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[54] **DEVICE FOR PASSING A CONDUCTOR THROUGH THE COVER OF AN ELECTRICAL PRECIPITATION APPARATUS**

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[52] **U.S. Cl.** ..... **174/31 R**, 55/146, 174/31.5, 174/211

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[58] **Field of Search** ..... 174/11 BH, 12 BH, 174/14 BH, 15 BH, 16 BH, 17.06, 18, 31 R, 31.5, 139, 211; 55/146

[56] **References Cited**

UNITED STATES PATENTS

3,595,983 7/1971 Muller et al. 174/31.5

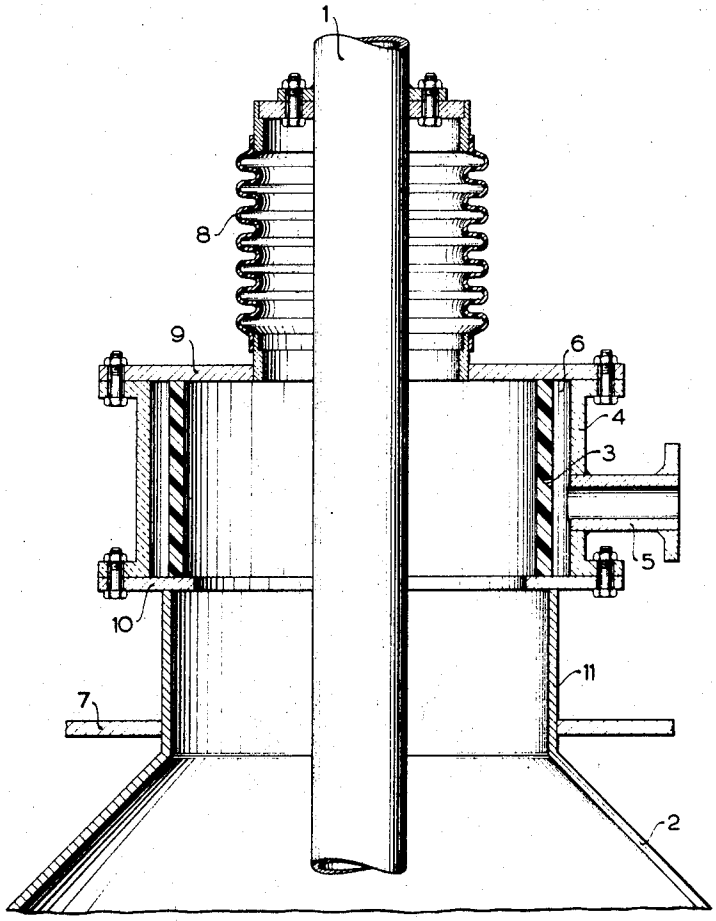
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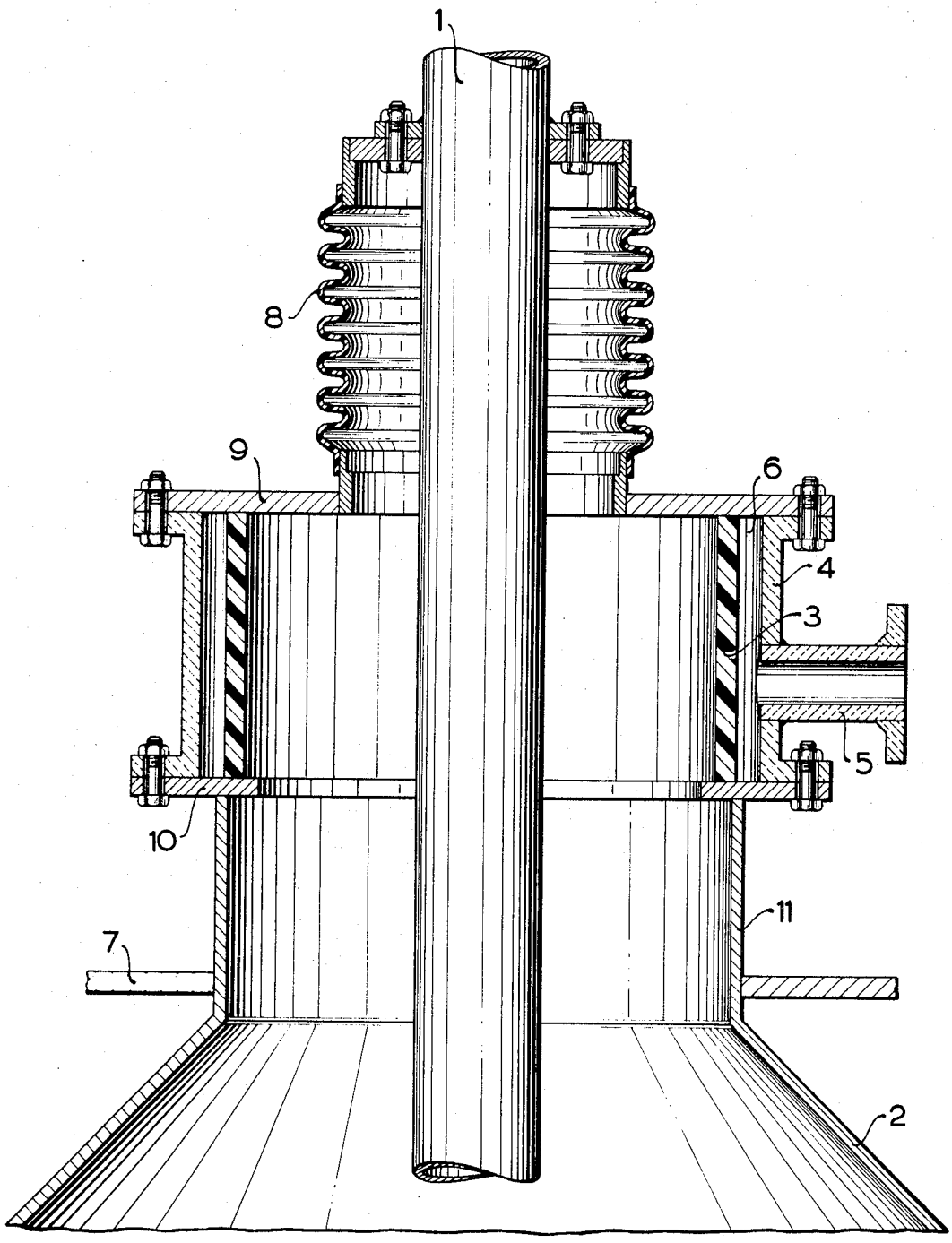
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[57] **ABSTRACT**

