

(No Model.)

R. C. STEWART, Jr. & W. A. STEWART.
JAIL.

No. 601,005.

Patented Mar. 22, 1898.

FIG. 1.

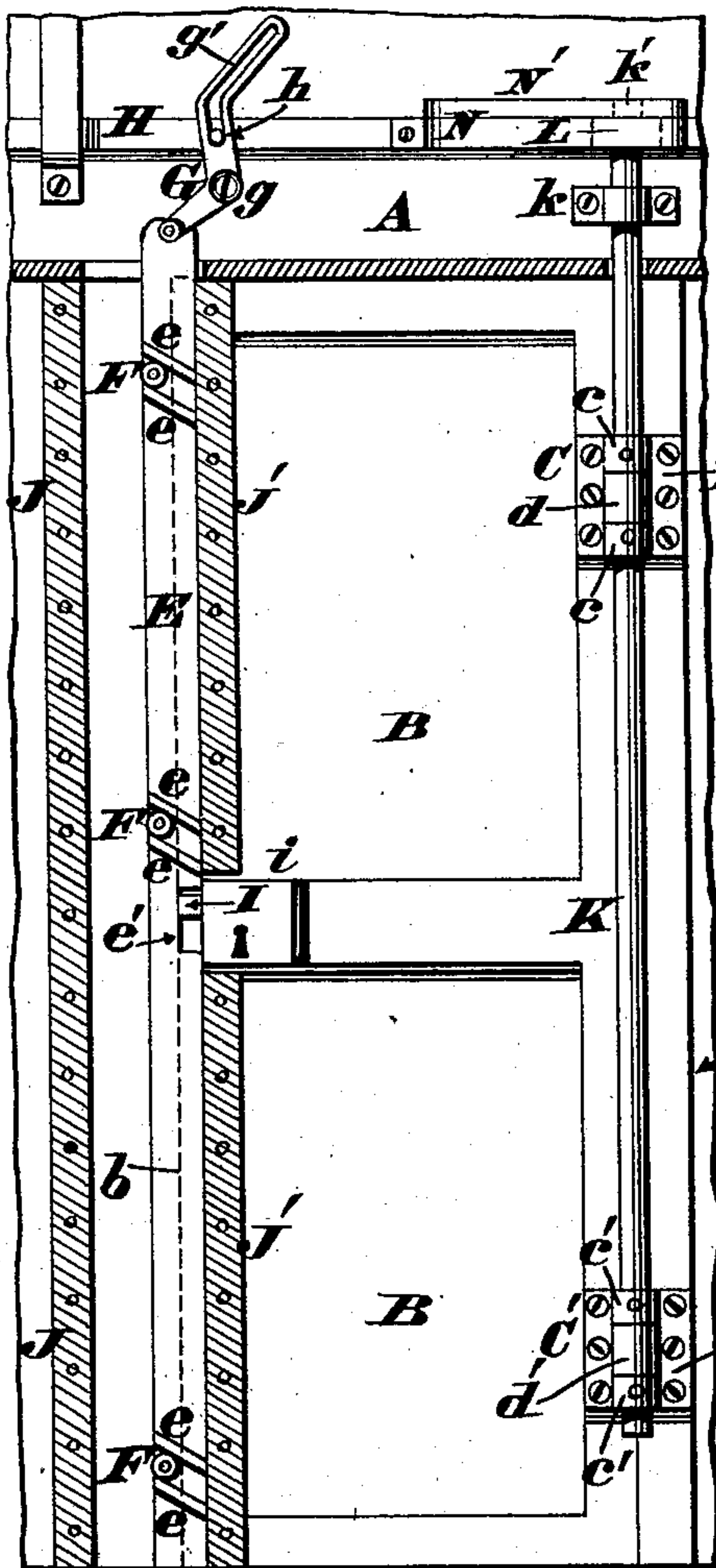


FIG. 2.

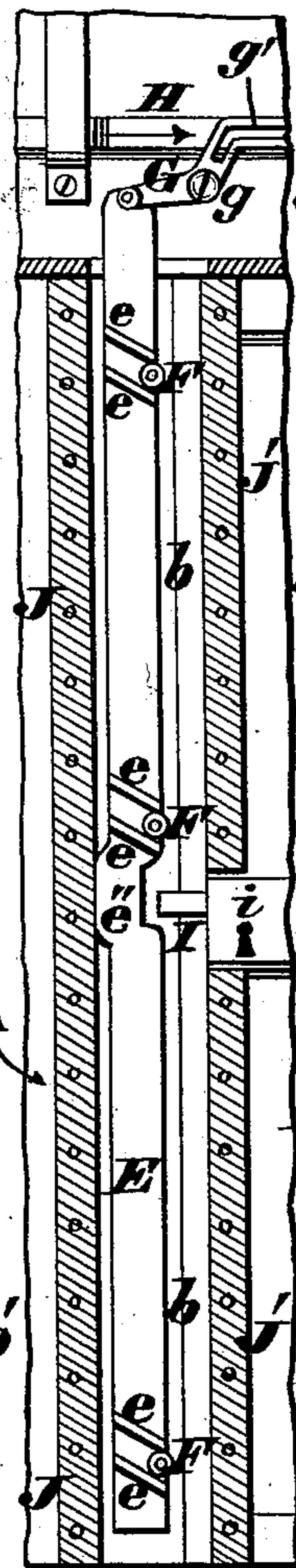


FIG. 3.

