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PATENTED APR. 28, 1908.

J. U. NETTENSTROM.
MECHANISM FOR LOCKING ROUNDHOUSE DOORS.
APPLICATION FILED SEPT. 20, 1906.

Fig. 1.

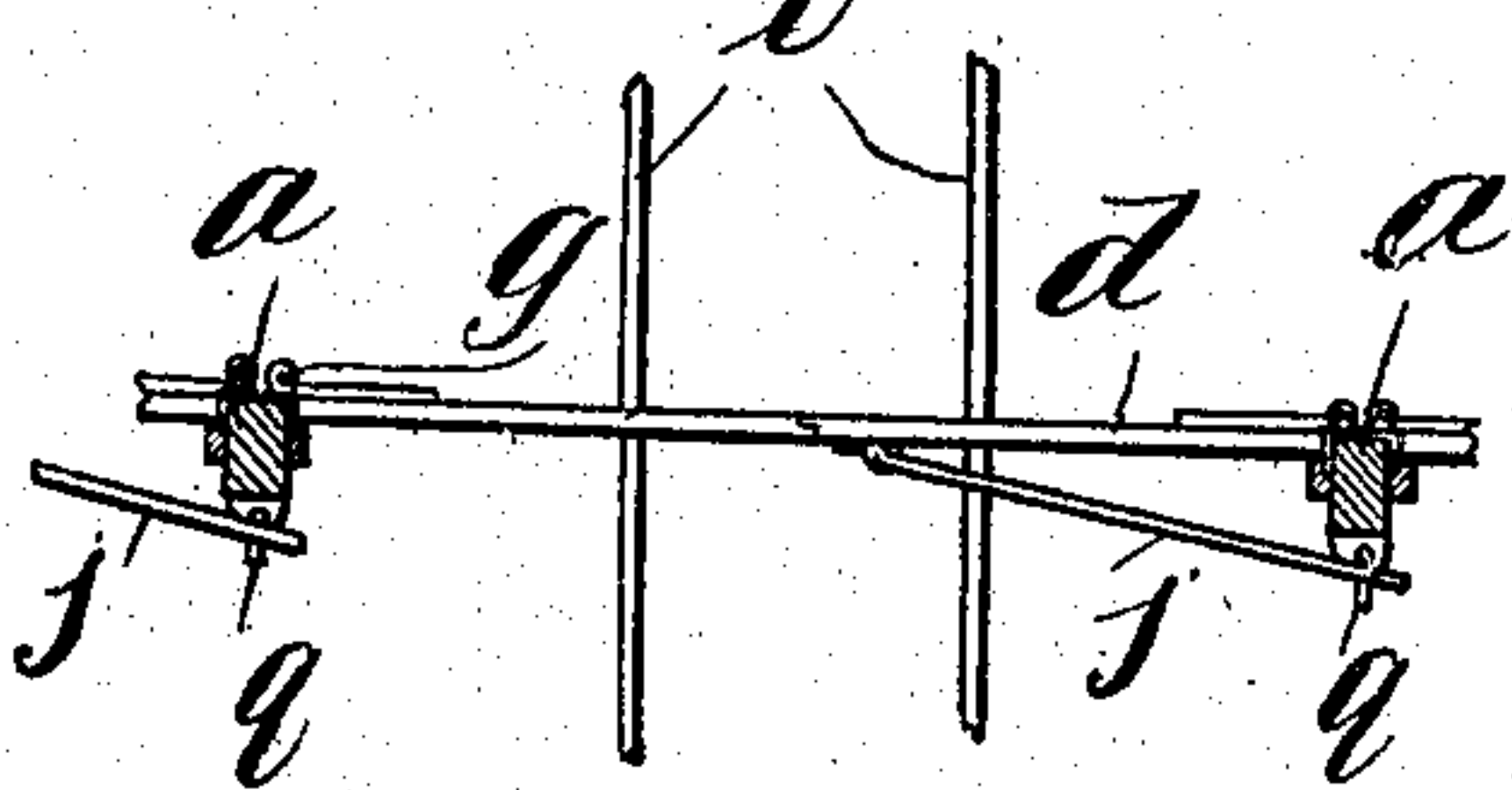


Fig. 2.

