S. J. WILLNER & G. FOLEEN.

DOOR HANGER.

APPLICATION FILED JULY 28, 1914.

**1,133,080.**

**Patented Mar. 23, 1915.**

2 SHEETS—SHEET 1.

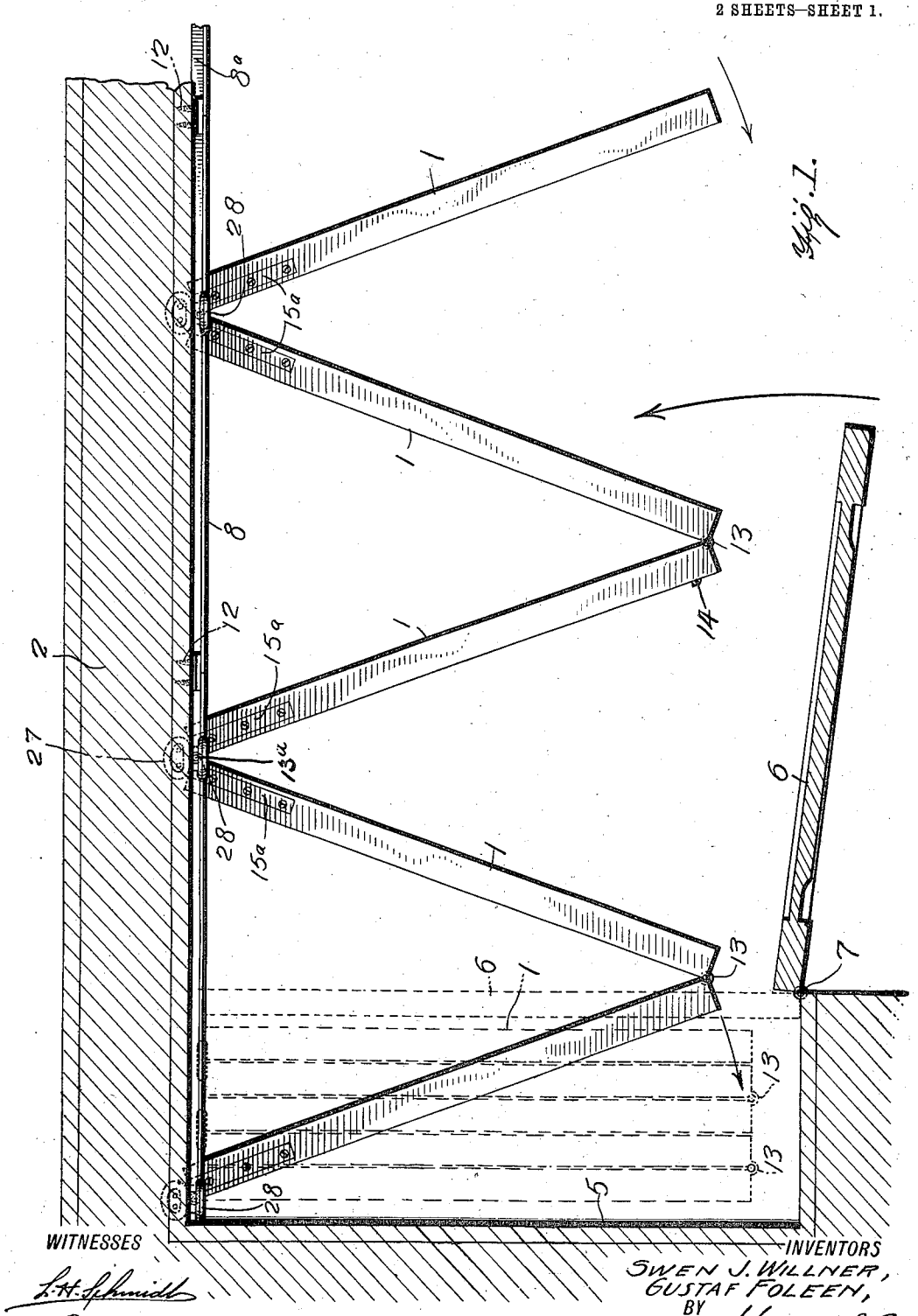



Fig. 1.

