Oct. 23, 1956 F. C. MORRIS ET AL. 2,767,415

PIPE CLEANING APPARATUS FOR GAS LINES

Filed April 20, 1954 2 Sheets-Sheet 1

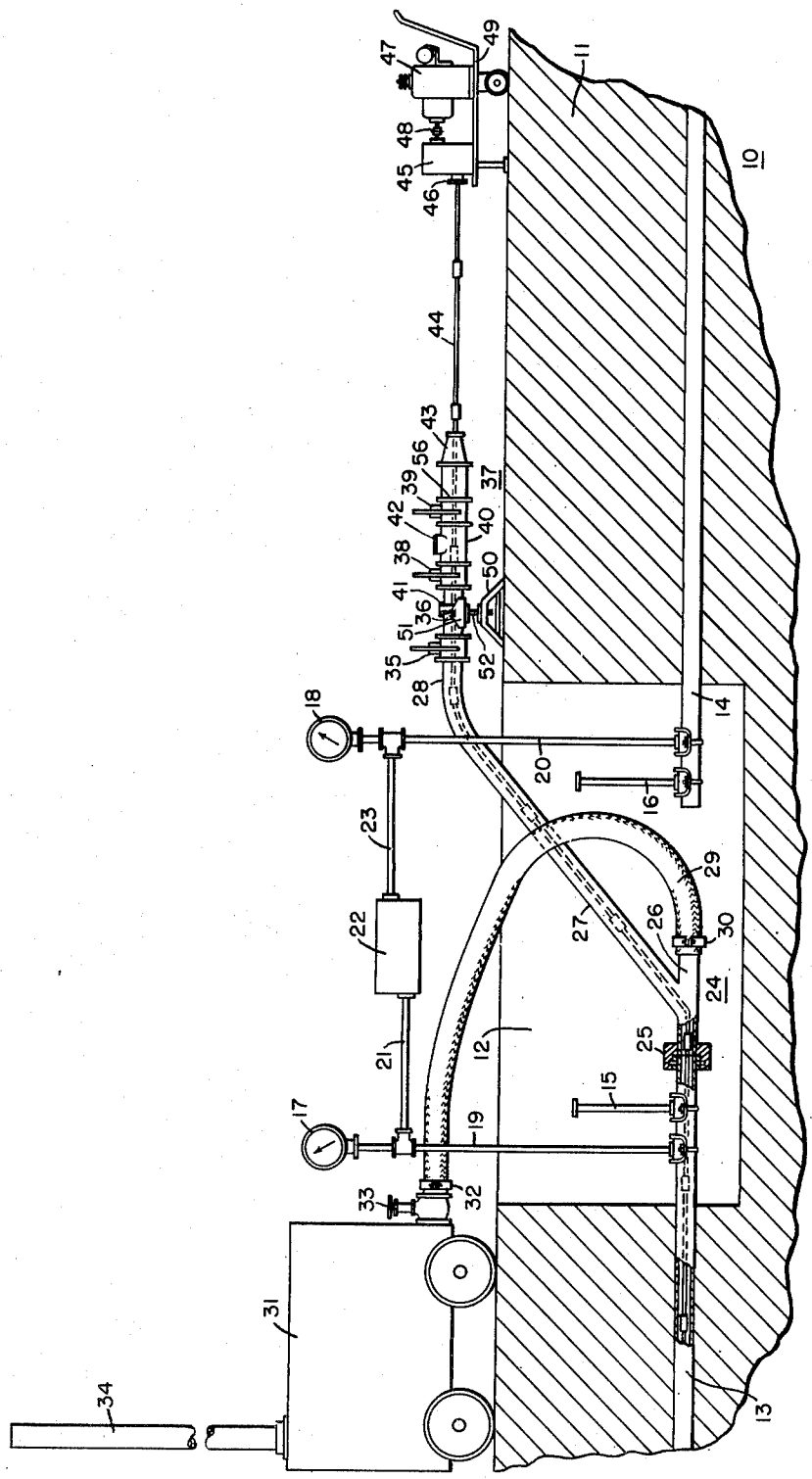

Fig. 1.

