

PART I.—MECHANICS.

Articles—

1. MOTION considered as the Foundation of Mechanics.
2. Gravity and Elasticity the first moving Principles of all Mechanics.
3. The Power of Elasticity unknown.
4. Of Motion and its Properties.
5. General Laws of Motion.
6. Of the Momentum or Force of Bodies in Motion, and the Difference between the Force of Elastic non-elastic Bodies—Demonstration that their Effects produced, are as the Squares of (and not as the Simple) Velocities.
7. Laws of the Motion and Force of falling Bodies—A Table of their Motion.
8. Laws of the Motion of Bodies descending inclined Plains and curved Surfaces.
9. Motion of Projectiles.
10. Laws of circular Motion and central Forces.
11. General Laws of Mechanical Powers.
12. General Rule for computing the Powers of any Engine.
13. Rule for computing the Power of a Compound of Levers, applicable to Mill-wheels.
14. Power and Velocity, in inverse Proportion to each other—Therefore,
15. Demonstration, that no real Power can be gained by large Wheels in Mills.
16. Ditto, that no Power can be gained by double Gears to turn Mill-stones.
17. Of the Pulleys.
18. Wheel and Axle.
19. Inclined Plain.
20. Wedge and Screw, their great Powers compared.
21. Of Friction, the Loss of Power shewn to be to overcome Inertia, and not Friction.
22. Of Fly-wheels, their Principles, and where useful.
23. Laws of Friction, means for reducing it—Rollers applied to reduce it.
24. Of the Maximum Velocity and load for Engines, by the old Theories.
25. The old established Theory investigated by a Scale, and its Error shewn.
26. Scale and Experiments made for discovering true Theories.
27. A Scale on a new Plan, by which a true Theory is discovered, that as to Load of Engines, so as to produce the greatest Effect.
28. A Scale of the Proper Velocity, of the Circumferences of Overshot to produce the best Effect, with a steady Motion, and of the proper Motions.

HYDRAULICS

30. Shows the Force of Bores in Motion, to produce Effects, are
Flashes and Winds, demonstrated.
31. The Hydrostatic Paradox explained.
32. Theorem or Rule for finding the Velocity of Water spouting under
33. Rule for calculating the Effect of any Gate of Water, under any Head,
34. Demonstration that the Effects of Water acting on Wheels by Gravity,
directly.
35. Demonstration that Water acts with its whole Power, in the whole of its per-
over the Wheel, without Loss, on account of its not being on the End of the Lever, as
as some have supposed.
36. Laws of the Friction of Water issuing through an Aperture.
37. Preface of the Atmosphere, the cause of Water rising in Pumps, &c. Ditto, the Principles by wh
rises in Water-spouts at Sea.
38. Common Kind of Pumps for raising Water, explained.
39. Of conveying Water over Hills, under Valleys, &c. or under Ground, to Mills or wheels.
40. A Paradoxical Mill, that will not move empty, explained, the Principles of which often take place in
to the great Injury of a Mill.
41. A Breast or Pitch-back wheel does not run before the Gravity of the Water, after the Stroke, if there be
too much Head, as does the overshot—Theory of the Motion of Breast-wheels, Rule for finding it.
42. A new and simple Rule for measuring the Power of Water acting by Gravity—Power of 16 cubic Feet of
Water per Second, acting by Five different Applications, on a Wheel, calculated, and their Difference
shewn—A Table of Powers per Second, of different Quantities of Water, under different Falls.
43. Rule for finding the Circumference and Area of a Stone, from its Diameter, and the Number of superficial
Feet passed in a given Time—Table of the Falls of Water, Head above the Gates, and Diameter at
Mouth of the Wheels, number of Cogs and Rounds in the Gears, and Size and Motion of the Stones
(and Power it required to turn several of them) of 18 good Mills in Practice—And Observations o
said Table, that confirms the Theories in this Work established.
44. Rule for finding the Size of the Mill-stone to suit the Power of the Seat—Table of the Area of different
sized Stones, and Power required to drive them, and the Quantity they will grind.
45. Directions for digging Canals through rocky Ground, in the cheapest Manner, to convey the Water to th
Mill.
46. Theorem for determining their Size, to suit the Size or Number of the Mill-stones they are to drive.
47. Of Air-pipes, to prevent long tight Trunks from bursting.

AN attempt to shew the Rules or regular Steps that are necessary, and have been taken, in the Discovery of several useful Improvements—intended to excite others to take the like Steps, and make further Improvements.

E X E M P L I F I E D

1. In improving the Art of Threshing Grain.
2. ————— Cleaning ditto.

WE have so far perused the manuscript copy, of a work, proposed to be published by Oliver Evans, entitled, *The Young Mill-wright and Miller's Guide*, as to be satisfied that it will be useful and instructive in general, and to Mill-wrights and Millers in particular: And therefore we think it merits, a place in our Publick.

DAVD. R.
R. PATTER
J. B. BORDL
GEO. CLYME

NB a lot of the sulphur to be sent there the higher up the River