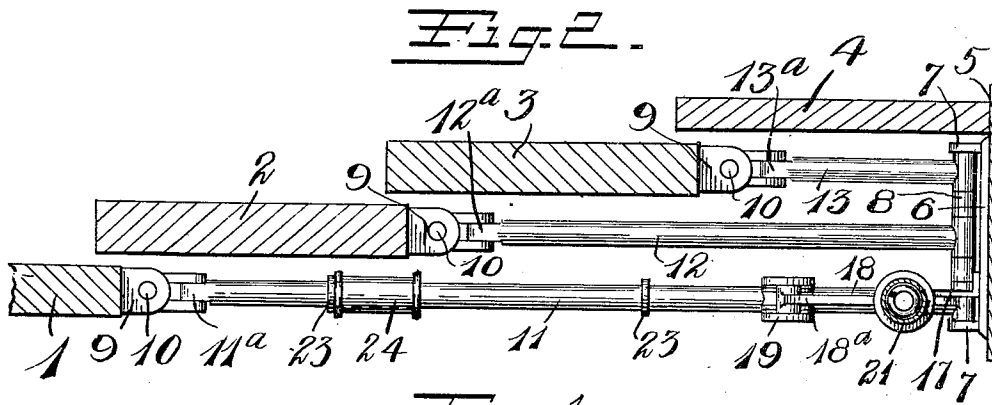
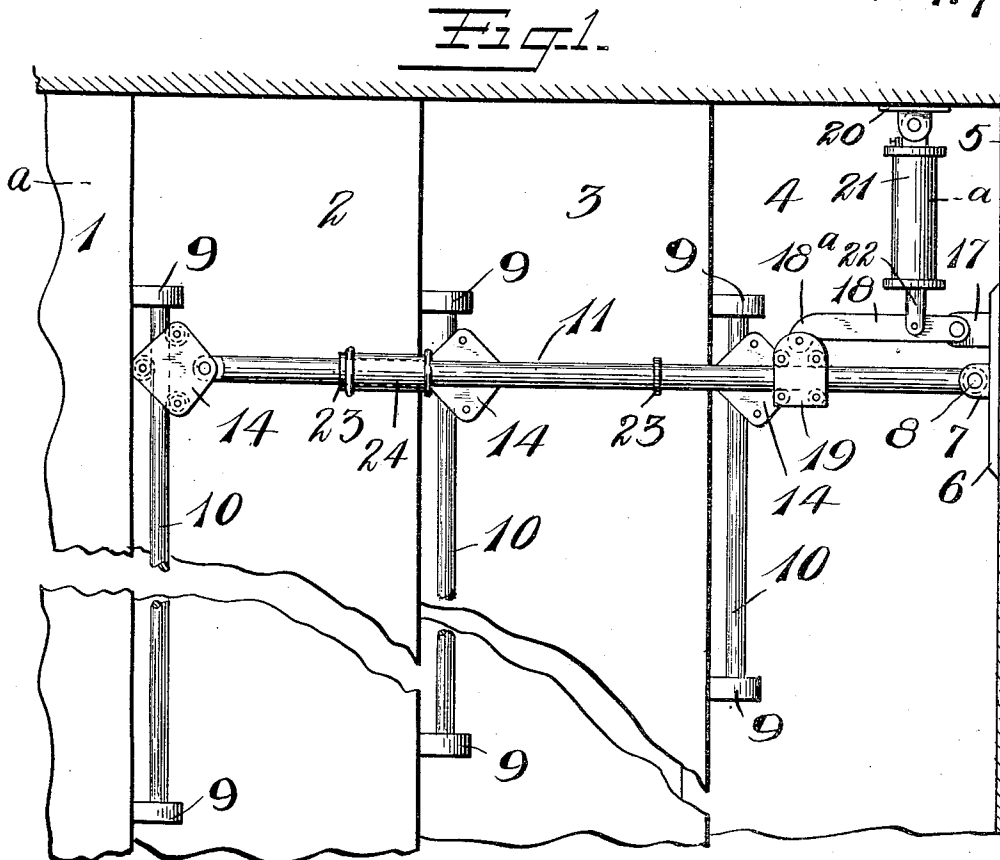


1,085,071.

