table of relative loads, consequently they may be screwed up to a tension of about nine tons, and this is accomplished with a wrench of about 31 to 4 feet long.

After the cables have obtained their permanent set, and the suspenders and stays have been adjusted, no more attention need be paid to this part of the structure. The relative supporting power of the cables, stays, and arches will remain unaltered, they will not undergo any further change. And as changes of temperature will influence the arches as well as the cables, alike and uniform, no strife between the different members can arise on that account.

The curve formed by a cable when freely suspended and not loaded, will be that of a catenary, because the weight of a unit of cable is supposed to be the same throughout its length. But with a weighty horizontal platform suspended to the cables their curve is changed, and will be found to correspond more to a parabola than to a catenary. The suspenders may accordingly be calculated for a parabola, but it will be found in practice that they vary, and sometimes considerably, from both curves. The curves at the ends of the suspenders will be the means of adjustment. But another change in the curvature of the cables will take place when the stays are tightened and begin to relieve the cables at those points. They will then be lowered in the centre and raised near the towers. Allowance must be made for this in the length of the suspenders, so far as the stays extend.

SUSPENDERS.

The maximum weight borne by the 96 suspenders of the middle span is 626 tons. Each suspender, therefore, has to support 6.54 tons. Allowing seven times the strength, we want for the wire-rope suspenders an ultimate strength of 45 tons, or 14" diameter rope.

Fig. 5, Plate 6, shows a wire-rope suspender, both ends fastened in wrought-iron sockets, and the lower socket attached to a stirrup which passes around the floor-beam. Fig. 2 exhibits one of the short, solid suspenders hung to the cable-strap and to the stirrup below. The rods are 14" diameter, and the stirrups 11" diameter. These dimensions may appear extravagant, but when it is considered that under a heavy passing load, every single suspender is taxed more than its general proportion, this large allowance will be justified.

CHORDS.

The arrangement of the upper and lower chords is plainly exhibited on the plans. Plates 2 and 4 show it more particularly. The 9 in. channel-bars composing them extend from end to end without interruption. The lower chords are not plated underneath at any point. This is not wanted on account of strength, and their lateral stiffness is simply insured by the floor-beams, by the plates to which the tie-rods are secured, and by the stay-bolts. Nor are the upper chords plated on top, except in the side spans from the end of the truss to the point where the cable enters. These top plates are 1 inch thick and 56 inches wide. The cross-beams are here placed on top of these plates and riveted to it.

The splicing of the chords is done in the same manner as that of the arches, and will be explained more fully when speaking of the latter. Whenever a stay-bolt is applied to the chords it is passed through a gas-tube, which is cut off on the nut to the right length, and thus a firm and simple connection is made. In order to meet the thrust of the arches, in excess in the one span, while no load is on the other, a section of 60 in. inches was found to be necessary for the lower chords. The horizontal action of the stays at the tower is compressional only, and does not add to the