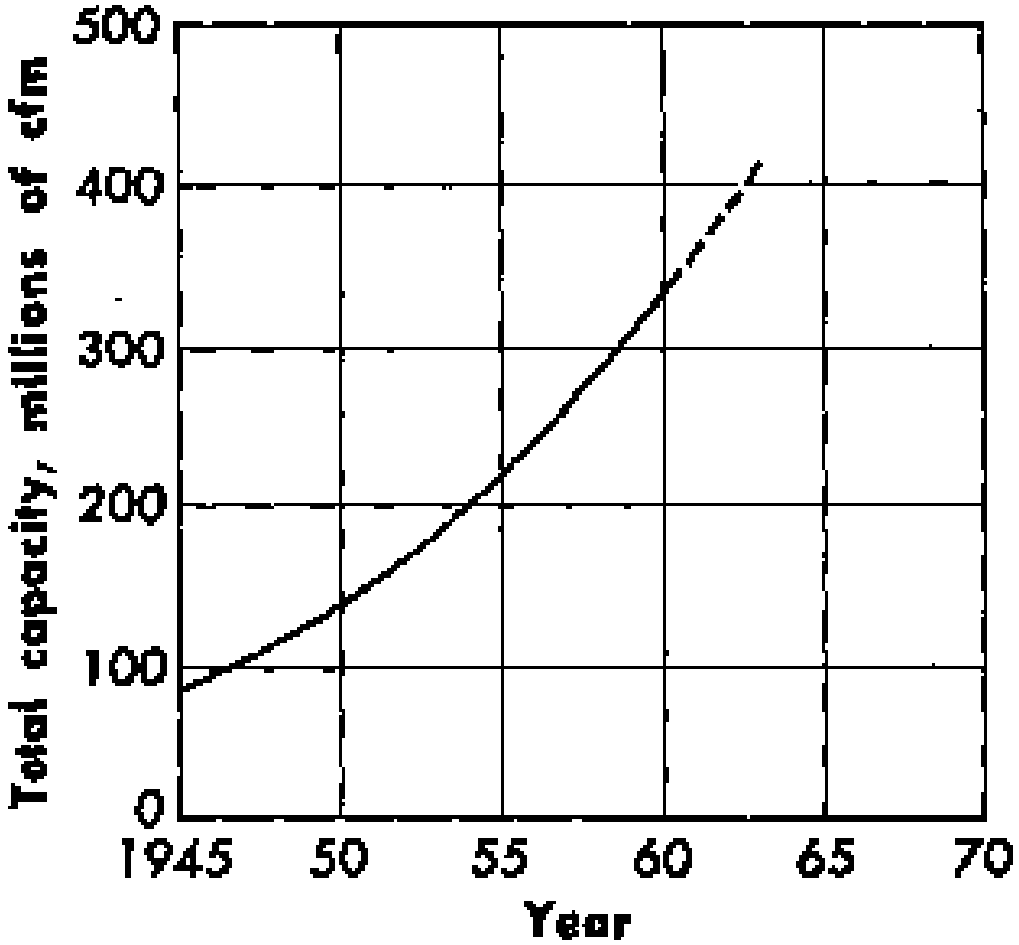
500
400
300
200
100
0
Total capacity, millions of cfm
1945
50
55
60
65
70
Year

TABLE 1.1

SUMMARY OF UNITED STATES PRECIPITATOR INSTALLATIONS IN MAJOR FIELDS OF APPLICATION, 1907–1962

Application	First installation	Total number precipitators	Total gas flow, million cfm	
Electric-power industry (fly ash)	1923	880		230
Metallurgical:				57
Copper, lead, and zinc	1910	240	17	
Steel industry	1919	400	33	
Aluminum smelters	1949	100	7	
Cement industry	1911	250		34
Paper mills	1916	200		23
Chemical industry	1907	640		12
Detarring of fuel gases	1915	600		5
Carbon black	1926	50		3
Grand total		3360		364

TABLE 1.2

RANGE OF PRECIPITATOR OPERATING CONDITIONS

Gas flow	1 cfm to over 3,000,000 cfm
Gas temperature	to 1200°F
Gas pressure	to 150 psi
Gas velocity	3 to 15 ft/sec for most applications; 25 to 50 ft/sec for a few special air-cleaning units
Draft loss	0.1 in. to 0.5 in. w.g.
Particle size	0.1 to 200 + μ
Particle concentration	0.0001 to 100 grains/ft^3
Particle composition	no basic limit; solid, liquid, corrosive chemicals
Treatment time	1 sec to 10 sec for most applications; as low as 0.1 for a few special cases
Efficiency	most applications 80% to 99%; some 99.9 + %

TABLE 1.3

SUMMARY OF U.S. PATENTS

Collecting and discharge electrodes	100
Electrode cleaning means	50
Precipitator applications	150
Two-stage precipitators	100
Combination precipitators (electro-mechanical, electroscrubber, etc.)	100
Electrical energization	50
Details of construction	200
Miscellaneous	~250
Total for the period 1886 through 1957	~1000