DELTA METAL.

Mr. T. A. Crompton, chief engineer of the steamer Assyrian Monarch, has recently shown us some specimens of this new alloy, which is stated to possess a number of valuable qualities. In color it resembles gold. The following are some of its qualities as claimed by its inventor and manufacturer (Mr. Dick).

Delta metal can be forged and rolled *hot*, and when so treated is 50 per cent stronger than wrought iron. In its molten state it runs freely, and sound, close-grained castings can be produced from it. When cold it may be *rolled* into the thinnest of sheets, or drawn into the finest wire, its tensile strength in the latter form being nearly three times that of the best wrought iron. It is adapted for all kinds of cylinders, cocks, valves, and other steam fittings; being grainless, it is easily manipulated by any cutting tool, will take a high polish, and does not tarnish or corrode.

Its quality of non-corrosion renders it specially suitable for air, circulating, feed, and bilge pump rods, linings, buckets, valves, rams, condenser tube plates, studs, and bolts, or anything exposed to the action of salt or fresh water. For screw propellers, its great tensile strength and non-liability to flaw or breakage in cases of fouling wreckage, or such like, will render it invaluable, its nature being that of bending to a blow long before fracture can take place; and by its great superiority in hardness, toughness, and ductility over cast iron, gun metal, or brass, propellers may be made much lighter in weight, and their bladesmuch thinner at their extremities, and shaped to finer and quicker curves and bends, in "Delta metal" than in any other now in use.

A great future is open to this metal, its qualities before enumerated making it less liable to damage by indenting than other metals; and its power of resisting corrosive action, combined with its lesser required thickness for the same strength, points to its special adaptation for purposes where the transmission of either heat or cold—as in stills, refrigerators, fresh water or surface condensers, land and marine boilers, etc.—is a desideratum.

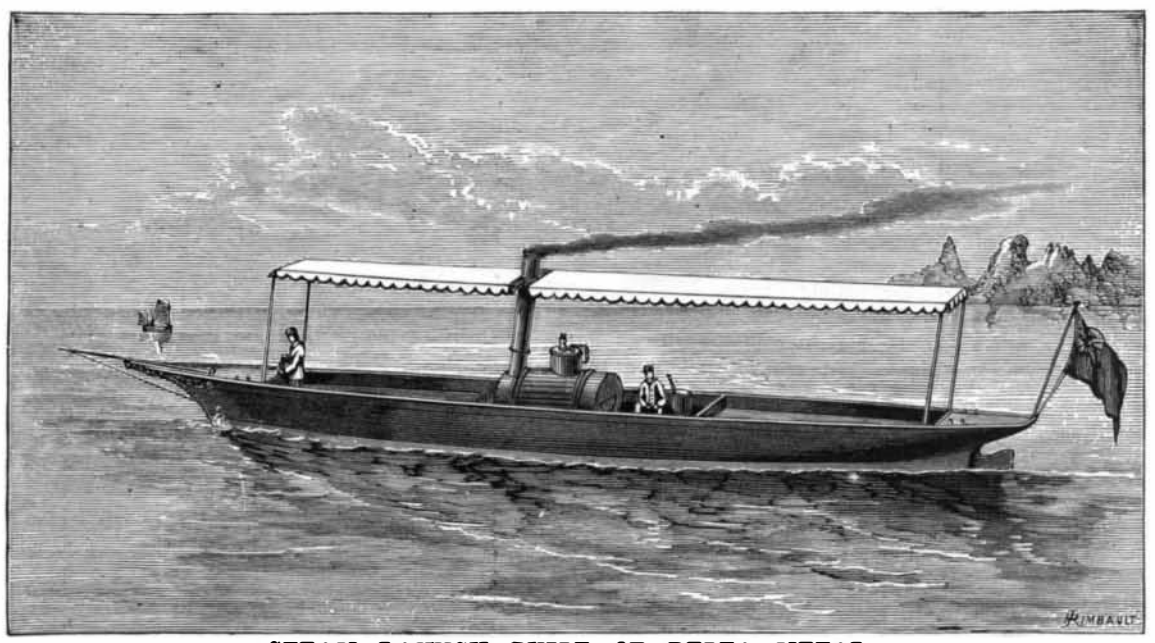
Outside the more direct uses to which this metal may be put by the mechanical, marine, hot water, gas, or electric engineer, or shipbuilder, its possible applications are truly "legion" in number, as there is hardly anything made of metal, either inside or outside our factories, shops, offices, or houses, or in our streets, which may not be fashioned out of it.

