for a total leader pipe area up to 790 sq in. Above 790 and up to 1,000 sq in. of leader pipe area the lining should be at least 11¼ x 11¼ in. inside. In case of brick flues not less than 35 ft in height with no linings, the internal dimensions should be at least 8 x 12 in. up to 790 sq in. of leader area, and at least 12 x 12 in. for leader capacities up to 1,000 sq in. Chimneys under 35 ft in height are unsatisfactory in operation and hence should be avoided.

CHIMNEYS FOR GAS HEATING

The burning of gas differs from the burning of coal in that the force which supplies the air for combustion of the gas comes largely from the pressure of the gas in the supply pipe, whereas air is supplied to a bed of burning coal by the force of the chimney draft. If, with a coal-burning boiler, the draft is poor, or if the chimney is stopped, the fire is smothered and the combustion rate reduced. In a gas boiler or furnace such a condition would interfere with the combustion of the gas, but the gas would continue to pass to the burners and the resulting incomplete combustion would produce a dangerous condition. In order to prevent incomplete combustion from insufficient draft, all gas-fired boilers and furnaces should have a back-draft diverter in the flue connection to the chimney.

TABLE 2. SUGGESTED GENERAL DIMENSIONS FOR VERTICAL BACK-DRAFT DIVERTER

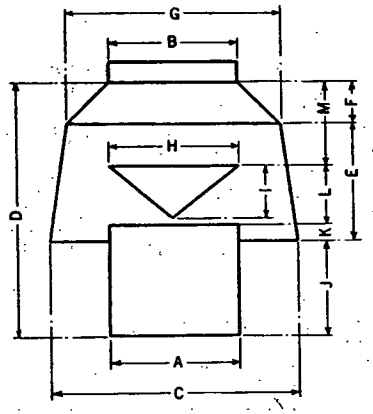

Table of Dimensions (In.)

Pipe Size	A	B	C	D	E	F	G	H	I	J	K	L	M
3	3	3	5.5	7.0	3.8	0.7	4.4	3.0	1.5	2.5	0.7	1.5	2.3
4	4	4	7.2	9.5	5.0	1.0	6.0	4.0	2.0	3.5	1.0	2.0	3.0
5	5	5	9.4	10.8	5.3	1.5	8.0	5.0	2.3	4.0	0.9	2.4	3.5
6	6	6	11.5	12.0	5.6	1.9	9.8	6.0	2.5	4.5	0.8	2.7	4.0
7	7	7	13.5	13.9	6.4	2.3	11.6	7.0	2.9	5.3	0.9	3.1	4.6
8	8	8	15.5	15.8	7.1	2.7	13.4	8.0	3.2	6.0	1.0	3.5	5.3
9	9	9	17.5	17.5	7.7	3.1	15.2	9.0	3.5	6.7	1.0	4.0	5.8
10	10	10	19.7	18.8	7.9	3.6	17.2	10.0	3.8	7.3	1.0	4.3	6.2
11	11	11	22.2	20.7	8.4	4.3	19.6	11.0	4.1	8.0	1.5	4.6	6.6
12	12	12	24.7	22.2	8.7	5.0	22.0	12.0	4.4	8.5	1.7	5.0	7.0

A study of a typical *back-draft diverter* shows that partial or complete chimney stoppage will merely cause some of the products of combustion to be vented out into the boiler room, but will not interfere with combustion. In fact, gas-designed appliances must perform safely under such a condition to be approved by the *American Gas Association* Laboratory. Other functions of the back-draft diverter are to protect the burner and pilot from the effects of down-drafts, and to neutralize the effects of variable chimney drafts, thus maintaining the appliance efficiency at a substantially constant value. Converted boilers or furnaces, as well as gas-designed appliances, should be provided with back-draft diverters.

Since back-draft diverters have a special function to perform in protecting gas burning appliances, it is necessary that they should be built to the proper size as shown in Table 2 for a vertical type and in Table 3 for a horizontal arrangement. Equipment of this kind listed by the *American Gas Association* Testing Laboratory must bear the listing symbol *A.G.A.*

TABLE 3. SUGGESTED GENERAL DIMENSIONS FOR HORIZONTAL BACK-DRAFT DIVERTER

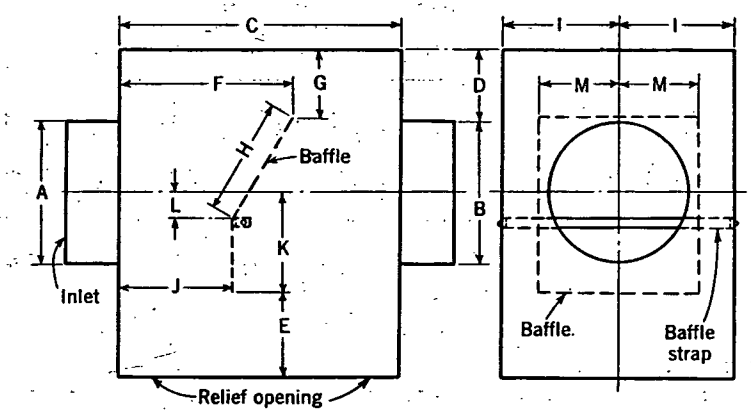

Table of Dimensions (In.)

Pipe Size	A	B	C	D	E	F	G	H	I	J	K	L	M
3	3	3	6	1.5	4.8	3.8	1.4	2.5	2.5	2.5	2.1	0.6	1.8
4	4	4	8	2.0	4.8	5.0	1.9	3.4	3.4	3.4	2.9	0.8	2.3
5	5	5	10	2.5	4.8	6.3	2.4	4.2	4.2	4.2	3.5	0.9	2.9
6	6	6	12	3.0	4.8	7.5	2.9	5.0	5.0	5.0	4.3	1.1	3.5
7	7	7	14	3.5	4.8	8.8	3.4	5.9	5.9	5.9	5.0	1.3	4.1
8	8	8	16	4.0	4.8	10.0	3.9	6.7	6.7	6.7	5.6	1.5	4.7
9	9	9	18	4.5	4.8	11.3	4.4	7.5	7.5	7.5	6.4	1.7	5.3
10	10	10	20	5.0	4.8	12.5	4.9	8.4	8.4	8.4	7.0	1.9	5.8
11	11	11	22	5.5	4.8	13.8	5.4	9.2	9.2	9.2	7.8	2.1	6.4
12	12	12	24	6.0	4.8	15.0	5.9	10.0	10.0	10.0	8.5	2.3	7.0