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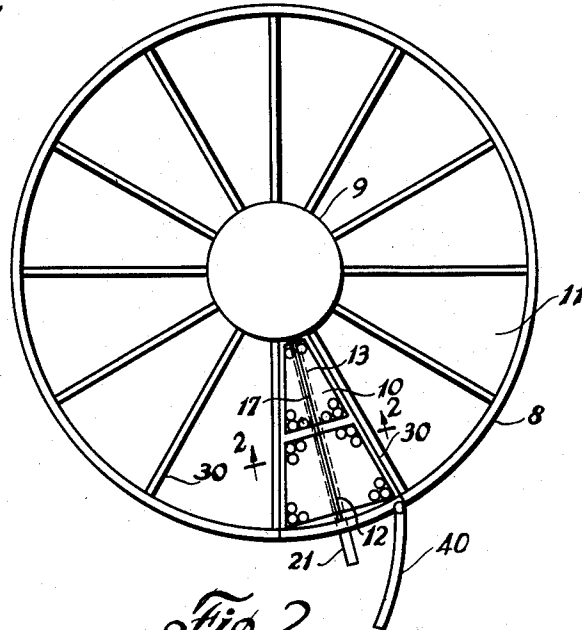
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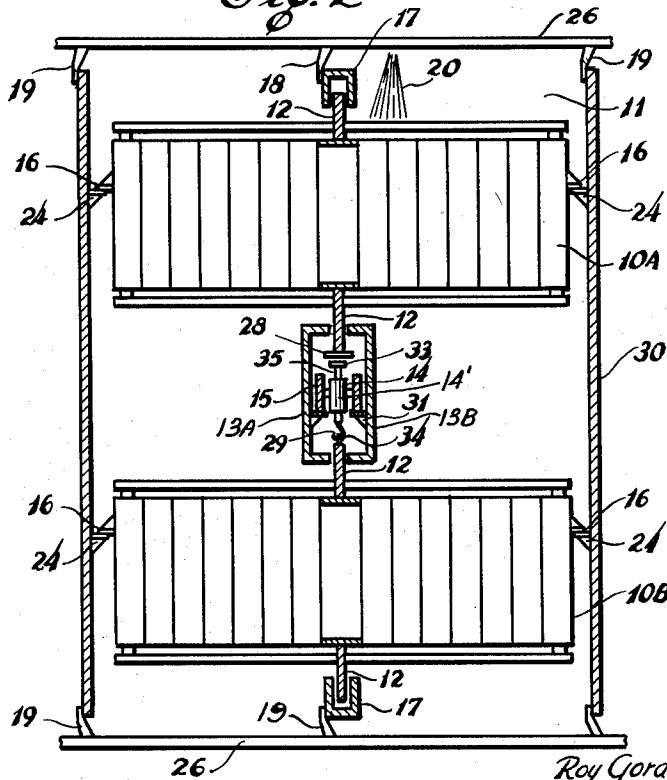
DRAWER REMOVAL FOR PRECIPITATOR ELECTRODES AND COLLECTORS

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*Fig. 1*



*Fig. 2*



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## DRAWER REMOVAL FOR PRECIPITATOR ELECTRODES AND COLLECTORS

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5 Claims. (Cl. 183—7)

This invention relates generally to gas cleaners of the electrical precipitation type and more particularly to an improved construction and arrangement whereby heavy drawers or baskets of precipitator electrode and collector elements may be easily lifted and removed from their support means on the frame structure of a rotary precipitator.

In the accompanying drawings:

Figure 1 diagrammatically shows a circular type precipitator in plan view.

Figure 2 shows a sectional elevation of the precipitator structure as seen from 2—2 of Figure 1.

In the drawing Figure 1 illustrates a stationary cylinder or a rotor having a series of abutting sector shaped "drawers" of cleaning elements positioned inside a cylindrical housing 8 and outward from a central post 9 or rotor axis to form an annular body adjacent one end of the post. Adjacent the other end of the rotor post 9 and spaced from said first named annular body is a second annular structure embodying the same composite formation as the first named annular body as illustrated in Figure 2.

Wedge or sector shaped drawers of collecting elements 10 fit into compartments of like configuration formed between radial diaphragms 30 which are axially fixed to the rotor post 9. Supporting strips or runners 16 are connected to the sides of sector shaped drawers 10 and are disposed to cooperate with strips or tracks 24 on the sides of the diaphragms so as to provide a pair of support members on which each drawer may be carried during the period of precipitator operation.

Removing dust deposits from collecting tubes is readily accomplished by subjecting the space between two diaphragms to a blast of purge gas 20 emanating from any suitable diffusion means located between the sector plate 26 and drawers 10. To reduce purge gas consumption and power necessary to purge the precipitator of collected particles, the sector shaped drawers may be subdivided into smaller units by the intermediate diaphragms 12 which halve the purge gas required for the larger sectors. Furthermore, the intermediate diaphragms 12 serve as points of contact whereby superimposed baskets may be simultaneously contacted and raised from their supports on the sides of the diaphragms before being withdrawn from the precipitator for servicing.

