

961,622.

Fig. 2.

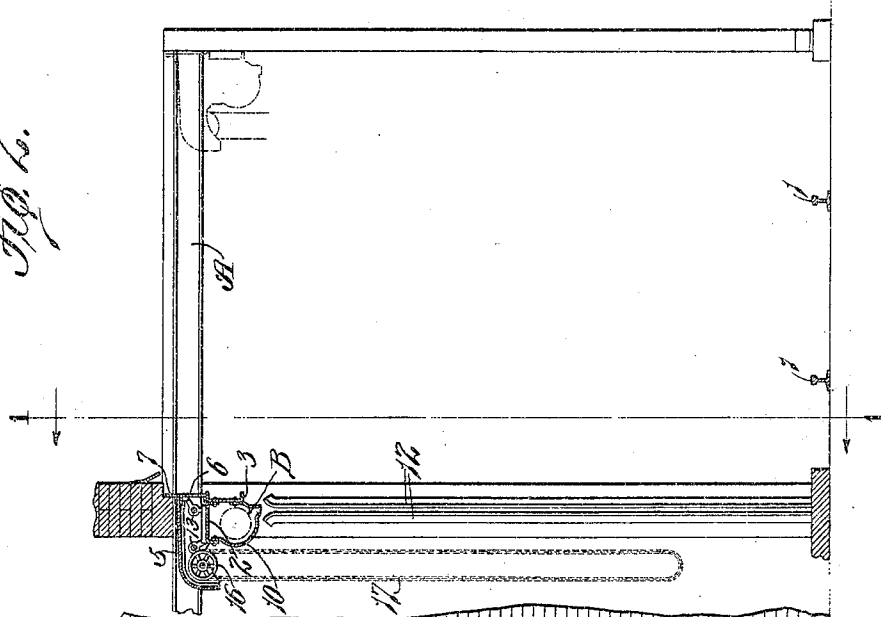
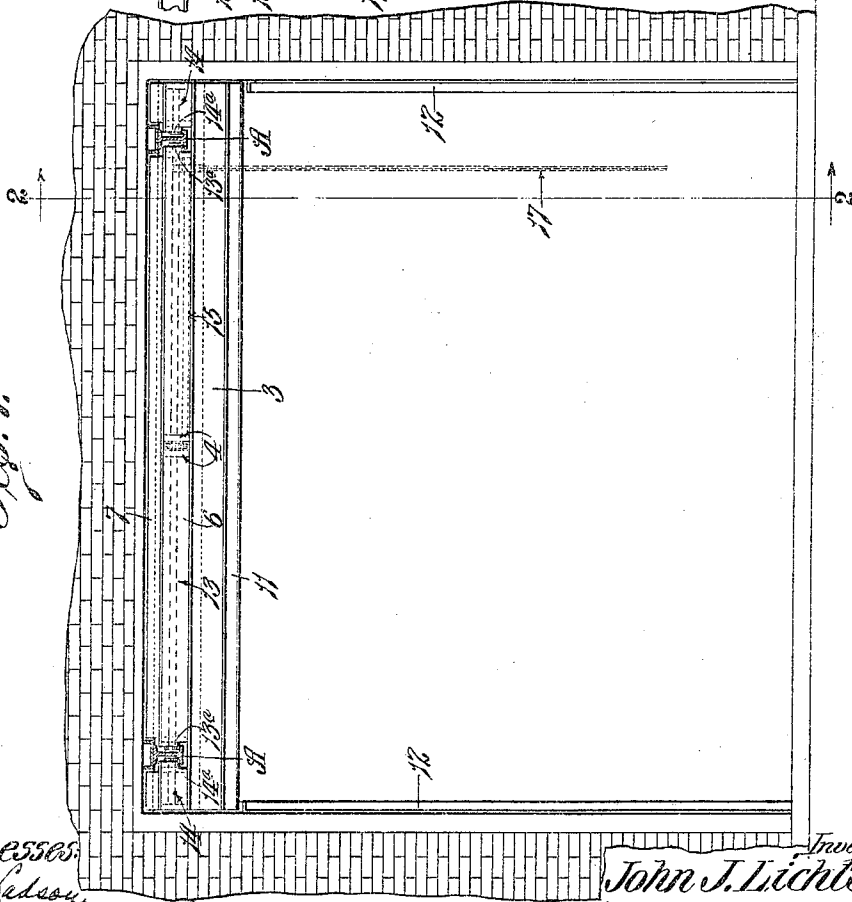


Fig. 1.



