of the engine of a vessel named the Clyde, the first of the kind we ever saw

The top of the piston-rod carries a quadripartite cross­head *h h,* on each end of which stands a pillar *h* *h ;* these four pillars again unite in another quadruple cross­head, sustained upright by a vertical guide ; and it is from this summit that a connecting rod descends to the crank *k.* We believe that this principle of continuing the piston-rod round the axis by a forked frame was first devised, at the end of the last century, by Trevithic, the famous high-pressure engineer, and by him applied to steam-carriages. It is drawn in his patent specifica­tions.

After passing through a great variety of phases, the steeple-engine appears to have settled down into the two following shapes. In figs. 14 and 15. the piston-rod is seen united to a triangular frame, from the apex of which the connecting rod descends to the crank. In fig. 16, this frame is shown to be square, and fig. 13 is the side view of both varieties.

Another method of accomplishing the direct connec­tion without encumbering the deck, has twice been pa­tented : in the last instance by Mr Humphreys. It may

be called the trunk-en­gine. The axis is placed at the height of half the st· oke, or more, above the cylinder, and a connect­ing rod unites immedi­ately the crank-pin with the centre of the piston. In this way the connecting rod, passing through the top of the cylinder, would allow the steam to escape but for a large trunk or casing with which it is surrounded, and which, passing through a chasm of large area conceived to be steam-tight, rises and falls with the piston to whιich it is at­tached. In fig 17, A A is the cylinder: to its piston is attached a trunk B. which works through a stuffing­box in the cylinder cover; to the piston the connecting rod *c c* is attached. Fig. 18 represents the top of the cylinder A A, with its stuffing-box and the trunk B.

For a like purpose, oscillating cylinders have been used with some measure of success. Rotatory engines have been unsuccessfully tried. The reader may now examine the vertical engines in the plates.

In short, it does not appear that any vessel, either on a large or small scale, constructed with an engine differ­ent from the ordinary side lever engine, has been found to be practically superior to it ; and therefore we shall for the future speak of the lever-engine of the ordinary construction, when we treat of the marine steam-engine, unless when another species is expressly men­tioned. The lever-engine possesses three advantages of an important nature :—first, its parts are nearly in equi­librio; secondly, its basis embraces a large part of the vessel's bottom for strength; thirdly, the lever presents great facility for working its appendages.

*The Cylinder of the Marine Steam-Engine.—*The cy­linder of the steam-engine being that portion of its ap­paratus, by means of which the elastic force of the steam is directly applied to the mechanical arrangements by which the force of the machine is developed, is there­fore the principal member of the engine, oh the size of which its powers and the dimensions of the other parts depend.

It is according to the dimensions of the cylinder that an engine receives its denomination, and is bought or sold. An engine is called a 10, 20, 50, or 100 horse­power engine, according to the number of inches in the diameter of the cylinder. It is not to be expected, how­ever, that every steam-engine will develop the power of a given number of horses, simply because it has a cylinder of a given number of inches. This depends equally on the proper proportion, construction, and con­dition of all the other parts, without which the engine will be incapable of doing its proper duty. The engines of some makers will develope double the power of those made by inferior engineers, even although in name and dimensions identical. Hence, the dimension of cylinder is taken according to a rule somewhat arbitrary, of the value both dynamical and pecuniary of the engine under the term nominal power; and the actual efficiency of the engine under given circumstances, is called the real or effective power. Hence an ambiguity is incurred in speaking of the relative powers of engines, when it is not determined whether the real or nominal power is referred to. An engine of 100 horse power, which ought to be capable of giving out an effective power of 100 horses, may, from bud workmanship, bad arrangements, or modified circumstances, only give out the real power of 50 horses ; and an engine of the same dimension of