

Miscellaneous.

Special Correspondence of the Scientific American.
Life Boats.

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Among the numerous classes of articles, the life boat, to the people of America and England, is one of the most important. It stands high above either the organ or piano in point of true usefulness, although not in point of general interest; the latter feeling however, is quite natural, and no one can find fault with it.

"The requisites of a life-boat are—that it should be sufficiently strong to bear the shocks of breakers or of a rocky shore; that it should be light, so as to be readily launched; that its buoyancy should be independent of the air space accessible to the waves; that it should be so constructed as not to capsize; and be easily manageable withal."

Quite a number of life boats are exhibited, but the American one of Francis in my opinion surpasses every one made in this country. The favorite plan of the builders of the boats exhibited, is to give them perfect buoyancy by filling up the space at the head and at the stern of the boats either with enclosed air or with cork, and buoyancy is given to the sides in the same manner by the air being enclosed either in one continuous compartment, divided into partitions, or in separate cases. The superior lightness of air renders it more efficient as a buoyant agent than cork, but it is liable to the risk of escaping.

Cork is 4 times lighter than water, air is 850 times. One boat by a Mr. Clarkson, of London has cork planking and is a partial application of Mr. Annesley's principle of ship building. [This system was adopted in America, and tried on government vessels. A steamboat on Seneca Lake was also built on this principle, but we do not know of any vessel now in use in this country built on this principle, it has some merits however, which have been overlooked.]

The first layer of cork is attached to light framework, it is then covered with canvass and marine glue, on which other layers of cork are placed transversely, until the desired thickness and buoyancy are attained.

Several boats appear to be built so as to be easily capsized by having the air vessel under the seats—too near the centre of gravity, and some are too narrow. Great breadth affords increased security, especially when, as may be observed in several instances, a projecting thickness of cork is placed along both sides above the level of the seats. There is the model of an iron bottomless boat, enclosing air sufficient to give it ample buoyancy, is well adapted to go through the surf without upsetting, but cork is generally supposed to be a better material than iron. One of the most remarkable models exhibited is that of a collapsible life-boat, which is covered with felt, coated with India rubber. This boat will fold up so as to occupy little space on board ship, and when opened for service, the different compartments are filled with air and kept water-tight. It is well adapted to be kept in ships for the preservation of the passengers and crews in case of accident at sea; but it does not seem so well fitted to encounter breakers on shore.

Several of the models exhibited are constructed on the twin principle, two boats being fixed together by intervening planks. This form has the advantage of greater steadiness, as it would be almost impossible to capsize such a boat, but it has the inconvenience of weight, and would be difficult to manage.

Respecting one of the models exhibited, the inventor boasts that the boat would float equally well bottom upwards; a forlorn consideration, I suppose to those whose evil fortune might happen to be staked on its trustworthiness, especially when the bottom was up, and the bodies of the wrecked below.

[Twin life-boats are constructed upon a most erroneous principle. They do not boat so well as a single boat, they are liable to capsize, and have a greater preference for floating bottom upwards than downwards. To our

knowledge, a twin life-boat highly recommended by some nautical men, was tried on the East River, in this city, and made a most beautiful somersault a short time after it was launched into the briny deep.]

One boat here is peculiarly constructed. A number of water-tight cylinders are placed inside a boat, each cylinder being adapted to hold a man. The interstices between the cylinders are filled with cork, and a deck, corresponding with the cylinders is fixed on the top. The boat thus forms a mass of cork, with holes in it, and with an external protecting planking of boards. No more persons could get on to such boats than there are holes to contain them; yet they may be made large enough to hold forty-eight persons, allowing a buoyancy power of three hundred weight for each person.

The Duke of Northumberland has offered a distinct premium for the best life boat.

The Crystal Palace is still being crowded every day, at least there is no falling away of visitors. It is expected that the Exhibition will close in the middle of October. Several contributions have recently been made to the American Department: they are chiefly agricultural implements, with some very handsome light carriages. I still miss an American Fire Engine—a number of them might easily have been sent; if they had been, we should have had more to boast about, as they would have stood No. 1. McCormick's Reaper attracts a great deal of attention, now, after its trial in Essexshire.