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Inventor:

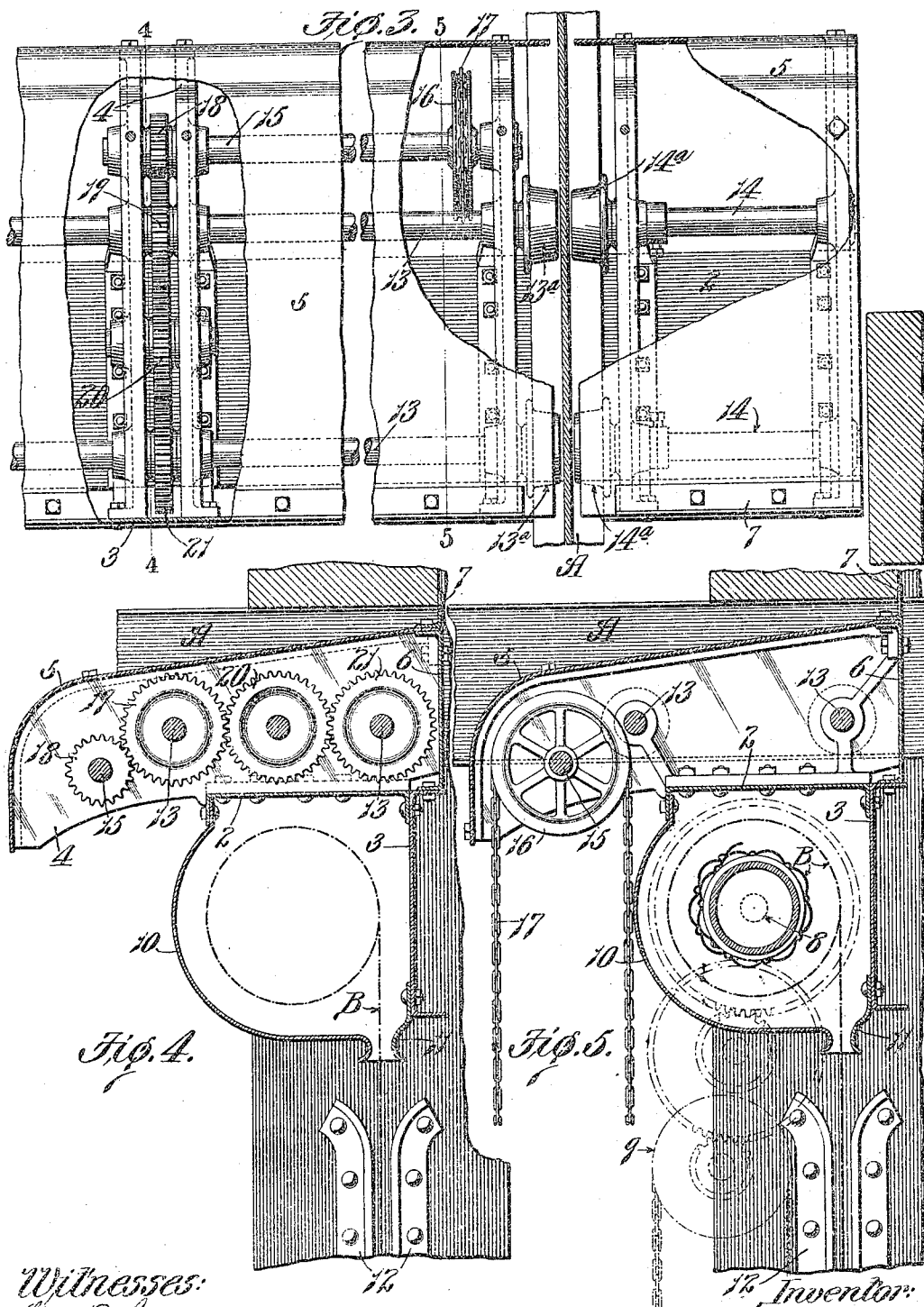
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961,622.

Patented June 14, 1910.

2 SHEETS—SHEET 2.



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IS PATENT OFFICE.

