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## **On the economy of machinery and manufactures**

**Babbage, Charles**

**London, 1832**

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Chap. V. Extending the time of action of forces.

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## CHAP. V.

## EXTENDING THE TIME OF ACTION OF FORCES.

(31.) THIS is one of the most common and most useful of the employments of machinery. The half minute which we daily devote to the winding up of our watches is an exertion of labour almost insensible ; yet by the aid of a few wheels its effect is spread over the whole twenty-four hours. In our clocks this extension of the time of action of the original force impressed is carried still further ; the better kind usually require winding up once in eight days, and some are occasionally made to continue in action during a month, or even a year. Another familiar illustration may be noticed in our domestic furniture : the common jack by which our meat is roasted, is a contrivance to enable the cook in a few minutes to exert a force which the machine retails out during the succeeding hour in turning the loaded spit ; thus enabling her to bestow her undivided attention on the other important duties of her vocation. A great number of automatons and mechanical toys moved by springs, may be classed under this division.

(32.) A small moving power, in the shape of a jack or a spring with a train of wheels, is often of great convenience to the experimental philosopher, and has been used with advantage in magnetic and electric experiments where the rotation of a disk of metal or

other body is necessary, thus allowing to the inquirer the unimpeded use of both his hands. A vane connected by a train of wheels, and set in motion by a heavy weight, has also on some occasions been employed in chemical processes, to keep a solution in a state of agitation. Another object to which a similar apparatus may be applied, is the polishing of small specimens of minerals for optical experiments.