RECENT ERUPTION OF MOUNT HECLA.

Our engraving is from a sketch taken by Capt. Ambrosen, of the Danish mail steamship Valdemar, for the London Graphic, and exhibits a singular phase of the recent eruption. On the morning of March 24, about five o'clock, while steaming along the coast from Reykjavik, on the way to the Faroë Isles, those on board the Valdemar witnessed a great volcanic eruption. It appeared to be in a valley about five miles from Hecla, at a point about 1,500 feet above the level a plain slide valve moved by a complication of bell cranks. of the sea, or 3,500 feet below the summit of Hecla. The flames mounted to an immense distance into the air, apparently about twice the height of the mountain itself. The is about equally divided between the "yoke and block" and wind was blowing freshly from the north, and driving the flames and ashes in a southerly direction. The illustration shows the appearance it presented from the sea. About fourteen days previously sharp shocks of earthquake had been felt all over the island, and eruptions had continued more or less since that time. According to the London Echo, there are twenty-five more or less active volcanoes, some being mere solfataras, in Iceland, the most turbulent of which is Hecla. After the great eruption of 1845, the most terrible on record in Iceland, the augitic ashes cast up so covered the grass and other fodder that nearly all the cattle on the island died.

AMERICAN STEAM FIRE ENGINES.

There are few departments of American manufacture in which more praise is really deserved and less actually given than that of steam fire engines, in which the exacting demands of the purchaser, ever increasing and becoming more varied, have been met by the fiercely competing builders with a skill and promptness hardly less than marvelous.

It must be remembered that in this country of combustible buildings and bad roads the demand must imperatively be

In the engines there is perhaps marked room for improve-The advocates of the rotary and of the rotatory ment. (commonly called reciprocating) systems are here in fierce rivalry; there being two builders of rotaries on the Holly system (two pistons working together as true spur wheels), one of these employing adjustable packing plates on the ends of the revolvers. Of the reciprocating engines but two types are horizontal; one of these employing a rock valve, the other

As regards the transmission of motion from the steam piston to that of the pump, in the reciprocating types, the usage the crank, the former giving the greatest compactness and stiffness, but the most friction.

With pumps the usage is, while generally excellent, most remarkably various, there being about as many styles as makers. The general division into rotary and reciprocating here obtains; those of the latter class being either vertical or horizontal, and in the most marked variety as regards disposition, material, number, and proportions of valves (all, however, being double acting). At present there are but two builders using horizontal pumps, the vertical being given the preference from their greater compactness and stiffness, freedom from rocking the machine, more even wear of cylinder and piston, greater regularity of suction distribution, etc. The horizontal types have, in all sizes, but one steam and one pump cylinder; the vertical are built both single and duplex (generally the latter), and in some cases having a device for running either half independently in case of damage to the other. Both cast iron and brass are used for the pump barrels, the latter metal being required when salt or foul water is to be used. In all makes (except one of the two horizontal types alluded to) the valves are brass or rubbar faced poppets, many in number, interchangeable, and

pumping up to feed the boiler without supplying the hose. With but few exceptions the wheels are of American hickory, with patent hubs. One builder puts in strong steel fellies, with spokes set staggering from a very long gun metal hub, making a light and strong wheel. At present nearly all the frames are made "crane necked," which gives ease and quickness of turning and of ranging into position.

We may say that in general the American steam fire engine is distinguished for remarkable rapidity and capacity of steam generation, lightness and strength of frame and running gear, the greatest force of volume of discharge known in its field, and elaboration of ornamental detail.

The principal faults to be mentioned are the very general low efficiency of the steam cylinders; the great quantity of coal ejected bodily from the stack by the exhaust of the reciprocating styles; necessity of running the engine in order to feed the boiler in most makes; inadequate area of suction inlet and valves in many of the vertical reciprocating pumps; the danger to the driver, perched high up on the engine instead of riding the horses.

We would suggest the use of steel boilers, double riveted staggering," with steel rivets of oval section, in drilled or in punched and annealed holes; the use of the injector, at least as an auxiliary to the pump; and a feed heater when the latter is used; the coning of the fire box walls; more general introduction of the Perkins or Field suspended water tubes; blowing with live instead of with exhaust steam; shorter cut off and more cushion; larger suction inlets and valve area than are now general. G.

How British Commerce helps British Manufactures.