2 SHEETS—SHEET 1.



Witnesses:

Chas. A. Reed
John J. Grote

Inventor _____

H. G. Voight

By *h* *c* *g* Attorneys

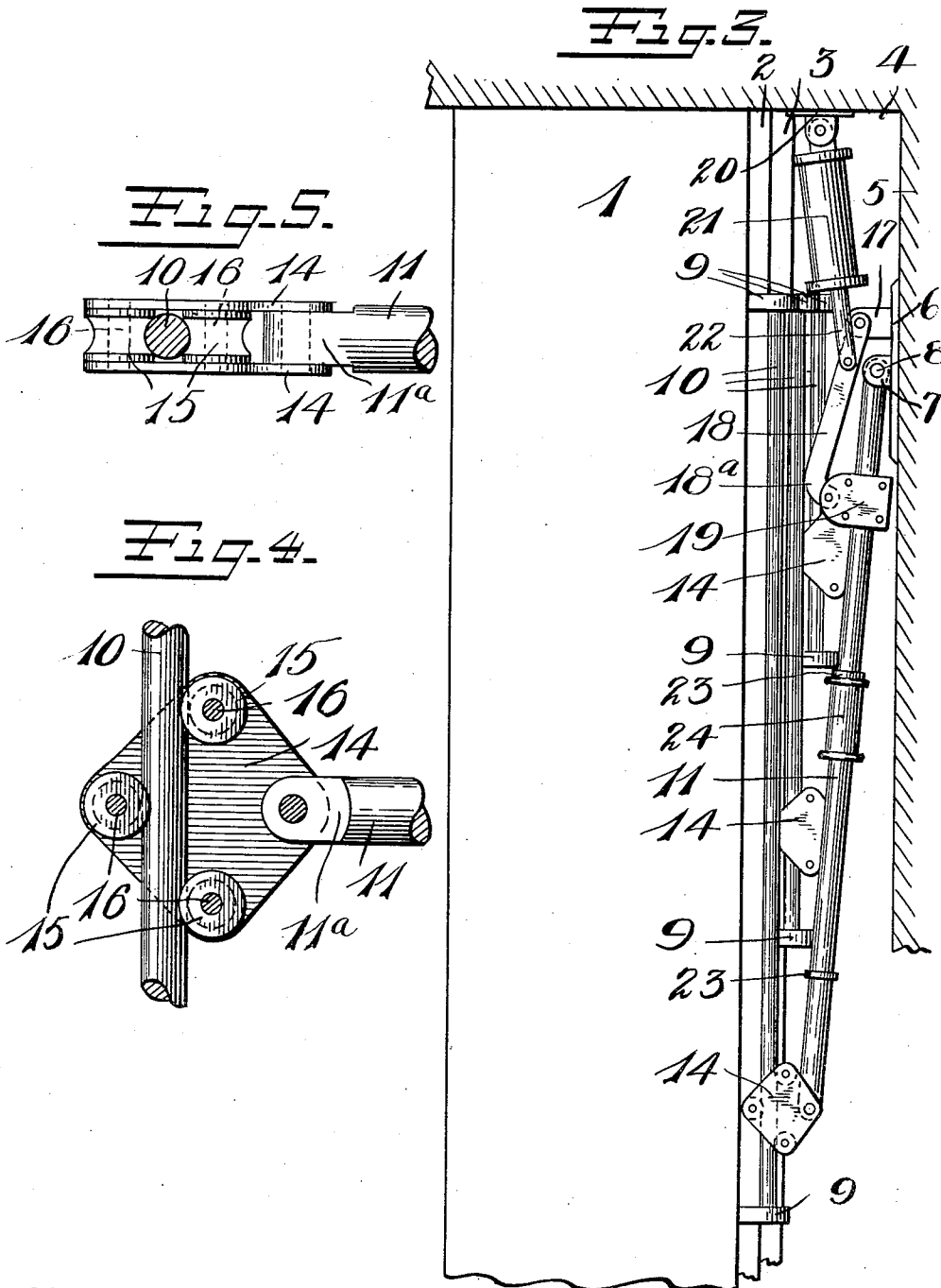
By the Attorneys
Barth. M. M. M. M. M.

H. G. VOIGHT.
CONTROLLING MEANS FOR MULTIPLE SECTION SLIDING DOORS.
APPLICATION FILED JUNE 23, 1913.

1,085,071.

Patented Jan. 20, 1914.

2 SHEETS—SHEET 2.



Witnesses:
Charles W. ...
John J. Grote

Inventor
H. G. VOIGHT
By his Attorneys
Barrett, Brownell & Mitchell

UNITED STATES PATENT OFFICE.

HENRY G. VOIGHT, OF NEW BRITAIN, CONNECTICUT.

CONTROLLING MEANS FOR MULTIPLE-SECTION SLIDING DOORS.

1,085,071.

Specification of Letters Patent.

Patented Jan. 20, 1914.

Application filed June 23, 1913. Serial No. 775,235.

To all whom it may concern:

Be it known that I, HENRY G. VOIGHT, a citizen of the United States, residing at New Britain, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Controlling Means for Multiple-Section Sliding Doors, of which the following is a full, clear, and exact description.

