

No. 704,887.

Patented July 15, 1902.

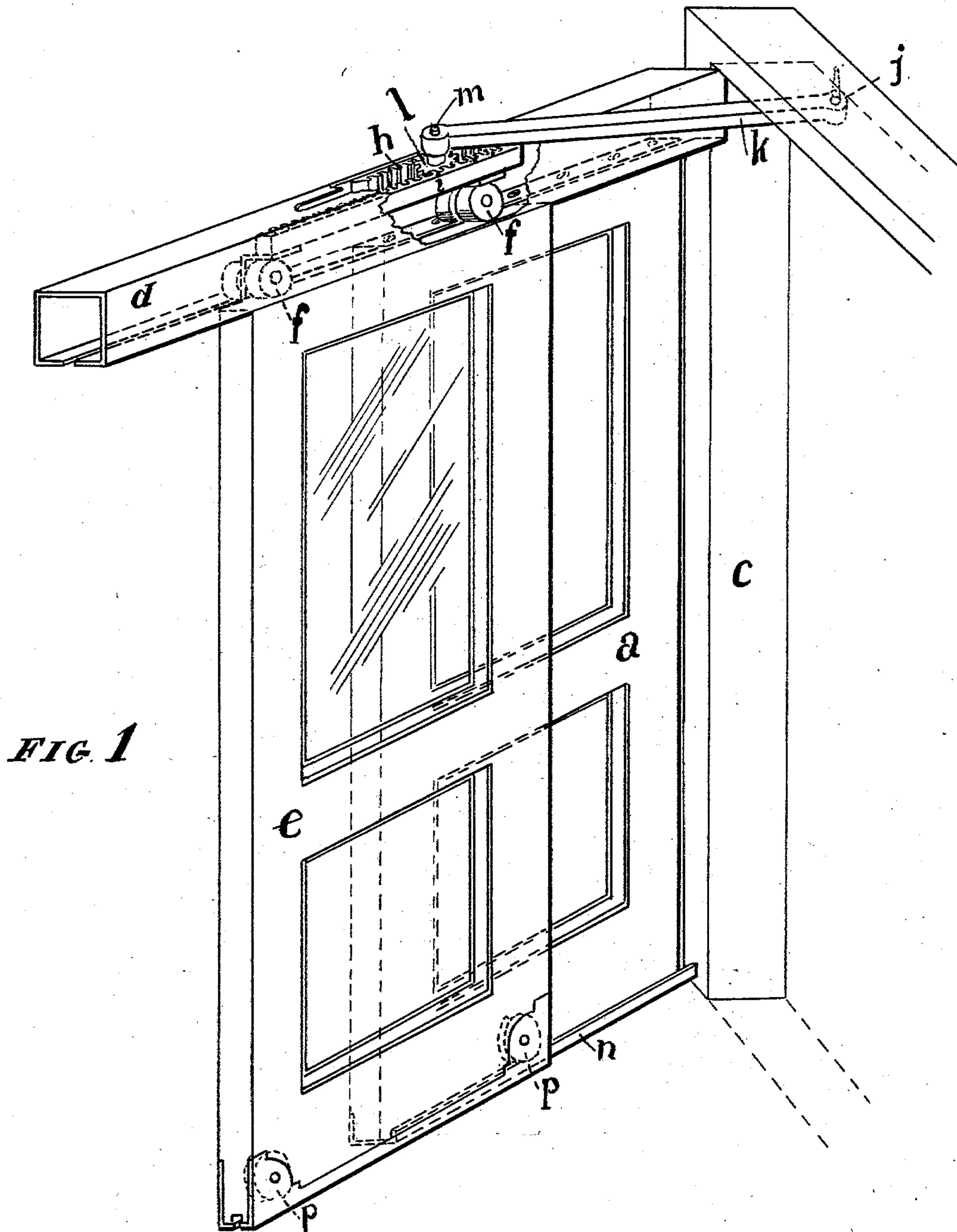
F. F. LOW.

DOOR.

(Application filed Apr. 22, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

Albert Hamilton
Alexander Hamilton

FREDERIC F. LOW, INVENTOR.

