C. C. TOMKINSON & A. T. PRESCOTT.

MOVABLE DOOR COLUMN.

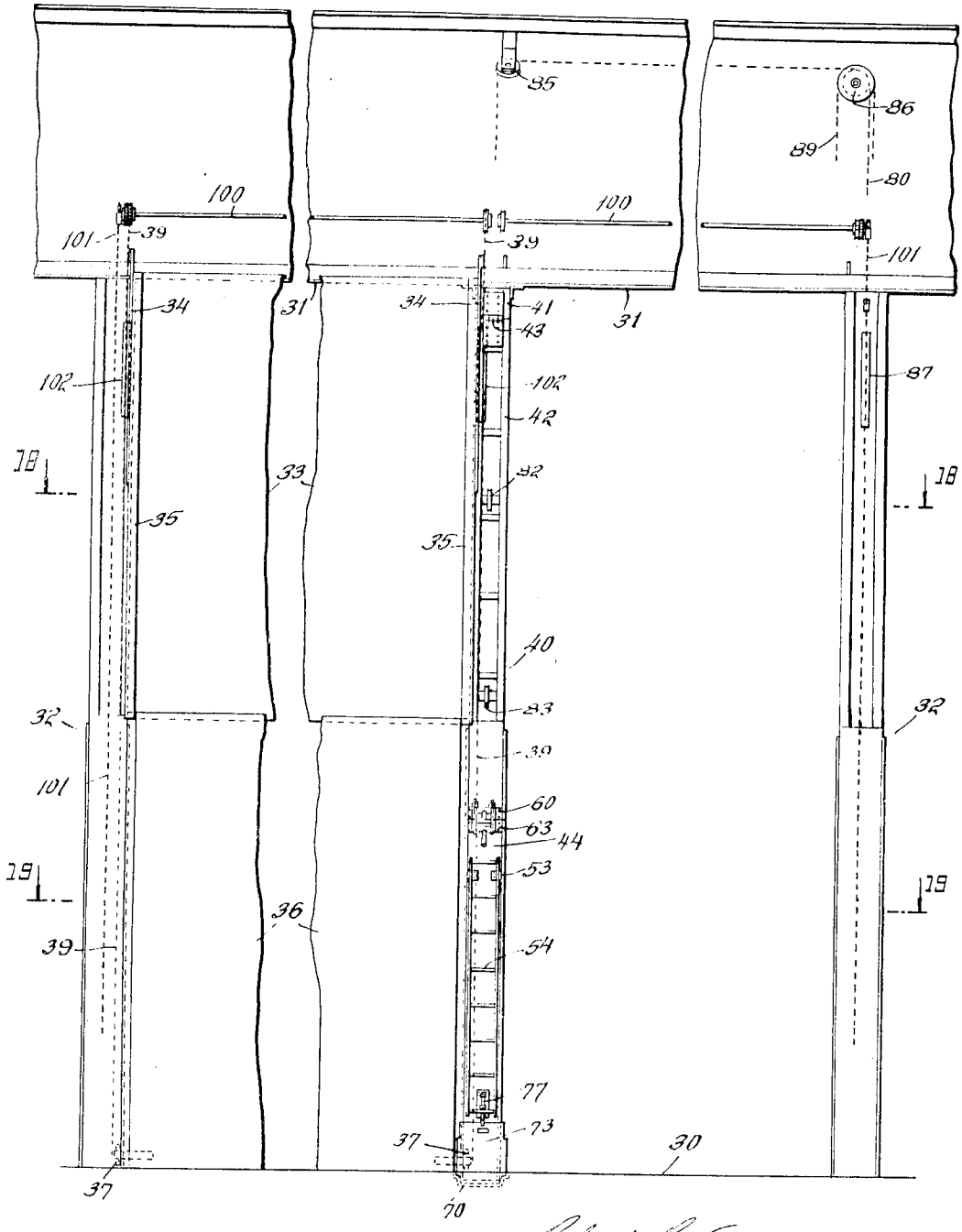
APPLICATION FILED MAR. 1, 1917.

1,258,638.

Patented Mar. 5, 1918.

5 SHEETS—SHEET 1.

Fig. 1.



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5 SHEETS—SHEET 2.

Fig. 2.

