

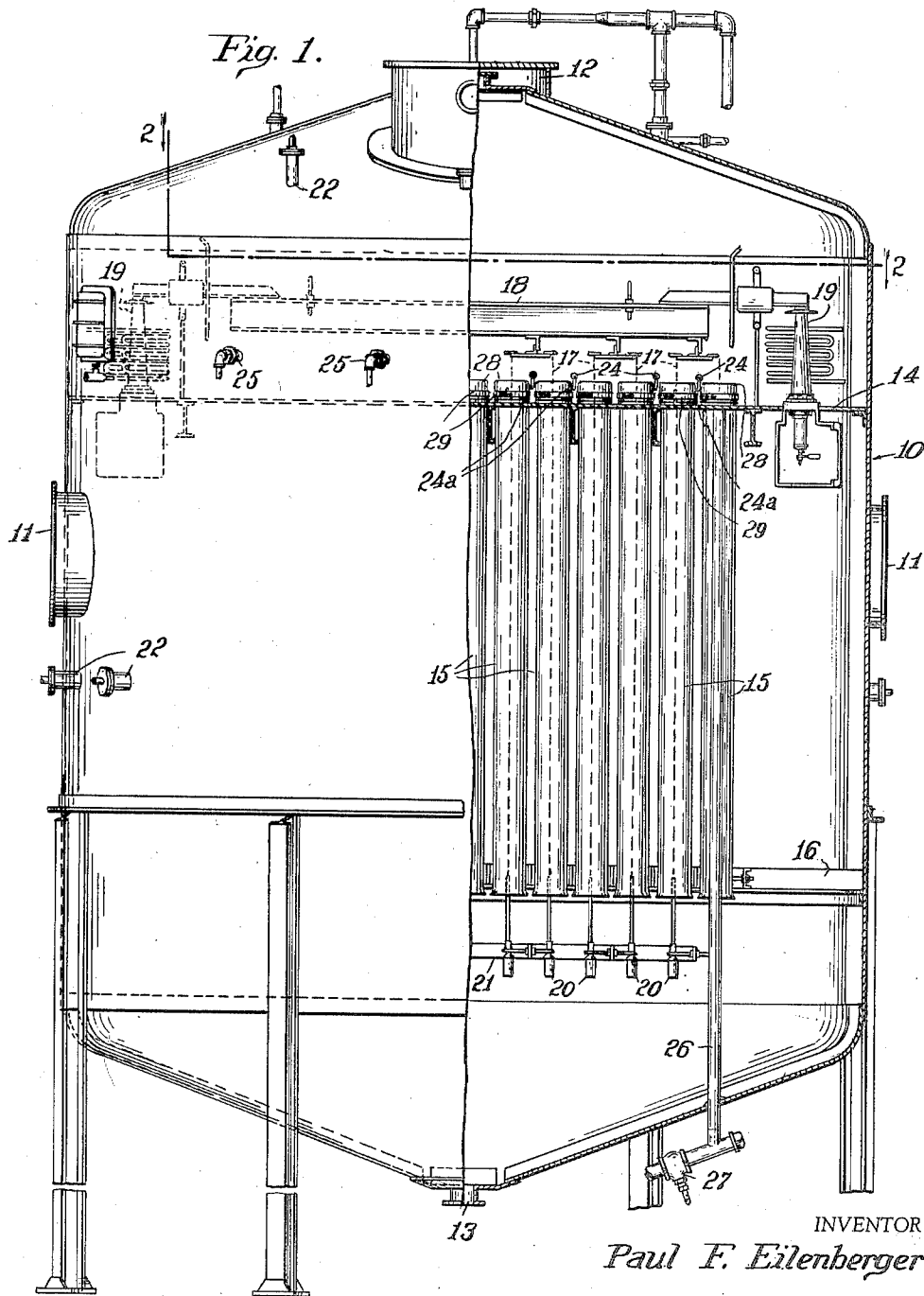
Feb. 1, 1955

P. F. EILENBERGER
ELECTRICAL PRECIPITATOR

2,701,028

Filed Oct. 31, 1951

3 Sheets-Sheet 1



INVENTOR
