

No. 765,196.

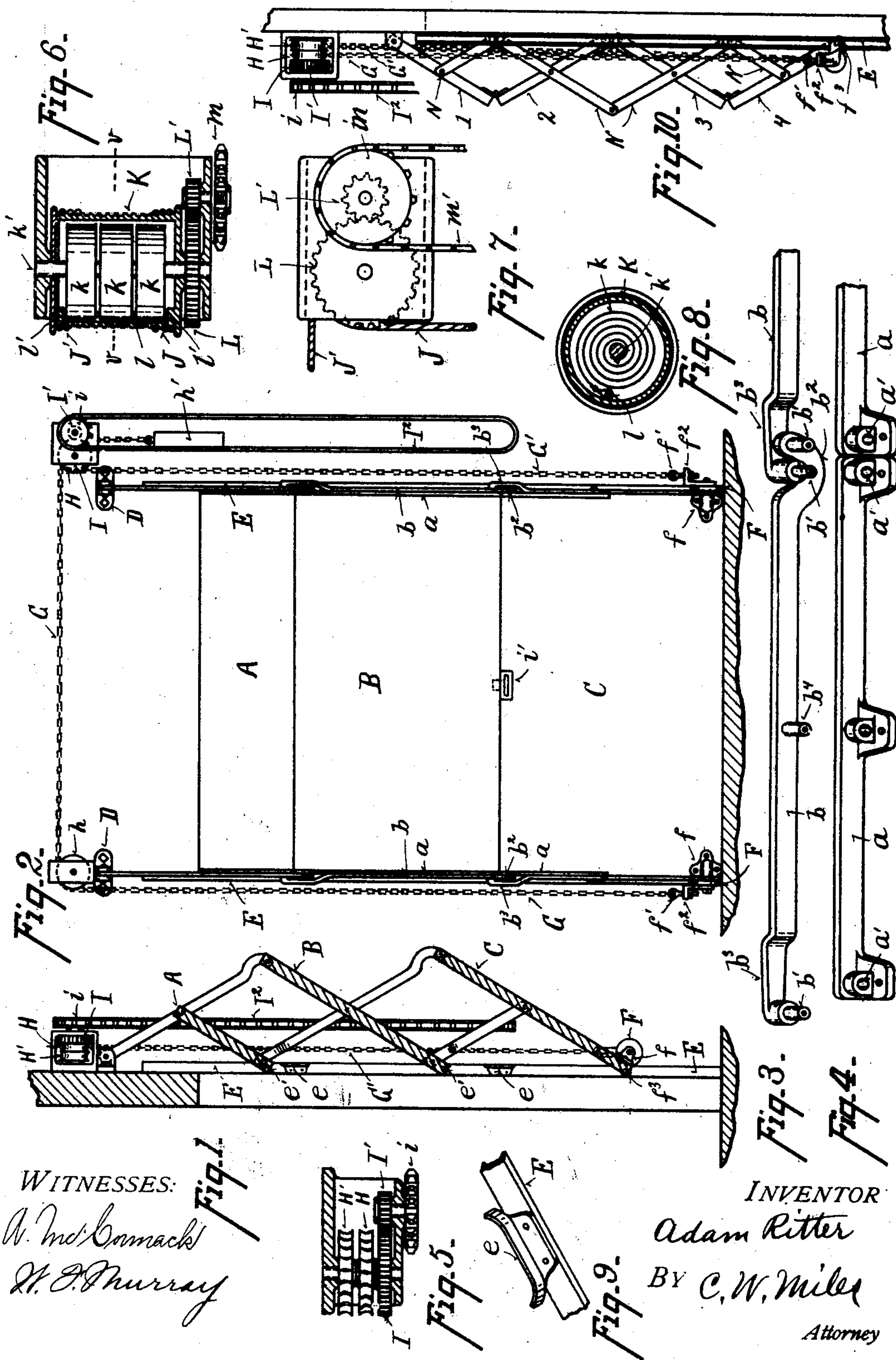
PATENTED JULY 19, 1904.