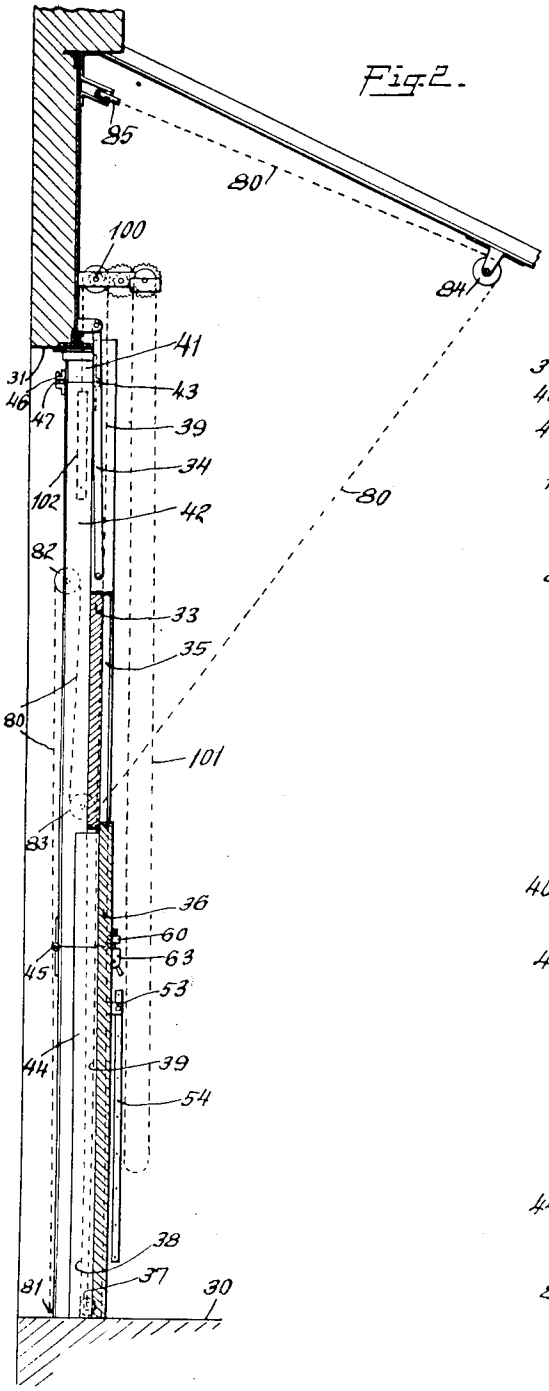


Fig. 3.

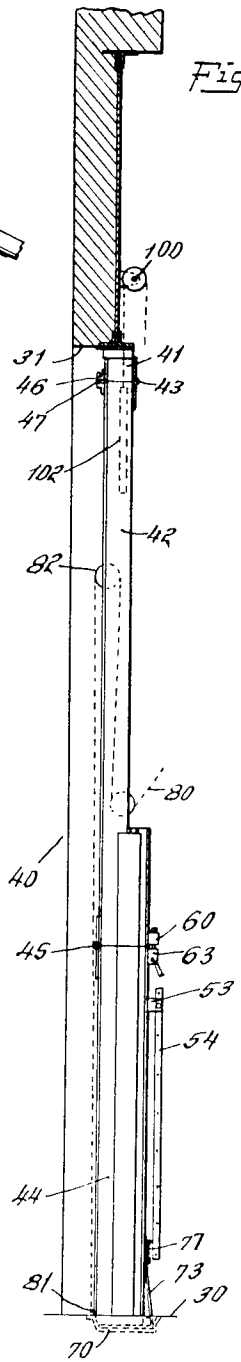
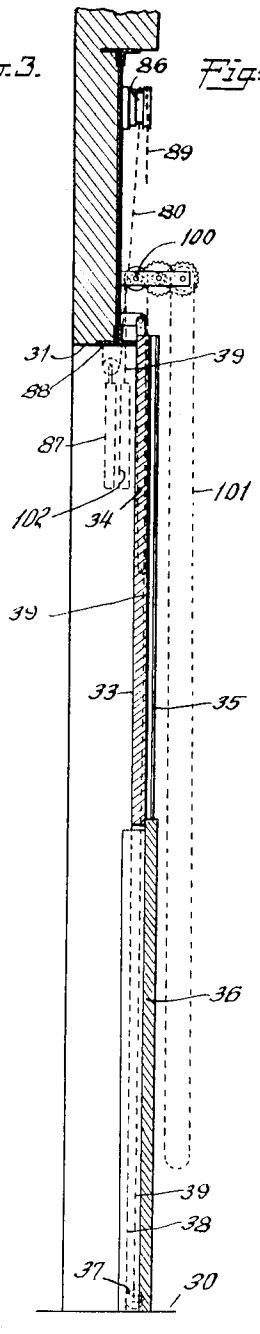


Fig. 4.



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5 SHEETS—SHEET 3.

Fig. 5.

