

# KINEMATICS OF MACHINES.

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## CHAPTER I.

### INTRODUCTORY CONSIDERATIONS.

**1. Study of Machines.**—In general the study of a Machine involves problems of three distinct kinds. We may first of all consider from a geometrical point of view the motion of any part of the machine with reference to any other part, without taking account of any of the forces acting on such parts. Or, the action of the forces impressed on the parts of the machine, and of the forces due to its own inertia or to the weight of its parts, may be dealt with, and the resulting transformations of energy may be determined. A third branch of the theory of machines treats of the action of these loads and forces in producing stresses and strains in the materials employed in the construction of the machine, and discusses the sizes, forms, and proportions of the various parts which are required either to insure proper strength while avoiding waste of material, or to make the machine capable of doing the work for which it is being designed.

The science dealing with the first-named class of problem is termed the *Kinematics of Machines*, which we may define as being that science which treats of the relative motion of the parts of machines, without regard to the forces producing such motions, or to the stresses and strains produced by such forces.