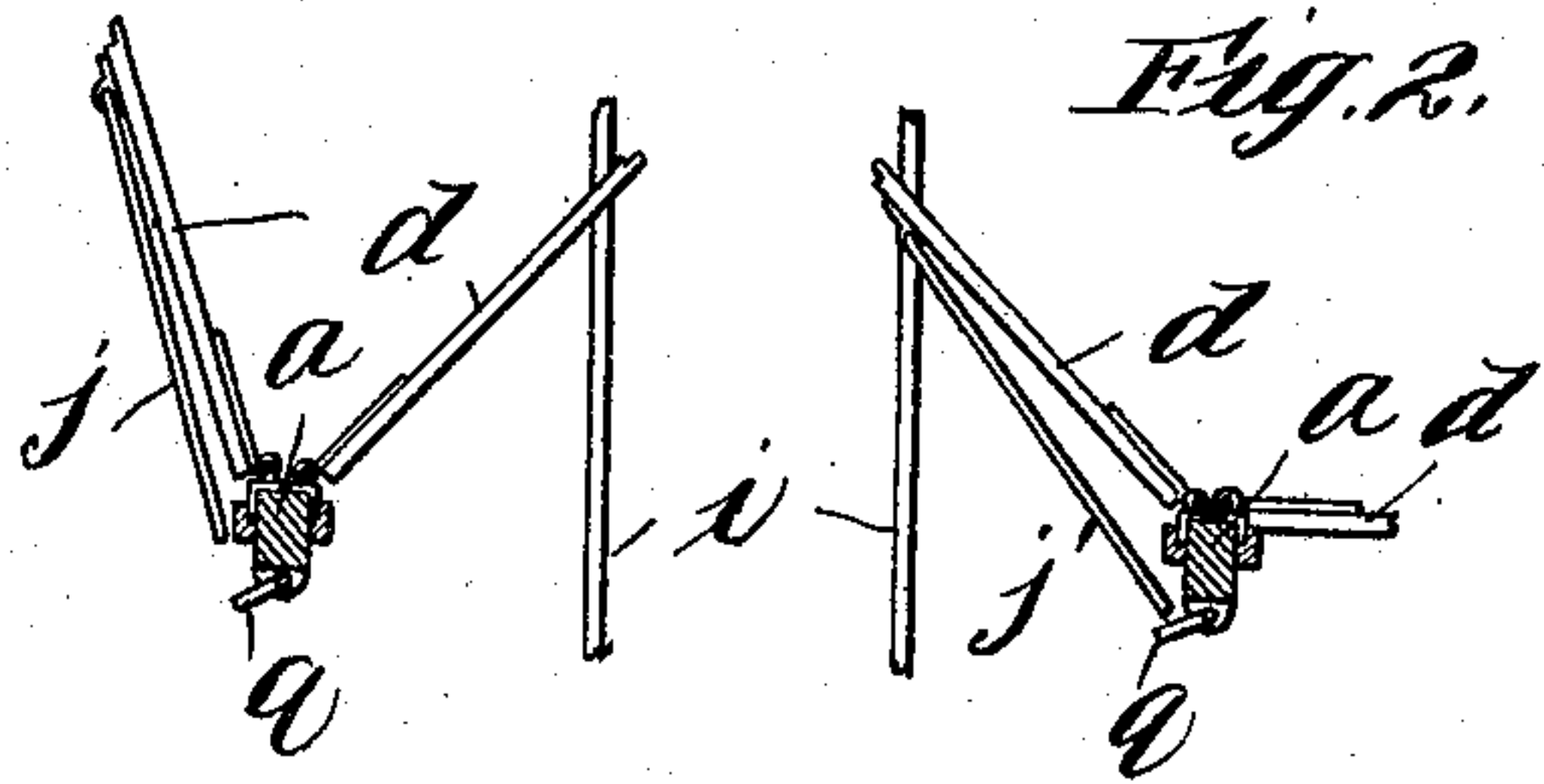


Fig. 3.

