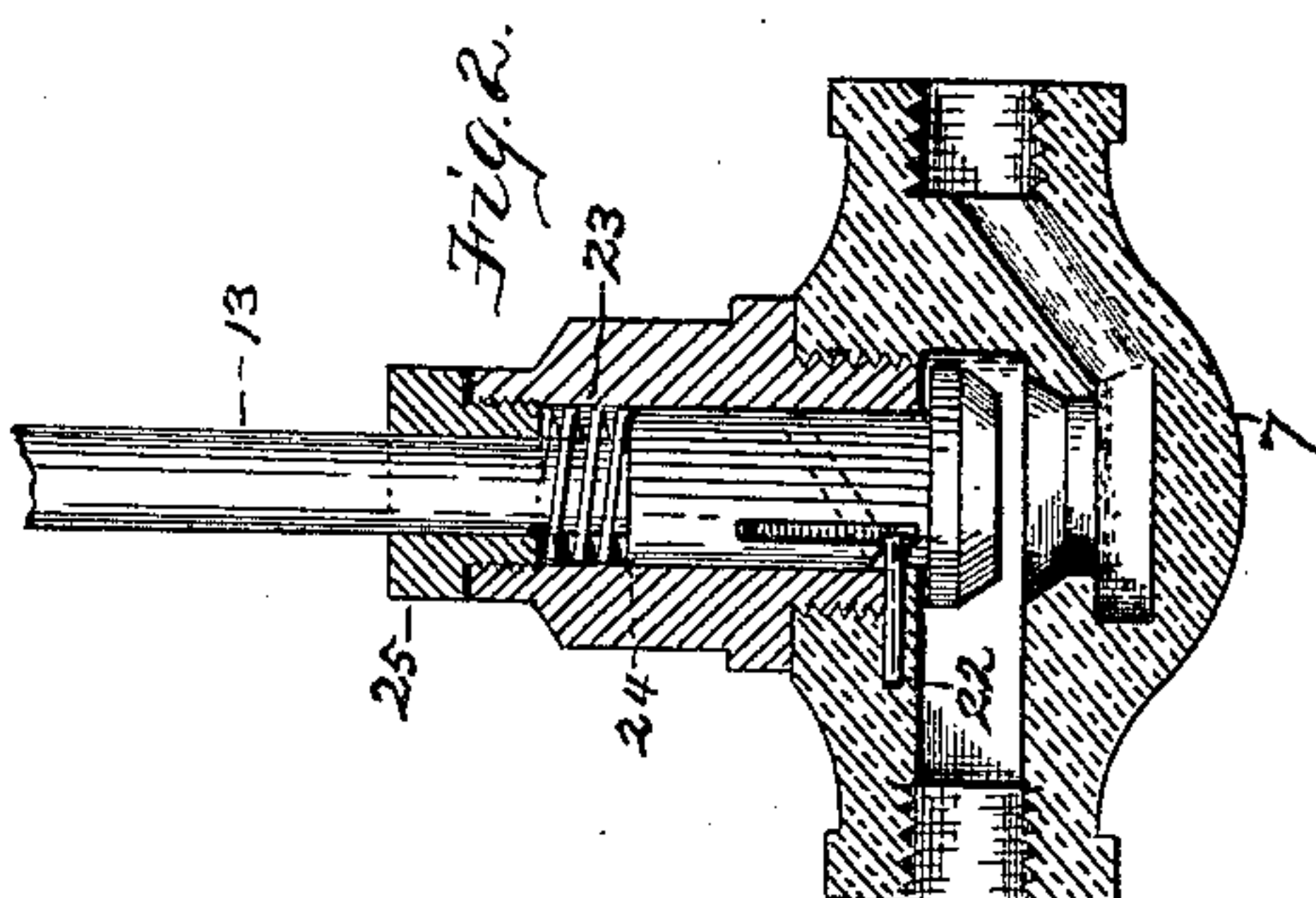
