to thirty-six men. The long spans require a proportionately greater number of men, on account of the heavy sections. For the same reason, the numbers given should be increased, if the bridge be wider than the ordinary size. For city bridges, which are proportioned for heavy loads and for smaller intensities of working-stresses, the numbers should be increased from ten to twenty per cent. When great haste is necessary, the numbers should be doubled.

The most economical number of men will depend, too, upon their skill; for green hands work at a great disadvantage in bridge-raising. They do not know how to use their strength, and require the foreman to stand over them to show them how to do their work; besides, they are often so light-headed as to be unable to work aloft. Sailors make excellent bridge-men on account of both their agility and their training, which has taught them to do in a few minutes many a difficult little piece of work that ordinary hands would puzzle over for hours.

It is necessary to have a few experienced men in every gang: the more of them, the better; provided that their travelling expenses, and wages when travelling, do not render their employment too expensive.

The cost of raising a bridge depends more upon the foreman than upon the men. The best men will fail to do their full quota of work if the foreman be not energetic. Nor does it suffice to have simply a good worker for a foreman: he must know how to keep the gang busy, or they will stand by and look on, while he does all the work. He should also have their good will, or the progress of the work will be unsatisfactory.

The outfit for a gang to raise ordinary county bridges should be as follows:—

1 forge, 2 pairs of tongs, 2 button setts for each size of rivets, 5 drift-pins of each necessary size, 2 handle cold chisels, 1 handle drift pin, 12 cape chisels, 6 plain chisels, 3 wrenches for 5/8" nuts, 3 wrenches for 3/4" nuts, 2 riveting-hammers, 1 light sledge, 1 heavy sledge, 4 hand lines 3/4" diameter, 4 guy lines 1" diameter by 130' long, 2 fall lines 1" diameter by 130' long, 6 to 10 rope slings, 2 sets 8" blocks, 2 snatch blocks, 5 steel