BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G82.650.1
Issue 2, June, 1959
AT&TCo Standard

SUCTION GAS INDICATOR
(AT-7823)

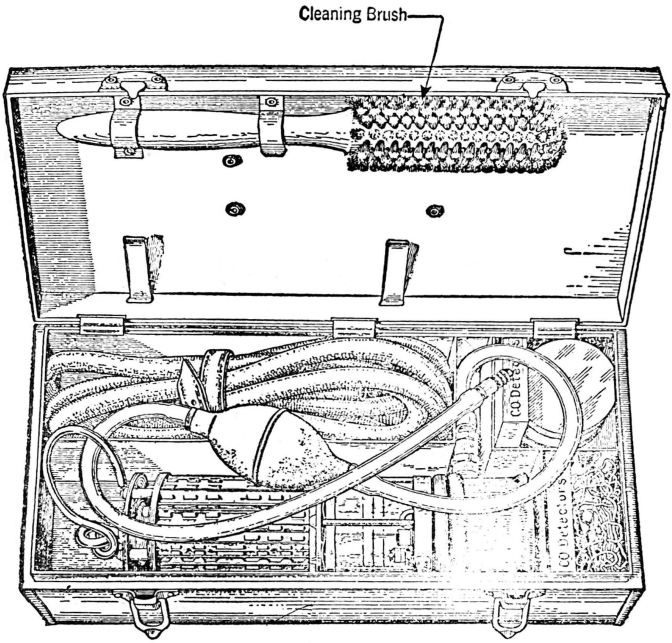
1. GENERAL

1.01 This section describes the Suction Gas Indicator (AT-7823) used in testing manholes and cable vaults for natural and similar type gases and oxygen deficiency.

1.02 The section has been revised to list additional items that have been made available as replacement parts and to advise that 1/2-pint and 1-quart cans are obtainable as optional parts.

2. DESCRIPTION

2.01 The Suction Gas Indicator, packed in its metal carrying case, is shown in the following illustration. There is sufficient space in the metal case for carrying the 1/2-pint fuel can.

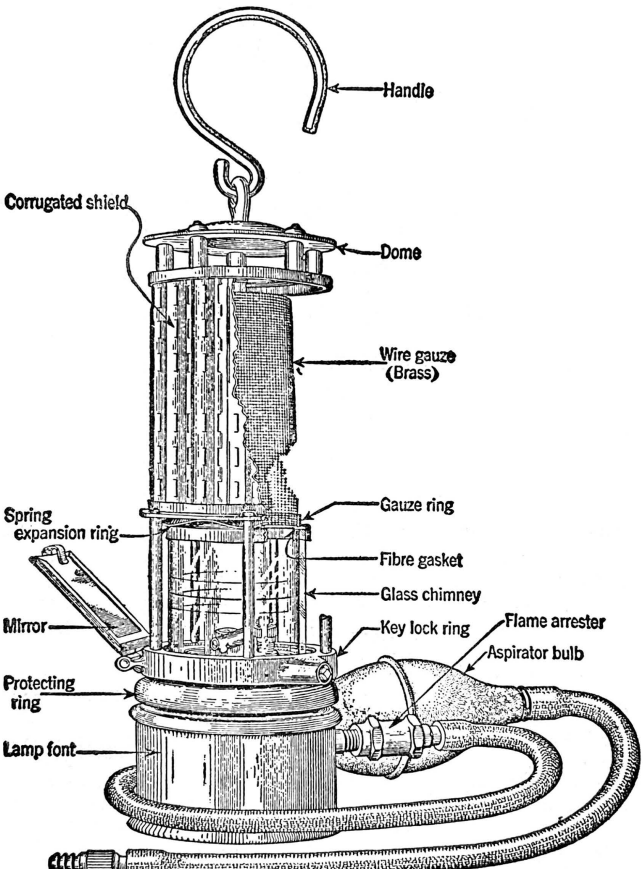


SPARE PARTS FURNISHED WITH SUCTION GAS INDICATOR

1 Glass Chimney **6** Fibre Gaskets **1** Metal Spark Pin **1** Capillary Screw Cleaner	Packed in circular carton

2.02 The indicator is an open flame type instrument designed for operation in normal air. A lighted indicator should not be lowered into a manhole under any circumstance because it would ignite inflammable gases. The indicator burns lighter fluid (the fuel used in cigarette lighters) and is equipped with a mechanical igniter for lighting the wick. An aspirator and a length of sampling hose are provided by means of which atmosphere can be drawn from the manhole through the combustion chamber.

