

## CHAPTER III.

### *THE CONSTRAINTMENT OF PLANE MOTION.*

#### ! 10. ELEMENTS OF MECHANISM.

HAVING so far investigated certain questions relating to the nature of plane motion, we have now to examine the nature of the means used to obtain such motion, *constrained*, in machines. . We have already pointed out (p. 8) that the motion of any piece of a machine is determined by the *form* of its connections with the other pieces, assuming these connections to be of suitable material. This form has to be such as not only to allow the required motion, but absolutely to render impossible all other motions in the way which has been already explained in § 1. The principle of the method used to obtain this double object is as follows, supposing it applied to a perfectly general case. We first form some part of one of the two bodies whose relative motion is to be constrained, into any convenient shape, say such a projection as *A* on the body  $\alpha$ , Fig. 20. Then, bringing the other body  $\beta$  to rest, we find all the positions of the shaped portion of the first relatively to it, and the curves bounding these positions form a figure *B* traced out on  $\beta$  by *A*, which is called in geometry the *envelope* of *A* upon  $\beta$ . By now removing the material of  $\beta$  within this figure so

