No. 856,369. PATENTED JUNE 11, 1907.

A. RITTER.

DOOR.

APPLICATION FILED SEPT. 11, 1905.

2 SHEETS—SHEET 1.

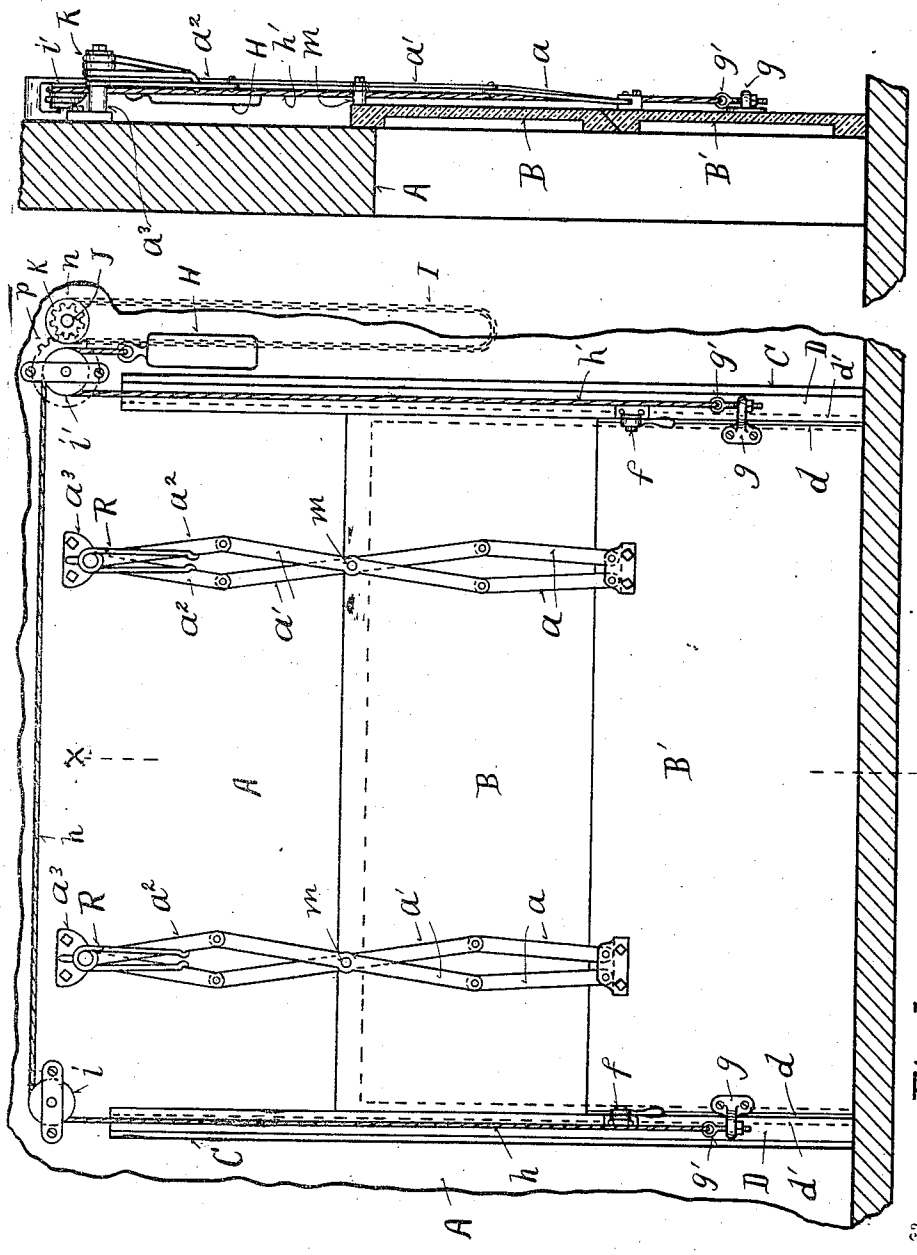

Fig. 2.

Fig. 1.

