

as a sort of necessary evil and a bill of expense for which the company employing him receives no return, whereas he is perhaps one of the most important factors in the whole undertaking, for while it is the duty of the designing engineer to calculate the stresses in the various members and to make a design which will be both safe and economical, it is the duty of the draughtsman to see that the various members are connected in a manner which will give the greatest amount of efficiency and will at the same time make the structure pleasing to the eye. It is his duty to so space each rivet that it will perform its work to its full capacity and no more, it is his duty to so design the connections as to ensure efficient shop work with the least possible expense and it is also his duty to so design his details that the various members may be erected in the most simple manner with the minimum amount of field riveting and with the utmost dispatch. In a word it is the duty of the detail draughtsman to be so thoroughly conversant with the various stages through which the work passes that the final result will be a satisfactory structure from the customer's point of view and a money making proposition to the bridge company fabricating and erecting the bridge.

After the shop drawings have been completed, blue prints are made and several copies sent to the fabricating shop. The first operation to be performed here is the making of the templets. This is done by making a heavy cardboard or wooden pattern of each piece of steel shown on the drawing. In some countries the templet maker has a great deal of laying out and rivet spacing to do, but on this continent, the drawings are so completely figured, that every cut and the exact location of every rivet and hole is clearly shown, it is therefore necessary to simply locate the various holes, etc., and then bore the templets. If you will examine the two samples which I have here you will get a very good idea of the manner in which this work is done. After the templet has been made, the assembly mark as shown on the drawing, the total number of pieces required and the contract number under which that particular piece of work is being fabricated, are painted on one face. This is done in order to obviate the necessity of using drawings during the next operation which is called

#### LAYING OUT

This is done by a man, who uses a hammer and a tool known as a centre punch. This is simply a piece of round bar steel about 4 inches long, tapered at one end to a point. The templet is laid on the steel section and clamped in position. The layer out then inserts his centre punch into each hole in the templet and gives it one hit with the hammer. This makes a small dinge in the steel exactly where the centre of the hole is to be.