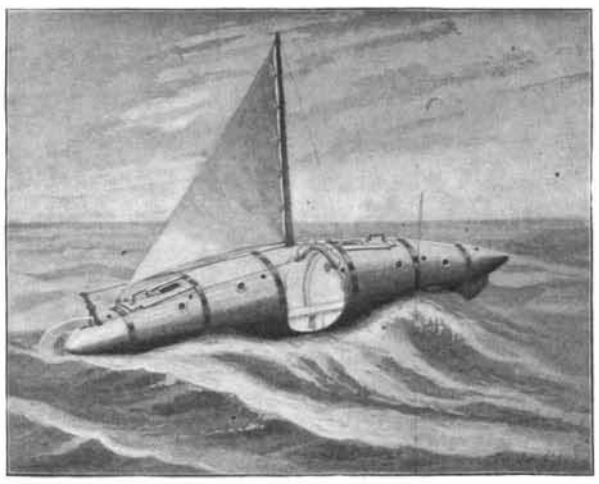
A NEW LIFEBOAT.

The accompanying illustration represents a novel lifeboat which has been devised and patented by James Mitchell, Sr., of Arrow River, Manitoba, Canada. In general form the boat is cigar shaped, tapering from the middle to both ends, and is constructed either of metal or wood. The boat pictured in the engraving is formed of wooden staves, surrounded by hoops and strengthened from within by stout ribs. A large conical block at each end of the boat is provided with a passage or rope guideway, whose ends are at right angles to each other. A rope passes through these guideways, extends through the whole length of the boat and is attached to a ship by the usual means. Within the body of each conical block and intersecting each rope guideway is a recess containing a spring-pressed block. When the rope is removed, the block is automatically forced down so as to prevent the entrance of water. Should it be impossible to lower the boat in the ordinary way by letting out the suspending rope, it may be launched upon an even keel by severing the rope from within.

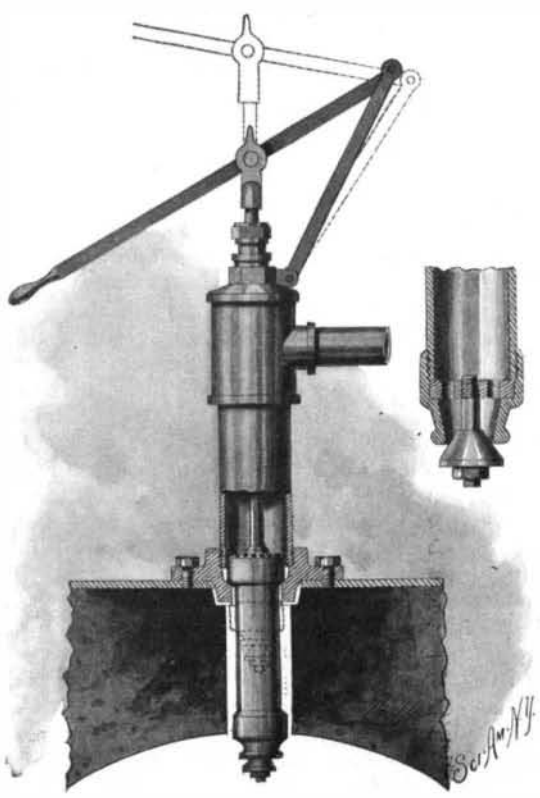


A NEW LIFEBOAT.

Hatchways for the entrance and exit of passengers, a rudder, and steering ropes operated from the hatchways or from within the boat, are all provided. A heavy keel gives the boat stability and rights it, should it be overturned. Ventilating pipes are provided which can be closed by valves to prevent the entrance of water.

A NOVEL SPRAYING DEVICE FOR CARBURETERS.