JOHN J. LICHTER, OF ST. LOUIS, MISSOURI.

DOOR FOR RUNWAY-OPENINGS.

961,622.

Specification of Letters Patent. Patented June 14, 1910.

Application filed March 4, 1910. Serial No. 547,307.

To all whom it may concern:

Be it known that I, JOHN J. LICHTER, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Doors for Runway-Openings, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to doors that are used for closing runway openings, namely, openings through which crane runways pass.

Runway openings are usually very large and it has heretofore been the general practice to use a number of hinged doors or doors composed of sections for closing said openings so that the doors could be opened or closed in high winds. Such structures are not only costly and unsightly but they are cumbersome to operate and are hard to keep tight on account of the number of joints or openings in same.

One object of my invention is to provide a closure for a runway opening which can be operated easily in a high wind.

Another object is to provide a closure for the purpose described that does not detract from the appearance of the building and which is substantial and tight.

Another object of my invention is to provide a door for a runway opening which is so designed that it will not be in the way of the workmen or obstruct any portion of the runway opening when the cranes which travel through said opening are in use.

Other objects and desirable features of my invention will be hereinafter pointed out.

Briefly described, my improved closure consists of a door, preferably, a flexible metal door that is adapted to be wound up into roll form on a shaft, and means for bodily moving said door toward and away from the building in which the runway opening is formed so as to permit the crane or cranes to be run through said opening into and out of the building.

Figure 1 of the drawings is a front elevational view of a portion of the side wall of a building equipped with a closure constructed in accordance with my invention, the crane runways being shown in section. Fig. 2 is a vertical sectional view taken on approximately the line 2—2 of Fig. 1; Fig. 3 is an enlarged top plan view of the carriage on which the door is mounted, por-

tions of the housings on said carriage being broken away to more clearly illustrate the construction of the carriage and the means for operating same; Fig. 4 is a vertical sectional view taken on approximately the line 4—4 of Fig. 3; and Fig. 5 is a vertical sectional view taken on approximately the line 5—5 of Fig. 3.

Referring to the drawings which illustrate the preferred form of my invention, A designates a pair of crane runways that pass through an opening formed in the side wall of a building. Said runways are located adjacent the upper edge of the opening, and they project outwardly from the building, as shown in Fig. 2, so that the cranes, not shown, which travel on said runways can be utilized for carrying objects into or out of the building, for example, objects that are to be unloaded from cars which travel on tracks 1 that extend alongside of the building, as shown in Fig. 2. The particular construction of the runways A is immaterial, so far as my broad idea is concerned, but I prefer to use commercially rolled I-beams for said runways arranged with their webs in a vertical position so that the bottom flanges of same can be used for tracks on which the door-carriage of my improved closure can travel. Said door-carriage can be built in various ways but I prefer to construct it in the manner herein shown as I have found that a carriage of this construction is strong and light and easy to operate. Said carriage comprises a continuous member 2, preferably a commercially-rolled channel, that extends transversely of the runway opening underneath the runways A, a member 3 of equal length, preferably a rolled channel arranged with its web in a vertical plane and its legs or flanges projecting outwardly, and a plurality of web plates 4 arranged at right angles to the members 2 and 3 and securely connected to same. These web plates 4 extend parallel to the runways A, and portions of same are in the same level or lie in the same horizontal plane as the runways so that they can be utilized as bearings for the wheel shafts or axles of the carriage, and for the shafts of the operating mechanism for the carriage. In the construction herein shown a pair of these web plates 4 are arranged at approximately the center of the carriage, as shown in broken lines in Fig. 1 and in full lines in Fig. 3. Two other pairs are ar-

ranged adjacent the runways, the plates of each pair lying on opposite sides of the runway, as shown in Fig. 3, and two other plates form the end walls of the carriage.

5 A cover or hood 5, which extends over the web plates 4, forms the top and rear wall of a housing which protects the operating mechanism hereinafter described, and also serves to tie said web plates together, and
10 additional tie members 6 and 7 are connected to the front ends of said web plates so as to impart the requisite stiffness to the carriage. The tie members 6 form the front wall of the housing just referred to, and
15 said members preferably consist of a long channel that extends between the two runways A and two short channels that extend between said runways and the end plates 4 of the carriage. The tie members 7 consist
20 of pieces of angle iron of the same length as the member 6 and arranged at the upper edge of the front end of the carriage so as to form a stop which coöperates with the front wall of the building to limit the inward
25 movement of the carriage, as shown in Figs. 4 and 5, the front edge of the hood 5 being interposed between the tie members 6 and 7. The hood 5 is, of course, provided with
30 suitable slots or openings for receiving the runways A, and the tie plates 4 are provided with flanges for receiving the fastening devices that connect said plates to the members with which they coöperate to form the carriage.