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ATTORNEYS

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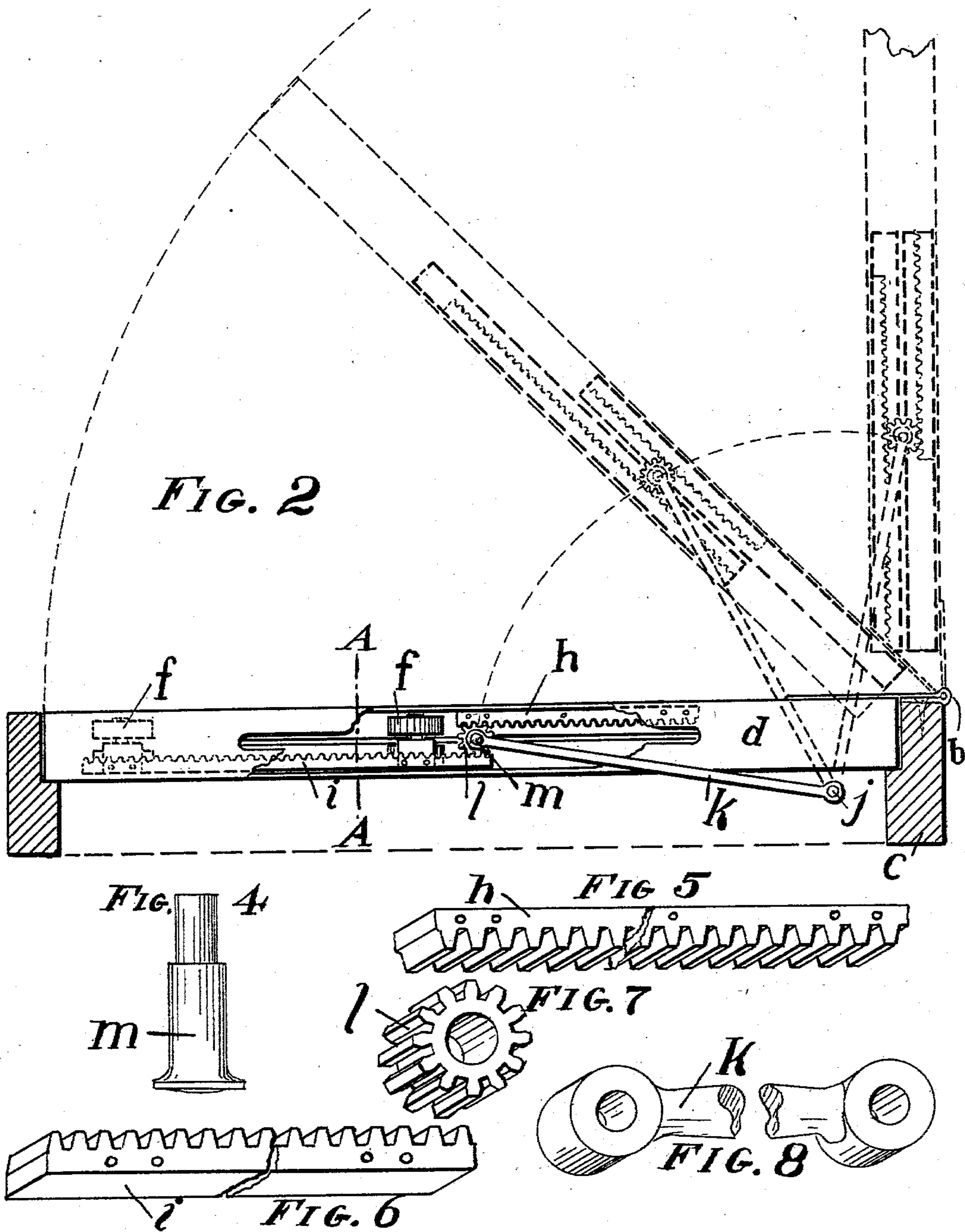
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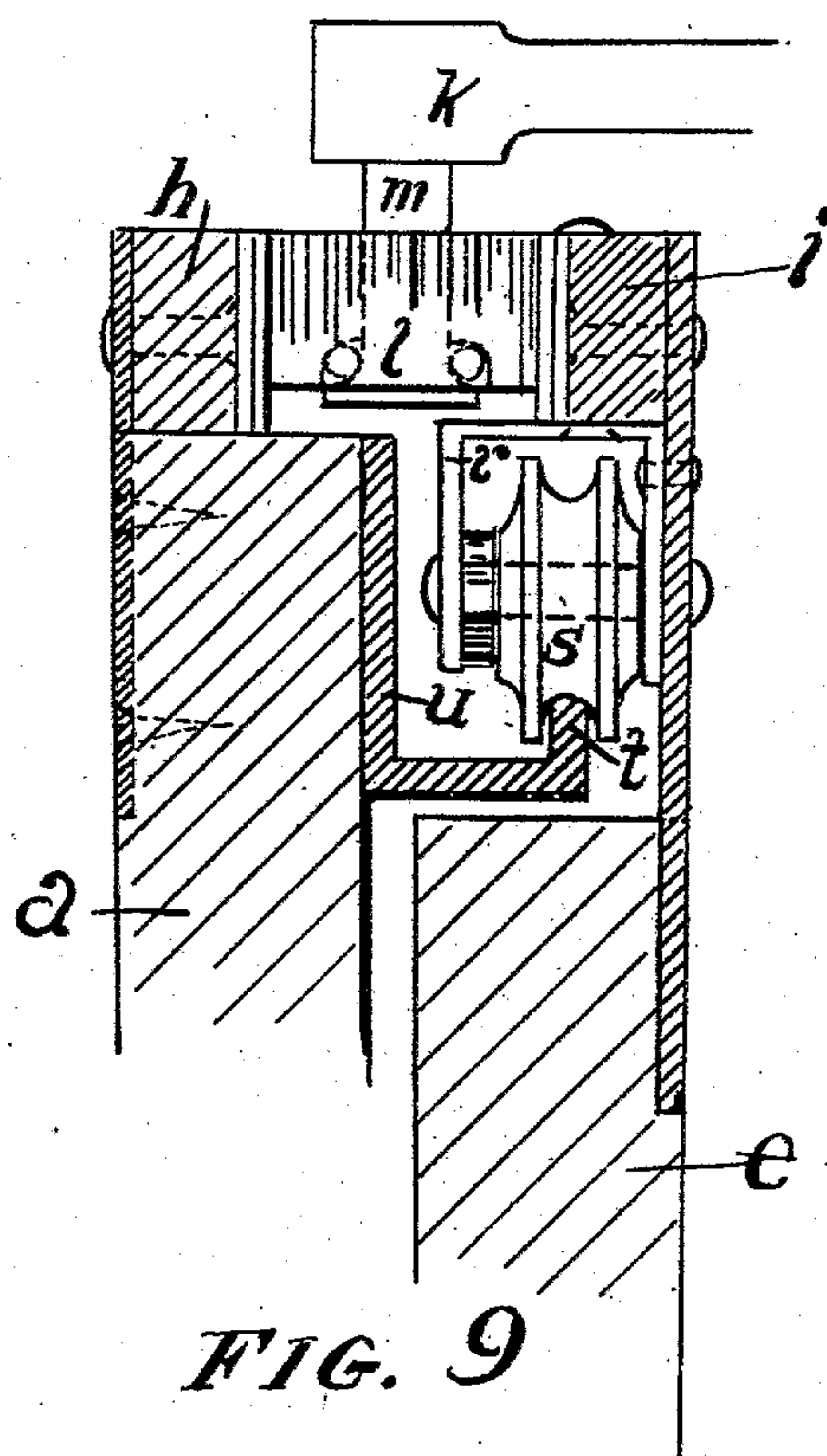