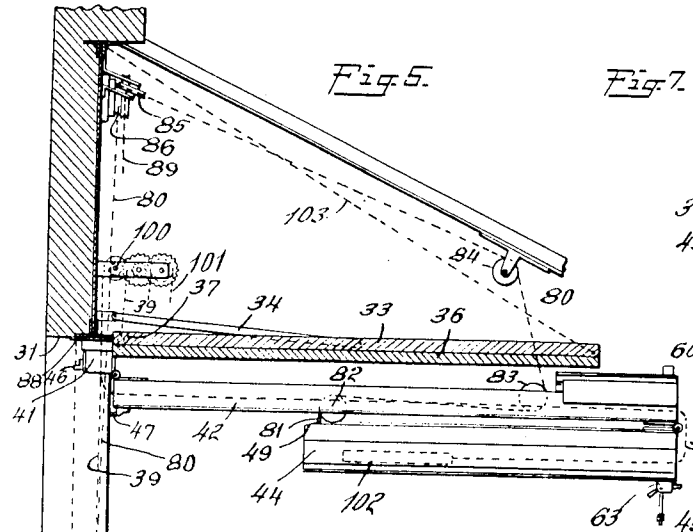


Fig. 7.

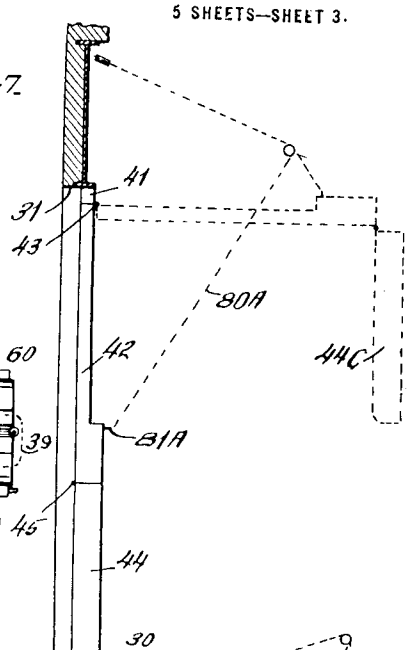


Fig. 6.

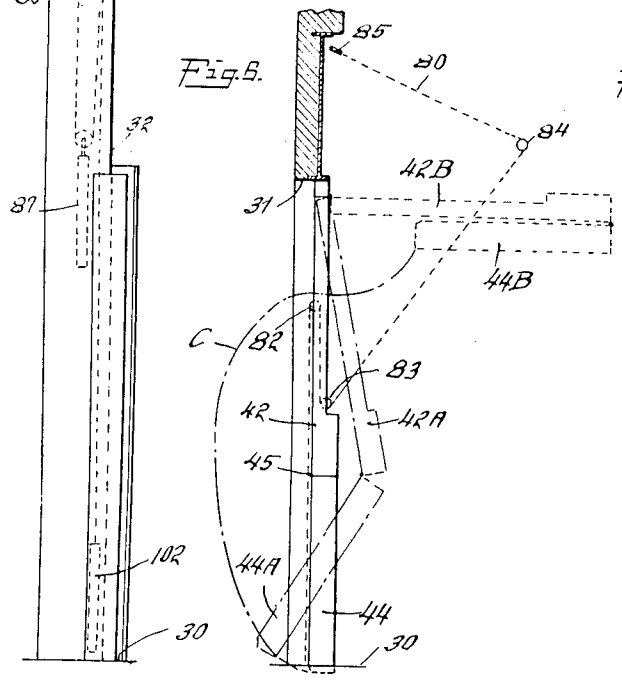
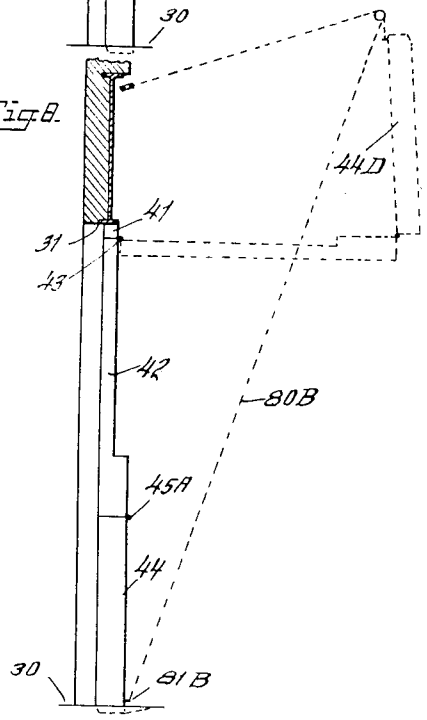


Fig. 8.



