

quality at various points on the expansion line denoted by figures and also represented by the curve, diagram "C" at the top of the figure. In Fig. 3 is shown the diagram, actual and enlarged in diagrams "A" and "B" respectively, the saturation curve corresponding to the weight of steam imprisoned in the clearance spaces, is drawn on the supposition that this steam is dry at the beginning of compression. The quality at different points in the compression curve and at different points in the expansion line, is denoted by figures on the enlarged diagram. The quality is also shown graphically by curves at the upper and lower portions of the figure. While no discussion of the results will be made here, it is interesting to note the improved character of the quality of steam produced by the late compression. It should not, however, be concluded that the one case is for this reason much superior in economy to the other, as I believe that certain compensating disadvantages were experienced which made the economical results practically the same in both cases.

The application of this method to a compound or triple expansion engine, is quite similar to that described for the simple engine. In general, it will be found very much better to have the scale of pressures to as large a scale as possible, since in this case both the expansion curve and the saturation curve become more nearly vertical, and the intersection of the horizontal line becomes better defined, and is much more accurate. It has been our custom to treat each diagram from a compound or triple expansion engine, as already explained for the simple engine, and to obtain the positions of the saturation curve before the combined diagram showing all the cards to the same scale were constructed.

In making the combined diagram, we have tried various plans in order to have a continuous curve of reference to which they might be referred. To do this it is necessary to represent the diagrams as drawn from different clearance lines. Even then, because of the different weights of steam caught in the clearance spaces, the saturation curve would not be continuous, or, if adjusted, so as to be continuous it would have a different curvature for the part corresponding to each cylinder in each case. This later objection will not hold when the hyperbola is used as a reference line, however. The result of various experiments in combining diagrams has been to satisfy me that the