mentioned investigations. The first is the one to be ordinarily used: the second may be employed for districts where the timber is large and plentiful.

There seems to be an unfounded prejudice in the minds of county commissioners and bridge supervisors against long panels. Practically they make a better bridge than do short panels; for the members are fewer and larger, and therefore less affected by flaws, besides less subject to vibration, and less liable to inaccuracy of construction. The floor beams and joists being larger, there is less probability of often receiving their maximum working-loads. The only real objection to long panels is the extra cost of the joist timbers when they are to be replaced.

In addition to what precedes, the following general economic considerations should always receive attention.

Field riveting should be avoided as much as possible, and designs should be made so that all the parts will come together readily during erection.

Rivets should be spaced with regularity, so as to facilitate the punching of the holes by riveting machines.

It is generally better, in through bridges, to pack all but the end chord bars outside of the posts, and reduce the width of top chord plate to a minimum.

It is not always better to employ the apparently most economical depth of channels. For instance, if there be a choice of using ten or twelve inch channels for the top chords and batter braces, and if the sections alone would indicate a saving of say three hundred pounds of iron by the use of the twelve-inch channels, the others would be more economical; for the twelve-inch channels require larger stay plates, lattice bars, and re-enforcing plates, besides a wider top chord plate, which would increase the weights of the cover plates, chord pins, post latticing, post stay plates, shoe plates, etc., and even add a little to the lengths of the floor beams.