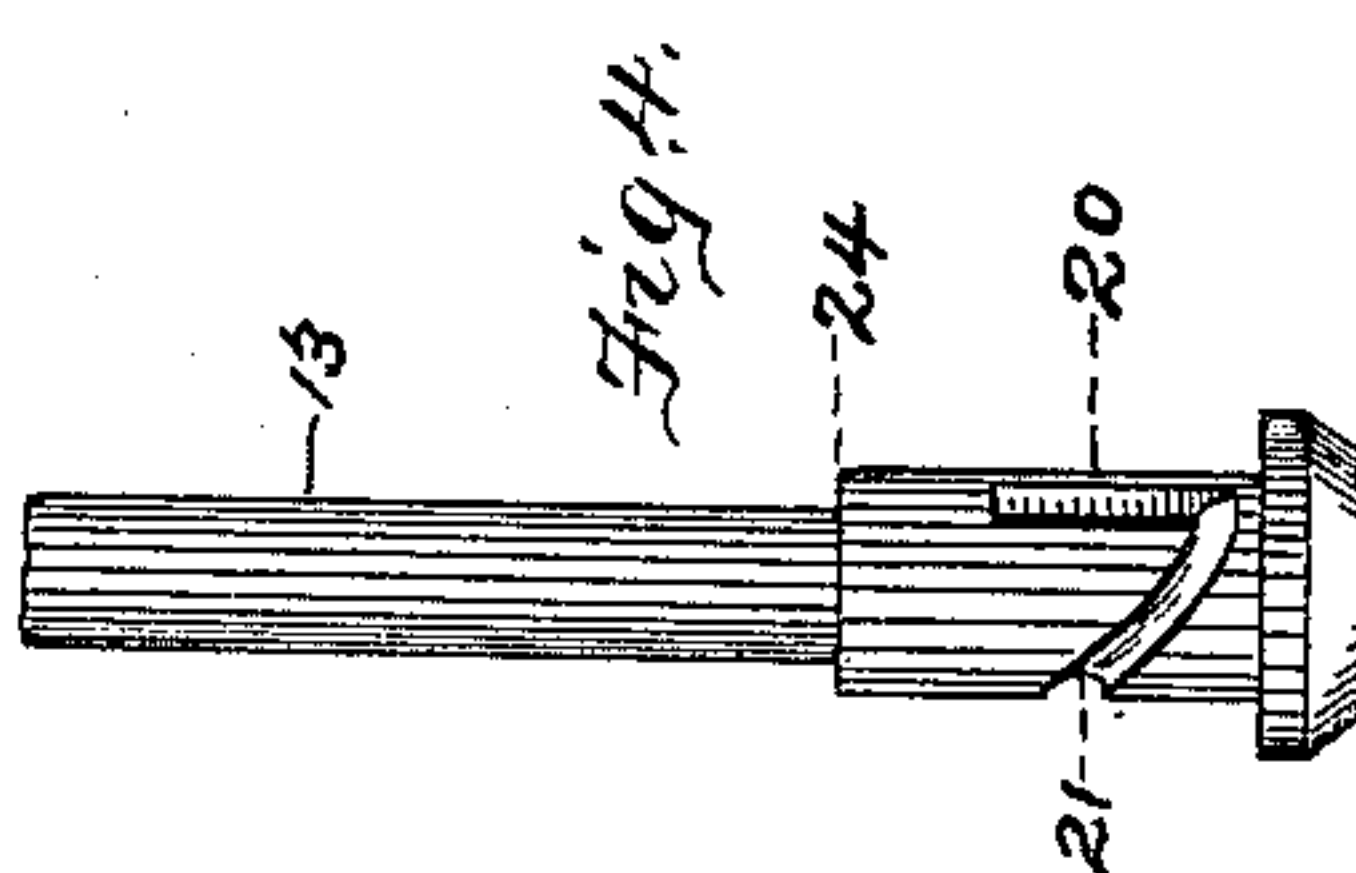
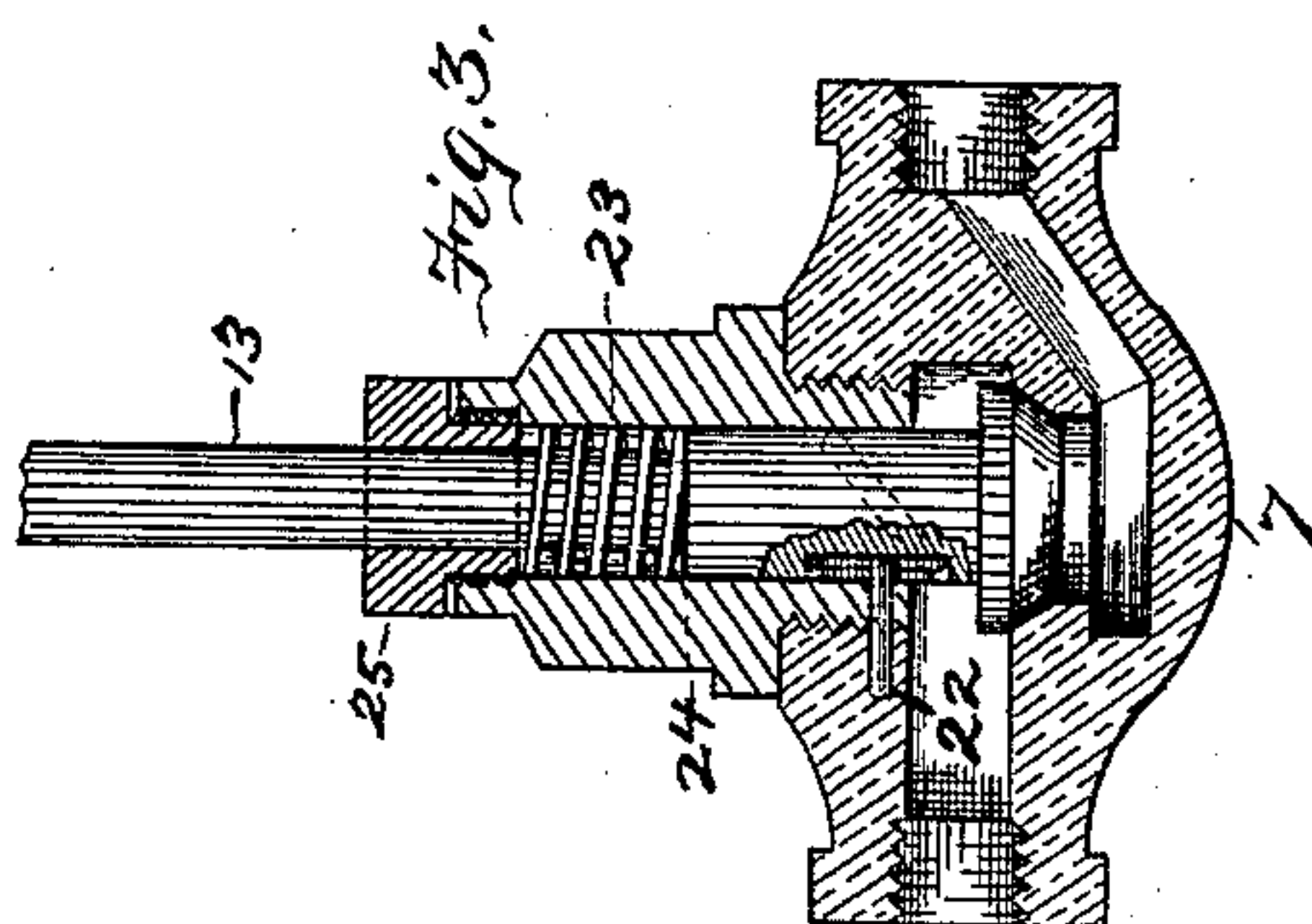
