

## Abstract

*This publication aims at covering subjects related to mechanisms and machines in general, such as design theory and methodology, kinematics of mechanisms, computational kinematics, multibody dynamics, dynamics of machinery, gearing and transmissions, and transportation machinery. Internal combustion engines have been analyzed in Chapter 1 while modern non-dismountable steel shell spark plugs are examined in the second chapter. Progressive technological methods implemented in production, high mechanization and automation were examined in the third chapter., Gear mechanisms used as summing (subtraction) mechanisms, mechanisms for co-ordination of two movements, mechanisms for compensating for the difference in angular speeds of independent movements, have been described in detail in the fourth Chapter. Suitable pressure vessel designs for minimum masses of transporting and storing compressed air were examined in the last chapter. The vessels were to carry an internal pressure, contain an internal volume and be made from material for ease of storage and transportation. Discussion of relevant decisions and applicability selection has been based on the design of thin shells depending primarily on the magnitude of the general system of membrane stresses. Attention has been also given to the effect of local bending stresses at regions of discontinuity in the shell. Chapter 6 analyzes handling mechanisms and namely, manual winches. Most of them are designed for industrial applications to handle heavy loads. Finally in the seventh chapter a bench drilling machine is designed and developed, intended to fill the market niche providing construction and functionality. By drilling small diameter holes in semi-finished products and materials is constantly the bench drill is required in large and small-scale industrial production, maintenance and repair activities, in subcontractor workshops, and at home. The size range of these holes makes the use of large size drill presses inefficient.*