behind the die, and where the iron is comparatively cold. In the case of slow upsetting by impact, the iron is gradually crowded back from the soft end, the effect of each blow being less and less as the metal gets cooler and the fibres become compacted. At the end of the operation, the metal will have chilled off rapidly, and near the base of the upset be almost cold. At the point of "grip" the metal becomes more or less crystallized, according to the temperature at that point. In view of this effect of temperature on iron, it follows that upsetting should be only performed by continuous pressure, by means of which the iron may be driven back in the die at welding heat, at one stroke of the piston.

Screw-ends are sometimes used for the upper ends of the diagonals, and form their connection with the top chord through the medium of a casting, which requires a very awkward and ugly enlargement to admit of their passage. Screw-ends should be enlarged over the body of the bar by upsetting, so that the cutting of the screw-threads will not diminish the sectional area. A serious objection to the use of screw-ends arises from the fact that they are a temptation to those custodians of public works who have a mania for screwing up any thing they can get a wrench around, and so, in their efforts to "adjust" a bridge, they are very apt to leave the diagonals under different degrees of tension. To adjust screw-ends properly, the workman must combine the "feel" of the wrench with the striking of the bars, so as to judge of the tension by the sound, which involves somewhat of a mu-