Crane Encyclopedia Article

Crane

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Crane

An invention of ancient origin, the crane is used for the loading and unloading of heavy objects and as an aid in the construction of tall buildings. It is distinct in that it moves objects both horizontally and vertically, unlike hoists or elevators. One common forerunner of the crane was the *shaduf*, prevalent in Egypt and India around 1500 B.C. Employed by a single person for lifting water, the shaduf consisted of a vertical support, a long, pivoting beam, and a counterweight.

The first true cranes, founded on principles governing the use of levers and counterweights, employed a pulley system affixed to a single mast (or boom). Lifting power was provided by humans or draft animals operating a treadmill or large wheel. Eventually, a second mast and guy wires were added to increase the strength and stability of this early form of crane.

One of the most significant developments in crane design, which probably occurred during Medieval times with the advent of Gothic architecture, was the jib-crane, which featured a pivoting horizontal arm that projected outward from the top of the boom. The addition of hinged movement to the outermost section of the jib allowed for even further versatility and movement. Jib-cranes are also known as derrick cranes, derrick being the term originally applied to gallows structures at the time when Englishman Godfrey Derrick became a prominent hangman.

In modern nomenclature, the derrick is a large hoisting machine similar in most respects to the crane, save for its typically stationary foundation. Oil derricks, for example, are specialized steel towers used for raising and lowering equipment for drilling oil wells. One of the most powerful cranes, a barge derrick, is a double-boomed structure capable of lifting and moving ships weighing up to 3,000 tons. Other cranes with specialized uses include the cantilever crane (featuring a suspended horizontal boom and used in shipyards), the overhead traveling crane (guided by rails and a trolley-suspended pulley system and used for indoor work), and the tractor-mounted crawler crane (a hydraulic-powered crane with a telescoping boom). A simple example of a small-scale crane is the fork-lift truck. Like its much larger relatives, the fork-lift is limited not so much by the size of its hoisting apparatus as by the force of its rear counterweight.