THOMPSON'S APPARATUS FOR EXTINGUISHING FIRES AT SEA.

(See page 28.)

Of the many dangers to which travellers on sea are liable, certainly not the least is an outbreak of fire. A calamity, appalling enough on land, becomes doubly so when it occurs in mid-ocean, far away from the possibility of human aid, and with scarcely a chance of escape for life, to say nothing of the protection of property ; and it is not to be wondered at that sailors, who more than landsmen can appreciate the gravity of such a situation, should, from time to time, have turned their attention to devising schemes for diminishing so dread a danger. Thos. Captain W. H. Thompson has patented the arrangement illustrated on page, which is now being brought out by Messrs. Merryweather and Sons, of Long Acre and Lambeth. The apparatus has already been fitted to the Britannic and the Germanic (the former of which Captain Thompson commands), two of the most powerful vessels of the White Star Line, each being of about 5000 tons burthen, and the cost per steamer has been considerably under $1000. No exception can, therefore, be urged on the score of expense. Captain Thompson does not take credit for having originated the idea of using steam or carbonic acid gas as a fire extinguisher ; he claims for combining the two powers, and for the mode of their application, which appears to us to be at once simple, safe, and efficient. This will be readly understood by a reference to the accompanying engravings. Fig. 1 is a sectional view of a vessel having an arrangement for extinguishing fire by means of steam and gas combined. The steam pipe, which may be brought from the principal boilers, or from the boiler driving the winch engine, is joined by a portable connecting pipe to one of a series of vertical steam pipes which lead to the main deck, 'tween deck, hold, or coal bunkers, by means of a quadrant plate, similar to the deck-plate of a Downton's pump. Fig. 2 is an enlarged perspective view showing the steam and portable connecting pipes, which latter may be made of flexible hose or of copper, joined to the quadrant plate A. Fig. 3 is a view of the apparatus having the gas generator fixed between the steam inlet and the portable pipe. This generator, which may be constructed of iron, or of wood lined with pure lead, contains the ingredients for making carbonic acid gas in quantity sufficient, when mixed with steam, to master any fire that may break out. To extinguish any fire by steam only, all that is necessary is to connect the portable pipe to the descent pipe opening into the compartment in which the fire occurs, and open the steam cock, but when carbonic acid is to be an extinguishing agent as well as steam, the gas is released by merely unscrewing a nut on the generator, the steam is turned on, and the combined gas and steam pass on to the seat of danger. If preferred, carbonic acid gas can be used without the aid of steam. He is also prepared to fit up vessels with a fire detector somewhat similar to the electric alarms now so generally used in large private establishments. The wires will communicate with a dial in the captain's cabin, and not only will the fact of fire be indicated, but also the actual compartment in which it occurs. The captain can, with scarcely any aid, extinguish the flame, and this can be done so noiselessly that during the night no alarm need be created and the passengers may remain unaware of the danger which has been averted. These combined arrangements will, it is believed, reduce the possibility of a fire on board ship obtaining the least hold to a minimum, and their simplicity leaves but little chance of their getting out of order. There are no valves to become leaky or to be opened by mistake, neither can there be condensation in the pipes or other objectionable features. Shipowners and others interested can see the apparatus on board the *Britannic* or the *Germanic*, when either steamer is lying off Liverpool.—*From Engineering.*

POWDER FOR HEAVY GUNS.

The guns on the British iron-clad Devastation are of thirty-five tons, the largest afloat. They carry a projectile weighing 700 pounds ; but it has been found that every time they are fired they score the iron decks of the ship. This at first could not be accounted for, but it is now found to be caused by the grains of powder that have not had time to be consumed within the guns. To remedy this, the guns are to be lenghtened ; for to move so heavy a weight as the shot they throw, a slow-burning powder is essential. The grains of the powder hitherto used have been about the size of ordinary marbles. It is now proposed to increase their size to about the bulk of good-sized walnuts, and at the same time plans are being taken at the royal gun factories to construct guns of sixty tons, with the prospect of going on shortly to seventy-five tons.

