

ed with stones, iron, or any heavy matter, will not overturn so easily, as when loaded with wood, hay, or any light article; for when the load is not higher than a b, fig. 22, a line from the centre of gravity will fall within the centre of the base at c; but if the load be as high as d, it will then fall outside the base of the wheels at e, consequently it will overturn. From this appears the error of those, who hastily rise in a coach or boat, when it is likely to overset, thereby throwing the centre of gravity more out of the base, and increasing their danger.

CHAPTER II.

ARTICLE 15.

OF THE MECHANICAL POWERS.

Having premised and considered all that is necessary for the better understanding those machines called mechanical powers, we now proceed to treat of them. They are six in number; namely:

The Lever, the Pulley, the Wheel and Axle, the Inclined Plane, and the Screw.

These are called Mechanical Powers, because they increase our power of raising or moving heavy bodies. Although they are six in number, yet they are all governed by one simple principle, which I shall call the First General Law of Mechanical Powers; it is this, *the momentums of the power and weight are always equal, when the engine is in equilibrio.*

Momentum, here means the product of the weight of the body multiplied into the distance it moves; that is, the power multiplied into its distance moved, or into its distance from the centre of motion, or into its velocity, is equal to the weight multiplied into its distance moved, or into its distance from the centre of motion, or into its velocity; or, the power multiplied into its perpendicular descent, is equal to the weight multiplied into its perpendicular ascent.