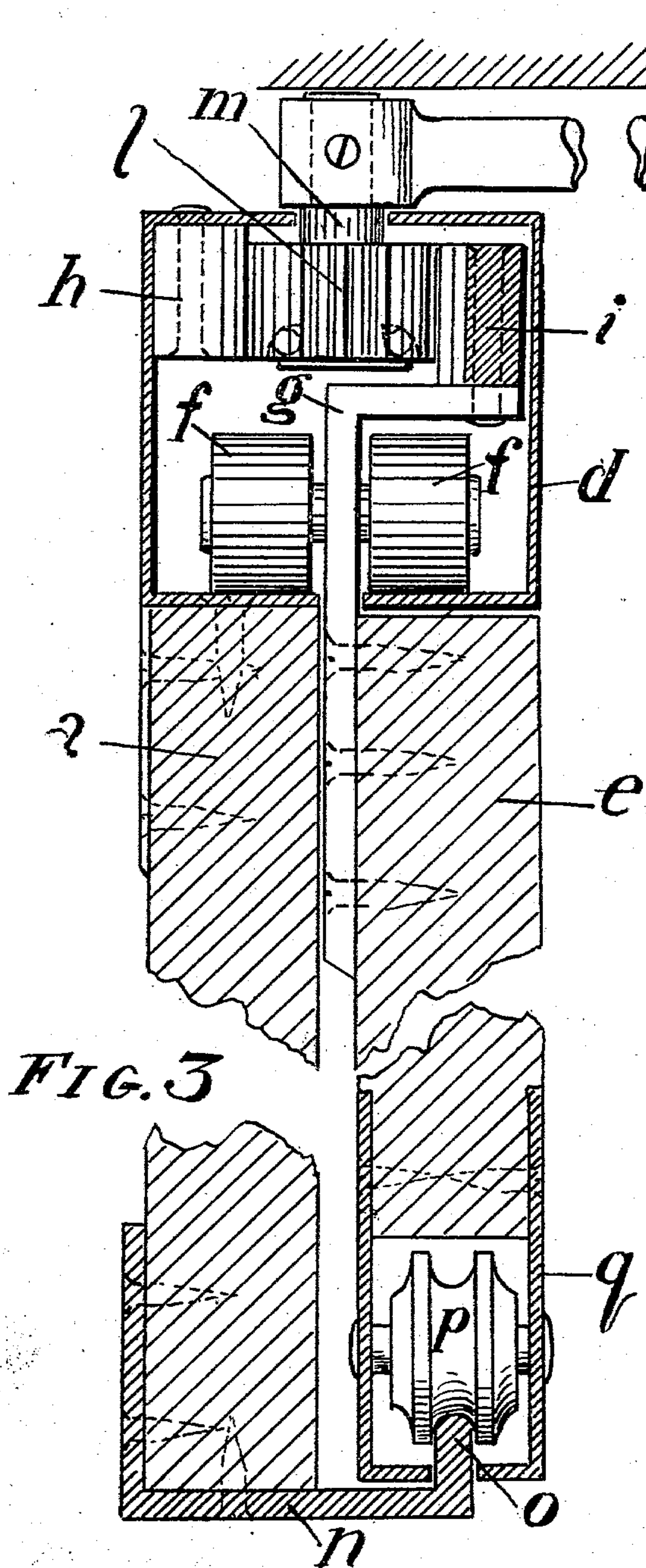
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UNITED STATES PATENT OFFICE.

