

the burning of the powder. So that for a brief moment the energy that was freed by the ignition of the powder existed in two forms of moving energy: one we call mechanical, as manifested in the movement of the bullet through the air; and the other molecular, existing in the form of heat. The sum of the two forms is equal to that which exists as molecular energy or heat, after the mechanical energy of the bullet has been spent. When a body is heated there is a certain amount of internal work done by increasing the rapidity and amplitude of the movement of the atoms.

Work may be resistant work, or motor work. When we undo work that has been already performed it is called negative, or resistant work. It is laid down as a principle that the total work performed upon a particle is equivalent to the kinetic or moving energy it gains; and the total work undone is equivalent to the kinetic energy it loses. If in performing a certain work it is attended by more or less friction, the same amount of work is performed in either case.

When work is performed by a piece of machinery that is driven by a fixed standard of power, the amount of effective work that will be performed will depend upon the friction that has to be overcome in driving the machinery itself. If the friction is great, the