A. RITTER.
DOOR.

APPLICATION FILED JUNE 29, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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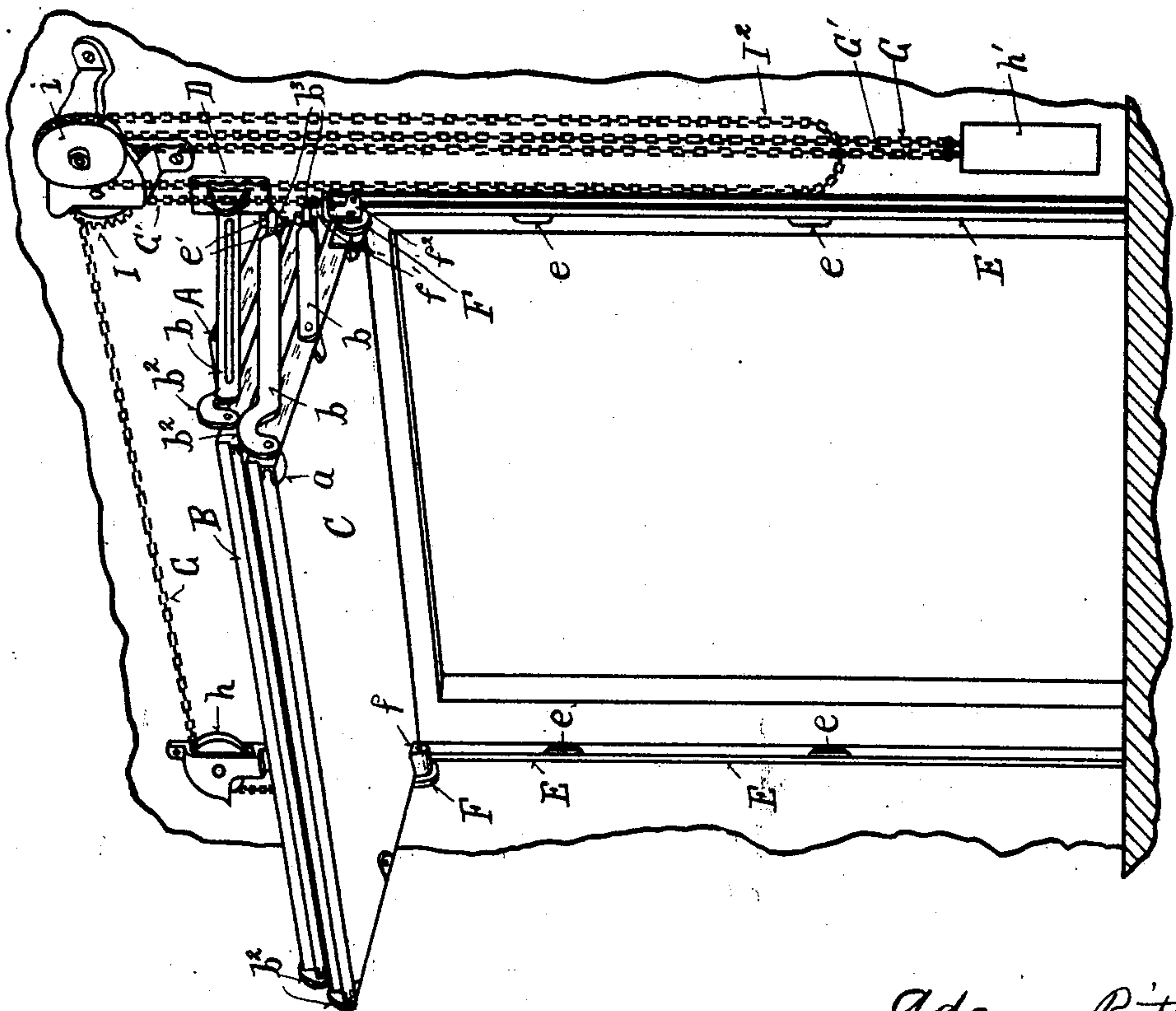
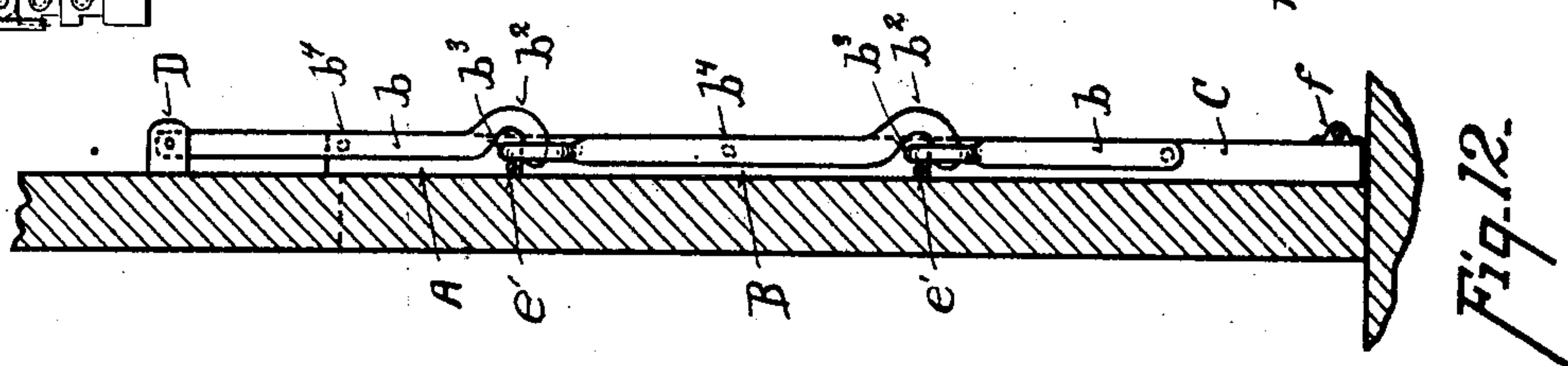