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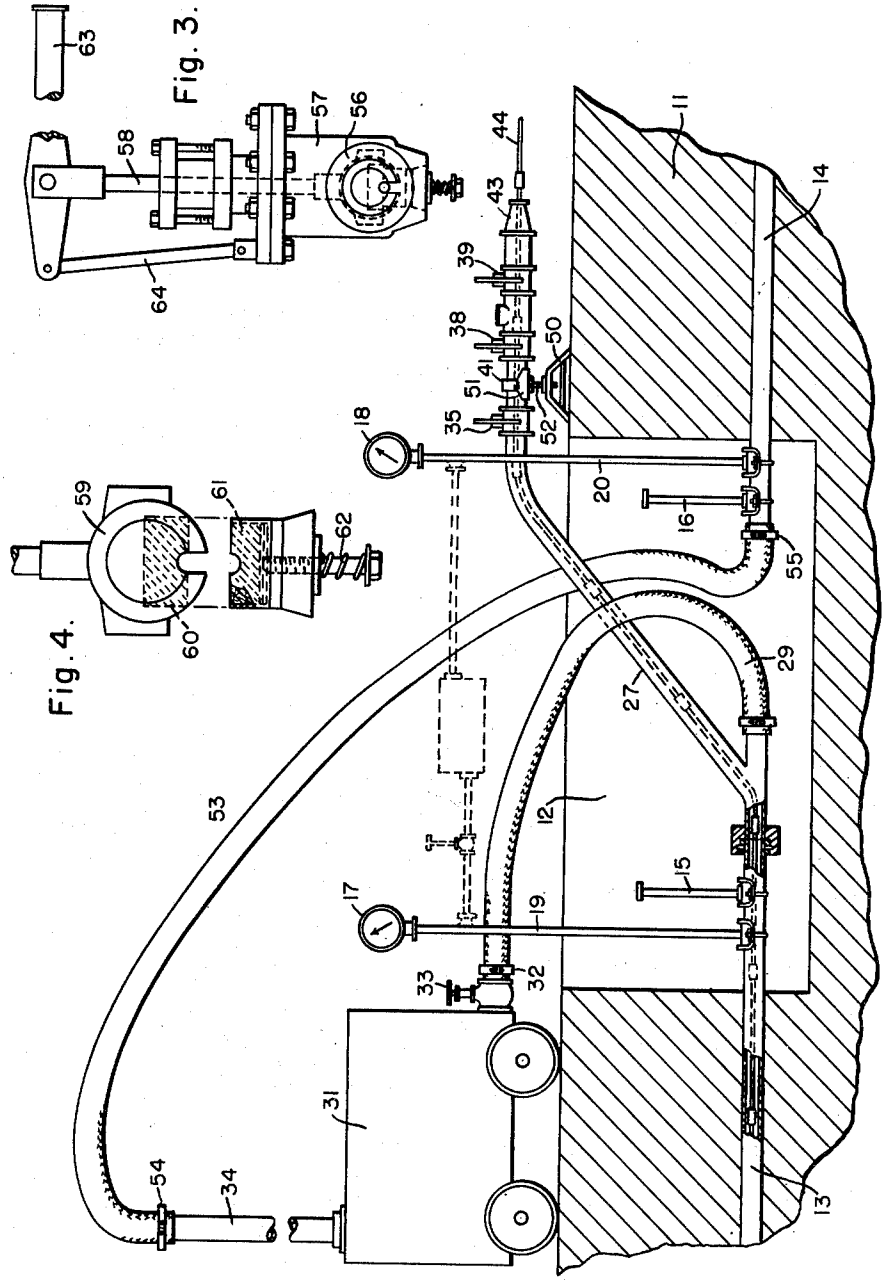

Fig. 3.

Fig. 4.

Fig. 2.

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United States Patent Office 2,767,415 Patented Oct. 23, 1956

2,767,415

PIPE CLEANING APPARATUS FOR GAS LINES

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Application April 20, 1954, Serial No. 424,414

9 Claims. (Cl. 15—104.1)

The invention relates to pipe cleaning apparatus, and more particularly to pipe cleaning apparatus that may be utilized for cleaning the pipe of a gas supply system without interrupting the supply of gas to the consumer.

It is well known that gas supply pipe lines to homes and other consumers become coated with deleterious matter carried by the gas. It has long been the practice when it becomes necessary to clean such lines to interrupt the service and when the gas has been removed from the pipe line proceed with the pipe cleaning operation. This results in protests from the consumers, a weak selling point in obtaining new customers, and a loss in gas sales.

The object of the invention is to provide gas pipe cleaning apparatus that may be utilized for entering and cleaning a gas line without interrupting the supply of gas through the line.

It is also an object of the invention to provide for utilizing the gas flow through the pipe line to blow out of the line the loosened deleterious matter that has been collected during the period that the gas line has been in service.

