(No Model.)

J. N. CHAMBERLAIN.

PRESSURE REGULATOR AND YOKE FOR GAS CHANDELIERS.

No. 414,493. Patented Nov. 5, 1889.

Fig 1

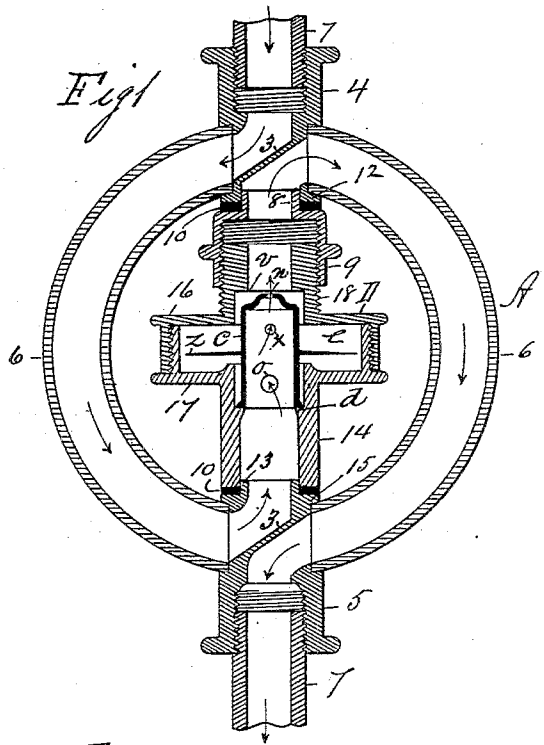


Fig 3

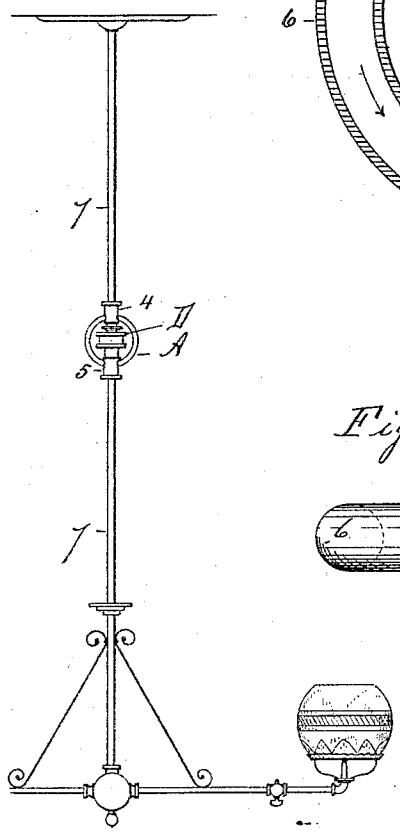


Fig 2

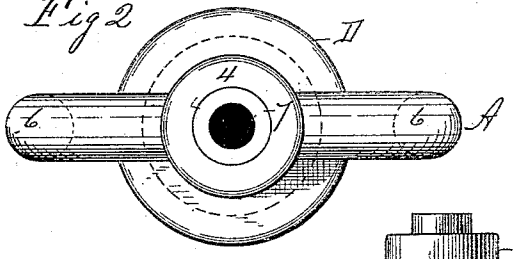
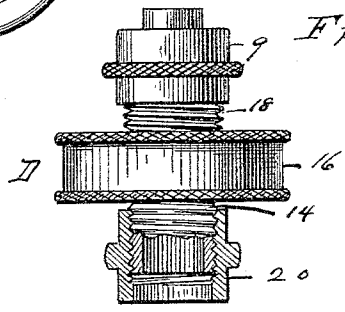


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN N. CHAMBERLAIN, OF SPRINGFIELD, MASSACHUSETTS.

PRESSURE-REGULATOR AND YOKE FOR GAS-CHANDELIERS.

SPECIFICATION forming part of Letters Patent No. 414,493, dated November 5, 1889.

Application filed August 2, 1888. Serial No. 281,743. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. CHAMBERLAIN, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Pressure-Regulators and Yokes for Gas-Chandeliers, of which the following is a specification.

This invention relates to pressure-regulators and yokes for gas-chandeliers and other similar gas-burning devices, the object being to provide for the above-named purpose improved pressure-regulating devices which are adapted to be attached to the main pending stem of the chandelier or gas-lamp for regulating at one point thereon the pressure at which the gas is delivered to all of the burners, instead of having a regulator connected with each burner, as is ordinarily practiced.