WITNESSES

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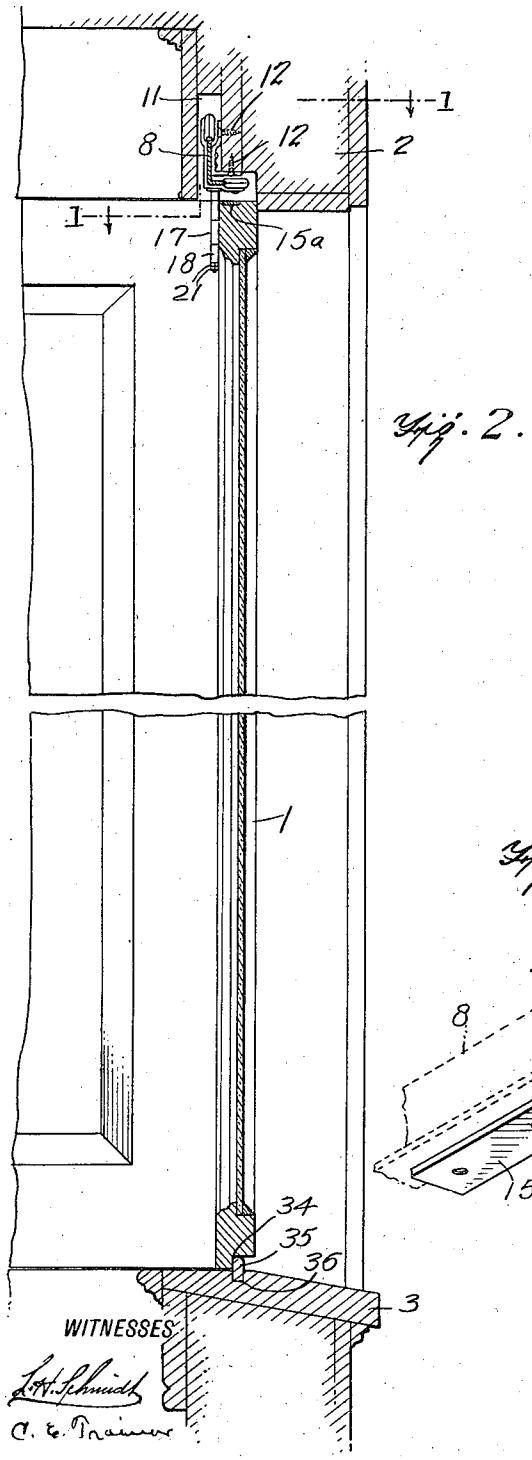



Fig. 2.

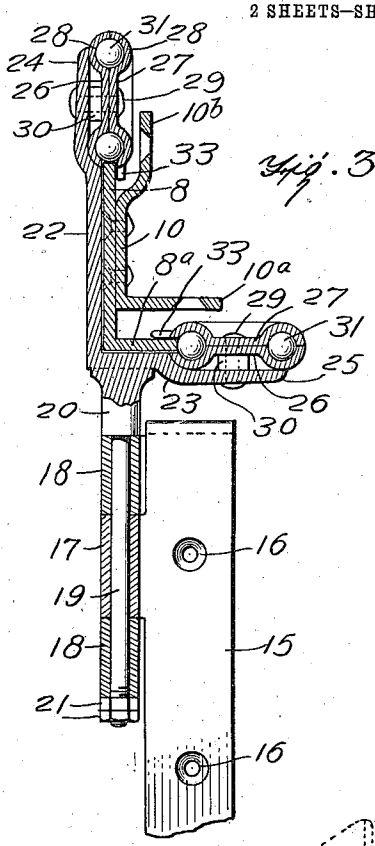



Fig. 3.

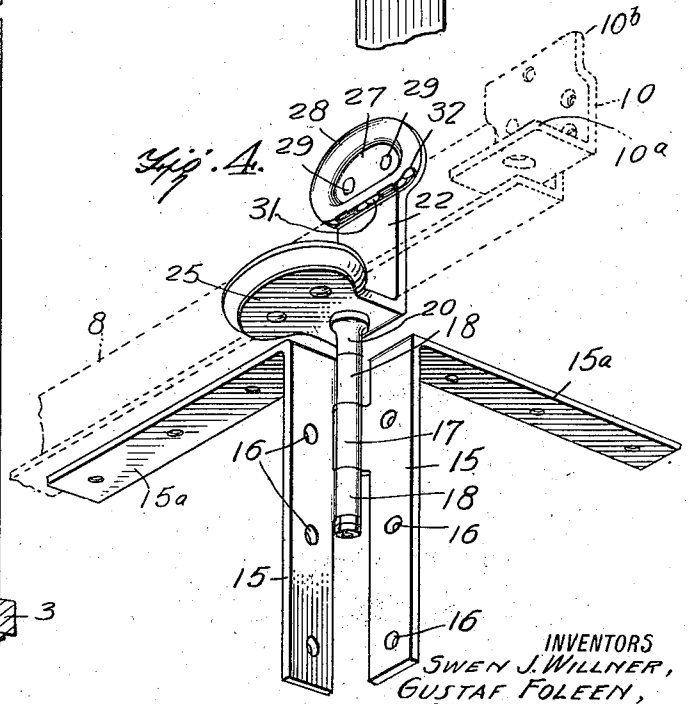



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## DOOR-HANGER.