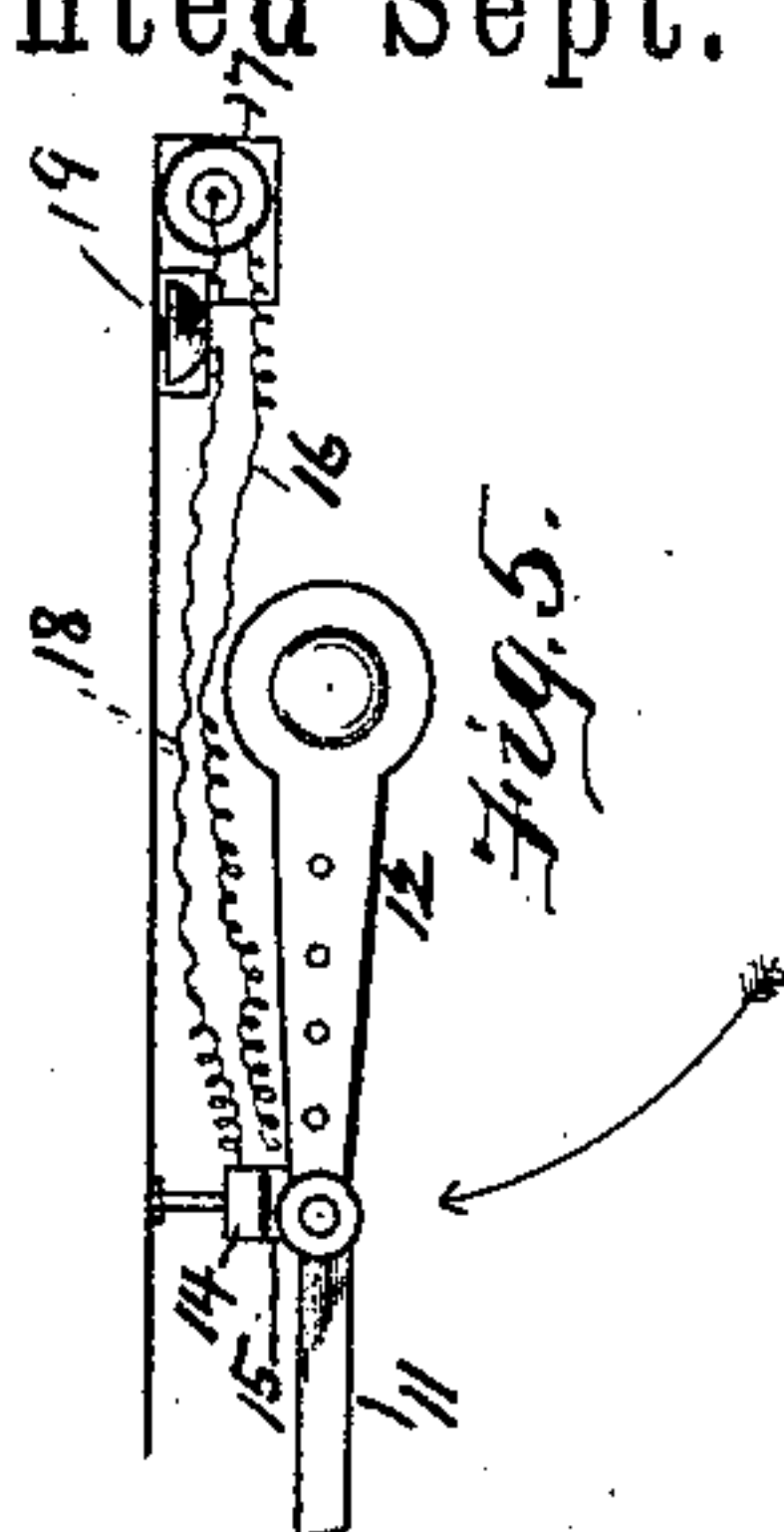
