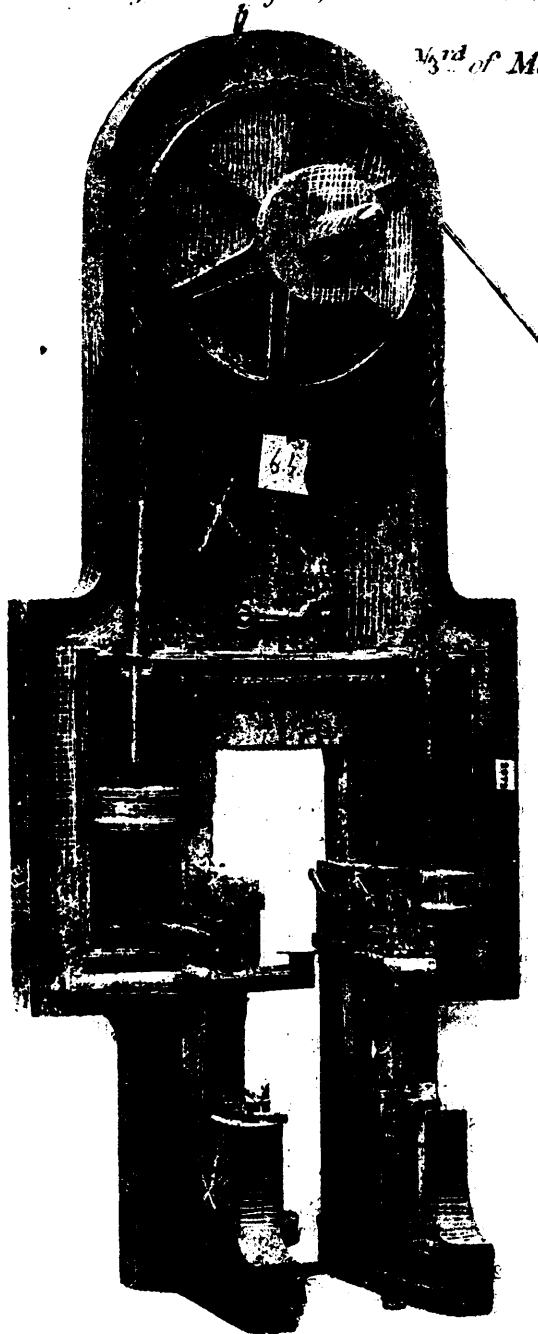


## INVENTIONS OF WATT.

Fig 27 *Two-cylinder Engine, for double action.**1/3<sup>rd</sup> of Model.*

roads is put forth, to be worked by steam above the pressure of the atmosphere, which is to be allowed to escape into the atmosphere when it has done its work; a fore-carriage and steering apparatus is named, and a light and portable boiler with the fire inside the boiler in an iron tube, whilst the body of the boiler *might* be made of wood for lightness, and be strongly hooped to retain the steam.

The author may mention the fact that some internally-fired boilers for practical work have had their shells made of wood; as his late uncle, about sixty years ago, assisted in the construction of one for a dredger in London, in which thick planks,

well tongued together, and jointed with white lead, formed the sides and the top and bottom, there being a mass of clay placed on the top to help it to withstand the pressure of the steam. The pressure was very low, and the engine of the dredger was a condensing engine.

Watt went so far into detail as to give the diameter and stroke of the cylinders for a small steam carriage, to take two persons, viz. 7 in. cylinder, 12 in. stroke.

Watt says, "The elastic force of the steam in the boiler must occasionally be equal to the supporting a pillar of mercury 30 in. high."