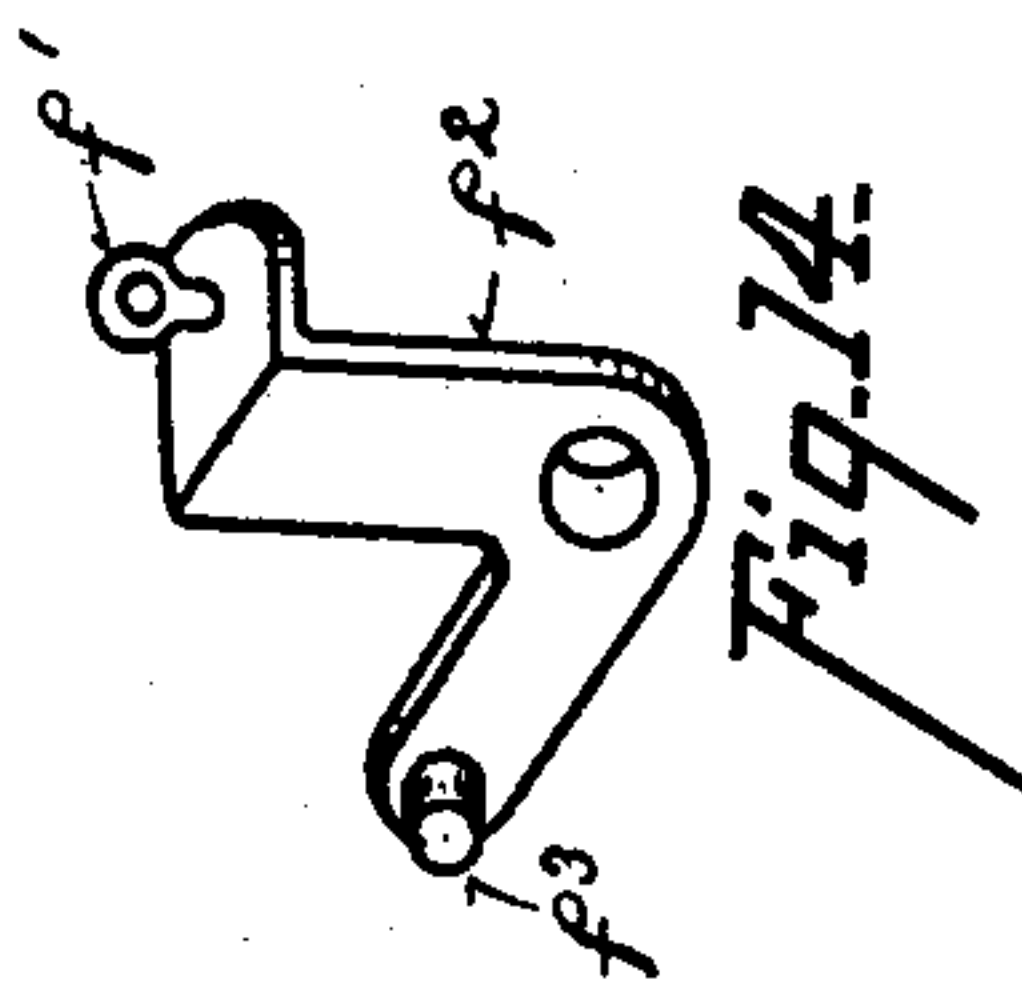
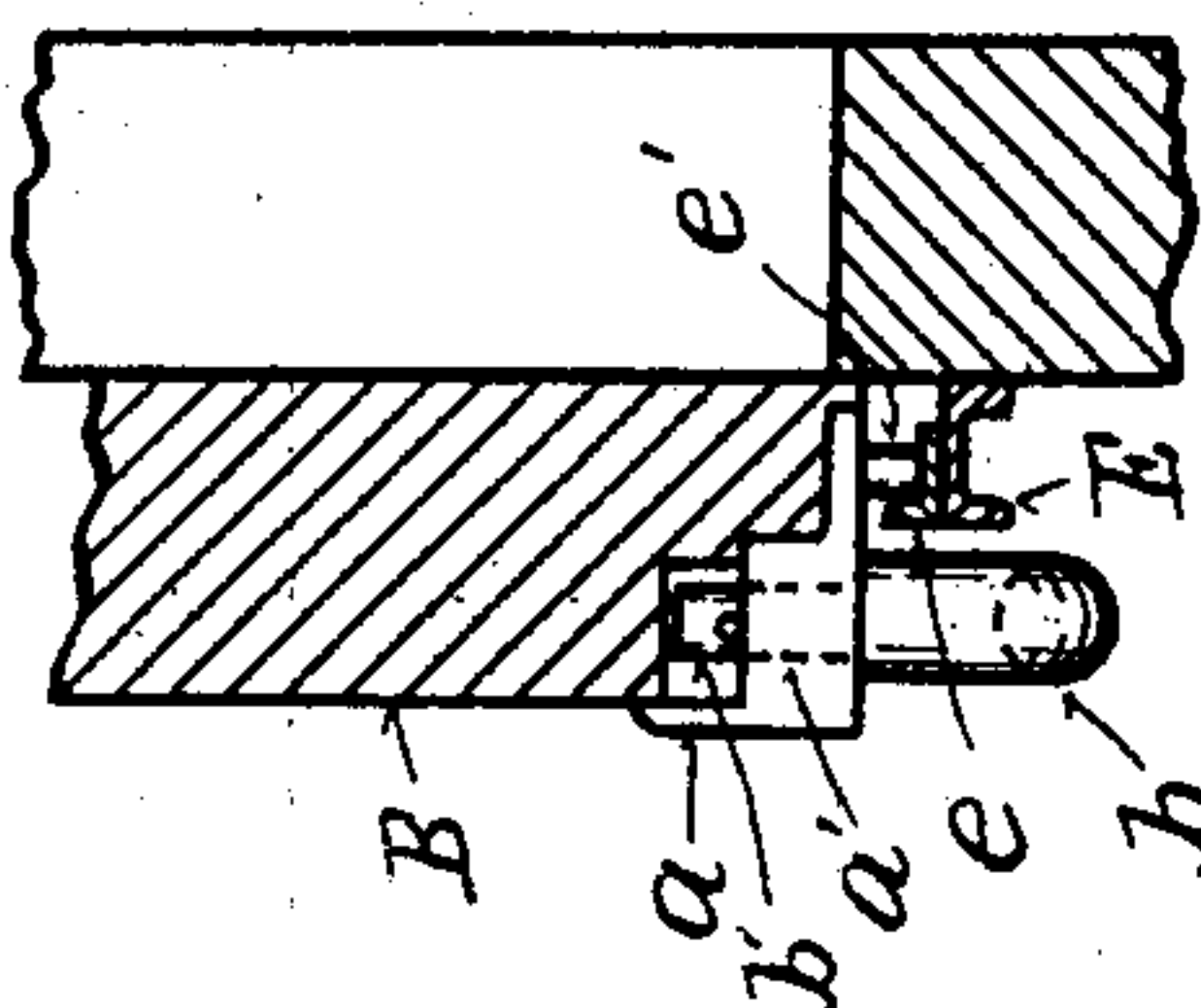
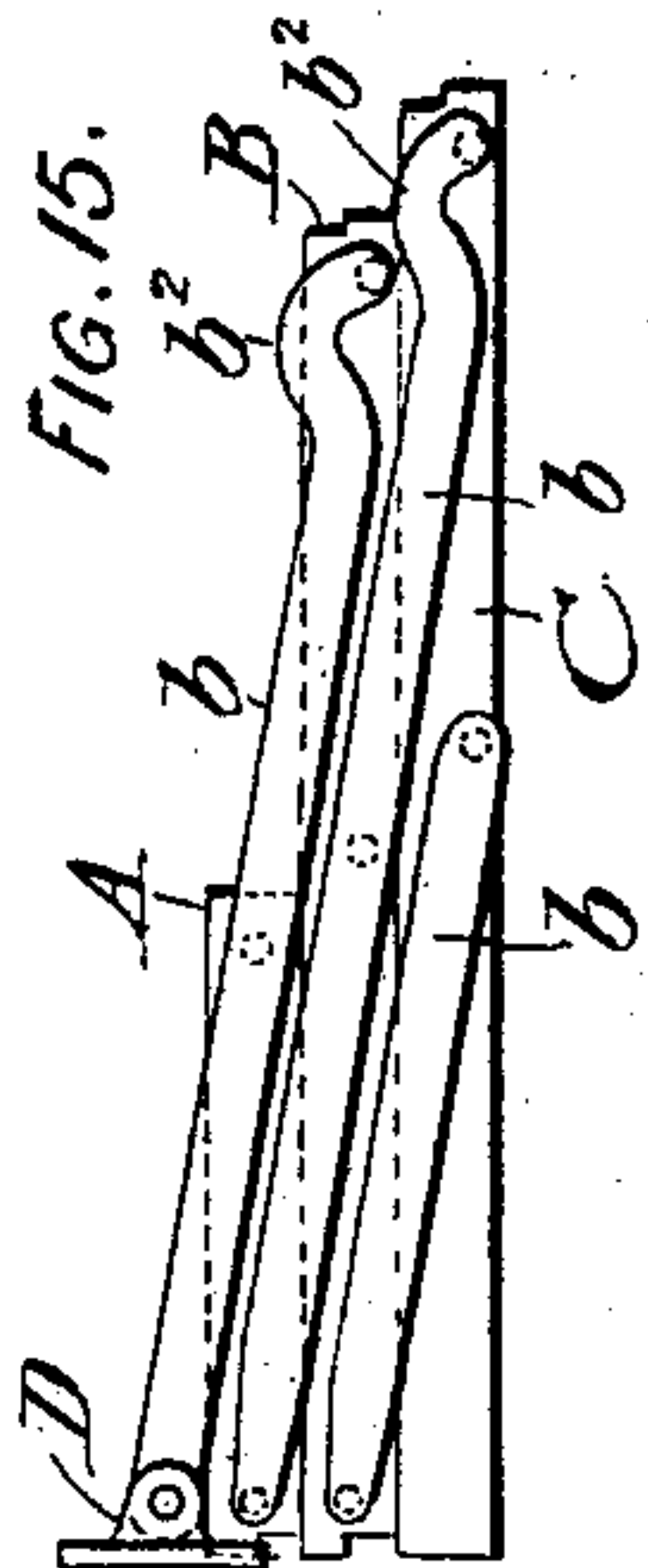
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2 SHEETS—SHEET 2.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