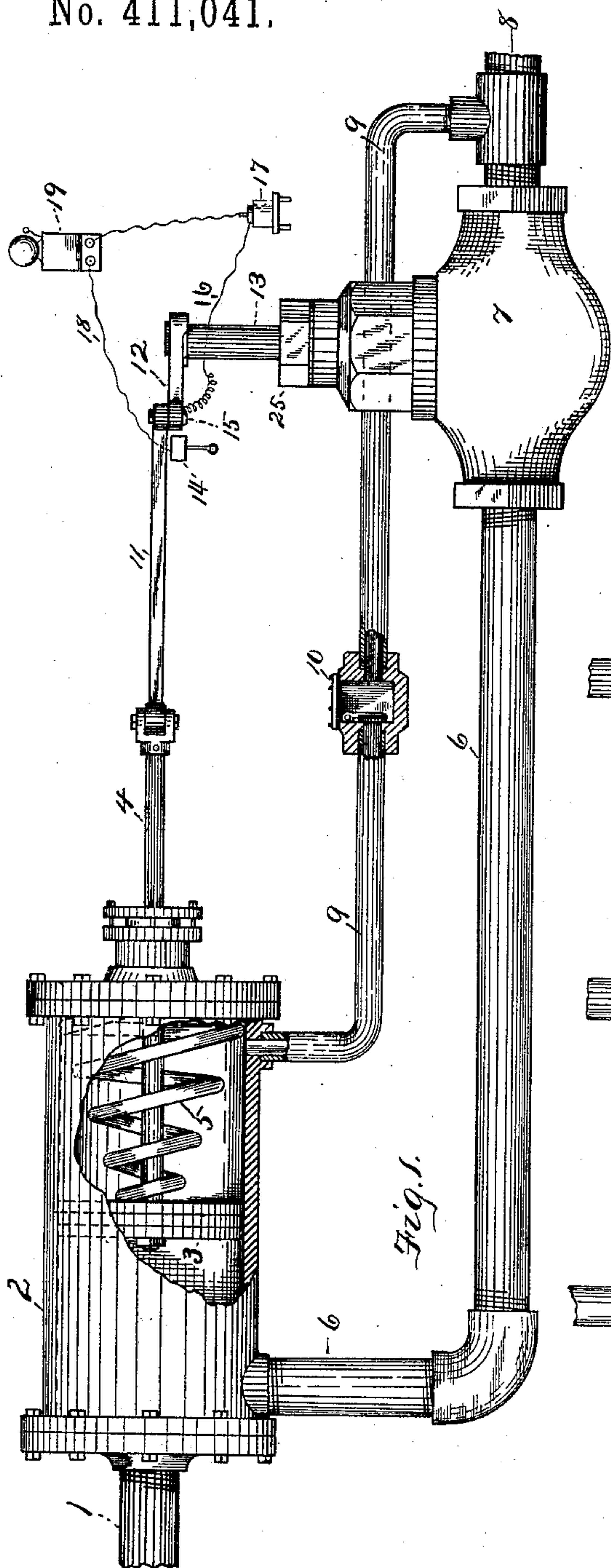


