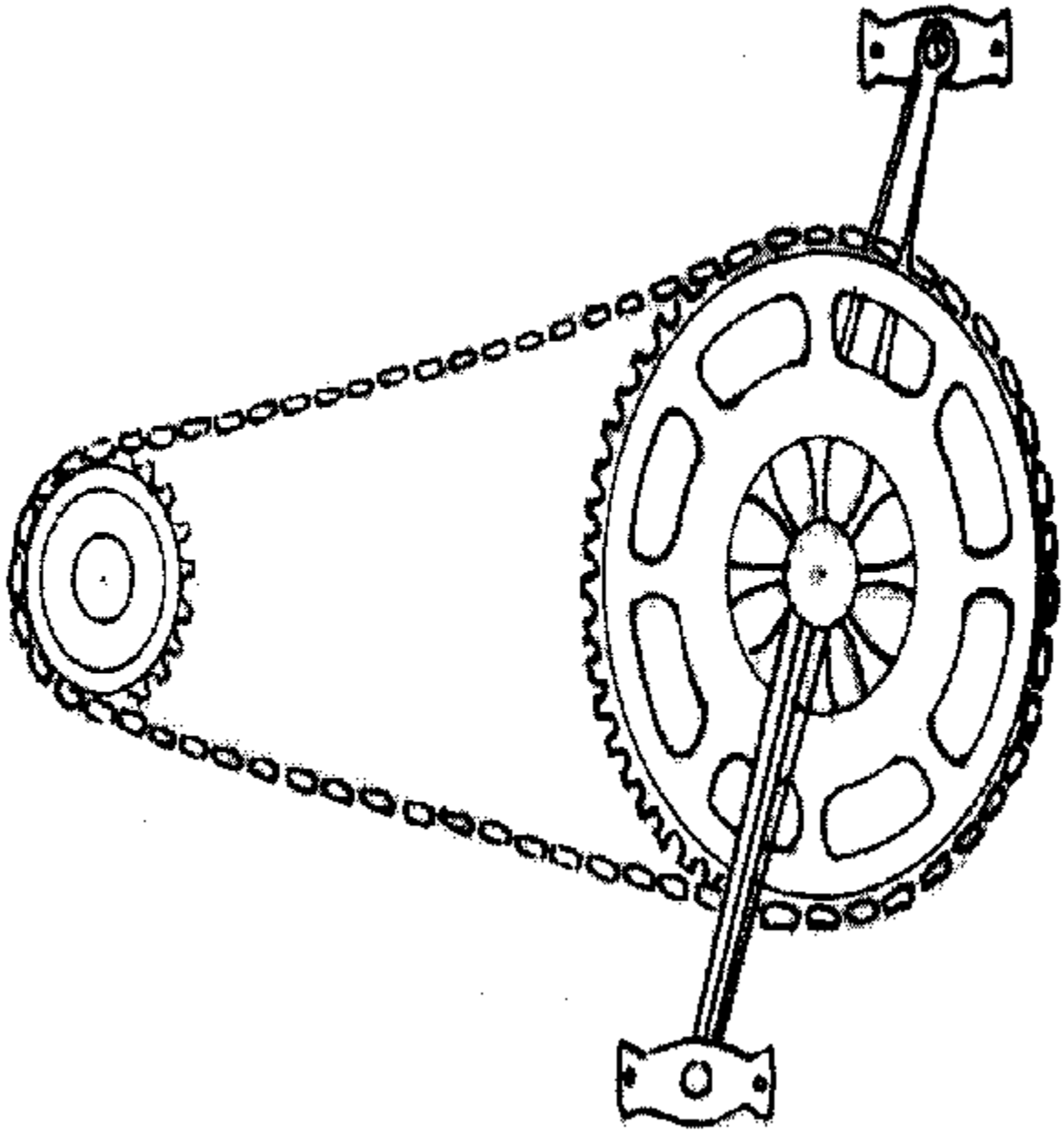
Material Drawing: Chain



Obsolete chain designs previously used on bicycles included the block chain, the skip-link chain, and the Simpson lever chain. Most modern bicycle chains used with a single chainring and single rear sprocket are conventional industrial bushing chain. Until the 1980s, most derailleur chains were also bushing chains, but today, virtually all derailleur chains are of the "Sedis" bushingless design. Compared to a bushing chain, a bushingless chain is cheaper to make, is less

likely to break under shifting load, promotes better lubricant flow inside the rollers, and creates more lateral flexibility for multi-geared bicycles. However, it also wears much faster and has slightly worse mechanical efficiency than a bushing chain.

Early examples of chain-driven bicycles include the 1869 Guilmet and Meyer,[1] the 1879 Lawson, the 1884 McCammon,[2] and the 1884 Starley Rover.

Before the safety bicycle, bicycles did not have chains and the pedals were typically attached directly to the drive-wheel, thus limiting top speed by the diameter of the wheel and resulting in designs with front wheels as large as possible. Various linkage mechanisms were invented to raise the effective gear ratio, but with limited success. Using chain drive allowed the mechanical advantage between the drive and driven sprockets to determine the maximum speed, thereby enabling manufacturers to reduce the size of the driving wheel for safety. It also allowed for the development of variable gearing, allowing cyclists to adjust their gearing to the difficulty of the terrain, on the fly.

Efficiency[edit]

A bicycle chain can be very energy efficient: one study reported efficiencies as high as 98.6%.[3] The study, performed in a clean laboratory environment, found that efficiency was not greatly affected by the state of lubrication.[3] A larger sprocket will give a more efficient drive, reducing the movement angle of the links. Higher chain tension was found to be more efficient: "This is actually not in the direction you'd expect, based simply on friction".[3]