

## CHAPTER IX.

## PROPORTIONING OF FLOOR SYSTEM.

THE wooden portions of the floor system are the joists, flooring, hand railing, hub planks, and guard rails, or felly planks. Of these, only the joists require calculation for strength. Pine flooring is generally three inches thick, and oak flooring two and a half inches. The hand railing, when of wood, should consist of  $4'' \times 6'' \times 4'$  posts, not more than ten feet apart,  $2'' \times 6''$  rails, and  $2'' \times 12''$  hub plank, all of pine, and built as shown in Plate II., Fig. 13, and as specified on p. 23.

The guard rails should be of  $6'' \times 6''$  pine, connected as specified in the same place.

To proportion the joists, first assume their number per panel and their dimensions, in order to determine the total weight of lumber per panel; to this add the total maximum panel live load, or the product of the panel length by the clear roadway by the live load per square foot, given on p. 5, the sum being expressed in tons; then, referring to Table XIII. or Table XIV., find, with the given panel length and the assumed depth of joists, the safe load for a joist one inch wide, and divide this number into the total load just found: the quotient will be the total width of joists per panel, when laid side by side. Divide this total width by the assumed width of one joist: the quotient will be the number of joists per panel. If it agree approximately with the number assumed, and if the distance between centres of joists, when in place, will be between eighteen and twenty-four inches, all right; if not, another trial must be made, with a different depth of joist, and a new assumed panel weight of lumber. It may be well, in any case, to try two depths of joists, in order to see which is the more economical. The