2.03 The names of the various parts of the indicator are shown in the following sketch.



3. MAINTENANCE

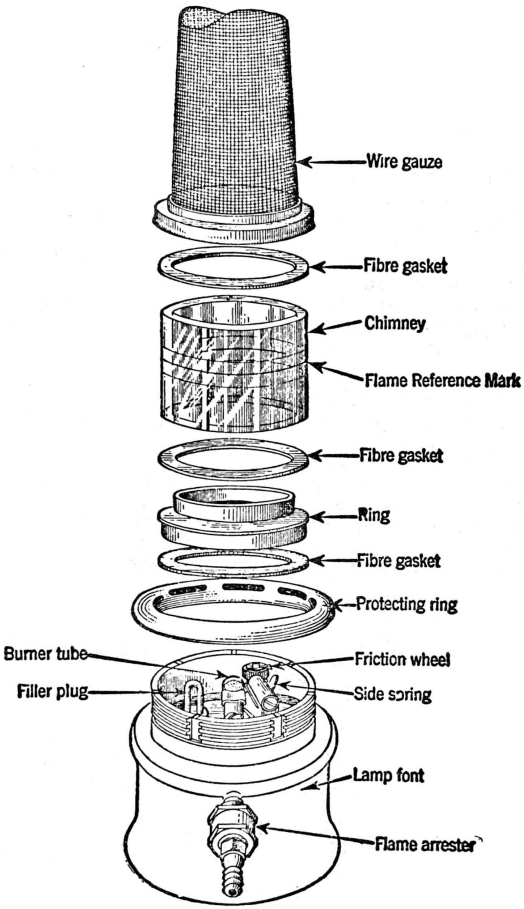
3.01 **Dismantling and Assembly:** To take the suction gas indicator apart for inspection or maintenance purposes, disengage the key lock ring with the key provided for this purpose. Hold the font firmly with one hand and unscrew the top portion from the font at the key lock ring by turning the top to the left with the other hand. After the top portion has been unscrewed from the font, raise it vertically until it clears the top of the wire gauze. Then, in order, remove the wire gauze, fibre gasket, glass chimney, fibre gasket, inner solid ring, fibre gasket and protecting ring. The instrument should be assembled in the reverse order. The important points to observe in assembling the indicator are:

(1) That all parts are in good condition.

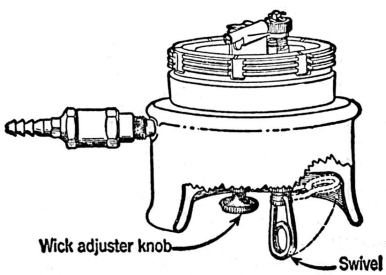
(2) That all parts are assembled in the correct order.

(3) That the font is screwed in place so as to ensure a tight fit between the glass chimney and the gaskets.

(4) That the top portion is locked in position with the key.


Wire gauze
Fibre gasket
Chimney
Flame Reference Mark
Fibre gasket
Ring
Fibre gasket
Protecting ring
Burner tube
Friction wheel
Filler plug
Side spring
Lamp font
Flame arrester

3.02 **Wick Adjuster:** The wick is adjusted by means of the wick adjuster knob located on the underside of the font. To raise the wick, turn the knob to the left and to lower it, turn the knob to the right.



3.03 **To Trim Wick:** Formation of crust on the top of the wick tends to obstruct the flow of fuel. In order to ensure flame stability, the wick should be trimmed whenever any appreciable quantity of crust accumulates. This should be done as follows: first raise the wick as high as possible by turning the wick adjuster knob. Trim the wick square, using a pair of scissors. After trimming, the wick should project about 3/8 inch above the wick stop. If not, the wick should be pulled through the wick holder as far as necessary using a pair of long-nose pliers.

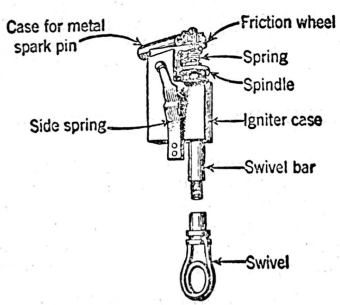
3.04 **Replacing Wick:** The wick can be replaced as follows: Remove the filler plug and then the cylindrical cotton spreader below the plug. With a pair of long-nose pliers, remove all of the cotton in the font. Then remove the wick stop with a pair of long-nose pliers as shown in the following sketch. Turn the wick adjuster knob to the left until the screw disengages the thread in the sleeve on the wick holder. The wick assembly can then be removed with the fingers. To install a wick, follow the above procedure in the reverse order.

