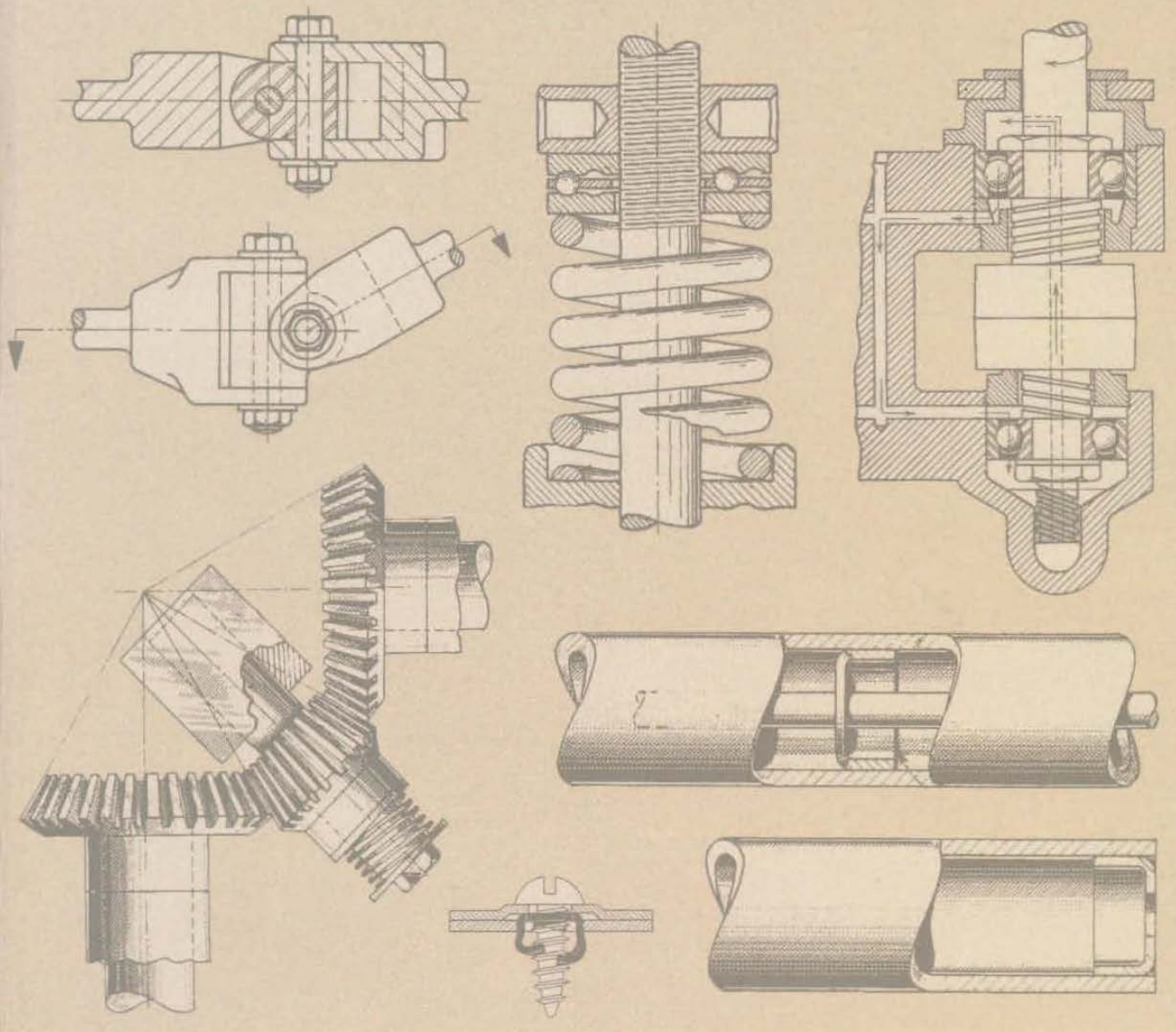
ILLUSTRATED SOURCEBOOK

of

MECHANICAL COMPONENTS



ROBERT O. PARMLEY, P.E.

ILLUSTRATED SOURCEBOOK of MECHANICAL COMPONENTS

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SECTION 3

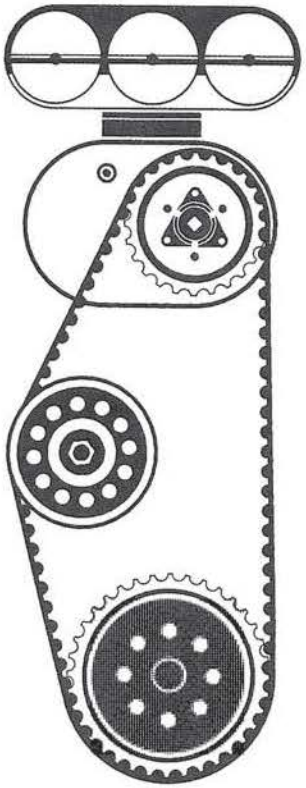
BELTS & BELTING

Unique Belt Applications

Brent Oman

Belt power transmission systems have been in operation in industry for over 200 years, going back to early flat belt drives. These early flat belts were typically composed of leather and cotton or hemp rope, used to transmit power from steam engines or water wheels to early industrial production machinery. Belt technology has increased dramatically, with modern engineered belt systems handling loads and applications with a design flexibility that other power transmission systems cannot match. Modern belt drives can handle a wide variety of loads and speeds that would not have been possible in the past.

An example of an extremely harshly loaded belt application is the supercharger belt drive system used on the supercharged, nitromethane consuming Top Fuel and Funny Car classes in professional drag racing. The belt drive is used to drive the supercharger, transmitting power from the engine crankshaft. Vehicles in these drag racing classes commonly traverse the 1/4 mile track in under 5 seconds. Belt tensioning is provided by the addition of an idler. The superchargers used to develop such high vehicle speeds can require in excess of 1000 HP to operate, at speeds in excess of 10,000 RPM. Engine acceleration at the start of a race can be nearly 5,000 RPM in 0.2 seconds. Such extreme operating conditions requires a belt with equally extreme capabilities. A polyurethane synchronous belt with high strength aramid tensile cords and a modified curvilinear tooth form is the only belt which can handle such a demanding load requirement. Supercharger drive belts are commonly 14mm pitch (distance from the center of one belt tooth to the center of an adjacent belt tooth) and approximately 3 inches wide.



An example of a Top Fuel or Funny Car supercharger driven from engine crankshaft

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