



VERTICAL PLANING MACHINE.

Vertical planing machines are now becoming pretty general in engineering workshops of the first class. The Chinese Government have lately established arsenals and dockyards on the European system at several of their principal ports, and among the tools sent out from this country by Messrs. John Bourne and Co to furnish these establishments, there is a type of vertical planing machine which offers several features of advantage. Of this machine we give an illustration.

Upon a planed base plate of cast iron formed with grooves fitted with a T-headed bolts for the attachment of the object to be operated upon, two strong standards are erected which carry planed cross pieces at the top and bottom, along which are drawn by means of screws a great upright bar which carries the cutting tool. The toolholder with the tool, or if desired three tools, is made to travel up and down upon the vertical bar by means of a screw—shown in the engraving—and after each cut the vertical bar is drawn sideways by the top and bottom screws through a suitable distance, whereby an action resembling that of an ordinary planing machine is maintained, except that the cut is vertical. The foundations in many parts of China being precarious, the tool is so constructed as to be independent of walls or buildings. The vertical travel is 12 ft., and the horizontal is 16 ft. The cutting tool travels up at twice the speed that it travels down, and as will be seen by a reference to the engraving, the design is one which combines strength with simplicity. The base plate is formed in two parts bolted together laterally for facility of shipment. Only

about one-third of its depth is shown above the floor. At the back of the machine there is a pit about 3 ft. deep in which the attendant stands when the machine is at work.

DOVETAILING MACHINE.

We illustrate, on page 125 a dovetailing machine manufactured by the Sächsische Maschinen-fabrik, of Chemnitz, an excellent piece of workmanship, and an exact copy of the American machine now largely manufactured by Messrs. Robt. and Son, of Rochdale. The principles of this machine are too well known to require a repetition here. It will be sufficient to point out that the saw blades by which the dovetails are cut are mounted on the discs set at an angle to each other, as shown in the engraving. For a portion of their length around the periphery of the disc they are simple blades, and for the remainder the top of the blade is bent at right angles, so that in entering the wood it may cut the bottom of the dovetail. The timber to be cut is clamped upon the table, with its edge projecting far enough to be operated on by the saws, and the table is made to advance by a feeding screw, which is also shown in the sketch. By altering the rate of feed, dovetails of varying pitch may be cut. By reversing the bent blades in the disc, the recesses for the dovetails may be cut. The table is arranged so that it can be set at an angle, and blind dovetails formed when desired.