

## BURNING NATURAL GAS.

We are indebted to Prof. Henry L. Mott for a description of a new burner for burning natural gas under steam boilers now extensively used at Toledo, Ohio, and in other places. We give herewith an illustration.

The boiler is set in the usual manner. A series of grate bars, A, are arranged above the ash pit, their rear ends being inclined and terminating in the fire wall, B. Upon the tops of the bars is laid a sheet iron covering, C, which extends in height to about three-quarters of the length of the rear parts of the bars, the remaining portions of the bars being uncovered. On the top of the sheet iron covering is placed a thin layer of fire clay, and upon the fire clay is placed a series of clay pipes, six inches in diameter.

Above the inner ends of the clay pipes is a fire brick wall. A sheet iron cover, D, extends across the tops of the two walls. The gas is delivered through the pipe, E, to the horizontal pipe, F, which is furnished with a series of perforations which are arranged opposite the outer extremities of the clay pipes.

In operation, the air enters through the ash pit and rises into the chamber above the rear ends of the grate bars, where it strikes against the iron plate, D, which is at all times highly heated. The contact of the air with this plate heats the air to a high degree. It then passes on in the direction of the arrows through the clay pipes to the gas burner, F, where the hot air becomes mixed with the incoming gas and the latter is inflamed, producing almost perfect combustion at a high heat.

The products of combustion pass over the fire walls, under the boiler to the rear thereof, thence through the tubes of the boiler to the up-take, G. The arrangement is very simple, highly effective, and is being very extensively adopted.

## CATCHING BAIT IN CALAIS HARBOR.

Line fishing as well as net fishing contributes largely to "the harvest of the sea," and is much used for taking cod and haddock in the German Ocean; the lines run out to a length of 300 feet, with a hundred hooks on each line, baited with mussels, whelks, or limpets, or with small pieces of herring or whiting. Eight such lines may be thrown out from one boat. So many vessels are engaged in this kind of fishing that it becomes difficult to obtain a sufficient supply of bait; and where shellfish do not abound on the shore, but must be imported from distant places, it is a costly item of expense. Mussels are largely cultivated for this purpose on the western coast of France, at Esnandes and Aiguillon, near Rochelle. Cuttlefish also make very good bait. There is a considerable variety of marine mollusks available for tempting the more valuable fish to the hook, and fish of less price can be cut up to use for bait. In Calais harbor, and in other ports of the Channel, these are obtained by large drop-nets lowered from the switches fixed to the mast of a boat, or from the pier, as shown in our illustration. The produce is readily sold to fishermen, who require great quantities of fresh bait. It will be re-

remembered that in the disputes with the French about their fishery rights off Newfoundland, and with the Americans respecting their admission to the Nova Scotia and New Brunswick fisheries, the question of their being allowed to purchase bait has been regarded as an important point in the diplomatic negotiations. —Illustrated London News.

## The Naphtha Launch Abroad.

Another new American invention is drawing attention in Europe. The London *Times* says: A launch, the engines of which are driven on a new principle—namely, by the vapor of naphtha—has just reached England from America, and has been inspected by us at Mr. Rowland Ward's, 166 Piccadilly, London.

which in turn drives the screw propeller. The gas burner is now no longer supplied with gas by means of the hand pump, but with fuel from the retort by means of an injector. When once started, the engine feeds itself and performs all other necessary functions. Speed and pressure are regulated by the injector valve, which is opened to increase and closed to reduce the speed. The forward and backward motions of the engine are governed by the turning of a hand wheel. The naphtha vapor, after having done its work in the engine, is condensed and forced back into the tank to be re-used. The consumption of naphtha is that due to the heating burner, and with a two horse power engine this is stated to be from three quarts to one gallon per hour.

There are many advantages attendant upon this system of propulsion, which was described by Mr. Yarrow at the last meeting of the Institution of Naval Architects, and illustrated by drawings of a 40 foot launch built and engine by him on this principle. In the first place, there is more room for passengers than in an ordinary steam launch, as the engine and retort occupy so small a space. Then there is rapidity in getting up power, starting and stopping, and great cleanliness, which is due to the absence of the dirt and dust accompanying the use of coal.

