C. C. ARMSTRONG.

GAS REGULATING VALVE.

APPLICATION FILED NOV. 6, 1907.

931,668. Patented Aug. 17, 1909.

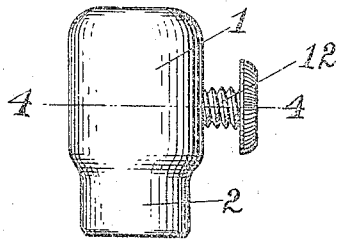

Fig. 1.

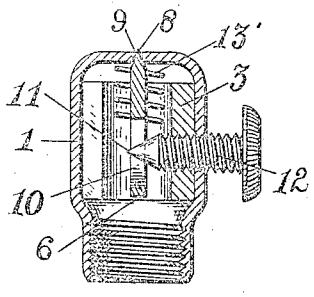

Fig. 2.

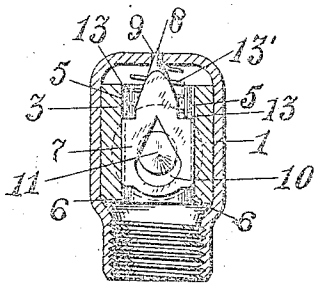

Fig. 3.

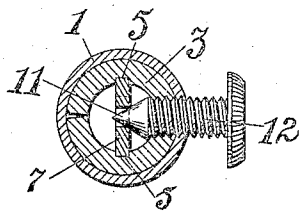

Fig. 4.

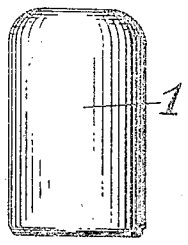

Fig. 5.

Attest:

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UNITED STATES PATENT OFFICE.

CHARLES C. ARMSTRONG, OF MARYSVILLE, OHIO.

GAS-REGULATING VALVE.

No. 931,668. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed November 6, 1907. Serial No. 400,962.

To all whom it may concern:

Be it known that I, CHARLES C. ARMSTRONG, a citizen of the United States, residing at Marysville, Ohio, have invented certain new and useful Improvements in Gas-Regulating Valves, of which the following is a specification.

My invention relates to improvements in regulating devices for gas of the general form in which the device is used as a regulator to be screwed on to the standard gas burner.

It is the object of my invention to provide a regulating device which will be economical to manufacture, light in weight and symmetrical and neat in appearance, and one which will insure uniformity of the product as made by the machinery or devices provided for the purpose of turning out the goods.

The invention consists of the features, combination and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings,—Figure 1 is a side view of the regulating device complete. Fig. 2 is a central vertical sectional view of the device. Fig. 3 is a similar view taken through a plane a quarter turned from Fig. 2. Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 1. Fig. 5 is a side view of the outer shell as produced by a drawing operation and ready to receive the interior parts.

In these drawings, 1, is the outer shell of the attachment of substantially cylindrical form having its top slightly rounded and having a reduced portion at 2, this portion being threaded to fit the burner tube. Within the shell a sheet metal member 3 is arranged, this consisting of a plate or small sheet of metal which is bent into cylindrical form with its edges in contact. This member fits in the enlarged upper part of the shell and is confined therein by the contracted lower part 2. It is provided on its interior with grooves 5 extending from the upper edge of the cylindrical inner member to a point near the bottom thereof, but leaving intact portions at 6 forming limiting stops or shoulders for the needle point carrier 7 to contact therewith when moved downwardly. This needle point carrier is in the form of a sheet metal piece having the needle valve or point 8 at its upper end adapted to enter the gas outlet opening 9 formed in the top of the outer shell. The needle point carrier 7 is provided with a substantially V-shaped opening 10 and the walls of this opening are engaged by the point 11 of an adjusting screw 12. This screw passes through an opening formed in the outer shell of the tip or attachment and also through the cylindrical inner member, these openings being threaded to receive the screw. The needle point or needle valve carrier is provided with shoulders at 13, upon which rests a spiral spring 13′, which surrounds the needle point or valve and bears at its upper end against the inner side of the outer shell of the attachment.

By turning the regulating screw toward the right its point contacting with the walls of the V-shaped opening will move the needle valve carrier upwardly to make the said valve enter the gas outlet to regulate the size thereof or to close the same entirely, this action taking place against the resistance of the spring 13′. When the screw is turned in the opposite direction the spring will force the needle valve carrier downwardly to open the gas outlet.

In the manufacture of the device constructed as above described, the outer shell of the attachment is first drawn with dies into substantially the form shown in Fig. 5, it being of cylindrical form with one end slightly rounded and closed.

