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PRECIPITATOR CHARGE INDICATOR

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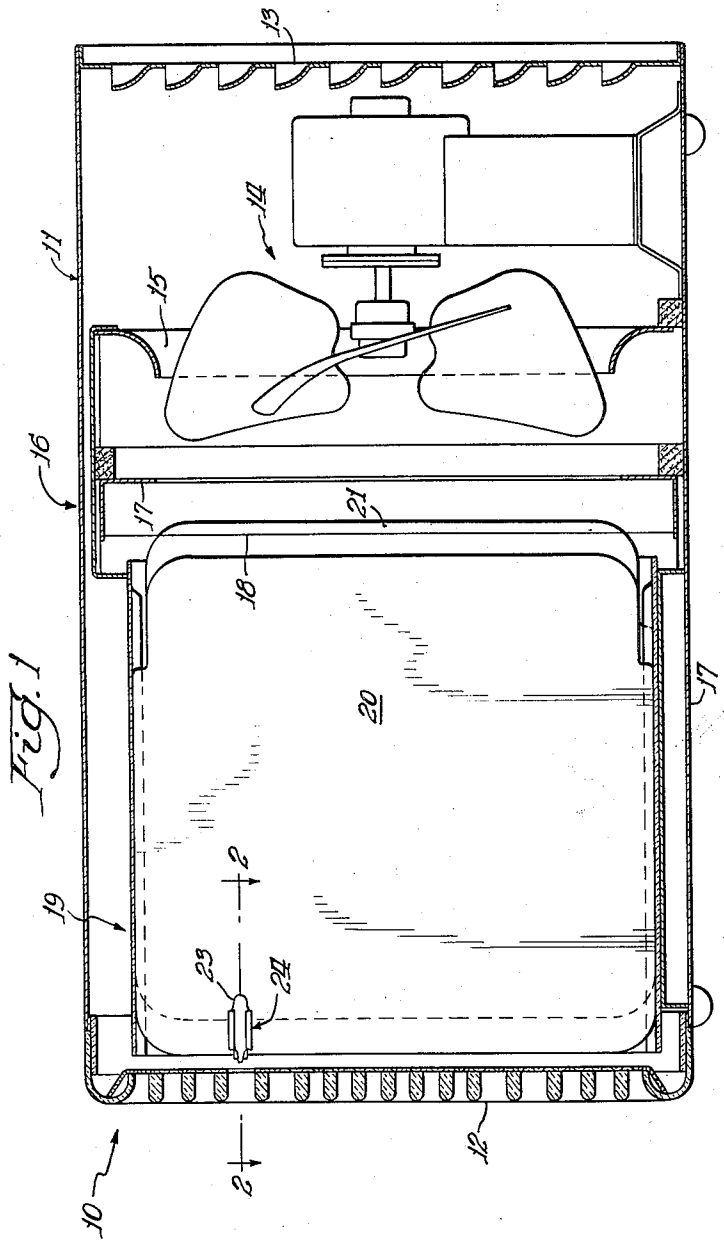


Fig. 1

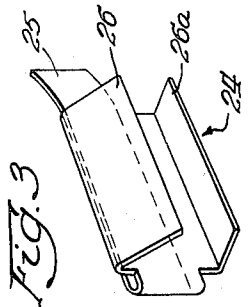


Fig. 3

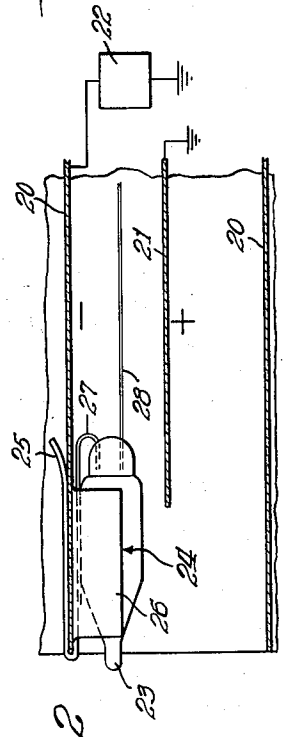


Fig. 2

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PRECIPITATOR CHARGE INDICATOR

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2 Claims. (Cl. 340—252)

This invention relates to electric precipitators for precipitating dust or smoke from the atmosphere. More particularly, the invention relates to precipitators of the type in which air to be cleaned is first ionized by an ionizing device and thereafter passed through a precipitating device comprising a plurality of parallel plates, alternate plates being charged in one polarity and intervening plates being charged in the opposite polarity. The invention is primarily concerned with an indicator for indicating the presence of a charge on the plates of the precipitating device. In precipitators of the type to which the invention relates, a power pack supplies a high voltage to the parallel plates of the precipitator. It is important to the user of the device to be sure that voltage is being supplied to the collecting plates at all times when the precipitator is in use. In the past, precipitators have used indicating lights or meters which indicated voltage on the low voltage side of the power pack. However it is possible that because of a broken connection or a bad vacuum tube, voltage would be indicated at the power pack but no voltage would be transmitted to the collecting plates and therefore there would be no charge upon them and the plates would not function as collectors of dust.

It is among the objects of the present invention to provide a small inexpensive indicator which can be readily attached to existing precipitators and will indicate the presence of or absence of a charge on the collector plates.

It is a further object of the present invention to provide a small inexpensive indicating device which will not use any appreciable amount of current.