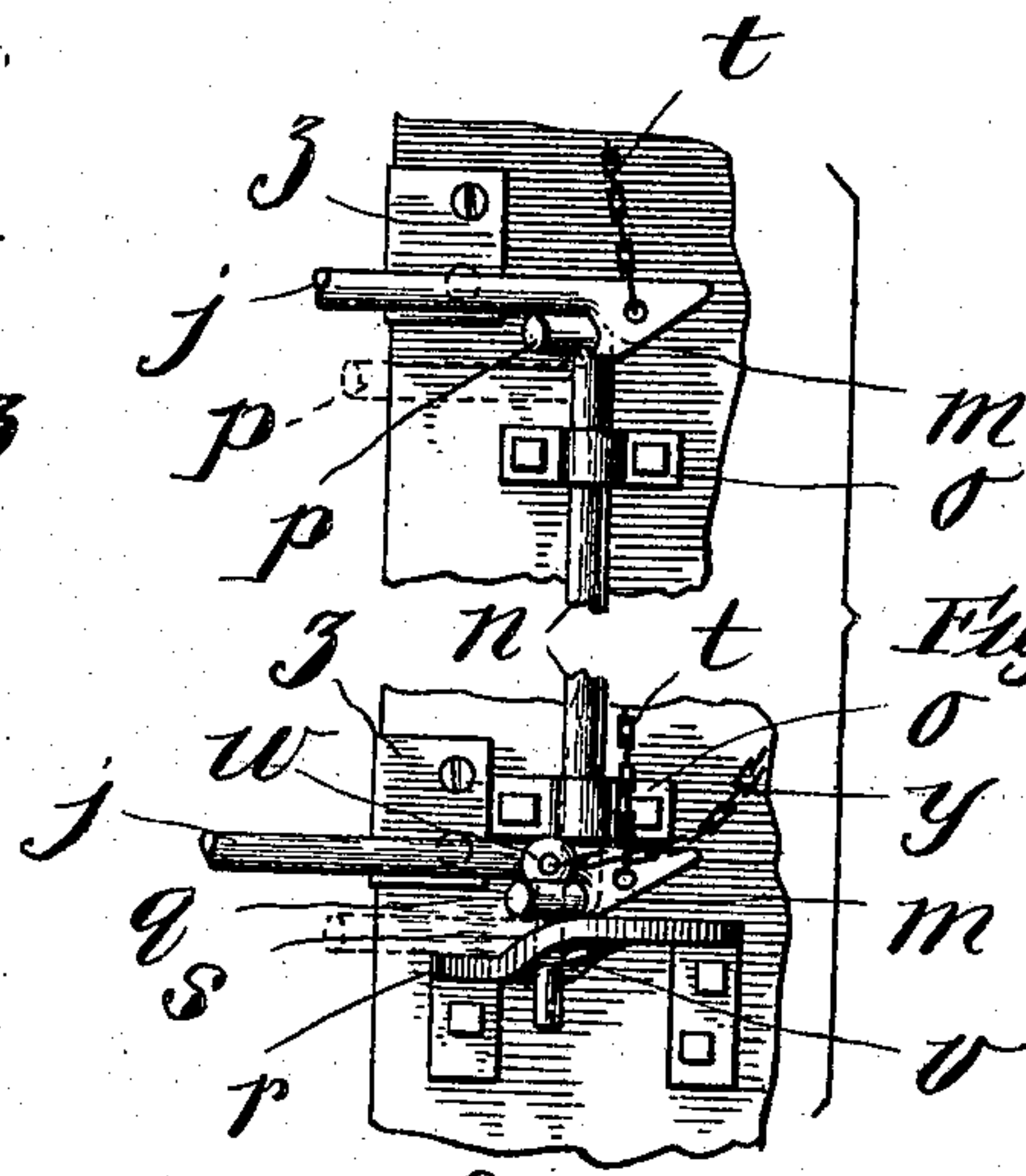
