forward by the twisting movement of the di cs, every revolution driving it against the cutters, whereby ery effective trituration is effected of the fibrous and other un composed portions, and the whole thus reduced to a pulpy, ho ogeneous mass.

At the delivery end of the cylinder t pulped peat is forced out through orifices, of any s ction that may be found suitabl , on to a system of rollers, which carry it forward to trays, where it is cut into lengths, and either carri d or passed along a tramway to the drying sheds, where in about three days it becomes sufficiently dry to permit of its being taken from the portable trays, and stacked in open racks of a somewhat special construction, but th s is merely a question of getting the best ventilation in the smallest space, where the final drying is completed.

The great feature, as it appears to us, in the whole of this manipulation, is the breaking up of the cellular tissues of the peat, which contain what may not inaptly be called the *fixed* moisture; the mere hygroscopic or free water can always be readily got rid of, but fine and close trituration is absolutely necessary to enable th other to be removed, and that this is really realised the remarkable shrinkage which takes place in the blo ks or briquettes in drying is the best and most tangible proof. The condensed peat, when made ready for the market, which, we are assured, does not require more than eight days at the very outside, is of great firmness and solidity, and quite as strong in its resistance to a cutting edge as many of our softer woods As to its inflammable qualities, we can only say that we saw a bright, clear fire burning in one of the office-rooms at Messrs. Clayton's which was made up of the condensed peat, and which was distinctly most admirably adapted to cooking. Until further experiments have been made it is impossible for us to give any data as to what may be the water-evaporating power of this new fuel; but, judging from appearances, we are disposed to believe that it will be found high, whilst as to the reduction of iron in blast furnaces, w are prepared at once to say—and our experience with wood charcoal has not been inconsiderable —that it is admirably adapted for that use. The difficulty in this process has always been to get the peat in a sufficiently solid form to resist the pressure of blast just at the tuyeres, but we believe that Messrs. Clayton, Son and Howlett's patent produces it so condensed that it will be found equal to sustaining the impingement of a pillar of blast of, say, 2lb. to 2½lb, which is amply sufficient. We may also call the attention of the manufacturers of charcoal tinned-plates, whose supplies of wood are necessarily daily decreasing, to this process, which places within their reach a fuel admirably adapted for use in their hollow and sinking-down fires."

It is stated that this fuel can be prepared in England at a cost of from five to six shillings per ton of the dry briquettes. The cost of production here should be, if anything, less than that, and would moreover give employment to hundreds of our population who now go annually to work in the factories and brick-fields of the States.

MILL'S FUEL ECONOMISER.—(See page 45.)

Mr. R. Mill, of Val Plaisant, Jersey, has lately patented a simple and, as it seems, very effective arrangement of tubes for promoting the circulation of water in steam boilers, while at the same time increasing the heating surface, besides possessing collateral advantages which will be mentioned further on. The accompanying drawings illustrate some modes of carrying this invention into effect. Fig. 1 is a vertical section through an ordinary Cornish boiler; Fig. 4 is a horizontal section through the flue of the same; and Fig. 2 is a front elevation. Two pipe systems are shown over the grate, bent serpentine fashion, or similarly joined by bends, as shown; and each connected with its side of the boiler, viz., at the back, connected to the water space over the crown of the furnace, and in front connected to the water space near the bottom of the flue; A is a circulation cock, and B a blow-off cock; by shutting the former, and opening the latter, the tubes may be cleared of any sediment, though very little deposit takes place because of the scouring action of the rapid circulation. The pipes are supported by brackets, Fig. 3 is a front elevation of a Cornish boiler, fitted with two similar pipe systems, but without circulation cocks. There is besides shown a third system, in the centre of the flue, and which will be described with reference to Fig. 5. Fig. 5 is a vertical longitudinal section of a furnace flue for a Cornish, Lancashire, marine, or other furnace flue boiler. D is the lower limb of a pipe system, and is by the pipe F connected to the water space in the lower part of the boiler, close by the ashpit, or front side of the bridge. Where the pipe passes through the grate the bars are cut short, and supported from their adjoining bars, or in any other suitable manner. E is the upper limb of the system, which is carried to the back of the boiler and terminates in the water space at or near the furnace crown. This arrangement may, for very small furnace flues, be used alone, but for larger flues, in combination with the pipe systems described, with reference to Figs. 1, 2, and 3, and either separa from or connected to them.

Fig. 6 is a vertical elevation of an egg-ended boiler, fitted with two pipe systems, one on each side, and with their tubes arranged vertically, or slanting one above the other, but so as to leave the middle of the furnace clear. I, K, and L are three tubes, connected together by double bends, or in one piece bent to the shape. The pipe I runs along the whole length of the underside of the boiler, and has its exit in the water space at the back end of the boiler; the pipes K and L are arranged under the pipe I, but only in the furnace part of the flue. L runs to the front of the brickwork setting, and is by the pipe M connected to the water space at the front of the boiler; N is the circulation cock, and O the blow-off cock, as described with reference to Figs. 1, 2, and 3.

As to the advantages resulting from the application of these circulating tubes, some experience, extending over from two to eleven months, has already been gained in respect to land boilers. Firstly, a clear and considerable saving in fuel, because of the additional and effective heating surface, and increased circulation, and secondly, a saving in wear and tear in the furnace crown or in the bottom plates as regards boilers fired underneath, because of the equalisation of the heat given out in the furnace, a great part of it being used to heat and evaporate water drawn from other parts of the boiler, instead of as heretofore, being for the greatest part absorbed by the plates over the furnace, which thus do many times more work than any other part of the boiler. Unequal expansion, with its disadvantages, is also lessened. Thirdly, obtaining a much lower temperature at, and in front of the furnace door, which by the application of this invention, has been effected. Fourthly, a saving in the wear and tear of the brickwork in the furnace of externally-fired boilers, as it remains black instead of being red, or white hot, thereby preventing the possibility and inconvenient stoppages for relining.—*Engineer.*

CULINARY BOILER.—(See page 61.)

Mr. Israel Kinney, of London, Canada, is the inventor of the novel form of culinary vessel represented in our illustration. The object sought is to provide a means of conducting away vapours arising from the cooking article, so that they will pass into the stove and up the chimney, and thus not be disseminated through the house. This is effected by casting the side wall of the pot with a vertical recess, extending down from the top to the bottom, following the offset made by the pit. The outer edges of the recess, down to the plane of the offset for the pit, are formed with flanges to receive a sheet metal slide, A, which closes the recess and preserves the circular form of the vessel, and at the same time forms a flue. The vapours rising are drawn down through the latter, and thence into the stove. This improvement is applicable to all vessels used in cooking. Patented August 27, 1872.—*Scientific American.*

The total annual production of iron is estimated at about eleven and one-eighth millions of tons for the whole world, in 1869, and must have increased greatly in more recent years. At that time England produced over five millions; the United States of North America, over one and a-half millions, France nearly one and a-quarter millions; Prussia rather more than one million; Belgium not quite half a million, the Austrian Empire a third of a million, Sweden and Norway nearly 400,000; Russia and the Zollverein nearly half a million tons between them, of which four-sevenths came from the former. Spain and Italy made up nearly 100,000 tons, two-fifths from the latter The increase in the production of the United States in the five preceding years was nearly 64 per cent; in Prussia, 36 per cent.; and in England, in six years, 26 per cent.