

THESE SHIPS ARE FOR WAR

Non-Combatant Vessels That Serve the Men-of-War as Floating Hospitals, Helpers, etc.—Are Never Fired Upon.

The finest of our fighting ships, with all their boasted self-sufficiency, their manifold mechanism, and their complex provisions against accident or mishap, are really helpless creations the moment their coal supplies become exhausted. Nothing could be more pathetically distressed than a great battleship wallowing aimlessly in a seaway, her powers of offense intact but paralyzed, like her great body, for want of energy or its correlative, coal; her great eyes blind for want of electrical force; her lungs fouled by tainted air because of her halted blowers; her whole body either feverish or chilled, as the weather dictated, for want of circulation or proper respiration; and her complement athirst for need of enough heat to transform that tantalizing sea water into drink. Such a thing is distinctly possible, and it is against even the slightest approach to a like condition that we have taken ample means to provide.

The modern, heavy fighting craft carries between eighty and ninety engines of various sorts, aside from those directly occupied in propelling the ship; and, under normal circumstances, it is quite safe to say that at least fifteen or twenty per cent of all steam generated is taken up in their service. Most of them are vital to the fighting efficiency of the vessel; but there are a few of them, such, for instance, as the engineers' workshop, the distillers, and the refrigerating plant, which may be termed auxiliaries of secondary importance; and it is the purpose of the government to run these accessories on half-time, so to speak, and to leave just that much more energy for other more needful purposes. To this end, we have fitted up the repair ship, the distiller ship, and the refrigerator ship, while to the coilers has been relegated the common service of supplying coal to all craft distant from ready bases of supply, and the engineer-in-chief has done his utmost to make them capable.

The Repair Ship.

The repair ship, fittingly named the Vulcan, was the well-known steamer Chatham, of the Merchant and Miners' line, between Baltimore and Boston. Into the ship has been placed something like eighty tons of tools and machinery, and today the vessel is a veritable floating workshop. There are plate bending rolls, and punching and shearing machines that can bite right through an inch of solid steel. There are lathes for turning castings of considerable size, and planers, drills and milling machines of compass enough to meet almost any need short of that demanded in the complete reconstruction of a large engine. There are pipe cutters, bolt cutters, forges and grinders; and there is a good-sized foundry for the melting of sufficient metal to make a pretty heavy casting. There are a number of blowers to supply the several forges and to draw off air from between decks and to send it skyward through the red-mouthed ventilators above. There are also evaporators and distillers of a capacity equal to a daily output of quite 10,000 gallons of potable water—several times more than the needs of the Vulcan could demand. A supplemental electric plant has given excellent lighting facilities through the ship, but principally in the workshops on what is termed the third deck.

The purpose of this craft is manifest. She is to follow in the wake of a fleet—her great coal capacity giving her a wide radius of action, and she is to supply fresh water to the other vessels and to make then and there all possible repairs which might otherwise take the ships miles and miles away to some naval station.

A broken spindle might render helpless two great guns; but a few hours' work on the Vulcan would remedy the trouble; and even less time might place the engines of one of our torpedo boats in trim after a considerable break. At the close of an engagement, the wounded vessels could hasten to her or she to them, and such work then be done as to place them back in the line of battle, once more a formidable menace to the foe.

The mission and the usefulness of such a craft can not be overestimated, when every pound of coal must tell its tale of work well done in our defense. It is a very modern adaptation of that wise saw, "A stitch in time saves nine," and a typical instance of the great value of a traveling base of repairs.

The Distiller Ship.

The distiller ship, now named the Iris, was the British steamer Menemsha. Unlike the Vulcan, the Iris will make no repairs, but will be devoted solely to converting the ocean's brine into drinking water; and to this end, she will carry a very large supply of coal and will have four up-to-date distillers of considerable capacity. These distillers or evaporators will each consist of three elements like the modern triple expansion engine, and are intended to utilize the steam with the

making good the loss of fresh water consumed by the boilers, that the use of salt water must be obviated and the formation of a troublesome scale of salt—difficult to reach—may be guarded against in the ship's boilers proper.