A box type beam 13 is fixed to the post 9 between upper and lower drawers 10A, 10B and projects radially outward from housing 8 in the manner shown by Figure 1. Beam 13 comprises a pair of juxtaposed channel members 13A and 13B spaced from each other a distance slightly greater than the width of intermediate diaphragm 12 so as to permit the end edges of said diaphragms to extend into the space between adjacent channels. An elongated strip 28 is fixed perpendicularly to the end edge of the upper diaphragms 12 which extends downward between the channel comprising the beam 13 and hook means 29 is fixed to upper edge of lower diaphragm 12 which extends upward between channels com-

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prising said beam. Attached to the inside wall of each channel member and extending radially from the rotor post to the outer extremity of each said channel member is a support member 31, adjacent support members together comprising a pair of parallel tracks permitting a hydraulic lifting device 14 including a standard pressure cylinder 14' mounted on wheels 15 to be rolled over said tracks radially inward or outward.

The lifting device 14 is of standard construction having an abutting platform 33 on top plunger 35 to contact plate 28, and a hooking means 34 on a lower plunger for engaging a hook 29 on said lower diaphragm 12. When actuated by any suitable outside source a pressure fluid, the plunger 35 raises and contacts the member 28 on upper diaphragm 12 and the hook member 34 on the lower plunger simultaneously raises and engages the hook 29 on lower diaphragm 12. Further actuation of the lifting mechanism 14 raises the upper and lower drawers and separates the supporting strips 16 from the strips 24. When drawers 10 are both raised off the support strips 24, their entire weight is carried by wheels 15 fixed to sides of the lifting device and resting upon the tracks 31 on the inside walls of the box beam 13. It is usually desirable that one such lifting device be positioned near the radial inner and one near the radial outer extremity of the sector shaped drawers, so that when actuated, the lifting devices will raise the drawers evenly off the supports 24. When raised off said supports, the drawers may be easily pulled out of their respective sector shaped compartments manually or by any suitable pulling device.

Before a drawer is removed from its compartment within the rotor, an extension 21 is temporarily bolted or otherwise secured to the outer end face of beam 13 to provide an extended support for the element drawers as they are drawn outside the rotor housing. To prevent canting of the drawer assemblies during the period when they are supported solely on the beam 13, channel members 17 are fixed radially outward from the rotor post so they may serve as fixed guide means for portions of the partitions 12 which extend into the space between element drawers and their adjacent end plates.

Secured to the radial edges of the diaphragms 30 and the radially extending guide channels 17 are radial sealing strips 19 arranged so as to contact the end of sector plates 26 as the rotor assembly turns on its axis, if a rotary precipitator device is utilized. Such sealing strips at both ends of the rotor eliminate, to a large degree, leakage of purge gas from the sector being cleaned during the purging operation.

When it is desired to remove a drawer assembly from the precipitator housing for servicing or repair, the rotor is turned until the drawer to be removed coincides with a door 40 or temporary opening in the precipitator housing. The extension 21 to box beam 13 is then fixed outwardly thereto and the lifting means 14, 15 is placed on the tracks 31 so that it may be rolled into operative contact with the hooking means on lower diaphragm 12. Hydraulic pressure is applied to the lifting means from any suitable source of such pressure so that plunger 35 raises to bring platform 33 into contact with strip 28 and hook 34 into engagement with hooking means 29. Additional hydraulic pressure applied to the lifting means raises the drawers 10 entirely off their supports 24 so that said drawers may readily be withdrawn from the rotor.

The permanently positioned beam members 13 and 17 are structurally strong and yet they offer a minimum of obstruction to gas flowing through the precipitator, and they do not in any way obstruct the blast of purge gas as schematically indicated by numeral 20 in its traverse of the collecting tubes.

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It is obvious also that the above defined permanent members assist in insertion as well as removal of element drawers, so that outage time required for maintenance or repair of a precipitator so equipped is substantially reduced.

What I claim is:

1. In a rotary electrostatic gas cleaning apparatus comprising a housing enclosing a cylindrical rotor having an axially extending rotor post; a plurality of spaced diaphragm plates extending radially outward from the rotor post and forming therebetween a series of sector shaped compartments; a box beam centrally positioned in each compartment and extending radially outward from the rotor post to the peripheral edge of the rotor; upper and lower sector shaped drawers of collecting elements fitted into adjacent compartments to form annular banks of collecting elements above and below the radially extending box beams; support shoulders on said diaphragm walls supporting said element drawers; intermediate diaphragm members radially bisecting the sector shaped drawers of collecting elements; and lifting means supported by said box beam arranged to apply a lifting force to the intermediate diaphragm members of superimposed element drawers whereby said drawers may be raised off their support shoulders and moved radially with respect thereto.

2. In an electrostatic precipitator as defined in claim 1 channel means fixed to said rotor post and positioned

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radially outward therefrom adjacent the extremities of said rotor post to provide guide means limiting tilting movement of the element drawers during their removal from or insertion into rotor compartments.

3. In an electrostatic precipitator as defined in claim 2 said channel means positioned to cooperate with radially extending edges of said partitions to provide guide means for said drawers.

4. In an electrostatic precipitator as defined in claim 1 said box beam comprising a pair of facing channel members providing a permanent support structure for said lifting means.

5. In an electrostatic precipitator as defined in claim 1 wherein said lifting means operatively engages axially displaced portions of the intermediate diaphragm members which extend into axially opposite sides of said box beam.

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