ADAM RITTER, OF CINCINNATI, OHIO.

DOOR.

SPECIFICATION forming part of Letters Patent No. 765,196, dated July 19, 1904.

Application filed June 29, 1903. Serial No. 163,528. (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 an improved door suitable for freight-depots and similar purposes in which the door-sections when open occupy a substantially horizontal position above the doorway, leaving the floor-space clear.

Another object is to provide improved, simple, and reliable mechanism for opening and closing the door.

Another object is to provide an improved ventilated door which can also be tightly closed when desired.

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 central vertical section through the door, showing the door partly opened. Fig. 2 is an inside elevation of the same with the door closed. Fig. 3 is a perspective view of the links connecting the door-sections. Fig. 4 is a perspective view of the straps by means of which the door-sections and links are secured together. Fig. 5 is a central horizontal section through the hoisting-sheaves. Fig. 6 is a similar view of a modification of the same. Fig. 7 is a side elevation of the same. Fig. 8 is a section on line vv of Fig. 6. Fig. 9 is a perspective view of a section of the channel-guide at the side of the door-sections. Fig. 10 is a side elevation of a modification of the door. Fig. 11 is a perspective view showing the door-sections raised to nearly the limit of their upward movement. Fig. 12 is a section taken inside the channel E, showing the door closed in edge elevation. Fig. 13 is a sectional detail showing the relative position of stud e' and angle e when the door is closed. Fig. 14 is a perspective view of the parts f' ,

f^2 , and f^3 . Fig. 15 represents a detail side elevation, showing the position of the links and door-sections when the sections are closed tightly against each other in a horizontal position.

The doors heretofore generally employed for freight-depots and similar purposes required to be constructed and shipped to the place of use were difficult to install and keep in working order, while the door herein illustrated can be erected where it is to be used, is easily repaired and kept in running order, and has other advantages over the doors heretofore in use.

The door is composed of a series of sections A B C, &c., as many sections being employed as desired. These sections may be composed of wood, sheet metal, wood sheathed with sheet metal, or of frames to receive glass. To the side edges of the sections are attached metal straps a , which serve as a means for attaching the links b to the door-sections, the straps being preferably provided with holes a' to receive the pins b' , projecting from the links, the ends of the pins being held in place in the holes by means of keys or screws and washers. The lower ends of the respective links are curved at b^2 , while the opposite ends of the links are bent or looped at b^3 , so that the ends of the respective links will pass each other when the door is closed, as indicated in Figs. 2 and 3, the ends b^2 being attached to the upper end of the lower door-section, and the end b^3 passing it and being attached to the lower end of the next upper door-section. The pins b^4 enter the central holes of the straps. Thus each of the intermediate links is attached to three door-sections in the manner indicated in Figs. 1, 2, and 3. The upper links of the series are pivoted to brackets D, secured to the door-frame or wall above the door, the series of links serving to suspend the several door-sections from the brackets D.

E represents channel-irons attached to the sides of the door-frame a short distance outside the door-sections. These channel-irons preferably have their flanges turned from the door and have short angle-irons e projecting toward the door and located so that when the door is closed the studs e' enter beneath the

angles e and hold or lock the door-sections to the door-frame.

F represents rollers preferably pivoted at the lower end of the lower door-section by means of brackets f .

f' represents eyebolts carried by the hangers f^2 also pivoted to the brackets f .

f^3 represents studs on the hangers traveling between the flanges of the channel-irons.

In order that the door-sections when closed may rest close against the wall or door-frame and when open may be folded in a horizontal position close to each other, I construct the door-sections and links b , so that each successive section shall be wider than the preceding one, the amount of increase in width depending upon the proportions of the door. Thus, as will be noted particularly in Fig. 11, while the door-sections rest in a horizontal position close to each other the links b assume an angular position parallel to each other, with their ends connected, respectively, to opposite ends of lower and higher door-sections, and when the door is closed the links hang vertically beneath each other and the face of the door-sections fit tightly against the wall or door-frame. If desired, the face of the door may be let into a recess or door-jamb in the door-frame.

Attached to the eyebolts f' are chains or cables $G G'$, one of which, as shown in Figs. 1 and 2, passes directly over the sheave H, while the other passes first over an idler-sheave h and then over a sheave H' on the same shaft as sheave H, said sheaves having recesses in their faces to engage the links of the chains.

h' represents a counterweight to which each chain is attached, the strain on the chains being equalized by adjusting the eyebolts f' .

The sheaves $H H'$ are driven to raise or lower the doors by means of gears $I I'$ and a hand-chain I^2 passing over the sprocket-wheel i , the counterweight causing the door to remain in any position to which it is adjusted. When fully open, the respective sections lie close to each other in substantially horizontal planes above the door-opening. v' represents a lock or catch to hold the sections in the closed position.