A further object of the invention is to provide for collecting the deleterious matter from the gas employed for blowing it out of the pipe line during a pipe cleaning operation.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention, accordingly, comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a view in side elevation with parts broken away showing pipe cleaning apparatus constructed in accordance with this invention,

Fig. 2 is a view in side elevation with parts broken away showing a modification of the invention,

Fig. 3 is a view in end elevation showing a seal valve employed in conjunction with the apparatus illustrated in Figs. 1 and 2, and

Fig. 4 is a view partly in elevation and partly in section of the sealing members of a seal valve.

Referring now to the drawings and Fig. 1 in particular, a pipe line shown generally at **10** is buried at a predetermined depth below the surface of the earth of a street or other right of way **11**. Such pipe lines are usually cast iron or welded iron pipe capable of withstanding usage to which pipe lines are subjected in distributing natural or producer gas for consumption in homes or industrial plants.

As is well known, natural gas and manufactured gases carry a substantial amount of deleterious matter such as carbon and particles of sand and dust. As the gas flows through gas lines, such as **10**, the deleterious matter in the process of time is deposited on the inside of the pipe and adheres very tight. It has been found that in the course of years, the gas lines become pretty well clogged and the flow of gas is greatly restricted. Further, even when the pipe lines accumulate only a small deposit of deleterious matter, greater resistance is offered to the flow of the gas. This greatly decreases the efficiency of the pipe lines and increases costs and it is necessary to clean them.

The apparatus which constitutes the subject matter of this application is adapted for cleaning sections of gas lines without interrupting the flow of gas or service. This is highly essential when the gas lines supply industries and is very desirable in the case of gas supply or service to homes.

In order to as effectively as possible describe the features of the invention, it is first necessary to describe how access may be obtained to the gas line in order to utilize the cleaning apparatus or equipment constituting the invention. The first step will be to select a section of the gas line **10** that it is desired to clean and then a spot where the apparatus may be installed with the least interference with the public living in the section of the city or other community that is serviced by the gas lines. The length of the section of pipe that may be cleaned will depend on the pipe cleaning apparatus available and the capacity of the power plant provided for driving the pipe cleaning tools. Further, the apparatus may be modified to meet the different conditions that are found in cities and towns.

In the embodiment illustrated, it is assumed that the selection of the section of pipe line to be cleaned has been made, then a pit **12** is dug in the street or right-of-way to give access to the pipe line **10**. The size of the pit will depend to some extent on the size of the apparatus to be employed for the cleaning operation. Generally, a pit having a surface area eight feet by three feet and extending a foot below the pipe line is adequate.

When a predetermined length of the pipe line **10** has been exposed, a section of the pipe is cut out of the line. This provides a gap between pipe sections designated **13** and **14** of the pipe line **10**. The section designated **13** is the portion of the pipe line that it has been decided to clean.

In this particular instance, the gas flows from left to right in the pipe line **10**. Therefore, the section **13** of the pipe line may be referred to as the upstream section and the section **14** the downstream section relative to the gap cut in the pipe line.

The pressure found in distributing gas lines may vary considerably in different cities and towns. It has been found in some lines that the pressure is of the order of 20 to 25 pounds, which is adequate for effecting a very substantial flow of gas through an ordinary 2" gas main or line. After the gas line is cut and the apparatus is installed, there will be an appreciable drop in the gas pressure from the upstream section to the downstream section even though the gas continues to flow to maintain the service. The amount of pressure required in the downstream side to maintain service will depend on the length of line cut off from the main line and the flow of gas required.

In order to prevent the escape of gas at the gap cut in the pipe line and to maintain the pressures required for the service or supply of gas that must be provided, certain more or less standard pieces of apparatus will be installed. Standard gas stops **15** and **16** are shown connected into the upstream section **13** and downstream section **14**, respectively. These stops may be of any well

known type commonly used in controlling the flow of gas. It has been found that a gas stop employing a rubber bulb which may be blown up to completely fill the pipe and stop the flow of gas is satisfactory. The reason for using stops of this kind and mounting them at 15 and 16 is to facilitate the insertion and operation of the gas cleaning tool without danger of having the tool obstructed or causing excessive heat or wear by the operating tools to be described hereinafter.

In addition to the stops 15 and 16, gauges 17 and 18 are connected into the upstream section 13 of the downstream section 14, respectively. These gauges will be of any well known make and the capacity that they should have will be that of the pressures that may be expected in distribution lines of this kind.