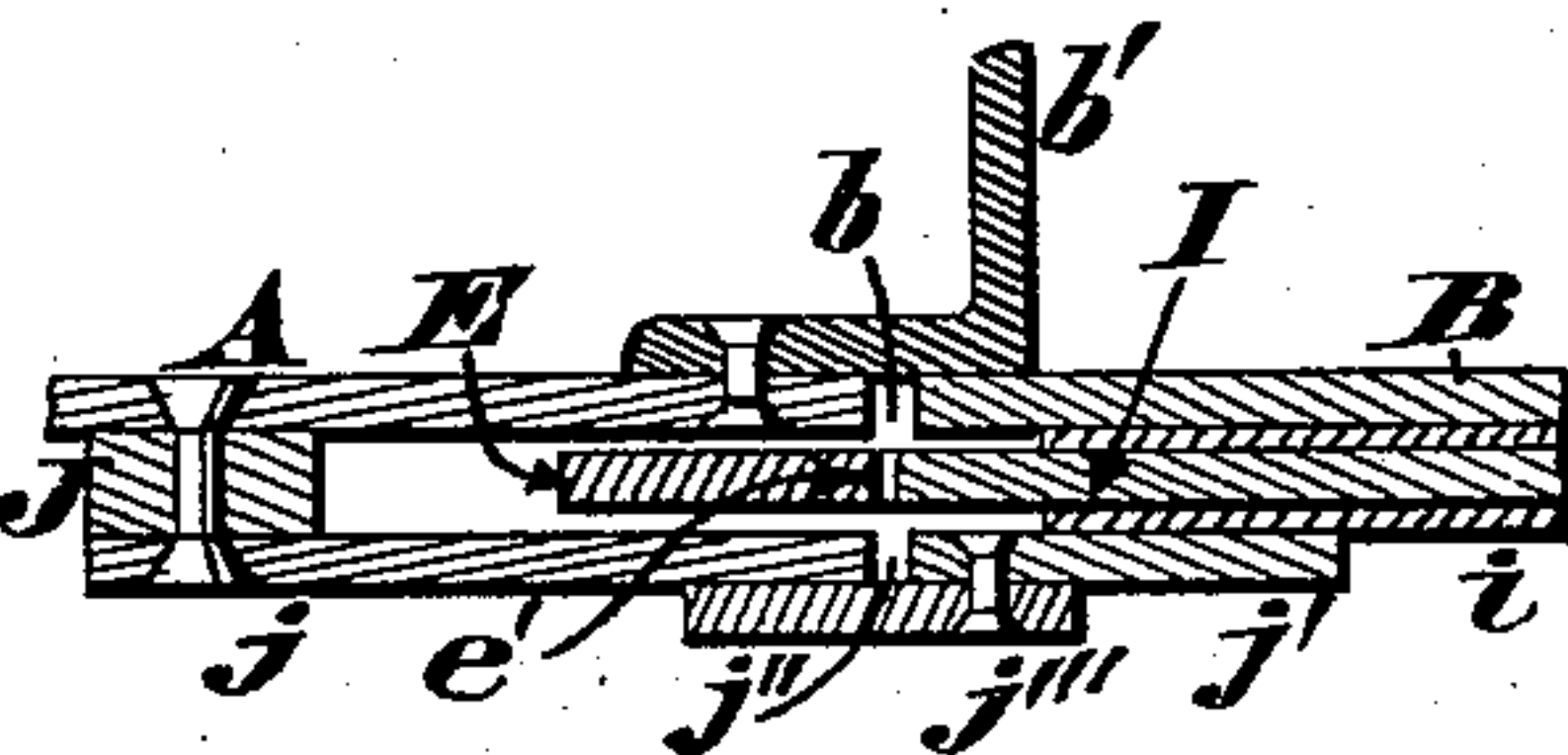


FIG. 4.