3.05 **Igniter:** The metal spark igniter is shown in the following illustration. It can be removed from the font in the following manner:

(1) Swing the swivel into the vertical position and then push it up so as to raise the friction wheel and spark pin.

(2) Unscrew the swivel by turning it in a counter-clockwise direction.

(3) Press the side springs against the igniter case and then raise the unit vertically out of the pocket of the font.

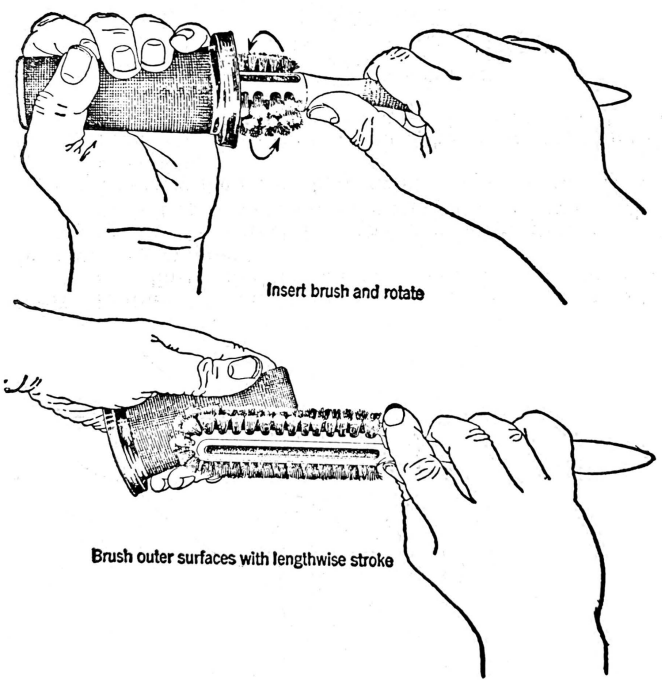


3.06 To operate the igniter, swing the swivel into the vertical position and push up on the swivel until the friction wheel and spark pin are on a level with the top of the burner tube. Turn the swivel to the right until a spark is obtained.

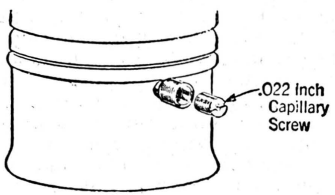
After the wick is lighted, the friction wheel and pin should be lowered by pulling down on the swivel, then swing the swivel into the horizontal position. If difficulty is experienced in obtaining sufficient spark to ignite the wick, turn the adjusting screw on the spark pin case so that the pin bears more firmly on the friction wheel, or examine the pin and replace it if it is worn.

3.07 **Wire Gauze:** The wire gauze should be kept free of dust, oil, soot or any other obstruction which would interfere with the circulation of air through the indicator. The gauze should be cleaned with the special brush provided. The brush will thoroughly clean the inside and outside of the gauze and should be used in the manner shown below.

METHOD OF CLEANING WIRE GAUZE

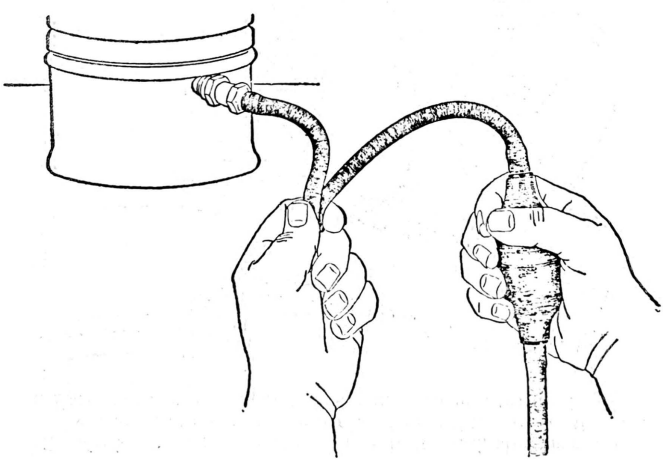


3.08 **Flame Arrestor:** The flame arrestor (shown in the figure in Paragraph 2.03) located between the nozzle and the font is provided to minimize the possibility of the flame or an explosion within the combustion chamber flashing back through the sampling hose. If difficulty is experienced in forcing air into the combustion chamber, it may be due to an obstruction of the capillary screw. To correct this, remove the flame arrestor with a wrench and then take out the capillary screw using a small screwdriver. The opening in the capillary screw should be cleaned using the Capillary Screw Cleaner and then replaced.