In the drawings forming part of this specification, Figure 1 is a vertical sectional view of a pressure-regulator and a yoke with which the latter is connected constructed according to my invention, said figure showing parts of a chandelier-stem connected to the yoke. Fig. 2 is a top plan view of the regulator and yoke shown in Fig. 1. Fig. 3 is a side elevation of a gas-chandelier (one arm being shown broken off) having the regulator and yoke applied to its suspending stem or pipe. Fig. 4 is a side elevation, partly in section, of the regulator, showing a modified construction of its lower end connection.

In the drawings, A is the yoke in and to which the regulator of the gas-pressure is secured, as below described, said pressure-regulator being designated by D. The yoke A is of suitable metallic construction, brass being the preferable metal, owing to the facility of working it and its capability of taking a fine finish. Said yoke consists, essentially, of a tubular ring having two partitions 3 across the interior of said ring opposite each other, as shown in Fig. 1, wherein it is shown that the yoke consists of an inlet-piece 4 and of an outlet-piece 5, the two ring-sections 6 being rigidly secured to said pieces 4 and 5 in the relative positions shown in said figure. The said ring-sections and inlet and outlet parts 4 and 5 of the yoke are shown in Fig. 1 as made separately from each other and solidly united in any suitable way; but, if preferred, said parts may be cast in one piece. The aforesaid partitions 3 extend diagonally across the passages through the inlet and outlet parts 4 and 5, as shown, and serve to direct the flow of gas through a portion of the yoke and then through the regulator D, and finally through a second part of the yoke to the chandelier or lamp, as hereinafter described.

The inlet and outlet parts 4 and 5 are made substantially alike, each having a screwed socket in its outer end to receive screwed portions of the pending stem 7 of the chandelier, as shown, suitable sockets in the opposite sides to receive the ends of the tubular ring-sections 6, and each having the partition 3 diagonally across the passage through it, whereby when they become fixed parts of the complete yoke, as shown in Fig. 1, the gas-passage therein is divided for the purpose aforesaid. The inner ends of said inlet and outlet parts 4 and 5 or those projecting toward the center of the yoke are, however, each given a different form to provide for peculiar means of connecting the regulator D within the yoke in such a manner that the attachment and detachment of the regulator are rendered quite easy and may be done without disturbing the connection of the yoke with the chandelier-stem 7 and without the use of tools. Facilities for replacing one regulator with another with ease are desirable in constructions such as are herein shown, so that a regulator of the capacity best adapted to the conditions under which the chandelier may be used, as to the number of burners, gas-pressure, and light required, may be conveniently fitted thereto. To this end the said inner end of the inlet 4 is adapted to receive the reduced end 8 of a screw-threaded coupling 9, and on said reduced end of said coupling is placed a packing-washer 10, of rubber, leather, or like yielding material, which occupies a position between the end of the coupling and the flanged end 12 of said inlet.

The inner end 13 of the outlet part or connection 5 is reduced, as shown, to fit it to enter the end of the socket of the lower neck 14 of the regulator-case, and a flange 15 is formed at the base of said reduced end 13, on which is placed a second packing-washer, as above

described, this last-named washer occupying a position between the end of said neck 14 and the flange 15 of the outer connection, as shown. If desired, the lower neck 14 of the regulator-case may have thereon the nut 20, as shown in Fig. 4, to screw against the packing 10, the end of nut 20 in that case inclosing the reduced end 13 of the yoke and being adapted to screw firmly against said packing. The addition of the nut 20 provides for more easily removing the regulator from the yoke and for nicer adjustment therein.

The regulator-case consists of two metallic shells 16 and 17, screwed together, as shown, 16 being the upper one and having thereon the externally-screw-threaded tubular neck 18, having its internal gas-passage reduced at *v* to form a seat for the end of the valve-tube *c* of the regulator, as below described. Said coupling 9 screws onto the end of the said neck 18 of the regulator-case. The lower shell 17 is provided with the above-referred-to tubular neck 14, having an annular shoulder *d* around the gas-passage therethrough, on which the lower end of said valve-tube *c* rests when the valve of the regulator drops.

The walls of the valve-chamber *e* of the regulator are finished to a perfectly cylindrical form to receive the valve thereof, which consists of a thin metallic disk *z*, having a diameter slightly less than that of said case and of the said valve-tube *c*, passing through and rigidly fixed to said disk. Said valve-tube *c* is provided with the perforations *o* and *x* through its side and the perforation *n* through its tip.

The regulator and the coupling 9, (the latter having a projecting ring around it, as shown, which in practice is "knurled" to facilitate turning it with the fingers,) made as above described, before being connected to the yoke A are united by screwing the coupling sufficiently onto the neck 18 of the regulator-case to permit of setting the lower end of the neck 14 over the end of the outlet 5 and onto the washer 15 and of bringing the extended end 8 of the coupling 9 under the open end of the inlet-connection 4 and the body of the coupling under the washer 10, and then, by screwing the coupling toward the lower end of said connection 4, the end 8 thereof is made to enter the end of said connection and the coupling is forced against the washer 10, and consequently the said washer between the end of the neck 14 of the lower regulator-shell and the outlet-connection 5 is compressed between said parts. It is thus seen that by operating the coupling 9 as aforesaid the regulator is easily and quickly secured to and disengaged from the yoke.