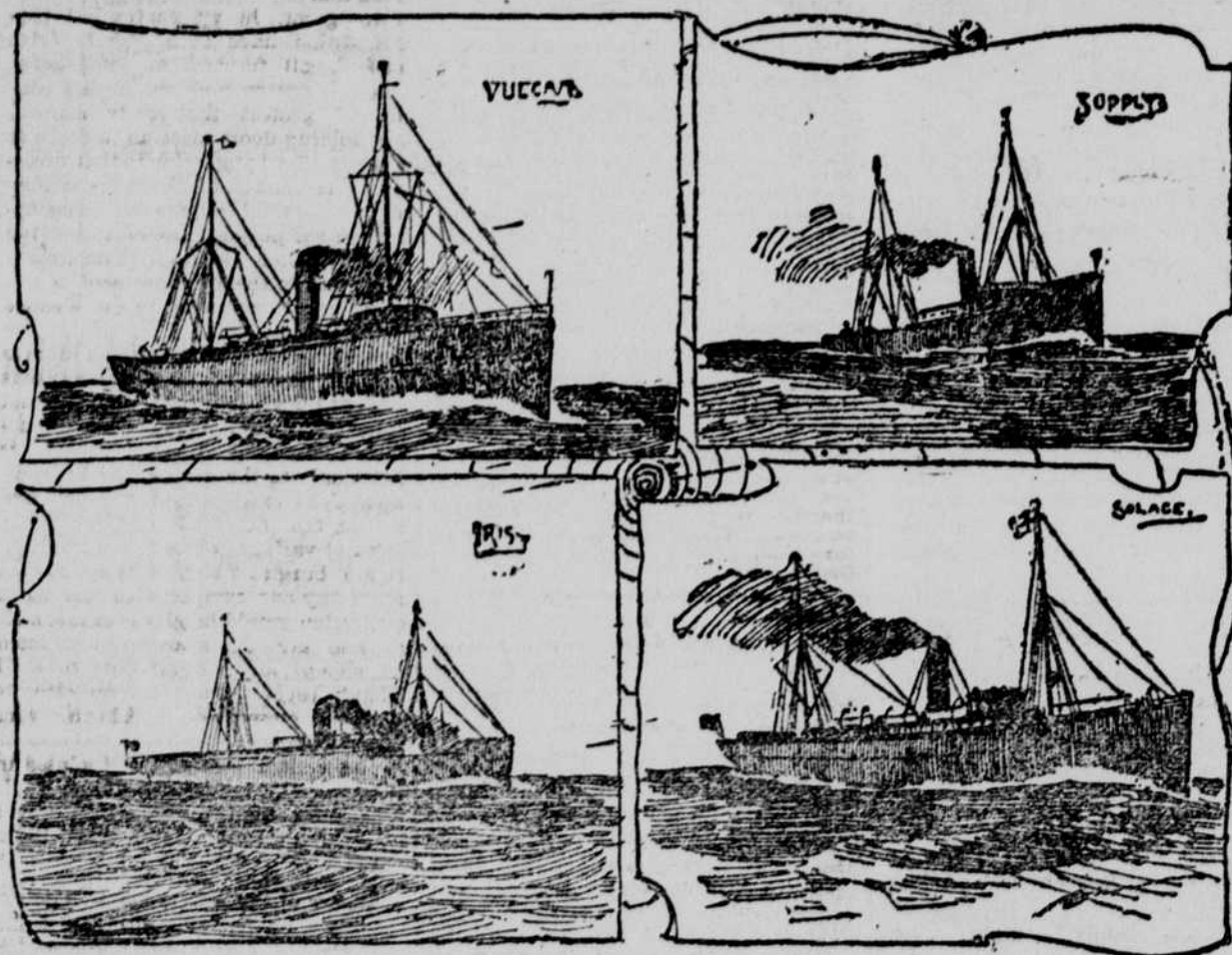
The hygienic value of sufficient fresh water can not be overestimated when the rigors of warfare are aggravated by the close confinement of shipboard in the tropics; and it may even be the purpose of this vessel to lend its bounty to the military branch of the service. Poisoned wells and tainted streams need not be feared under such circumstances; they can be avoided.