In order to maintain a predetermined service supply of gas after the gap has been cut in the pipe line, a bypass will be provided from the upstream section of the pipe line 13 to the downstream section 14. In this embodiment of the invention, the pipes 19 and 20 utilized for the gauges 17 and 18, respectively, are employed as part of the bypass. The stand pipe 19 is connected through the pipe section 21, the filter 22 and the pipe section 23 to the upright meter pipe 20.

The filter 22 will be of any well known kind and it has been found satisfactory to use a cylindrical container packed with fiber glass. The capacity of the filter 22 will depend on the operation to be carried on. It has been found that fiber glass will collect the deleterious matter from the gas that is supplied to maintain service. The fiber glass can readily be cleaned and utilized for many operations. However, it is to be understood that any other suitable type of filter may be employed as long as it collects the deleterious matter effectively.

The vertical meter pipes 19 and 20 may be connected to the pipe line sections 13 and 14 in any well known manner and a detailed description of these connections is deemed unnecessary.

In order to provide for the insertion and operation of a pipe cleaning tool and for utilizing the gas flow to discharge deleterious matter loosened from the pipe in the cleaning operation a branched fitting, shown generally at 24, is provided. As illustrated, the branched fitting 24 comprises a coupling 25 for connecting it to the end of the pipe section 13. There are many couplings suitable for this purpose well known in the art. A coupling that is easy to clamp to the pipe section 13 is preferable since it will facilitate the installation of the pipe cleaning apparatus. In this particular embodiment of the invention, the branched fitting comprises a short pipe section 26 and a longer section 27 which is bent to present a horizontal portion 28 for receiving the pipe cleaning tools to be described hereinafter.

The straight section 26 of the branched fitting 24 has a flexible hose 29 connected thereto by means of a clamp 30. This flexible hose may be of any predetermined length depending upon where the filter 31 may be located. As shown, the flexible hose 29 is clamped at 32 to a fitting provided on the filter 31. The fitting provided on the filter 31 has a valve 33 mounted therein for controlling the gas pressure to which the filter is subjected.

The filter 31 may be of any well known type suitable for collecting deleterious matter from gas. Such filters are well known in the art and will not be described in detail. However, in this particular instance the filter is mounted on wheels so that it may be readily transported to the location where it is desired to utilize it.

Since these gas cleaning operations are rather extensive, the filter should be of an adequate size. Further, since large quantities of deleterious matter will be collected from the gas, doors should be provided to give access to the filter for cleaning out the collected deleterious material.

In cleaning the gas mains of a city, the pipes are quite often entered in residential areas where the homes are two or three stories high. In such instances, the stack 34 provided for discharging the gas will be high enough to deliver it at an altitude where it will not drift into the homes. Ordinarily a height of 15 feet to 25 feet will serve the safety requirements.

The branch 27 of the branched fitting will have a shut off valve 35 mounted therein to control the flow of gas. This valve may be of any well known gate valve type and need not be described herein.

The length and shape of the branch 27 will depend on the conditions to be met. Usually the branch 27 will terminate in a threaded portion at 36. However, in some instances it may include the structure employed for effecting the insertion of the pipe cleaning tool and for preventing the flow of gas along the transmission line for operating the pipe cleaning tool. In this embodiment of the invention, the apparatus shown generally at 37 for facilitating the insertion of the pipe cleaning tool and the power transmission line to be described hereinafter is made as a separate unit.

It comprises two seal valves 38 and 39 mounted in a pipe section 40. The size of the pipe section 40 and of the seal valves 38 and 39 will depend on the equipment with which it is to be utilized and the size of the branched fitting 27. However, the apparatus shown generally at 37 may be utilized with branched fittings of different sizes by using reducer couplings and the like well known in the art. When the apparatus 37 is made as a separate unit, it may be connected to the branched fitting 27 by means of a coupling 41. As shown, the pipe 40 comprises a number of short pieces between which the seal valves 38 and 39 are connected. The construction of the seal valves is shown in Figs. 3 and 4 and will be described hereinafter.

In addition to the seal valves, a sight glass 42 is provided in the pipe 40. This sight glass will be entered in the top of a pipe section as shown. The fixture for carrying the sight glass may be cast in the pipe section. However, an opening may be drilled in the pipe 40 and a threaded fitting carrying the sight glass mounted therein. The mounting of a threaded connection in the top of the pipe section is the practiced method and can be applied by anyone skilled in this art.

In addition, a tapered bearing 43 made from brass or an equivalent material is provided and connected to the end of the pipe 40 which carries the seal valves. This brass bearing is provided so that the transmission line 44 for operating the pipe cleaning tool will not cause sparks. If an iron bearing were employed, there would be a possibility of the transmission line causing sparks which might ignite the gas. The brass bearing supports the transmission line 44 for driving the pipe cleaning tool centrally of the pipe section 40. It also helps to support the transmission line in the seal valves 38 and 39.