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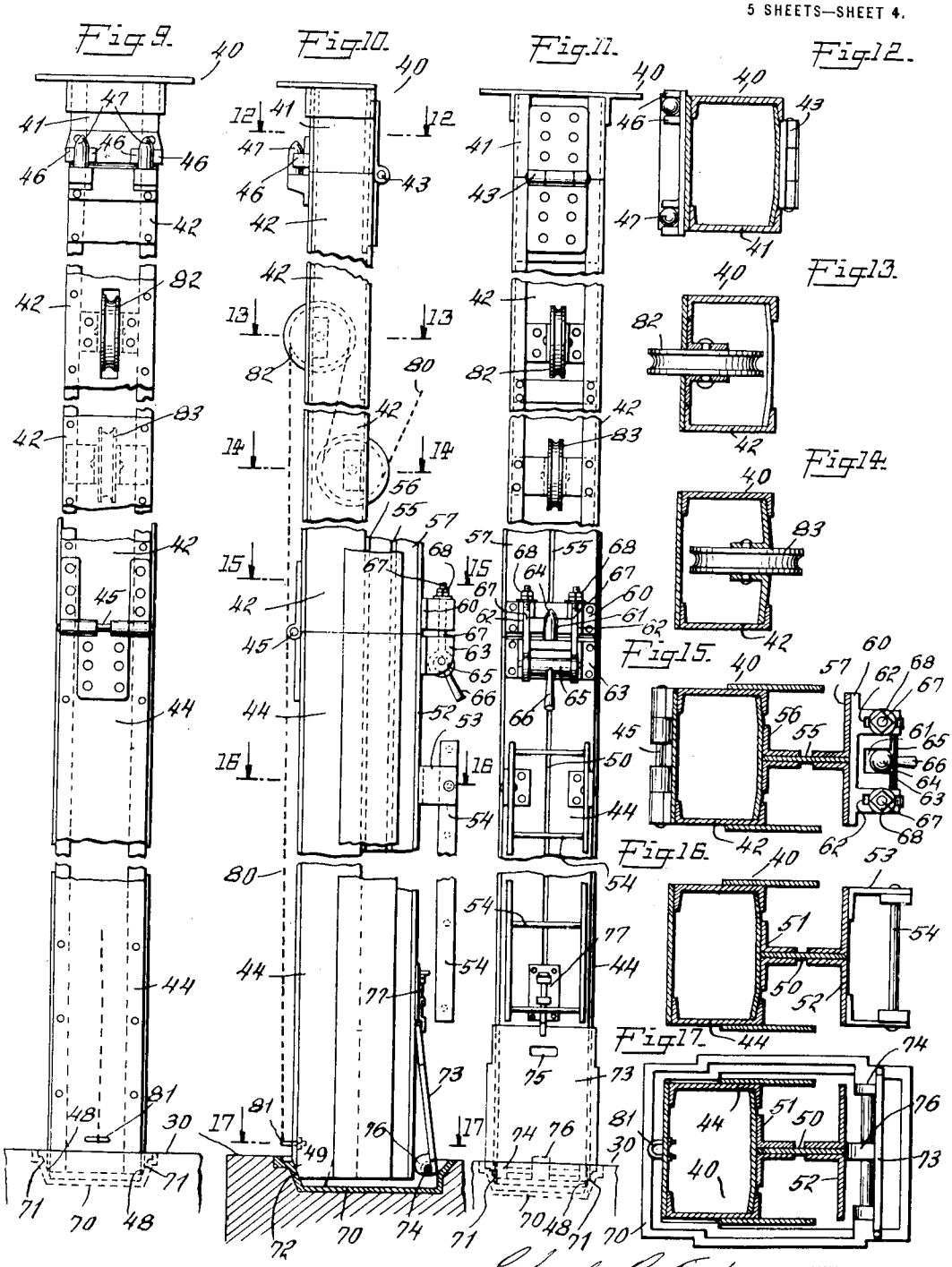
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5 SHEETS—SHEET 4.



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APPLICATION FILED MAR. 1, 1917.

1,258,638.

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5 SHEETS—SHEET 5.

Fig. 18.

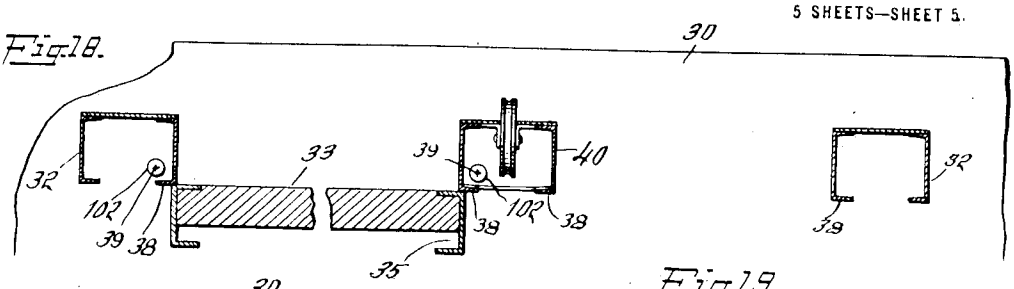


Fig. 19.

