would keep the heat shut off 21 hr. out of a possible 24, and that with an average outside temperature of 16 deg. the heat was on the radiator only a trifle more than 5 hr. per day.

The savings in fuel to be gained by automatic-heat control are enormous. In many large institutions, such as universities, having central stations, high-grade supervision, meters, etc., the savings have been proved to equal one-half of the uncontrolled consumption.

In one metered city club a saving of 27 per cent was made by installing automatic-heat control. This is after the two seasons were equalized for outside temperature.

Of two similar office buildings, one having automatic-heat control, the other without it, both metered, during four years the automatic controlled building used an average of 556 lb. of steam per sq. ft. of radiation, while the other used 894 lb. of steam per sq. ft. of radiation, around 38 per cent to be credited to the control.

INSULATION

HEAT LOSS FROM UNINSULATED SURFACES

THE determination as to whether pipes and other heated surfaces should be insulated is made after a consideration of the heat loss from such surfaces if they are allowed to remain bare. The heat losses from bare pipes are given in Table 52, together with the number of pounds of coal required to produce these quantities of heat, and the cost of the same.

Example.—Three hundred feet of bare 3-in. pipe containing steam at 10-lb. gage, and located in a room where the air is at 70 deg. fahr., will radiate $2.46\times(239.4-70)\times300=125{,}020$ B.t.u. per hr. The corresponding expenditure of coal is $3\times3{,}292=9{,}876$ lb. per month if steam is kept in the pipe continuously, and the value of the coal at $12 per ton is $\$8.24\times3\times\frac{12}{4}=\$74.16$ per month.

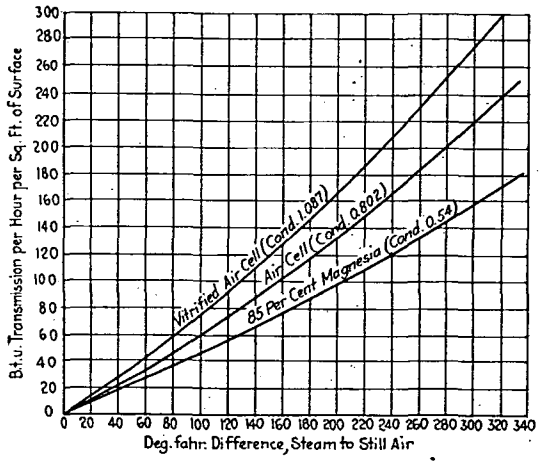

FIG. 51. HEAT TRANSMISSION IN B.T.U. PER HOUR PER SQUARE FOOT OF COVERED PIPE (1 IN. COVERING)

The heat loss from uninsulated flat surfaces or surfaces of large radius, such as boilers, feed-water heaters, heating and ventilating ducts and flues, hot-water tanks, etc., is given in Table 53 in B.t.u. per square foot per hour per degree fahr. temperature difference. Pounds of coal used are given per 100 sq. ft. per month assuming continuous use of the

Material for this section was prepared especially for THE GUIDE 1923 by L. L. Barrett and L. B. McMillan, New York.