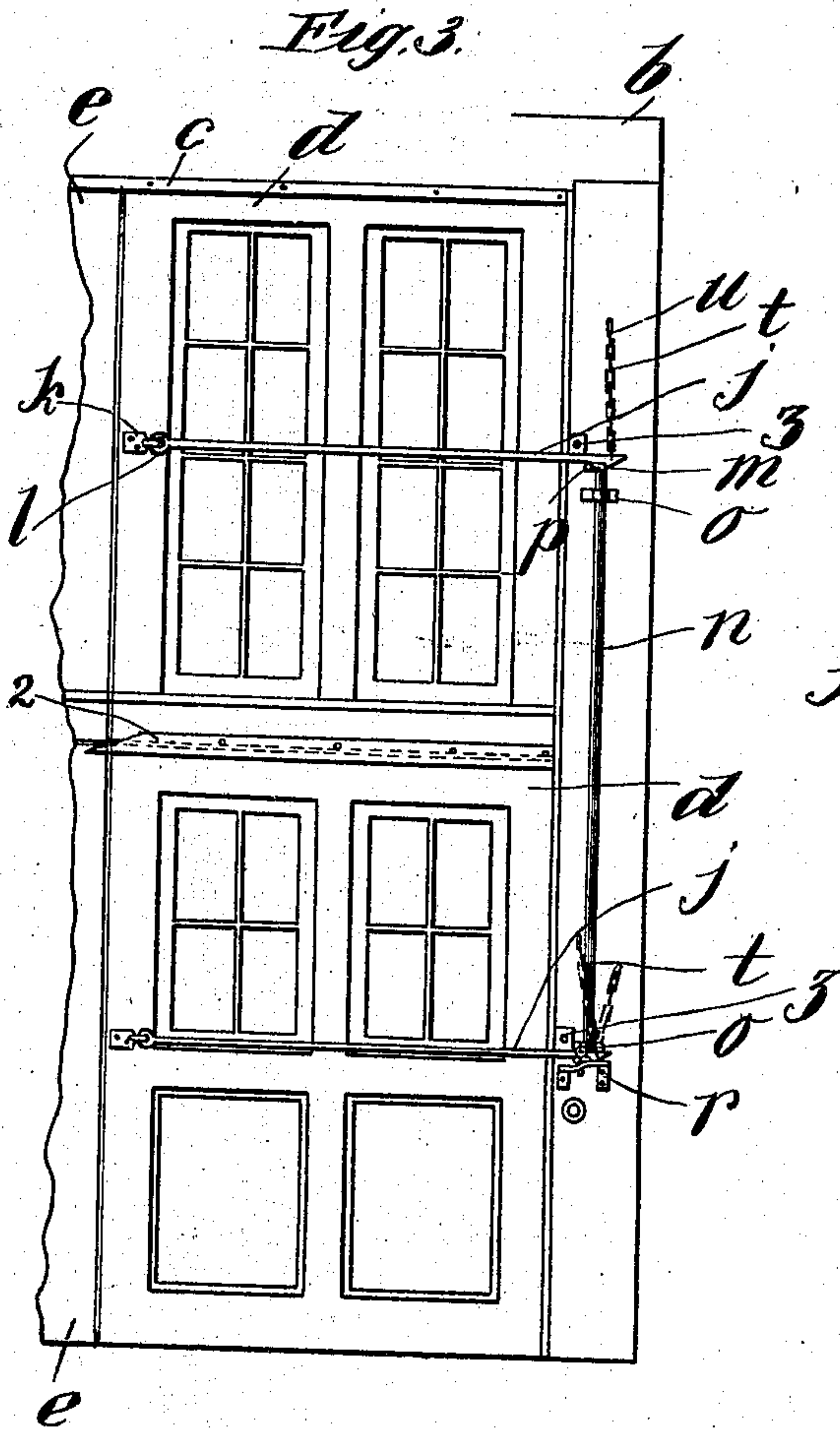