There is considerable talk here about the American Yacht, "The Challenge," which is now at Cowes, and respecting which its Captain, Stevens, has challenged all England to sail her against any number of schooners belonging to the Yacht squadrons of Britain, outside of the Isle of Wight, with a six knot breeze. The whole of the Royal Yacht Squadron are afraid of her; the challenge has not yet been accepted. EXCELSIOR.

For the Scientific American.

Paddle-Wheels and Propellers.

It is admitted, at present, that paddle-wheels are superior to propellers for propelling steam vessels; but whether pre-eminence is justly on the side of the paddle-wheel is worthy of enquiry, as it is a question of great importance and interest. Is it in accordance with any known mechanical law, that a propeller requires a much larger per centage of steam than the paddle? It is true the propeller is a more complicated instrument in its theoretical construction, but, if made right, it is a direct acting propelling instrument as well as the paddle-wheel; it seems, therefore, that there is some room for improvement. It is well known to any mathematician or propeller maker, how to make a regular screw propeller, but that is not alone sufficient to bring out the maximum effect of the steam in such a way as to propel the vessel with the greatest economy. As the water on which the propeller acts, is not a regular nut, the propeller ought to differ accordingly, that is to the slip, which, if known, it is easy to make it right. First, there is the "Regular Screw;" second, there is the "Irregular Screw;" third, no screw at all. The third is the propeller where the blades form an angle to the centre line in the centre of the propeller. The second is the propeller where the generatrix for the screw momentarily changes its form, and one point (say centre of effort) on the generatrix having a uniform motion around its centre, while having an accelerative motion in the direction parallel to the centre line of the screw. This one seems to be the propeller which should be applied for propelling vessels; it is governed by the slip, thus differing from the regular screws.

The next question is the proper velocity, in order to give the propeller its maximum effect. The proper velocity can be theoretically ascertained, and when this is excelled, there is loss of effect. The velocity depends on the pitch and slip, and can, by them, be proportioned to suit the engine.

The next question is the slip; this depends on the displacement, that is, the greatest sectional area of displacement in propellers of

equal diameter, pitch, and velocity. When the diameter or pitch changes, the slip will also change, but this is no measure of loss of effect. The slip is nearly constant, with different revolutions, up to a certain point—a limit—when this point is passed, the slip will increase by the excess of velocity. The above quantities must be arranged to get the maximum effect of the screw propeller. As the screw is the most valuable instrument for propelling vessels, it deserves a series of thorough experiments on two or three vessels and six or more different propellers to test the full value of the best propeller; I believe those experiments would corroborate the above deductions. Experiments, it is true, have been made again and again, but the principle feature has been too often overlooked. N.

Stephens' Book of the Farm.

Mr. C. M. Saxton, of our city, the distinguished Agricultural Book Publisher, has published this justly valuable "Book of the Farm" in two fine volumes, with Notes by John S. Skinner, now deceased. The "Book of the Farm" treats of every branch of agriculture as pursued in Great Britain, where, at the present moment, the science is more highly cultivated than in any other country. The publication of such a work affords us a pleasing evidence of the interest now generally manifested to pursue agriculture according to the best modes of economy—not the wretched economy of starving the soil and sending the manure heap down the Mohawk, a practice quite common at one time—but of applying labor and fertilizers to the soil, &c., in such a manner as to conduce to the most profitable results, present and ultimate. Farming is not an art nor a science that can be learned in a day, as many suppose, but requires experience, reading, study and continual diligence to master not only its leading outlines, but its details. The use of books, for it is to them we principally allude at present, confers this great advantage upon a farmer; he gets within their covers the experience of others, and that for a long succession of years, and in no book with which we are acquainted, is there so much good information upon every branch of farming, as in these two volumes, "Stephens' Book of the Farm." The history of farming, the nature of soils, farm-buildings, all kinds of implements, horses, cattle, sheep, &c., their form, treatment, &c., in short, no single subject, connected with any branch of agriculture, is missed. It is a standard book, without which no Farmer's Library can be complete. It is a complete Guide to the farmer, plowman, cattleman, sheep farmer, field worker, and for dairying.

The Universal Stair Builder.