FREDERIC F. LOW, OF BOSTON, MASSACHUSETTS.

DOOR.

SPECIFICATION forming part of Letters Patent No. 704,887, dated July 15, 1902.

Application filed April 22, 1901. Serial No. 56,878. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC F. LOW, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Doors, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an isometric view of my new door. Fig. 2 is a plan view of my new door, showing it in three different positions—open, partly open, and closed. Fig. 3 is a sectional view on line A A, Fig. 2. Figs. 4, 5, 6, 7, and 8 illustrate details hereinafter referred to, and Fig. 9 shows a modification hereinafter described.

My invention relates to doors and similar structures made up of two or more members the rotation of one of which causes the other member to slide and fold itself with the rotary member.

The object of my invention is to provide a two-part door which will close a maximum width and yet require a minimum space when it is being opened and in its open position.

My invention consists in the structure hereinafter described and claimed.

In the drawings illustrating the principle of my invention and the best mode in which I have contemplated applying that principle, *a* is the swinging door, hinged at *b* to the upright or jamb-post *c*. The track *d* is fastened securely to the top of the swinging door *a* and projects out over the sliding door *e*, (see Figs. 1 and 2,) which is supported thereon by the rollers *f*, journaled in the hangers *g*. (See Fig. 3.) Secured to the upper part of the swinging door *a* is the rack *h*, and to the upper part of the sliding door *e* a similar rack *i*. (See Figs. 5, 6, 1, and 2.) Pivoted at *j* in the door-frame, Fig. 1, is the arm *k*, Fig. 8, which carries at its free end the pinion *l*. This pinion *l* meshes with the racks *h* and *i* and is adapted to rotate about the pin *m*, by which it is secured to the arm *k*. To the lower part of the swinging door *a* is secured the track *n*, upon the flange *o* of which rides the grooved roller *p*, journaled in the frame *q*, secured to the lower side of the sliding door *e*. (See Fig. 3.)

In Fig. 9 I show another mode of hanging the sliding door on the swinging door. A

frame *r* is secured to the sliding door *e* and carries a grooved roller *s*, which rides on the flange *t* of the track *u*, secured to the swinging door *a*.

The operation of the various parts is as follows: When the swinging door *a* is pushed inward or opened, a strain is brought upon the arm *k*, as will be made evident by a glance at Figs. 1 and 2, which show that the pivotal points of the swinging door *a* and the arm *k* are not coincident. By reason of the eccentricity between the swinging door *a* and arm *k* the rack *h* travels so as to cause the pinion *l* to rotate, and the rotation of the pinion *l* causes the movement of the rack *i*, and thereby of the sliding door *e*, to which the rack *i* is secured. Hence the opening of the door is accomplished by swinging inward the swinging door *a*, thereby communicating motion to the sliding door *e* by means of arm *k*, rack *h*, pinion *l*, and rack *i* and causing the sliding door to fold upon the swinging door, as is clearly shown in Fig. 2. The space necessary to open a wide door is thus reduced to a minimum. The roller-mountings of the sliding door reduce to a minimum the force needed to open or close the door.

Among the uses to which such a door may be put are the following: doors for street-cars, in which only a limited space is available; doors for fire-engine houses, in which space in front is valuable for storing the apparatus; doors for car-houses, in which proper clearance for the cars must be obtained to permit their passage; doors for schools and other public buildings, stores, and dwellings, where stairs or other obstructions prevent the swinging of a wide door, and doors in vestibules of public buildings, in which the doors stand side to side when closed and back to back across the vestibule when opened. In this latter instance a door embodying my invention would give a broader passage-way in the vestibule when the doors at the side are opened. In short, my new door would be very useful in all cases in which economy of floor-space is sought. While I have shown my invention as embodied in a single door, it may be readily applied to a double door made up of two single doors.

I do not desire to be understood as limiting myself to the exact structure herein shown, as

many modifications may be made therein without departing from the spirit of my invention. For example, the tracks may be hinged to the jamb-post, the racks *h* may be secured to the track-frame, and other means may be devised for transmitting motion from the swinging door to the sliding door.

What I claim is—

1. In combination in a door, a support; a pivotal member; a slidable member; a pair of coacting racks, one for said pivotal member and the other for said slidable member; and a toothed mechanism which engages and travels over one of said racks and communicates rectilinear motion to the other of said racks.

2. In combination in a door, a support; a pivotal member; a slidable member; a pair of coacting racks, one for said pivotal member and the other for said slidable member; and a pinion which is mounted to swing about said support and which intermeshes with said racks.

3. In combination in a structure of the class described, a fixed support; a swinging support formed with a rack; a slidable rack; an arm pivoted on said fixed support; and a pinion carried by the free end of said arm, said pinion meshing with said racks.

4. In combination in a structure of the class described, a rotatable member formed with a rack; a support for said rotatable member; a slidable member formed with a rack; a pinion in mesh with said racks; and an arm pivoted in said support and carrying said pinion at its free end.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Boston, Massachusetts, this 20th day of April, A. D. 1901.

FREDERIC F. LOW.

Witnesses:

JOSIAH DEARBORN,
JAMES HAMILTON.