

in solid water, unaffected by stern post, rudder, and the overhanging part of the stern, as in ships of the usual form.

A vessel of this form will not roll and pitch as much as other vessels, as the body of water above the projecting part of the hull offers considerable resistance to such motions.

The rudders may be nearly balanced, and will require but little power to work them, and on account of the peculiar form of the stern, the rudders may have considerably less area than those of the common model, as it requires less power to move the stern laterally.

The form of the hull, while permitting very sharp entrance and run, affords ample room for the application of the greatest engine power compatible with carrying capacity. Two propellers, acting entirely independent of each other, will increase security against accidents to the machinery at sea, and the same may be said of the two rudders, which, although designed to be worked together by the same steering apparatus, may in case of necessity be worked separately.

The increasing width of the hull below as well as above the load water line gives great steadiness to the ship, so that it may be moved about even without load or ballast. This is owing to the fact that the metacenter rises with increased beam much more rapidly than the center of gravity.

The merits of this system are likely soon to be brought to a practical test, and it would be no surprise to those who have given the subject a careful investigation, if the efficiency of the system should prove greater than is indicated by the figures given.

Dangers of Phosphorus.

A series of investigations that have been published in several numbers of a German match journal has led to the following general conclusions:

- 1. The manufacture of matches from white phosphorus, owing to the unavoidable evolution of phosphorus vapors, is fraught with the gravest danger to the health and lives of the workmen.
2. The vapors of phosphorus, if breathed for a long time, produce general ill-health, under circumstances not yet fully understood, but which are probably to be sought for in the idiosyncrasies of the individual.
3. The necrosis of the jaw, if not relieved in time by an operation, results in death.
4. The injurious constituents of the phosphorous vapors are neither phosphorous acid nor phosphoric acid, but phosphorus itself, free and uncombined, which passes into the blood as such, and probably circulates in the blood in the form of vapor, and from the blood acts upon special organs (liver, kidney, heart, stomach, and muscles) as well as on the bone tissues.
5. The most dangerous operations in making matches are making up the paste, dipping the splints, drying and packing the matches.
6. The manufacture of matches should only be permitted under the conditions that the phosphorous vapors shall be completely excluded from the work-rooms
7. These conditions can be sufficiently complied with by energetic ventilation, and the use of a safety apparatus like those constructed by Beck & Henkel in Cassel.
8. The absolute prohibition of the manufacture of matches from white phosphorus does not seem necessary from the sanitary police point of view.

Dr. Hahn, in a communication to the Chemiker Zeitung, makes the following comments to these conclusions: All the objections that have been made to the use of white phosphorus would deserve the fullest consideration if it was possible as yet to make cheap and easily inflammable matches without phosphorus. This, however, is not the case. Matches made of chlorate of potash, bichromate of potash, sulphur, and glue or gum, ignite only on a prepared surface covered with red phosphorus, gray antimony, pyrites, black oxide of manganese, and glass. The so-called "Swedish matches" fulfill the hygienic conditions of freedom from danger in manufacture perfectly, and are only in a slight degree explosive. In their manufacture the wood of the aspen tree must be used, and as this is very scarce in Germany, or has to be imported from Russia, they are about twice as expensive as the ordinary matches made of pine splints and hence have not found much favor among the people there.

But all inflammable mixtures made without the use of red phosphorus have the disadvantage of being uncertain, or difficult to ignite, and although theoreticians and some manufacturers that are trying to introduce such matches consider them a grand success, the public in general look on them as a grand failure.

Matches should, of course, never be made at home, where in addition to poor ventilation, the work-room must often serve as eating and sleeping room as well.

An anvil cast in Pittsburg is supposed to be the heaviest casting made in this country. It is said 160 tons of iron was melted to pour it.

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A DUBIOUS AMENDMENT OF THE COPYRIGHT LAW.

At its last session Congress passed an act (approved August 1), which provides "That manufacturers of designs for moulded decorative articles, tiles, plaques, or articles of pottery or metal subject to copyright, may put the copyright mark prescribed by section forty-nine hundred and sixty-two of the Revised Statutes, and acts additional thereto, upon the back or bottom of such articles, or in such other place upon them as it has heretofore been usual for manufacturers of such articles to employ for the placing of manufacturers', merchants', and trade marks thereon."