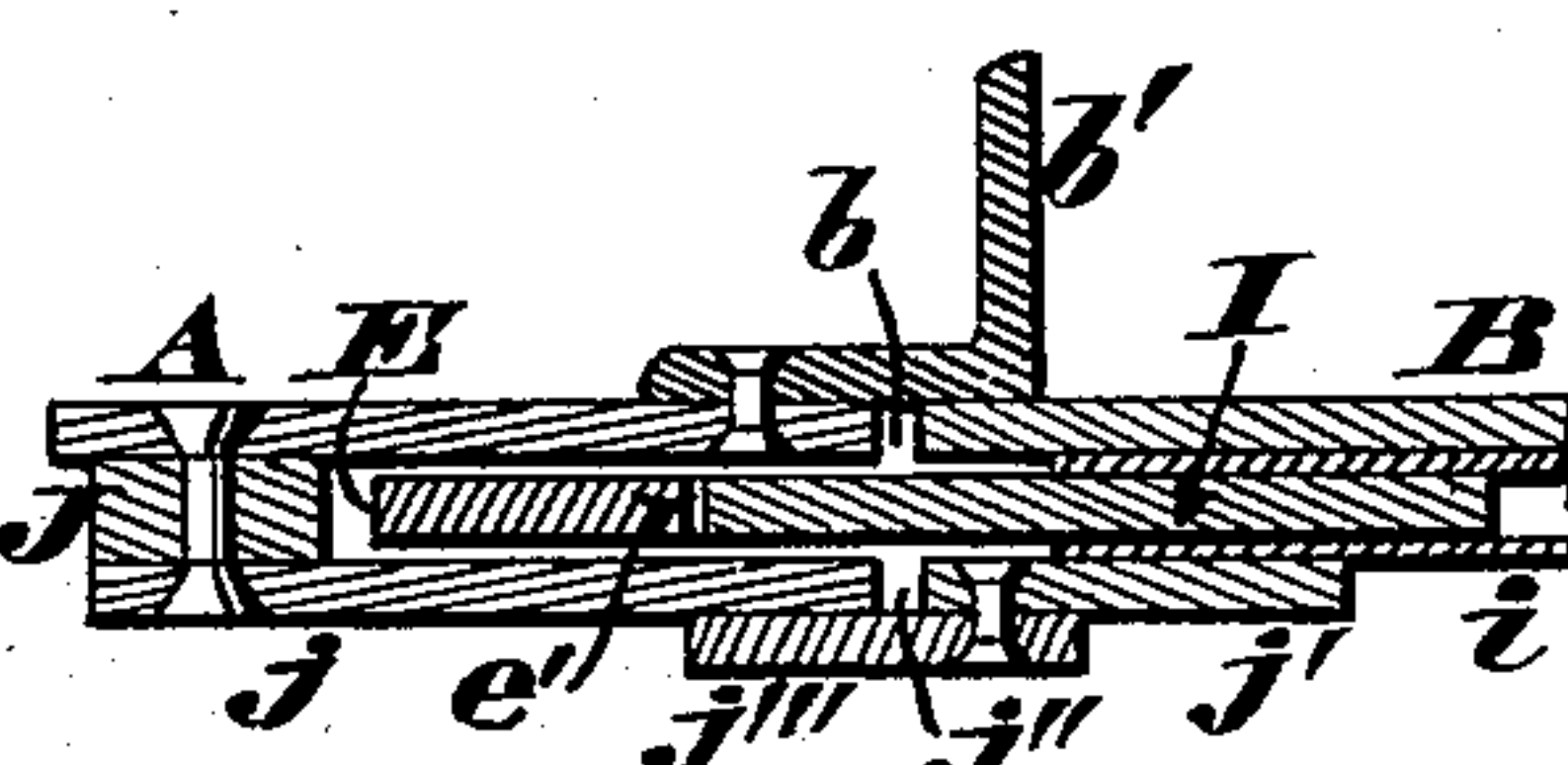


FIG. 8.

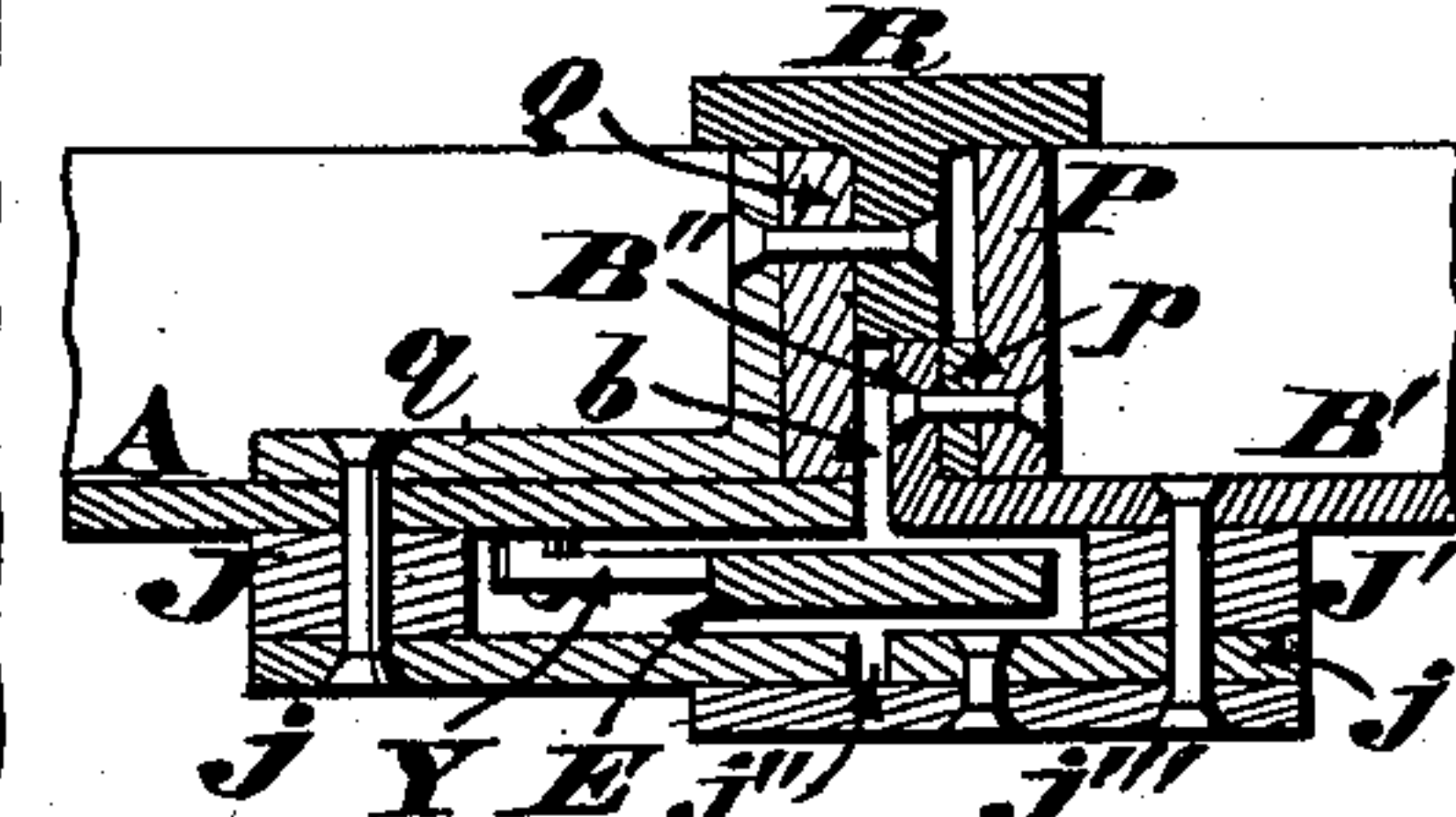


FIG. 9.

