C. C. TOMKINSON.

COUNTERWEIGHTED SECTIONAL DOOR.

APPLICATION FILED JULY 16, 1917.

1,248,756.

Patented Dec. 4, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

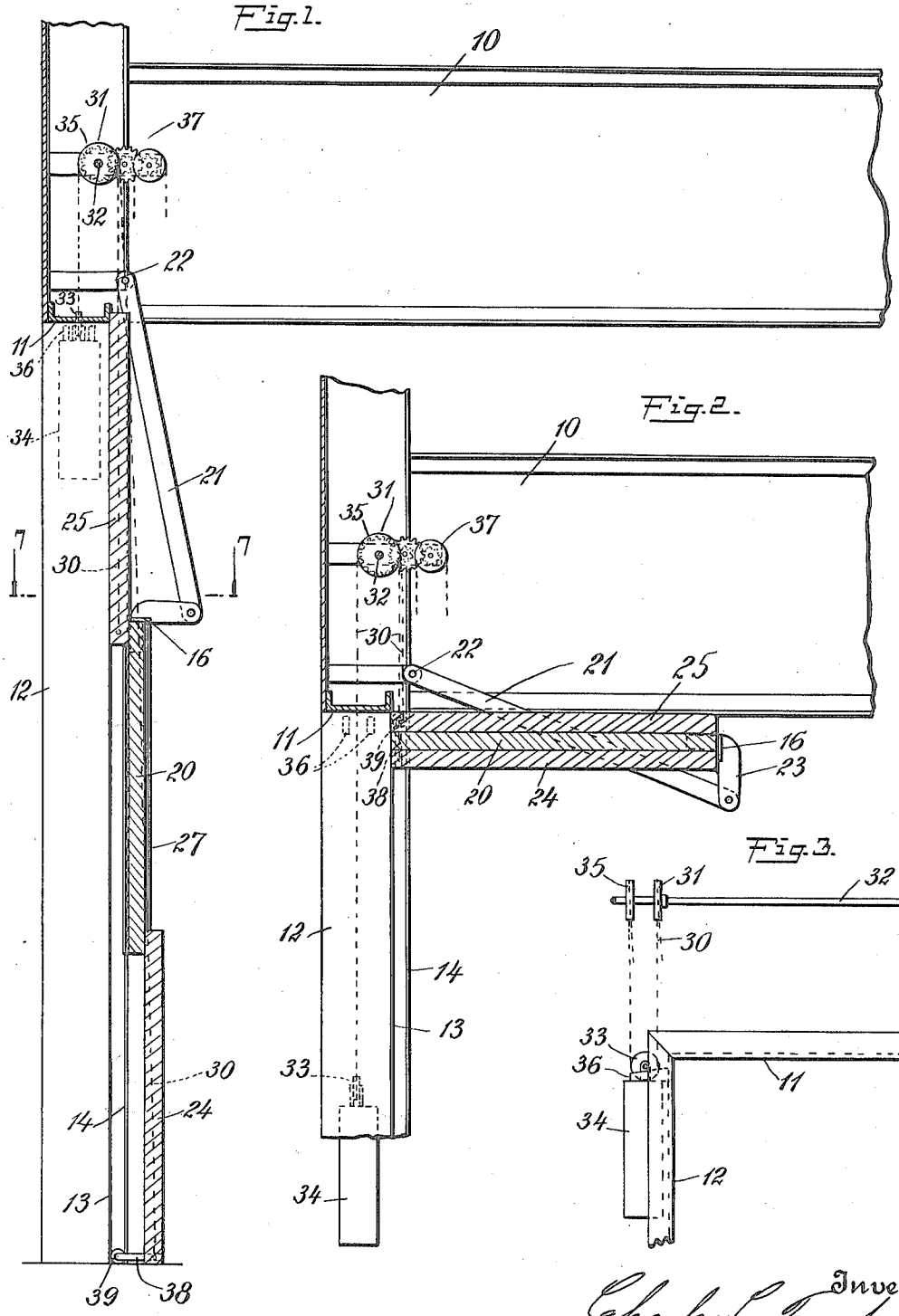


Fig. 2.

Fig. 3.

Inventor

Charles C. Tomkinson

By his Attorneys

Marshall & Dearborn

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2 SHEETS—SHEET 2.

Fig. 4.