QUERIES.

[1006]—Can any of your readers inform me the best way to take mildew out of linen ?—YOUNG HOUSE KEEPER.

[1007]—I am fond of keeping fowls but often lose some of them from their crops becoming as it were too full for digestion. Perhaps some will kindly inform me the cause of this—what is the best food to fatten fowls in winter, and also to make them lay ?

ANSWERS TO QUERIES.

[1001]—PRINTING ON CANVAS FOR OIL PAINTING.—Take glue and let it soak in rain water ; then boil it in a pipkin till it is quite dissolved, and of a moderate thickness for a good size. With this, after you have strained your cloth or canvas on a frame, and rubbed it smooth with a sleek stone, size it over. If you add a little honey to your size it will keep it from cracking. When your first priming is dry, whiten it over with whiting and size ; and last of all, when thoroughly dry, paint it all over with a grayish colour of white lead and a little black, ground with linseed oil, and laid on the cloth smooth and even. This being dry, you may then begin the design you intend to paint.—J. M. H.

[1004]—HEADACHE.—Your headache arises from neuralgia, with slight derangement of the stomach, brought on, no doubt, from irregularity in your time for taking food, which avoid. When the symptoms show themselves (which you can tell by the peculiar irritation and tightness of the skin of the face) bathe the hands and face with very hot water—the hotter the better ; steep a sponge in the same, squeeze dry, and place on the back of the neck, or on the part where the pain is most severe ; take a small quantity of very hot brandy-and-water, and lie down in a darkened room, with the eyes covered. Also remember the following : =Avoid pressure on the throat at all times ; live substantially, but plainly, and not too much stimulant ; plenty of exercise in the open air ; and, above all, practise self-control, and do not suffer yourself to get excited, but learn to take things quietly. The writer will vouch for the above being efficacious in nearly every case in which it has been adopted. Should the pain not yield to the remedy, be assured the stomach in the offending member.—A SUFFERER.

[1005]—By using a soft sponge on the accessible portion of the glass, and keeping a number of the common water-snails in the aquarium, the conferor will be kept down. The snails can be easily procured, even in winter, in any moss-lined springs by means of a scoop net. Gold fish also consume large quantities of the floating cells. When coral or other irregular minerals become encrusted a very diluted mixture of sulphuric acid and water destroys the deposit. A weak solution of ammonia neutralizes the acid and careful washing afterwards prevents any injurious effect on the fish.—JOHN N. MILLER.

BELTING *vs.* GEARING.—The largest leather belt ever made in England has just been supplied to a large cotton spinning mill in Bolton, by W. J. Edwards, 20, Market-place, Manchester. The belt is one of Messrs. Sampson and Co.'s patent, manufactured from the best English leather, and is 38 in. wide and 90 ft. long, double (or two thickness), without a single cross-joint from end to end, and of even thickness throughout. The belt is for driving direct from the flywheel of engine, and to transmit 350 horse power indicated. The same firm have also two double belts of the same make, each 29 in. wide, driving direct from the fly-wheel of engine. The driving pulley is 28 ft. in diameter, and 5 ft. on the face, crowned or turned up for the two belts, and the belts travel through 4500 ft. per minute, transmitting 600 horse power indicated. It is claimed for this belting that it is especially adapted for main driving, and has the advantage of running perfectly straight. A prize medal for their specialities has just been awarded by the Society for the Promotion of Scientific Industry, Cheetham Hill Exhibition (this is the sixth medal awarded at various exhibitions). This system of driving direct from flywheel is becoming more general in this country every day. The patentees have lately fitted up a large spinning mill where they are transmitting 2000 indicated horse power through this class of belting.

WHY is glass (which is transparent,) rendered opaque by being ground or pulverised ?—Because the whole substance, from surface to surface, is no longer of one uniform density.