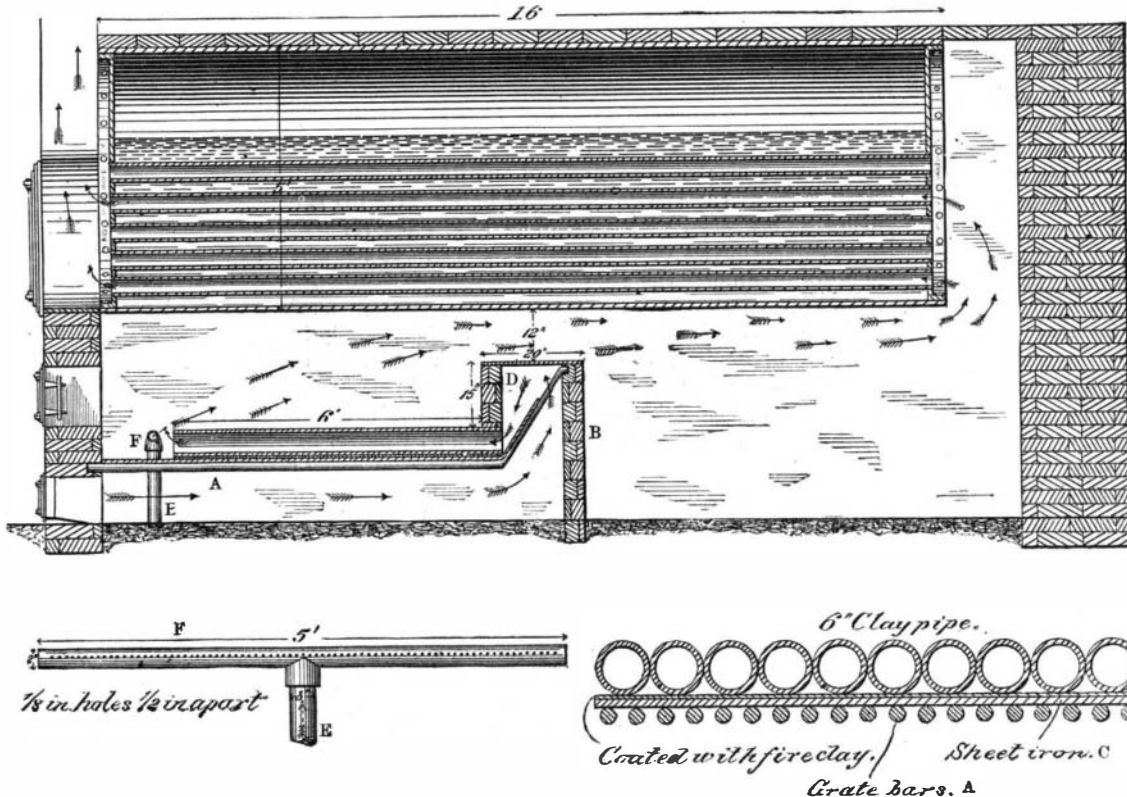
The launch being exhibited in a house, there was, of course, no opportunity for testing any of her working points. If we assume all that is stated on this head to be correct, however, the system would appear to have a very promising future before it, particularly for pleasure craft.

## Mineralogical Notes.

At the last meeting of the New York Academy of Sciences, Mr. George F. Kunz exhibited some of the finest red corundum (ruby), from within twenty miles of Atlanta, Ga. This was in pieces weighing one pound, and was part of a mass weighing 350 pounds which was found on the surface. He also exhibited gold quartz from Dutch Guiana (gold formerly found there only in placer deposits had been traced to the vein by a brother of the United States consul, Mr. Thomas Brown), and exhibited specimens said to have assayed \$450 to the ton.

The mines are situated four miles from Parimari-bo, and the ore is sent to the coast by natives, who carry it on their heads in fifty pound bags, making two trips a day.

He also read a paper entitled "List of Diamonds Found in the United States," which will be published later by the society, and stated, in reference to the diamond weighing  $4\frac{1}{3}$  carats, exhibited and reported by him two months ago as having been found near Morrow Station, 13 miles south of Atlanta, Ga., that he had recently heard of a two carat stone which was brought to Mr. L. O. Stevens, of Atlanta, Ga., by a colored man, who found it in his garden a few miles from the city, but who would not sell it or allow it to be sent North. It was imperfect and off-colored. Mr. Kunz also said that five years ago he had identified topaz for the first time in Maine, at Stoneham, and ever since then he had been on the lookout for

