10. CONSTRUCTION:

Walls—12-in. brick, with ½-in. plaster applied directly to inside surface.
Roof—3-in. stone concrete and built-up roofing.
Floor—5-in. stone concrete on 3-in. cinder concrete on dirt.
Doors—One 12 ft. x 12 ft. wood door (2 in. thick) at each end.
Windows—Fifteen, 9 ft. x 16 ft. single glass double-hung windows on each side.

11. TRANSMISSION COEFFICIENTS:

Walls—(Table 9, Chapter 3)..... $U = 0.277$
Roof—(Table 29, Chapter 3)..... $U = 0.610$
Floor—(Table 28, Chapter 3)..... $U = 0.521$
Doors—(Table 33B, Chapter 3)..... $U = 0.382$
Windows—(Table 33A, Chapter 3)..... $U = 1.13$

12. INFILTRATION COEFFICIENTS:

Windows—Crack assumed $\frac{1}{16}$ in. The leakage per foot of crack for an 11-mile wind velocity is 92.7 cu. ft. per hour, for a plain window. (By interpolation from Table 2, Chapter 4). The heat equivalent per hour per degree is

$$92.7 \times 0.075 \times 0.24 = 1.67 \text{ B.t.u.}$$

Doors—Assume infiltration loss through door crack twice that of windows or

$$2 \times 1.67 = 3.34 \text{ B.t.u.}$$

13. CALCULATIONS:

See calculation sheet, Table 6.

RESIDENCE (See Fig. 2)

1. LOCATION..... Chicago, Ill.
2. LOWEST OUTSIDE TEMPERATURE (Table 3)..... − 23 deg. fahr.
3. BASE TEMPERATURE..... (− 23 + 15) = − 8 deg. fahr.
4. DIRECTION OF PREVAILING WIND (during Dec., Jan., Feb., Table 3)..... Southwest
5. INSIDE TEMPERATURE..... 70 deg. fahr.
6. TEMPERATURE DIFFERENCE (item 5 − item 3)..... 78 deg. fahr.
7. AVERAGE WIND VELOCITY (during Dec., Jan., Feb., Table 3)..... 17 miles per hour

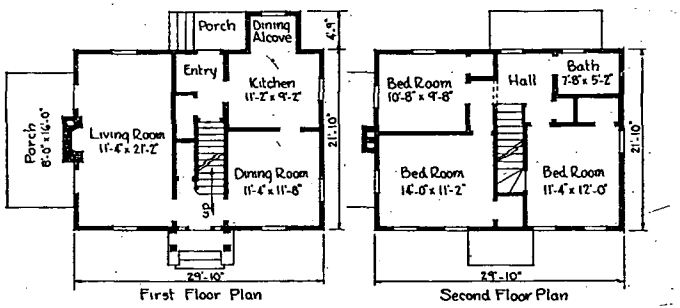

FIG. 2. FLOOR PLAN OF SIX-ROOM RESIDENCE[a]

[a]Plan 6-F-3, Architects Small House Service Bureau.

TABLE 7-A. SUMMARY OF HEAT LOSS CALCULATIONS FOR RESIDENCE SHOWN IN FIG. 2

Room or Space No.	Room	Glass Transmission Losses	Other Transmission Losses	Infiltration Losses	Total
1	Living Room	7,100	9,040	8,970	25,110
2	Dining Room	2,640	4,640	742	8,022
3	Kitchen	1,060	3,300	663	5,023
4	Dining Alcove	1,370	3,718	807	5,895
5	Entry	1,888	1,312	4,320	7,520
6	Vestibule	1,854	1,436	3,900	7,190
7	Bedroom (A) and Closet	3,773	3,558	1,445	8,776
8	Bedroom (B) and Closet	3,960	4,070	1,445	9,475
9	Bedroom (C) and Closet	2,900	3,765	1,660	8,325
10	Upstairs Hall	1,450	920	1,660	4,030
11	Bath	1,450	1,940	1,660	5,050
12	Attic (heated)	3,040	28,021	1,125	32,186
	GRAND TOTAL of heat required for building in B.t.u. per hour at −8 deg. with a 17-mile southwest wind				126,602

TABLE 7-B. HEAT LOSS CALCULATION SHEET FOR LIVING ROOM (FIG. 2)

Part of Building	Exposure	Net Surface Area or Crack Length	Co-efficient	Temp. Difference	Net B.t.u.	Exposure Factor	Total B.t.u.
Wall	E	75.6	0.263	78	1,550		1,550
Glass	E	15.0	1.13	78	1,320		1,320
Crack $\frac{1}{16}$ in.[a]	E	19.0	0.5	78	(742)[d]		
Wall[b]	S	127.6	0.263	78	2,620	1.15	3,010
Doors	S	42.0	1.13[c]	78	3,710	1.15	4,260
Crack $\frac{1}{16}$ in.	S	40.0	2.50	78	7,800	1.15	8,970[d]
Wall	W	75.6	0.263	78	1,550	1.15	1,780
Glass	W	15.0	1.13	78	1,320	1.15	1,520
Crack $\frac{1}{16}$ in.[a]	W	19.0	0.50	78	(742)[d]		
Floor	Over Basement	241.0	0.339	33[e]	2,700		2,700
GRAND TOTAL of heat required for room in B.t.u. per hour at −8 deg. with a 17-mile southwest wind							25,110

[a]Windows weatherstripped.

[b]Chimney figured as part of wall, that is, of the same construction.

[c]Transmission coefficient taken same as glass for entire door.

[d]Three sides of this room are exposed and therefore only the wall having the greatest infiltration loss is used in estimating the total leakage for the room. If the infiltration loss for the south side of the room containing the two outside doors had been less than half the total infiltration loss for the room, then half the total leakage would have been used.

[e]Air temperature at floor assumed 65 deg. fahr. Air temperature in basement assumed 32 deg. fahr.