3. Multiply the net wall by 27, if from zero to 70 deg., or by 37 if from −10 deg. to 70 deg.

4. Add results of 2 and 3, and divide by 250. This will give you the square feet of direct radiation necessary to overcome heat losses through glass and walls, which in the average school room is 120 to 140 sq. ft. Add 10 per cent to above figures for north or west exposures.

5. To determine the number of Wall Boxes required, first determine the number of pupils for the room. This can be obtained by dividing the cubical contents of the room by 225 (allowing 225 cu. ft. of contents per pupil).

6. Multiply the number of pupils by the amount of air required for each pupil per minute, which, for Indiana, is 30. This gives the total amount of the air required for the room per minute.

7. Divide the total amount of air required per minute by the capacity of the Wall Box to determine the number of boxes required.

8. *Example:* Assemble a room designed for 34 pupils; then, 34 × 30 (cu. ft. of air per minute per pupil) equals 1020 cu. ft. per minute; 1020 c.f.m. divided by 300 (capacity of 8 x 30 in. Wall Box) equals 3.4, or it will be necessary to use four 8 x 30 in. Wall Boxes.

9. Therefore, there will be required in the room four radiators, with a Wall Box for each radiator. Since, when using an 8 x 30 in. Wall Box, twelve sections of a Five Tube 38-in. radiator are enclosed by the air diffusers, there will be 60 sq. ft. of radiation enclosed in each radiator, or a total of 240 sq. ft. for ventilation.

10. To the preceding amount must be added the direct radiation required for wall and glass. Assume this to be 120 sq. ft. There would then be a total of 240 sq. ft. plus 120 sq. ft., making 360 sq. ft. in the room.

11. In designing the boiler, take special notice that the 240 sq. ft. of indirect radiation, or those sections enclosed in the Air Diffusers will condense two and one-half times as much steam as ordinary direct radiation. Therefore, the four radiators in the room will be equivalent to $2\frac{1}{2} \times 240 = 600 + 120$, or a total of 720 sq. ft. of direct radiation.

12. If the building is an eight-room school house, it will require 8 × 720 plus whatever direct radiation there may be required in the halls, toilets, offices, etc.

13. Say there are 500 sq. ft. of radiation in the halls, etc. Then 8 × 720 = 5760 sq. ft.; 5760 sq. ft. + 500 sq. ft. = 6260 sq. ft.

The size of the boiler, together with the supply and return piping, should be based on an equivalent of 6260 sq. ft. of radiation, making due allowances for mains and risers.

We recommend, on account of better air distribution, the use of four Wall Boxes for the ordinary class room, the size depending, of course, upon the requirements.

Do not use radiation less than 26 in. high.

All Ventilating Radiators shall be arranged for supply and return connection at bottom on opposite ends.

All Ventilating Radiator Units used in connection with one pipe gravity steam system to be tapped as follows: 50 to 100 sq. ft. 1½ in. In no case should the Ventilating Radiator used in connection with the one pipe gravity steam system contain more than 100 sq. ft

All Ventilating Radiator Units used in connection with two pipe vacuum steam system tapped as follows, with supply and return connection at bottom of opposite ends:

60 to 90 sq. ft. 1 in. supply and ¾ in. return.

Above 90 sq. ft. 1¼ in. supply and ¾ in. return.

Each class room should be provided with a suitable foul air vent-flue, constructed on the opposite side of the room from the ventilating radiators. The size of this foul air vent-flue is based upon the number of pupils in the room. The State of Indiana requires 16 sq. in. in the foul air vent-flue for each pupil. Aspirating Radiators should be installed in each foul air vent-flue, allowing ⅝ sq. ft. per pupil on the first floor and ⅞ sq. ft. on the second floor.

All Foul Air Ventilating Flues should be connected to a foul air collecting chamber or chambers constructed in attic. The size of collecting chamber or chambers should be 10 per cent larger than the combined free area of all ventilating flues connecting into same. The foul air collecting chamber or chambers should be connected to a revolving automatic ventilator on the roof of the building of sufficient size and capacity to meet all requirements.

In determining size of American Automatic Ventilator one-half sq. in. free area in ventilator should be allowed to each one sq. in. of free area in foul air vent-flue.

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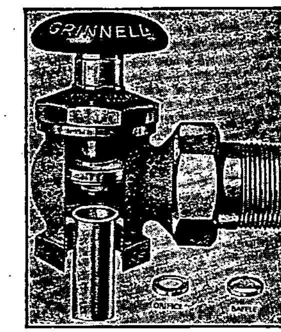

Equiflo Valve

installations of this type of heating system.

This whole problem has now been simplified by the invention of the *Grinnell Equiflo Valve.*

The Grinnell Equiflo Valve for forced hot water heating *permits:*

1. The calculation of pipe sizes for this system by simple tables, similar to those commonly used in connection with the design of vacuum steam systems.

2. Change in locations of radiators or piping during installation to take care of local construction conditions without recalculation of pipe sizes.

The Grinnell Equiflo Valve for forced hot water heating *accomplishes:*

1. More nearly perfect equalization of flow to every radiator than has ever been