Table 1. Heat Emitted by Direct Cast Iron Heaters—Conversion Factors

Steam Pressure		Temp. of Steam in Deg. Fahr.	Temperature of Room					
Vacuum In. Hg.	Lb. Absolute		80 deg. fahr.	75 deg. fahr.	70 deg. fahr.	65 deg. fahr.	60 deg. fahr.	50 deg. fahr.
23.4	3.71	150	0.388	0.424	0.462	0.499	0.538	0.617
19.7	4.75	160	0.462	0.499	0.538	0.577	0.617	0.697
15.3	5.99	170	0.538	0.577	0.617	0.657	0.697	0.782
12.3	7.51	180	0.617	0.657	0.697	0.740	0.782	0.868
8.7	9.33	190	0.697	0.740	0.782	0.825	0.868	0.955
6.5	11.32	200	0.782	0.825	0.868	0.911	0.955	1.045
Lb. Gage								
1	15.7	215	0.911	0.955	1.000	1.045	1.091	1.183
2	16.8	219	0.947	0.991	1.036	1.081	1.128	1.220
3	17.8	222	0.973	1.018	1.063	1.109	1.155	1.249
4	18.9	225	1.000	1.045	1.091	1.137	1.183	1.277
5	19.6	227	1.018	1.063	1.109	1.155	1.202	1.296
6	20.8	230	1.045	1.091	1.137	1.183	1.230	1.325
8	22.8	235	1.091	1.137	1.183	1.230	1.277	1.373
10	24.9	240	1.137	1.183	1.230	1.277	1.325	1.421

These conversion factors multiplied by the heat emitted by a conductor operating at 215 deg. fahr. in a room at 70 deg. fahr., give the heat emitted by a conductor operating under the indicated conditions.

sation rate in pounds per hour for the time elapsing after steam is turned into a column conductor. In practice the rate of steam supply to the conductor while heating up is, however, frequently retarded by controlled elimination of air through air valves or traps, and if sufficient time is allowed for the heating-up process, overload on the boiler may practically be eliminated.

Effect of Paint

Painting a conductor changes the emissivity constant of the radiating surface, but has practically no effect upon the heat lost by convection. It is, therefore, a surface effect and it makes no appreciable difference what paints are placed on the heater as a priming coat; the results are

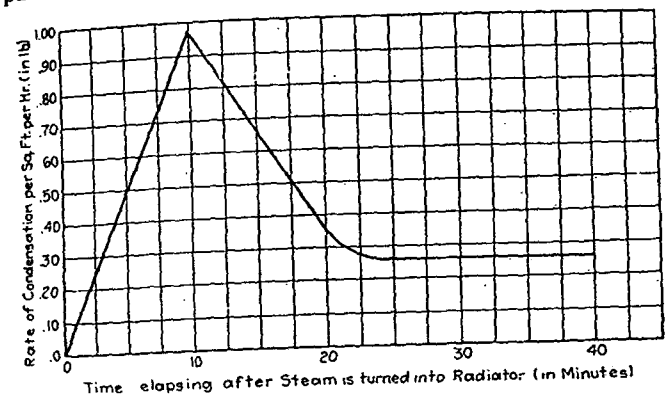

Fig. 1. Chart Showing the Steam Demand Rate for Heating-Up a Cast-Iron Conductor with Free Air Venting and Ample Steam Supply

always dependent upon the last coat of paint. In conductors having a large proportion of radiating surface such as pipe coils or wall coils, the effect of painting will be more marked than in tubular conductors having a comparatively small radiating surface in proportion to the amount of convecting surface. Most finely ground pigments have about the same radiation constant as black cast-iron. Therefore paints having finely ground pigments will usually have little effect. Bright metals have a much lower radiation constant and therefore, bronze metallic paints will reduce the direct radiation emission from a conductor.

Table 2. Effect of Painting 32-in. Three Column, Six-Section Cast-Iron Column Conductor[a]

Radiator No.	Finish	Area Sq. Ft.	Coefficient of Heat Trans. B.t.u.	Relative Heating Value Per Cent
1	Bare iron, foundry finish	27	1.77	100.5
2	One coat of aluminum bronze	27	1.60	90.8
3	Gray paint dipped	27	1.78	101.1
4	One coat dull black Pecora paint	27	1.76	100.0

[a]Comparative Tests of Radiator Finishes, by W. H. Severns (A.S.H.V.E. Transactions, Vol. 33, 1927).