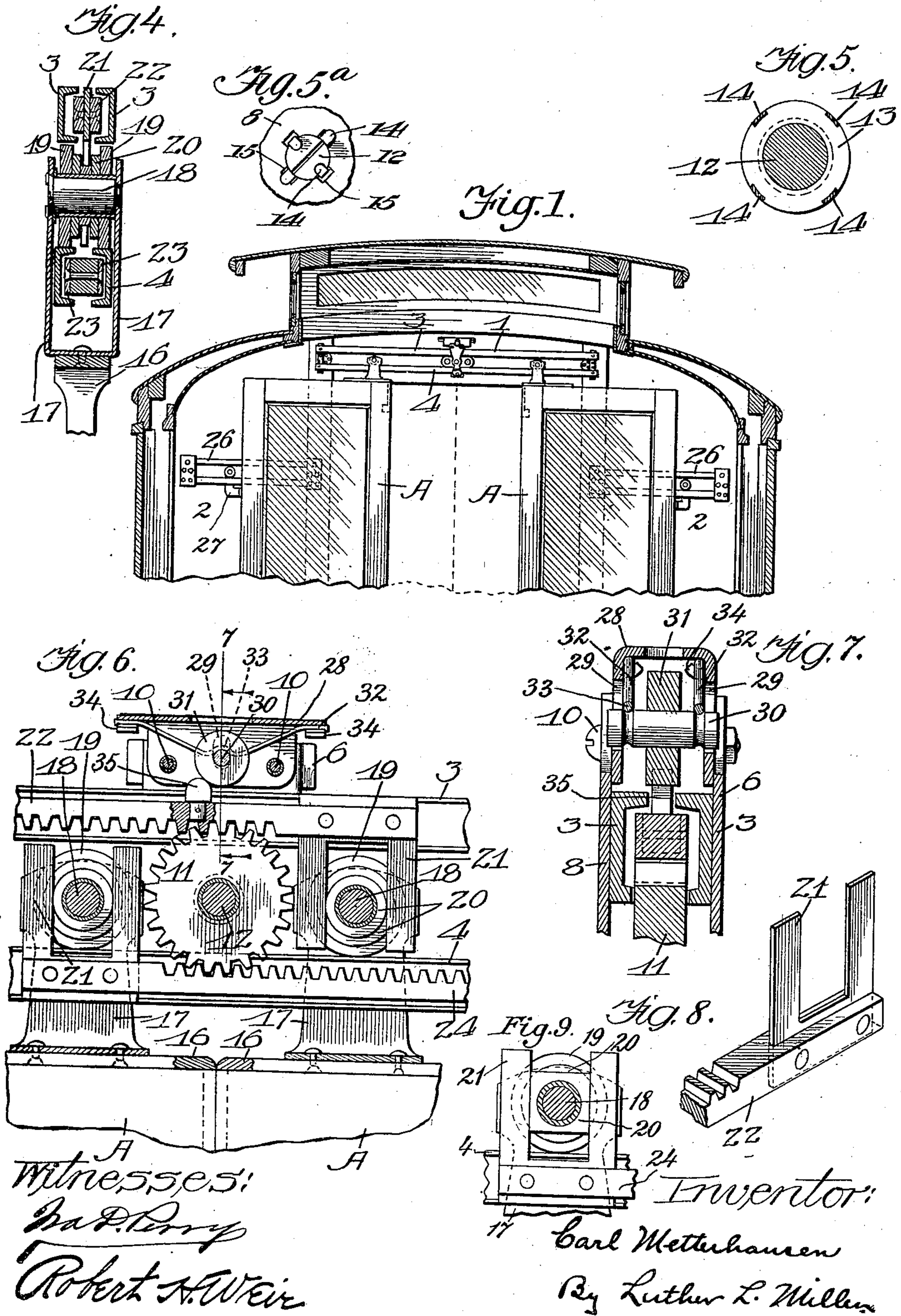


No. 886,531.