Paul F. Eilenberger

BY *Stowell & Evans*

ATTORNEYS

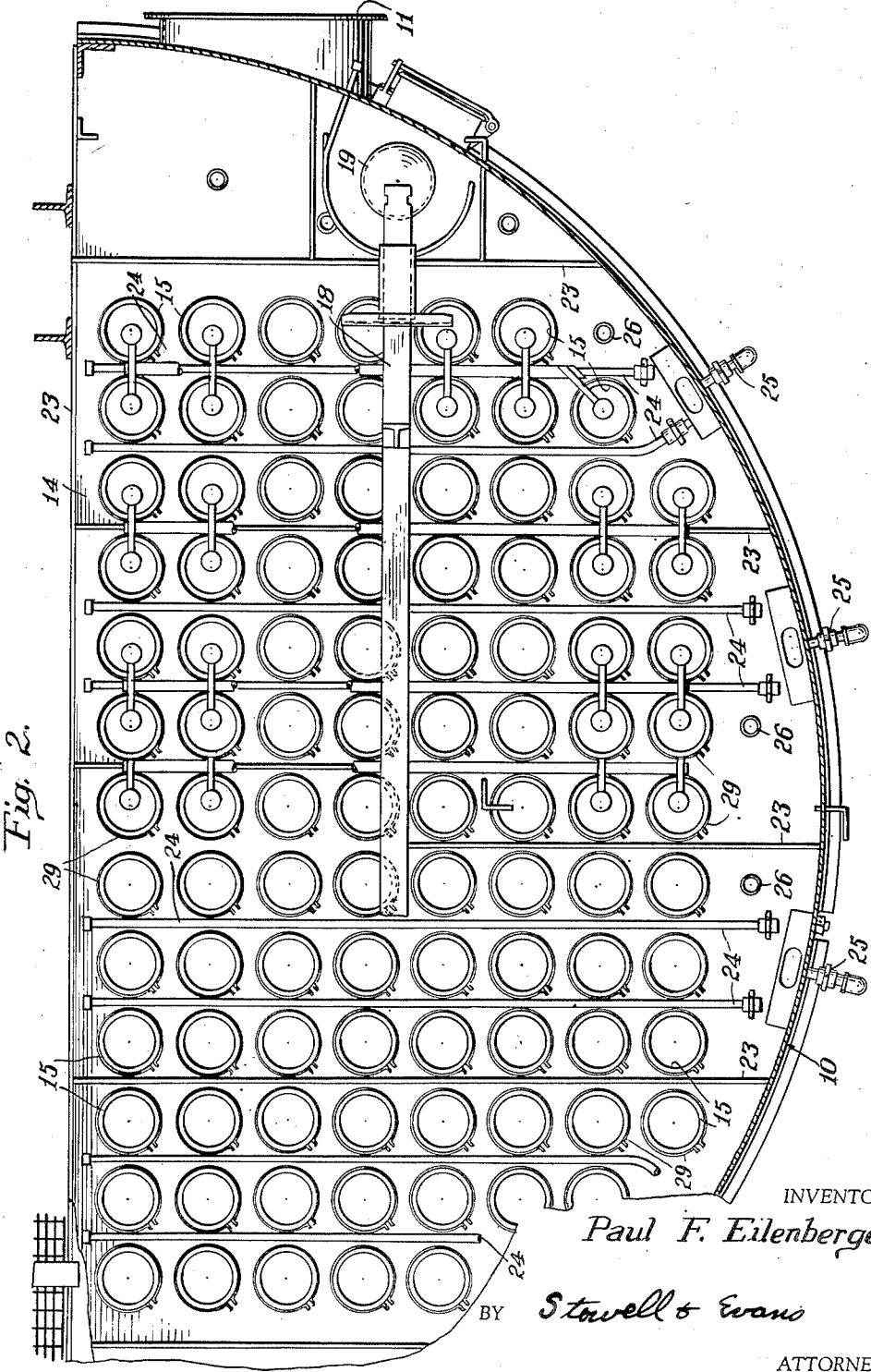
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