

TABLE 7. TABULATION OF RESULTS (EXAMPLE 6)

| SECTION | AIR VOLUME<br>cfm | EQUIVA-<br>LENT<br>LENGTH<br>ft | VELOCITY<br>fpm | RECTANGULAR<br>DUCT<br>in. | DIAM.<br>in. | FRICTION<br>PER 100<br>ft<br>in. H <sub>2</sub> O | NET PRES-<br>SURE LOSS<br>in. H <sub>2</sub> O |
|---------|-------------------|---------------------------------|-----------------|----------------------------|--------------|---------------------------------------------------|------------------------------------------------|
| A       | 8000              | 40                              | 1500            | 48 x 16                    | 29.2         | 0.13                                              | .05                                            |
| B       | 6000              | 25                              | 1500            | 36 x 16                    | —            | —                                                 | .03                                            |
| C       | 4500              | 15                              | 1300            | 31 x 16                    | —            | —                                                 | 0                                              |
| D       | 3000              | 26*                             | 1040            | 26 x 16                    | —            | —                                                 | 0                                              |
| E       | 1500              | 15                              | 860             | 16 x 16                    | —            | —                                                 | 0                                              |
| F       | 2000              | 22.5                            | 1200            | 15 x 16                    | 17.          | 0.13                                              | .03                                            |
| G       | 1000              | 15                              | 900             | 10 x 16                    | —            | —                                                 | 0                                              |

\* Includes additional equivalent length of elbow between outlets 2 and 3, which is assumed as 5.5 W, or 11 ft equivalent length of duct. (Based on 3000 cfm at estimated velocity of 1100 fpm).

5. Total pressure loss of the system is the loss in Section A, plus the loss in Section F (or B), plus the loss in the outlet as follows:

$$\begin{aligned} \text{Loss in Section A} &= 0.13 \text{ in.} \times \frac{40}{100} = 0.05 \\ \text{Loss in Section F (or B)} &= 0.03 \\ \text{Outlet Loss} &= 0.12 \\ \text{Total Pressure Loss} &= 0.20 \text{ in.} \end{aligned}$$

### DUCT CONSTRUCTION DETAILS

Straight sections of round duct are usually formed from sheets, rolled to the proper radius with a longitudinal grooved seam. Each section is swaged 1.5 in. from each end and assembled with the larger end of the adjoining section butting against the swage. The sections are held in place by rivets, sheet metal screws, or by soldering.

Rectangular ducts are generally constructed by breaking the corners and grooving the longitudinal seam, although some fabricators still use the standing seam. Elbows and transition sections are generally formed with Pittsburgh corner seams because this seam is easier to lock in place than the double seam, but complicated fittings such as double compounded elbows are usually constructed with double seam corners. The constructions of these various seams, as well as the types of girth connections, are shown in Fig. 15. The application of the various slips and connections is outlined in Table 8. The end slip may be used wherever S slips are recommended. Where drive slips are used, the end slip may be applied on the narrow side of the duct, and the drive slips on only the maximum side.

Designs M to P of Fig. 15 are for flush type seams on ductwork where joints are to be concealed. For smooth appearance the seams may be soldered flush or filled with auto body filler. Screws or rivets used should be of flat-head type.

Ducts 25 to 30 in. in size should be reinforced between the joints, but not necessarily at the joint. Ducts 31 in. and up should be reinforced at the joint and between the joints; if drive slips are used the angles are usually riveted to the duct about 2 in. from the slips. It is good practice to cross-break or kink all flat surfaces to prevent vibration or buckling due to the air flow and accompanying variations in internal pressure.

The construction of elbows and changes of shape cannot be definitely outlined, because of the varied conditions encountered in the field, but in general, long radius elbows and gradual changes in shape tend to maintain

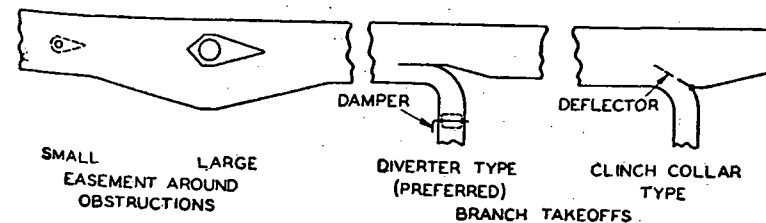
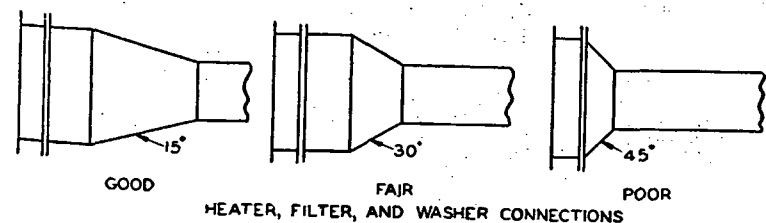
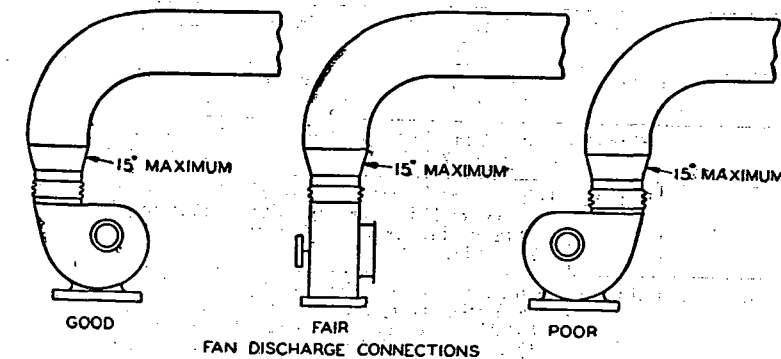
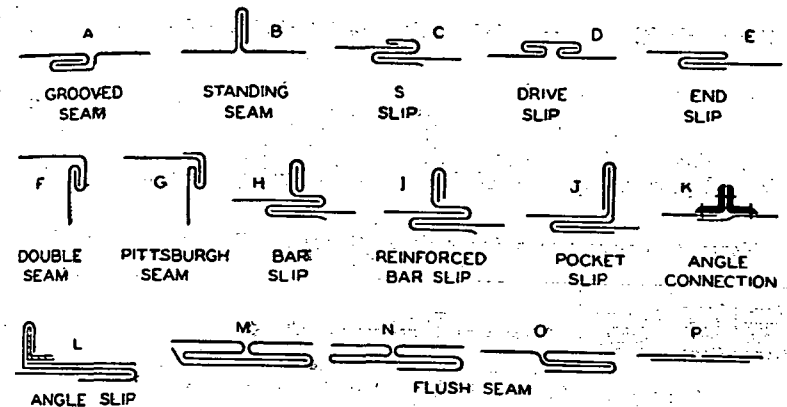


FIG. 15. SHEET METAL DUCT AND ARRANGEMENT DETAILS