C. METTERHAUSEN. PATENTED MAY 5, 1908.
SLIDING DOOR FIXTURE.
APPLICATION FILED OCT. 24, 1907.

2 SHEETS—SHEET 1.

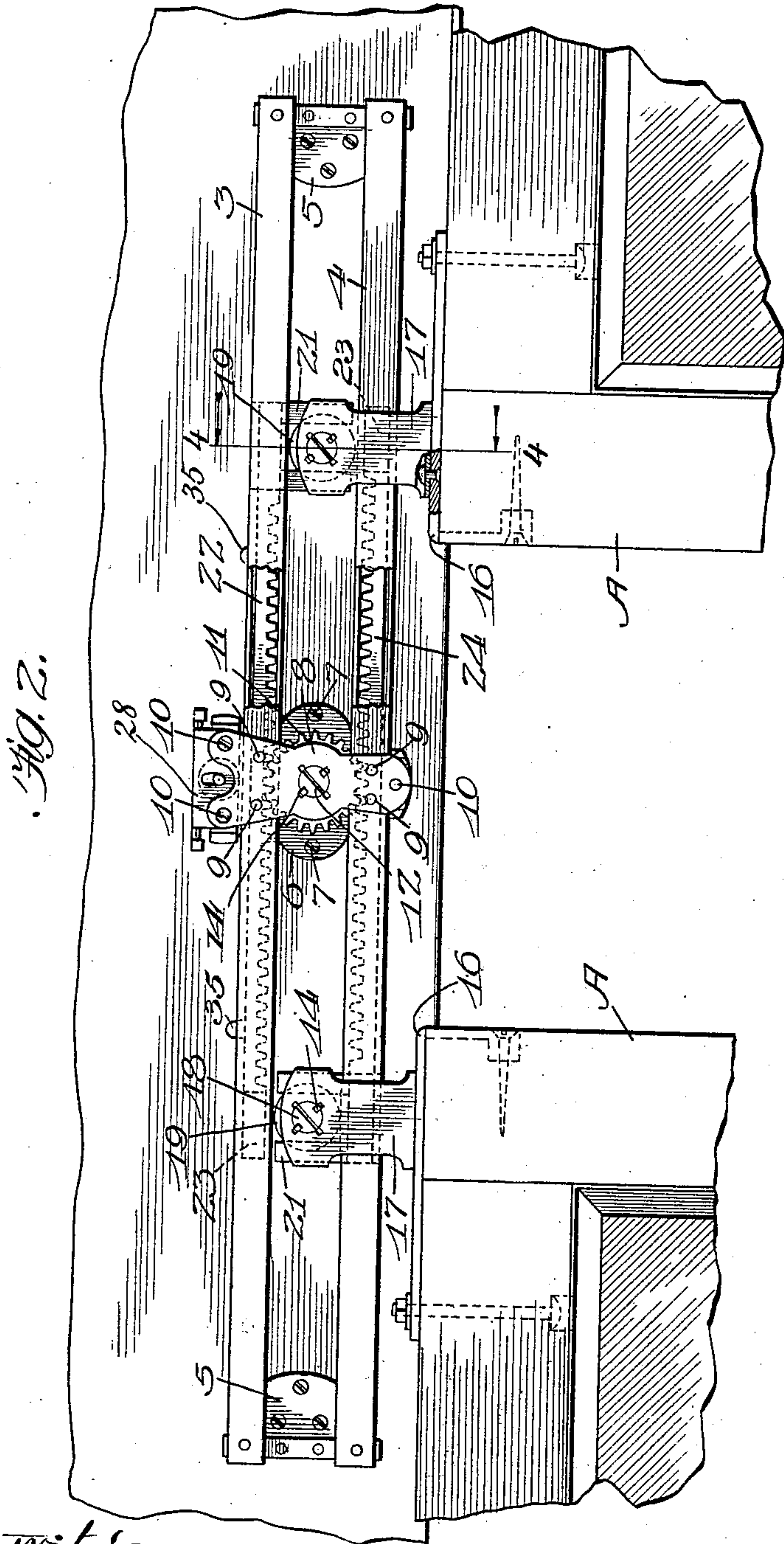


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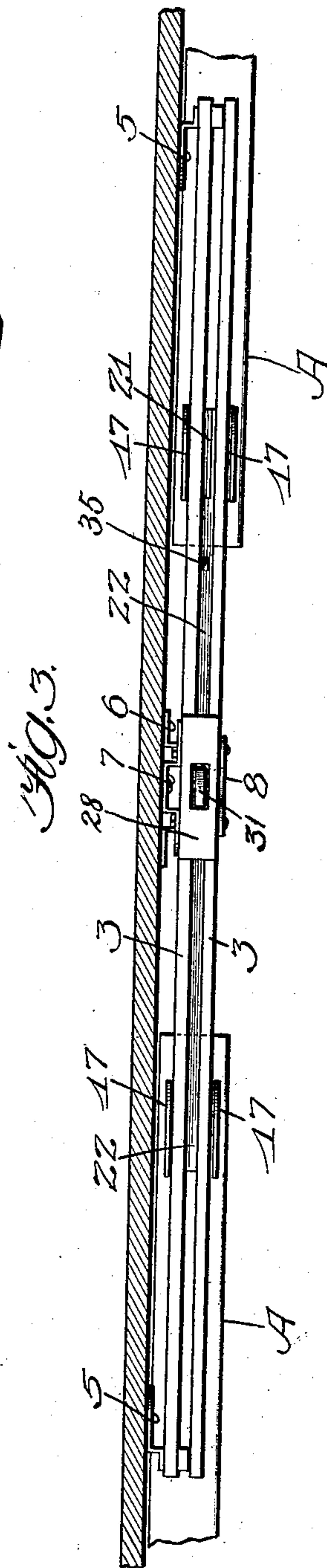
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2 SHEETS—SHEET 2.



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CARL METTERHAUSEN, OF CHICAGO, ILLINOIS.

SLIDING-DOOR FIXTURE.

No. 886,531.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed October 24, 1907. Serial No. 398,876.

To all whom it may concern:

Be it known that I, CARL METTERHAUSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sliding-Door Fixtures, of which the following is a specification.

This invention relates to means for movably supporting sliding doors, and refers especially to double doors connected together so that the movement of one will cause a movement of the other.

One of the objects of the invention is the provision of an improved connection between each door and its operating rack bar, adapted to permit the door to be raised or tilted slightly independently of said rack bar, whereby binding of said bar is prevented.

A further object is to provide means for locking the doors in a predetermined position.

A further object is the provision of means for preventing accidental rotation of the journal screws employed in the mechanism. The invention also relates to the other improvements in sliding door mechanisms hereinafter set forth.

In the accompanying drawings, Figure 1 illustrates a double door fixture embodying my invention and in operative relation to two sliding car doors within a car body. Fig. 2 is a side elevation of said fixture partly in section and drawn to a larger scale than in Fig. 1. Fig. 3 is a top plan view of the fixture. Fig. 4 is a sectional view on dotted line 4 4 of Fig. 2. Figs. 5 and 5^a illustrate a means for preventing rotation of the journal screws. Fig. 6 is a sectional view illustrating the gear connection between the two doors and the means for locking the doors in the closed position. Fig. 7 is a section on dotted line 7 7 of Fig. 6. Fig. 8 is a perspective view of the connection between each of the racks and the door moved thereby. Fig. 9 is a detail view of one form of connection between the door and its actuating rack bar.

