Oct. 22, 1929. L. W. LOWTHER 1,732,902

CONTROLLING MECHANISM FOR REVOLVING DOORS

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Fig. 1.

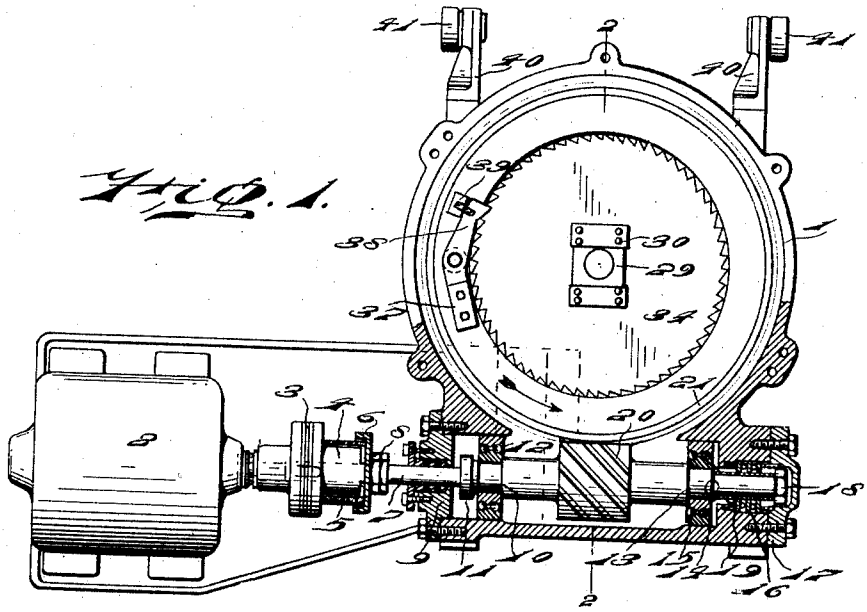
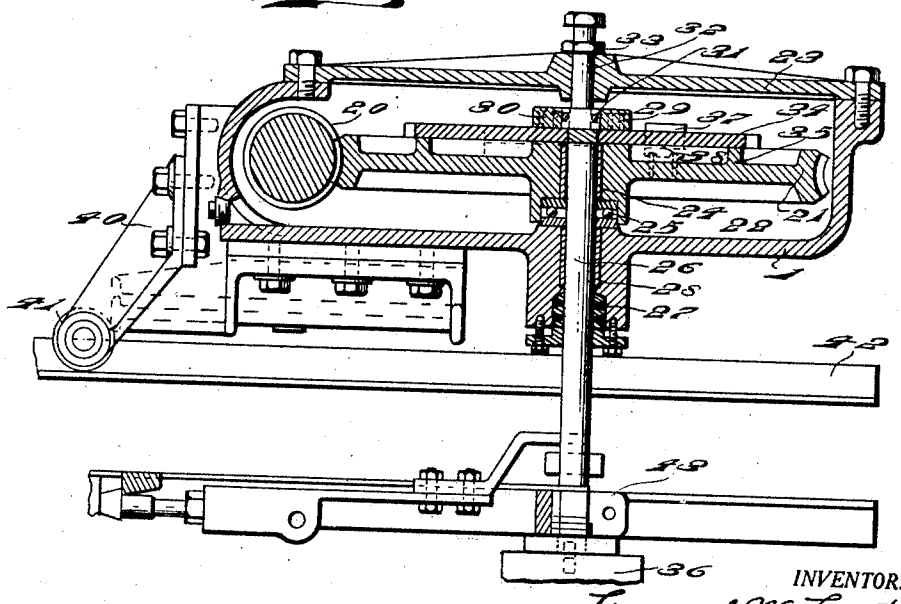


Fig. 2.



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CONTROLLING MECHANISM FOR REVOLVING DOORS

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The object of this invention is to devise novel controlling mechanism for revolving doors which will prevent the door being revolved at a speed greater than a desired number of revolutions per minute, and to permit the door to freely revolve at any speed less than the predetermined number of revolutions per minute.

In devices of this character, as heretofore constructed, there is a liability of persons passing through the door opening becoming injured due to a person in back of them revolving the door at such speed that they are caught between the door and the door frame, or are struck by one of the wings of the door as they are passing through, and there have been numerous cases where people have been injured due to the door being revolved at too high a speed.

With the above and other objects in view, as will more clearly hereinafter appear, my invention comprehends novel controlling mechanism for revolving doors.

It further comprehends novel controlling mechanism for revolving doors wherein the door is free to be revolved by a person or persons passing therethrough, at any speed below a set standard of revolutions per minute, and as soon as the set standard of speed is reached, the door is prevented from revolving at a higher speed than such standard.

It further comprehends a novel controlling mechanism for revolving doors wherein a member is driven at a continuous and constant speed, and is adapted to interlock with means carried by the door as soon as the speed of revolutions of the door equals that of the driven member, so that the door cannot be revolved at a greater speed than the set standard of speed of the driven member.

Other novel features of construction and advantage will hereinafter clearly appear in the detailed description and the appended claims.

For the purpose of illustrating the invention, I have shown in the accompanying drawing a typical embodiment of it, which, in practice, will give reliable and satisfactory results. It is, however, to be understood that this embodiment is typical only and that the various instrumentalities of which my invention consists can be variously arranged and organized, and that the invention is not, therefore, limited to the precise arrangement and organization of these instrumentalities as herein set forth.

Figure 1 is a sectional plan view of controlling mechanism for the doors embodying my invention.

