

### III.

10. Experiments illustrating atmospheric pressure ; cause.
11. Principle and description of pneumatic engine.
12. Principle and use of the barometer ; conditions necessary to insure its efficiency.
13. Weight of atmospheric pressure in pounds.
14. Law of Mariotte ; description and manner of using the manometer.
15. Principle of the balloon ; how to produce an ascensional force.
16. Principle of the syphon and the pump.
17. Description of the principal kinds of pumps.

### IV.

18. Sound ; its production and the manner in which it is communicated.
19. Laws of the variation of the intensity of sound ; principle of the reflection of sound ; echo and vibration.

### V.

20. Principle and use of the thermometer ; manner of construction and liquids employed.
21. Conditions necessary to ensure good qualities ; scale of the principal kinds of thermometers.
22. Manner of comparing the degrees of the scales of the Fahrenheit, Reaumur and Centigrade.
23. Unequal expansion of different liquids ; maximum density of water.
24. Conductors ; name the principal conductors in their order.
25. Point out the most advantageous means of securing warmth within habitations, according to the laws which influence conductors of heat ;—utility of double-windows.

### VI.

26. Radiation of heat ; examples.
27. Intensity of radiation ;—capacity for heat ;—name the bodies possessing the greatest power of radiating heat.
28. Reflection of heat ;—its relation to radiation.
29. Application of the principles of radiation and reflection to heating and preservation of heat.
30. Fusion ;—refractory bodies ;—law of fusion.
31. Congelation ;—law of congelation.