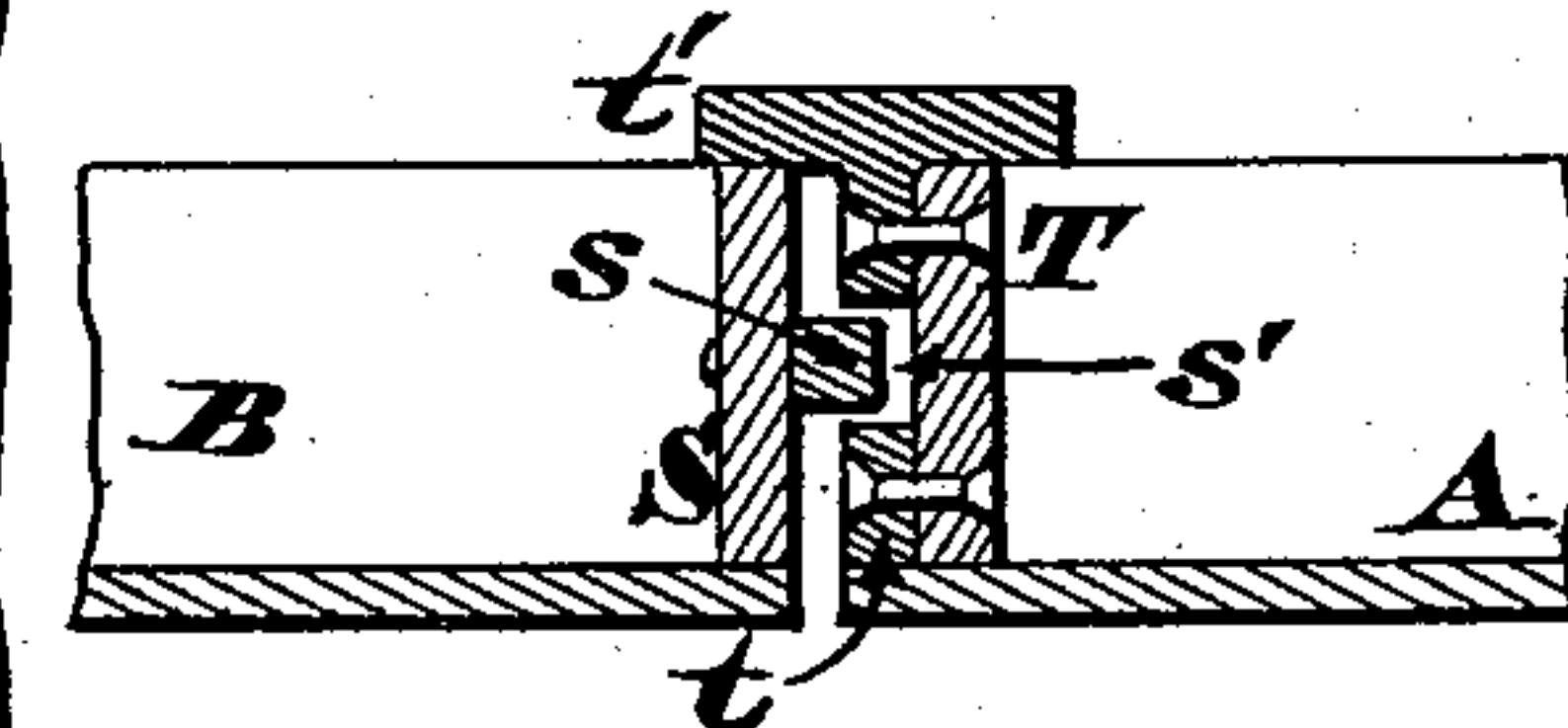


FIG. 10.

