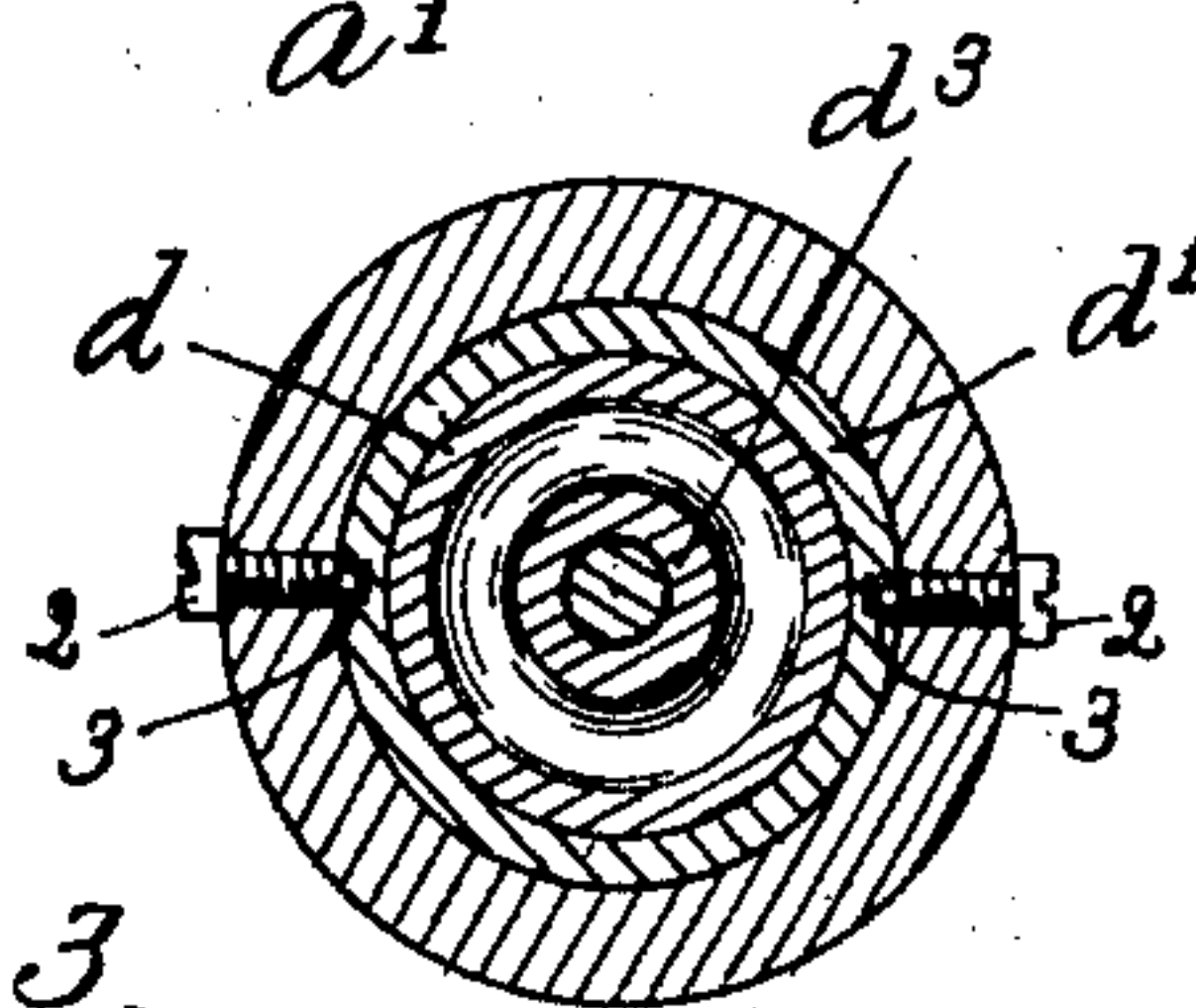
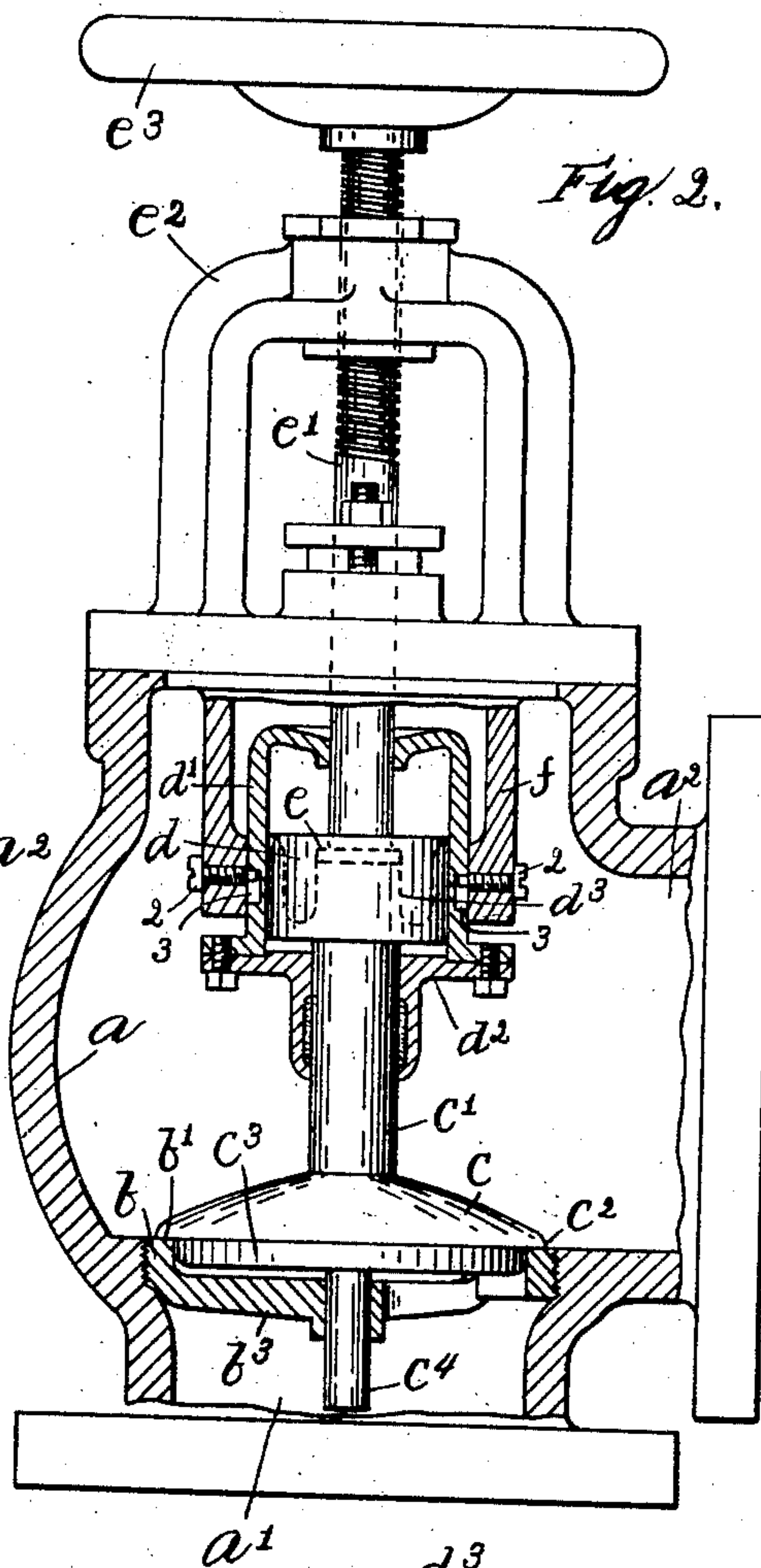
