

L. C. NORTON.
 DOOR CHECK.
 APPLICATION FILED JUNE 21, 1915.

1,152,339.

Patented Aug. 31, 1915.

Fig. 1.

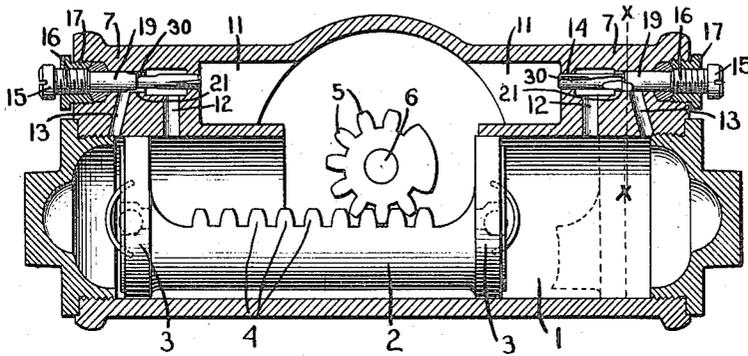


Fig. 2.

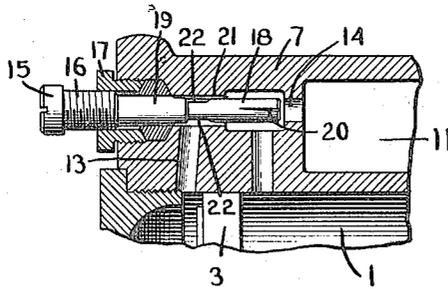


Fig. 3.

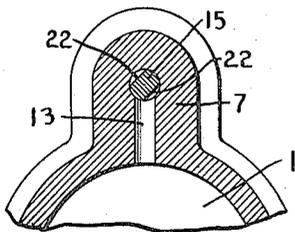
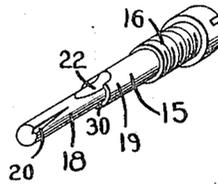


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DOOR-CHECK.

1,152,339.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEWIS C. NORTON, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented an Improvement in Door-Checks, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to door checks of that type having means for controlling the movement of the door at the latch or at the termination of the closing movement, which is capable of adjustment separately from the means for controlling the door throughout the greater portion of its closing movement, and the object of the invention is to provide a novel regulating device by which the initial and final closing movements of the door can be regulated and which is so constructed that when the regulating device is adjusted it will first effect an adjustment or regulation of the closing movement of the door and will subsequently effect regulation of the final movement of the door at the latch. The advantage of this construction is that the adjustment of the regulating device for securing the proper movement of the door at the latch will automatically effect the adjustment for the main closing movement of the door, and, therefore, when a door check is installed in position the manipulation of the regulating device to secure the proper closing movement of the door at the latch will automatically effect proper regulation of the door throughout the greater part of its closing movement.

In order to give an understanding of my invention I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

In the drawings Figure 1 is a horizontal sectional view through a liquid door check embodying my invention; Fig. 2 is a fragmentary sectional view showing the position of the regulating screw before any adjustment is made; Fig. 3 is an enlarged section

on the line $x-x$, Fig. 1; Fig. 4 is a perspective view of the regulating screw.

In the drawings 1 indicates the cylinder of a liquid door check within which operates a piston element 2 herein shown as provided at each end with a piston head 3. This piston element is provided with rack-teeth 4 which mesh with a pinion 5 on the shaft 6 that is actuated by the usual spring mechanism of a liquid door check. Each of the piston heads 3 is shown as provided with a check valve mechanism adapted to open in one direction as usual in devices of this sort. Inasmuch, however, as my invention does not relate either to the piston element of the door check or to the spring mechanism for operating it to close the door, I have not deemed it necessary to further illustrate these features.

The wall of the cylinder 1 is provided with the portion 7 in which is formed the usual by-pass 11 through which the liquid is transferred from in front of the piston element to the rear thereof during the movement of the latter, and this by-pass is provided with two ports 12 and 13 that open into the cylinder at different points. The piston element 2 will be at the left-hand end of its stroke, as shown in full lines Fig. 1, when the door is fully opened, and during the first part of the closing movement while the piston is moving from the full to the dotted line position, the speed of the door will be controlled by the speed with which the fluid can be transferred through the by-pass 11 at the right-hand end of the piston in Fig. 1. After the head 3 of the piston element passes the port 12, then the speed of the closing movement will be determined by the speed at which the fluid can be transferred through the port 13 to the back side of the piston either through the port 12 or the by-pass. I have herein shown a construction wherein the by-pass 11 and ports 12 and 13 are provided at each end of the cylinder, and each piston head is provided with valves so that the movement of the piston element in both directions will be checked or controlled, but it will be obvious that the in-

vention might be embodied in a construction in which the controlling means was situated at one end of the cylinder only.

