METHODS OF CONSTRUCTION AND FORMS OF SECTIONS.

The various systems under which iron-work is framed may be classified as the "pin connection," "screw-end connections," and all "riveted connections," which may be and often are combined, to a greater or less extent, in the same bridge. The first two systems are peculiarly American in their origin and practice, while the last is the system pursued almost entirely in England and on the Continent, although latterly the attention of American engineers has been drawn to a considerable extent to riveted work. As has been before intimated, the knowledge of a good bridge-designer will be shown in his details, more than in his mathematical expertness in figuring up strains; and, perhaps, it will not be hazarding too much to say, by way of emphasizing this remark, that few iron highway bridges built in the United States are as strong at the joints as the parts they serve to connect. The very great difficulty in obtaining this joint strength in purely riveted work is due to the general nature of such designs. In the first place, as built in this country, the bars or pieces uniting at the panel-points do not assemble in the axial lines of the truss, thus producing a complexity of cross strains unknowable in amount. In a large bridge, involving heavy pieces and large joints, it is impossible to so dispose the rivets as to distribute the strain equally