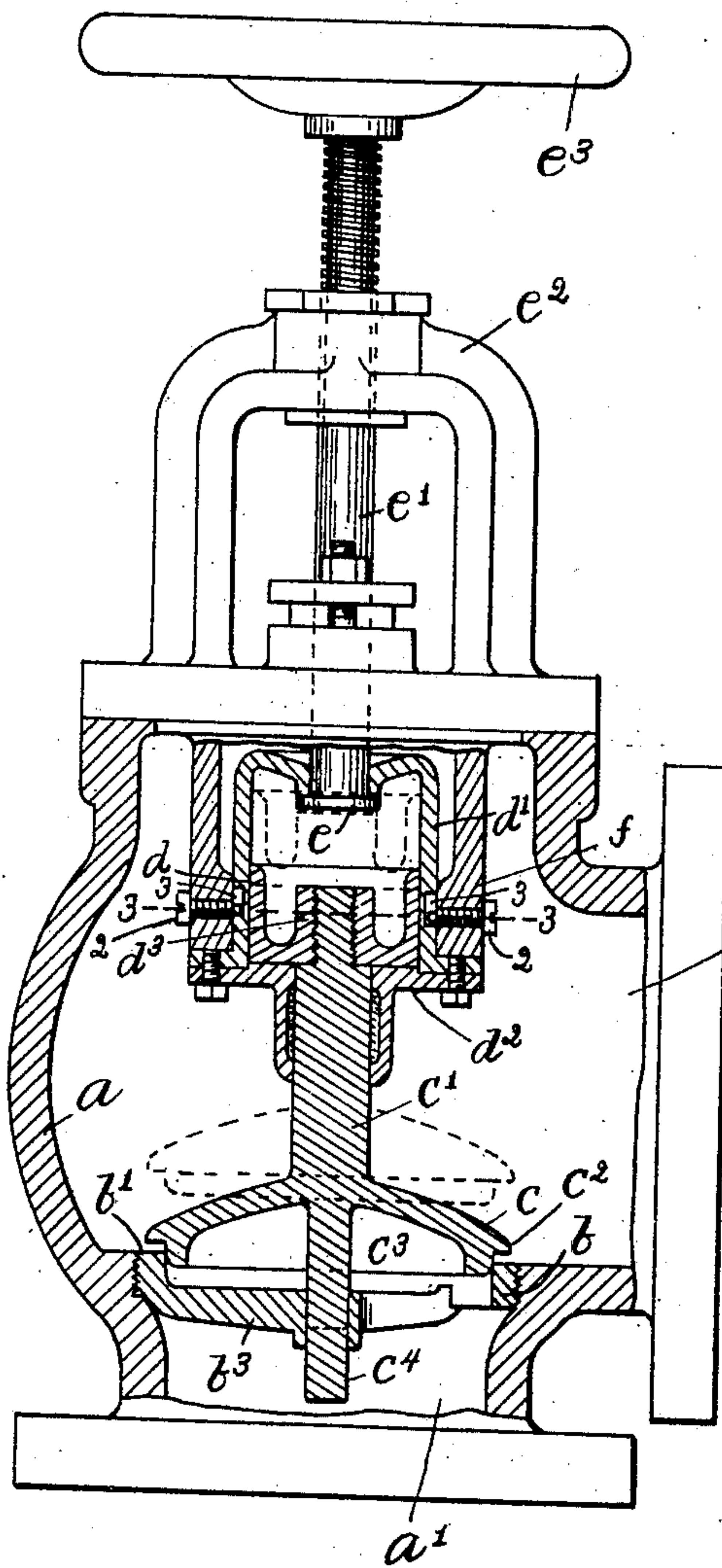