The Refrigerator Ship.

The refrigerator ship Supply, formerly the Illinois, of the American line, will be used as a traveling base of fresh provisions; and the tax on the refrigerating plants of the fighting ships will be eased to just that extent. The Illinois was originally built for a passenger ship, but was later relegated to the transportation of cattle and beef to England, still as an adjunct to the American line. In that capacity she necessarily had an extensive system of cold storage, and this has readily adapted the vessel to our present needs. She will carry tons of ice and fresh provisions of all kinds—but especially of a vegetable nature—the surest safeguard against disease in the tropics, and with her extensive coal capacity, her own distilling plant, and her ample burden, she will prove an exceedingly efficient part of the fleet. The government is

much emphasized by the record of every war. As far as possible, the Solace has been made to meet the more pressing needs of the service for which she has been called into requisition, but she is not that perfect craft suggested by Surgeon-Gen. Van Reyden and carefully planned by the chief constructor. There is one commodious elevator into which the sick and wounded will be carried from either side, and then raised or lowered either to the large, airy operating room, or to the deck on which they are to be housed. The stateroom accommodations already in the craft have been readily adapted to hospital uses, and there is ample room between decks for additional cots. The convalescents will be carried above, where they can be in the fresh air while under the sheltering cover of wide-spread awnings. Steam cutters and large barges will facilitate the easy transportation of the injured and sick, and a well-known apparatus peculiar to our service will lift them from the boats and swing them inboard and onto the rolling cots that carry them to their immediate destination. Everything has been done to contribute to the efficiency of the vessel and the comfort and convenience of all on board, and there is every just reason to believe she will prove herself invaluable from the common point of hygiene and humanity—for a fighting ship is a cruel place for sick or wounded after a heavy engagement.

Although all these vessels will strict-



SOME NON-COMBATANT SHIPS OF THE SPANISH-AMERICAN WAR.

most economical expenditure demanded in the output of a total supply daily of at least 60,000 gallons of thoroughly palatable drinking water.

The operation is simple. Each of the evaporators consists of a cylindrical steel boiler containing a coil of piping surrounded by cold sea water. The steam is supplied to the first coil directly from the ship's boilers. That steam raises the sea water to the boiling point and gradually evaporates it in that way. The steam thus generated in conjunction with such of the original steam not condensed in the first coil in the operation, passes into the coil of the second evaporator, repeating the operation in connection with the sea water there, and finally merging with the steam raised from the salt water in the third evaporator and passing together into the condenser. The condensation from the first two coils is caught by traps and carried off to the tanks. In this way the latent heat from the first steam from the boiler is economically absorbed by the three stages of salt water, and a higher percentage of performance is attained than is possible in a single-element evaporator. After condensation the water is carefully aerated and the result is a thoroughly palatable water devoid of that flatness generally characteristic of condensed sea water.

A sediment of salt—the residue of the ocean brine—gradually forms upon the coils of the distillers, and these evaporators are so arranged that this scale can be readily removed. On the other ships their distillers will be worked as far as possible only to the extent of

making provisions for one or two more vessels of the same sort.

The Coilers.

The coilers explain themselves, and, being boats of fair speed and great carrying capacity, will form the principal supply links between our fighting craft and our base of supply. As carefully as our coal will be used, still hundreds upon hundreds of tons of it will be used daily to keep the ships always ready for instant service and prepared to meet the enemy at any moment; and the safe conduct of their precious ebullient burdens will be a matter often demanding good, cool judgment and no mean skill on the part of their commanders. In war time, and sore pressed as Spain is, coal is worth its weight in gold, and a coiler will prove a nugget worthy of a good, stiff chase and a moderate tussle, and the captain that can dodge such a foe and run his cargo safely into the intended haven will be doing just as much good, perhaps, as the skipper that sinks a foe.

The Ambulance Ship.