The transmission line 44 may be any well known sectioned drive rods suitable for operating a pipe cleaning tool which is well known in the art. The length of the sections of the transmission line 44 will be selected to suit the particular operation.

The power transmission line 44 will be driven from the gear box 45. Any suitable train of gears will be provided depending upon the speed at which it is required that the transmission line 44 be operated. Drives of this kind are well known in the art and need not be described. The rod sections of the transmission line 44 will be connected to the coupling 46 provided on the gear train.

The gear train may be driven from any suitable prime mover. Generally a gas engine or an electric motor is employed. In this instance a gas engine 47 is illustrated. The size of the gas engine will depend on the operation to be performed. The gas engine may be connected to the train of gears in the gear housing 45 by a coupling 48.

In the illustrated embodiment of the invention, the engine 47 and gear housing 45 are mounted on the manu-

ally movable truck 49. The purpose of this is to permit the advancing of the transmission line and, therefore, the pipe cleaning tool as it operates. For convenience in illustrating a manually operable truck as shown. However, any other suitable means for moving the engine and gear train housing 45 may be employed.

In order to support the branch 27 of the branched fitting 24 and the pipe section 40 carrying the seal valves 38 and 39 a stand 50 is employed. As shown, this stand is provided with an adjustable support 51 that may be moved up and down by means of the screw 52 which engages in a threaded opening provided in the stand 50.

There will be many instances when an embodiment of the invention, such as illustrated in Fig. 1, will not be entirely satisfactory. For example, when the pipe line to be cleaned is located among tall buildings, such as stores, apartment houses and office buildings, the height of the stack 34 required to discharge the escaping gas so as not to endanger people occupying the high buildings would be excessive. The stack might have to be 100 to 150 feet high to deliver the escaping gas out of range of these buildings. It would, therefore, be more or less impractical. To meet such conditions, a modification such as shown in Fig. 2 is more satisfactory.

Referring now to Fig. 2, in this modification a flexible hose 53 is shown connected from the stack 34 to the downstream section 14 of the pipe line. The hose 53 may be coupled to the stack 34 by means of any well known clamping device 54. Further, a similar clamping device 55 may be employed for connecting the hose to the downstream section of the pipe line. This embodiment of the invention is entirely satisfactory if the pressures are high enough.

It has been found that with pressures of the order of 20 pounds or greater, the gas is effective in blowing the deleterious matter from the pipe and overcoming the loss of pressure in the filter. The gas which passes through the filter 31 will then maintain the service. The only problem that may arise is a short interruption of the service at times when the filter is opened to remove deleterious matter. However, in order to avoid interruption of service a bypass such as employed in the embodiment illustrated in Fig. 1 may be utilized. The bypass has been described in connection with Fig. 1 and since it would be exactly the same when applied with the embodiment of the invention shown in Fig. 2, further description is unnecessary.

The apparatus illustrated in Fig. 2 is more economical in the use of the gas than the modification of the invention illustrated in Fig. 1. However, it is to be pointed out that the loss of gas resulting from the use of apparatus shown in Fig. 1 is a minor matter and the gas companies do not object to such a small loss of gas, the more important feature being the maintenance of the gas service.

In the operation of the modifications of the invention illustrated in Figs. 1 and 2 after the connections have been made, the section of the power transmission line 44 is inserted through the tapered bearing section 43. The pipe cleaning tool is then attached to the end of the rod section which has been inserted through the bearing 43. The bearing is then coupled to the pipe section 40 in any well known manner. The seal valve 39 is then opened and the pipe cleaning tool advanced to where it can be seen through the sight glass 42. The valve 39 is closed to seat on the transmission line 44. The next step is to open the sealed valve 38 and advance the cleaning tool to a point between the seal valve 38 and the gate valve 35. The seal valve 38 is then closed.

The gate valve 35 is now opened and the pipe cleaning tool advanced into the branch 27 of the branched fitting 24. From now on the pipe cleaning tool may be advanced to the pipe section 13 to be cleaned.

As soon as the pipe cleaning tool reaches the pipe section 13, the engine 47 may be connected through the train of gears mounted in the gear housing 45 to drive

the transmission line. The rate at which the pipe cleaning tool is advanced will depend on the operation to be performed.

