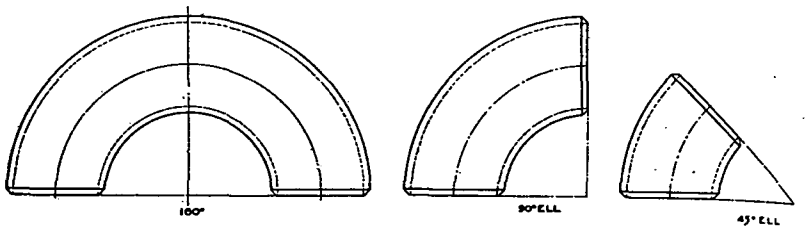
Sectional Committee B16. Tables 10 and 11 give these dimensions for welding-neck flanges suitable for 150 and 300 lb per sq in. gage pressure.

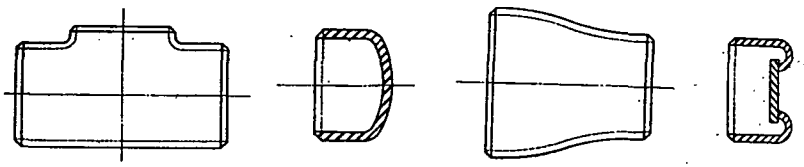
VALVES

Valves are made with both threaded and flanged ends for screwed and bolted connections just as are pipe fittings.

The material used for valves of small size is generally brass or bronze for low pressures and forged steel for high pressures, while in the larger sizes either cast-iron, cast-steel or some of the steel alloys are employed.



a. TYPICAL SHORT RADIUS ELBOWS



b. TEE *c.* FORGED CAP *d.* CONCENTRIC REDUCER *e.* END CLOSURE

FIG. 3. TYPICAL WELDING FITTINGS

Practically all iron or steel valves intended for steam or water work are bronze-mounted or trimmed.

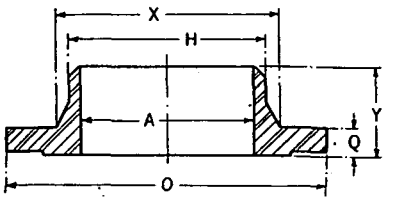
Brass, bronze, and iron valves are generally designed for standard or extra heavy service, the former being used up to 125 lb and the latter up to 250 lb saturated steam working pressure, although most manufacturers also make valves for medium pressure up to 175 lb steam working pressure. The more common types are gate valves or straightway valves, globe valves, angle valves, check valves and automatic valves, such as reducing and back-pressure valves.

Gate valves are the most frequently used of all valves since in their open position the resistance to flow is a minimum. These valves may be secured with either a rising or a non-rising stem, although in the smaller sizes the rising stem is more commonly used. The rising stem valve is desirable because the positions of the handle and stem indicate whether

the valve is open or closed, although space limitations may prevent its use. The globe valve is less expensive to manufacture than the gate valve, but its peculiar construction offers a high resistance to flow and may prevent complete drainage of the pipe line. These objections are of particular importance in heating work.

Check valves are automatic in operation and permit flow in only one direction, depending for operation on the difference in pressure between

TABLE 10. PROPOSED DIMENSIONS OF STEEL WELDING NECK FLANGES FOR MAXIMUM STEAM SERVICE PRESSURE OF 150 LB PER SQ IN. (GAGE) AT A TEMPERATURE OF 500 F, AND 100 LB AT 750 F



Nominal Pipe Size	Diameter of Flange	Thickness of Flg. Min.	Diameter of Hub	Hub Diam. Beginning of Chamfer	Length Thru Hub	Diam. for Standard Pipe	Diam. of Bolt Circle	No. of Bolts	Size of Bolts
	O	*O*	*X*	*H*	*Y*	*A*			
1	4¼	7/16	1 15/16	1.32	2 3/16	1.05	3⅛	4	½
1¼	4⅝	½	2 5/16	1.66	2¼	1.38	3½	4	½
1½	5	9/16	2 9/16	1.90	2 7/16	1.61	3⅞	4	½
2	6	⅝	3 1/16	2.38	2½	2.07	4¾	4	⅝
2½	7	11/16	3 9/16	2.88	2¾	2.47	5½	4	⅝
3	7½	¾	4¼	3.50	2¾	3.07	6	4	⅝
3½	8½	13/16	4 13/16	4.00	2 13/16	3.55	7	8	⅝
4	9	15/16	5 5/16	4.50	3	4.03	7½	8	⅝
5	10	1 5/16	6 7/16	5.56	3½	5.05	8½	8	¾
6	11	1	7 9/16	6.63	3½	6.07	9½	8	¾
8	13½	1⅛	9 11/16	8.63	4	7.98	11¾	8	¾
10	16	1 3/16	12	10.75	4	10.02	14¼	12	⅞
12	19	1¼	14 3/8	12.75	4½	12.00	17	12	⅞
14 O. D.	21	1⅜	15¾	14.00	5	13.25	18¾	12	1
16 O. D.	23½	1 7/16	18	16.00	5	15.25	21¼	16	1
18 O. D.	25	1 9/16	19⅞	18.00	5½	17.25	22¾	16	1⅛
20 O. D.	27½	1 11/16	22	20.00	5 11/16	19.25	25	20	1⅛
24 O. D.	32	1⅞	26⅛	24.00	6	23.25	29½	20	1¼

All dimensions given in inches.

A raised face of 1/16 in. is included in *thickness of flange minimum.*

It is recommended that the taper of the hub should not exceed 6 deg for a reasonable distance back of the chamfer in order to reduce the heat transfer while welding.

the two sides of the valve. The two principal kinds of check valves are the swing check in which a flapper is hinged to swing back and forth, and the lift check in which a dead weight disc moves vertically from its seat.

Valves commonly used for controlling steam or water supply to radiators constitute a special class since they are manufactured to meet heating system requirements. These valves are generally of the angle type and are usually made of brass. Graduations on the heads or lever