No. 757,179. PATENTED APR. 12, 1904.

W. A. CROSS.

VERTICALLY MOVING DOOR.

APPLICATION FILED AUG. 1, 1903.

NO MODEL.

Fig. 1.

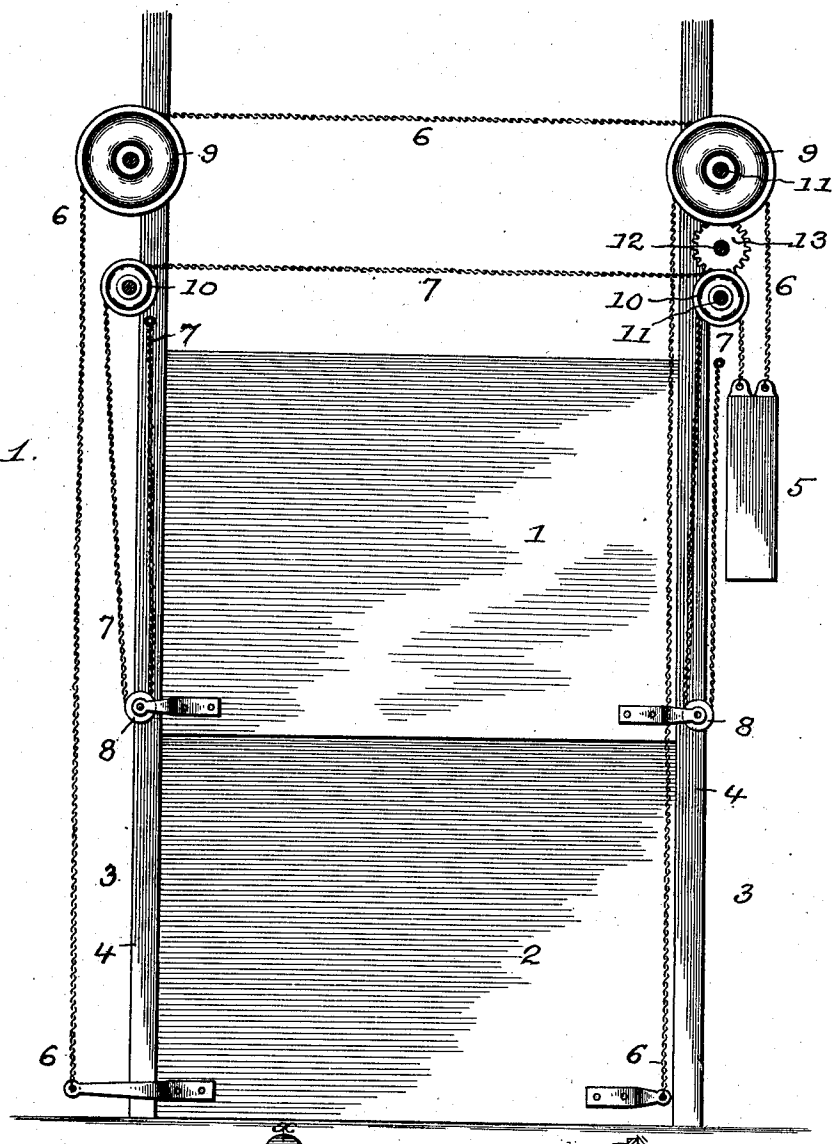


Fig. 2.

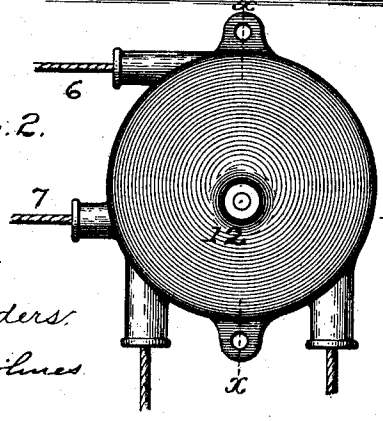
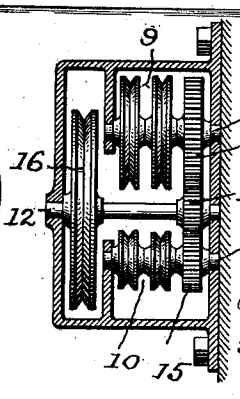


Fig. 3.



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No. 757,179. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM A. CROSS, OF CHICAGO, ILLINOIS.

VERTICALLY-MOVING DOOR.

SPECIFICATION forming part of Letters Patent No. 757,179, dated April 12, 1904.

Application filed August 1, 1903. Serial No. 167,821. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. CROSS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vertically-Moving Doors, of which the following is a specification.