35 The roller door B which is mounted on the carriage, may be of any preferred type or design, and the shaft 8 onto which it is wound is mounted in bearings that are connected to the carriage, the shaft 8 being
40 rotated to raise and lower the door by means of an operating mechanism 9. The continuous members 2 and 3 of the carriage which are arranged under the runways, form the top and front walls, respectively, of a housing for the door, and the remainder of said
45 housing is formed by plates 10 and 11 whose lower edges are spaced away from each other, as shown in Fig. 4, so as to form a slot through which the door can pass.

50 The carriage projects into the building through the runway opening when the door is closed so as not to detract from the appearance of the building, and as said carriage extends the entire width of the runway opening, it acts as a closure for the
55 upper part of the opening. The building is provided with guides 12 which receive the side edges of the door and thus prevent the door from swaying, the upper ends of said guides being flared, as shown in Fig. 4, so as
60 to cause the door to properly enter same. The carriage is provided with a pair of long wheel shafts or axles 13 that extend from runway to runway, and also two pairs of
65 short shafts or auxiliary shafts 14 which ex-

tend from the runways to the end walls of the carriage, all of said shafts being journaled in the web plates 4 of the carriage. The long shafts 13 are provided at their opposite ends with wheels or rollers 13^a and
70 the short shafts or auxiliary shafts 14 are provided at their inner ends with rollers 14^a, all of said rollers traveling on the bottom flanges of the runways. While it is not absolutely necessary to provide the carriage
75 with these auxiliary shafts and rollers, still it is preferable to construct it in this manner so as to more equally distribute the weight of the carriage on the runways and prevent the runways from spreading apart.
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The cranes, not shown, which travel on the runways can be used for moving the carriage away from the building and returning it to the building but I prefer to provide the carriage with means for propelling the wheels or rollers 13^a so as to produce a complete self-contained structure.
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Referring to Figs. 3 to 5 which illustrate one means that can be used for operating the carriage, 15 designates a horizontally
90 disposed shaft journaled in some of the web plates of the carriage and provided at its outer end with a sprocket wheel 16 over which a chain 17 travels, and at its inner end with a gear 18 that is arranged between
95 the pair of web plates 4 at the center of the carriage. This gear 18 meshes with a gear 19 on one of the wheel shafts 13 of the carriage, and said gear 19 meshes with an idle gear 20 that meshes with a gear 21 on the
100 other wheel shaft so as to cause both wheel shafts to rotate when the operating shaft 15 is turned.

When it is desired to open the door, the workman operates the mechanism 9 which
105 turns the door shaft 8 so as to wind the door onto said shaft. He then turns the shaft 15 by means of the chain 17 so as to cause the carriage to travel outwardly on the crane runways A into the position shown in
110 broken lines in Fig. 2. The cranes which travel on said runways can now be run into and out of the building without interfering with the door which is arranged in such a position that it is completely out of the way
115 of the workman. When it is desired to close the door, the carriage is returned to its former position by operating the chain 17 and the door is then lowered by means of the operating mechanism 9.
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A closure of the construction above referred to can be operated easily by one workman even in high winds, and it is strong and forms a tight closure for the runway opening owing to the fact that the
125 major portion thereof consists of a single member, namely, the flexible door B. The fact that a track is not required for the bottom of the door makes it a decided improvement upon a laterally sliding door because
130

a track or rail at the lower edge of a runway opening continually requires attention.

While I have herein stated that the carriage is provided with a metal roller door I do not wish it to be understood that my invention is limited to such a structure for it is immaterial, so far as my broad idea is concerned, whether the carriage is provided with a rigid door or a flexible door that can be wound up into roll form, my invention consisting broadly in a carriage that is adapted to be moved at an angle to the wall in which the door opening is formed, and a door mounted on said carriage. Furthermore, while I have herein referred to the carriage as being moved outwardly away from the building after the door has been raised or opened, it will, of course, be obvious that the carriage could be so designed that it could be run inwardly or farther into the building so as to get it out of the way of the cranes.