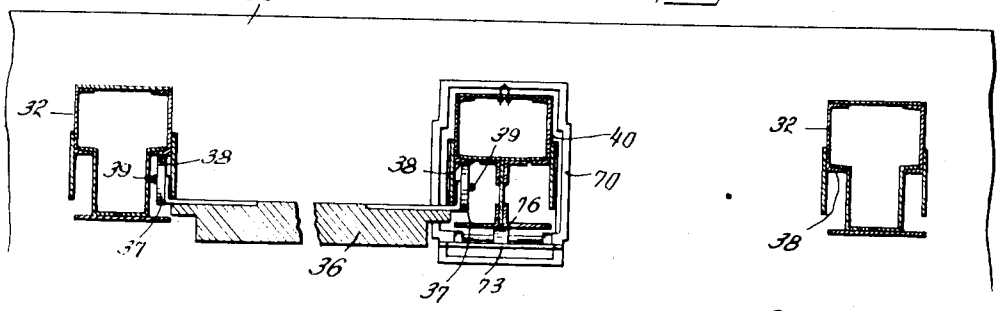


Fig. 20.

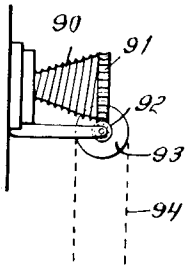
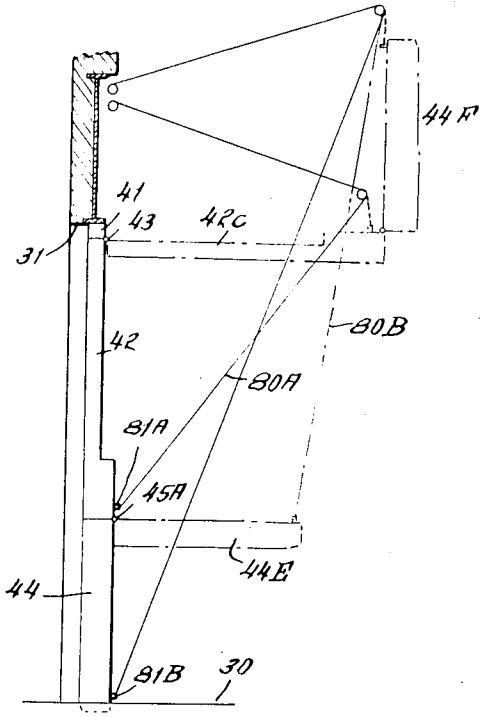


Fig. 21.



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UNITED STATES PATENT OFFICE.

CHARLES C. TOMKINSON, OF PLAINFIELD, AND ARTHUR T. PRESCOTT, OF EAST ORANGE, NEW JERSEY, ASSIGNORS TO GEORGE H. FROTHINGHAM COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MOVABLE DOOR-COLUMN.

1,258,638. Specification of Letters Patent. Patented Mar. 5, 1918.

Application filed March 1, 1917. Serial No. 151,867.

To all whom it may concern:

Be it known that we, CHARLES C. TOMKINSON, a citizen of the United States of America, and a resident of Plainfield, county of Union, and State of New Jersey, and ARTHUR T. PRESCOTT, a citizen of the United States of America, and a resident of East Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Movable Door-Columns, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

Our invention relates to improvements in door structures, and particularly to door frame columns, such as are interposed between adjacent door openings, and its object is to provide a column which in one position may serve as a part of two adjacent door frames, with means for moving it out of the way when the doors are open so that two door openings may be thrown into one.

Other objects are to so construct such a column that it may serve as a support for guides for adjacent sliding or folding doors, to provide means for securing the column in its door frame position, and with means for manipulating the column.

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

Referring to the drawings:

Figure 1 is a front elevation of a part of a structure such as a pier shed, warehouse or the like, with two stationary columns forming between them a large door opening, and with one of our improved columns between them dividing this space into two smaller door openings.

Fig. 2 is a sectional end elevation of the same structure showing a door and the movable column.

Fig. 3 is similar to Fig. 2 with the door omitted.

Fig. 4 is also similar to Fig. 2 but with the column omitted.

In the preceding figures the door is shown closed and the column in its vertical position, and Fig. 5 is a view similar to Fig. 2 but with the door opened and the column raised.

Fig. 6 is a diagrammatic end elevation illustrating the movement of the column.

Figs. 7 and 8 are end elevations of columns made according to and embodying our invention, but of different forms of construction.

A preferred form of the column is shown in elevations in Figs. 9, 10 and 11.

Fig. 9 is a back elevation of the column as viewed from the outside of the structure.

Fig. 10 is a side elevation of the column and

Fig. 11 is a front elevation of the column as viewed from the inside of the structure.

