A table of temperatures, from 1 to 50 atmospheres, calculated in coincidence with the experiments of the French academicians, and adapted to English measures, is given by us in Article 57, for the purpose of convenient practical reference.

33. The latest series of experiments on the elastic force of high-pressure steam, we owe to America. At the re quest of the Hon. S. D. Ingham, Secretary of the Treasury of the United States, a committee of the Franklin Institute, of the State of Pennsylvania, was appointed “ to examine into the causes of the explosions of the boilers used on board of steamboats, and to devise the most ef­fectual means of preventing the accidents, or of diminishing the extent of their injurious effects.” Among other subjects, such as the strength of boilers, the construction of safety-valves, to which we shall refer in another place, this committee took into consideration the elastic force of high-pressure steam at different temperatures. Funds were placed at their disposal by the House of Representatives, and the committee consisted of such a combination of scientific and practical men, as to give high authority to their results. On the 1st day of November, 1830, the subject was placed in the hands of the following gentle men :—Professor Alex. Dallas Bache, Mr Benjamin Reeves, Mr λV. H. Keating, Mr M. W. Balwin, Mr S. V. Berrick, and Isaiah Sukens.

We shall enter more fully on the description of their apparatus of experiment than we should otherwise have done, because we shall have frequent reference to make to the whole of their experiments, not only in this article, but in our article on the Steam-Engine, where we treat of explosions of boilers and their causes.

The boiler used by the committee is represented in figs. 20, 21, 22. It is a cylinder, twelve inches in internal diameter, two feet ten inches and a quarter in length within, and a quarter of an inch thick, of rolled iron, with the ends rivetted in the usual manner. Fig. 21 is a side view. Figs. 20 and 22 are end views of the boiler,

and of the apparatus connected with it. The boiler was placed horizontally in a furnace, the fire surface extending about halfway round the cylinder. The furnace was arranged for a charcoal fire, the grate bars extending the whole length of the boiler, and the fire being applied nearly the whole length. The draught entered by an

opening, closed in the usual manner, and left the furnace through a flue placed at one end and side of the boiler. In fig. 20, A is the ashpit door, B the furnace door, and in 21 and 22, C is the furnace chimney.

In order to examine, readily, the interior of the boiler during the progress of the experiments, each end was provided with a glass window (D, figs. 20 and 22). The glass used was three-eighths of an inch thick. The openιngs in the ends, which were rectangular, were two and a half by one and three quarters inches wide.

Three gauge cocks were placed in the front end of the boiler ; their positions will be particularly stated hereafter; they are shown in figs. 20 and 21, at *a, b,* and c.

To the same end and by the side of the gauge cocks, a glass water gauge (*w*, *x,* figs. 20 and 21) was attached, a particular description of which will be given in the detail of experiments made to compare its performance with that of the gauge cocks.

To supply the boiler with water, a forcing pump EE'