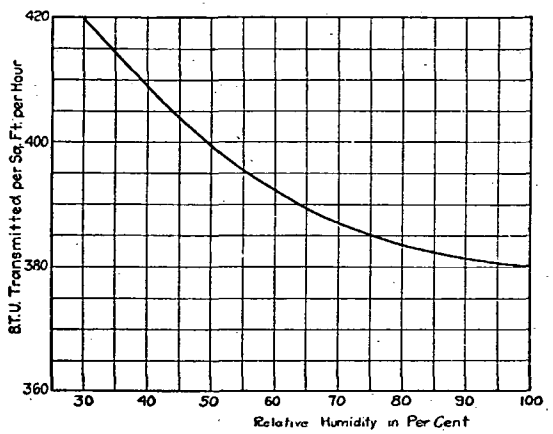

FIG. 1. EFFECT OF HUMIDITY ON HEAT TRANSMISSION

hour for the time elapsing after steam is turned into the radiator. It will be noticed that the maximum condensation in the radiator occurs 10 min. after steam is turned on, and in that case it amounts to about three and one-half times normal condensation. After the end of 25 min., the radiator had reached a normal rate of condensation. This curve was made from observations at intervals of 10 min. so that the intermediate points between the 10 min. points are not known, and the form of the curve is not exact. It shows, however, that when a plant is initially started up and the system filled with steam during a short period of time the demand made upon the boiler may be very much higher than the normal demand. In practice the rate of steam supply to the radiator 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 be practically eliminated.

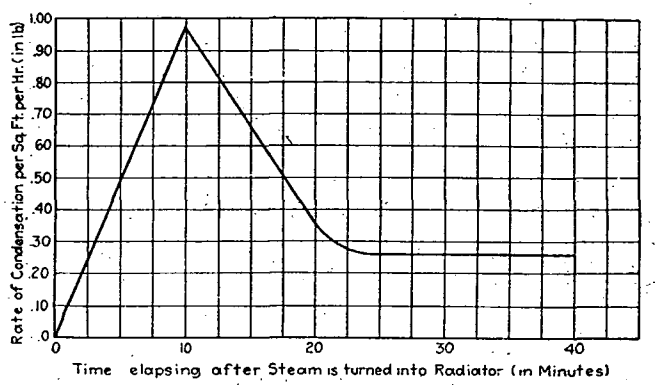

FIG. 2. CHART SHOWS DEMAND UPON BOILER FOR HEATING-UP

EFFECT OF PAINTING

The effect of painting was originally determined by experiments made with a cast iron rectangular box, and in applying these to radiators of standard type, corrections must be made to allow for the difference between the area of the radiating and convecting surfaces. The effect of painting is to change the radiation constant of the radiating surface and has practically no effect upon the heat lost by convection. It is, therefore, a surface effect and it makes no difference what paints are placed on the radiator as a priming coat, the results are always dependent upon the last coat of paint put upon the radiator. In radiators having a large proportion of radiating surface such as pipe coils or wall coils, the effect of painting will be more marked than in four-column radiators having a comparatively small radiating surface in proportion to convecting surface. All finely ground materials have about the same radiation constant. Therefore all paints having finely ground pigments will give about the same effect. Metals have a poor radiating effect so that any paint involving flake metal, such as the bronze, will have a low radiating constant.

Table 15 shows the effect of painting an experimental cast iron box of rectangular shape. *It should be noted that in this case all the surface emitted heat by direct radiation.* Column radiation having a larger ratio of convecting surface to radiating surface would show less effect due to painting.

TABLE 15. EFFECT OF PAINTING A RECTANGULAR RADIATOR

PERCENTAGE OF EFFECTIVENESS

Based on Values in Tables as 100 per cent

Cast Iron, bare	100%
Painted with flat black	100%
Painted with aluminum bronze	80%
Painted with gold bronze	81%
Painted with white enamel	101%
Painted with maroon japan	100%
Painted with white zinc paint	101%
Painted with no-lustre green enamel	96%

The effects of painting a six-section 32 in. three-column radiator as found by Wm. H. Severns are given in Table 16.

TABLE 16. EFFECT OF PAINTING 32 IN. THREE-COLUMN, 6-SECTION CAST IRON RADIATORS[1]

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

It is generally assumed that an enclosed radiator shows a decreased heat emission. This is borne out by results recently published by Kratz and Fahnestock, Table 17[2]. This data indicates that the heat emission from the enclosed radiator equals or exceeds that of an exposed radiator only in the case where the enclosure is much higher than the radiator so as to produce a pronounced chimney effect.

[1]Comparative tests of Radiator Finishes by Wm. H. Severns, JOURNAL, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, January, 1927.

[2]Effect of Enclosures on Radiator Performance by A. P. Kratz and M. K. Fahnestock, JOURNAL, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, June, 1927.