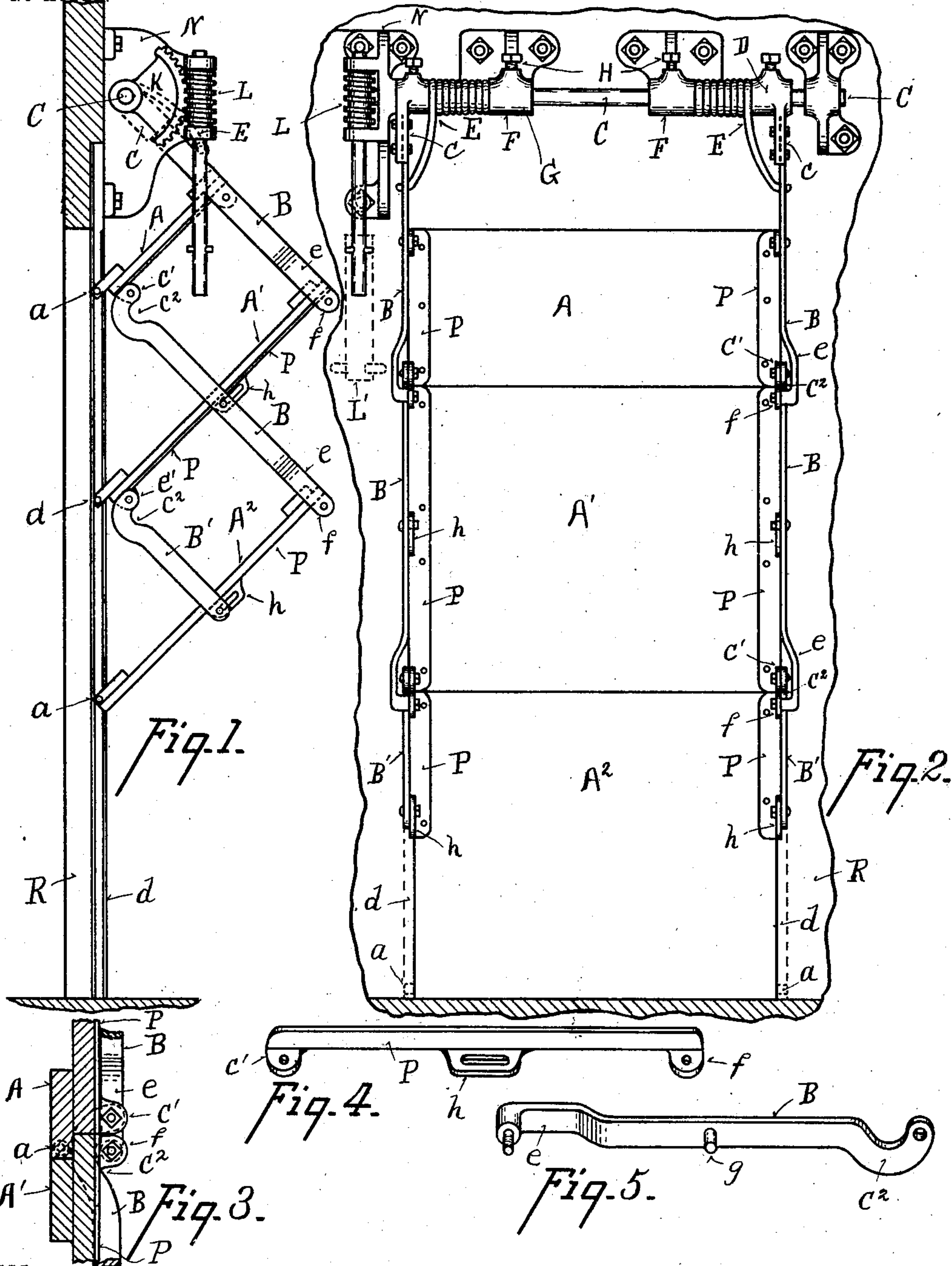


A. RITTER.
DOOR.

APPLICATION FILED APR. 1, 1903.

NO MODEL.



WITNESSES:

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ADAM RITTER, OF CINCINNATI, OHIO.

DOOR.

SPECIFICATION forming part of Letters Patent No. 742,355, dated October 27, 1903.

Application filed April 1, 1903. Serial No. 150,512. (No model.)

To all whom it may concern:

Be it known that I, ADAM RITTER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in doors. One of its objects is to provide a door suitable for freight-houses and similar places where it is desirable when the door is open to have it out of the way.

Another object is to provide a door to accomplish the above purpose which can be put together on the premises and readily adjusted and repaired by any mechanic of ordinary skill.

Another object is to provide a door which when open is folded in sections above the opening and improved means for opening and closing the same.

Another object is to provide improved means for opening one or a series of such doors which is adapted to resist the efforts of unauthorized persons to operate the same and which is positively locked in any position to which it may be adjusted.

Another object is to provide a door which can be used interchangeably as a tight or ventilating door.

It also consists in certain details of form, combination, and arrangement, all of which will be more fully set forth in the description of the accompanying drawings, in which—

Figure 1 is a side elevation of the door, taken just inside the door-frame, showing the door partly raised. Fig. 2 is an inside plan view with the door closed. Fig. 3 is a sectional detail of the joint between two sections of the door. Fig. 4 is a perspective view of one of the plates carrying the attachment-ears and which is secured to the door-section. Fig. 5 is a perspective view of one of the links or arms employed to connect up the door-sections.

