TABLE 36. COEFFICIENTS OF TRANSMISSION (U) OF DOORS, WINDOWS AND SKYLIGHTS

Note.—THESE COEFFICIENTS ARE BASED ON A WIND EXPOSURE OF 15 MILES PER HOUR, AND ARE EXPRESSED IN B.T.U. PER HOUR, PER SQUARE FOOT, PER DEG. FAHR. DIFFERENCE IN TEMPERATURE BETWEEN THE AIR INSIDE AND OUTSIDE OF THE DOOR, WINDOW OR SKYLIGHT.

A. Windows and Skylights

	U
Single	1.13[a-c]
Double	0.45[a]
Triple	0.281[a]

B. Solid Wood Doors[b-c]

NOMINAL THICKNESS INCHES	ACTUAL THICKNESS INCHES	U
1	$25/32$	0.563
1¼	$1\frac{1}{16}$	0.485
1½	$1\frac{5}{16}$	0.432
1¾	$1\frac{3}{8}$	0.421
2	$1\frac{5}{8}$	0.382
2½	$2\frac{1}{8}$	0.321
3	$2\frac{5}{8}$	0.277

[a] See page 212, Volume I, *Mechanical Equipment of Buildings*, by Harding and Willard, second edition, 1929.

[b] Computed using $C = 1.0$ for wood; $f_i = 1.34$ and $f_o = 4.02$.

[c] It is sufficiently accurate to use the same coefficient of transmission for doors containing thin wood panels, as that of single panes of glass, namely, 1.13 B.t.u. per hour per square foot per 1 deg. fahr. difference between inside and outside air temperature.

HEAT LOSSES BY INFILTRATION

Heat Required to Warm Air Leaking into Building

In addition to the heat transmission of the walls, glass and roof, consideration must always be given to the inleakage of cold outside air which must be heated to room temperature. This inleakage or infiltration is exclusive and independent of air that may be supplied for ventilation through ducts or flues of any sort. Calculation of the heat required for this purpose is a very simple matter if the volume of air leaking into the building per hour is known.

$$H_i = 0.24\ Q\ d\ (t - t_o) \qquad (16)$$

where

H_i = B.t.u. per hour required for heating air leaking into building from outside temperature t_o to breathing-line temperature t.
Q = cubic feet of air entering per hour at breathing-line temperature, t.
d = density (pounds per cubic feet) of air at breathing-line temperature, t
t = breathing-line temperature.
t_o = outside air temperature for which heating system is designed.
0.24 = specific heat of air.

Infiltration through Materials

It is possible for infiltration to take place through certain types of porous materials, but such infiltration is reduced to a minimum by good workmanship and by the use of building paper and plaster.

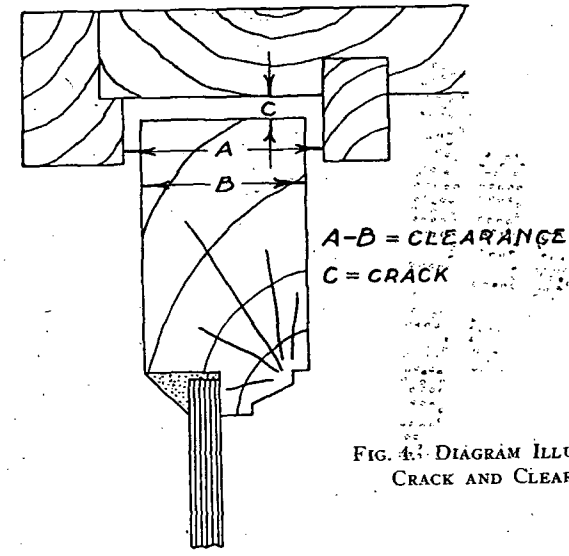

FIG. 4. DIAGRAM ILLUSTRATING CRACK AND CLEARANCE

Table 37 gives the leakage through brick and wood-frame walls, with and without plaster. In addition to the information in this table, the authors make the following statement: "In the case of walls with furring, lath, and plaster painted, walls plastered directly on the brick with or without paint or frame walls with plaster painted, the leakage is so small as to require about 0.10 of a square foot of radiation per 100 sq. ft. of wall, or in fact, it could be said that the heat loss due to infiltration of such walls is negligible."

Infiltration through Cracks

Definitions of Crack and Clearance: Fig. 4 illustrates what is meant by crack and clearance. The crack around the sash perimeter is equal to one half the difference between the width of the frame and the width of the sash, that is, the crack is the same on each side of the sash. The clearance is the difference between the width of the stile and the thickness of the sash. These terms are chosen arbitrarily to distinguish the two principal air passages which are found in double-hung windows.

The linear feet of crack for a double-hung sash is equal to the sash perimeter plus the meeting rail. For a standard type steel sash constructed of solid rolled sections the linear feet of crack consists of the perimeter of the ventilating section plus the linear feet of sash section in contact with steel work as, for example, vertical and horizontal mullion steel. The perimeter of sash properly grouted with cement mortar into brickwork or concrete is not to be counted as crack.

In no case should the amount of crack used for computation be less than half of the total crack in the outside walls of the room. Thus, in a room with one exposed wall, take all the crack; with two exposed walls,