By reference to Fig. 1 it will be seen that each of the two doors A is supported at its inner and outer edges, said doors being suspended from their inner upper corners from a central hanger or fixture 1, and supported at their rear edges by back hangers 2. The central hanger or fixture comprises an upper and a lower track, each being preferably made tubular to contain a rack bar as will

appear hereinafter. I have herein shown each of said tracks as formed of two channel irons 3 3 and 4 4 (Fig. 4) disposed with their flanged faces toward each other. Said channel bars are secured together and to the car structure in any suitable way, as, for example, as illustrated generally herein and shown more fully in Patent No. 847,488, issued to me March 19, 1907, said securing and supporting means comprising brackets 5. In the center of the track structure just described is a back plate 6 secured to the car frame by means of screws 7. The rear channel bars 3, 4 are secured to said back plate in any suitable way. A front plate 8 (Fig. 2) is secured to the forward channel bars 3, 4 by means of rivets 9 and to the back plate 6 by the screws 10. Said plates serve to secure the central portion of the track structure to the car frame and provide means of support for a gear wheel 11. Said gear wheel is rotatably mounted upon a journal screw 12 (Fig. 6) engaging the plates 6 and 8. The screw 12 is held from turning by means of a ring 13 (Fig. 5) lying just behind the front plate 8 and having upon its periphery in this instance, four lugs 14. Said lugs are bent to extend through four openings 15 (Fig. 5^a) in the front plate 8, two of said lugs being bent to lie upon the head of said screw and the other two being bent over against the face of the front plate.

A bracket 16 is rigidly secured in any suitable way to the inner upper corner of each of the doors A. Said bracket comprises two upwardly extending side members 17 in which is supported a journal screw 18 held against rotation by means (Figs. 2 and 4) similar to that employed for preventing rotation of the screw 12. Upon said screw are rotatably mounted two rollers 19 adapted to travel upon the upper edges of the lower channel bars 4 4 and the lower edges of the upper channel bars 3 3. Between said rollers are three washers 20, the middle one being of less diameter than the other two. While the middle washer is shown in Fig. 6 as round, it may be made square, as illustrated in Fig. 9 the latter form being perhaps preferable.

Referring to the parts attached to the right hand door: A yoke 21 is rigidly fixed by its closed end to one end of a rack bar 22, said yoke bestriding the middle washer 20, and the upper closed end of said yoke extending into the space between the upper flanges

of the channel bars 3 3 (Figs. 2, 4 and 6). The rack bar 22 is slidably mounted in the space between the two upper channel bars 3 3 and meshes with the gear wheel 11. The rack bar 22 is preferably held centrally of its guiding means by means of a plate 23 riveted or otherwise secured to each side of the free end of the rack bar, as shown in Figs. 2 and 4.

The yoke connection just described, between the rack bar and the door bracket, permits the door to be raised or tilted slightly without causing an upward movement of the rack bar or causing said rack bar to bind in the tubular track in which it is supported.

The left hand door is similarly provided with a yoke 21, a rack bar 24 meshing with the gear wheel 11, and supporting means 23 for supporting the free end of said rack bar.

Referring now to the back hanger or fixture 2: Said fixture comprises a track structure 26 secured to the car frame and a hanger 27 carrying a roller or rollers arranged to run on said track structure.

In order to lock the doors A in the closed position I provide the means to be next described. Referring to Figs. 6 and 7, 28 is a housing secured to the back plate 6 and the front plate 8 by means of the screws 10. In the opposite side walls of said housing are formed two vertically elongated openings 29 receiving the ends of a shaft 30. Upon said shaft is mounted a roller 31 which is yieldingly held with its shaft 30 lying in the lower ends of the openings 29 by means of two springs 32. Each of the springs 32 has a seat 33 therein for the shaft 30, the ends of said springs being slidably mounted in clips 34 upon the ends of the housing 28. A stud 35 having a rounded upper end is rigidly fixed in the rack 22 in such a position as to be forced under the roller 31 as the doors A come together, as shown in Fig. 6, the roller 31 preferably bearing against said stud when the doors are thus closed. The doors being geared together as already described, the stud 35 and the roller 31 yieldingly lock both of the doors A against opening movement. If desired, the doors A may be yieldingly held in the open position by means of a stud 35 fixed in the rack 22 at a suitable point to be forced under the roller 31 when the doors reach their outermost position.

