impart a rotary motion to shaft 16, said shaft will rotate the rotary portion 71 of said worm, which worm, engaging with rack 50, attached to door, will communicate motion to the cell-door No. 1, it being premised, however, that the rotary portion 71 engages with the rack formed on the first door. To operate door No. 2 independently of No. 1, the pointer 81 should be moved to No. 2 of the graduated box, and by the same operation, as hereinbefore set forth, cell-door No. 2 may be operated, and by causing the pointer to point to 0 the two cell-doors may be operated simultaneously in the manner as hereinbefore set forth, it being obvious that the numbers on the box 30 are so adjusted that when the pointer 81 points to any one thereof the shaft will be in a position to actuate the worm of the cell-door corresponding to such number.

The operation of locking the doors, for further elucidation, is as follows: When the doors strike the door-jambs or are closed, (by the construction as hereinbefore described,) the racks 50 are permitted to move, or, in other words, they are susceptible of lost motion; or the racks may be moved independdently to a limited extent of the doors. This independent motion of the racks, from the construction as hereinbefore described, lowers the vertical locking-bars 45 and locks the doors. It is evident that in opening the doors as the wedges 54 pass through the cut-away portion of the vertical locking-bars 45 and are moved horizontally by the racks 50 the said vertical bars will be raised by the initial movement of the racks 50, releasing the doors, which may then be opened in the manner hereinbefore described.

It can be readily perceived from the construction as hereinbefore set forth that the doors may be operated independently of each other or simultaneously; also, that the doors may be partly opened, and by the construction as hereinbefore set forth are securely locked in said position. The worm-threads 72, engaging with the rack-bar attached to door, act as a wedge and prevent moving of the door other than by wheel 4, located outside of the walls of the cells, thus preventing manipulation of the door by the inmates of the cells; and although we have described our invention as applied to the operation of two doors, the same principle may be extended and equally operate any number of doors.

Referring to Fig. 2, it may be observed that

the mechanism may be locked by a device within the iron room, as illustrated in Fig. 15, in the following manner, to wit: 82 indicates a lever which is pivotally secured to one side of the corridor-wall in any suitable and mechanical manner. Said lever is provided with a U-shaped bend, which is adapted to fit over the angular shaft 5, and may be locked and secured in said position by any appropriate mechanism. It may be further observed in Fig. 17, wherein a plan view is illustrated, that the operative mechanism is protected from manipulation of any prisoner that may be let out in the jail-corridor 85, as the entrance to said corridor can only be effected through a door 86, which is provided with a combination-lock, the combination of which is only known to the authorized party.

Referring to Fig. 2, 87 indicates a door which incloses the essential part of the operating mechanism.

Referring to Fig. 17, 88 and 89 represent the cells, cell 88 having its door No. 1 closed and cell 89 having its door No. 2 entirely open.

It may be observed that the casing 90, which covers actuating-shaft 16 and the mechanism operated by the same, protects said mechanism from manipulation by the prisoners. Said casing is secured to the cell-wall No. 2 in any suitable and mechanical manner.

Having fully described our invention, what we claim is—

1. In a device for operating and locking jail-doors, independent mechanism for sliding a door and securing each door separately and a horizontal longitudinally-adjustable shaft adapted to actuate said mechanism, means for revolving said shaft, a register or indicator, and a shaft having connections with said register and horizontal shaft and adapted to adjust the latter longitudinally, substantially as set forth.

2. In a device for operating and locking jail-doors, the combination of the door-locking devices for said door, a shaft, such as 16, provided on its terminal portion with a groove, as 17, and mounted to slide and revolve, pinion 13, provided with feather 15 and feathered upon said shaft, with said feather in engagement with said groove 17, means, substantially as described, for revolving said pinion, and means, substantially as described, for sliding the shaft.

3. In a device for operating and locking jail-doors, independent mechanism for operating and securing each door separately, a horizontal longitudinally-adjustable shaft adapted to actuate said mechanism, means to revolve said shaft, a register or indicator, and a shaft having connection with said register and horizontal shaft and adapted to adjust the latter longitudinally, substantially as described.

4. The combination, with a series of doors, of sliding plates carried thereby, locking mechanism operated by said plates, and means to operate the plates, whereby the movement thereof will release the lock and then move the door, substantially as described.

5. The combination, with a series of doors and rack-bars mounted thereon, of a horizontal shaft, rotary portions thereon having worms meshing with the rack-bars, devices on the shaft adapted to engage and rigidly hold said rotary portions from revolution on the shaft, and means for operating the shaft, substantially as described.

6. The combination of a series of doors, a horizontal longitudinally-adjustable shaft, mechanism connecting said shaft with the doors, means to rotate the shaft, a register or indicator, a worm-wheel on the horizontal shaft, and a second shaft carrying worms at each end thereof, the upper one of which meshes with said worm and the lower with a worm-wheel on the indicator, substantially as described.

