G. S. NEELEY.

GAS PURIFIER.

APPLICATION FILED DEC. 9, 1914.

1,235,998. Patented Aug. 7, 1917.

Fig. 1

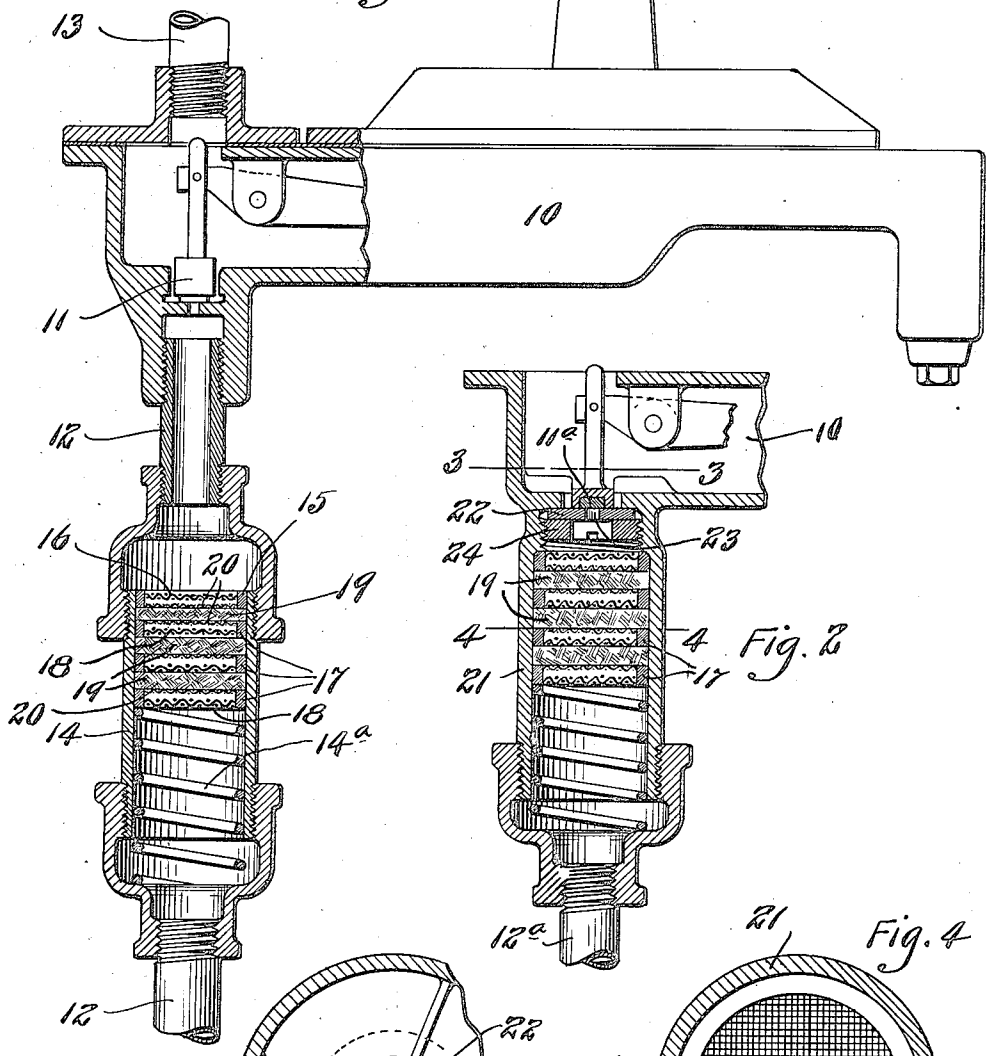


Fig. 2

Fig. 3

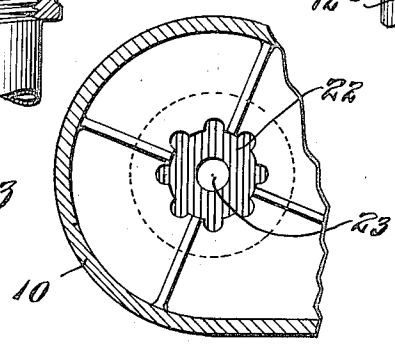
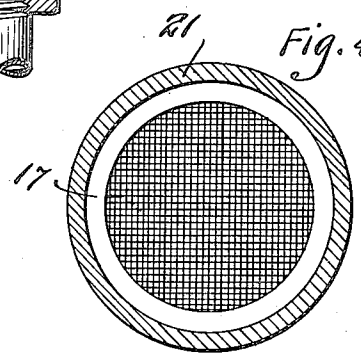


Fig. 4



Witnesses
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By J. W. Cornwall Atty.