From the results of experiments made to ascertain the comparative tensile strengths of Delta metal, brass, and gun metal:

Delta metal, cast in sand (green), showed a breaking strain of	21·6 tons per sq. in.
Ditto, rolled hard (1½ in. diameter bar)	33·6 " " "

Among recent applications of the new metal is its use for small vessels, such as steam launches. We give an engraving of such a boat constructed entirely of the Delta metal by Messrs. Yarrow & Co., of Poplar. The length of the launch, which is named the Delta, and is at present at the Crystal Palace International Exhibition, is 36 feet over all, with a breadth of beam of 5 feet 6 inches, and a depth from gunwale to keel of 3 feet, and she will conveniently seat twenty-five persons.

Delta metal is an alloy of copper, zinc, and iron; having repeatedly been proved of equal strength, ductility, and toughness to mild steel, the plates and angle pieces were made of the same thickness as if steel had been used, viz., three thirty-seconds of an inch. The stem, keel, and stern post are of forged Delta metal, and are scarfed together in the usual manner The angle frames, of the same material, are placed longitudinally instead of transversely, so as to obtain greater longitudinal strength. The four bladed screw propeller is cast in Delta metal, and has a diameter of 2 feet 4 inches, with a pitch of 3 feet. The engine, of the usual direct-acting inverted type, is of sufficient power to give a speed of eight knots per hour.



STEAM LAUNCH BUILT OF DELTA METAL.

Terrors of Lightning.

Nathan Miller, of Maryville, Kan., lost his four daughters, aged respectively 18, 17, 9, and 7 years, by a single stroke of lightning.

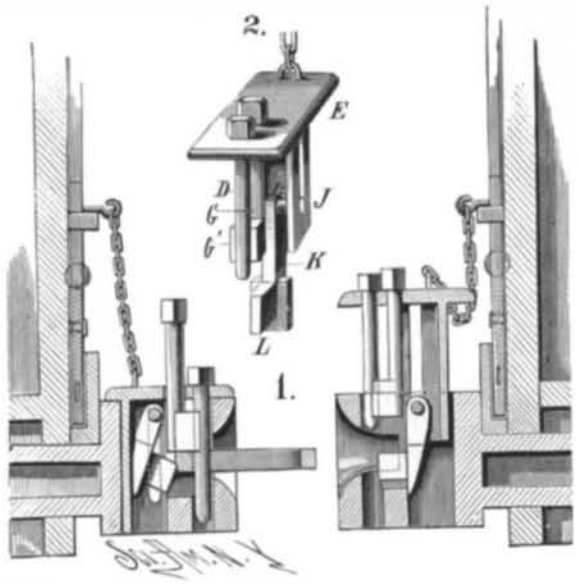
Lightning struck the house of John Queen, of Jacob's Creek, Pa., knocked from the wall his loaded gun, and at the same instant his daughter Nancy dropped dead. The gun was discharged, and the contents struck her in the breast. Whether she met her death by the lightning or the shot will never be known.

ONE hundred and five miles in 119 minutes, or almost 52 miles per hour—deducting stops, 55 miles per hour—was the time lately made by a special passenger train on the Illinois Central Railway, being from New Orleans to McComb City.

CAR COUPLING.

Near the outer end of the draw head is formed a vertical hole, for receiving the coupling pin, D, which is passed through a hole in the plate, E, on top of the drawhead. Behind this hole is a second one for receiving a downwardly projecting bar, G, having an enlargement at its lower end. Behind these is a third aperture extending from top to bottom and containing a hollow slide, J, projecting downward from the plate to which it is fastened. Pivoted on a transverse pin that passes through vertical slots in the sides of the slide is the latch, K, formed with an outwardly projecting tongue, L. A vertical sliding rod is held by clips on the end of the car and is connected by a chain with the plate, E. This rod is operated by two levers pivoted to the ends of the car and passed through a vertical slot in the rod.