(No Model.)

O. S. KING & H. H. SWANEY.
REGULATOR AND CUT-OFF.

No. 411,041.

Patented Sept. 17, 1889.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ORLANDO S. KING AND HOMER H. SWANEY, OF McKEESPORT,
PENNSYLVANIA.

REGULATOR AND CUT-OFF.

SPECIFICATION forming part of Letters Patent No. 411,041, dated September 17, 1889.

Application filed March 15, 1889. Serial No. 303,457. (No model.)

To all whom it may concern:

Be it known that we, ORLANDO S. KING and HOMER H. SWANEY, citizens of the United States, and residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Regulators and Cut-Offs, of which the following is a specification.

10 The purposes of our invention are to devise an automatic regulator for gas, steam, and water pressure, or similar gases or liquids; also, in combination with the regulator, an automatic cut-off; also, an automatic alarm to
15 indicate when the pressure is entirely removed.

In the accompanying drawings, which form part of this specification, Figure 1 is a side elevation, partly broken away, of the entire
20 device. Fig. 2 is a longitudinal central section of the valve with the stem raised. Fig. 3 is a corresponding view, partly broken away, of the valve when seated. Fig. 4 is a perspective of the valve-stem, and Fig. 5 a
25 top view of the short crank and showing bell-connection.

The regulator and cut-off is made as follows:

In Fig. 1, 1 is the high-pressure pipe by which the gas or fluid is admitted to the cylinder 2,
30 in which moves the piston 3 on the piston-rod 4.

5 is a coiled spring of fixed strength secured at one end to the rear of the cylinder and at the other to the piston.

6 6 is a high-pressure main running from
35 the cylinder 2 to a valve 7.

8 is a low-pressure pipe or main.

9 9 is a leakage-pipe running from the extreme rear of the cylinder 2 to the low-pressure pipe or main 8, and is provided with a
40 check-valve 10, of ordinary construction, opening toward the low-pressure side or to the right in the drawings.

11 is a connecting-rod, and 12 a short crank moving the valve-stem 13.

45 14 is an electrical contact to touch under given conditions a contact-point 15 on the short crank 12.

16 is the connection to the battery 17 from the contact-point 15, and 18 the connection
50 from the contact-point 14 to the bell 19. These latter details are shown more clearly in Fig. 5.

The valve-stem 13, as best shown in Fig. 4, has a short longitudinal slot 20 at its lower end and a spiral groove 21 starting from the lower end of the slot 20 and extending about
55 half-way around the stem. In the slot 20 and the groove 21 a pin 22, set in the shell of the valve 7, slides. A loose spring 23 is compressed between the shoulder 24 on the valve-stem 13 and the gland 25.

The operation of the regulator and cut-off will now be apparent. The pressure of the liquid, gas, or vapor entering by the pipe 1 will pass down the pipe 6 to the valve 7. Simultaneously the pressure will force back the
60 piston 3 against the tension of the spring 5, (which may be graduated for any particular use.) The piston-rod 4 will be correspondingly driven back, throwing the connecting-rod 11 out of line, which will tend to rotate
65 the short crank 12 and turn the valve-stem 13 set therein. Assuming that the guiding-pin 22 is in the groove 21, the valve-stem will be rotated from left to right, sliding down upon the pin and contracting the opening in the
70 valve, allowing less gas to pass through the valve. When the pressure of the gas or liquid and the expansive power of the compressed spring 5 are equal, the valve-stem 13 will stand still. If the pressure should de-
75 cline, the spring 5 will expand, tending to straighten the rods 4, 11, and 12 and rotate the stem 13 from right to left, raising the valve and correspondingly enlarging the passage for the gas. Should the pressure en-
80 tirely die out, the pin 22 will be brought to the bottom of the slot 20, and the spring 23 will force the valve down upon its seat, and the pin 22, sliding up the slot 20, will lock the
85 valve down, effectually preventing any gas or liquid passing into the low-pressure main 8
90 until the stem 13 is raised by hand and rotated to slide the pin 22 back in place in the groove 21.