No. 839,862.

PATENTED JAN. 1, 1907.

N. C. LOCKE.
CHECK VALVE.

APPLICATION FILED OCT. 30, 1905.



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NATHANIEL C. LOCKE, OF SALEM, MASSACHUSETTS.

CHECK-VALVE.

No. 839,862.

Specification of Letters Patent.

Patented Jan. 1, 1907.

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To all whom it may concern:

Be it known that I, NATHANIEL C. LOCKE, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Check-Valves, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to valves, and particularly to that type known as "return-stop check-valves," which are designed to be used upon the outlet of each boiler of a battery to prevent a return-current of steam from entering a disabled boiler, which may be losing steam by reason of a break or other cause. In practice it has been found that for this purpose the ordinary check-valve chatters on its seat when in use and soon becomes useless, and for this reason it has been necessary to provide a stop to prevent the valve from entirely closing on its seat, and while such provision prevented chattering it permitted a considerable flow of steam, which rendered the valve comparatively useless.

My invention has for its object to provide a check-valve with a steam shut-off which operates to shut off the steam as the valve approaches its seat and to entirely shut off the steam before said valve engages its seat, and, furthermore, to provide a stop for limiting the moving of the valve-plate in a direction toward its seat to prevent it from engaging its seat, yet permitting the steam shut-off to operate and close the fluid-passage, and, furthermore, to provide a controlling device for the valve-plate by means of which its movements toward and from its seat are regulated or retarded, and, furthermore, to provide means for positively closing the valve-plate on its seat whenever desired—as, for instance, when necessary to make a hydrostatic test.