Fig. 4.

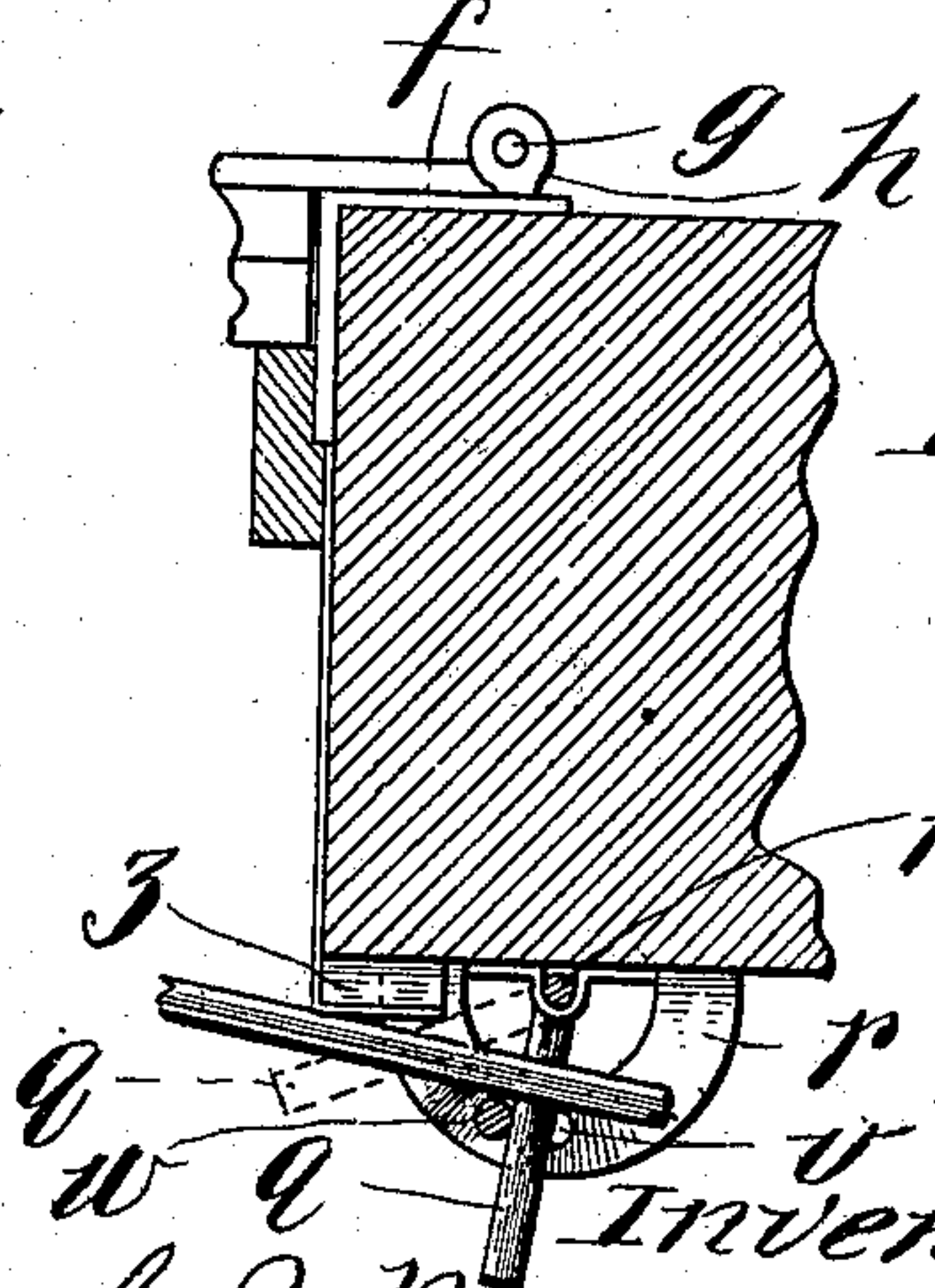


Fig. 5.

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MECHANISM FOR LOCKING ROUNDHOUSE-DOORS.

No. 885,858.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed September 20, 1906. Serial No. 335,450.

To all whom it may concern:

Be it known that I, JOEL U. NETTENSTROM, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanisms for Locking Roundhouse-Doors.

The invention relates to that class of door locking mechanisms having operating lever mechanism adjacent to the hinged side of the door or doors and having connecting tension members or rods connected with such lever mechanism and secured to the swinging portion of the door or doors,—the operating lever mechanism being provided with means for securing it and thereby the doors in closed position.

The principal object of the invention is to provide a simple, economical and efficient mechanism for closing and locking round house doors.

A further object is to provide a door closing and securing mechanism, adapted to enable a plurality of doors to be tightly closed and secured in closed position by means of a single operating lever.

A further object is to provide means for enabling a plurality of doors of large dimensions such as are required for admitting locomotive engines and which are liable by reason of their size to become warped, to be tightly drawn at different points to closed position and securely held in such position, and to enable the lever mechanism to be within convenient reach of the operator from the floor level and operatively connected with tension rod or link mechanism which is secured to the door at the required plurality of points one or more of which may be at such an elevation as to be beyond the reach of the operator.

Other and further objects of the invention will appear from the examination of the drawings and the following description and claims.

The invention consists in the features, combinations and details of construction hereinafter described and claimed.