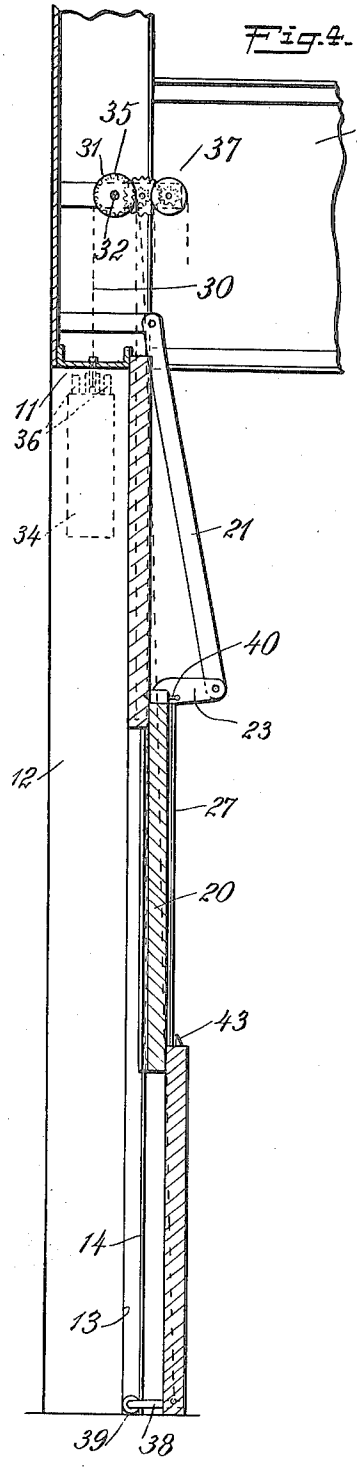


Fig. 5.

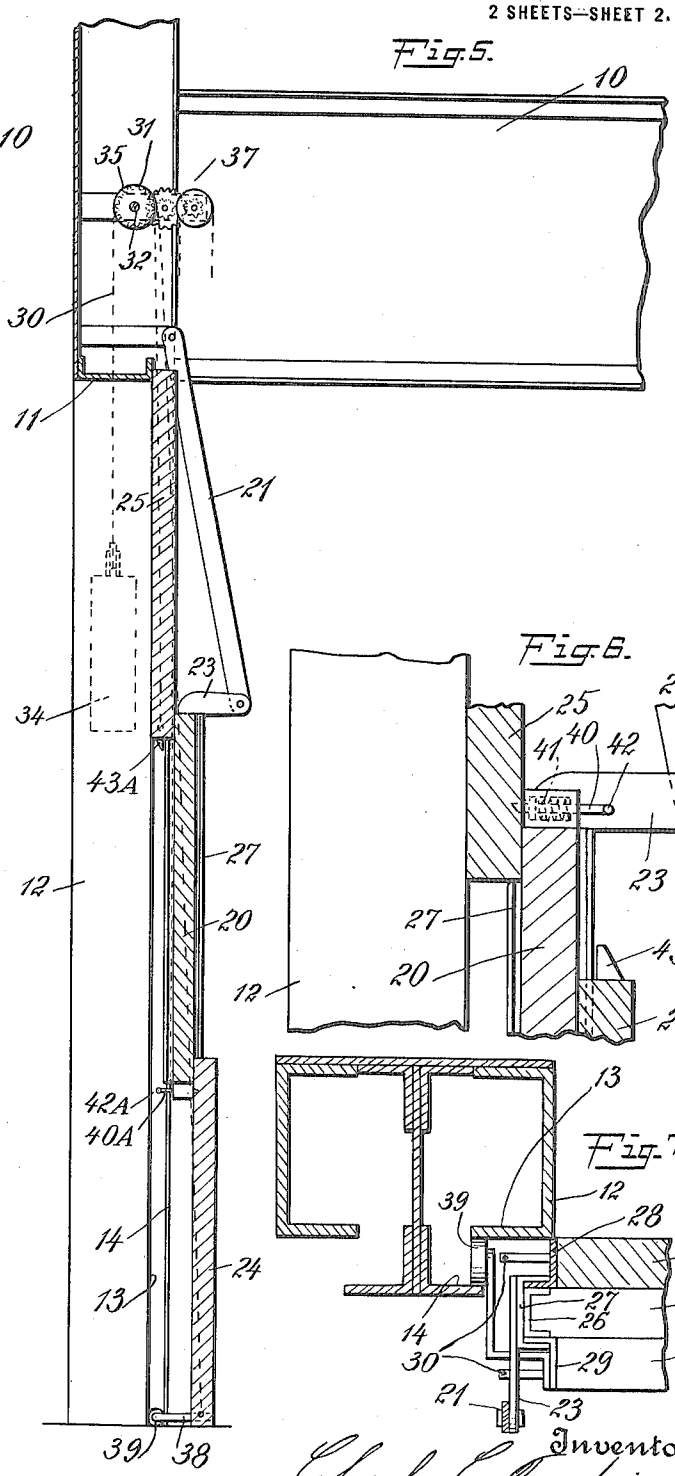


Fig. 6.