In an able review of the condition and prospects of the British Empire in the Nineteenth Century, Sir Julius Vogel incidentally points out one secret of England's command of for fire engines that shall combine the maxima of lightness, having short lift and springs to cause quick seating. In the carrying trade of the world, and the importance of that



ERUPTION OF MOUNT HECLA, ICELAND.

strength, and pumping power, together with great simplicity | scarcely any two makes are the valves grouped alike or | trade to the prosperity of her mechanical industries. The of construction, quick steaming capacity, and freedom from placed similarly as regards the axis of the pump barrel. In injury by impure water and from reckless driving to fires.

As regards the boilers, American steam fire engines have but little of which to be ashamed. Without exception they are all vertical, most of them multitubular, having waterleg and submerged smoke dome. Two makers build boilers both multitubular and tubulous-a number of short dependent water tubes extending from the lower flue sheet into the combustion chamber. In one of these types an inner tube causes circularea and giving, as desired, either volume or pressure of dislation in each water tube. In the other, this is substituted by three partition slips of sheet iron. In another boiler the fire vails of putting one of the pumps and engines parallel before box has tapering walls. In all the employment of "variable the other, giving a stiff trussed frame, permitting the engiis a marked feature. One make, different from all others in the world, and popular in our Western and thus not requiring him to go from one side to the other. States, has a coil boiler, in which the water is pumped, in small quantity at a time, and vaporized rapidly. Generally there are automatically coupling heater attachments, by which a low steam pressure is constantly maintained while in the house, while steam from cold water in three minutes is by no means an unusual performance. Steel is as yet but little used for boilers. One or two makers are supplied with fresh water tanks for boiler supply. Few heat the feed water. Some can feed both from a donkey pump driven while the main engine and pump are working, and from the main pump. The "rotaries" have independent rotary donkeys, and also independent reciprocating feeders. The forced generation supplies steam so wet that the use of the ordinary locomotive injector is not feasible and not attempted—a fact that ordinarily wasted by the others in "backing and filling" greatly to be regretted. It is possible that the duplex injector, or "inspirator," might fill the bill. Nearlyall the reciprocating engines work with from 100 to 160 pounds boiler pressure; the rotaries, at 60 to 80 pounds.

most instances the provision for removing a valve in very short time is praiseworthy.

With one exception the pistons are solid plungers. In one ciple on which the English shipping trade with other counof the horizontals the plunger consists of a smoothly turned tries is conducted is to make the homeward freight supply solid center attached to the piston rod, and having around it the profits. On the outward route a barereturn to cover exa sleeve bored true inside and turned outside to fit the barrel penses, and sometimes not even that, is submitted to, the homeward voyage to make the whole trip a profitable one. proper. This sleeve may be made to act as a part of the pis-For instance, a ship carrying out a \$100,000 cargo, makes for ton or a bushing to the barrel at will, thus varying the piston her outward freight \$12,500. She will under ordinary circharge. With two makers in one Eastern city the usage precumstances make at least \$25,000 on the way home, or \$37,500 on the entire trip. If this were equally divided there would be a return of r to have one side of the machine as the "working side, 18,750 each way; the difference between that the sum actually received on the outward route is \$6,250, and The air chambers are large and well proportioned, save that is so much bounty to the cargo carried out, or $6\frac{1}{4}$ per perhaps in the neck, where they are too narrow. One cent. And the same amount may be added as an impost on Western builder has an air pump to counteract absorption the homeward freight. This system has arisen accidentally; and keep the chamber properly cushioned. There is always nevertheless it greatly helps England's exterior trade, the a vacuum chamber to aid steady suction supply. In one prosperity of which has been largely due to her control of the merchant marine. It will be readily seen how critical case this is contained within the discharge air chamber. would be England's position in case a foreign war should There are generally two suction and three discharge connecseriously interfere with her commercial supremacy. Engtions, so as to make the engines "right or left handed." The discharge gates have tight and quick acting valves. The land is now one vast industrial concern. Deprive her of the rotary and the horizontal makes have the suction hose permeans of making that industry profitable, and the loss of manently attached, and carried "squirrel tail" fashion; and wealth would be as rapid as the previous gain. draught from the center of the front of the machine. This saves the time required to attach the heavy suction hose, and THE Kansas City Price Current says that the drive of Texas cattle this season will reach fully three hundred before a hydrant to get the right distance. thousand head in good condition, and they will reach their Nearly all the reciprocating machines have "relief valves," destination much earlier than last year. Eighty-five thousand head of cattle in Southern Kansas will be ready to go else between the discharge side and the suction) to permit of to market by the middle of June.

groove into which the conduct of England's shipping has fallen supplies one of the largest systems of trade protection and bounty that has ever been in operation. The whole prin-

opening communication between both ends of the pump (or