In the accompanying drawing Figure 1 is a diagrammatic plan view of a set of doors provided with my improved door closing and locking mechanism, showing the doors in closed position. Fig. 2. a similar view showing a set of doors in open position, and the door operating mechanism in corresponding position. Fig. 3. a view in elevation of a set

of doors provided with my improved closing and locking mechanism with certain parts of the doors omitted. Fig. 4. an enlarged detail view in elevation showing the operating and locking lever mechanism and connecting tension or link members with parts broken away, and showing the operating lever rod in releasing position in dotted lines, and Fig. 5. an enlarged sectional plan view in detail, showing the operating lever and lever plate or locking and guiding segment and one of the tension members or hooked rods shown in Fig. 4., and illustrating the position of such parts with relation to the hinged side of the door or doors to be closed and secured thereby.

In the art to which this invention relates it is very desirable to provide door closing mechanism requiring but one operating lever or rock shaft for closing and securing an entire set of four round house doors, such mechanism being adapted to enable the doors to swing to open position with the hooked tension rods entirely out of engagement with the operating lever mechanism in such a manner that the doors and the closing and locking mechanism will occupy the minimum amount of space between the tracks upon which locomotives pass in and out. It is also desirable that such door closing and locking mechanism be adapted to be operated by a person upon the floor level and that the mechanism should act in such a manner as to draw upon the doors at different points, one or more of which are at a height beyond the reach of the operator, so as to tightly close both the upper and lower portions of doors of such large dimensions as are required to permit the passage of locomotive engines therethrough, and overcome the tendency of such doors to warp.

In constructing a device in accordance with my improvements and adapted to accomplish the above objects in an efficient manner, I provide a door-frame having upright members *a* and suitable horizontal upper members *b* and *c* which may be of any ordinary and well known type forming a door-frame of such strength and dimensions as are required in doors for permitting the passage of locomotive engines therethrough.

A set of preferably four doors is mounted in each door-frame, each set comprising preferably a pair of doors *d* arranged one above the other in one side of the door-frame and upper and lower doors *e* arranged one above

the other in the other side of the frame, so that the swinging upright edges of the doors overlap at the center of the door-frame. These doors are secured to the frame by means of hinges *f* having upright pintles *g*, said hinges each having fixed hinge members *h* mounted in the upright side members of the door-frame in position to permit a pair of doors of each adjacent set to be mounted upon the same upright portion or door-frame and swing to open position midway between railway tracks *i* which pass through the doorways thus provided. Each of the doors *d* is provided with one or more connecting tension members or rods *j* having one end articulately secured to the door at or near its outer swinging edge by means of a clip *k* into which the loop portion *l* of the connecting rod or tension member extends. The opposite end of each tension member or connecting rod *j* is provided with a depending hook portion *m*. Operating lever mechanism in the form of a rock-shaft or lever-rod *n* is rotatably mounted in suitable metallic bearings *o* which are secured to the upright side frame member. The upright main body portion of this rock-shaft or lever-rod is provided at its upper end with a lever-arm *p* and at its lower end with a lever-arm *q* which forms the main operating lever. Each of these lever arms is movable into and out of engagement with the hooked end of the adjacent tension or connecting rod members. The lower lever-arm rests upon a lever-plate or locking and guiding segment *r* which is secured to the upright side portion of the door-frame and extends downward and toward the hinged side of the door at an incline so as to provide an upper inclined cam surface portion *s*, upon which the operating lever mechanism slides downward and toward the door to releasing position, and upward and away from the edge of the door to door-closing or securing position. The lever rod or rock shaft is so mounted in its supporting bearings as to freely slide upward during movement of the levers to door-closing or locking position as shown in full lines in Fig. 4, and downward during movement of the lever arms to releasing position, as shown in dotted lines in said figure. The hooked end of each of the tension members *j* is supported by means of a chain *t* which is secured by means of an eye member *u* at a sufficient distance above the hooked rod to permit the doors to swing freely to extreme open and closed positions. The lever plate or locking segment *r* is provided with a plurality of perforations *v*, and a locking pin *w* is secured to the door-frame by means of a guard chain *y* and is adapted to be inserted in any desired one of such perforations in position to securely hold the lower lever arm *q* and thereby the doors in closed position.