10 The present invention comprises an improvement in controlling means for multiple section sliding doors, such as commonly used in elevator shafts, and is designed to provide a simple and efficient device of this character requiring minimum operating power and arranged to have the various door sections reach their fully opened and closed positions substantially simultaneously.

20 In the accompanying drawings and in the following detailed specification to be read in connection therewith, I am illustrating and describing a preferable embodiment of the invention.

25 In these drawings, Figure 1 is a view in side elevation of a three-section sliding door provided with the controlling means of the present invention. Fig. 2 is a horizontal sectional view on the line *a-a* of Fig. 1. Fig. 3 is a fragmentary view in elevation of the door sections shown in Fig. 1 but moved to fully opened position. Fig. 4 is a fragmentary view in elevation of one of the door controlling arms and its connection to the rear edge of a door section. Fig. 5 is a top plan view of the parts shown in Fig. 4.

30 Referring to the drawings by numerals, 1, 2 and 3 designate the three sections of a sliding door structure to which the present invention may be applied. 4 designates the stationary door casing and 5 the wall of the door casing, or other stationary abutment. These door sections may be supported and guided by any suitable means, as is well known in the art.

45 Secured to the wall or fixed abutment 5 is a plate 6 having projecting therefrom spaced and alined brackets 7 in which are journaled the ends of a rock shaft 8. To the rear edges of each of the door sections 1, 2 and 3 are secured spaced brackets 9 connected by guide rods 10. The spacing of these brackets and the length of the guide rods varies in each case with the length and range of movement of the controlling arm coöperating with these rods, as will be here-

inafter described. The door sections are, of course, arranged to overlap and lie in parallel planes, as is usual in multiple section sliding doors.

60 A plurality of controlling arms are provided one for each door section, these arms being designated by the numerals 11, 12 and 13 respectively. These arms are fixed at their inner ends to the rock shaft 8 and swing with the oscillation of said shaft. The arms are different lengths corresponding to the distance between the rock shaft and the rear edge of their respective door section. Their outer ends are flattened as at 11^a, 12^a, and 13^a and have a sliding connection with the guide rods carried by the rear edges of the respective door sections. One form of connection which may be employed comprises spaced plates 14 between which are journaled the grooved rollers 15 spaced and shaped to engage the periphery of the guide rods 10 and affording a three-point contact therewith. The flattened ends of the controlling arms are pivotally mounted between these spaced plates at their inner ends and the plates themselves are secured together by means of the studs 16 forming the journals for the rollers 15.

85 At a point above the arm 11 and its adjacent bracket 7, the plate 6 is provided with a second bracket 17 to which is secured the inner end of a link 18 whose outer end is curved as at 18^a and is pivoted between spaced plates 19 inclosing therebetween the arm 11 and having a plurality of rollers guiding thereon. A bracket 20 is secured to the top or ceiling of the door casing and has pivotally attached thereto a power closer cylinder and check 21 preferably of the type employing a coiled spring operating against the piston, such as shown in my prior Patent No. 1,028,833. The piston rod 22 of this power cylinder is pivotally connected to the link 18 intermediate its ends and tends to swing said link to move the arm 11 and turn the rock shaft. The plates 19 with their anti-friction rollers provide a sliding connection with the arm 11 at a point intermediate its ends and adjacent the rock shaft. It is particularly advantageous in this structure to connect the power mechanism to the longest of the controlling arms and to have a sliding connection with said arm which will move relatively to the fulcrum of said arm formed by the rock shaft 8. The long arm 11 is attached to the

outermost of the series of sliding door sections, which arm is nearest the elevator casing and nearest the elevator operator, and this arm, therefore, will be manually operated to open the door sections, and will afford a most powerful operating leverage against the force of the power mechanism which normally tends to swing the arm 11 in a direction to move the door section to closed position.

Inasmuch as each of the controlling arms 11, 12 and 13 are fixedly carried by the rock shaft 8, it will be obvious that when the arm 11 is swung downwardly by the operator, the rock shaft will be oscillated and the other arms 12 and 13 will be likewise swung downwardly, this movement of all the arms, because of their sliding connections with the rear edges of the door sections, moving said door sections rearwardly. The length of these arms is so figured that differential rates of movement will be imparted to the different door sections so that they will reach fully opened position substantially simultaneously and so that when the rock shaft is oscillated in the reverse direction, they will all reach fully closed position substantially simultaneously. The sliding connection of the power controlled arm 18 with the door controlling arm 11 provides a point of connection, as before stated, which moves relatively to and toward the fulcrum of the arm (the rock shaft 8) upon door opening movement of said arm. This will, therefore, increase the operating leverage against said arm proportionately with the increased resistance caused by reason of the compression of the spring of the power mechanism. When the door sections have been opened and the operator releases the arm 11, the power mechanism will quickly return the door sections to closed position owing to the quick action leverage secured against arm 11 by reason of the short distance between its fulcrum and the point of connection of the link 18 therewith.