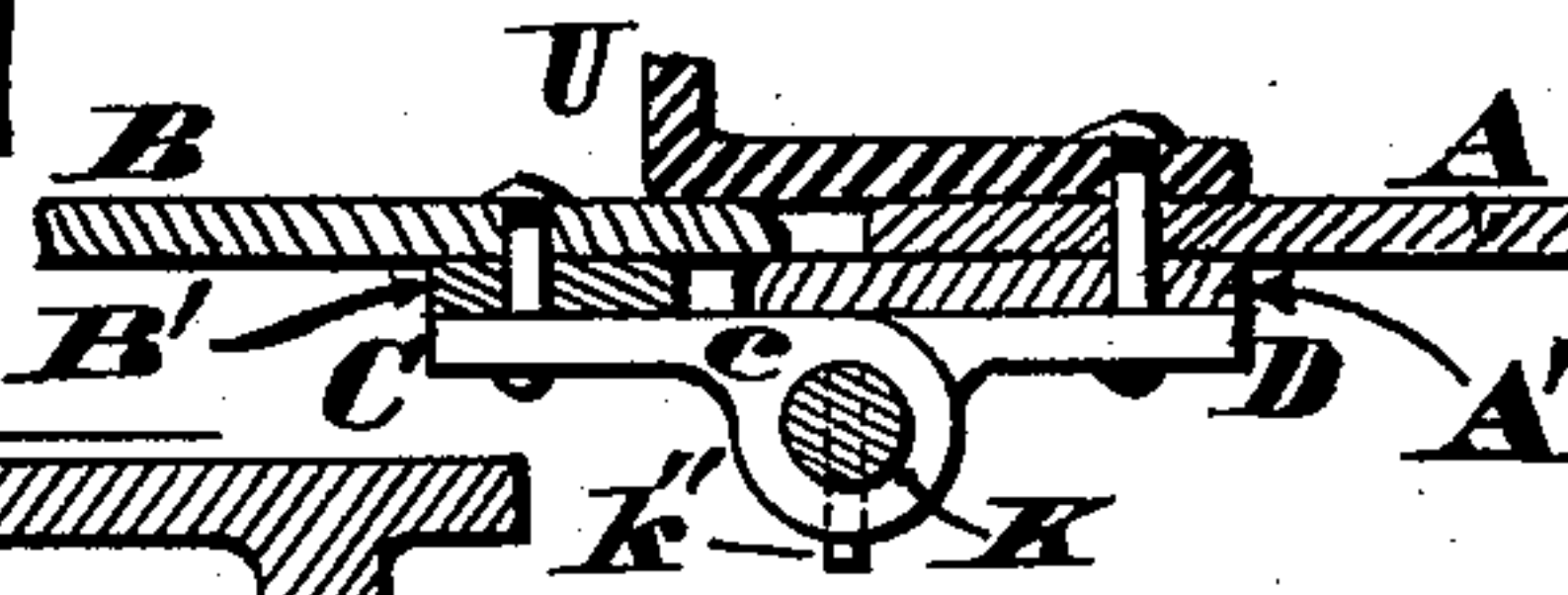


FIG. 6.

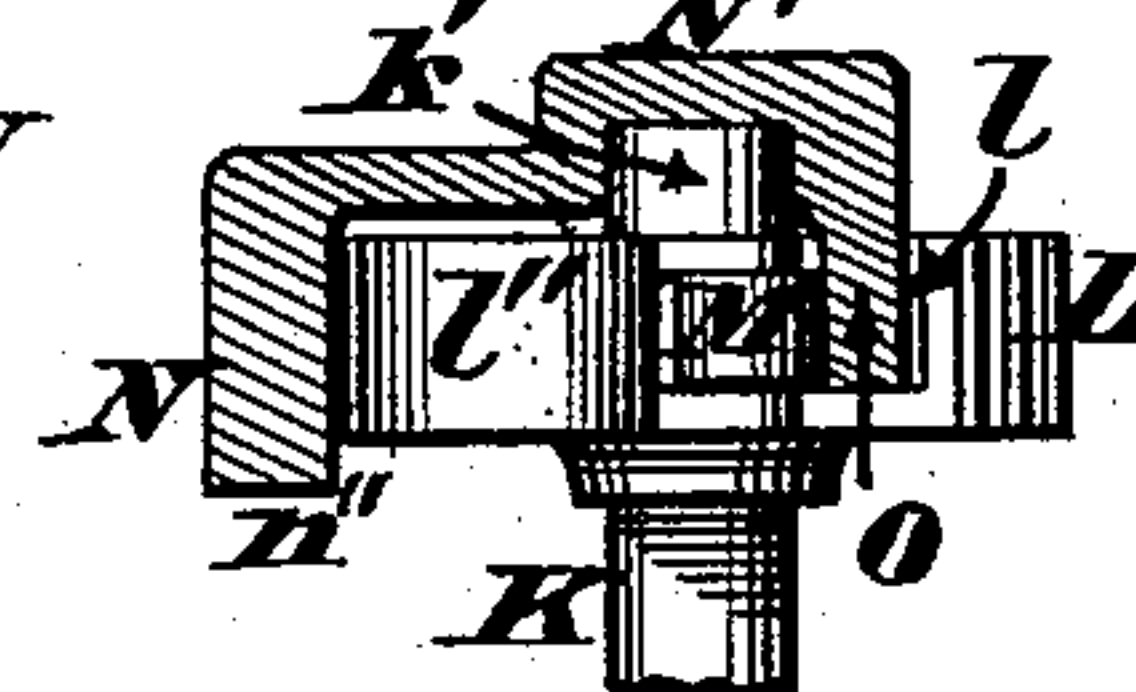


FIG. 5.