Improved lead-in device passing a conductor through the cover of an electrical precipitation apparatus down to its spray system. The improved device is characterized in that a porous insulator is used as the insulator and a gas-tight insulating cylinder concentrically surrounds the porous insulator. The device is further fitted with a tubular gas inlet opening into the porous insulating cylinder. The upper and lower ends of the insulator and the insulating cylinder, respectively, are connected together by annular metal plates so as to form a space therebetween, and the space is occupied by a sealing gas maintained at a relatively higher pressure than that prevailing inside the electrical precipitation apparatus.

4 Claims, 1 Drawing Figure




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DEVICE FOR PASSING A CONDUCTOR THROUGH THE COVER OF AN ELECTRICAL PRECIPITATION APPARATUS

The present invention provides a device passing a conductor through the cover of an electrical precipitation apparatus.

U.S. Pat. No. 3,595,983 describes a device for passing a conductor through the cover of an electrical precipitation apparatus down to its electrode system, the conductor being concentrically surrounded by a duct arranged to run through the cover of the electrical precipitation apparatus to the interior of the said apparatus, wherein the conductor is surrounded near its supper end by an insulator; the said insulator being positioned above the cover of the said apparatus so as to be radially spaced from the conductor, wherein an insulating bush is secured to the conductor at a position near the said insulator, and wherein the said insulating bush is surrounded by a barrier disk so as to leave a slit between itself and the barrier disk, the space left above the barrier disk being occupied by a sealing gas maintained under overpressure with respect to the pressure prevailing inside the electrical precipitation apparatus.

Upon the occurrence of undue pressure variations in the electrical precipitation apparatus, the sealing gas present in the duct is compressed and dust-containing gas can escape from the electrical precipitation apparatus and affect the insulating elements (insulating bush, barrier disk, insulator) with the resultant formation of electrically conducting material on said insulating elements. This in turn may result in electrical flashing over. The present invention now provides an improved device for passing a conductor through the cover of an electrical precipitation apparatus down to its electrode system, characterized in that the conductor passes centrally through a porous insulator; the said insulator being concentrically surrounded by a gas-tight insulating cylinder, the said insulating cylinder, being provided with a tubular gas inlet opening thereinto, the upper and lower ends of the said insulator and the said insulating cylinder, respectively, being connected together by annular metal plates so as to form a space therebetween, said space being occupied by a sealing gas delivered through said tubular gas inlet and maintained under overpressure with respect to the pressure prevailing inside the electrical precipitation apparatus.

Further preferred features of the device of the present invention, which can be used singly or in combination, provide;

a. for the said insulator to be made of porous polytetrafluoroethylene;

b. for the porous polytetrafluoroethylene to have pores with a diameter between 40 and 60 microns, preferably 50 microns.

The invention will now be described with reference to the accompanying drawing, of which the single FIGURE is a side elevational view of the device of the present invention.

As can be seen, a conductor **1**, i.e., the upper portion thereof, is surrounded by a bellows **8**, of which the upper end is connected to conductor **1**, e.g., by bolts, and of which the lower end is secured to an annular metal plate **9**. Further secured to annular metal plate **9** are a porous insulator **3** and an insulating cylinder **4** concentrically surrounding porous insulator **3**. A tubular gas inlet **5** opens into insulating cylinder **4**. The lower ends of porous insulator **3** and insulating cylinder **4** are connected together by means of an annular metal plate **10** so as to form an annular space **6** between and bounded by porous insulator **3**, annular metal plates (**9**, **10**) and insulating cylinder **4**. Placed below metal plate **10** is a cylindrical connection **11** and secured thereto are a cover **7** of a sealing cup and its associated diving bell **2**.

Sealing gas, which is introduced under a pressure of substantially **1** atmosphere (gauge) into space **6**, through tubular gas inlet **5**, flows through the pores of porous insulator **3** and produces a continually renewing gas film on the surface of porous insulator **3** facing conductor **1**. As a result, electrically conducting material is prevented from depositing on porous insulator **3**.

The consumption of sealing gas in the device of the present invention is very low, due to the dimensions selected for the pores (50 microns, for example).

We claim:

1. A lead-in device passing a conductor through the cover of an electrical precipitation apparatus down to its spray system, characterized in that the conductor passes centrally through a porous insulator; the said insulator being concentrically surrounded by a gas-tight insulating cylinder; the said insulating cylinder being provided with a tubular gas inlet opening thereinto; the upper and lower ends of the said insulator and the said insulating cylinder, respectively, being connected together by annular metal plates so as to form a space therebetween, and said space being occupied by a sealing gas maintained at a relatively higher pressure than that prevailing inside the electrical precipitation apparatus.

2. The device as claimed in claim **1**, wherein the said insulator is made up of porous polytetrafluoroethylene.

3. The device as claimed in claim **2**, wherein the porous polytetrafluoroethylene has pores with a diameter between 40 and 60 microns.

4. The device as claimed in claim **3**, wherein the porous polytetrafluoroethylene has pores with a diameter of 50 microns.

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