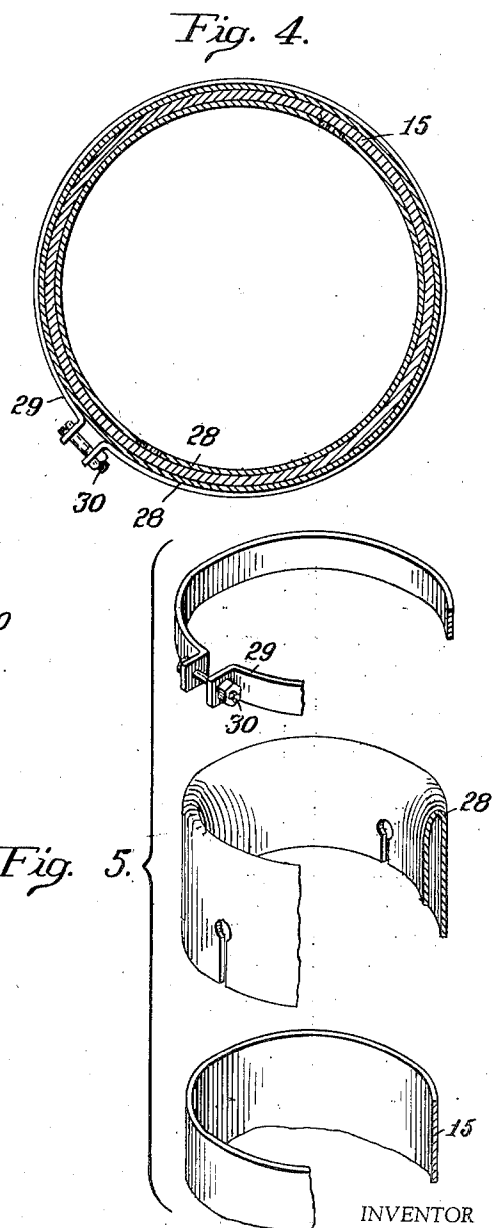
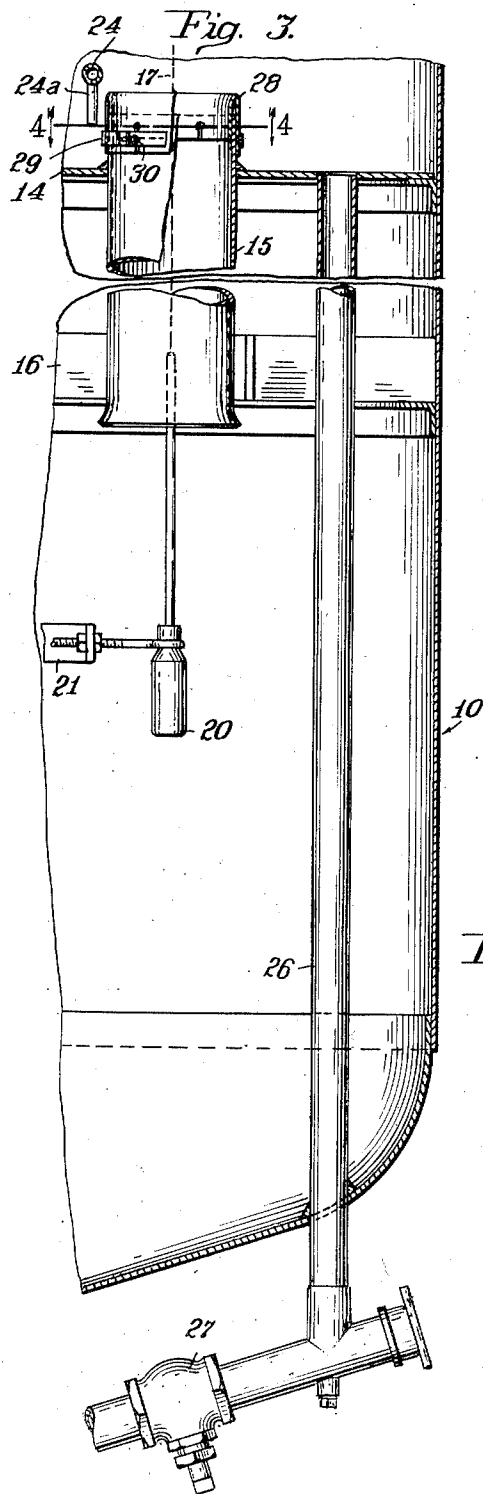
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INVENTOR
Paul F. Eilenberger

