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TORPEDO BOATS IN THE GALE.

that the recent loss of torpedo boats sustained by the the contrary, the lining is composed of oxides of the French is creating serious distrust in such vessels, and alkaline earths, and is therefore strongly basic. The is likely to affect the torpedo movement here, can converter employed is very similar to that used in the scarcely be founded upon anything more substantial acid process, and in some cases is identical, but in the than rumor. Surely no sailor or naval constructor best practice certain modifications are introduced, on would condemn the use of the torpedo boat for harbor account of the much more rapid destruction of the and coast defense because it could not outride the gale. basic lining. The movable bottoms and interchange-The torpedo boat, as designed for use here, is not a able parts of the vessel are of even greater importance cruiser, and not likely, even in active service, to be here than in the Bessemer; while the mouth of the called upon during storms. In harbors, which she is converter, instead of being inclined to one side, is predesigned specially to protect, she can always find a lee ferably wide and straight, in order that the charging to run under.

Nor should it be inferred, from the dispatches referred to, that the modern torpedo boat is unseaworthy. On the contrary, she has shown her capability to take preparation of the lining of the converter. Besides to the high seas under the ordinary prevailing conditions of tide and wind. The recent storm in the Mediterranean was of unusual fierceness, and was greatly generally chosen for this purpose is dolomite, a magintensified in its destroying power off Cape Corsica, where the torpedo boats were lost, by the set of the tide, which was athwart the wind; that is to say, at drois tar, or else it is burnt and ground, and then right angles to the direction whence the wind was rammed into the vessel, with tar as a cementing mablowing.

The Admiralty and Horse Guards Gazette says:

the purpose of assisting in the attack on the squadron by allowing rods, half an inch 'in diameter, and of at anchor in the Bay of Ajaccio. A stiffish breeze was sufficient length to reach entirely through the finished blowing and the sea was a bit loppy, but the weather was not sufficiently rough to interfere with the regular. When the plate and rods are withdrawn, the necessary arrival of the packet boats at Corsica. Of the eighteen openings are left for the entrance of the blast. The torpedoers that accompanied the men-of-war, only six got around Cape Corsica and of these only two were different from the Bessemer, and the reactions disin such a state as to prevent their taking part in the tinetly characteristic. The charge, varying according attack before making repairs. One was patched up, so to the size of the converter from 7 to 15 tons, is comfive torpedo boats engaged in the operation upon which posed of highly phosphoric pig iron, low in silicon. At so much interest centered. All the second and third the celebrated iron works at Creusot, France, a pig class torpedoers had been compelled to put back, those iron is used containing from 25 to 3 per cent of phoswhich got round being boats of the first class. It is phorus and 13 per cent of silicon. The most suitable said that only two men among the crews of the six irons for the basic process contain only 0.5 to 1.0 boats escaped seasickness."

of the torpedo boat, it must continue to be at least a tion of the latter constituent being, however, preferred. valuable auxiliary in the defense of harbors. Indeed, a torpedo boat which has cost but \$100,000 or less may, Chinese flagship Yung-Wo without losing a man.

Imperieuse, and the Italian Dandolo, could, with all terminates in a little over eleven minutes at the basic their great guns in play, safely pass a fleet of a score of 'plant in Westphalia, Germany. modern torpedo boats. A target moving as fast as the best torpedo boat, viz., 22 nautical miles an hour, is the acid lined vessel it is seldom possible to effect a not easily hit, and, when the smoke of battle covers the total elimination of the silicon, except in the Clappwaters, not readily seen.

to-day than to the war ship, and because of its effect-only the derest trace. But very little phosphorus is iveness and cheapness, it is not strange that this should removed during the blow proper. It is during the sobe the case.

THE BASIC STEEL PROCESS.

gether with the perfection to which the basic pro- phorus. to that of less favored districts. As yet the only become chilled, as it is the oxidation of this element product obtained was in every way satisfactory.

