Exhaust from kitchen range hoods should be discharged by a separate exhaust fan through a fireproof metal duct extending above the roof of the building and provided with automatic fire damper and steam jet fire extinguisher for use in case of emergency as the accumulation of the grease vapors in this flue frequently cause a fire.

After a good ventilating system is designed the engineer is only fairly well started on the road to good ventilation. A system is not a ventilating system until it ventilates. Here is where the operating man and proper supervision come in. Of all the things that go to make up success or failure these two are the most important. The one who lays out the plant should supervise, not only its installation, but testing and watch it until it is operating properly. Beyond this it must be kept in the hands of competent operators under the right supervision. Then and not until then, will good ventilation be obtained.

CHAPTER XVI

THE HILL SYNTHETIC AIR CHART

PERFECTION in ventilation depends upon the condition of the air in a room as affecting health and comfort rather than upon the quantity of outside air supplied. The known conditions of air which may affect human health and comfort are its temperature, humidity, air motion, dustiness, odor, bacterialogical content and carbon dioxide content.

The synthetic air chart, devised by Dr. E. Vernon Hill, and revised as a result of investigations by the Society's Research Laboratory is the accepted standard for grading the perfection of ventilation in any room by the conditions of the air itself.

According to the synthetic air chart Fig. 72 each of the conditions of the air which affect human health is rated in percentage of perfection in a separate column. The percentage of perfection as regards each factor is indicated by the height of the shaded area in that column. The percentage of penalization for imperfection as regards that factor is given by the difference between 100 per cent and the indicated per cent of perfection. The effect which the penalization for each factor will have on the composite penalization for all factors of ventilation of the room is given at the right hand side of the column. The sum of the penalizations for each of the factors as given in the right hand side of the various columns is taken as the total percentage of penalization representing the imperfection of ventilation for the room. The percentage of perfection of ventilation is 100 per cent minus this total and is indicated by the height of the shaded area in the last column to the right. The percentage of perfection for any factor is determined by crediting an ideal condition with 100 per cent and a condition impossible for life with zero per cent perfection. In other words, a condition, as pertains to any one of the five factors, that will produce death or permanent disability is rated at zero per cent perfect.

CONDITIONS OF MAXIMUM COMFORT

Temperature Humidity and Air Motion.—A person's feeling of warmth is determined, by the temperature, humidity and motion of the air. A single index of a person's feeling of warmth is given by a scale of effective temperature, which takes into consideration these three factors. This scale of effective temperature (abbreviated E. T.) has been determined by the Society's Research Laboratory and is discussed in Chapter XVII. For the average human being at rest an effective temperature of 64 deg. gives maximum comfort. Persons working at various rates are most comfortable at effective temperatures below 64 deg. The exact effective temperatures giving maximum comfort for persons working at various