Inventor

Adam Ritter

By C. W. Miles,

Attorney

Witnesses

Walter F. Murray

A. McCormack

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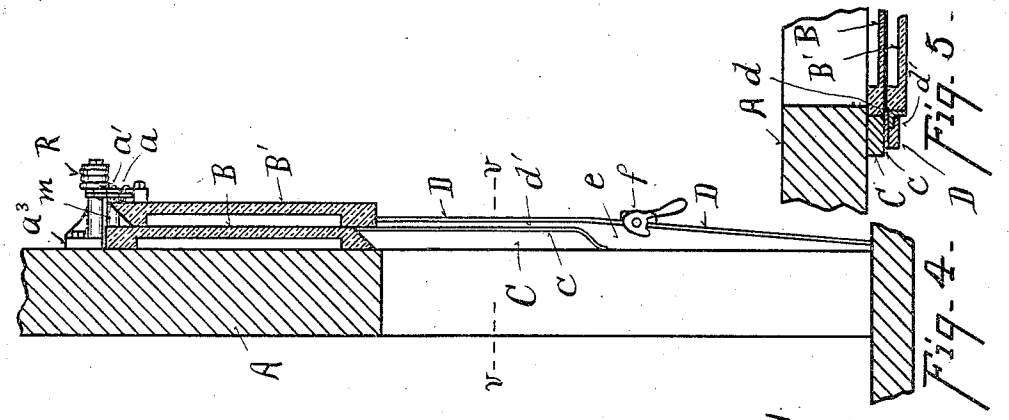

Fig. 4.

Fig. 5.

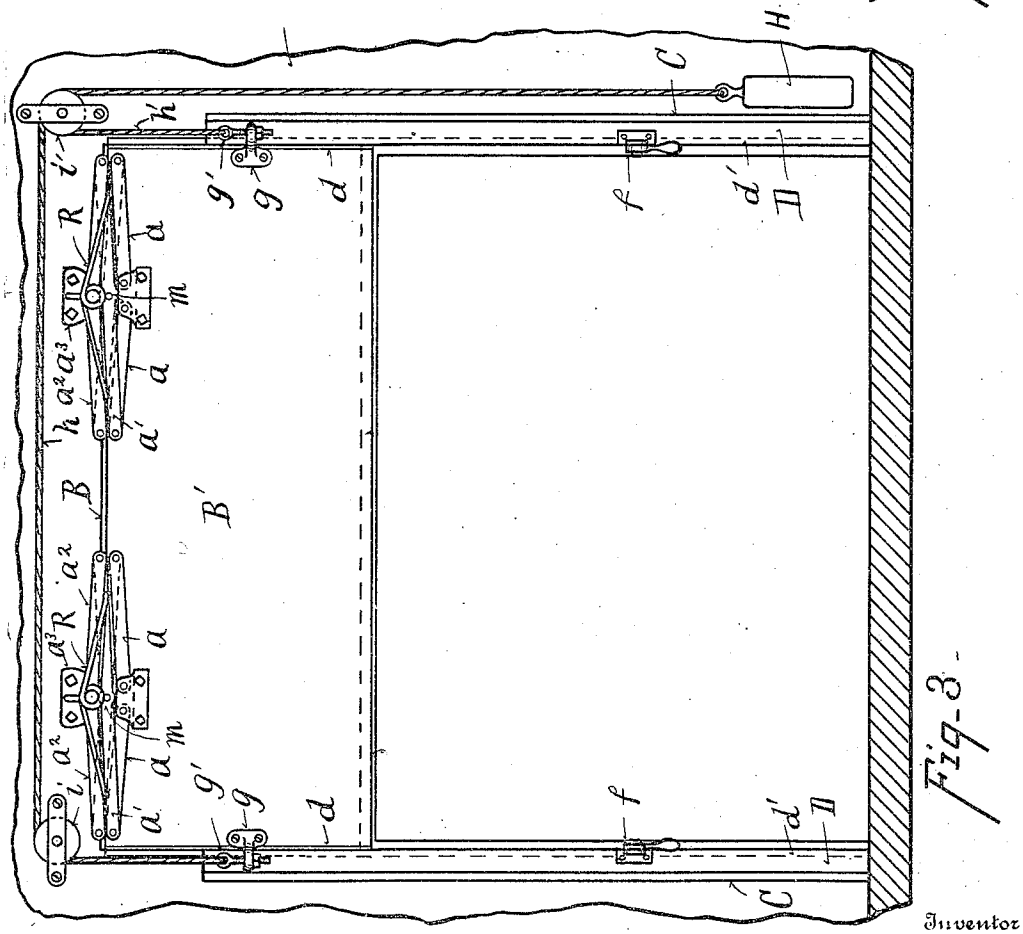

Fig. 3.

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UNITED STATES PATENT OFFICE.

ADAM RITTER, OF CINCINNATI, OHIO.

DOOR.

No. 856,369. Specification of Letters Patent. Patented June 11, 1907.

Application filed September 11, 1905. Serial No. 277,825.

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, of which the following is a specification.

My invention relates to improvements in doors.

One of its objects is to provide an improved door consisting of a series of sections and means for opening the same.

Another object is to provide an improved vertically moving door composed of a series of sections.

Another object is to provide such a door with improved guides and lifting and counterbalancing mechanism.

It further 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 plan view of my improved door with the door closed. Fig. 2 is a vertical section through the same on line x x of Fig. 1. Fig. 3 is a view similar to Fig. 1 with the door open. Fig. 4 is a central vertical section through the door Fig. 3. Fig. 5 is a section on line v v Fig. 4.

