

## BENDING TUBING

The instructions below apply particularly to steel, aluminum and aluminum alloy tubing. The bending of copper tubing for gas and oil lines is taken up in the section devoted to power plants.

It is quite difficult to bend tubing around a radius of less than six times its diameter. Even with the radius this large, great care is required to prevent buckling on the inside of the bend and flattening on the outside. See Fig. II - B. Unless the bend to be made is very gentle, a bending form, preferably of hard wood, similar to that shown in Fig. I should be made. If only one piece is to be bent, and if the radius of bend is fairly large, it may not be necessary to groove the form. A more satisfactory job will result, however, if the form is grooved. The bottom of the groove should be smooth and should fit the tubing accurately. The next step is to tube a tight fitting wooden plug into one end of the tube, which should be sufficiently long to extend far enough beyond the form to hold it satisfactorily. Then fill the tube with sifted sand, rapping it sharply with a block of wood as the sand is being poured in so that there will be no empty spaces left. When the sand has filled the tube and been well packed down, the open end should be plugged and the tube heated with a torch. If the material is steel, bring it to a bright red. If aluminum or duralumin is being bent, it should be heated until it will char paper. Aluminum does not change its color when heated, and will melt without even losing its silvery luster. When the tube has been heated to the proper degree, an assistant holds one end while the other is pulled around the form. Fig. II shows a tube which has been properly bent (A), and one which either was not heated properly or in which the sand was not packed tight (B). The thinner the gage of the tube, the harder it will be to bend without buckling.

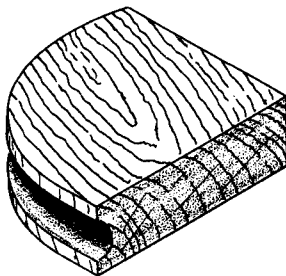


FIG. I

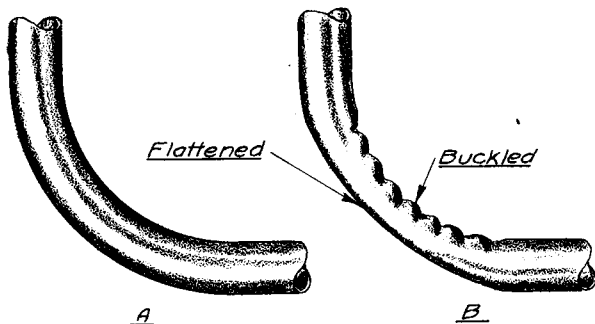


FIG. II

When a number of circles are to be bent, it is more satisfactory to make the form several inches thick and wrap the tubing around it in a spiral. One cut is then made down through the spiral and a number of rings are turned out at once. The ends of these are pulled into line and welded. In production, the form is usually made of cast iron, as the wood burns away after a time.