7. The combination, with a series of doors and plates carried thereby capable of slight longitudinal movement, of locking mechanism operated by the first movement of said plates, and mechanism having connection with said plates, whereby the doors are operated after the actuation of the locking mechanism, substantially as described.

8. The combination, with a series of doors, of a longitudinally-adjustable horizontal shaft made in sections, mechanism connecting said shaft and doors, means to operate the shaft, a worm-wheel thereon, an indicator or register, a shaft having connection with the same, and a worm on said last-mentioned shaft meshing with the worm-wheel on the horizontal shaft, substantially as described.

9. The herein-described shaft, which communicates motion to the cell-doors, and the mechanical powers for rotating and horizontally adjusting the same, in combination with a worm or worms consisting of a core, such as 70, a rotating portion, such as 71, provided on its exterior surface with worm-threads and on both ends with internal cogs, springs located on said core, carrying dogs adapted to engage with said internal cogs through lugs upon the said shaft, and a door having a toothed rack thereon, substantially as set forth.

10. The combination of a series of doors carrying rack-bars, a shaft 16, cores 70, secured thereto, spring-pressed dogs on said cores, rotary portion 71, surrounding the cores and having worms engaging the rack-bars, and lugs on shaft 16, adapted to force said dogs into engagement with the collars and hold the latter against rotation, substantially as described.

11. In mechanism for operating and locking doors, a worm, such as 66, and a core, such as 70, a collar 74, adapted to be inserted over one end of said core, a rotating portion, such

as 71, provided on its exterior surface with worm-threads and on both ends with internal cogs, and springs carrying dogs adapted to engage with said internal cogs, located on said core, substantially as set forth.

12. In mechanism for operating and locking doors, an actuating-shaft of the character described, and means for rotating and adjusting the same in a horizontal direction, in combination with a cell-door carrying a peculiarly-shaped bar, such as 48, friction-wheels 49, secured to the same, a rack 50, provided with a wedge-shaped portion 54, secured to said bar 48, a hinged knee, such as 56, the ends of which are pivotally secured to said rack 50 and bar 48, respectively, a crank-lever 58, pivotally secured in said rack, means for operating said crank-lever, a vertical locking-bar 45, provided with elongated perforations 60 and 61, and a lever 59, one arm of which normally rests in said perforations 60 and the other arm of the same adapted to be operated by said hinged knee, whereby said vertical locking-bar is lowered and the cell-door securely locked, substantially as set forth.

13. In a device for operating jail-doors, the combination, with a door having a toothed rack thereon and with an operating-shaft carrying a worm, of a bearing-box composed of two parts 68 and 69, substantially as set forth.

14. In mechanism for operating and locking doors, a shaft 16, of the character described, and worms 66, of the character described, mounted on said shaft, in combination with an externally-screw-threaded cylinder 18, located on said shaft between collars 24, firmly secured to the same, means for preventing said cylinder 18 from rotating, although permitting the same to move in a horizontal direction, and internally-screw-threaded cylinder 17, mounted on said cylinder 18, a worm-pinion 25, rigidly secured to said cylinder 17, a shaft 27, provided with a worm 26, for rotating said worm-pinion 25, whereby shaft 16 is adjusted in a horizontal direction, a bevel-pinion 13, longitudinally movable on and carried by the shaft 16, and a shaft 8, provided with a pinion 9 for giving said pinion 13, and consequently said shaft 16, a rotary motion, substantially as set forth.

15. In mechanism for operating and locking doors, a box 30, provided with a graduated face, a worm-pinion 29, carrying a pointer 81, located in said box, a shaft 27, provided with a worm 28, adapted to engage in said worm-pinion, a bevel-pinion 32, mounted on said shaft, and a bevel-pinion 33, provided with a handle 35 for rotating said shaft 27, and consequently moving the pointer 81, substantially as set forth.

16. In mechanism for operating and locking doors, a shaft, such as 16, provided with feathers 76 and lugs 80, formed on said feathers, and a groove 17, formed in the terminal portion of said shaft, the mechanical powers for rotating and adjusting the same, in combination with worms, such as 66, embodying a core, such as 70, a collar 74, adapted to be inserted over one end of said core, a rotating portion, such as 71, provided on its exterior surface with worm-threads adapted to engage with the cog-rack carried by the cell-doors and on both ends with internal cogs, and springs carrying dogs adapted to engage with said internal cogs, located on said core, substantially as set forth.

17. In mechanism for operating and locking doors, a pinion 13 and a shaft for rotating the same, a worm-pinion 25, a worm-pinion 29, carrying a pointer 81, a shaft 27, provided with worms 26 and 28, and a bevel-pinion 33 and crank 35 for rotating said pinions 25 and 29, in combination with an iron room provided with a door 87 for incasing and protecting said mechanism, substantially as set forth.

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

CHARLES H. SPARKS.
CHARLES O. SOBINSKI.

Witnesses:
ED. E. LONGAN,
C. F. KELLER.