A closure of the type herein shown is primarily intended for runway openings but it could, of course, be used for closing openings not provided with runways, the tracks on which the carriage travels being used solely for supporting the carriage.

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

1. Means for closing a runway opening, comprising a door, and a carriage for supporting said door and adapted to be moved toward and away from the wall in which said opening is formed.

2. A closure for an opening through which elevated tracks pass, comprising a carriage that is adapted to travel on said tracks, and a door mounted on said carriage.

3. A closure for an opening through which elevated rails pass, consisting of a carriage that closes the upper part of said opening and which is adapted to be moved toward and away from the wall in which said opening is formed, and a roller door on said carriage that forms a closure for the remainder of said opening.

4. A closure for an opening through which elevated rails pass, comprising a carriage that is adapted to travel on said rails toward and from the wall in which the opening is formed, means for operating said carriage, and a flexible roller door mounted on said carriage.

5. A closure for a runway opening, comprising a carriage provided with wheels that travel on said runways, and a flexible roller door supported by said carriage.

6. A closure for a runway opening, comprising a carriage that is adapted to close the upper portion of said opening, a flexible roller door mounted on said carriage, and means for moving said carriage longitudinally of said runways.

7. A closure for a crane runway opening, comprising a carriage provided with wheels that travel on said runways, a flexible roller door mounted on said carriage, and means for turning said wheels so as to cause the carriage to move toward and away from the building in which the opening is formed.

8. In a structure of the character described, runways that project outwardly from the wall of a building, a carriage on said runways that is adapted to enter said building, a flexible roller door mounted on said carriage, and guides on the building for receiving the side edge portions of said door.

9. A door carriage provided with a frame, rollers or wheels on said frame that are adapted to travel on a track, and a flexible roller door supported on said carriage.

10. A door carriage provided with a frame, rollers or wheels on said frame that are adapted to travel on a track, a flexible roller door mounted on said carriage, and means for propelling said carriage longitudinally of said track.

11. A carriage for the purpose described, consisting of a plurality of web plates, means for connecting said plates together, rollers or wheels on said carriage that are adapted to travel on a track, and a flexible door suspended from said carriage and arranged under said track.

12. A carriage for the purpose described, comprising a frame provided with wheels or rollers which are adapted to travel on a track, a housing or cover for said frame, a flexible roller door suspended from said frame, and a housing for said door.

13. A carriage for the purpose described, comprising a plurality of web plates that extend parallel to the track on which the carriage travels, wheel shafts journaled in said web plates, a continuous tie member connected to said web plates and arranged under said track, and a flexible roller door mounted on said carriage.

14. A carriage for the purpose described, comprising a plurality of web plates arranged parallel to the runways or tracks on which the carriage travels, a cover or housing connected to said web plates, shafts journaled in said web plates and provided with wheels that travel on the runways, continuous members connected to said web plates and arranged under the runways, and a plate that coöperates with said continuous members to form a housing for a flexible roller door.

15. A carriage for the purpose described, provided intermediate its ends with openings or slots for receiving rails or runways, wheels on said carriage that travel on said runways, and a flexible roller door mounted on said carriage and arranged under said runways.

16. In a structure of the character de-

scribed, a carriage provided intermediate its ends with openings or passageways, rails or runways arranged in said passageways, rollers on said carriage arranged on opposite sides of said runways, and a flexible door suspended from said carriage underneath said runways.

17. A carriage for the purpose described, comprising a frame that consists of a plurality of web plates and tie members for connecting said plates together, shafts journaled in said plates and provided with track-engaging wheels or rollers, an operating shaft journaled in said web plates, means for transmitting movement from said operating shaft to said wheel shafts, and a flexible

roller door arranged in a housing on the under side of said carriage.

18. Means for closing an opening in the wall of a building, comprising tracks arranged at an angle to said wall, a carriage mounted on said tracks and adapted to be moved toward and away from the wall, and a door on said carriage.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this twenty eighth day of February 1910.

JOHN J. LICHTER.

Witnesses:

WELLS L. CHURCH,
GEORGE BAKEWELL.