TABLE 1. FIRST STORY WARM-AIR DUCTS[a]

Combination No.	Leader Pipe Diameter, In.	Register Size, In.			
		Floor	Baseboard		
			Size	Extension	Throat Size
1	8	8 x 10	10 x 8	2¼	6⅛ x 10
2	9	9 x 12	12 x 8	2¼	6⅛ x 12
3	10	10 x 12	12 x 9	3¼	7⅛ x 12
4	12	12 x 14	13 x 11	5¼	9⅛ x 13
5	14	14 x 16	.....	.....	.....

[a] When the calculations indicate a requirement for a given room greater than Combination No. 4, two or more smaller units totalling the required capacity are recommended.

TABLE 2. SECOND STORY WARM-AIR DUCTS—SINGLE WALL STACKS AND FITTINGS

Combination No.	Leader Pipe Diameter, In.	Stack[b] Size In.	Register Size, In.			
			Floor	Baseboard		Sidewall
				Size	Extension	
11	8	10 x 3¼	8 x 10	10 x 8	2¼	10 x 8
12	9	12 x 3¼	9 x 12	12 x 8	2¼	12 x 8
14	10	14 x 3¼	10 x 14	13 x 11	2¼	.....
15	12	12 x 5¼	.....	12 x 9	3¼	.....
16	12	14 x 5¼	.....	13 x 11	5¼	.....

[b] Recommended stack sizes. Tables may also be applied to 3 in. and 3 1/2 in. stack depths.

TABLE 3. SECOND STORY WARM-AIR DUCTS—DOUBLE WALL STACKS AND FITTINGS

Combination No.	Leader Pipe Diameter, In.	Stack Size, In.		Register Size, In.			
		Internal	External	Floor	Baseboard		Sidewall
					Size	Extension	
21	8	2½[c] x 10	3⅛[c] x 10⅝	8 x 10	10 x 8	2¼	10 x 8
22	8	3 x 10	3⅝ x 10⅝	8 x 10	10 x 8	2¼	10 x 8
23	9	2½[c] x 12	3⅛[c] x 12⅝	9 x 12	12 x 8	2¼	12 x 8
24	9	3 x 12	3⅝ x 12⅝	9 x 12	12 x 8	2¼	12 x 8

[c] Commercial sizes vary 1/8 in. from values shown.

all correlated. Similarly in the case of return ducts, the selection specifies a complete unit consisting of return grille, return duct, and shoe connection.

Recommended Standard Sizes

For the purpose of simplification and standardization, selected combinations of commercial sizes of warm air pipes, return air pipes, ducts, grilles, fittings, and registers are designated as Combination Numbers. The numbers assigned and the combinations selected as standard are listed in the following Tables 1 to 4 inclusive.[3]

The selected types of boots are shown in Fig. 2, and their resistances expressed in equivalent elbows are shown in Table 5. It is essential that free areas be maintained throughout fittings.

Figs. 3 and 4 show recommended practice as given in Manual 5 of the

TABLE 4. RETURN AIR DUCTS

Combination No.	Duct Dia. In.	Duct Area Sq. In.	Area at Shoe Connection, Sq. In.	Metal Grille Sizes, Choose One			Baseboard Intake for First Story	When Joist Lining Is Used[d]		When Duct Is Used
				A	B	C		No. of Joists Lined	Min.[e] Depth In.	Choose One
31	10	78			8 x 14	10 x 12		1	7	14 x 6 12 x 8
32	12	113		6 x 30	8 x 24	12 x 14	14 x 10 4-In. Ext.	1 or 2	9 5	12 x 6 16 x 8
33	14	154	170	8 x 30	10 x 24	14 x 16		1 or 2	12 6	28 x 6 22 x 8
34	16	201	220	10 x 30	12 x 24		30 x 10 4-In. Ext.	1 or 2	16 8	28 x 8 22 x 10
35	18	254	280	12 x 30	14 x 24			2	10	36 x 8 28 x 10
36	20	314	340	14 x 30	18 x 24			2	12.5	36 x 10 30 x 12
37	22	380	420	18 x 30				2	15.0	42 x 10 36 x 12
38	24	452	500	20 x 30				2	18.0	42 x 12 36 x 14

[d] Based on 14 in. space between joists.

[e] Use full depth of joist except when joist depth is less than minimum depth required, *when pan must be used.*

NWAH & ACA. For construction, design features, and ratings of gravity furnaces see Chapter 16.

Carrying Capacity

The Btu per hour carrying capacities of the selected warm air and return air combinations are shown in Tables 6, 7 and 8.

The selected types of return air ducts and fittings are shown in Fig. 5.

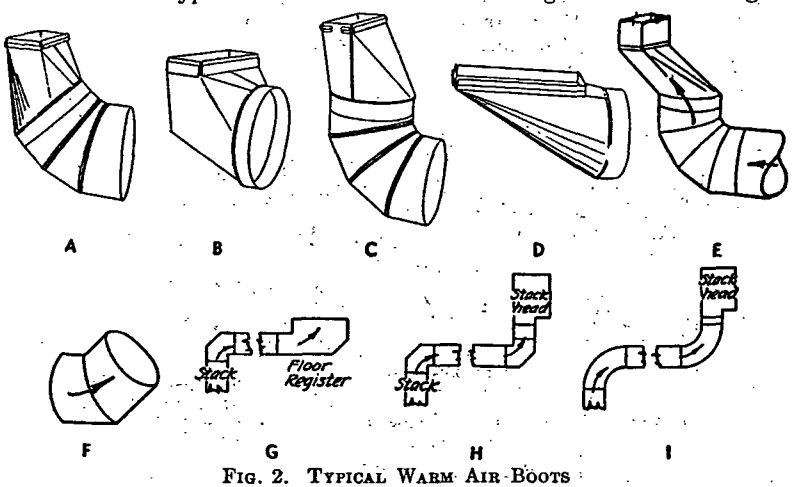

FIG. 2. TYPICAL WARM AIR BOOTS