In using spraying devices for the introduction of oil and hydrocarbons as fuel, it frequently occurs that the intense heat to which the nozzles are subjected causes them to burn out. New nozzles must then be substituted, necessitating the loss of much time and causing considerable expense. To avoid these inconveniences, Mr. George H. Weeks, of No. 412 East One Hundred and Twentieth Street, New York city, has patented a spraying device in which the nozzle is withdrawn from the heated chamber when not in use. Referring to our illustration, it is seen that the spraying device is provided with a protective casing fixed to the walls of the carbureter and screwing into a plate, whose inner surface constitutes a valve-seat. Within the casing a movable cylinder is fitted and provided with a perforated cap, through which oil may pass. The inner edge of the cap forms a valve adapted to engage the valve-seat mentioned previously, so as to prevent the oil from flowing around the cylinder. To the other end of the cylinder another cap is threaded, which forms the head of the nozzle. Into the outer end of this cap an adjustable cone screws, by means of which the size of the spray may be regulated. To the perforated cap upon the inner end of the cylinder a rod is attached which extends through the casing and is pivoted to a lever fulcrumed upon a link. As soon as the spraying is discontinued, the nozzle is withdrawn from the immediate action of the heat merely by operating the lever. In manufacturing illuminating gases, spraying devices of this character would be exceedingly useful, preventing, as they do, the rapid burning out of nozzles and obviating the necessity of frequently substituting new ones for those which have been destroyed.



A SPRAYING DEVICE FOR CARBURETERS.

The Heat of the Incandescent Electric Lamp.

The incandescent electric lamp is essentially a device which transforms electricity partly into light but mostly into heat, says The London Lancet. As is well known, the carbon filament of the lamp is a substance offering great resistance to the passage of the current, and the product of this resistance is light and heat. It is an instance of the translation of one form of energy into another. It may not, however, generally be known that the light produced is but after all only a small percentage of the energy thus manifested—some 5 or 6 per cent only at the most. This fact is very important, bearing in mind a very common notion that the electric incandescent lamp is free from the heat rays. It is true that the lamp when working is not comparable with a flame or naked light, but at the same time the heat evolved is such as may lead to ignition. We are disposed to emphasize this point because the incandescent electric lamp is used for the purposes of illumination and decoration in shops without any regard to the possibility, nay, probability, of fancy goods being fired which happen to be contiguous. Indeed, so firm is the idea that the incandescent electric lamp is free from heat that it is frequently to be found buried in a mass of easily ignited and highly inflammable material. This is a mistake, and care should be exercised with the electric lamp in its application in this connection, but the risk, of course, is not so great as where naked lights are employed. We have found by experiment that on immersing a 16 candle power lamp (100 volts pressure) in half a pint of water, the water boils within an hour and in proportionately less time when a 32 candle power lamp is substituted. If again the lamp be buried in cotton-wool, the wool soon begins to scorch and ultimately to burst into flame. In one experiment which we tried, the bursting into flame of the wool was accompanied by a loud report, due to the implosion of the lamp. It clearly appears from this that the incandescent electric lamp cannot be regarded as an unlikely means of starting a serious fire, and shopkeepers, especially those who exhibit highly inflammable fabrics, should know that there is risk in placing such goods too close to the lamp. The lamp in contact with celluloid fires it in less than five minutes, and therefore the danger is particularly obvious in the case of toy shops, where electric incandescent lamps are often suspended in the midst of toy celluloid balls.

Too Poor to be Economical.

Several leading Americans who have been seeking to place contracts in this country, says the English Iron and Coal Trades Review, both for labor-saving machines and for other American notions of merit, have informed me that they are surprised to find how generally the complaint is made that our manufacturers are too poor to be able to afford the luxury of more economical methods and appliances. In a number of cases this is known to be the case, but it seems to be more largely the fact than most people anticipated. And yet it is not so surprising after all. The majority of the large concerns engaged in the iron and steel industries of this country are limited liability companies, and it rarely happens that limited companies are allowed by their shareholders to provide as large a reserve as they ought to do in order to meet all emergencies. In many cases almost the last sixpence has been paid out in dividends, and repairs and renewals are inadequately provided for. In some industries this might not be a matter of much concern. In the iron and steel industries it counts for a great deal. The truth is that, as history has been lately made in these industries, it has almost been necessary to completely reconstruct mills, forges, and other plant, every ten years, so that any plant kept in use for a longer period has become more or less antiquated. Our American friends appear to have realized this condition more fully than ourselves, and when they find that a plant is no longer up to date they make no fuss about removing and replacing it. It is their readiness in this respect that has brought them to the front; it is our backwardness in the same essential that has left us in many cases lagging behind.

