It is sometimes convenient to indicate the range over which the grid voltage varies by showing the wave of alternating grid voltage on an extension of the plate characteristic through the static operating point, as in Fig. 4-14. It should be noted that because the static characteristics for equal intervals of grid voltage are not usually equally spaced, the wave of plate current cannot be accurately constructed by projecting from the grid voltage wave to the load line and thence to the plate current wave.

4-8. Plate Diagram for a Load Having Equal A-c and D-c Resistance.—Figure 4-14 shows the plate diagram for a circuit in which the load is a pure resistance that does not vary with frequency. Since the a-c and d-c load resistances are equal, the static and dynamic load lines

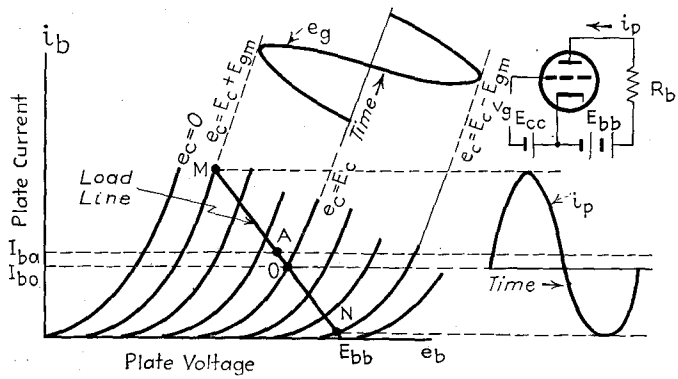

FIG. 4-14.—Triode plate diagram. Pure resistance load. $r_b = R_b$.

coincide. The path of operation and shape of the static characteristics are such that the current amplitude of the positive half cycle exceeds that of the negative. The average plate current therefore increases with excitation and the dynamic operating point A lies above the static operating point O. In general, the position of A relative to O depends upon the region of operation and the shape of the static characteristics. Shift of the operating point with excitation is predicted by the series expansion for alternating plate current, since the even-order terms of the series give rise to direct components of current, the magnitudes of which increase with the excitation amplitude.

4-9. Simplified Plate Diagram for a Load Having Unequal A-c and D-c Resistances.—Figure 4-15 shows an approximate plate diagram for a circuit in which the a-c resistance of the load exceeds the d-c resistance.[1] In the construction of this diagram it is assumed that the dynamic load line passes through the static operating point. The wave of alter-

[1] In Fig. 4-15 values of instantaneous plate voltage in excess of the supply voltage result from voltage induced in the inductance of the load coupling transformer.