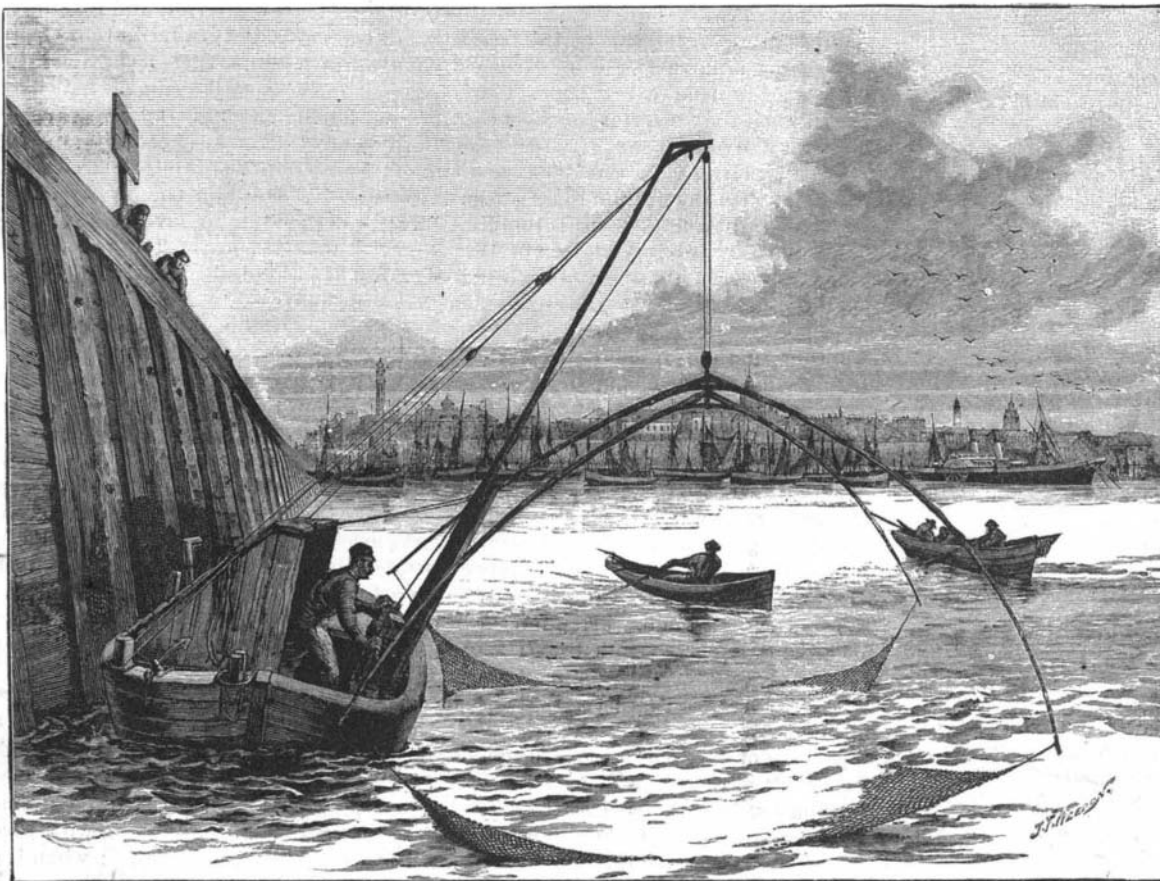


ARRANGEMENT FOR BURNING NATURAL GAS.

The launch is 18 feet long by 5 feet beam, and 2 feet 6 inches deep, and is fitted with a two horse power naphtha engine driving a screw propeller. She will carry from six to ten persons at a stated speed of from six to eight miles per hour. In her bows is a stone tank capable of holding between 30 and 40 gallons of deodorized naphtha. Close in the stern of the boat are the engines and vaporizer, which only cover an area about 18 inches square, thus affording far greater space for passengers than in a steam launch of the same size.

The oil vaporizer or retort, which corresponds to the steam boiler of an ordinary engine, is a coil of tubing, and to start the engine this coil is first heated by a burner placed beneath it. By means of an air pump fixed near the engine, and worked by hand, air is forced into the naphtha tank and returns thence to the burner in the form of a gas, which is ignited and heats

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up the retort. When sufficiently heated, which will be in the course of a few minutes, a naphtha pump is started by hand, and naphtha is pumped from the tank in the bows to the retort. Here it becomes vaporized, and when the pressure is sufficiently high, as indicated by a gauge, the vapor is admitted to the cylinder of the engine, which is now driven by it, and

the rare gem phenacite, crystals of which he had the pleasure of showing on that evening. This was the first time it had ever been found in the United States outside of Colorado, where it was first discovered in 1882. In Maine, a number of superb light green and sherry colored topaz crystals were found. They were several inches in length, but of little gem value.