BY *Stowell & Evans*

ATTORNEYS

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ELECTRICAL PRECIPITATOR

Paul F. Eilenberger, Plainfield, N. J., assignor to Research Corporation, New York, N. Y., a corporation of New York

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3 Claims. (Cl. 183—7)

This invention relates to electrical precipitators and particularly to electrical precipitators having liquid flushed collecting electrodes.

An electrical precipitator construction having liquid flushed collecting electrodes is described in United States Patent 1,968,334 to A. N. Crowder in which vertical tubular collecting electrodes are supported in a horizontal header sheet near their upper ends forming a container for a liquid pool around the upper ends of the tubes from which liquid flows down the inside surfaces of the tubes. This form of construction has been very successful in practice, but the accurate adjustment and leveling of the upper ends of the tubes to insure substantial equal supply of liquid to each tube and uniform flow of liquid down the inner surfaces of the tubes has been troublesome and time-consuming.

A principal purpose of the present invention is to provide an electrical precipitator construction of the liquid flushed type in which the difficulties in adjusting and maintaining the level of the upper ends of the collecting electrodes is greatly minimized.

This is accomplished in the precipitator of the invention by providing readily adjustable weir members on the upper ends of the collecting tubes whereby leveling of the overflow edges may be effected without altering the position of the tubes, so that the tubes may be welded or otherwise firmly positioned in the header sheets when the precipitator is erected, making the final adjustments of level after construction, and as required during operation, by altering the position of the weir members.

This and other features and advantages of the invention will be more fully described with reference to the accompanying drawing in which:

Fig. 1 is an elevation in partial section of an electrical precipitator embodying the principles of the invention;

Fig. 2 is a fragmentary horizontal section on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary enlarged section of a portion of the precipitator of Fig. 1;

Fig. 4 is an enlarged horizontal section on line 4—4 of Fig. 2 through the upper end of a collector tube provided with the adjustable weir member of the invention; and

Fig. 5 is an exploded perspective view showing the parts of the weir member.

In the drawings, 10 is the shell of a precipitator provided with gas inlets 11, a gas outlet 12 and a drain 13. A horizontal header sheet 14 divides the shell into a lower inlet space and an upper outlet space. Mounted in the header sheet 14 are a plurality of tubular collecting electrodes 15, which are positioned at their lower ends by structural grid members 16.

Discharge electrode wires 17 are centrally suspended in the collecting electrode tubes from beams 18 carried on insulating bushings 19 through which the discharge electrode system is energized. The discharge electrodes are maintained taut by weights 20 at their lower ends which are positioned by grid members 21.

Spray nozzles 22 are positioned about the upper portion of the shell and also in the sides thereof.

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The collecting electrode tubes 15 are tightly welded into header plate 14, which forms with the walls of the shell 10 a pond adapted to hold a pond of water about the upper ends of the tubes. To simplify the leveling problem in large precipitators the pond is advantageously divided into a plurality of smaller ponds by partitions 23. The ponds are supplied with water by feeder pipes 24 which are provided with downwardly extending outlets 24a spaced across the ponds. Flushing boxes 25 are provided along the outer walls for washing out the ponds periodically, the flushing water being drained through the drainpipes 26 which are provided in each of the ponds. By opening the drain plugs 27 and operating the overhead sprays, the ponds can be quickly cleaned of accumulations of sediment.

Mounted on the upper edge of each collecting electrode tube is an adjustable weir comprising an annular U-shaped member 28 and a clamping ring 29. As shown more particularly in Figs. 4 and 5, the U-shaped weir member has inner and outer skirts which fit over the upper ends of the tubes 15. The skirts are slotted to aid in fitting the weirs to the tubes. When the upper edges of the weirs 28 are set at the proper level, the weirs are firmly held in place by tightening the bands 29 by means of bolts 30. Instead of using bolts, snap rings may be used. While desirable, the bands 29 are not essential, as the weirs 28 may be made to fit tightly enough on the tubes to maintain the positions in which they are placed by the spring action of the slotted skirts.

The upper edge of weirs 28 are preferably bent outwardly to reduce the possibility of electrical discharge therefrom.

I claim:

1. In an electrical precipitator including a horizontal header, means cooperating with said header to provide a reservoir for washing liquid, and a plurality of vertically disposed tubular collecting electrodes projecting through said header and joined thereto by a gas and liquid tight joint, adjustable weirs on the top ends of the tubular collecting electrodes comprising spaced concentric cylindrical skirt members joined at their upper ends to define an annulus having a U-shaped cross section, at least the outer of said skirt members having axially extending slots in the lower end thereof, said skirt members being spaced apart to accommodate the upper portions of the tubular collecting electrodes, and fastening means adapted to urge the outer of said skirt members against the outside of the tubular collecting electrodes.

2. A weir comprising spaced concentric cylindrical skirt members joined at their upper ends to define an annulus having a U-shaped cross-section, at least the outer of said skirt members having axially extending slots in the lower end thereof and means for exerting an inwardly directed tightening force on the outer of said skirt members.

3. A weir comprising spaced concentric cylindrical skirt members joined at their upper ends to define an annulus having a U-shaped cross-section, at least the outer of said skirt members having axially extending slots in the lower end thereof, a band around the outer of said skirt members, and fastening means for tightening the band against the outer of said skirt members.

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