As shown in Figs. 1 and 2, the door is composed of section A A' A². As many sections may be employed as desired. These sections are connected together by means of

links B, which are in turn connected to and supported from a shaft C by means of crank-arms c, projecting from the hubs D, secured to the shaft.

E represents springs, which are coiled about the shaft C, one end being fast to the brackets F, while the other end engages the arms or links B, so as to counterbalance the weight of the door-sections and enable the door to be more easily raised. If desired, counterweights might be employed in place of these springs. To assist in setting the springs in place and coiling them to the desired tension, I employ, in connection with the brackets F, the sleeves G, through which the shaft passes, and means for rigidly holding one end of the spring, which may be a hole through the bracket in which the end of the spring engages or a clamp to hold the end of the spring to the bracket. A set-screw H is provided, by means of which the shaft may be clamped in the sleeve of the bracket until the spring is coiled and adjusted, after which the set-screw is released and the shaft allowed to turn. These brackets also serve to support the shaft.

For the purpose of raising and lowering the door-sections I preferably employ a segment of a worm-wheel K, secured to one end of the shaft and driven by means of a worm L, mounted in bearings in the bracket N. The shaft of this worm is adapted to be engaged by a removable key L' (shown in dotted lines, Fig. 2,) to turn the worm, so that a series of doors may all be operated by the same key and so that once adjusted the doors cannot be tampered with by unauthorized persons after the key is removed. It will be noted that by employing the worm and worm-wheel the parts are locked to whatever position they may be adjusted, that the sections when raised cannot fall, and that when let down to close the door and the key removed no other locking mechanism is required.

The lower ends of each door-section have small rollers a, mounted on pins or studs, which several rollers engage and roll in channels d in each side of the door-frame R to hold the several sections in place. The link members are pivoted to an ear c' at the lower end of the upper section, there being a curve c² in the upper end of the link near this pivot to clear the lower end of the next link above

when the door is in the closed position, while the lower end of each link has an offset *e* to clear the upper end of the next lower link around which it passes and is attached to an ear *f* at the top of the lower section, as illustrated in Figs. 2 and 3. Thus when the door is closed the link ends pass each other and the middle links are pivoted, respectively, to the lower end of the upper section and to the upper end of the lower section.

While I have shown and regard the worm-wheel and worm as the best means for raising and lowering the door, I do not wish to limit myself to the precise mechanism employed for this purpose, as it may be variously modified without departing from the principle of my invention.

In Fig. 4 I have shown the plate *P*, carrying the ears for the attachment of the links to the door-sections, which plate I preferably construct from an angle-iron of proper length by cutting away part of one side, leaving the ears *c'* and *f* at the ends and the slotted ear *h* near the center, through which the pins *g* of the links project. If desired, these ears *c'* *f* *h* may be provided as small detached brackets to be separately secured to the door-sections.

The top door-section is of only about half the area of the remaining sections. In connecting the bottom section only half-length links *B'* are employed. When the door is open, the door-sections may be permitted to lie one above the other in substantially horizontal planes, or, if desired, the shaft may be turned until they lie in vertical planes against the wall above the shaft. When it is desired to elevate them above the shaft, provision must be made to release the rollers *a*, which may be done by cutting away the side of the channel at the top or providing a segmental guide or channel for them in their movement around the shaft. The door-sections may be constructed of wood or iron or of wood sheathed with iron. Where ventilation is desired, as for the storage of fruit, &c., the door may be nearly closed and left in that position, when there will be a small opening beneath the door and a small opening between the several sections. If desired, the door may be set so as to open from one side instead of the top.

Having described my invention, what I claim is—

1. In a door, a series of door-sections se-

cured to each other by links, the upper links of the series being pivoted above the door-frame and means for turning said upper links on the said pivots, whereby the several door-sections are caused to rise in unison.

2. In a door, a series of door-sections secured to each other by links, the upper links being secured to a shaft above the door, means for turning said shaft in its bearings, whereby the upper links are raised, thereby causing the whole series of door-sections and links to rise.

3. In a door, a series of door-sections secured to each other by links, the upper end of said series being secured to a shaft above the door, means for counteracting the weight of the door-sections, a worm-segment on said shaft, and a worm meshing therewith and adapted to drive the segment and thereby turn the shaft to raise the door-sections.

4. In a door, a series of door-sections secured to each other by links, the upper end of said series being secured to a shaft above the door, a worm-wheel on said shaft, and a worm meshing therewith and adapted to drive the worm-wheel and shaft to raise and lower the door-sections.

5. In a door, a series of door-sections secured to each other by links, offsets at the respective ends of said links to enable the ends of the links to clear each other, a shaft to which the upper links are secured, and means for turning said shaft to raise and lower the door-sections.

6. In a door, a series of door-sections secured to each other by links, offsets at the respective ends of said links to enable the ends of the links to clear each other, a shaft to which one set of links are secured, a worm-wheel, a worm meshing therewith and adapted to drive the worm and shaft to open and close the door.

7. In a door, a series of door-sections secured to each other by links, the end links of the series being pivoted to the door-frame, and means for applying power to said end links to cause them to move the several door-sections to open and close the door.

In testimony whereof I have affixed my signature in presence of two witnesses.

ADAM RITTER.

Witnesses:

C. W. MILES,
C. HOGAN.