

# Ismaeel al-Jazari Biography

## Ismaeel al-Jazari

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# Biography

Little is known about the life of Ismaeel al-Jazari, an Arab who began serving the sultans in northern Mesopotamia in 1181. However, through his writings we can learn about the engineering craftsmanship of the medieval Arab society.

In 1206 al-Jazari presented his sultan with the *Book of Knowledge of Ingenious Mechanical Devices*, devised for both educational and entertainment value. In this singularly important work, he described contemporary labor-saving devices and unusual clocks, including some of his own designs. Even though the book does not contain descriptions of the astrolabe or balance, for which Arab scientists were famous, it plainly displays stronger and weaker aspects of Arabic engineering.

Most of the machines, with varying degrees of utility, used age-old principles of mechanics, including systems of weights, pulleys, gears, cams, and levers. The crankshaft was first described by al-Jazari, if not invented by him.

One water-raising device described in his book had a water wheel which brought a series of scoops to the surface through cogs along its shaft. These types of water machines comprise the majority of the useful gadgets al-Jazari notes, and consequently, he has been called a hydraulic engineer.

He also mentioned many amusing, yet practical, devices, including several unusual clocks, which were much more elaborate than those developed elsewhere. They were sometimes driven by a weighted cord on a pulley-wheel that also operated the time mechanism. As the weight fell, it encountered resistance from a float riding in a water tank. Others involved a bucket that tipped over when filled with water, hitting a ratchet that moved the clock ahead. These extraordinary clocks struck the hour with a cacophony of noise from moving figures with musical instruments.

Al-Jazari noted a number of practical joke devices in his text. Some were trick drinking vessels that appeared to contain water but could not be emptied. Others looked empty but produced water when tipped over.

In producing these not-so-useful inventions, al-Jazari was typical of his age. Arabic engineers had a reputation for frivolous machines that dated back to the writings of the ancient Greeks. Had he lived in a different society, al-Jazari might have put his ingenuity to a different purpose.