1,133,080. Specification of Letters Patent. Patented Mar. 23, 1915.

Application filed July 28, 1914. Serial No. 853,615.

*To all whom it may concern:*

Be it known that we, SWEN J. WILLNER and GUSTAF FOLEEN, both of whom have declared their intention to become citizens of the United States, and residents of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Door-Hangers, of which the following is a specification.

Our invention is an improvement in door hangers, and has for its object to provide a hanger of the character specified, especially adapted for use with a series of doors or windows for hinging the doors and windows together and for connecting the said doors and windows to a track bar to permit the doors or windows to take a position in the same plane or in parallel planes.

In the drawings:—Figure 1 is a section on the line 1—1 of Fig. 2, looking in the direction of the arrows, Fig. 2 is a vertical section through the window with the sashes extended and in the same plane, Fig. 3 is a section through one of the hinges, and Fig. 4 is a perspective view of one of the hinges.

In the present embodiment of the invention a series of doors or windows is shown, each of the windows 1 being of the usual construction, and comprising an open substantially rectangular frame having a filling of glass or like transparent material, and the series is arranged adjacent to a window opening, having upper and lower frame members 2 and 3, and end frame members 5, but one of which is shown, and the said frame member is a receptacle, as shown in Fig. 1.

The receptacle 5 is of a width and height corresponding approximately to the width and height of the individual frames, and of a depth sufficient to receive the five window sections shown when folded into parallel planes upon each other. A door 6 is provided for closing the receptacle 5, the door being hinged to the receptacle as shown at 7 for swinging movement into open and closed position.

A track bar 8—8ª is arranged above the window opening in the frame member 2, the said track bar consisting of sections as shown, and the sections are connected and supported by brackets 10—10ª, the brackets being secured to the frame member 2 within a chamber or recess 11 provided within the frame member for receiving the track bar or rail. The track bar as shown in Fig. 3, is of angle material, comprising a vertical portion 8 and a horizontal portion 8ª integral with the portion 8 and arranged at a right angle thereto. The brackets 10—10ª are also of angle material, the portion 10 being secured to the portion 8 of the track rail by rivets or the like and the extremity of the portion 10 is offset laterally in the direction of the portion 10ª as indicated at 10ᵇ, and this portion as well as the portion 10ª is provided with openings for receiving screws 12 or the like for securing the bracket in place.

With this arrangement the track rail is supported out of contact with the surface to which it is secured and with the edges of the portions 8 and 8ª free and unobstructed. All of the window frames 1 are hinged together at their abutting side edges, and the uppermost member of each alternate pair of hinges is carried by the track bar 8—8ª. The intermediate hinges 13 are of ordinary construction, and are independent of the track rails, and adjacent to each of the hinge connections 13, one of the frames is provided with a sliding bolt 14 for engaging the portion 3 of the casing frame to hold the frames in closed position.

The alternate hinge connections are shown more particularly in Figs. 3 and 4. Each hinge consists of two leaves connected by a pintle, one of the leaves being connected to each sash frame. Each of the leaves is an angle bar, consisting of two portions 15 and 15ª, arranged at a right angle with respect to each other and each of the said portions is provided with a series of openings 16, the openings being countersunk at the remote faces of the portions.

The openings are designed to receive screws or the like for securing the leaves to the sashes, and it will be noticed that one of the portions of each leaf is secured to the inner side edge of the adjacent sash frame, while the other portion 15ª is secured to the end of the frame. Each leaf thus embraces a corner of the sash. The portion 15 of one of the leaves is provided with a single bearing 17, and the portion 15 of the other leaf is provided with a pair of spaced bearings 18, the bearings being adapted to aline with the bearing 17 for receiving a pintle.

The bearings 18 are spaced apart sufficiently to receive the bearing 17 between them, and the pintle 19 is passed through the three alined bearings as shown in Figs.

3 and 4. The pintle is connected with a sliding bracket or carriage to be presently described, and that portion of the pintle which passes through the bearings is reduced. The end of the pintle adjacent to the bracket is of approximately the same diameter as the bearings, as indicated at 20, and the opposite end of the pintle is threaded and nuts 21 are engaged with the threaded end which extends beyond the remote bearing 18 to prevent disengagement of the pintle.

The bracket or carriage before mentioned consists of integral portions 22 and 23, arranged at a right angle with respect to each other, and the pintle 19 extends from the portion 23, being integral therewith. Each of the portions 22 and 23 is provided at its outer end with an enlargement 24 and 25 respectively, the said enlargements forming leaves, and the enlargements or leaves are offset laterally away from the body of the portions 22 and 23.