The door sections may be opened by the elevator operator by simply grasping the arm 11 of the outermost door section and moving the same downwardly to oscillate the rock shaft, as hereinbefore described. However, I prefer to provide a convenient operating handle having a sliding engagement with said arm and to this end, mount on said arm to slide thereon an operating sleeve 24 and provide on the arm, spaced stop collars 23. It will be noted that in the form of the invention shown, the points of door and rock shaft connection of each arm are in horizontal alinement when the door sections are fully closed. This provides a dead center lock whereby these arms are locked from the outside against door opening movement. The swinging of arm 11 downwardly by the operator, however,

breaks the horizontal alinement in the case of this arm, and through the consequent oscillation of rock shaft 8, the alinement of the other arms so that the door sections may be readily moved to open position from the interior by the operator.

The door section controlling arms provide one desirable form of sliding connection between the rock shaft and the respective door sections, but it will be obvious that the specific construction may be varied within the limits of the object to be attained. Furthermore, while the specific form of power mechanism and connection described herein is preferable, other forms may be substituted therefor within the limits of the object of the invention and still be within the scope of the present invention.

What I claim, therefore, and desire to secure by Letters Patent is:

1. Controlling means for a plurality of complementary sliding door sections comprising a rock shaft and separate sliding connections between said shaft and a plurality of said door sections arranged to move such sections toward and from closed position.

2. Controlling means for a plurality of complementary sliding door sections comprising a rock shaft, a sliding connection between said shaft and one of said sections arranged to move said section with the oscillation of said shaft, means whereby the remainder of said sections may be moved by the oscillation of said shaft, and power mechanism operatively connected with said shaft to oscillate the same in one direction.

3. Controlling means for a plurality of complementary sliding door sections comprising a rock shaft, separate sliding connections between said shaft and a plurality of said door sections arranged to move such sections toward and from closed position, and power mechanism operatively connected with said shaft and arranged to oscillate the same in one direction.

4. Controlling means for a plurality of complementary sliding door sections including a rock shaft, a plurality of arms carried by said shaft to swing with the oscillation thereof, and sliding connections between each of said arms and separate door sections.

5. Controlling means for a plurality of complementary sliding door sections including a rock shaft, a plurality of arms carried by said shaft to swing with the oscillation thereof, sliding connections between each of said arms and separate door sections, and power mechanism operatively connected with said rock shaft and arranged to oscillate said shaft in one direction.

6. Controlling means for a plurality of complementary sliding door sections comprising a rock shaft, a plurality of arms of different lengths carried by said shaft to swing with the oscillation thereof, sliding connec-

tions between the free ends of each of said arms and one of said door sections, the longest of said arms coöperating with the outermost door section, and power mechanism operatively connected with said longest arm at a point adjacent said rock shaft and arranged to oscillate said shaft in one direction.

7. Controlling means for a plurality of complementary sliding door sections including a rock shaft, a plurality of arms carried by said shaft to swing with the oscillation thereof, sliding connections between each of said arms and separate door sections, power mechanism, and means connecting said mechanism and one of said arms at a point intermediate its ends to swing said arm to oscillate said shaft, said means providing a point of connection with said arm varying relative thereto with the swinging movement of said arm.

8. Controlling means for a plurality of complementary sliding door sections comprising a rock shaft, a plurality of arms of different lengths carried by said shaft to swing with the oscillation thereof, sliding connections between each of said arms and one of said door sections, the longest of said arms coöperating with the outermost door section, power mechanism, and means connecting said mechanism to said longest arm at a point intermediate its door connection and

rock shaft and adjacent its rock shaft to thereby swing said arm and oscillate said rock shaft, said means slidably engaging said arm and moving relative to and toward its rock shaft on door opening movement of said arm.

9. Controlling means for a plurality of complementary sliding door sections comprising a rock shaft carried by a fixed abutment, a plurality of arms of different lengths each carried adjacent one end by said rock shaft and having its other end in sliding engagement with the rear edge of a sliding door section, said arms swinging with the oscillation of said rock shaft and being positioned with their points of connection in horizontal alinement when in closed position, the longest of said arms coöperating with the outermost door section, a power cylinder mechanism carried by a fixed abutment, and means for operatively connecting said mechanism to said longest arm at a point adjacent its rock shaft and adapted to swing said arm and oscillate said shaft in door closing direction, said means slidably engaging said arm and moving relative to and toward its rock shaft on door opening movement of said arm.

HENRY G. VOIGHT.

Witnesses:

GWENDOLINE A. JACKSON,
CHAS. E. RUSSELL.