

Sometimes the screw is fixed and the block moveable, as in the case of a common *nut*; or the groove may be cut in the screw itself, and the thread project in the block.

To all these cases the preceding investigation applies.

76. *The Wedge.*

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This is a solid, whose bounding surfaces are two intersecting planes. Most cutting instruments come under this class. It is used generally to separate the parts of bodies, either by blows or a moving pressure, and in this mode of use its investigation belongs to Dynamics. When used to keep open a rift in a body, it acts generally by means of friction, and not by a weight applied to it; it is therefore useless to proceed with its examination on the principles employed hitherto.

VIRTUAL VELOCITIES.

77. If a machine at rest under a power P and a weight W be put in motion, so however that its geometrical relations are unaltered, the space described by the point of application of the power, estimated always in the direction of the Power, is called the *virtual velocity* of the power: and similarly for the weight. Virtual velocities.

The principle of virtual velocities asserts that the product of P by P 's virtual velocity is equal to that of W by W 's virtual velocity. Principle of

78. This principle is only a special application of a far more general one, which it is not here necessary to examine. We