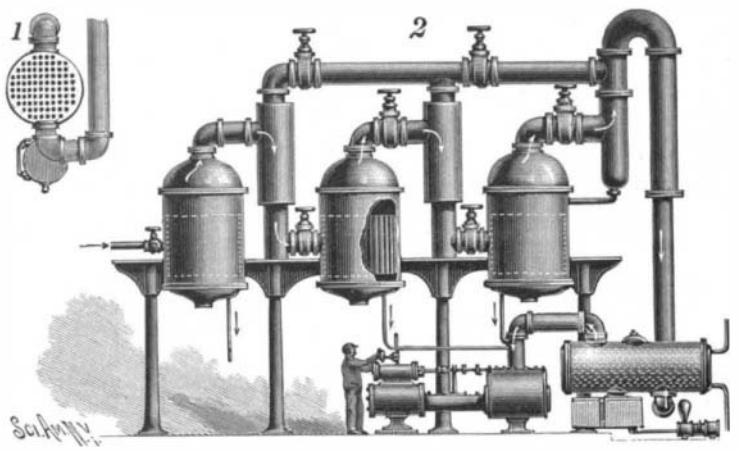
Patterns and Models.

It has been decided by the Board of United States General Appraisers that "dress patterns are not models of invention." A case was brought before the board in which it was claimed that an importation of muslin dress patterns, made up and stiffened to show the effect of the garment, ought to be exempt from duty under the provision of the law bearing upon "models of invention and other improvements in the arts." General Appraiser Wilkinson affirms that, while it may be fairly assumed that a pattern is a model, and that dressmaking is an art, the question to be determined is whether a change of fashion in dress is an invention or improvement in the arts within the contemplation of the statute. In rendering judgment in the case he says:

"There are various devices in wearing apparel that are patented, such as skirt supporters and glove fasteners, and these would be inventions within the meaning of the law; but a change from a tight to a balloon sleeve and from a full to a narrow skirt are not patentable inventions, and only a vivid imagination could discover an improvement in the arts in the continual ebb and flow in the tide of fashion. We find that the goods are not models of inventions or of improvements in the arts."

A SIMPLIFIED VAPOR-CONDENSER FOR VACUUM PANS.

In the apparatus now generally used for condensing the vapors of sugar juices, some loss is occasioned by the vapors coming into contact with the water used for condensation. An improved apparatus for condensing these vapors without loss and without the use of any complex devices has been devised and patented by W. and A. W. Dunn, of Honolulu, Hawaiian Islands. The apparatus is provided with the usual vacuum pans, each connected by a valved pipe to a separator. Each separator is in turn connected with the next vacuum pan; and from the last separator a pipe leads to the bottom of a surface condenser containing a coil of pipe connected at its ends with water supply and water discharge pipes. The condenser is furthermore connected to a vacuum pump which draws the vapors from the vacuum pans and separators down through the condenser and around the coil of pipe. By this arrangement the vapors of sugar are condensed without direct contact with the water, the apparatus differing in this respect from the usual vacuum condensers. The products of condensation flow into a reservoir, from which they are pumped to a tank to be further treated. The drums of the vacuum pans are connected to the pipe of the vacuum pump, so that the discharge from the drums passes through the vacuum pump with the vapors.



DUNN'S VAPOR-CONDENSER FOR VACUUM PANS.

Reasons Why We Underdrain.

It is, explains The Drainage Journal:

To get the excess of water out of the soil.

To prevent the surface washing of the soil.

To save the humus of the soil.

To save the fine particles of the soil.

To save the fertility brought up by the capillary action of the soil.

To save the fertility brought down out of the air by rainfall to the soil.

A drained soil is ready for the plow several days in advance of the soil not drained.

A drained soil is eight or ten degrees warmer and is more easily made ready for the seed.

Is deeper, allowing the feeding roots to penetrate as deep as the tile are laid for food and moisture.

A drained soil is ready to cultivate sooner after a rainfall.

A drained soil is less injuriously affected by wet or dry weather.

Crops on a drained soil have a longer season for maturity.

A well underdrained soil will increase the crop productions from 10 to 50 per cent—sometimes more.

A drained soil is in the best possible condition to grow maximum crops with intelligent husbandry.