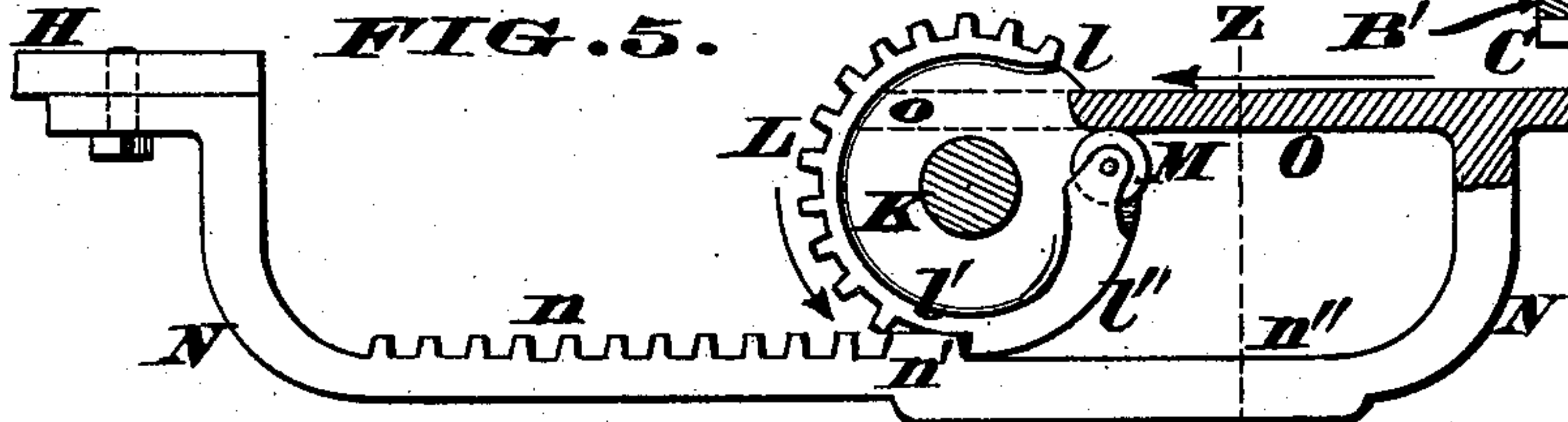
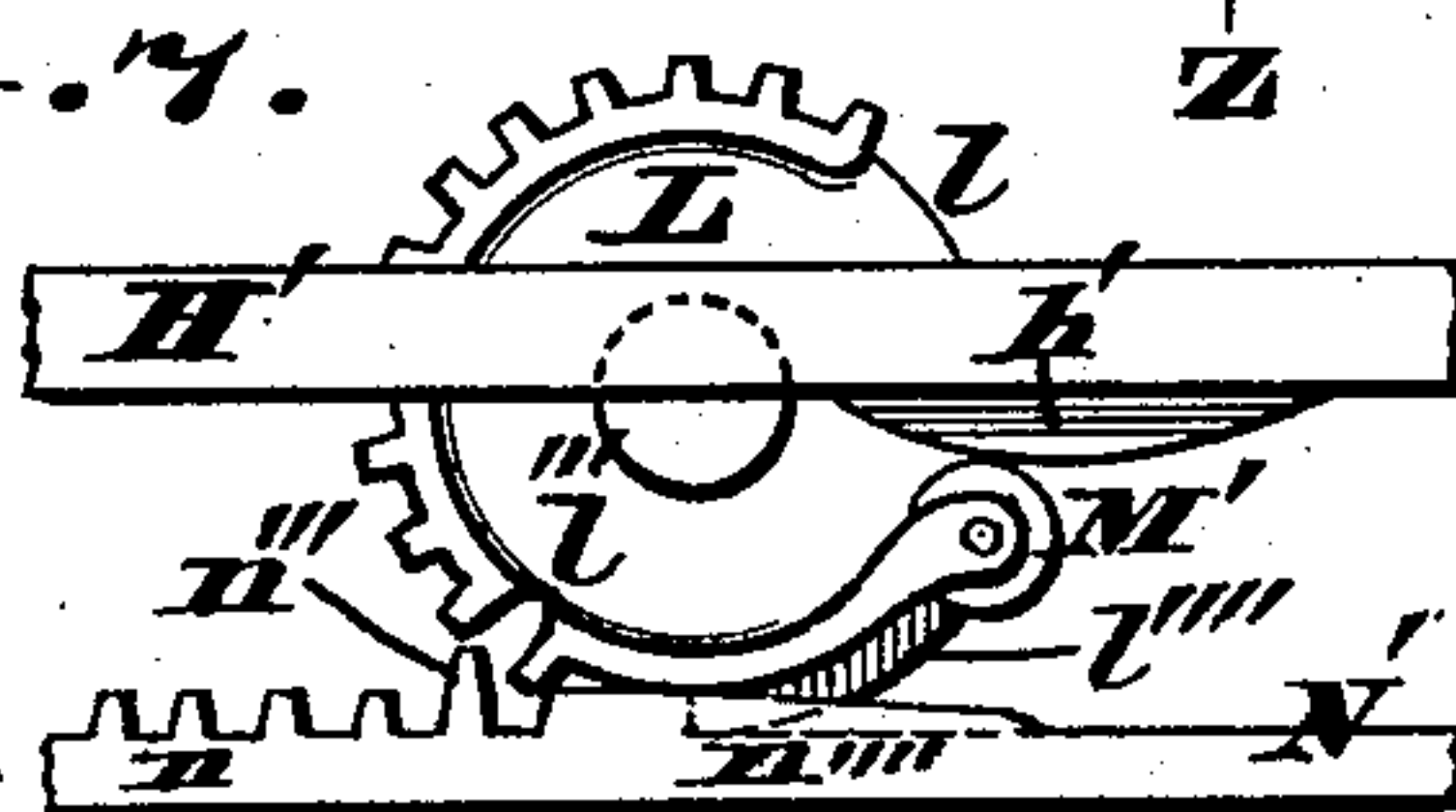


FIG. 4.



Attest.

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UNITED STATES PATENT OFFICE.

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JAIL.

SPECIFICATION forming part of Letters Patent No. 601,005, dated March 22, 1898.

Application filed September 16, 1897. Serial No. 651,854. (No model.)

To all whom it may concern:

Be it known that we, RICHARD C. STEWART, Jr., and WALLACE A. STEWART, citizens of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Jails; and we do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form a part of this specification.

In the most approved construction of jails, prisons, and other houses of detention it is customary to arrange a number of cells so as to communicate with a corridor or passageway and to provide mechanism wherewith the doors of the cells can be simultaneously operated by an officer stationed in a guard-room; and the principal feature of our present improvements consists in applying a "check attachment" to such operating means. The object of this check attachment is to prevent any possible rebound or partial opening of a door immediately after being closed, and said attachment may be applied to any approved form of door-operating mechanism; but we prefer using it in connection with the system of sliding bars, lap-plates, racks, and pinions, (seen in Letters Patent No. 584,610, granted to us June 15, 1897,) as hereinafter more fully described.