This act is a model of ambiguity. The only thing certain about it is that it gives permission to put the copyright mark on the back or bottom of articles "subject to copyright." By implication it includes among articles subject to copyright moulded decorative articles, or designs therefor, hitherto protected only by design patents; but it does not say that such articles may now be copyrighted.

The purpose of the author of the bill was evidently to bring under the action of the laws of copyright a class of purely decorative objects not already subject to copyright, since they are not "models or designs intended to be perfected as works of the fine arts;" but the bill as draughted signally fails to do so.

The Librarian of Congress accordingly refuses to allow the registration of such purely decorative articles, for which no specific provision is made in this or previous statutes relating to copyrights, leaving them to be protected as heretofore by the law for design patents.

We are informed that the bill as enacted was introduced in the Senate by the patent committee, which properly had nothing to do with the subject; that neither the proper committee nor the Librarian of Congress ever heard of the bill until it was passed; and that the House acted upon it without due consideration and without referring it to the proper committee.

Thus it would appear that the manner in which the bill was passed was as loose as its grammatical and logical construction. As a law it is unintelligible, and only adds confusion to what was sufficiently confusing before.

NEW ANTISEPTICS FOR SURGICAL USE.

Certain inconveniences and disadvantages attending the use of carbolic acid spray in dressing wounds have led to a general search for acceptable substitutes. One of the most promising is the use of substances which are volatile as well as of antiseptic nature, such as eucalyptol, cajeput, terebene, and peppermint, by means of which a wound may be kept, if necessary, in an antiseptic atmosphere not merely while being dressed but at all times.

At the late annual meeting of the British Medical Association Mr. A. W. Mayo Robson described a series of experiments made by him to test the efficiency of atmospheres charged with such volatile antiseptics in preventing the development of life in putrescible fluids, the results being exceedingly encouraging. Flasks of sterilized hay infusion suspended in large, wide-mouthed, open jars, into which a little eucalyptus oil, cajeput oil, or the like, had been poured, remained clear, while flasks of the same infusion briefly exposed to ordinary air and then covered with cotton wool began to lose clearness and to scum over within a few hours. Altogether the results were thought to indicate that at ordinary temperatures air saturated with vapors of the class named was fatal to the germs of bacteria and micrococci, and probably also to the germs of fevers and other infectious diseases. As the vapors tested are not unpleasant or injurious when breathed, it is to be hoped that practical tests in hospital wards will confirm the promise of Mr. Robson's experiments. As eucalyptol—derived from the common eucalyptus—is abundant and cheap, it has been selected for further tests. Several surgeons have taken part in these tests, and the results are decidedly encouraging. When the vapor is used during surgical operations a bellows is employed to discharge air charged with it upon the spot exposed. The air is first drawn through a vessel filled with cotton wool, then through others filled with pumice stone over which a small quantity of eucalyptol has been poured. The emerging air is thus loaded with invisible particles of the antiseptic, which seems to be capable of destroying any vestiges of germ-life which may have been drawn in from the surrounding atmosphere. This is a pleasanter method than Lister's or the boroglyceride treatment of Professor Barff.

Not less promising is the turf-mould dressing of Dr. Neuber, of Kiel, the result of investigations of the antiseptic qualities of turf-mould made by him during the past two years. The fibrous and friable character of turf, and its lightness, softness, and elasticity, make this substance much neater and more comfortable than "dry earth" as a surgical dressing; and it seems also to have much greater antiseptic power. The mould, reduced to powder, is inclosed in bags of carbolized gauze, and simply bound upon the wound, which has previously been washed with a carbolic or other antiseptic lotion. This dressing has been used by Professor Esmarch in fifty-five cases, most of them severe operations, with wonderfully good results. In thirty-one cases there was no fever, and in only five cases was it necessary to remove the dressing, owing to either local or general disturbance. The chief advantages claimed for this dressing are its great absorbent power, its tendency to prevent the formation of putrefactive products; the easy adaptability of the turf pads to the surfaces of the body and limbs; and its cheapness, the cost being about one-ninth that of the Lister-