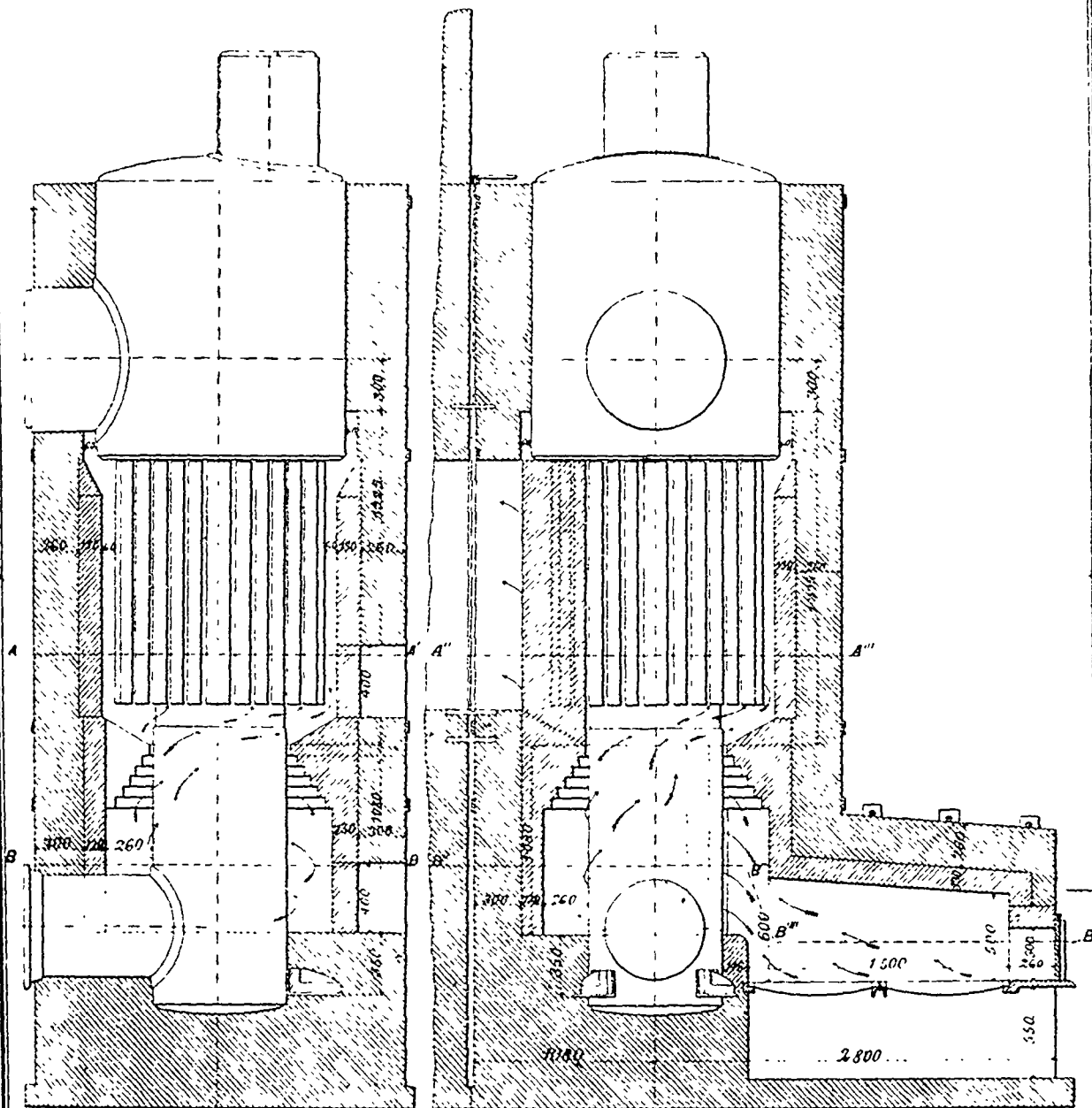


Fig. 1.



BERGMANN'S HIGH-PRESSURE BOILER AT THE VIENNA EXHIBITION.

On this and following pages we illustrate some of the principal exhibits at the Vienna Exhibition. Our first illustration is from *Engineering* and represents one of the two large boilers on Bergmann's patent. They are not exhibited at work but are lying outside the German boiler house in a position where every part of them can be freely inspected. Their construction is somewhat novel and the boilers themselves have excited a good deal of attention in Germany.

In our engravings Fig. 1 shows a front and a side elevation of the boiler, with corresponding cross sections of its furnace and brick setting. Fig. 2 is a longitudinal section, of the boiler only. Fig. 3 shows a cross section of the boiler and furnace along the line B, B' in Fig. 1, and Fig. 4, above, a similar section along the line A, A'. Figs. 5 and 6 are sections through the upper and lower horizontal branches respectively. The boiler consists essentially of two cylinders, of which the upper one is larger in diameter and shorter than the lower one. The lower cylinder is 10 ft. 3 3/4 in. long by 2 ft. 7

in. in diameter, its bottom end is entirely embedded in brickwork for a depth of about 14 in. A wrought-iron sediment tube, which also is mostly imbedded in brickwork, and which is 1 ft. 9 1/2 in. in diameter, is rivetted to the shell as near the bottom as possible. In the cover of this tube are the feed valve and the blow-off valve, but the latter is thus necessarily several inches above the lowest part of the boiler. The upper part of the boiler is 4 ft. 7 1/2 in. in diameter by 5 ft. 6 in. high. From its lower plate hang suspended 44 tubes of the kind well known in England as Field tubes, that is, water tubes closed at the lower end, and having an internal circulating tube of small diameter. These tubes, as will be seen from the engravings, are placed so as to hang vertically in a double ring round the lower part of the boiler. They are 3 in. external diameter, and 4 ft. 8 in. long. On the upper end of each a conical ring is welded and the holes in the tube plate are of the same taper as the ring, the tubes being kept tight by the pressure of the steam. In order that the steam and water