The above-described regulator of the gas-pressure embodies substantially the constructions shown and described in my patents of October 15, 1878, and of January 11, 1881, and the operation thereof in connection with the said yoke in which it is connected, in regulating the flow of gas to the burners of a chandelier, substantially such as is shown, or to the burners or outlets of the common and well-known gas-lamps of large size in which the gas escapes for combustion through a series of small burners or of perforations through the walls of an annular ring, is as follows:

Gas flows to the chandelier or lamp under the action of the pressure of the street-mains, be it more or less, through the stem 7 in the direction indicated by the arrow within the part of the latter at the upper end of the yoke A, Fig. 1, and passing into one of sections 6 of said yoke, into which it is directed by the partition 3 in the direction indicated by the arrows, and passing downward the gas meets the partition 3 at the lower end of the yoke, and thence flows upward through the neck 14 of the regulator-case, and the valve-chamber within the latter becomes filled with gas, and the pressure of the latter operates against the under side of the disk *z*, causing the upper end of the valve-tube *c* to engage with the seat *v* above it, and for an instant the passage of gas between the end of said tube and the seat is stopped; but as soon as that part of the valve-chamber above the disk becomes filled with gas under the action of the gas-main pressure (which occurs immediately) the pressure within the valve-chamber above and below the disk *z* becomes equalized, and thereafter the valve floats in the passing current of gas through the regulator, rising and falling according to the increase or decrease of the pressure, thereby enlarging or rducing the size of the gas-passage between the end of the tube *c* and its seat *v*, so that the flow of gas at the burner is maintained at the same pressure, although the pressure of the gas above the regulator and yoke or in the gas-mains may be constantly varied. Under excesssive pressure in the mains the upward movement of the valve caused thereby tends to close the gas-passage between the end of the tube *c* and its seat, thereby reducing the amount of gas that can pass through said passage for the moment more than is desirable, and to avoid the effects of such action upon the supply of gas to the burner the perforation *n* is made in the upper end of the tube *c*, so as to let a portion of the gas pass through it directly from the lower part of the regulator-chamber, thus tending to so equalize the effect of said increased pressure above and below the disk *z* as to bring the valve under the proper control of the gas-flow within the regulator, whereby it is made to act as before when subject to the conditions of a normal degree of pressure. The perforations *o* and *x* through the sides of the tube *c* facilitate the entrance of the gas into the chamber *e* below and above the disk *z*, and the area of said perforations is suitably adjusted, together with that of the perforation *n*, so that the gas which flows therethrough and which passes between the periphery of the disk *z* and the adjoining

walls of the chamber *e* is equal to the amount of gas per hour that the regulator is constructed to deliver. By means of the above construction the regulating effects of a floating governing-valve and a common "check-burner" are combined, thus making a perfect instrument for governing or controlling the quantity of gas-flow. After the gas has passed the regulator under the conditions just stated it flows upward and down through one of the sections 6 of the yoke, and escapes through the outlet 5 into the lower portion of the stem 7 of the chandelier, and thence to the burners of the latter.

The necessity of sections 6 6 of the yoke will of course be apparent when it is taken into consideration that the regulator and its disk *z* move upwardly under the gas-pressure, which must necessarily be entered to the regulator from below, and it is preferred to form said sections of circular form, as in such case the passage therethrough is continuous and free from impediments incidental to elbows or angles which would result were the yoke made of rectangular form, and moreover the yoke may thus be more compact and made with greater facility.

What I claim as my invention is—

1. A yoke for gas-pressure regulators, consisting of the inlet and outlet connections 4 and 5, respectively, each having the partition 3 therein, and the hollow circular ring-sections 6, connected to and rigidly uniting said inlet and outlet connections, combined with a regulator-case, substantially as described, having the neck 14 thereof engaging with said connection 5, a screw-coupling connected with a second neck 18 on said case, having a tubular projection thereon engaging with said inlet-connection 4, and a compressible washer inserted between said coupling and the connection 4 and between said neck 14 and the connection 5, substantially as set forth.

2. The combination, with the yoke A, consisting of the ring-sections 6, united by the inlet and outlet connections 4 and 5, respectively, of the regulator-case D, having the screw-threaded neck 18 and the neck 14, and the screw-coupling 9, having the tubular extension 8, substantially as set forth.

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