File: `assembly-crane.tex`

Definition 0.1 An assembly crane is a small type of crane used for lifting heavy building elements and machine components in workshops. It usually consists of a base frame supports all components of the assemblycrane and transfers the forces induced by the load to be floor. The base frame is often realized as a two-pronged fork structure with two legs.

The vertical mast supports the jib, a horizontal beam that carries the sheaves for the cable which carries the lifting hook.

File: `cable.tex`

Definition 0.2 A wire rope, or cable, is a type of rope which consists of several strands of metal (usually stell) wire laid into a helix.

File: `castor.tex`

Definition 0.3 A caster (or castor) is an undriven, single, double, or compound wheel mounted on a fork that is designed to be mounted to the bottom of a larger object (the "vehicle") so as to enable that object to be easily moved. They are available in various sizes, and are commonly made of rubber, plastic, nylon, aluminum, or stainless steel.

There are two kinds of casters:

- rigid casters whose fork is fixed relative to the vehicle, and
- swivel casters have an additional swivel joint above the fork allows the fork to freely rotate about 360 °, thus enabling the wheel to roll in any direction.

Castors are found in numerous applications, including shopping carts, office chairs, and material handling equipment. High capacity, heavy duty casters are used in many industrial applications, such as platform trucks, carts, assemblies, and tow lines in plants. Generally, casters operate well on smooth and flat surfaces.

File: `crane.tex`

Definition 0.4 A crane is a type of machine, generally equipped with a hoist or winch, cables or ropes, and sheaves, that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places.

File: `gear.tex`

Definition 0.5 A gear or cogwheel is a rotating machine part having cut teeth, or cogs which mesh with another toothed part in order to transmit torque, in most cases with teeth on the one gear of identical shape, and often also with that shape (or at least width) on the other gear.

File: `hoist.tex`

Definition 0.6 A hoist is a device used for lifting or lowering a load by means of a drum or lift-wheel around which rope, cable, or chain wraps. It may be manually operated, electrically or pneumatically driven and may use chain, fiber or wire rope as its lifting medium. The load is attached to the hoist by means of a lifting hook.

Definition 0.7 A lifting hook is a device for grabbing and lifting loads by means of a hoist. A lifting hook is usually equipped with a safety latch to prevent the disengagement of the lifting wire rope sling, chain or rope to which the load is attached. A lifting hook may have one or more built-in pulleys to amplify the lifting force.

File: `keyed-joint.tex`

Definition 0.8 A key is a machine element used to connect a rotating machine element to a shaft. The key prevents relative rotation between the two parts and enables torque transmission. A key is used for temporary fastening. For a key to function, the shaft and rotating machine element must have a keyway, also known as a keyseat, which is a slot or pocket the key fits in. The whole system is called a keyed joint. A keyedjoint still allows relative axial movement between the parts.

Definition 0.9 In a feather key joint, both the key and the rotating machine element have rectangular keyways between which a rectangular key is placed for joining.

File: `rope.tex`

Definition 0.10 A rope is a linear collection of plies, yarns or strands which are twisted or braided together in order to combine them into a larger and stronger form. Rope is thicker and stronger than similarly constructed cord, line, string, and twine.

Observation 0.11 *Ropes have tensile strength and so can be used for dragging and lifting, but are far too flexible to provide compressive strength. As a result, they cannot be used for pushing or similar compressive applications.*

File: `sheave.tex`

Definition 0.12 A sheave is a wheel or roller with a groove along its edge for holding a belt, rope, or cable. When hung between two supports and equipped with a belt, rope or cable, one or more sheaves make up a pulley.

File: `torque.tex`

Definition 0.13 The torque τ, moment or moment of force, is defined to be the rate of change of angular momentum of an object. When it is called moment, it is commonly denoted as M.

The magnitude of torque depends on three quantities: the force applied, the length of the lever arm connecting the axis to the point of force application, and the angle between the force vector and the lever arm

$$\tau = r \times F \qquad \text{or} \qquad |\tau| = |r||F|\sin\theta$$

where τ is is the torque vector and $|\tau|$ is the magnitude of the torque, r is the displacement vector (a vector from the point from which torque is measured to the point where force is applied), F is the force vector, and θ is the angle between the force vector and the lever arm vector.

File: `transmission.tex`

Definition 0.14 A transmission is a machine that provides speed and torque conversions from a rotating power source to another device.

File: `welding.tex`

Definition 0.15 Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by causing coalescence. This is often done by melting the workpieces and adding a filler material to form a pool of molten material (the weld pool) that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld.

Definition 0.16 A weldment design is a design of an artefact whose components are mainly joined by welding.

File: `winch.tex`

Definition 0.17 A winch is a mechanical device that is used to pull in (wind up) or let out (wind out) or otherwise adjust the tension of a cable. A winch consists of a spool (also called winch drum) and a crank or motor.

File: `worm-drive.tex`

Definition 0.18 A worm drive is a transmission in which a worm (which is a gear in the form of a screw) meshes with a worm gear (also called a worm wheel).