15 15 designates a regulating screw by which the size of the by-pass duct 11 as well as the size of the port 13 can be controlled. This screw 15 is provided with the screw-threaded portion 16 which screws into a bushing 17 that is secured in the end of the cylinder 3, and said regulating screw is provided with the portion 18 that coöperates with the necked portion 14 of the by-pass duct 11 to control the size of the by-pass duct, and it is also provided with the portion 19 by which the size of the port 13 is controlled. The portion 18 of the regulating screw is of a size to substantially fill the necked portion 14 of the by-pass duct, and said screw is shown as provided with a tapering groove or slot 20 in the portion 18 which determines the effective size of the by-pass duct. The portion 19 of the regulating screw is somewhat larger than the portion 18 and operates in a cylindrical bore 21 formed in the cylinder wall. This portion 19 is preferably flattened on opposite sides, as at 22. The screw 15 is so constructed that the portion 18 controlling the by-pass duct has such a relation to the portion 19 controlling the port 13 that when the regulating screw is advanced from its retracted position shown in Fig. 2, the end 18 will enter the necked portion 14 of the by-pass duct before the portion 19 becomes operative to effect or regulate in any way the size of the duct 13 so that when the screw has been sufficiently advanced to begin an effective regulation of the duct 13 the portion 18 has entered the necked portion of the by-pass duct sufficiently to effect the desired regulation thereof. The reason for this construction is to make it certain the person setting up the door check shall secure a proper regulation of the size of the by-pass duct 11 by the time that the size of the port 13 is properly regulated.

In installing a door check it is customary for the person doing the work to adjust the regulating screw to secure the desired movement of the door at the latch without regard to whether the door has the proper speed of movement during the greater part of its closing. In other words, the party makes an adjustment of the regulating screw and then tests the adjustment by partially opening the door and then releasing it and noting how the door moves just as it latches or closes. If the door slams at the latch the regulating screw is given a further forward adjustment, while if movement of the door is too slow at the latch the regulating screw is backed off somewhat.

In the device herein shown the movement of the door at the latch is controlled by the

position of the portion 19 of the regulating screw 15 for controlling the size of the port 13, while the speed of movement of the door during the first part of its closing movement is determined by the size of the by-pass duct 11, as determined by the portion 18 of the regulating screw.

Since the groove 20 is a tapering groove, it will be evident that the speed at which the door moves during the first part of its closing movement will depend upon the extent to which the regulating screw is entered into the necked portion 14, and by the time that the end of the screw has entered said portion 14 sufficiently to check the door, the part 19 has been advanced into a position to effect the checking movement at the latch.

By making the screw with the two flattened portions 22, it is possible to secure a regulation of the checking movement of the door at the latch by a partial turn of the screw 15 and without making any appreciable change in the regulation of the speed of the door throughout the greater portion of its closing movement, for a partial turn of the screw will bring one or the other of the flattened portions 22 more or less into alinement with the port 13. If the regulating screw is adjusted so that the flattened portions 22 are entirely out of alinement with the port 13, then the effective size of the port 13 will be determined by the position of the shoulder 30 at the end of the portion 19. By giving the screw a partial turn one of the flattened portions 22 will be brought more or less into alinement with the port 13 thereby correspondingly enlarging said port 13. Such partial turn does not materially change the size of the opening through the necked portion 14.

The construction herein shown also provides means whereby the speed of the closing movement of the door through the main extent of its movement can be regulated independently from the movement at the latch. This can be done by adjusting the screw 15 until the speed throughout the greater extent of the closing movement is properly regulated or gaged by the V-groove 20, and when this result has been secured the proper speed at the latch can be obtained by giving the screw 15 a partial turn so that the flattened portion 22 will provide the correct opening for the port 13.

While I have illustrated herein a selected embodiment of my invention I do not wish to be limited to the constructional features shown.

I claim:

In a door check, the combination with a cylinder having a by-pass duct provided with two ports leading to the cylinder chamber near one end thereof, of a single regulating screw having screw-threaded engage-

ment with said cylinder and having a portion cooperating with one of said ports to control the size thereof and another portion cooperating with the by-pass duct to
5 determine the size thereof beyond both ports, said latter portion having such relation to the first-named portion and to said port

that when the screw is advanced such latter portion will effect the desired regulation of the by-pass duct before the former portion 10 effects the desired adjustment of said port.

In testimony whereof, I have signed my name to this specification.

LEWIS C. NORTON.