Figs. 12, 13, 14, 15, 16 and 17 are sectional plan views of the column, the sections being taken respectively on the lines 12—12, 13—13, 14—14, 15—15, 16—16 and 17—17 of Fig. 10.

Figs. 18 and 19 are sectional plan views of the structure shown in Fig. 1, the sections being taken respectively on the lines 18—18 and 19—19 of the latter figure.

Fig. 20 is a side elevation of a portion of the actuating mechanism showing a detail of construction.

Fig. 21 is a diagrammatic end elevation of a modified structure embodying our invention and shows the movable column in its vertical and its raised positions.

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

30 designates the floor of a building in which a column embodying our invention is installed. 31 is that part of the same building which forms the lintels of the door openings. Between these parts of the structure are stationary columns 32 of any preferred construction, and one of our improved columns 40. Between these three columns two door openings are formed.

The doors shown are of the type described and claimed in U. S. Letters Patent No. 973,691 issued to J. Edward Ogden. Each of these comprises an upper section 33, pivotally suspended from above the door opening by links 34, having guides 35 at its edges into which a lower door section 36 slides. Rollers 37 at the lower corners of the lower section run up on guides 38 on the columns

32 and 40 when the door is opened by a pull on the lifting chains 39.

Our improved movable column 40 comprises primarily an upper stub section 41, permanently affixed to the lintel 31, an intermediate section 42 hinged to a stub section at 43, and a lower section 44 hinged to the intermediate section at 45.

On the side of the stub section 41 opposite the hinge 43 are two pairs of projecting lugs 46, and centering studs 47 are affixed to the upper part of the intermediate section 42 in such positions as to each be engaged by a pair of the lugs 46 when the column is in its vertical position.

A web 50 projects inwardly from the lower section 44 to which it is affixed by angle irons 51. Other angle irons 52 are affixed to the outer edge of the web 50. Angle brackets 53 on these angle irons 52 serve as parts of a pivotal support for a ladder 54.

55 is a web affixed to the intermediate column section 42 by angle irons 56 in alinement with the web 50, and 57 are other angle irons on web 55 in alinement with angle irons 52. 60 is a casting affixed to the lower ends of angle irons 57. This is constructed to form a central slot 61 and two side slots 62. Directly below this casting 60 is a casting 63 affixed to the upper ends of angle irons 52. This is constructed to form a centering stud 64 which fits into the central slot 61. It also forms a pivotal support for an eccentric roller 65 from which an actuating handle 66 projects. Eye-bolts 67 are mounted upon this eccentric roller. These are adapted to be swung up into the slots 62 when the column is in its vertical position. Their upper ends are threaded and provided with adjusting nuts 68.

The floor 30 is recessed directly below the end of the column for the reception of a rectangular socket 70. Three sides of this socket are tapered as shown at 71 and 72, and a cover plate 73 is pivoted at 74 at its other side. The lower end of the lower column section 44 is tapered as at 48, 49, to fit into this socket to thus center the column in closing. The cover plate is provided with a finger hold hole 75 and near the center of its pivoted edge with a cam 76 adapted to press against the inner face of the column. A slide bolt 77 on column section 44 is provided to hold the socket cover plate in the position in which it is shown in Figs. 3, 10 and 11.

It is obvious that this plate covers the socket when the column is raised and that its cam 76 engages one side of the bottom of the column to force the opposite side against its adjacent side of the socket.

In the form of column which is shown in Figs. 1, 2, 3, 4, 6, 9–17, a hoisting chain or cable 80 is affixed to the outer part of the lower column section 44 near its lower end at 81. This is carried up over a sheave 82 and under a sheave 83 both of which are mounted upon the intermediate column section 42. Thence it is led up to and around a sheave 84 pivotally supported at a point inside of the building materially spaced from the door opening and above the hinge 43 (Figs. 2 and 5). From pulley 84 the chain or cable may be led over pulleys 85 and 86 under a sheave on a counterweight 87, and up to a point 88 where its end is fastened. The counterweight, may, if desired, be within one of the stationary columns 32. In Figs. 1 and 4, 89 is a hand chain run over a hoisting mechanism for moving the chain sheave 86 and the chain 80.

If preferred, the hoisting arrangement shown in Fig. 20 may be used. In this case the chain or cable 80 is wound up upon a fusee drum 90 on one end of which is a worm gear 91, in mesh with a worm 92 on the shaft with a chain sheave 93 which is actuated by a hand chain 94. When such a mechanism is used a low pitch worm is employed so that the weight of the column cannot cause the worm gear to rotate.

Before specifically describing the modifications shown in the other figures of the drawings, we will describe the operation of the structure which has thus been pointed out.