The deleterious matter which is usually carbon and dust, such as blown from natural gas wells, is light and when loosened from the inner surface of the pipe line may be blown out by the flowing gas. Since the main flow of the gas is through the hose 29, the deleterious matter will be delivered to the filter 31.

In the embodiment of the invention illustrated in Fig. 1 the gas which maintains the gas service will flow through the bypass and filter 22. Since the cleaning operations will be so arranged as to interrupt service to only a portion of the pipe system at a time, an adequate flow of gas for maintaining service at offhours can be effected through the bypass. The bypass may also be utilized to maintain service with the embodiment of the invention shown in Fig. 1. When a bypass is employed with the embodiment shown in Fig. 2, anyone skilled in the art may insert valves to shut off the bypass when the gas is flowing through the filter 31.

The gas which flows through the bypass including pipe 19 is connected to the upstream section 13 of the gas line where the deleterious matter has been loosened. Therefore, the gas entering the bypass will carry an excessive amount of deleterious matter. However, this excess of deleterious matter will be caught by the filter 22 and will not enter the downstream section 14 of the gas line. The filter 22 may be renewed from time to time and cleaned out to assure a free flow of gas through the bypass.

The meters 17 and 18 by indicating the difference in pressures will give advance warning of when the filter 22 is holding an excess of deleterious material. During this operation, of course, the stopper 16 will be closed to prevent any escape of gas from the downstream section 14 as a result of back pressure. The stop valve 15 will be opened so as to permit the entry of the pipe cleaning tool.

The valve 33 which has been provided to regulate the flow of gas to the filter will be operated as required. This valve can be used successfully to control the flow of gas through the filter.

The modification illustrated in Fig. 2 dispenses with the bypass containing the filter 22 and delivers the gas directly from the main filter 31 to the downstream section 14 of the gas pipe line. In this case the difference of pressure indicated by the meters 17 and 18 will warn the operator of the state of the filter 31. If there is a substantial drop in the pressure, it indicates that the filter should be cleaned.

In order to facilitate the operation of the apparatus of the modifications shown in Figs. 1 and 2, the seal valves 38 and 39 will be constructed in accordance with the showing in Figs. 3 and 4.

Referring now to Figs. 1 and 2, the seal valves 38 and 39 will be provided with flanges 56 for coupling to the pipe section 40. Any seal valve which will prevent the flow of gas along the power transmission line 44 may be utilized.

A seal valve that has been found to be satisfactory for this purpose is illustrated in Figs. 3 and 4. In this showing the seal valve comprises a valve casing 57 with flanges 56 for connecting it into the pipe sections 40. As illustrated, a vertically movable plunger 58 is connected to a packing housing 59 which carries an upper packing member 60. This is disposed in alignment with a lower packing member 61. The two packing members 60 and 61 are shaped to fit around the transmission rod 44, so as to prevent the escape of gas along the rods. The lower packing member is mounted in the packing holder as illustrated, and a spring 62 holds it in position.

In order to accelerate the operation of the seal valves 38 and 39, a handle 63 is provided for actuating the plung-

er 58. The handle 63 is pivotally connected to a rigid link 64 so that it may be actuated to raise and lower the packing member 60. In this way the seal valves may be open to permit the insertion of the pipe cleaning tool and the joints of the power transmission line 44.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim as our invention:

1. In pipe cleaning apparatus for cleaning a gas line which has had a gap cut therein to provide an entry, without interrupting the flow of gas, in combination, a bypass for bridging the gap cut in the gas line and maintaining gas service, a branched fitting for connecting to the upstream end of the gas line, a filter for catching deleterious matter blown from the gas line, means for connecting one branch of the branched fitting to the filter, a pipe cleaning tool, means for advancing and operating the pipe cleaning tool through another branch of the branched fitting, and sealing valves connected to the branch of the branched fitting through which the cleaning tool is inserted and cooperative with said tool advancing and operating means to prevent the escape of gas.

2. In pipe cleaning apparatus for cleaning a gas line without interrupting gas service, the gas line having a gap cut therein providing an entry and temporarily dividing the gas line into an upstream section and a downstream section of the gas line, in combination, a branched fitting having a plurality of branches for connecting to the upstream section of the gas line, a valve for disposition in the downstream section of the gas line to prevent escape of gas, a filter having an intake opening and a delivery opening for collecting deleterious matter out of the gas passed through it, means for connecting one branch of the branched fitting to the intake opening in the filter, means for connecting the delivery opening of the filter to the downstream section of the gas line on the downstream side of the valve, a pipe cleaning tool, a power transmission line for advancing and actuating the tool, the tool and power transmission line being adapted for insertion through another branch of the branched fitting into the line, means for closing the branched fitting to the flow of gas around the power transmission line, means for operating the pipe cleaning tool through the transmission line to loosen deleterious matter deposited inside the gas line, the gas as it flows through the upstream section of the gas line serving to carry the deleterious matter loosened from the gas line to the filter where it is collected and from whence the clean gas flows on to the downstream section of the gas line to maintain gas service.