We also improve other features in the construction of jail-cells generally, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a sectionized front elevation of cell-door closed and fastened with our improved operating mechanism, the bolt of an auxiliary lock applied to said door being retracted. Fig. 2 is a similar elevation of a portion of said door after being unfastened and temporarily secured by advancing the bolt of said lock. Fig. 3 is an enlarged horizontal section of the door and its housing, said section being taken in the plane of the retracted bolt of the auxiliary lock. Fig. 4 is a similar section, but showing said bolt advanced. Fig. 5 is an enlarged horizontal section of a rack and pinion and its check attachment. Fig. 6 is a transverse section of said attachment, taken at the line $z z$ of the preceding illustration. Fig. 7 is a plan

of a modification of the check attachment. Figs. 8, 9, and 10 are horizontal sections through different portions of the door and its casings or jambs.

A represents a portion of a cell in a jail or prison or other house of detention, which cell may be made of metallic plates or of ordinary gratings; but in either event it is provided with a door B, opening outwardly on two or more hinges, the outer knuckles of which, $c c' c'$, are integral with leaves C C', attached to said door, while the inner knuckles $d d'$ are integral with the complementary leaves D D', secured to the door casing or jamb. b , in Figs. 2, 3, 4, and 8, is the vertical parting between the cell-casing and the free or lock edge of said door, which parting when the door is closed is covered by a lap-plate E, the latter being provided with inclined guides e , adapted to travel on small rollers F, secured either to the cell or to a housing on the outside thereof. This lap-plate is suspended from a bell-crank G, pivoted above the door at g and having an angular slot g' , traversed by a pin h , projecting laterally from a reciprocating bar H, which devices G g' H h , together with their operating mechanism, may be arranged as seen in our patent above referred to. Furthermore, said lap-plate has on its edge nearest the door a notch e' , whose length should fully equal the vertical travel of said plate; but the equivalent of said cut can be effected by bending the plate to one side in the manner shown at e'' in Fig. 2. The object of this notch e' or bend e'' is to enable the plate E to move without coming in contact with a bolt I of a lock-case i , which bolt can be advanced only by a key; but it can be retracted either by said key or by the notched edge of said plate coming in contact with the exposed end of the bolt. Again, this bolt can never be completely retracted within the case; but when forced back to its full limit it projects from said case a distance equal to the depth of the notch e' of the lap-plate E, as seen in Figs. 1 and 3, for a purpose that will presently appear.

Secured to the cell A is a vertical bar J, and bolted to this bar is a plate j , which two members constitute a housing within which

the lap-plate and its guides, &c., are confined in such a manner as to permit said plate having the proper vertical and lateral play. *J'* is another similar vertical bar secured to the door, but divided into two parts to admit the lock-case, a plate *j'* being bolted to said bar, as seen in Figs. 3 and 4. *j''* is the parting between the inner edges of these plates *j, j'*.

Secured to the plate *j'* is a guard-plate *j'''*, that completely closes this parting and prevents the lap-plate *E* being tampered with from the outside of the cell, while the other parting *b* is protected by an angle-iron guard *b'*, attached to the inner side of the cell, as seen in Figs. 3 and 4.

The door pivot or pintle consists of a single vertical shaft *K*, traversing the hinges *C, C'* and also passing through a box *k*, secured to the cell, said shaft being pinned or otherwise rigidly fastened to the knuckles *c, c', c'', c'''* of said hinges in order that the proper turning of said shaft will either open or close the door *B*. It is of course understood that this shaft turns freely within the knuckles *d, d'* of those leaves *D, D'* secured to the door-casing, the upper end of said shaft being provided with an incomplete pinion *L*, whose peculiar construction is seen in Fig. 5. Reference to this illustration shows that the teeth of said pinion extend only about half-way around its periphery and that a gap *l* is left between the last one of said teeth and a small check-roller *M*, the latter being journaled on a pin fitted vertically in the pinion.

l' is an open space between the first tooth and a smooth concentric periphery *l''* of the pinion, said smooth surface being a continuation of a circle described around the face of the teeth.

N is a casting bolted to the end of a reciprocating bar *H* and provided with a rack *n*, lug *n'*, and untoothed surface *n''*. The back of this casting has a vertical flange *O*, projecting toward the pinion *L* and adapted at the proper moment to pass through the gap *l* of said pinion, as indicated by the dotted lines *o*. The top of this casting has a longitudinal groove or race *N'*, traversed by a roller *k'*, journaled on the upper end of shaft *K*, as more clearly seen in Fig. 6.

In the modification of our door-check mechanism seen in Fig. 7 the bar *H'* has a bulge *h'* to bear against the roller *M'* and the rack *n* has a long tooth *n'''* to engage with a deep interdental space *l'''* of the pinion. *l''''* is a concentric rib of the pinion, and *n''''* is a groove in the casting *N'* to admit said rib.

Fig. 8 shows a very secure construction of the lock side of a door and a jamb or casing against which the door closes, said construction being applicable either to doors and cells made of plates or to those composed of gratings. In this construction the door or lock-stile *B'* of the same is bent inwardly at *B''*, and between this flange *B''* and vertical plate *P* of said door a filling-strip *p* is inserted, the members *B'' P p* being firmly riveted together.

The plate *A* of the cell is stiffened in the rear by a jamb-plate *Q*, and these two plates *A, Q* are backed up with an angle-iron *q*. *R* is an T-shaped angle-iron so bolted to the jamb-plate as to form a stop for the closed door. Furthermore, this angle-iron serves as a guard that prevents the inmate of a cell passing a tool in between the door and jamb and shifting the lap-plate *E*, which is here shown as being carried by one of a number of links *Y*.