The lower ends of the chains *t* above de-

scribed which support the hooked ends of the tension members *j* are adapted to swing with such tension members as the doors are swung open. As these supporting chains swing away from vertical position they tend to raise the hooked ends of the connecting rods out of engagement with the operating lever mechanism, and at the same time the upper and lower lever arms *p* and *q* descend during their movement to releasing position until the lever arms and hooks become entirely disengaged by the movement of the doors to open position. The closing of the doors brings the hooks back into position to be engaged by the lever arm, and the lever mechanism may then be turned to position shown in full lines in Fig. 5 to draw the doors to tightly closed position. The lever mechanism is then secured in locking position by means of the locking pin as above suggested. The lever mechanism is on the inner side of the upright door-frame member and the hinges of the doors to be operated by such lever mechanism are on the outside of such side frame member, so that the hooked rods or links extend from their point of connection with the swinging edges of the doors practically entirely across the doors toward the hinged sides thereof and outward at an angle to the points of engagement with the operating and locking lever mechanism above described. Face plates with fillers *z* are mounted upon the corners of the upright door-frame members in position to guide the tension members or hooked connecting rods and prevent the wearing away of the wooden portion of the door-frame.

The swinging edges of the doors to which the closing and locking mechanism is directly connected overlap the swinging edges of the other pair of doors of the set, so that the entire set of four doors in each door-frame are tightly closed and held in closed position by the same lever-rod or rock-shaft. The hooked connecting rods or tension members draw the doors at a plurality of points snugly into tightly closed position,—the points to which such tension members are secured being at suitable intervals and in such positions on the doors to minimize the tendency to warp. In fact door operating mechanism thus constructed and connected with the inner sides of the doors tends to straighten and tightly close such doors even though they may be warped to a considerable extent.

The hooked tension members or rods are so arranged that their hooked ends swing entirely out of engagement with the lever mechanism when the doors are in their extreme open position. While out of engagement with the operating lever mechanism, the tension members are supported at their free or hooked ends, by the chains *t* so as to swing with the doors. There are one or

more tension members upon each door *d*, and the upper doors have metallic strips or flanges 2 on their inner sides or bottom edges and which overlap the edges of the lower doors. The upper doors may therefore be closed and held in closed position by the door operating mechanism while one or both of the lower doors is in either open or closed position, and permitted to swing to either open or closed position. Either or both of the doors *d* to which the tension members are secured may be closed and securely locked while either one or both of the doors *e* are open or closed, as desired. The lever mechanism or rock-shaft, and the guide-plate and locking mechanism are all mounted in such position on the inner side of the door frame and laterally beyond the upright inner edge of the doors that the entire opening formed by the door-frame is unobstructed by such door operating and locking mechanism. The doors are permitted to swing to the widest possible open position so that the whole door operating mechanism and the doors occupy the minimum amount of space between the tracks.

I claim:—

1. In a device of the class described, the combination of a hinged door, a tension member secured to the inner side of the door, and door operating lever mechanism mounted adjacent to the hinged side of the door and movable into and out of engagement with such tension member and thereby with the door.

2. In a device of the class described, the combination of a hinged door, lever mechanism mounted adjacent to the hinged side of such door, and a hooked tension member secured to the door and movable into and out of engagement with such lever mechanism.

3. In a device of the class described, the

combination of a rock-shaft provided with lever arms, means for connecting the lever arms of such rock-shaft with door mechanism to be operated thereby, means for pivotally supporting such rock-shaft, and guiding mechanism mounted in engagement with the rock-shaft mechanism and provided with means for holding the same in door closing position.

4. In a device of the class described the combination of a longitudinally movable rock-shaft provided with crank or lever-arm portions, means for connecting the lever arm portions of such rock-shaft with door-mechanism to be operated thereby, and guiding mechanism having an inclined guiding surface portion in engagement with such rock shaft.

5. In a device of the class described, the combination of a plurality of hinged doors, tension members secured to a plurality of such doors, and a rock-shaft having a plurality of crank arms each movable into and out of engagement with one of such tension members.

6. In a device of the class described the combination of a plurality of hinged doors, door closing lever mechanism connected with the inner sides of a plurality of such doors, and means for locking such lever mechanism in door closing position.

7. In a device of the class described, the combination of a plurality of hinged doors, door closing mechanism mounted adjacent to the doors, and tension members secured to the door mechanism and movable independently of each other into and out of engagement with such door operating mechanism.

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Witnesses:

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