Figure 1 shows in vertical section a return-stop check-valve embodying this invention, the valve-plate being represented in position to shut off the steam, yet free to be lifted by pressure from beneath. Fig. 2 is a similar vertical section of the return-stop check-valve, the valve-plate being positively closed on its seat. Fig. 3 is a sectional detail taken on the dotted line 3 3, Fig. 1.

a represents the valve-case, which as herein shown is of globular form, although it may be of any other desirable form. The valve-case has an inlet a' and an outlet a'' .

c represents the valve-plate, which is made independently movable or self-operating, and

said plate is formed integral with or attached to a stem c' . The valve-plate is herein shown as a circular disk having a circumferential flange c^2 , which is adapted to engage the valve-seat, and also having an annular projection c^3 , which extends downward from its under side.

b represents a ring which is screwed into the valve-case at the inlet a' , and the top of said ring is flat or otherwise formed to serve as a seat b' for the flange c^2 of the valve-plate, and the inner side of said ring is formed to receive the annular projection c^3 on the valve-plate. The annular projection c^3 so closely fits the ring as to shut off the steam when projected therein, and said annular projection is made long enough to enter the ring and effectively shut off the steam before the flange c^2 engages its seat b' . Hence the annular projection and ring serve as a shut-off when the valve is used as a check-valve, as it will be under ordinary conditions.

The ring b is supported by or supports a spider b^3 , having a central hole through it which receives a short stem c^4 , projecting downward from the valve-plate to thereby assist in guiding the valve-plate in its movements.

The valve-stem c' is connected to a controlling device by which the movements of the valve-plate toward and from its seat or in a direction to open or close the fluid-passage are regulated or retarded to thereby obviate any sudden movement of said plate in either direction. Said controlling device consists of a piston d , contained in a cylinder d' . One of the elements of said controlling device is movable and the other stationary, and, as herein shown, the cylinder d' is stationarily supported, and the piston is movable relative thereto. The movable element—as, for instance, the piston—is formed integral with or attached to the valve-stem c' ; but I do not desire to limit my invention to which element of the controlling device shall be stationarily supported. Incidentally, in the construction of my valve there are advantages for having the cylinder stationarily supported and the piston movable.

The cylinder d' has secured to its lower end a head d^2 , which is formed or provided with a hole for the valve-stem c' . The head d^2 serves as a stop for the piston, which latter is constructed and arranged to abut against it when in its lowermost position, and said head is so disposed relative to the valve-seat and

the parts so proportioned that when abutting it the valve-plate will be held with its annular projection extended into the ring *b*, so as to shut off the steam, and its flange *c*² will be held free from engagement with the seat *b*'. Therefore said head serves as a stop for the valve-plate to limit its movement toward the seat and normally prevent it from engaging its seat.

The upper end of the cylinder *d*' is supported upon the flanged end *e* of a stem *e*', which passes up through the valve-case and has a screw-threaded portion which passes through a nut in the bonnet *e*² and has at its upper end a hand-wheel *e*³, by which it may be turned. The cylinder is normally held by the flanged stem in fixed position—as, for instance, with its lower flanged end abutting against the part *f* of the case—and in the normal use of the valve as a check-valve the cylinder is thus stationarily supported. The cylinder, however, has a limited movement in a direction toward and from the valve-plate, so that it can be lowered sufficiently to enable the valve-plate to be moved into engagement with its seat *b*', and such movement of the cylinder is accomplished by turning the hand-wheel, and thereby permitting it to fall by gravity or to be moved positively by means as will be hereinafter described. Screws 2 pass through the wall of the part *f* of the case, which enter vertical slots or recesses 3, formed in the side wall of the cylinder, said slots or recesses affording a limited vertical movement of said cylinder. When the hand-wheel is turned in the proper direction, the cylinder is permitted to fall by gravity or will be pushed out until the screws bear against the upper ends of the slots or recesses in the cylinder.

The flanged end of the stem *e*' is adapted to engage the piston and force the piston and valve-plate connected therewith hard upon its seat *b*', and, as herein shown, said piston is formed with a central boss *d*³, having a flat top which is adapted to be engaged by the flanged end of the stem *e*'. When the piston is thus engaged and forced downward, the cylinder will be moved positively if for any reason it should not fall by gravity. Hence the valve-plate can be moved into engagement with its seat whenever desired by turning the hand-wheel—as, for instance, if it should be desired to make a hydrostatic test or for any other purpose.

