

EXAMPLE IN THE USE OF THE CHART

Determine the percentage of perfection of ventilation in a room where the following conditions are observed. The room, to be occupied by persons normally clothed and doing light work.

Dry Bulb Temperature.....	74 deg.
Wet Bulb Temperature.....	62 deg.
Air Velocity.....	50 ft. per min.
Dust Count by Hill Counter.....	10,000 particles per cu. ft.
Bacteria colonies developed in a 2 min. plate.....	10
Odors.....	Faint
CO ₂ analysis inside Station No. 1.....	6 parts in 10,000
CO ₂ analysis inside Station No. 2.....	6.3 parts in 10,000
CO ₂ analysis inside Station No. 3.....	5.5 parts in 10,000
CO ₂ analysis inside Station No. 4.....	5.0 parts in 10,000
CO ₂ analysis outside.....	4.0 parts in 10,000
Other objectionable substances.....	None

The effective temperature for the observed wet and dry bulb temperature and air motion is determined from the Table 93 to 99 in Chapter XVII. From Table 94 (See Chapter XVII) for 50 ft. per min. air velocity the intersection of the line for 74 deg. dry bulb and the column for 62 deg. wet bulb gives 65.3 deg. as the E. T. of the condition. For 100 per cent perfection 62.5 deg. E. T. is required for persons doing light work whereas the existing condition is 65.3 deg. E. T. or 2.8 deg. too high, which gives according to the chart, 91.6 per cent perfection and 8.4 per cent penalization for this factor and a penalization of 7.6 per cent for imperfect ventilation. This is indicated in the chart, Fig. 72.

10,000 dust particles per cu. ft. of air gives according to the chart 96 per cent perfection and 4 per cent penalization for this factor and 1 per cent penalization for imperfect ventilation.

10 bacterial colonies on a 2 min. plate gives 98 per cent perfection for this factor and a penalization of 1 per cent for imperfect ventilation.

A faint odor or 90 per cent free from odors calls for a 10 per cent penalization for this factor and 1.5 per cent penalization for imperfection of ventilation.

The average carbon dioxide content of the 4 samples taken in the room is 5.7 or 1.7 parts more than the outside sample, which, according to the chart, is 99.5 per cent perfect for this factor and calls for 0.4 per cent penalization for imperfection of ventilation.

There are no other injurious substances indicated hence no penalization is given for such factors.

The variations of the carbon dioxide content of the four stations from their average are as follows:—

Station No. 1.....	6.3—5.7 = 0.6 parts per 10,000
" " 2.....	6.0—5.7 = 0.3 " " 10,000
" " 3.....	5.7—5.6 = 0.1 " " 10,000
" " 4.....	5.7—5.0 = 0.7 " " 10,000
	4 $\overline{1.7}$

The average variation is..... 0.42, and the percentage of variation is $\frac{0.42}{5.7} \times 100 = 7.4$ per cent. Therefore the percentage distribution is $100 - 7.4 = 92.6$, and the percentage penalization for imperfect ventilation is 2.2.

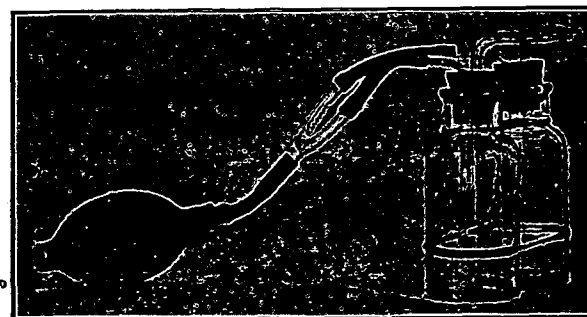


FIG. 73. AMMONIUM-CHLORIDE APPARATUS FOR DETERMINING VELOCITY AND DIRECTION OF AIR CURRENTS

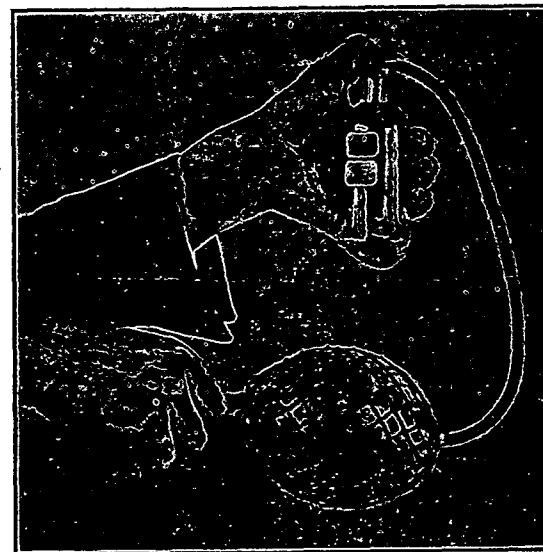


FIG. 74. TAKING AN AIR SAMPLE

The percentage of perfection for each factor is indicated in the chart, Fig. 72 and are summed up in Table 92. The sum of all the penalizations for imperfection in ventilation is 13.7 and the percentage of perfection of ventilation is 100 minus 13.7 or 86.3 which is shown in the last column of the chart.