Fig. 9 shows a very secure construction of the hanging side of a cell-door, the plate *S* thereof having a tongue *s* bolted to it and the tongue being adapted to enter a vertical groove *s'*, formed between the opposing edges of a bar *t* and an angle-iron *t'*, bolted to the door-jamb *T*. This tongue extends from the top to the bottom of the door and prevents it being forced either out or in, while the angle-iron *t'* closes the parting between said door and its jamb.

Fig. 10 shows one way of fastening a hinge to a cell and door. Here the door *B* is in line with the cell frame or plate *A* and has a metallic strip or batten *B'* riveted to it, the same rivets serving also to fasten the hinge-leaf *C* in place. *A'* is a similar batten secured to the cell-frame by rivets that hold in place the hinge-leaf *D* and internal angle-iron brace *U*. As the door *B* is engaged behind the batten *A'* it is evident the mere breaking off of a hinge would not permit the door to be detached or opened as long as its lock edge is fastened. This advantage also inheres in the construction seen in Fig. 9. Again, Fig. 10 shows a pin *k''* for fastening the shaft *K* to the hinge-knuckle *c*.

The operation of our check attachment is as follows: The bar *H* may be shifted back and forth by any approved means; but we prefer the operating mechanism seen in our patent previously alluded to, and, assuming that said bar is advanced, as seen in Fig. 1, the door *B* will be locked by the lap-plate *E*, because it closes the parting *b* between said door and jamb, as more clearly represented in Fig. 8. Again, in this advanced position of the bar the smooth portion *n''* of casting *N* is now opposite the teeth of pinion *L*. To open the door, the bar is forced back, as indicated by the arrow in Fig. 2, thereby raising the lap-plate *E* and shifting it over toward the bar *J*. Consequently the parting *b* is uncovered, as seen in Fig. 2. As soon as the bar has traveled far enough to unlock the door, the rack *n* engages with the pinion-teeth and turns it in the direction of the arrow seen in Fig. 5, thereby initiating the opening of said door. This opening movement continues as long as the bar is sliding back; but when it stops the last tooth of rack *n* will be engaged with the pinion and the door will stand wide open. Some little power is required to start the door, especially if its hinges have been permitted to rust; but by providing a thick lug *n'* and causing it to bear against the end of the portion *l''* of the pinion there will be

no danger of either of the devices L or *n* being injured by the strain. To close the door, the bar H is shifted in the direction indicated by the arrow in Fig. 5, and at the very first movement in this direction the rack begins to turn the pinion L and its attached shaft K, and by the time said pinion has reached the position seen said door will be completely shut. The very instant the door is completely closed the advancing flange O comes in contact with the roller M, thereby checking any retrograde turning of pinion L and shaft K. Consequently any rebound of the door is thus effectually guarded against. The dotted lines *o* indicate that the advancing end of the flange O traverses the gap *l* and passes over to the opposite side of the pinion L; but during this time the side of said flange is bearing against the roller M. Furthermore, while the flange is describing this path the untoothed portion *n''* of the casting is advancing, but has no effect on the pinion. This inoperative travel of the casting N is necessary to enable such a final shifting of the bar H as will insure the restoration of the lap-plate E to its normal position, (seen in Fig. 1,) or, in other words, the locking devices cannot come into action until the door is completely closed and so checked as to prevent it rebounding.

In the modification of our check mechanism seen in Fig. 7 the swell *h'* performs the duty of the flange O, and the long tooth *n'''* by entering the deep interdental space *l'''* initiates the turning of the pinion L' for the purpose of opening the door. The engagement of the rib *l''''* with the groove *n''''* assists in preserving the rack N' in its proper operative position as it travels back and forth.

We claim as our invention—

1. A hinged door, a shaft adapted to open and close it; a pinion secured to said shaft; a reciprocating rack that operates said pinion; and a check that arrests the latter as soon as said door is closed, for the purpose stated.

2. A hinged door, a shaft serving as the pintle of its hinges, a pinion secured to said shaft; a reciprocating rack that operates said pinion, and a check that arrests the latter as soon as said door is closed, for the purpose stated.

3. A hinged door, a shaft or pintle adapted to open and close it; an incomplete pinion L secured to said shaft, and provided with a gap *l*, and roller M, and a reciprocating rack N *n n'*, O that actuates said pinion, in the manner described, and for the purpose stated.

4. A cell, a door hinged thereto; a vertically and laterally shiftable lap-plate having a notch of sufficient length to permit the up-and-down movement of said plate, and a lock-case secured to the door and provided with a bolt capable of being advanced and retracted by a key, and also of being retracted by the contact of said plate with it; which bolt when thus forced back projects from its case a distance equal to the width of said notch, for the purpose described.

5. The cell A having a jamb-plate Q secured to it by an angle-iron *q*, and the T-shaped angle-iron R fastened to said jamb-plate, for the purpose described.

6. The cell-door plate B', bent inwardly at B'', the plate P, fastened to this bend B'', and a filling *p*, interposed between said plates in the manner described.

7. The door B having a plate S secured to its hinge side, and a vertical rib *s*, fastened to said plate, in combination with a cell having a plate T, secured to it, and a pair of bars *t, t'*, secured to said plate T, so as to leave an interval *s'* between them, for the purpose described.

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

RICHARD C. STEWART, JR.

WALLACE A. STEWART.

Witnesses:

JAMES H. LAYMAN,

EARLE R. PASSEL.