The ambulance ship is the naval sister of mercy, and will minister wholly to the sick and wounded of our officers and seamen, or, if need be, the stricken of our army of occupation as well.

The Solace, formerly the Creole, of the Cromwell line, has already begun, perhaps, the duty for which she was hastily prepared; and what it means to transport comfortably and hastily the wounded from the feverish tropics to some more temperate haven beyond the boom of guns and beyond the exciting reach of war's alarms is a boon very

ly avoid the enemy, still, in their way, they are just as vital to our success as those that take their places in the line and bear the brunt of battle; and any man might be proud of the duty entrusted him in their command.

R. G. SKERRETT.

Exports and Imports.

The exports of merchandise for the month of April aggregated \$99,426,463, an increase of \$21,177,674 as compared with the same month last year and for the ten months ended April 30, \$1,025,426,651, an increase of \$125,497,435 compared with a similar period of 1897. The imports of merchandise for April were \$55,923,653, a decrease of \$45,398,748 compared with April of last year, and for the ten months ended April 30, \$511,187,186, a decrease of \$89,008,058 compared with the same period of 1897.

RECENT INVENTIONS.

To prevent the slipping of wheels of electric cars on grades a pair of supplemental rails is placed inside the main rails, with grooves cut crosswise in their surface, to engage toothed wheels mounted on the shaft.

Dressmakers will appreciate a new sewing machine attachment, consisting of a U-shaped frame attached to the back of the table to support a cloth basket, which prevents the work from pulling or getting on the floor.

Wires can be easily spliced by a new pair of pliers, one jaw having a slot for the passage of the main wire, while the other jaw has a slotted ear through which the second wire slides to wind it around the first wire as the pliers are revolved.

To relieve the sudden pull of winds on swinging signs, etc., a new hanger is formed of an outer casing to screw into the board, with a coiled spring inside to support a central rod having an eye at the outer end for attachment to the building.

Blank gun cartridges can be used in a recently patented burglar alarm, which has a metal barrel to be attached to the door by a screw, with a sliding yoke actuated by a V-shaped spring to strike the cartridge as soon as the door is pushed open.

Aluminum balls are coming into use in England for golf, tennis, cricket and billiards, the metal being alloyed to make it hard, or the balls can be formed with an aluminum core and a harder metal covering of the right thickness to give the ball proper weight.

The shower that spoils a woman's new bonnet is a rain of terror. True friendship between women is a matter of doubt to most men.

"GRAFTING" INSECTS.

A SERIES OF EXPERIMENTS WITH LOWER TYPES.

Defects Made Artificially—In Butterflies, Moths, Chickens, Fish and Frogs—Monstrosities Calculated to Give One a Sort of Physical Nightmare.