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

1. In a check-valve, the combination of a valve-case having a fluid-passage and a surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a stop for preventing said valve-plate from engaging its seat yet permitting the an-

nular projection thereon to close the fluid-passage, and means for moving said stop permitting the valve-plate to engage its seat, substantially as described.

2. In a check-valve, the combination of a valve-case having a fluid-passage and a surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a stop for preventing said valve-plate from engaging its seat yet permitting the annular projection thereon to close the fluid-passage, and means for moving said stop and for moving said plate into engagement with its seat, substantially as described.

3. In a check-valve, the combination of a valve-case having a fluid-passage and a surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, means for retarding the movement of said valve-plate, a stop for preventing said valve-plate from engaging its seat yet permitting the annular projection thereon to close the fluid-passage, and means for moving said stop permitting the valve-plate to engage its seat, substantially as described.

4. In a check-valve, the combination of a valve-case having a fluid-passage and a surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a cylinder and piston movable one with relation to the other, the movable member being connected with said valve-plate, a stop for preventing said valve-plate from engaging its seat yet permitting the annular projection thereon to close the fluid-passage, and means for moving said stop permitting the valve-plate to engage its seat, substantially as described.

5. In a check-valve, the combination of a valve-case having a fluid-passage and surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a piston connected with said valve-plate, a cylinder containing it having a stop for the piston which prevents the valve-plate from engaging its seat yet permits the annular projection thereon to close the fluid-passage, and means for moving said cylinder permitting the valve-plate to engage its seat, substantially as described.

6. In a check-valve, the combination of a valve-case having a fluid-passage and surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a piston connected with said valve-plate, a cylinder containing it having a stop for the piston which prevents the valve-plate from engaging its seat yet permits the annular projection thereon to close the fluid-passage, and means for moving said cylinder

and piston to cause the valve-plate to engage its seat, substantially as described.

7. In a check-valve, the combination of a valve-plate having an annular projection on its under side, a ring adapted to receive said projection having a seat for said plate, a stop for preventing said valve-plate from engaging its seat yet permitting the annular projection thereon to enter the ring and close the fluid-passage, and means for moving said stop permitting said plate to engage its seat, substantially as described.

8. In a check-valve, the combination of a movable valve-plate having a circumferential flange and also having an annular projection on its under side, a ring adapted to receive said annular projection having a seat for said flange, a stem bearing said plate, a stop which prevents the flange of the plate from engaging its seat yet permits the annular projection to enter the ring and close the fluid-passage, and means for moving said stop permitting said flange to engage its seat, substantially as described.

9. In a check-valve, the combination of a movable valve-plate having a circumferential flange and also having an annular projection on its under side, a ring adapted to receive said annular projection having a seat for said flange, a stem bearing said plate, a stop which prevents the flange of the plate from engaging its seat yet permits the annular projection to enter the ring and close the fluid-passage, and means for moving said stop and for also moving said plate to cause its flange to engage its seat, substantially as described.

10. In a check-valve, a movable valve-plate having a circumferential flange and also having an annular projection on its under side, a ring adapted to receive said annular projection having a seat for said flange, a stem bearing said plate, a controlling device for said plate which is adapted to regulate its movement, a stop for limiting the move-

ment of said plate which prevents the flange thereon from engaging its seat, yet permits the annular projection thereon to enter the ring and close the fluid-passage, and means for moving said stop permitting the valve-plate to engage its seat, substantially as described.

11. In a check-valve, the combination of a valve-case having a fluid-passage and surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a piston connected with said valve-plate, a cylinder containing it having a stop for the piston which prevents the valve-plate from engaging its seat yet permits the annular projection thereon to close the fluid-passage, a threaded stem bearing a hand-wheel and having a flanged end supporting said cylinder, movement of which permits the cylinder to fall and the valve-plate to engage its seat, substantially as described.

12. In a check-valve, the combination of a valve-case having a fluid-passage and a surrounding valve-seat, a valve-plate adapted to engage said seat having an annular projection adapted to enter and close said fluid-passage, a piston connected with said valve-plate, a cylinder containing it having a stop for the piston, which prevents the valve-plate from engaging its seat yet permits the annular projection thereon to close the fluid-passage, a threaded stem bearing a hand-wheel and having a flanged end supporting said cylinder which is adapted to be moved into engagement with the piston to force the valve-plate into engagement with its seat, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NATHANIEL C. LOCKE.

Witnesses:

B. J. NOYES,
H. B. DAVIS.