3. In pipe cleaning apparatus for cleaning gas lines without interrupting gas service, the gas line having a gap cut therein providing an entry and an upstream section and a downstream section, in combination, a bypass for bridging the gap in the gas line, a branched fitting for connecting to the upstream section of the gas line, a portable filter for collecting deleterious material expelled from the gas line, means for connecting one branch of the branched fitting to the portable filter, a pipe cleaning tool, a power transmission line for advancing and actuating the tool, the tool and power transmission line being adapted for insertion through another branch of the branched fitting into the line, means for closing the branched fitting to the flow of gas around the power transmission line, means for actuating and advancing the cleaning tool through the transmission line to loosen deleterious matter deposited inside the pipe line, the flow of gas in the pipe line serving to carry the deleterious matter loosened by the tool to the filter, the filter serving to collect the deleterious matter from the flowing gas.

4. In pipe cleaning apparatus for cleaning gas lines without interrupting gas service, the gas line having an entrance made therein dividing it into an upstream section and a downstream section, in combination, a branched fitting having a plurality of branches for connecting to the upstream section of a gas line having an entrance in it, a valve for disposition in the downstream section of the gas line, a filter having an intake opening and a delivery opening for collecting deleterious matter from the gas, means for connecting one branch of the branched fitting to the intake opening of the filter, means for connecting the delivery opening of the filter to the downstream section of the gas line on the downstream side of the valve, a pipe cleaning tool, a power transmission line for advancing and actuating the pipe cleaning tool, the tool and power transmission line being adapted for insertion through another branch of the branched fitting into the line, means for closing the branched fitting to the flow of gas around the power transmission line, means for operating and advancing the cleaning tool through the transmission line to loosen deleterious matter deposited on the inside of the pipe line, the loosened deleterious matter being blown from the gas line and carried to the filter by the flowing gas, the filter collecting the deleterious matter while permitting the continuous flow of gas to the downstream section of the gas line to maintain service and a bypass for connection from the upstream section of the line to the downstream section of the line to maintain gas service when the flow of gas through the filter is interrupted.

5. In pipe cleaning apparatus for cleaning gas lines without interrupting gas service, the gas line having an entrance made therein dividing it into an upstream section and a downstream section, in combination, a branched fitting having a plurality of branches, said fitting being adapted to be connected to the upstream section of a gas line into which an entrance is made, a valve for disposition in the downstream section of the gas line, a filter having an intake opening and a discharge opening for collecting deleterious matter from the gas as it flows, means for connecting one branch of the branched fitting to the intake opening in the filter, means for connecting the discharge opening of the filter to the downstream section of the gas line on the downstream side of the valve, a pipe cleaning tool, a power transmission line connected to the pipe cleaning tool for advancing and actuating it, a fitting through which the pipe cleaning tool and power transmission line is entered connected to a branch of the branched fitting, and a plurality of valves disposed in the fitting in spaced relation, the valves having slots therein for receiving the power transmission line, the valves being spaced far enough apart to receive the tool between them whereby one valve may be open to permit the insertion of the tool and then closed around the transmission line to prevent the flow of gas along the transmission line, and the other valve opened to permit the advance of the tool and then closed around the transmission line to cooperate in preventing the flow of gas along the power transmission line, the pipe cleaning tool serving to loosen the deleterious matter deposited on the inside of the gas pipe line, the flowing gas serving to carry the loosened deleterious matter to the filter.

6. In pipe cleaning apparatus for cleaning a gas line without interrupting gas service, the gas line having an entrance made therein dividing it into an upstream section and a downstream section, in combination, a branched fitting having a plurality of branches for connecting to the upstream section of the gas line, a filter having an intake opening and a delivery opening for collecting deleterious matter from the flowing gas, means for connecting one branch of the branched fitting to the intake opening in the filter, means for connecting the delivery opening of the filter to the downstream section of the gas line, a pipe cleaning tool, a power transmission line for advancing and actuating the pipe cleaning tool,

the tool and power transmission line being adapted for insertion through another branch of the branched fitting into the gas line, means for closing the branched fitting to the flow of gas around the power transmission line, means for operating the cleaning tool through the transmission line to loosen deleterious matter deposited on the inside of the pipe line whereby the flowing gas carries the deleterious matter from the pipe line to the filter where it is collected and the gas permitted to flow on to the downstream side of the pipe line to maintain service, a bypass for connection from the upstream section of the gas line to the downstream section, a filter disposed in the bypass to collect deleterious matter from the gas flowing through the bypass, the bypass serving to maintain service when the flow of gas through the filter connected to the branched fitting is interrupted.

