Using ground-based magnetometer data of the April 06, 2000, superstorm, we obtained maps of ionospheric and field-aligned currents (FACs) by means of the magnetogram inversion technique MIT-2. It is shown that there persists an approximate equality between the Region-1 current intensity and the sum of both Region-2 and Region-0 current intensities at the dawn and dusk side independently. Based on these observations, we deduced a conceptual electrical circuit scheme of the disturbed magnetosphere/ionosphere system and its magnetospheric generators, which includes both hemispheres. This model implies that the generator system creates primarily the Region-1 FACs of Iijima and Potemra at both hemispheres, while the Region-2 and Region-0 FACs form by spreading of the Region-1 currents through the ionosphere. Moreover, we found an asymmetric characteristics of the dawn and dusk side FAC intensities, which appears to be quite strong and variable in sign. This asymmetry is interpreted in terms of FACs, which connect both hemispheres via the asymmetric ring current of the inner magnetosphere, DRP-1.