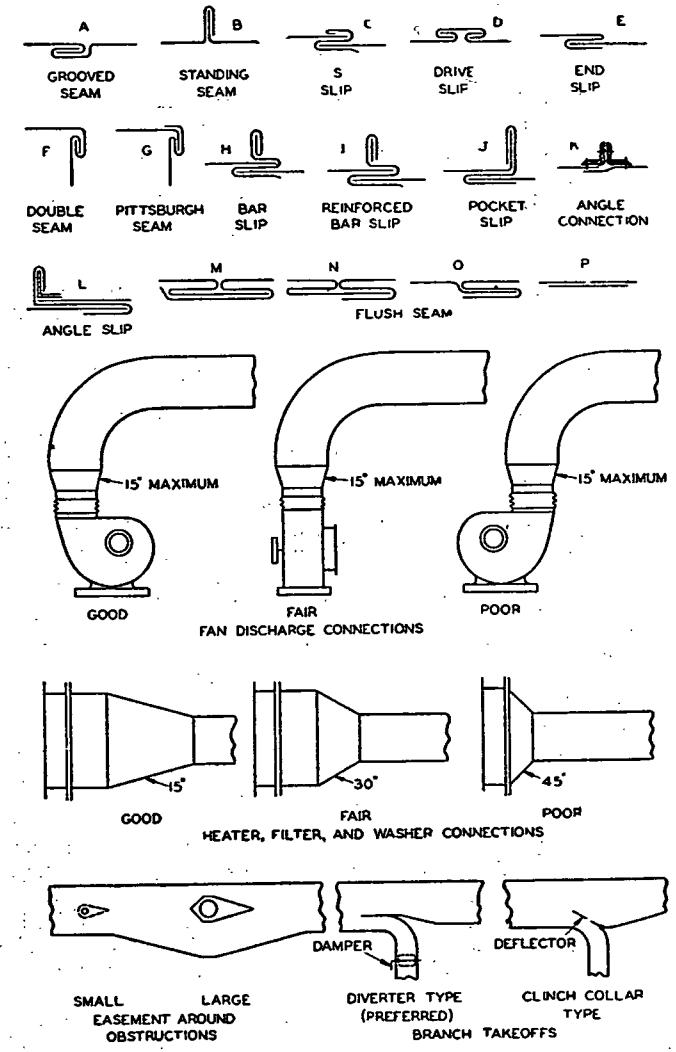

FIG. 15. SHEET METAL DUCT AND ARRANGEMENT DETAILS

offs should always be arranged to cut or slice into the air stream in order to reduce as far as possible the losses in velocity head.

Wherever ducts pass through fire walls or connect two fire areas of a building, automatic fire dampers should be provided. For design of such dampers and other fire protective details, see Pamphlet No. 90 of the *National Board of Fire Underwriters*.[24]

The recommended gages for steel (or iron) and aluminum sheet metal rectangular ducts are given in Table 8. Steel or iron sheets are specified

according to the manufacturers or U. S. Standard Gage System. Aluminum sheets are specified according to the American or Brown & Sharpe Gage System. Weights of black and galvanized steel and iron sheets per square foot of surface for various gages are given in Table 9. Similar data for 2S aluminum sheets will be found in Table 10. Weights of standard copper sheets are given in Table 11. In calculating the total weight of a given length of duct work from these tables, it is customary to add 20 percent for the weight of joints and bracings.

Aluminum sheets of the 2S and 3S type alloy and ¾ hard temper are

TABLE 8. RECOMMENDED SHEET METAL GAGES FOR RECTANGULAR DUCT CONSTRUCTION[a]

ALUMINUM B.&S. GAGE	STEEL U. S. STD. GAGE	MAXIMUM SIDE, INCHES	TYPE OF TRANSVERSE JOINT CONNECTIONS[b]	BRACING
24	26	Up to 12	S. Drive, Pocket or Bar Slips, on 7 ft 10 in. centers	None
22	24	13 to 24	S, Drive, Pocket or Bar Slips, on 7 ft 10 in. centers	None
		25 to 30	S, Drive, 1 in. Pocket or 1 in. Bar Slips, on 7 ft 10 in. centers[c]	1 x 1 x ⅛ in. angles 4 ft from joint
20	22	31 to 40	Drive, 1 in. Pocket or 1 in. Bar Slips, on 7 ft 10 in. centers[c]	1 x 1 x ⅛ in. angles 4 ft from joint
		41 to 60	1½ in. Angle Connections, or 1½ in. Pocket or 1½ in. Bar Slips with 1⅜ in. x ⅛ in. bar reinforcing on 7 ft 10 in. centers[c]	1½ x 1½ x ⅛ in. angles 4 ft from joint
18	20	61 to 90	1½ in. Angle Connections, or 1½ in. Pocket or 1½ in. Bar Slips 3 ft 9 in. maximum centers with 1⅜ x ⅛ in. bar reinforcing	1½ x 1½ x ⅛ in. diagonal angles, or 1½ x 1½ x ⅛ in. angles 2 ft from joint
16	18	91 and up	2 in. Angle Connections or 1½ in. Pocket or 1½ in. Bar Slips 3 ft 9 in. maximum centers with 1⅜ x ⅛ in. bar reinforcing[d]	1½ x 1½ x ⅛ in. diagonal angles, or 1½ x 1½ x ⅛ in. angles 2 ft from joint

[a] For normal pressures and velocities (see Table 5) utilized in typical ventilating and air conditioning systems. Where special rigidity or stiffness is required, ducts should be constructed of metal two gages heavier. All uninsulated ducts 18 in. and larger should be cross-broken. Cross-breaking may be omitted on uninsulated ducts if two gages of heavier metal are used.

[b] Other joint connections of equivalent mechanical strength and air tightness may be used.

[c] Duct sections of 3 ft 9 in. may be used with bracing angles omitted, instead of 7 ft 10 in. lengths with joints indicated.

[d] Ducts 91 in. and larger require special field study for hanging and supporting methods.

readily workable, and can be used for practically all duct work. The 2S type (commercially pure aluminum) is suitable for all, except very large ducts. For large ducts, where more strength is desired, the 3S alloy with ¾ or ½ hard temper is frequently used. The higher tempers, particularly full hard, do not have the formability of the lower tempers. For very large ducts, where considerable strength is required, aluminum sheets should be 2 gages heavier than indicated in Table 8, and should be amply stiffened. Joints can be of any of the standard designs, and can be fabricated in the same manner as iron. Repeated sharp bending and rebending should be avoided, as aluminum has a tendency to crack under such treat-