Such a door as that shown in Figs. 1, 2, 4, 5, 18 and 19, is opened by an upward pull upon a hoisting chain 39 connected with the lower corners of the lower door section 36. This may be accomplished by any suitable hoisting mechanism such, for example, one comprising a transverse overhead shaft 100 and a hand chain 101. With such a mechanism counterweights 102 usually are employed. These counterweights may run inside of the side columns 32 and as the movable column 40 is hollow such a counterweight may be placed inside of it too, if desired. The lower door section telescopes back of the upper door section 33 supported in the guides 35. Further upward movement of the hoisting chain 39 causes the two door sections to be swung upwardly and inwardly by the links 34, until they reach the position in which they are shown in Fig. 5. 103 in this figure designates a head check for supporting the inner ends of the door sections in their open position. During all of this opening movement and also in closing the rollers 37 run on the part 38 of the columns 32 and on similar parts of the movable column which thus act as tracks or guides for the door.

When the door is open one of the rollers 37 rests upon the track or guide portion of the stationary stub section 41 of the movable column, so that the rest of the column may be moved without interfering with the door.

Now the socket plate 73 may be released and swung back out of the way to remove the pressure of its cam 76 from the column. An upward pull on the chain or cable 80 will have the effect of causing the lower end of the intermediate column section to swing inwardly as indicated by dotted lines at 42^A in Fig. 6, and the lower column section to swing outwardly as at 44^A, thus breaking in the hinge joint at 45. These movements will continue until the column sections assume the positions in which they are indicated by dotted lines at 42^B and 44^B in Fig. 6, and in which positions they are shown in Fig. 5. The path of movement of the lower end of the lower column section is indicated by the dot and dash line C of Fig. 6. Thus two adjacent door openings are thrown into one large one. The advantages are obvious, such for example when used as a part of a pier shed, large articles may be moved laterally to or from a ship or cargo loading or unloading points shifted without shifting the vessel.

In closing the column or returning it to its vertical position, the operation is reversed. As the column approaches the limit of its downward movement, the centering studs 47 are moved in between the lugs 46 and the centering stud 64 is moved into the slot 61 thus insuring the proper registration of the column sections. The tapered end of the lower column section is centered by its engagement with the tapered sides 71 and 72 of the floor socket.

Now the eye-bolts 67 are swung up into the slots 62 and the handle 66 pulled down to pull the column sections 42 and 44 together opposite the hinge 45. The ladder 54 is provided to make these parts accessible. It is pivotally supported at 53 near the hinge joint so that its lower end may be swung inward and used as a strut to force this hinged joint together against wind pressure if need be.

The cover plate 73 may now be raised into the position in which it is shown in Fig. 10, and its cam 76 will then jam the bottom of the column into intimate contact with the socket 70.

In some cases it is desirable to have no part of the column move outside of the door opening. This may be accomplished by either of the arrangements shown in Figs. 7, 8 or 21.

In Fig. 7, a single hoisting chain 80^A is used, connected at 81^A near the lower end of the intermediate column section. In this case when the column is raised, its lower section will swing down into the position indicated by the dotted lines at 44^C.

Or by connecting a hoisting chain 80^B to the lower end of the lower column section as at 81^B in Fig. 8, and placing the hinge 45^A between the intermediate and lower sections of the column on the inside of the column, the lower section may be pulled up out of the way as shown at 44^D, Fig. 8. This gives the advantage of permitting the lower column section to be moved out of the way without moving the intermediate column section. The same advantage may be attained by the use of the arrangement shown in Fig. 21. In this case the hoisting chain 80^A is affixed at 81^A near the lower end of the intermediate column section, as in Fig. 7, and another hoisting chain 80^B is attached at 81^B to the lower end of the lower door section. These ropes may be actuated independently and the lower column section moved up into the position indicated by the dotted lines at 44^E in Fig. 21, or the intermediate and lower column sections moved up into the positions indicated by the dotted lines at 42^C, and 44^F respectively.

It is obvious that many modified forms of structure may be used to embody our invention. We have illustrated several to show that the invention is not limited to any specific form of construction. In fact, we intend no limitations other those imposed by the appended claims.

What we claim is:

1. In combination with a pair of door structures each having a vertically sliding portion, a column between the door structure forming a part of the boundary of each of the two door openings for said structures and having tracks for said sliding portions of said door structures, and means for swinging said column away from said openings when the doors are open to thereby throw said two door openings together into a single door opening.

2. In combination with a pair of door structures each having a sliding portion, a column between the door structure forming a part of the boundary of each of the two door openings for said structures and having tracks for said sliding portions of said door structures, said column comprising a stationary stub section at its upper end arranged to support the sliding portions of the doors when they are open, means for pivotally supporting the remainder of the column from said stub section, and means for swinging said remainder of the column about said pivotal support when the doors are supported by said stationary stub section.