7. In pipe cleaning apparatus for cleaning a gas line without interrupting gas service, the gas line having an entrance made therein dividing it into an upstream section and a downstream section, in combination, a branched fitting having a plurality of branches for connecting to the upstream section of the gas line having an entrance in it, a valve for disposition in the downstream section of the gas line, a filter having an intake opening and a delivery opening for collecting deleterious matter from the flowing gas, means for connecting one branch of the branched fitting to the intake opening of the filter, means for connecting the delivery opening to the downstream section of the gas line on the downstream side of the valve, a pipe cleaning tool, a power transmission line connected to the pipe cleaning tool for advancing and actuating it, the pipe cleaning tool and power transmission line being adapted for insertion through another branch of the branched fitting into the line, a fitting for giving entrance to the tool and power transmission line to a pipe section comprising a pipe fitting connected to a branch of the branched fitting, a plurality of valves disposed in the fitting in spaced relation, the valves having slots therein for passing the power transmission line, the valves being spaced far enough apart to receive the tool between them, whereby one valve may be opened to permit the insertion of the tool and then closed around the transmission line and the other valve also to permit the advance of the tool and then closed around the transmission line to provide for the insertion of the tool into the gas line in which the gas is flowing.

8. In pipe cleaning apparatus for cleaning a gas line without interrupting gas service, the gas line having an entrance made therein dividing it into an upstream section and a downstream section, in combination, a branched fitting having a plurality of branches for connecting to the upstream section of the gas line having an entrance in it, a valve for disposition in the downstream section of the gas line, a filter having an intake opening and a delivery opening for collecting deleterious matter from the flowing gas, means for connecting one branch of the branched fitting to the intake opening of the filter, means for connecting the delivery opening to the downstream section of the gas line on the downstream side of the valve, a pipe cleaning tool, a power transmission line connected to the pipe cleaning tool for advancing and

actuating it, the tool and power transmission line being adapted for insertion through another branch of the branched fitting into the line, a fitting for giving entrance to the tool and power transmission line to a pipe section comprising a pipe fitting connected to a branch of the branched fitting, a plurality of valves disposed in the fitting in spaced relation, the valves having slots therein for passing the power transmission line, the valves being spaced far enough apart to receive the tool between them, whereby one valve may be opened to permit the insertion of the tool and then closed around the transmission line and the other valve opened to permit the advance of the tool and then closed around the transmission line to provide for the insertion of the tool into the gas line in which the gas is flowing, and a tapered bearing connected to the pipe fitting for supporting the power transmission line centrally of the fitting to prevent the tool from hitting the fitting.

9. In pipe cleaning apparatus for cleaning a gas line without interrupting gas service, the gas line having an entrance made therein dividing it into an upstream section and a downstream section, in combination, a branched fitting having a plurality of branches for connecting to the upstream section of the gas line having an entrance in it, a valve for disposition in the downstream section of the gas line, a filter having an intake opening and a delivery opening for collecting deleterious matter from the flowing gas, means for connecting one branch of the branched fitting to the intake opening of the filter, means for connecting the delivery opening to the downstream section of the gas line on the downstream side of the valve, a pipe cleaning tool, a power transmission line connected to the pipe cleaning tool for advancing and actuating it, the tool and power transmission line being adapted for insertion through another branch of the branched fitting into the line, a fitting for giving entrance to the tool and power transmission line to a pipe section comprising a pipe fitting connected to a branch of the branched fitting, a plurality of valves disposed in the fitting in spaced relation, the valves having slots therein for passing the power transmission line, the valves being spaced far enough apart to receive the tool between them, whereby one valve may be opened to permit the insertion of the tool and then closed around the transmission line and the other valve opened to permit the advance of the tool and then closed around the transmission line to provide for the insertion of the tool into the gas line in which the gas is flowing, and a tapered bearing connected to the pipe fitting for supporting the power transmission line centrally of the fitting to prevent the tool from hitting the fitting, the tapered bearing for supporting the power transmission line being brass.

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