## Tatara Furnace and Bellows

This full-scale replica of a *tatara* furnace from the late nineteenth century is accompanied by the actual bellows used at Wakasugi Ironworks (Shimane Prefecture) from 1891 to 1913.

Building a *tatara* furnace of this size required roughly 4 metric tons of clay. The walls were thicker at the base, forming a triangular trough where the molten iron and steel gathered. As smelting progressed, the clay walls began to melt. The sticky, liquified clay reacted with impurities in the iron and steel before flowing out of the furnace as a byproduct called "slag." At the end of each operation, the hearth's half-melted walls were torn down, and a new hearth was built.

The foot-operated bellows on either side of the furnace are called *tenbin*, or "balancing scale" bellows. This type of bellows, operated by a single person who stood atop the wooden pedals, came into use by the early eighteenth century. Throughout the multiday smelting operation, a crew would work the bellows in shifts, feeding air into the furnace in a consistent rhythm.

The clay faces molded into the tops of the bellows were meant to serve as protective charms. Although many different designs were used, the two faces here depict Gan Jiang and Mo Ye, a semi-mythological husband and wife associated with swordmaking in Chinese literature.