UNITED STATES PATENT OFFICE.

GEORGE S. NEELEY, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO THOMAS C MOLONEY, OF ST. LOUIS, MISSOURI.

GAS-PURIFIER.

1,235,998. Specification of Letters Patent. Patented Aug. 7, 1917.

Application filed December 9, 1914. Serial No. 876,274.

To all whom it may concern:

Be it known that I, GEORGE S. NEELEY, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a certain new and useful Improvement in Gas-Purifiers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of a gas purifier of my improved construction, the same being associated with an ordinary gas regulating valve.

Fig. 2 is a vertical section of a portion of a gas regulating valve having a part of my improved purifier formed integral therewith.

Fig. 3 is an enlarged horizontal section taken approximately on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged horizontal section taken approximately on the line 4—4 of Fig. 2.

My invention relates to a gas purifier particularly designed for use in connection with the gas regulator which is located in the connection leading from the street main to the piping of a building, and my improved device can be made a part of and connected directly to the regulator, or it may be located in the pipe which leads from the street main to said regulator.

The principal objects of my invention are, first, to provide a comparatively simple and inexpensive purifier or filter which is adapted to be located immediately below or in front of the regulating valve and which purifier will be effective in eliminating from the gas passing through the regulating valve and into the piping of the building, all foreign substances, such as dust and rust from the interior of the street mains and service pipes.

My improved purifier is particularly intended for use in connection with high pressure systems, and in this connection it will be understood that in the systems now in general use for city lighting and heating, the street mains carry a pressure of approximately forty pounds, and in the service pipes in the buildings, the pressure is approximately six or eight-tenths of a pound.

It will be understood that in gas distribution it is necessary to make use of regulating valves for the purpose of reducing the pressure between the street mains and the point of use, and it is, of necessity, a requirement that these gas regulating valves be accurate and positive in action.

The ordinary regulating device is equipped with a valve having a flexible member of leather, rubber or analogous material which normally rests on a flat seat and closes the orifice in said seat. A source of much of the trouble and inoperativeness in gas regulating valves, is due to the fact that small particles of foreign substances such as dust or rust which forms on the inner surfaces of the street mains is carried by the gas into the regulating valve and lodges on the seat or the compressible member of the valve, thereby preventing a tight joint between said valve and seat, and permitting leakage from the comparatively high pressure street mains to the house piping. As a result, "seal blows" often occur, the same being attended by considerable danger inasmuch as they frequently result in explosions and asphyxiations. Furthermore, "seal blows" are very destructive to painting on the exterior of buildings.

In actual service conditions it has been demonstrated that in gas distribution systems where high pressures are used, practically forty or fifty per cent. of complaints in gas service is due to trouble in the regulating devices, and this trouble in turn is directly traceable to leakage of gas through the valves of said regulating devices. As a result much time, labor and consequent expense is involved in opening the housings of the regulating devices and cleaning the valves thereof, and I propose to eliminate all this trouble and expense by providing a simple gas purifier in the form of a mechanical filter, the same being located immediately adjacent to the regulating device, thus preventing all dust, rust, etc. from entering the regulating device and interfering with the proper operation of the valve therein.

A further object of my invention is to provide a purifier and filter with one or more beds or layers of fibrous material such as mineral wool, the same being slightly impregnated with oil, and thus as gas flows through the purifier it will absorb and carry with it a certain amount of oil which, in

turn, will be deposited onto the valve and valve seat, thereby providing sufficient lubrication to insure the proper operation of the valve and maintain it in serviceable condition.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed.

In the form of device illustrated in Fig. 1, 10 designates the housing of the regulating device, 11 the valve therein, and 12 the supply pipe leading to the piping of the building.

Located in the pipe 12 and preferably immediately adjacent to the housing 10 is the housing of my improved purifier and filter, the same comprising a substantially tubular or hollow body 14, the ends of which are detachably connected in any suitable manner to sections of the pipe 12.

Fixed in the upper end of the housing 14 is a ring 15 which is provided with a section of foraminous or reticulated material 16. Removably positioned in the upper portion of the housing 14 and below the fixed ring 15 is a series of rings 17 each being provided with a section 18 of foraminous or reticulated material and positioned between said removable rings are layers or beds 19 of fibrous material such as mineral wool, the same being preferably impregnated to a slight degree with a suitable liquid lubricant such as oil.

In order to prevent extremely fine particles of dust and rust from passing through the foraminous or reticulated plates, sections of woven fabric 20 such as muslin, are positioned on top of and below each layer of fibrous material. This arrangement not only holds the fibrous material in layer form but also prevents any small particles of fiber from passing out of the filter with the filtered or purified gas.

