body, draw upon them obliquely upward and outward, in opposite directions, or from opposite sides of the void, with a certain stress, and the body will be sustained in its position. Apply two rods to it obliquely upward, of a proper degree of stiffness, in the same vertical plane, and on opposite sides of the perpendicular, a certain thrust exerted upon those rods, will prevent the descent of the body.

IV. Here, then, we have the elementary idea—the grand fundamental principle in bridge building. Whatever be the form of structure adopted, the elementary object to be accomplished is, to sustain a given weight in a given position, by a system of oblique forces, whose resultant shall pass through the centre of gravity of the body in a vertically upward direction, in circumstances where the weight can not be conveniently met by a simple force, in the same line with, and opposite to, that of gravity.

For a more clear illustration of this elementary idea, let us suppose a a', Fig. 1, to represent the banks of a river, or the abutments of a bridge; and gg', the line of transit for carriages, &c.; and let us further suppose a load of a certain weight, w, to have arrived at a point centrally between a a'. The simplest method of sustaining the weight is, perhaps, either to erect two oblique braces a w, a' w, or suspend two oblique chains or ties p w, p' w, from fixed supporting points a a', or p p'.

It is not necessary that the weight be at the angular point w, of the braces or chains, but it may be sustained by simple suspension at w' below, or simple support at w'' above, and such obliquity may be given to the braces or chains as may be most economical; a consideration which will be taken into account hereafter.