The present invention relates to mechanisms for opening and closing the vertically-moving sectional doors of elevator-wells and the like and has for its object to provide a simple, durable, and effective mechanism for raising and lowering a door formed in sections and which sections are arranged to slide vertically in adjacent relation, all as will hereinafter more fully appear and be more particularly pointed out in the claims.

In the accompanying drawings, illustrative of the present invention, Figure 1 is an elevation illustrating the present improvement; Fig. 2, a detail front elevation of the overhead sheaves; Fig. 3, a detail sectional elevation of the same at line *x x*, Fig. 2.

Similar numerals of reference indicate like parts in different views.

Referring to the drawings, 1 and 2 are two halves or sections of a door which closes a doorway 3 of a warehouse elevator-well or the like.

4 represents vertical guides of any usual form secured at the sides of the doorway 3 and adapted to guide the door-sections in their vertical movement.

5 is a counterbalance-weight common to both door-sections and connected thereto by flexible connections, as follows:

6 is a branched flexible connection, the two branches of which pass around the series of overhead sheaves, hereinafter described, and are attached to the lower corners of the lower door-section 2, as shown.

7 is a branched flexible connection, the two branches of which pass around the aforesaid series of overhead sheaves and in the present improvement loop around sheaves 8 at the lower corners of the upper door-section 1, with the end of the loop so formed secured to the wall of the building immediately beneath the overhead series of sheaves heretofore referred to.

9 and 10 are the overhead sheaves around which the branched flexible connections 6 and 7 pass and which are arranged in line with the sides of the doorway 1. Each of said overhead sheaves in the preferred form of the present invention, as illustrated more especially in Fig. 3 of the drawings, will consist of two pairs of pulleys arranged vertically one pair above the other and in separated relation, as shown, and such pairs are carried by separate shafts 11, to which they are secured so as to rotate in unison.

12 is an intermediate shaft carrying a pinion 13, gearing with the gear-wheels 14 and 15, secured to the shafts 11 aforesaid and adapted to impart simultaneous rotation to the said shafts 11 in the operation of the described mechanism.

16 is an operating-pulley secured to the intermediate shaft 12 aforesaid and affording means for imparting movement to the aforesaid pairs of pulleys and through the same to the flexible connections and door-sections in the operation of closing or opening the doorway. Such pulley may be operated in a direct manner by hand or in an indirect manner by an ordinary endless operating-chain, as may be found most desirable.

With the described arrangement of parts the lower door-section will have a travel twice as fast as the upper door-section and so that in the upward movement of the two door-sections to uncover the doorway the said lower door-section will assume a final position over the doorway alongside of the upper door-section.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a door-closing mechanism, the combination of a pair of door-sections, means for guiding the same in a vertical direction, a counterweight, a flexible connection attached at one end to said counterweight with its other end looped around a pulley on the upper door-section and attached to the wall of the building, a flexible connection attached at one end

to said counterweight and at the other end to the lower door-section, individual overhead pulleys for the passage of said flexible connections, and means for imparting simultaneous rotation to said pulleys, substantially as set forth.

2. In a door-closing mechanism, the combination of a pair of door-sections, means for guiding the same in a vertical direction, a counterweight, a flexible connection attached at one end to said counterweight with its other end looped around a pulley on the upper door-section and attached to the wall of the building, a flexible connection attached at one end to said counterweight and at the other end to the lower door-section, individual overhead pulleys for the passage of said flexible connections, and means for imparting simultaneous rotation to said pulleys, the same comprising an operating-shaft, an intermediate pinion carried by said shaft, and gear-wheels attached to the overhead pulleys aforesaid and meshing with said pinion, substantially as set forth.

3. In a door-closing mechanism, the combination of a pair of door-sections, means for guiding the same in a vertical direction, a counterweight, a branched flexible connection attached at one end to said counterweight with its branched ends looped around pulleys on the upper door-section and attached to the wall of the building, a branched flexible connection attached at one end to said counterweight with its branched ends attached to the respective lower corners of the lower door-section, individual overhead pulleys for the passage of said flexible connections, and means for imparting simultaneous rotation to said pulleys, substantially as set forth.

4. In a door-closing mechanism, the combination of a pair of door-sections, means for guiding the same in a vertical direction, a counterweight, a branched flexible connection attached at one end to said counterweight with its branched ends looped around pulleys on the upper door-section and attached to the wall of the building, a branched flexible connection attached at one end to said counterweight with its branched ends attached to the respective lower corners of the lower door-section, individual overhead pulleys for the passage of said flexible connections, and means for imparting simultaneous rotation to said pulleys, the same comprising an operating-shaft, an intermediate pinion carried by said shaft, and gear-wheels attached to the overhead pulleys aforesaid and meshing with said pinion, substantially as set forth.

Signed at Chicago, Illinois, this 29th day of July, 1903.

WILLIAM A. CROSS.

Witnesses:

ROBERT BURNS,

M. H. HOLMES.