

the useful areas of diagrams at the five points of cut-off indicated. Measurements on ordinates are obtained as follows:\*

For cut-off "B" the area of useful work is 2.68 inches, and the assumed constant loss by condensation of 1.69 inches makes the total area due to the steam consumed equal to 2.68 inches + 1.69 inches = 4.37 inches. Of this amount the area actually realized, 2.68 inches, is 61.3%, which is measured on ordinates and establishes the point "B." For cut-off "B<sub>1</sub>," in the same manner as before, we have useful area of,

"A, B <sub>1</sub> , C <sub>1</sub> , C, D, A."	3.58 inches.
Free expansion of "C <sub>1</sub> , E <sub>1</sub> , C."	.09 "
Assumed condensation.....	1.69 "

Total area due to steam used at cut-off B<sub>1</sub>..... 5.26 inches.

Of this area only 3.56 inches has been realized, or 66.7%, which establishes point "B<sub>1</sub>" in curve "A. C." (Fig. 4.) The succeeding points on this curve are found by the same process, using the indicated areas at each progressive step.

Curve "D. E." is produced by the same method, the only difference being that the smaller and varying condensation is assumed, thus instead of the constant area of 1.69 as assumed in curve "A. C.", the condensation is supposed to be represented by the following areas:

.74 inches for cut-off B.	
.81 " " " B <sub>1</sub> .	
.88 " " " B <sub>2</sub> .	
.95 " " " B <sub>3</sub> .	
1.02 " " " B <sub>4</sub> .	

These quantities are substituted for the constant quantity, 1.69 inches, used in curve "A. C." and the result is curve "D. E."

From an examination of these curves it appears that with the conditions assumed for curve "A. C." the highest economy is obtained at or near cut-off "B<sub>3</sub>," while with the conditions which produce curve "D. E.", the highest economy is found at or near cut-off B<sub>1</sub>.

If the condensation assumed for either of these curves was known to be correct, then the best point of cut-off would at

\* This method is fully illustrated on page No. 1067, Vol. XIV., *Transactions American Society Mechanical Engineers*.