Great interest as well as curiosity has been roused in scientific and lay circles throughout the United States by some experiments in what may be termed the "grafting" of insects recently conducted by Prof. Crampton of Columbia university, New York, says the London Post. Without going so far as to say that the experiment of Prof. Crampton makes it at all probable that the process of grafting will ever be made applicable to more highly developed creatures than grubs, caterpillars and their winged relatives, there appears in the mere fact of the successful "grafting" of these lower types promise enough to warrant an investigation of the amazing physiological phenomena which have rendered the operation possible. It is no detraction that the American professor's experiments are not altogether new. So far, indeed, as the artificial production of insect monstrosities is concerned, the idea is much older than many are aware. More than 200 years ago the German physiologist Schwammerdam, having studied the metamorphoses of grubs and caterpillars, noticed how often both the wings and the antennae of butterflies were deformed when emerging from the chrysalis condition, and, thinking that these abnormal results might be due to external causes, he determined to test the matter by subjecting the insects to certain experiences during the period of change. So successful was he that in nearly every case he contrived by artificial means to produce the defects he had observed in the emerging butterflies. It is unfortunate for those interested in such experiments that the means taken by Schwammerdam to manufacture his insect oddities were not recorded in the "Memoires" published by the great Dutch physician Boerhave, hence they are lost to science. But the suppression was probably due to the German physiologist himself, for he was when young an intensely religious man—religious in the sense understood in mediæval days. He strongly held the opinion that all monstrosities in animal life were due to man's primal error and therefore he did not care to stultify himself to a certain extent by showing that these freaks could, within certain limits, be produced artificially, and thus provide his antagonists with a powerful weapon against what was then deemed religion. But the experiments of M. Alme Barthelemy of the Lycee at Jau are well known to all students of that singular branch of physiology known as teratology, and there is no doubt that the example he first set inspired the transatlantic professor of Columbia college. It is true that M. Barthelemy did not do anything in the way of grafting or attempting to graft the creatures on whose bodies he made his investigations. But that was because he succeeded in obtaining insect freaks by simpler means, which helped to explain the manner in which the deformities usually observed in these creatures were ordinarily caused. His experiments were made principally with the grub of the Bombyx mori, presumably the ordinary death's head moth. By slight compression carefully applied in certain parts during the continuance of the metamorphic progress M. Barthelemy succeeded in obtaining monstrosities with no heads, hunch backs and reverted antennae. Some he secured with enormous heads and others consisting only of abdomen and legs, with neither head nor tail. He gave some insects double spines, caused others to develop an enormous abdomen, while in yet other instances he suppressed the growth of useful organs altogether, without, strange to say, otherwise affecting the creature. He reduced the eyes to the size of pin heads and at will deprived them of the organs of sight entirely. Other Frenchmen and Germans, too, have since the date of M. Barthelemy's investigations, about thirty years ago, taken up the experiments, and the result, it may be worth pointing out to English readers, demonstrates the soundness of the views regarding the development of such lower forms of animal life as the caterpillar and grub which were first set forth by our distinguished countryman Harvey, who, it may be remembered, considered the chrysalis as physiologically identical with an egg.

Ellephant Guns for Artillery.

The United States will employ a light artillery of breech-loading guns of 3.2 caliber. They are the most effective cannon for field purposes constructed up to date. They can deliver projectiles with a muzzle velocity of a quarter of a mile in a second, and their effective range is four miles. The projectiles employed are usually chrapnels, each one in bursting being resolved into about 300 fragments.—Ex.

One Way of Telling Papa.

Young Man—"Mr. Gotrocks, let me congratulate you on the marriage of your daughter." Gotrocks—"Married! My daughter, married! To whom, sir, to whom?" Young Man—"Excuse me, sir; but, er—you see, I—er—modestly forbids me, sir; but the fact is, sir, she married me."—Adams Freeman.

Why Isn't a Bride for a Woman's Tongue a Necessary Part of Her Harness?

Don't judge a man by the clothes he wears, instead of by those he pays for.

Nervous and Tired

Was Not Able to do Her Work Until Hood's Sarsaparilla Cured.

"I was troubled with headaches, nervousness and that tired feeling. I read in the papers about Hood's Sarsaparilla and began taking it. I am now able to do my work, as Hood's Sarsaparilla has relieved me." Mrs. T. F. Rich, Hampshire, Ill.

Hood's Sarsaparilla

Is America's Greatest Medicine. \$1; six for \$5. Hood's Pills cure indigestion, biliousness.

The Bachelor—Nero Killed thousands to hear the death rattle in their throats. The Benedict (textually)—"Maybe he had a baby to amuse."—New York Journal.

Don't Tobacco Spit and Smoke Your Life Away.

To quit tobacco easily and forever, be magnetic, full of life, nerve and vigor, take No-To-Bac, the wonder-worker, that makes weak men strong. All druggists, 50c or \$1. Cure guaranteed. Booklet and sample free. Address: Sterling Remedy Co., Chicago or New York.

"What bum poetry that is!" "What other kind would you expect to find in a magazine?"—Chicago Tribune.

COSMO BUTTERMILK TOILET SOAP makes the skin soft, white and healthy. Sold everywhere.

The American navy has practically all been built since 1853.

To Cure Constipation Forever.

Take Ca-carets Candy Cathartic, 10c or 25c. If C. C. fail to cure, druggists refund money.

