among them, although they can only be proportioned on that supposition. It will be apparent to any one, on a moment's reflection, that when two pieces of iron are riveted together through the medium of a splice-plate, the rivets at the ends of the splice are the first ones to feel the effect of a strain in the bars, and consequently are brought into action before the rivets at the middle of the splice are affected; and if the bars are large, the splice-plate long, and the rivets numerous, it is doubtful if the rivets in the middle of a splice do any service whatever; certainly not before the iron has stretched considerably, in which case the first rivets may have upon them double the strain they were calculated to bear. As manufactured in this country, the holes of each piece are separately punched from wooden templates, and despite all the care exercised, the drift-pin must be always at hand to force the matching of the holes of contiguous plates, to admit the insertion of the rivet, thus developing initial strains on the iron impossible to compute, which may be regarded as another very serious indictment of riveted work. Workmen can not always be watched, and the eyes of even the fiercest inspector can not keep every hole and rivet before him. The carelessness of a workman may be rapidly and nicely covered up with a neatly-shaped rivet-head, which tells no tale of the horribly mutilated holes beneath, to which a cold-chisel had possibly been applied, or perchance the holes overlapped too badly for the drift-pin to even give an appearance of matching. Another imperfection very apt to creep in when hand-