Fig. 7.

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By his Attorneys

Marshall & Dearborn

UNITED STATES PATENT OFFICE.

CHARLES C. TOMKINSON, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO J. EDWARD OGDEN, OF MOUNTAINVILLE, NEW YORK.

COUNTERWEIGHTED SECTIONAL DOOR.

1,248,756. Specification of Letters Patent. Patented Dec. 4, 1917.

Application filed July 16, 1917. Serial No. 180,699.

To all whom it may concern:

Be it known that I, CHARLES C. TOMKINSON, a citizen of the United States of America, and a resident of Plainfield, Union county, and State of New Jersey, have invented certain new and useful Improvements in Counterweighted Sectional Doors, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to new and useful improvements in doors of the three section type and particularly to a counterweighting system therefor. More specifically it relates to a three-section door of which the central section is suspended by pivoted links and over opposite sides of which the lower and upper sections slide into registering positions. Doors of this general type are adapted to close large openings such as the doorways of warehouses, pier sheds and the like, and consequently are heavy structures. Their operation is difficult unless some suitable way of counterweighting them is provided. Heretofore no way has been known for counterweighting doors of this specific type and the particular object of this invention is to overcome this difficulty and to provide a simple and effective counterweighting system for such doors.

Another object of this invention is to so construct and arrange the parts that either the lower section may be raised without moving the other section to thereby effect a partial opening of the doorway, or the upper section may be lowered without moving the other sections for ventilating purposes.

In order that my invention may be thoroughly understood I will now proceed to describe the same in the following specification, and then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is a sectional side elevation of a three-section door of the type to which this invention relates, with my improvements connected therewith. In this figure the door is shown in its closed position.

Fig. 2 is a similar view of the same parts with the door shown fully open.

Fig. 3 is a front elevation of a part of the mechanism shown in the other figures.

Fig. 4 is a view similar to Fig. 1 with the addition of a holding mechanism, for the upper section releasable by the lower section.

Fig. 5 is a view similar to Fig. 4 of another modification with a holding mechanism for the lower section releasable by the upper section.

Fig. 6 is an enlarged sectional end elevation of the holding and release mechanism of Fig. 4.

Fig. 7 is a sectional plan view of some of the parts on a larger scale, the section being taken on the line 7—7 of Fig. 1.

Like characters of reference designate corresponding parts in all the figures.

10 designates a part of the structure of a building, 11 the part thereof which forms the lintel of a door opening, and 12 the side posts of the door opening. One face 13 of each door post forms a vertical track for rollers 39 on the lower door section and back of these rollers and spaced from these tracks are parallel roller guides 14.

The door comprises a central section 20 suspended by links 21 which are pivoted at 22 above the door opening and to brackets 23 on the upper corners of the central door section. 24 is a lower section and 25 an upper section. On each of the vertical edges of the central section 20 are two channel irons 26 and 27 between the flanges of which are spaces which slidably fit the flanges of angle irons 28 and 29 on the lower and upper door sections respectively. These parts form guides for the lower and upper door sections and hold the three sections together.

To the lower corners of section 24 are affixed chains or cables 30. These pass over sheaves 31 which are affixed to a transverse shaft 32, under sheaves 33 rotatively mounted on the upper ends of counterweights 34, thence up to and over sheaves 35 loosely mounted on shaft 32 and down to the lower corners of section 25 to which their other ends are affixed. 36 are stops which limit the upward movement of counterweights 34. 37 is a hoisting mechanism for rotating shaft 32 and sheaves 31. Brackets 38 on the lower corners of the lower section support rollers 39 which run between the tracks 13 and the roller guides 14.

Before specifically describing the holding mechanisms which are shown in Figs. 4, 5 and 6, I will describe the operation of the parts which have been pointed out. The

hoisting mechanism is actuated by some suitable means such, for example, as a hand chain. The rotation of sheaves 31 will produce an upward movement of the parts of chain 30 which are affixed to the lower door section and it will rise up inside of section 20. The counterweight 34 is somewhat lighter than the combined weights of sections 24 and 25 so that chains 30 will be paid out around sheaves 31 and 35 and section 25 will drop down outside of section 20. This movement of sections 24 and 25 will continue until they are in registering relation with section 20 and with each other when it will be arrested by the upper edge of section 24 coming in contact with a stop 16 affixed to the upper edge of section 20.

Further upward movement of the lower edge of section 24 will raise the lower edges of the three sections together vertically but they will be swung inwardly by the links 21 until they have reached a horizontal position. During this part of the operation the counterweight 34 will move downwardly and assist in raising the three sections.