8801 mer vessel, no provision is made for the removal of 10 per cent of silica, 10 to 15 of phosphoric anhydride, The reactions occurring in such a converter are there- | England. fore limited to the oxidation of the silicon, carbon, and The elimination of the phosphorus seldom requires seez manganese, while the greater part of the phosphorus more than about two minutes. When it is judged to

contained in the pig iron remains combined with the The report sent hither from Washington to the effect resulting steel. In the Gilchrist-Thomas process, on and discharging may be on opposite sides, thus equalizing the excessive wear. The success of the basic process is largely dependent upon the proper being strongly basic, it must be sufficiently refractory to resist extremely high temperatures. The material nesian limestone. This is either manufactured into bricks, which are then cemented together by anhyterial. The bottom of the converter is about two feet thick, and is formed of the same material as the rest "A force of eighteen torpedo boats left Bastia for of the lining. The blast holes, or tuyeres, are made lining, to project upward from the bottom plate. manipulations of the basic lined converter are quite percent of silicon, merely a trace of sulphur, and Regardless of such instances of impotency on the part from 1 to 3 per cent of phosphorus, the higher propor-

The converter, having been carefully heated, well burnt lime, free from silica, and in amount equal to under favorable conditions, destroy a modern steel about one-fifth of the subsequent charge of pig iron, is monster which has cost three or four millions. Those introduced, and by means of fine coke brought to a interested in this matter will remember the brilliant bright glow. The phosphoric pig iron is then added. affair in Chinese waters, during the recent Franco-Chi- Air under a pressure of 25 pounds is turned on, and the nese war, when a well handled torpedo boat sunk the vessel brought to a vertical position. The blow lasts about thirteen minutes, in some localities longer, and Indeed, it is by no means certain that a fleet of great is divided into two distinct periods, the Bessemer, or leviathans, like the English Devastation, the French blow proper, and the after-blow. The ordinary blow

The silicon is first oxidized, and then the carbon. In Griffiths converter, but it is characteristic of the l'asic More attention is being given to the torpedo boat process that the resulting steel contains no silicon, or called after-blow that the reaction takes place upon which the invention of Messrs. Gilchrist and Thomas depends. The temperature rises at the close of this Among the several modifications of the pneumatic, 'period to about 1,800° C. The phosphorus is rapidly or Bessemer, steel process which have been brought oxidized to phosphoric anhydride, and combines with forward during the past few years, none has proved the lime added to the charge to form a phosphate of of such large commercial importance as that intro-calcium, which is not subsequently reduced. In order duced by Messrs. Gilchrist and Thomas, and known to remove as much phosphorus as possible, it is necesgenerally as the "dephosphorization," or "basic," sary to keep the slag very basic; and consequently, process. Though comparatively a recent invention, when the silicon in the pig iron much exceeds 1 per it has met with a wide application in Europe, both cent, it is best to treat the metal by the "transfer methon the Continent and in Great Britain. In America, od," in which the amount of silicon is first reduced in the plentiful supply of rich hematites and magnetites an acid lined converter, and the metal then transferred practically free from phosphorus has somewhat de- to one with basic lining for the after-blow. For otherlayed its introduction, since provision for dephos- wise the large amount of silicon would increase the phorization is less a necessity here than abroad. But slag, and not only more rapidly destroy the basic lining, the higher price of non-phosphoric pig iron, or Besse- but prolong the time required for a blow by hindering mer pig as it is denominated in the metal market, to- the basicity necessary for the removal of the phos-

cess has now been brought, makes it a desirable addi-| There is, however, a minimum percentage allowable tion to the steel industry of this country as well as as well, for in the absence of silicon the metal would basic "plant" in America is that just erected at Potts- which produces a large proportion of the heat of the town. Pa., by the Pottstown Iron Company. The reaction. The high temperature obtained in the afterfirst blow of basic steel was made on July 1, and the blow is due to the combustion of the phosphorus. By oxidation to phosphoric anhydride it affords 5,747 heat Though there are a number of minor differences be- units, and performs very much the same function durtween the Bessemer and the Gilchrist-Thomas pro- ing this part of the process that the silicon does during cesses as regards the design of the converter and its the blow proper. The slags produced in this process subsequent manipulations, the essential difference becare almost double in quantity those produced in an tween the two is in the lining. In the typical Besse- acid lined vessel. Average specimens contain about phosphorus from the metallic bath, and therefore 10 of oxide of iron, 40 to 50 of lime and magnesia, and none but the purest brands of pig iron are available. varying amounts of manganese. It has recently been The lining is entirely acid, being composed of ganis- proposed to utilize these phosphatic slags in the manuter, a silicious rock in which the silica is held to-facture of fertilizers, and the proposition is now cargether by a small quantity of argillaceous material. ried out on a commercial scale in both Germany and