This shell is then trimmed accurately to the proper length and the gas outlet opening is simply punched therein. The inner member or bushing is cut by a die from comparatively heavy sheet metal of the correct size and then this sheet metal is bent or turned into cylindrical form with its ends abutting and the size of this cylindrical bushing or member is such as to fit closely within the outer shell. Before insertion into the outer shell, however, the bushing is cut on its interior to form the two grooves above described, these grooves not being cut the entire length of the bushing so that sufficient stock is left to provide a limiting stop for the needle valve carrier. The needle valve

and its carrier is cut out from sheet metal, by means of a die, of substantially the exact shape for use with the exception that the tapered upper part is pointed to form the needle valve.

In assembling the different parts, the needle valve carrier is inserted in the grooves of the inner member or bushing, the coil spring is then placed around the needle valve and the bushing carrying these parts is then slipped into the drawn outer shell and thereafter the lower part of the shell is reduced as at 2 and this reduction of the outer shell serves not only to hold the inner members in place securely without any additional fastening means, but the reduced portion provides means for attaching the tip or regulator to the burner tube of a standard gas fixture, this reduced portion being threaded on its interior for this purpose. After the bushing or inner member has been placed in position and held by reducing the shell at the point 2, the threaded opening to receive the regulating screw is drilled through the outer shell and also through the bushing and is tapped to provide the screw thread for receiving the regulating screw

The usual method of making gas fixture tips of the general character above described is to turn the work up from a solid stock, a series of cutters, drills, and the like being provided for this work. These tools require frequent sharpening and re-setting, causing variation in the finished product and the parts thereof and causing difficulty when the parts are assembled. This method also results in a considerable loss of metal. By my structure, however, the outer shell is simply drawn from sheet metal and there is practically no waste due to boring or turning up from a solid piece of metal. Further, the gas outlet may be formed by simply punching it instead of drilling. This insures not only uniform size but prevents the formation of burs and roughness and economizes time in the manufacture. The bushing is also made from sheet metal and is struck up from flat stock and this bushing not only provides means for supporting the needle valve, but it provides a sufficient thickness of stock to enable a screw thread of such length to be cut therein as to prevent leakage of the gas. Further, by my construction, the act of reducing the lower end of the tip retains the bushing and other parts in proper position and at the same time provides a neck or nipple of correct size for tapping and threading to fit the gas burner tube.

I claim as my invention:—

1. In a gas regulator, a shell of drawn sheet metal, a valve therein, a bushing serving to guide the valve and adjusting means for the valve passing through the shell and bushing and directly actuating the valve, substantially as described.

2. In combination in a gas regulator, a valve, a shell of sheet metal, a bushing carrying the valve and arranged within the shell, said bushing and shell being provided with threaded openings in alinement, and a regulating screw passing through the said openings to engage the valve, substantially as described.

3. In combination in a gas regulator, a shell, a split bushing of sheet metal having its edges in contact, said bushing being arranged within the shell, a valve carried by the bushing and a screw passing through the bushing and shell for adjusting the valve, substantially as described.

4. In combination in a gas regulator, an outer sheet metal shell of inverted cup shape having an opening at its upper end for the escape of gas, a split bushing comprising a sheet metal piece of substantially cylindrical form to fit the interior of the shell, a valve carried by said bushing and a regulating screw passing through the bushing and the sheet metal shell, substantially as described.

5. In combination in a gas regulator, an outer shell, a bushing arranged therein having grooves on its interior with stops at the lower ends of said grooves, a valve consisting of a carrier plate moving in the said grooves and having a needle point thereon, and means extending through the shell and the bushing to engage the carrier plate for operating the valve, substantially as described.

6. In combination in a gas regulator, a valve, a bushing carrying said valve, means for operating the valve, and a sheet metal shell of inverted cup shape inclosing said parts having a puncture in its upper end, and having its lower part of reduced diameter to hold the bushing and the valve in position, said reduced portion being internally threaded, substantially as described.

7. In combination in a gas regulator, a valve, a split sheet metal bushing for guiding the valve, means for operating the valve, and a shell of sheet metal of inverted cup shape having a puncture in its upper end and having its lower end of reduced diameter and inclosing the bushing and valve.

8. In combination in a gas regulator, a shell or casing, a needle valve consisting of a thin flat piece of sheet metal having a perforation in its body portion, and having a tapered end, a stem extending through the wall of the casing and having a conical surface working within the perforation in the valve, and a spring maintaining contact between the valve and stem, substantially as described.

9. In combination in a gas regulator, a shell or casing, a valve consisting of a flat piece of metal having a reduced portion of tapered form to provide a needle valve point, said valve having shoulders and being

guided by its edges within the casing, and having also a perforation in its body portion, a stem having a conical point extending through the casing and engaging the perforated portion of the valve, and a spring surrounding the reduced portion of the valve and bearing upon the shouldered portion thereof to keep the valve in contact with the conical portion of the stem, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

CHARLES C. ARMSTRONG.

Witnesses:

RICHARD L. CAMERON,

ROBT. MCCRORY.