A sectional housing is secured to each of the leaves 22 and 23, each housing consisting of similar sections 26 and 27. Each section of the housing is provided with a continuous groove 28 on its inner face, the grooves being at the margins of the housings and coöperating to form a ball race and the housing sections are secured together and to the adjacent leaf 24 or 25 as the case may be, by means of rivets 29.

Sleeves or washers 30 are arranged on the rivets between the sections 26 and the adjacent leaf to space the housings from the sleeves. The sleeves are of such length that the outer faces of the grooves 28 of the housing sections 26 will rest against the inner face of the leaf.

The grooves 28 of the housing sections register as before stated, to form a ball race, and a series of balls 31 is arranged within each race. Each housing has a slot or passage 32 between the sections adjacent to the track bar, for receiving the adjacent edge of the track bar, in order that the said edge may engage the balls in the adjacent ball race. A ball bearing is thus provided between each housing and the track rail or between the carriage or bracket and each edge of the track rail.

Each uppermost hinge of the connection at the alternate joints is connected to a carriage which is mounted to slide on the adjacent track rail, and it will be evident that this hinge being movable with the carriage may be brought to any desired portion of the window opening. The lowermost hinge $13^a$ at the alternate joints between the sashes is similar to the hinges 13, except that it is oppositely arranged, and may be of any ordinary or desired construction.

It will be noted from an inspection of Fig. 3 that the section 27 of each housing is provided with lugs 33, extending inwardly over the adjacent face of the adjacent portion of the track rail, to prevent displacement of the bracket with respect to the track rail. That portion of each ball race adjacent to the edge of the track rail is straight as will be noted from an inspection of Fig. 4, the arrangement being such that a number of balls will be held in a straight line and in position to simultaneously engage the adjacent edge of the track rail.

Each of the hinge connections shown in Figs. 3 and 4 is in fact a combined hinge and slide adapted for connection with a closure of any character, either a door or a window. Each of the combined hinges and slides is composed of the hinge leaves, the pintle, and the carriage which carries the pintle.

In operation, the sash frames 1 may be arranged over the window opening, and closing the same, the respective frames being in the same plane, or the said frames may be arranged as shown in Fig. 1, wherein the alternate frames are inclined in the opposite direction to the intermediate frames. If desired, all of the sash frames may be folded as indicated in dotted lines in Fig. 1 and run within the receptacle 5, and when the door 6 is closed, the sash frames are concealed and the window opening is free and unobstructed from end to end.

It will be noted from an inspection of Fig. 2 that the lower ends of the sash frames are rabbeted on their under faces as indicated at 34, and a strip 35 is arranged in a groove 36 in the upper face of the sill of the frame, the said strip engaging in front of the sash frames at the rabbeted portions to prevent outward movement of the frames. The frames are supported by the track rail, and the strip 35 limits the outward movement of the lower ends of the frame with respect to the casing. It will be obvious that any number of sashes may be connected in this manner to provide for covering window openings of any desired width. The hinges 13 are arranged in the opposite manner to the hinges 15—$15^a$ and $13^a$. That is, the hinges 13 are arranged to permit the sash frames to swing in one direction, while the hinges 15—$15^a$ and $13^a$ are arranged to permit the sash frames to swing in the opposite direction.

We claim:—

1. A combined hinge and slide connection, comprising a hinge having a pintle, a carriage to which said pintle is connected, the hinge comprising sections at right angles to each other, said section having offset portions on their inner faces, housings fitting partially within the offset portions and having continuous ball races and balls in the races.

2. A fixture, comprising a carriage having portions arranged at an angle to each other and provided with ball races lying in planes at approximately a right angle to each other, and a hinge connected with said carriage.

3. A combined hinge and slide for connection with a track bar of angular material, and comprising a carriage having portions adapted to fit against the outer edges of the track bar, one of the portions being provided with a pintle and hinge leaves having registering bearings for engagement by the pintle, a sectional housing connected with each portion of the carriage, each housing having a continuous ball race, a portion of which is adjacent to the adjacent edge of the track bar, balls in the race, each housing having an opening or passage for receiving the said edge of the track bar to permit the said edge to engage the balls in the race.

4. A combined hinge and slide for connection with a track bar of angular material, and comprising a carriage having portions adapted to fit against the outer edges of the track bar, a hinge in connection with one of the portions of the carriage, a sectional housing connected with each portion of the carriage, each housing having a continuous ball race, a portion of which is adjacent to the adjacent edge of the track bar, balls in the race, each housing having an opening or passage for receiving the said edge of the track bar to permit the said edge to engage the balls in the race.

5. A combined hinge and slide for connection with a track bar of angular material, and comprising a carriage having portions adapted to fit against the outer edges of the track bar, a hinge in connection with one of the portions and a ball bearing carried by each portion and having a passage for receiving the adjacent edge of the track bar to permit the said edge to engage the balls of the race.

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Witnesses:
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