

The fixed charges for machinery in a Federal Building are 3 per cent interest and 5 per cent depreciation per annum on engines, boilers, etc., while on buildings, tunnels, etc., 2 per cent depreciation per annum is allowed.

The annual dividend which must be earned by the ordinary isolated Federal plant in comparison with the purchase of current from a public utility company is 10 per cent on the cost of the Government plant.

HEAT EXCHANGERS FOR WATER AND OIL

A valuable chapter on the subject of heat exchangers, giving the mathematics of this interesting thermal process, is included in THE GUIDE, 1929.

VENTILATION OF COLD STORAGE WAREHOUSES

Fruit and vegetables are alive until they begin to decay and if they are to remain alive and well they must be given an ample supply of air and favorable humidity conditions. Conclusive demonstration has been made of the necessity of controlled ventilation for rooms in which fruit and vegetables are stored, even though the temperature in such rooms may be kept very low. It is possible to obtain well developed proprietary systems of ventilation for cold storage warehouses, and as the volume of air to be changed may be comparatively small, the cost for extra refrigeration due to ventilation is trifling, and often is more than compensated for by the improved interior air circulation and the elimination of air-stratification.

Warehouses for fruit storage where no refrigeration is employed should have many doors and windows, which may be opened during the night in warm weather, and closed during the day. The product should be piled in such manner as to allow very free air circulation between the cases and around them. Fans for driving new air quickly through and around the cases often are employed to good advantage.

ZONING OF HEATING AND VENTILATION

All alert engineers are paying more and more attention to the control of heating and ventilating equipment with reference to the changing daily outside conditions.

The larger schools in Toledo, have for years been provided with central manual control whereby the heating may be accentuated on the colder sides of the building, or reduced on the warmer sides of the building, in addition to the usual local thermostatic control. Substantial savings in the fuel cost of hotels and apartment houses and office buildings are often made possible by means of control by zones. It is possible that much of the fuel saving by this zoning is affected by the prevention of too many open windows on the leeward or sunny sides of the building.

Remote controlled electrically or pneumatically-operated valves are obtainable, and the design of any large building which has no provision for zoned operation is subject to criticism. The various remote supply valves may be operated by thermostats or may be under manual control, or by throwing one switch either type of control may be selected. It is possible also to indicate at a central point, accurately and at low cost, the temperatures throughout the building, which information of course furnishes the inspiration for use of the manual controls. The effect of

sunshine on building heat-demand may thus be followed around the building each day.

A further, very simple refinement may cause the fuel-burning device, such as stoker or oil burner or gas flame to be shut down whenever the last zone valve closes, and to resume operation whenever the first zone valve opens, no matter which one this may be.

VENTILATION OF LACQUER SPRAY BOOTHS

In general there must be an exhaust fan which will provide an air velocity of at least 150 lin. ft. per minute through the opening into the hood from the room. It is preferable in installations of this type to use a pressure fan with an inductor-jet or nozzle so that the carried-away lacquer does not enter the fan at all. It is proper to make the exhaust duct in the vicinity of the booth of such type that accumulations of paint may be removed when they begin to clog the air ways.

In many automobile body spray booths the ducts for exhausting from the spray hood will range from 30 to 48 in. in diameter. A 30 in. duct usually requires about 2 hp. for the fan, which maintains on the 5 in. nozzle pipe, pressure equal to a column of water about 7 in. high. For a 48 in. duct the fan requires about 5 hp. and the pressure is 10 in. of water on a 6½ in. nozzle pipe. There are proprietary systems of this type.

VENTILATION OF PRESSING ROOMS IN MEN'S CLOTHING FACTORIES

In the men's garment manufacturing industry there are used large batteries of clothes pressing machines.

These usually have large heated areas filled with high pressure steam, and the heaters and the piping which serves them and the jets of steam used on some of the machines for direct application to the cloth, bring about a man-cooling problem of considerable extent. The following solution has been found reasonably satisfactory for use during warm weather:

1. Mechanical exhaust ventilation of about 2,000 cu. ft. per minute per machine, with gravity inlets through ducts, doors, windows, etc.
2. Mechanical supply ventilation taking air from out-of-doors, delivered horizontally directly toward the face and breast of each operative through an adjustable nozzle of about one-half square foot area at a velocity of about 800 lin. ft. per minute. This nozzle should be about 2 ft. from the man.
3. The inlet to the mechanical supply ducts should be taken if possible from the north or shady side of the building, or from a shaded court, never from above a sunny black roof, since the normal out-door air will gain considerable heat when drawn into the building over such a surface.

AIR CONDITIONING OF LIBRARIES¹

Temperature, per se, can be disregarded generally as having little effect upon the keeping qualities of books. There is an optimum temperature for the growth of each variety of mildew, but this growth can best be inhibited by depriving the mildew of water or by the use of chemical

¹Based on a paper by the Bureau of Standards.