3. In combination with a pair of door structures each having a vertically sliding portion, a column between the door structures forming a part of the boundary of the two door openings for said structures and having tracks for said sliding portion of said door structures, means for pivotally supporting said column near the top of said door openings and comprising a hinged

joint intermediate said pivotal support and the lower end of said column, and means for folding and swinging said column to thereby throw said two door openings together into a single door opening.

4. In combination with a pair of door structures each having a vertically sliding portion, a column between the door structures forming a part of the boundary of the two door openings for said structures and having tracks for said sliding portion of said door structures, said column comprising a plurality of sections, hinged connections between said sections, and means for folding and swinging said column sections together to thereby throw said two door openings together into a single door opening.

5. In combination with a pair of door structures each having a vertically sliding portion, a column between the door structures forming a part of the boundary of the two door openings for said structures and having tracks for said sliding portion of said door structures, a single hoisting chain arranged to fold and swing said column up when the doors are open, to thereby throw said two door openings together into a single door opening.

6. In combination with a pair of door structures each having a vertically sliding portion, a column between the door structures forming a part of the boundary of the two door openings for said structures, said column comprising an upper stationary stub section, an intermediate section, and a lower section, and hinge connections between said sections, each of said sections having tracks for said sliding portions of both of the doors, and means for swinging said intermediate column section up after the sliding portions of the doors are on the tracks of the stationary stub section of the column.

7. In combination with a pair of door structures each having a vertically sliding portion, a column between the door structures forming a part of the boundary of the two door openings for said structures, said column comprising an upper stationary stub section, an intermediate section, and a lower section, and hinge connections between said sections, each of said sections having tracks for said sliding portions of both of the doors, a hoisting chain connected with the intermediate and lower column sections arranged to swing said intermediate column section up after the sliding portions of the doors are on the tracks of the stationary stub sections of the column and to fold the lower column section against said intermediate column section.

8. In combination with a pair of door structures each having a sliding portion, a column between the door structures forming a part of the boundary of the two door openings for said structures, said column comprising an upper stationary stub section, an intermediate section, and a lower section, and hinge connections between said sections, each of said sections having tracks for said sliding portions of both of the doors, a pair of sheaves on said intermediate column and a hoisting chain run under one and over the other of said sheaves and to the lower end of the lower column section.

9. A movable door column comprising sections hinge-connected together on one side, a centering stud on one of the column sections opposite said hinge connection and a pair of lugs on the adjacent column section beween which lugs said stud is arranged to fit.

10. A movable door column comprising sections hinge connected together on one side, a bracket projecting from one of said sections opposite said hinge connection, a bolt pivoted to the adjacent section and arranged to engage said bracket and tightening means associated with said bolt.

11. A movable door column comprising sections hinge connected together on one side, a bracket projecting from one of said sections opposite said hinge connection, an eye bolt pivoted to the adjacent section and arranged to engage said bracket, adjustable nuts on said eye bolt, and a manually operable eccentric for the pivotal support of said eye bolt.

12. A movable door column comprising sections hinge connected together on one side, a bracket projecting from one of said sections opposite said hinge connection, a bolt pivoted to the adjacent section and arranged to engage said bracket, and tightening means associated with said bolt, a centering stud on one of the column sections opposite said hinge connection, and a pair of lugs on the adjacent column section between which lugs said stud is arranged to fit.

13. A movable door column comprising sections hinge connected together on one side, a bracket projecting from one of said sections opposite said hinge connection, a bolt pivoted to the adjacent section and arranged to engage said bracket, tightening means associated with said bolt, a centering stud on one of the column sections opposite said hinge connection, a pair of lugs on the adjacent column section between which lugs said stud is arranged to fit, and a ladder pivotally connected with said column near said pivotal connection.

14. A movable door column comprising sections hinge connected together, a floor socket for receiving the lower end of said column, and a cover plate hinge connected to said socket and arranged to cover the socket when the column is moved away from said socket, and to engage said column when it is in said socket.

15. A movable door column comprising sections hinge connected together, a floor socket for receiving the lower end of said column, and a cover plate hinge connected to said socket and arranged to cover the socket when the column is moved away from said socket, said socket cover being provided with a cam arranged to engage said column when it is in said socket.

16. A movable door column comprising sections hinge connected together, the lower end of the lower section of said column being tapered, a floor socket for receiving the lower end of said column, said socket having tapered walls to coöperate with the tapered lower end of the column, and a cover plate hinge connected to said socket, arranged to cover the socket when the column is moved away from said socket, and to engage said column when it is in said socket.

In witness whereof, we have hereunto set our hands this 26th day of February, 1917.

CHARLES C. TOMKINSON.
ARTHUR T. PRESCOTT.

Witnesses:
I. B. MOORE,
D. E. DEUTSCH.