me necessary to guide the skillful builder in the erection of bridges, for rail roads or common roads, of all lengths which will be likely to be undertaken upon the Truss principle. I will, therefore, leave this part of the subject for the present.

**Suspension Bridges.**

The general principle of Suspension Bridges was briefly alluded to in Article 6. It is not my purpose to go much into particulars with respect to this kind of bridges. My object is not to compile from works already before the public, but to give such results of my own labors and investigations, as are believed to possess originality and value. Not having given a large share of attention to the details of Suspension Bridges, I shall have but little to offer.

The longest spans ever built, have been on the suspension plan. In fact, this plan has advantages for very long spans, which render it practicable to construct longer stretches upon this than upon the truss principle. In the truss bridge, a large portion of the material does nothing towards directly sustaining the weight of the bridge and load. The horizontal portions, for instance, in trusses Fig. 7 and Fig. A do not directly sustain a pound of weight. They simply act and react upon one another through the medium of the oblique parts, and are essential to enable the latter to perform their functions. The chord chains also, in the arched truss, only sustain the horizontal action of the arch.

Now, all of these parts add to the weight of the structure, and proportionally to the necessary amount of material.

In the suspension bridge also, the oblique action of the suspension chains gives rise to horizontal forces which must be counteracted. But the material by which this counteraction is produced, is situated outside of the piers or abutments supporting the spans, and consequently, do not