The door sections are preferably arranged to lift vertically, and when open to occupy a position side by side above the door frame, but may if desired be arranged to slide to one side of the door frame. There may be two or more door sections employed, as desired, two being shown in the drawings.

A represents the door frame, B B′ represent the door sections, which may be composed of wood, wood sheathed in iron, iron, concrete, or other desired material. The door sections are secured together and to the frame A by means of a series of links a a' a^2 and brackets a^3 so that the lifting of one section, say the lower section, will serve to also lift the other sections. The upper door section is guided vertically by means of side rails C and straps c secured thereto and projecting over the edges of the section. The lower section is provided with angle irons d at each edge, which slide in grooves d' formed by the plates D. At e at the lower end these grooves d' are wider so as to permit the lower door section to assume a position vertically beneath the upper door section, which is effected by means of the cam shaped levers f which operate automatically by frictional engagement with the face of the lower door section to force it into alinement with the upper section. Said levers may also be operated by hand, if desired, and when the doors are in the closed position may be employed to lock the doors in place. When the lower door section is raised it is guided by the grooves d' to a position in rear of the upper door section as shown in Fig. 4. In order to permit the door sections to assume the position Fig. 4 the links a' are pivoted to the upper sections by means of studs m projecting therefrom a distance equal to the thickness of the lower section.

Attached to brackets g at the sides of the lower door section are eye-bolts g', from which cords, or cables h h' pass over pulleys i i' and are attached to counterweight H. The doors if large and heavy are opened and closed by means of a hand chain I passing over a sprocket wheel n on shaft J, which carries a gear K meshing with a larger gear p on the shaft of the pulley i'. Smaller doors may be operated by lifting or pulling down the door sections by hand. By the arrangement herein shown the counterweight is required to be only about half as heavy as the door sections, and the sections may be moved easily and smoothly from one position to another.

R represents springs whose free ends engage and tend to lift links a^2, and which may be employed or not as desired.

The mechanism herein specified is capable of considerable modification without departing from the principle of my invention.

Having described my invention, what I claim is;

1. In a door, a series of door sections, links pivoted at one end to the door frame, links similarly pivoted to the end door section, crossed links pivoted near their centers to the intermediate door section with their ends pivoted to the projecting ends of said links attached to the door frame and end door section, so that the door sections move in unison but at varying speeds, guides directing the door sections into one plane when closed and into parallel planes overlapping each other at one side of the opening when opened.

2. In a door, a series of door sections, a series of links pivoted to one face of said door sections, and comprising links centrally pivoted to the intermediate door section and pivoted at their ends to links pivoted respec-

tively to the door frame and to the end door section.

3. In a door, a series of door sections, link mechanism attached to one face of said door sections securing said doors together and to the frame, guides to direct the sections into one vertical plane when closed and into parallel vertical planes when opened, a counter-balance, flexible connections between the counter-balance and one of the door sections and movable suppor for said flexible connections.

4. In a door, a series of door sections secured together and to the frame by links, guides to direct the sections into one vertical plane to close the opening, and into parallel vertical planes side by side when the door is open, a counter-balance, flexible connections leading from one door section to the counter-balance, wheels supporting said flexible connections, and means for moving said flexible connections over the wheels to shift the door sections.

5. In a door, a series of door sections secured together and to the frame by crossed links pivotally attached to one face of the door sections so that the several sections move in unison but at varying rates of travel, guides directing the sections into position to close the door, and into parallel planes when the door is opened, and means for shifting the sections from one position to the other.

6. In a door, a series of door sections, a series of links pivoted to one face of said door sections and comprising links centrally pivoted to the intermediate door section and pivoted at their ends to links pivoted respectively to the door frame and to the end door section, and pivot studs for said centrally pivoted links projecting from the intermediate or overlapped door section.

7. In a door, a series of door sections, a series of links pivoted to one face of said door sections and comprising links centrally pivoted to the intermediate door section and pivoted at their ends to links pivoted respectively to the door frame and to the end door section, and springs engaging the links attached to the door frame to counterbalance the weight of the door sections.

8. In a door, a series of door sections, a series of links occupying a plane parallel with the door sections and pivotally connected to one face of said door sections, connecting said door sections together and to the door frame, guides at the edges of said door sections directing the door sections into one vertical plane when closed and into parallel vertical planes at one side of the opening when opened.

9. In a door, a series of door sections, a series of links occupying a plane parallel with said door sections and pivotally connected to one face of said door sections, connecting said door sections together and to the door frame above the opening, so that the movements of one door section necessitates the movement of the other door sections, guides at the edges of said door sections directing the door sections into one vertical plane when closed and into parallel vertical planes at the side of the opening when opened.

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

ADAM RITTER.

Witnesses:
C. W. MILES,
A. McCORMACK.