In closing, this operation will be reversed. During the swinging movement of the door sections the weight will rise until it meets the stops 36 which are so placed that they arrest the upward movement of the counterweight when the sections reach their vertical positions. The door section 24 is made a little heavier than section 25 so that it will move downwardly and raise section 25.

It is sometimes desirable to be able to raise the lower door section without disturbing the others because its height is generally great enough to provide head room for men with trucks or low parcels or objects. In such a case I provide at the upper edge of the central section a bolt 40 pressed by a spring 41 into a catch plate or recess in the upper section. This bolt has a transverse portion 42 and on the upper edge of the lower section is a wedge 43 which engages this transverse portion and retracts the bolt when the lower section reaches the limit of its upward vertical movement. This wedge is shown in Figs. 4 and 6.

It is obvious that with this holding mechanism the lower section may be raised and lowered at will without disturbing the other sections.

If it is desired to so arrange the mechanism that the upper section may be lowered and raised independently of the central and lower sections, the stops are dispensed with and the chains 30 made long enough to provide for an upward movement of counterweight 34 during the independent movement of section 25 as shown in Fig. 5. In this case the bolt 40^A is placed on the lower edge of central section 20 and is spring-pressed into engagement with a socket on the bottom section 24. Its transverse portion 42^A is arranged to be engaged by a wedge 43^A on the lower edge of the upper section 25.

What I claim is:

1. A door comprising three sections, links pivotally suspending the central section from above the door opening, guide connections between the door sections to provide for a verical telescoping movement of the sections, means for guiding vertically the lower part of the lower door section, a counterweight, a sheave rotatively mounted thereon, stationary sheaves above the door opening, and a flexible connection between the upper and lower sections passing over the stationary sheaves and under the counterweight sheaves.

2. A door comprising three sections, links pivotally suspending the central section from above the door opening, guide connections between the door sections to provide for a vertical telescoping movement of the sections, means for guiding vertically the lower part of the lower door section, a counterweight, a sheave rotatively mounted thereon, stationary sheaves above the door opening, a flexible connection between the upper and lower sections passing over the stationary sheaves and under the counterweight sheaves, and means for limiting the upward movement of the counterweight.

3. A door comprising three sections, links pivotally suspending the central section from above the door opening, guide connections between the door sections to provide for a vertical telescoping movement of the sections, means for guiding vertically the lower part of the lower door section, a counterweight, a sheave rotatively mounted thereon, stationary sheaves above the door opening, a flexible connection between the upper and lower sections passing over the stationary sheaves and under the counterweight sheaves, means for holding one of the upper or lower sections against movement during the telescoping movement of the other of said upper or lower sections, and means for releasing said holding means at the end of the telescoping movement of said other upper or lower section.

4. A door comprising three sections, links pivotally suspending the central section from above the door opening, guide connections between the door sections to provide for a vertical telescoping movement of the sections, means for guiding vertically the lower part of the lower door section, a counterweight, a sheave rotatively mounted thereon, stationary sheaves above the door opening, a flexible connection between the upper and lower sections passing over the stationary sheaves and under the counterweight sheaves, means for holding the central section and one of the other sections together against relative movement and

means on the third section for releasing said holding means at the end of its telescoping movement.

5. A door comprising three sections, links pivotally suspending the central section from above the door opening, guide connections between the door sections to provide for a vertical telescoping movement of the sections, means for guiding vertically the lower part of the lower door section, a counterweight, a sheave rotatively mounted thereon, stationary sheaves above the door opening, a flexible connection between the upper and lower sections passing over the stationary sheaves and under the counterweight sheaves, means for limiting the upward movement of the counterweight, means for holding the central and upper sections together during the telescoping movement of the lower section for releasing said holding means at the end of its said telescoping movement.

6. A door comprising three sections, links pivotally suspending the central section from above the door opening, guide connections between the door sections to provide for a vertical telescoping movement of the sections, means for guiding vertically the lower part of the lower door section, a counterweight, a sheave rotatively mounted thereon, stationary sheaves above the door opening, a flexible connection between the upper and lower sections passing over the stationary sheaves and under the counterweight sheaves, means for limiting the upward movement of the counterweight, a bolt on the upper edge of the central section spring-pressed into engagement with the upper section, said bolt having a transverse portion and a wedge on the upper edge of the lower section adapted to engage said transverse portion of the bolt to retract the bolt at the end of the telescoping movement of the lower section.

In witness whereof I have hereunto set my hand this 12 day of July, 1917.

CHARLES C. TOMKINSON.

Witnesses:

I. B. MOORE,

D. E. DEUTSCH.