"Mamma," said Tommy Tucker, "how much older will I have to grow before I can go to war?" "You would have to be at least twelve years older," answered his mother. And Tommy took another look at the last bulletins, went out to the barn, broke his wooden sword to pieces, crawled in the hay-mow and wept.—Chicago Tribune.

He (wondering if that Williams has ever been accepted): "Are both your rings bedrooms?" She (concealing the hand): "Oh, dear, yes! One has been in the family since the time of Alfred, but the other is newer and (blushing) only dates from the conquest."—Harlem Life.

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The Combined Experience of 21 Years.

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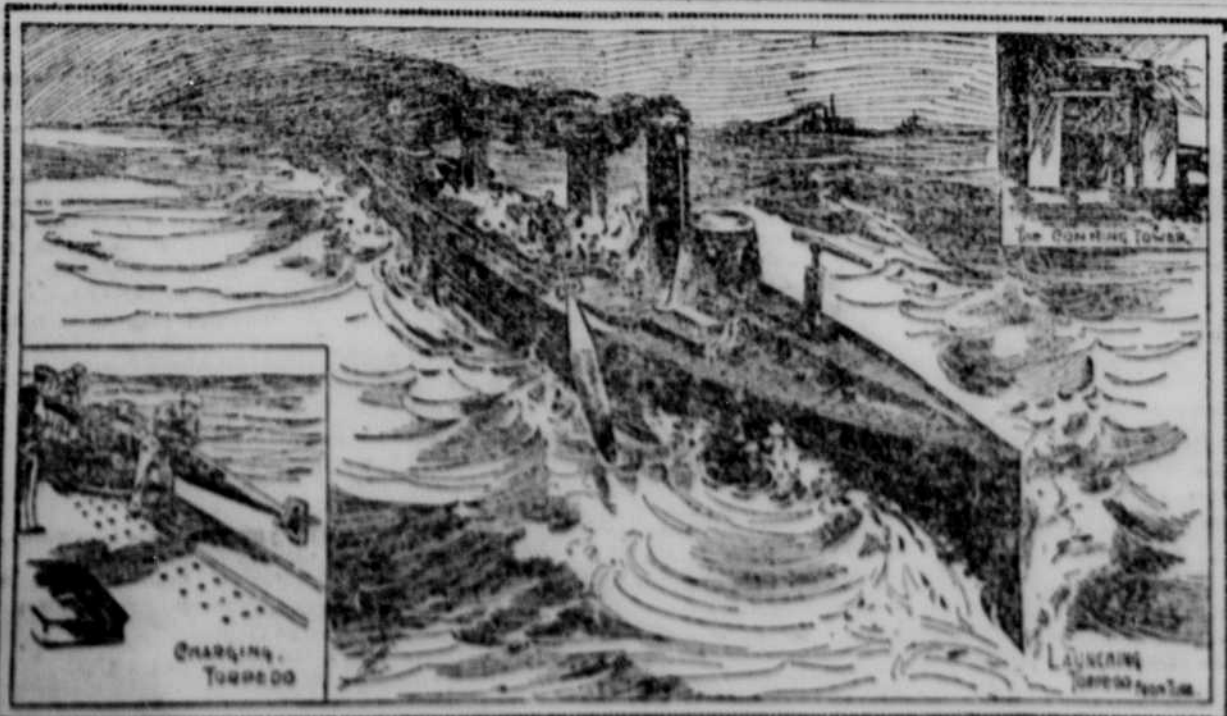
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Columbia Safety, - - - 50
Columbia Rapid, - - - 35

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DROPSY NEW DISCOVERY! One quick trial and you will know the value of this medicine. It is the only medicine that cures dropsy in 10 days. Treatment \$2.00. Dr. H. H. Thompson's Dropsy, Chicago, Ill.

AGENTS WANTED in every town for the best eye medicine ever used. Thompson's Eye Water. It is the only eye medicine that cures eye disease. Price 25c per bottle. Sold everywhere.



THE SPANISH-AMERICAN WAR—AN AMERICAN TORPEDO BOAT IN ACTION.