Operation

a. Rectification

When the Ⓐ generator lead is - and Ⓑ is +, current flows from Ⓐ through D_1 to ground, up through the battery to charge it and up through the load circuits, through D_2 and back to the generator at Ⓑ.

When Ⓑ is - and Ⓐ is +, the positive voltage is felt at the gate of the BCR through R_3 and D_3. (A small gate current flows from Ⓑ → BCR → BCR gate lead → D_3 → R_3 → Ⓐ.) This starts the BCR thyristor conducting and current from Ⓑ goes through the BCR to ground, the battery and load, and Via D_4 back to Ⓐ.

b. Regulation

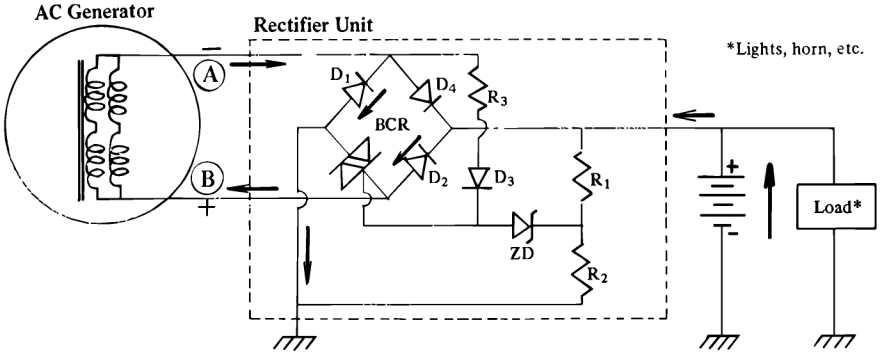
Voltage regulation at high speed occurs only on the half cycle when the generator Ⓐ lead is negative and the Ⓑ lead is positive. As the sine wave voltage rises from zero, current starts out normally through D_1, the load, and back through D_2. A small amount of current also flows through R_2 and R_1.

When 15 volts is reached, a portion of this voltage at the junction of R_1 and R_2 causes the Zener Diode to break down and gate the BCR. A small gate current* flows through the ZD to start the BCR conducting and current from Ⓐ is returned to the generator at Ⓑ via D_1 and the BCR.

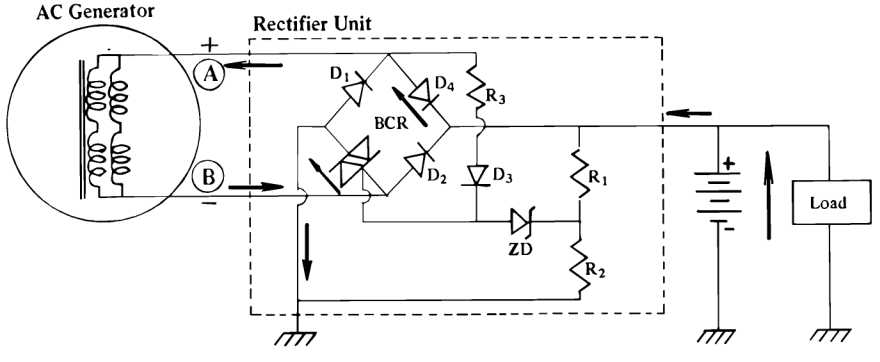
In this manner average voltage is held down to 15 ± .5 volts.

*In the actual circuit the ZD turns on a transistor which gives the thyristor a negative gate from ground.

Rectification when A is negative (423)



Rectification when B is negative (424)



Voltage Regulation (425)