This cut-off effected by the slot 20 is pe-
95 culiarly desirable where the regulator is used in supplying natural gas to dwellings, stores, &c., inasmuch as the fires would be put out by any stoppage of pressure, and if the gas were turned on again and the valve 7 open
100 the building would be filled with an explosive gas. When our invention is used as a gov-

ernor or regulator only, as on steam-engines or on reducing-stations for gas-mains, this slot 20 will be omitted.

We have also shown an electrical alarm, which will give warning of a cessation of pressure. A contact-point 14 is so placed that it will touch the contact-point 15 only when the levers 4, 11, and 12 are in a straight line, the position they will assume when the pressure stops. The bell 19, which may be put at any convenient point, is thus rung. This alarm will prove desirable in many places—for instance, when used in buildings or at reducing-stations—in the latter case to give an alarm at the central office.

The pipe 9 9 is to draw off any pressure which may generate in the rear of the cylinder 2 from leakage around the piston 3. The check-valve 10 will prevent any back-pressure from the main 8. In Fig. 5 the short crank 12 is shown perforated. By pivoting the connecting-rod 11 in different perforations a varying degree of leverage can be obtained to turn the stem 13. Under circumstances where there is but little friction and wear in the cylinder 2 the leakage-pipe 9 9 may be omitted.

Having fully described our invention, what we desire to claim and secure by Letters Patent is—

1. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to a crank turning a valve-stem, a valve-stem having a spiral and a straight groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, a high-pressure pipe leading from the front of the cylinder to the valve, a leakage-pipe having a check-valve leading from the rear of the cylinder to the low-pressure main, and an alarm brought into circuit by the straightening of the connecting-rod and crank when the pressure ceases, all substantially as shown and described.

2. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to a crank turning a valve-stem, a valve-stem having a spiral and a straight groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, a high-pressure pipe leading from the front of the cylinder to the valve, and a leakage-pipe having a check-valve leading from the rear of the cylinder to the low-pressure main, all substantially as shown and described.

3. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to

a crank turning a valve-stem, a valve-stem having a spiral groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, a high-pressure pipe leading from the front of the cylinder to the valve, a leakage-pipe having a check-valve leading from the rear of the cylinder to the low-pressure main, and an alarm brought into circuit by the straightening of the connecting-rod and crank when the pressure ceases, all substantially as shown and described.

4. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to a crank turning a valve-stem, a valve-stem having a spiral groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, a high-pressure pipe leading from the front of the cylinder to the valve, and a leakage-pipe having a check-valve leading from the rear of the cylinder to the low-pressure main, all substantially as shown and described.

5. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to a crank turning a valve-stem, a valve-stem having a spiral and a straight groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, a high-pressure pipe leading from the front of the cylinder to the valve, and an alarm brought into circuit by the straightening of the connecting-rod and crank when the pressure ceases, all substantially as shown and described.

6. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to a crank turning a valve-stem, a valve-stem having a spiral and a straight groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, and a high-pressure pipe leading from the front of the cylinder to the valve, all substantially as shown and described.

7. A combined regulator and cut-off consisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to a crank turning a valve-stem, a valve-stem having a spiral groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, a high-pressure pipe leading from the front of the cylinder to the valve, and an alarm brought into circuit by the straightening of the connecting-rod and crank when the pressure ceases, all substantially as shown and described.

8. A combined regulator and cut-off con-

sisting of a cylinder to receive the high pressure, a piston with a coiled spring at its back moving in said cylinder, a piston-rod, a connecting-rod pivoted to said piston-rod and to
5 a crank turning a valve-stem, a valve-stem having a spiral groove cut therein to track a pin set in the valve-shell, a spring in said valve tending to seat it, and a high-pressure pipe leading from the front of the cylinder to
10 the valve, all substantially as shown and described.

In testimony whereof we have hereunto set our hands.

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HOMER H. SWANEY.

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JOHN C. THOMPSON,
WM. L. PIERCE.

Witnesses as to Homer H. Swaney:

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