This is the title of a large folio, by R. A. Cupper, Architect; it is illustrated by 29 large and fine plates, containing many figures. It may be said the land is flooded with books on geometry; every week some new author comes out to illuminate the world with some new idea of his own, but totally worthless for any practical purpose. It is not the case with this book; it is science reduced to practice,—in other words, the geometry of a useful art, and the author is well qualified for the task he has undertaken, for he is not only a theoretical but a practical man—a skillful scientific workman. The art of stair building is a very elegant one, and in joinery, let us here say, our carpenters have much to learn, as it respects real good work, and from this book they will learn much, as well as he who makes stair-building alone his profession. A few years ago slush work, (we can call it nothing else), did very well, and still there is too much respect paid to quantity, however bad; but owing to the great number of fine buildings erected within the past few years in our city, a better taste has become prevalent. First class joiners will become more and more demanded and respected, and such men cannot be reared nor made without the study of such books as this one. This book is a great improvement on Nicholson's; it contains many new forms and superior methods of working. Its price is \$6, and it is sold at No. 240 26th street, corner of 9th avenue.

Route to New England.

We alluded, in our last number, to the superior comforts of steamboat travelling during the warm season, and now we take occasion to say to such of our friends as are intending to visit the New England States, to avail themselves of the splendid accommodations afforded by the Fall River route. The steamers Bay State and Empire State, for speed, comfort, and every other qualification which can, in any way, contribute to the ease of passengers, are unsurpassed, we might say unequalled; and the company, of whom Messrs. Tisdale & Borden, 70 West street, are agents, deserve, and are receiving a patronage commensurate with their endeavors. One of the advantages of this route is, that passengers are landed at Fall River, at day-break, affording an opportunity for a good night's rest, and after a ride of two hours, while the atmosphere is cool, the train reaches Boston in due season for breakfast. We have tried every route to Boston, and until within a few days we had not the pleasure of contrasting the difference, and as we know many of our friends will be passing back and forth, we thought best to give them a hint as to the best route. The boats start from pier No. 3, North River.

"Stop Five Minutes:"

Such was the exclamation of the conductor of the train on the Fall River and Boston Railroad, as the cars stopped at Bridgewater recently, when we were a passenger. We like these announcements on stopping at stations. They give passengers definite information how long to remain outside of the cars. The idea was new to us, but one that could be adopted on all railroads, much to the convenience of passengers.

[The above is from a cotemporary, and on reading it we almost wondered that our brother editor ever found his way to Boston and back—can't have seen much of the country. It is, however, a peculiarity of the profession to remain at home. The suggestion will make our railroad conductors laugh.]

Fairs and Mechanical Exhibitions.

The Fair of this State, (N. Y.) will be held in Rochester, on the 16th, 17th, 18th and 19th Sept. We hope it will be a good fair.

The Fair of the American Institute will be held at Castle Garden, this city, on the 1st October, and will continue throughout the month.

The Ohio State Exhibition will be held on the 24th, 25th, and 26th of September at —

The Maryland State Fair, will be held in Baltimore on the 23rd, 24th, 25th, and 26th of next month.

Rhode Island State Agricultural and Mechanical Exhibition, at Providence, Sept. 10th, 11th, and 12th.

New Hampshire State Exhibition, at Manchester, early in Oct., and will continue three days.

We hope that all these Fairs will be well attended, and well managed. They do much good when properly conducted.

Daguerreotype Pictures.

A few days since we stepped into the elegant saloons of Messrs. M. A. & S. Root, Daguerrean Artists, 363 Broadway: we noticed among the superb specimens on exhibition, several views illustrative of the sentiments embraced in that touching song, "The Old Arm Chair." The conception is one of the happiest hits we have seen for a long time, and the execution bestows the highest credit upon the artists. We esteem it an object of rare interest, and advise all our friends, who have the opportunity to call in and take a look. The above gentlemen are second to none in the wide world for their skill in the art of taking good pictures.

Fossils from the Yellow Stone River.

Dr. Evans, U. S. Geologist, who has recently travelled down this river, found near its banks the shoulder blade of a mastodon, measuring nearly three and a half feet across; also, some enormous foot bones of the same animal. He also found the head of a snake, shells, and other fossils in the same locality