In operation the movement of one door is transmitted to the other through the rack bars 22 and 24 and the gear wheel 11. The doors are releasably locked in the closed position by means of the stud 35 and the spring-pressed roller 31. The connection herein described between each door and its operating rack bar prevents binding of said rack bar in its guideway should the door be raised or tilted.

I claim as my invention:

1. In a sliding door mechanism, in combination, a bracket adapted for attachment

to a door; a roller carried by said bracket; a track for said roller; a rack bar; a yoke fixed to said rack bar and bestriding a part carried by said bracket, said yoke permitting vertical movement of said bracket with relation to said yoke; and guiding means for said rack bar.

2. In a sliding door mechanism, in combination, a bracket adapted for attachment to a door; a shaft carried by said bracket; a roller on said shaft; a track for said roller; a rack bar; a yoke fixed to said rack bar and bestriding said shaft, said yoke permitting vertical movement of said bracket with relation to said yoke; and guiding means for said rack bar.

3. In a sliding door mechanism, in combination, a bracket adapted for attachment to a door; a shaft carried by said bracket; two rollers mounted on said shaft; a track for said rollers; washers on said shaft between said rollers; a rack bar; a yoke fixed to said rack bar and bestriding one of said washers; and guiding means for said rack bars.

4. In a sliding door mechanism, in combination, a bracket adapted for attachment to a door; a shaft carried by said bracket; two rollers mounted on said shaft; a track for said rollers; three washers on said shaft between said rollers; a rack bar; and a yoke attached to said rack bar and bestriding the middle washer, said middle washer being smaller than the other washers.

5. In a sliding door mechanism, in combination, a bracket adapted for attachment to a door; a shaft carried by said bracket; two rollers mounted on said shaft; a track for said rollers; three washers on said shaft between said rollers, the middle washer having two parallel sides; a rack bar; and a yoke attached to said rack bar and bestriding said middle washer.

6. The combination, with a rotatable member, of a fixed member having two openings therein; a ring surrounding said rotatable member; a lug on said ring extending through one of said openings and overlying one end of said rotatable member; and a lug on said ring extending through the other of said openings and overlying said fixed member.

7. The combination, with a screw, of a fixed member having two openings therein; a ring surrounding said screw, and lying at one side of said member; a lug on said ring extending through one of said openings and overlying one end of said screw; and a lug on said ring extending through the other of said openings and overlying said fixed member.

8. In a double-door mechanism, in combination, a rack bar arranged to move with each door; a gear connection between said rack bars; a locking member carried by one of said rack bars; and a non-traveling lock-

ing member arranged to engage the first mentioned locking member for locking the doors in a predetermined position.

9. In a double-door mechanism, in combination, a rack bar arranged to move with each door; a gear connection between said rack bars; a stud carried by one of said rack bars; and a non-traveling spring-pressed locking member arranged to yield to permit said stud to pass it.

10. The combination, with a movable member, of a stud carried by said member; a stationary housing having a roller rotatably and slidably mounted therein; said stud being arranged to pass under said roller; and a spring, the middle portion of which acts upon said roller, and the end portions of which are slidably mounted in said housing.

11. The combination, with a movable

member, of a stud carried by said member; a stationary housing having two elongated openings therein; a shaft rotatably and movably mounted in said openings; a roller on said shaft under which said stud is arranged to pass; and two springs each engaging one end of said shaft.

12. In a sliding door mechanism, in combination, a member arranged to be connected and move with a door; a rack bar; and a yoke fixed to said rack bar and bestriding said member, said yoke permitting vertical movement of the door with relation to said yoke.

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Witnesses:

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