A further object of the invention is to provide an indicator light using a standard neon glow lamp which is readily available from commercial sources and is very inexpensive. The above and other objects and features of the invention will be made fully apparent to those skilled in the art from a consideration of the following detailed description taken in consideration with the accompanying drawing in which:

Fig. 1 is an elevational view partly in cross-section of an electric precipitator showing our indicating device attached thereto.

Fig. 2 is an elevational view partly in cross-section taken on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of the holding clamp for the indicator light.

Referring to the drawing the reference numeral **10** indicates an electrical precipitator of a small size which is readily portable and is commonly designated as a room size precipitator. It comprises a cabinet **11** which encloses the device on the sides, a front grille **12** on one end and a rear grille **13** on the other. Adjacent the rear grille **13** is a fan **14** which operates in conjunction with a venturi **15** to move air through the precipitator. Adjacent the venturi **15** is an ionizing section **16** which comprises a frame **17** supporting a plurality of ionizing wires **18**. Air passes from the ionizing section **16** through a collector section **19** which comprises a plurality of spaced parallel metal plates **20** and **21**. The plates **20** are adapted

to be charged with a negative polarity and the plates **21** are adapted to be charged with a positive polarity by a power pack **22**. The power pack **22** may be of any standard design which will deliver a voltage of the order of 8,000 volts.

In operation air is pulled by the fan through the rear grille **13** and is propelled by the fan through the ionizing section **16** where the charge on the ionizing wires **18** places a charge on the dust particles in the air. The air then passes through the collector section where the particles are attracted to plates carrying a charge of the opposite polarity and the cleansed air then passes through the front grille **12** into the room.

The present invention provides an indication of a charge on the collector plates **20** and **21** by a small neon glow tube **23** which is supported on one of the plates **20** or **21**. As is shown more clearly in Fig. 2 the support **24** for the glow tube may comprise a single piece of spring-like conducting material preferably copper with one portion **25** formed to provide a clip for attaching the device to the plate **20** or **21** and a second portion **26** bent to provide two wings **26** and **26***a* which enclose the tube **23**.

The glow tube **23** is provided with two lead-in wires **27** and **28**. The lead-in wire **27** is pressed against the support **24** by the spring-like action of the wings **26** and **26***a* pressing the tube **23** into place. The lead-in wire **28** extends parallel to the collection plates **21** and **20** and is spaced mid-way between them. Lead-in wire **28** should be at least 1 inch in length in the precipitator described to give a stable discharge.

In operation the indicating glow tube **23** in its support **24** is positioned on the front of one of the collector plates in a position behind the front grille **12** where it can be seen from the outside of the cabinet. The lead-in wire **27** should contact a portion of the support **24** so that electrical contact is maintained between it and the plate **20**. The lead-in wire **28** should extend parallel to the collector plates **20** and **21** and should be positioned approximately mid-way between them so that an air space is maintained on each side of said wire. The lead-in wire **28** acts like a probe and when a charge is placed on plates **20** and **21** a corona discharge is produced at the probe **28** causing the neon glow tube **23** to light. In effect this corona discharge serves as a large dropping resistor to the neon bulb discharge so that sufficient current passes through the bulb to cause it to be activated and produce light. Although the device may be attached to either the positive or the negative plate it has been found that a direct connection to the negative plate produces a more stable corona discharge at the probe causing a more steady emission of light than the contrary arrangement wherein the bulb is supported on the positive plate.

When the electric precipitator is energized, if there is a charge on the plates **20** and **21**, the glow tube **23** will glow immediately and the user is assured that a charge is present. If for any reason the voltage to these plates should be discontinued or drop to a low value, the glow tube **23** will not emit light and the user is immediately warned that the device is not operating properly even though the fan **15** may be turning and the power pack may be drawing current.

The invention has been described with a neon glow tube and we prefer to use this type of tube because of its dependability and low cost. However, other types of gaseous discharge tubes may be used in place of the tube described.

While there has been herein described a preferred embodiment of the invention, other embodiments within the scope of the appended claims will be apparent to those skilled in the art from the consideration of the form shown and the text hereof.

What is claimed is:

1. A device for indicating a charge on the collector plates of an electrical precipitator having a plurality of spaced collector plates adapted to be charged with high voltage comprising a neon glow tube having two lead-in wires, a clip for attaching said tube on one of the collector plates so that its emitted light may be visible from outside of the precipitator, with one of said lead-in wires being electrically connected to said one collector plate and the other lead-in wire extending approximately mid-way between said one collector plate and an adjacent collector plate and parallel with said plates to act as a probe whereby visible light will be emitted by said tube when a substantial difference in voltage exists between said adjacent collector plates.

2. In an electrical precipitator having a plurality of spaced collector plates adapted to be charged, a device for indicating a charge on said plates comprising, a gas filled glow tube having lead-in wires, means to position said tube on one of said collector plates including a unitary clip of spring-like conducting material formed with a base having two wing portions extending forwardly

therefrom and normally urged together to enclose the tube and an elongated portion bent back from the base and normally urged toward the back of said base so that it may frictionally hold on said collector plate and with one of said lead-in wires being electrically connected to said one of said collector plates and another of said lead-in wires extending in the space between adjacent collector plates to act as a probe whereby the glow tube will emit light when a substantial difference in voltage exists between the adjacent collector plates.

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