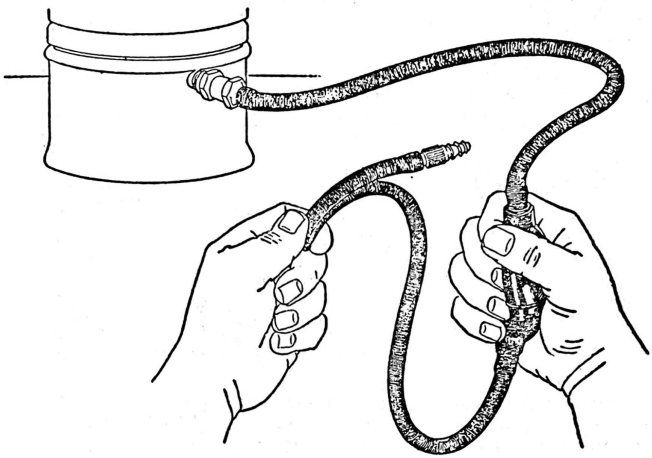


3.09 **Aspirator Bulb:** The bulb should be tested about once a week to determine whether the check valves are operating. It should be tested as follows:

(1) Kink the hose between the flame arrestor and the bulb, as shown below, and then press the bulb firmly. Difficulty should be experienced in compressing the bulb.



(2) Kink the hose between the bulb and the free end, as shown below, and compress the bulb, The bulb should inflate very slowly (not less than three minutes).



3.10 If the valves are not functioning properly, the aspirator bulb should be replaced.

3.11 **Refueling:** Lighter fluid should be used in the instrument. Treated or special gasoline should not be used. The filling hole is equipped with a screw plug which is shown in the figure in Paragraph 3.01. Before filling the font, remove the igniter and then fill with only enough fuel to saturate the cotton. After the font is filled, it should be turned upside down so that any excess fuel will drain. The outside surface of the font, including the pocket for the igniter, should be thoroughly dried with a cloth. This precaution is necessary because when the indicator becomes heated in use this excess fuel may evaporate and enter the testing flame thereby tending to give false indications.

3.12 The font will hold sufficient fuel to operate the indicator for approximately 10 hours. Under normal usage the font will require refueling about once a week. Before using an instrument which has not been in service for a week or more, or one that has been received from the supply department, ascertain whether refueling is required. To minimize evaporation of fuel when the indicator is not in use, the wick should be turned down so that it is below the top of the burner tube.

3.13 **Replacement Parts:**

Name	Manufacturer's No.
Arrester Assembly, Flame (Consists of Flame Arrester, Flame Arrester Housing and Nozzle)	2554
Arrester, Flame	2554A
Housing, Arrester, Flame	2554B
Nozzle, Arrester, Flame	2555
Bulb Assembly, Aspirator (Includes one Bulb, one Sampling Hose Nozzle and two lengths of Rubber Tubing)	2565
Bulb, Aspirator	2557
Nozzle, Hose, Sampling	2560
Tubing, Rubber (two required)	2558
Chimney, Glass	99amo
Cleaner, Screw, Capillary	2564
Gasket, Fibre	100amo
Gauze, Wire	24amo
Hose, Sampling, 12-foot	2559
Plug, Filler	13amo
Screw, Capillary	2556
Wick	53amo
Ring, Gauze	22amo
Mirror and Frame	2551
Mirror	2553
Screw, Frame, Mirror	2552
Brush, Gauze, Wire	3501
Key, Ring, Lock	34NV
Case, Indicator, Gas, Suction	2562
Screw, Lock	31NV
Igniter, Spark, Metal (Complete)	1520
Wheel, Friction	90ro
Spring, Wheel, Friction	88ro
Spring, Spiral	95ro
Screw, Adjusting, Igniter	94ro
Washer, Wheel, Friction	86ro
Pin, Cotter	93ro
Pin, Spark, Metal	1506

3.14 **Optional Parts:**

Can, Filling, Safety, Large (cap. 1 qt.)
Can, Filling, Safety, Small (cap. 1/2 pt.)

3.15 Orders for replacement or optional parts are worded as follows:

(Quantity) (Name of Part) for Suction Gas Indicator.

3.16 If the instrument cannot be repaired in the field, indicate on a tag provided, the repairs needed, and return the instrument in accordance with local instructions.