Positioned in the lower portion of the housing 14 and bearing against the lower one of the rings 17 is a compression spring 14^a which normally exerts pressure to hold all of the rings in proper position in the upper portion of said housing.

In the form of device illustrated in Fig. 2 a tubular housing 21 is formed integral with the housing of the regulating device and connected to the lower end of said housing 21 is the gas supply pipe 12^a. Removably positioned in the upper end of the housing 21 is a plate 22 which serves as a seat for the valve 11^a of the regulating device, there being an orifice 23 formed in the center of said plate and which orifice is normally closed by said valve 11^a.

Screw-seated in the upper portion of the housing 21 is a ring-nut 24 which rigidly fixes the plate 22 in position.

The housing 21 in this form of device is provided with a series of removable rings, foraminous or reticulated sections, layers of fibrous material, sections of fabric and the coil spring, the same as in the construction heretofore described.

The operation of my improved purifier and filter is apparent, for it will be readily understood that the gas in passing from supply pipe 12 into the regulating device must necessarily pass through the various layers of fibrous material which are held in position between the rings carrying the sections of reticulated or foraminous material and thus all impurities such as dust, rust, etc., will be removed from the gas and it will enter and pass through the regulating device in a thoroughly purified condition.

The gas in passing through layers of fibrous material will absorb a certain amount of the lubricant with which a portion of the fibrous material is impregnated and this lubricant will be absorbed by the leather on the regulating valve, thereby maintaining said leather in a pliable condition.

The device can be readily taken apart and assembled, thus facilitating repairs or renewal of the layers of fibrous material and by providing the readily removable nut 24 and plate 22, the valve of the regulating device can be easily and quickly removed in case of repairs or adjustment.

A purifier and filter of my improved construction is comparatively simple, can be cheaply manufactured, is effective in removing from the gas entering the regulating valve all foreign substances, such as dust, or rust, and consequently practically all of the trouble now arising from leaky regulating valves is entirely eliminated.

It will be readily understood that minor changes in the size, form and construction of the various parts of my improved purifier and filter can be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim:

1. A combined gas purifier and lubricator for high pressure gas regulating valves, comprising a housing, a section of reticulated material fixed within said housing near one end thereof, a series of rings removably positioned in said housing below the fixed section of reticulated material, a section of reticulated material carried by each ring, and layers of fibrous material between said rings and sections of reticulated material, said layers of fibrous material being impregnated with liquid lubricant.

2. A combined gas purifier and lubricator for high pressure gas regulating valves, comprising a housing, a section of reticulated

material fixed within said housing near one end thereof, a series of rings removably positioned in said housing below the fixed section of reticulated material, a section of reticulated material carried by each ring, layers of fibrous material between said rings and sections of reticulated material, said layers of fibrous material being impregnated with liquid lubricant, and a spring within the housing for maintaining pressure upon the rings and layers of fibrous material.

3. A combined gas purifier and lubricator for high pressure gas regulating valves, comprising a housing, a section of reticulated material fixed within said housing near one end thereof, a series of rings removably positioned in said housing below the fixed section of reticulated material, a section of reticulated material carried by each ring, layers of fibrous material positioned between the sections of reticulated material, said layers of fibrous material being impregnated with liquid lubricant, sections of fabric positioned against both faces of each layer of fibrous material, and yielding pressure means within the housing for holding the rings and layers of fibrous material in close contact with each other.

4. The combination with a high pressure gas regulating valve having a leather or fibrous disk which normally rests on the gas inlet orifice and the gas supply pipe leading to said regulating valve, of a combined gas filter and valve lubricator comprising a housing located in the supply pipe adjacent to said regulating valve and removably connected to said pipe, a section of reticulated material rigidly fixed within said housing near one end thereof, a series of rings removably positioned in said housing below said fixed section of reticulated material, a section of reticulated material carried by each ring, layers of fibrous material between said rings, said layers being impregnated with lubricant, sections of fabric between said rings and the layers of fibrous material, and a spring within said housing for holding the rings and layers of fibrous material in close contact with each other.

5. The combination with a high pressure gas regulating valve having a leather or fibrous disk which normally closes the gas inlet orifice, of a combined gas filter and valve disk lubricator connected to said regulating valve and comprising a housing and alternately arranged sections of reticulated material and layers of fibrous filtering material in said housing, the layers of fibrous filtering material being impregnated with liquid lubricant.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 5th day of December, 1914.

GEORGE S. NEELEY.

Witnesses:
M. P. SMITH,
M. A. HANDEL.