Figure 2 is a section on line 2—2 of figure 1.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings:—

1 designates a housing within which is adapted to be contained a controlling mechanism for revolving doors embodying my invention. The housing has mounted in it a driving motor 2 which is preferably an electric motor. The shaft of the motor 2 is connected by means of a flexible coupling 3 with a driven motor 4 one member of the coupling is loosely mounted on the motor shaft and carries a spring 5 which serves as the driving connection between the flexible coupling 3 and a transmitting disc 6, fixed in any desired manner to a worm shaft 7, and abutting against one of the nuts 8 which are in threaded engagement with the worm shaft 7, and one of which serves as a lock nut. The free end of the motor shaft is guided in the worm shaft 7, which is recessed at its end to receive it.

The worm shaft 7 passes through a stuffing box 8 in an end closure 9, secured to the housing in any desired manner. The worm shaft 7 is provided with a shoulder 10 between which and an adjustable set collar 11 is interposed an anti-friction bearing 12. The worm shaft 7 is also provided with a shoulder 13 between which and an abutment 14, is disposed an anti-friction device 15.

The free end of the worm shaft 7 is provided with a thrust bearing 16 which is disposed between a shoulder on the housing and an end cap 17, secured to the housing in any desired manner. The free end of the worm shaft 7 is provided with a nut 18 between which and the abutment 14 is disposed a spacing sleeve 19.

The worm shaft 7 is provided with a worm 20 which meshes with a worm gear 21, see more particularly Figure 2, which is located in a chamber 22 in the housing 1, the top of the housing being closed by means of a removable cover 23 which is adapted to receive lubricating material.

The worm gear 21 is loosely mounted on a sleeve 24 and is provided with a hub having an anti-friction bearing 25. The sleeve 24 is carried by a shaft 26 journalled in the housing and passing through a stuffing box 27.

The anti-friction bearing 25 has bearing against it a sleeve 28, the lower end of which abuts against the shoulder on the hub of the housing 1. The worm gear 21 has secured to its upper face, a cap washer 29 by means of fastening devices 30, and this cap washer carries an anti-friction bearing 31 which engages the guide rod 32 which passes through the removable cover 23. The guide rod 32 is seated in a recess in the upper end of the shaft 26 and is provided with a lock nut 33 which bears against the removable cover 23.

The fastening devices 30 pass through a ratchet 34 which is freely rotatable on the hub of the worm gear 21 and on an annular rib 35 arising from said gear. This ratchet wheel 34 is fixed to the shaft 26 in any desired manner so that it will revolve in unison therewith and also in unison with the revolving door 36 to which it is operatively connected in any desired manner.

The worm gear 21 has fixed to its upper face a bracket 37 which pivotally carries a pawl 38, and a spring 39 is carried by the bracket and presses against the free end of the pawl to cause it to normally be retained in the path of the teeth of the ratchet 34. The worm gear 21 revolves in the direction of the arrow, seen in Figure 1.

In order to facilitate the placing of the housing in proper position with respect to the door, it may be provided with brackets 40 which carry rollers 41, adapted to travel on the tracks 42 in the form of angles and supported in any desired manner above the door.

The shaft 26 is keyed or otherwise fixed to the ratchet 34, and at its lower end it is connected with an extension of the door 36 by means of a clamp 43 of any desired character.

The operation of my novel controlling mechanism for revolving doors will now be apparent to those skilled in this art and is as follows:—

It will be apparent that the driving motor 2 is operatively connected with the worm gear 21, so that, during the continuous running of the motor 2, the gear 21 will be driven at a desired speed, depending upon the ratio between the gearing.

It is desirable in a device of this character to run it at such a speed that people can rapidly pass through the door, and in practice a speed of eleven revolutions per minute has been found to be satisfactory, it, of course, being understood that any predetermined or set standard of speed may be provided.

Assuming now that the door is revolving, it will be apparent that as the worm gear 21 revolves, the pawl 38 carried by it will slide over the teeth of the ratchet 34 without causing the door to revolve. If however, a person passing through the door opening causes the door to revolve at a speed greater than that of the number of revolutions per minute of the worm gear 21, then the pawl 38 engaging a ratchet tooth of the ratchet 34 will prevent the door from revolving at a speed greater than that of the worm gear 21 and the pawl 38 which it carries.

It will be apparent that the revolving door can be revolved at any speed less than the speed of revolution of the worm gear 21. If a person tries to revolve the door at a greater speed than the speed of the driven member, the reaction is taken up on the gearing and the motor.

In accordance with my present invention, the speed of revolution of the revolving door can be accurately controlled to meet conditions and requirements met with in practice, and the danger of anyone being injured in passing through the door, due to the door revolving at too high a speed, is overcome.

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

1. The combination with a revolving door, of a continuously driven member, and means cooperating with said door and member to prevent the door revolving at a speed greater than that of said driven member.

2. The combination with a revolving door, of a motor driven detent, and means operatively connected with said door adapted to permit the revolution of said door at a speed less than that of said detent and to cooperate with said detent to prevent the door revolving at a speed greater than that of said motor driven detent.

3. The combination with a revolving door, of cooperating pawl and ratchet members controlling the speed of revolution of said door to prevent its revolving faster than a predetermined speed, one of said members being connected with said door to move in unison therewith, and means to drive the other of said members at said predetermined speed.

4. Speed controlling mechanism for re-

volving doors, comprising a ratchet operatively connected with the door to revolve with it, a worm gear, a spring pressed pawl carried by said worm gear and in the path of said ratchet, and a motor operatively connected with said worm gear to drive it at a desired speed said pawl cooperating with said ratchet to prevent the revolving of said door at a speed greater than said desired speed.

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