In the modification Figs. 6, 7, and 8, which is considered the preferred form, the chains $G G'$ are replaced with cables $J J'$, which are both attached to and adapted to be wound upon the drum K. Inside the drum are coiled springs k , one end of which is attached to the shaft k' and the other end to a rod l , passing through ears l' on the inside of the drum, so that the tension of the springs k serves to counterbalance the weight of the door. The drum is driven by means of gears LL' , sprocket m , and hand-chain m' . This form is preferable, for the reason that in raising the door-sections they can be more easily raised through the upper than through the lower half of the lift, and as the springs exert more effect when

tightly coiled than when partly uncoiled they more nearly counterbalance the door at all stages than do the weights h' . As the force required to counterbalance the door decreases as the door is lifted and the counterbalancing effect of the springs k decreases as they unwind, it is obvious that the springs serve to counterbalance the weight of the door at any position.

In the modification Fig. 10 the door-sections 1 2 3 4 are hinged to each other at their meeting ends and are also connected to each other by the pivoted links N, the door being raised and lowered by the mechanism heretofore described.

In practice the straps and links, which may be of malleable cast metal, drop-forgings, or wrought metal, are attached together to form a chain of links and straps, and then the straps are secured to the door-sections by screws or similar means. By employing the straps and attaching the links thereto I am enabled to accurately pivot the links so that the door-sections will move easily from one position to another and so that they will not be affected by any tendency to swell or warp on the part of the door-sections.

It will be noted that when the door is slightly raised openings are formed which serve the purpose of ventilation, while preventing access through the door and preventing damage from rain.

Having described my invention, what I claim is—

1. A door composed of a series of sections, each succeeding section being wider than the preceding section, links connecting the middle and end of one section to the end and middle of the adjacent section, said links near their lapping ends having offsets to permit the ends of the links to pass each other, and a counterpoised lifting mechanism adapted to lift and hold said sections to the adjusted position.

2. A door composed of a series of sections, each succeeding section being longer than the preceding section, links connecting the middle and end of one section to the end and middle of the adjacent section, said links near their lapping ends having offsets to permit the ends of the links to pass each other, whereby the door-sections are enabled to assume a horizontal position when open, and a vertical position against the door-frame when closed.

3. A door composed of a series of sections, each succeeding section being wider than the preceding section, metal straps secured to the side edges of said sections, links connecting said straps together, said links being provided with pivot-pins seating in journals formed in the straps.

4. A door composed of a series of sections, a series of links connecting the middle and end of one section to the end and middle of the adjacent section, and offsets at the lapping ends of the links to permit the ends of the

links to pass each other to bring the pivots of the links into vertical alinement when the door is closed.

5 In a door, a series of sections, a series of links connecting said sections together, so that the vertical movement of the sections shall bring them into horizontal position in which less force will counterbalance them, and a counterpoised lifting mechanism consisting
10 of a drum, coiled springs acting thereon to counteract the weight of the door-sections, cords leading from points near the lower portion of the door to said drum, and means substantially as shown for revolving the drum.

15 6. A door composed of a series of sections, links pivoted to and connecting the middle and end of one section to the end and middle of the adjacent section in such relation to each other that the sections fold horizontally one
20 above each other and close together when the door is open, and assume when closed a vertical position against the door-frame with the links in vertical alinement.

25 7. In a door, a series of door-sections, links longer than the door-sections connecting the middle and end of one section to the end and middle of the adjacent section, said links near their lapping ends having offsets to permit

the ends of the respective links to pass each other, and means for lifting the several door-sections to a position above the opening. 30

8. In a door, a series of door-sections, links longer than the door-sections connected at the middle to one section, and at the opposite ends to the ends of the adjoining sections, the
35 respective ends of said links having offsets to permit the ends of the adjacent links to pass each other, and means for lifting the several sections to a position above the opening.

9. In a door, a series of door-sections, means
40 for suspending said sections across the opening, channel-guides at the sides of the opening, short projections on said guides adapted to engage studs on the door-sections when closed to lock the sections across the opening,
45 studs secured to the lower section traveling in said channel-guides, rollers attached to the lower section engaging said guides, and mechanism for raising and lowering the sections.

In testimony whereof I have affixed my signature in presence of two witnesses. 50

ADAM RITTER.

Witnesses:

C. W. MILES,

A. McCORMACK.