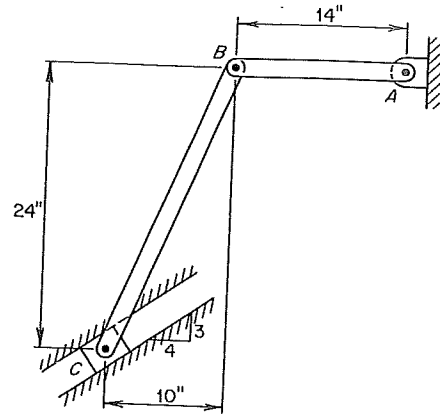
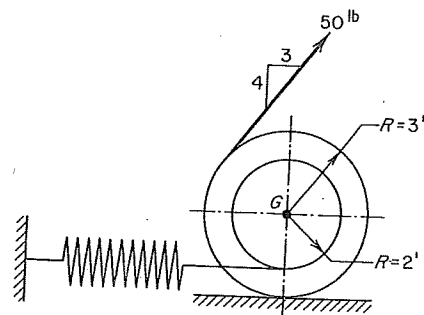


ENERGY PROBLEMS FOR RIGID BODIES

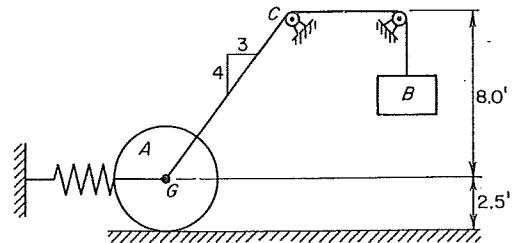
1) The slender uniform homogeneous rods AB and BC weigh 16.1-lb and 32.2-lb, respectively. Block C weighs 64.4-lb and moves in the slot as shown. Rod AB has a constant angular velocity of 2 rad/s (counterclockwise). Find the kinetic energy of the system of bodies for the given position.



2) The 644-lb wheel has a radius of gyration of mass with respect to a horizontal axis through G of 2.0 ft and rolls without slipping. The 50-lb force applied to the cord wrapped around the wheel has the constant slope shown. The modulus of the spring is 50-lb/ft and the spring is stretched 1 foot when the velocity of G is 12 fps to the right. Find the velocity of G after it has moved 6 ft to the right.



3) The 322-lb homogeneous disk A rolls without slipping on the horizontal plane. In the position shown, the 64.4-lb block B has a velocity of 15fps downward, and the spring is stretched 2 ft. The spring modulus is 40-lb/ft. Find the angular velocity of A when it passes directly under the smooth peg C.



4) The homogeneous bar AB weighs 96.6-lb and has an angular velocity of 2rad/s clockwise in the position shown. As the bar rotates, it strikes the spring, which is initially uncompressed, and is brought to rest in the vertical position. Find: a) the spring modulus, b) components of the pin reactions at A on AB at the instant the velocity becomes zero.