When the car is to be coupled the plate of that draw head which is to receive the link is raised by pulling up the rod,



HOOVER'S CAR COUPLING.

either from the top of the car or by means of one of the levers. When the plate is moved the latch swings outward, the tongue passing into a slot connecting the holes and holding up the plate, the hollow slide, the bar, and the pin. When the link enters it pushes the latch inward, thereby permitting the parts to drop, the coupling pin passing through the link. The bar, G, rests on the inner end of the link, and is of sufficient weight to hold the outer end of the link raised so that it will be in a horizontal position. To uncouple the cars the plate is raised by pulling up the vertical bar or by operating one of the levers.

This invention has been patented by Mr. G. W. Hoover, of Keithsburg, Ill.

Efficiency of Lightning Rods.

Prof. Mohn, of Christiania, Norway, having been employed by the government to investigate the efficiency of the protection afforded to buildings by lightning rods, seems to have substantially settled the much debated question, at least for that region of country. His report shows that lighthouse, telegraph station, and other exposed buildings, which were provided with conductors, did not by far suffer as much as churches, which in most cases were unprotected. It appears, in fact, that of about 100 churches reported to have been struck by lightning, only three were provided with conductors; that of these three the first had a conductor in good order, and the building was uninjured; the second had a conductor of zinc wire, which melted, and, of course, left the structure without protection; the third had a wire which was rusty where it joined the earth, and the church was burned. More than one-half the number of churches struck were totally destroyed. Mr. Preece, the English government electrician, states that no damage has occurred to telegraph poles since the practice was adopted of providing them with lightning rods or earth wires.

A New Saltpeter Bed.

To the eastward of Cocha-bamba, in Bolivia, South America, an immense saline deposit has been discovered near the village of Arane. Analyzed by M. Sacc, the ingredients are potassic nitrite, 60·70; borax, and traces of salt and water, 30·70; organic matter, 8·60 per cent. On dissolving this mixture in boiling water and cooling it, a plentiful crystallization of pure saltpeter is obtained. The soil on which the bed lies is brown and inodorous when it is dry, but when moistened it gives out an odor of carbonate and sulphydrate of ammonia. M. Sacc has found it composed of incombustible residue, 74·20; borax and salts, 15·50; and organic matter with water and ammoniacal salts, 10·30 per cent.

The incombustible residue is formed of a very fine sand, and of phosphate of lime, magnesia, and iron in large proportion. The saltpeter has evidently originated from the oxidation of the ammoniacal salts of the soil in presence of potash and soda produced by the slow decomposition of the schists on which they rest. The potassic nitrate has mounted by capillarity to the surface of the soil, while the deliquescent nitrate of soda has been drawn by the rains toward the dry and warm regions of the coast, where it forms the beds of nitrate of soda actually worked in Chili. As immense quantities of fossil bones are found in the soil around Arane, it is possible that the saltpeter beds, there, which are capable of supplying the whole world, are a result of the decomposition of a vast deposit of antediluvian animal remains.

Asthma.

The most popular remedies for this disorder are those used by inhalation, and experience demonstrates them the most effective. The following formula has no superior:

Grindelia	8 drachms
Jaborandi	8 "
Eucalyptus	4 "
Digitalis	4 "
Cubebs	4 "
Stramonium	16 "
Nitrate of potash	12 "
Cascarilla bark	1 "

The ingredients should he in fine powder, and thoroughly dry before mixing. The composition is used by burning from one-fourth to one-half teaspoonful, and inhaling the smoke, which is most conveniently done by using the cover of a tin box. Not only is the powder effective, but its price is reasonable, averaging about thirty-five cents per pound.

An Old Tunnel.

After years of exertion the present governor of Samos, Abyssides Pasha, has succeeded in uncovering the entrances to a tunnel of which Herodotus speaks with admiration as the work of Eupalinos and Megaira, and which, according to the same authority, was built during the tenth century B.C.

The tunnel, about five thousand feet long, was intended to secure a supply of fresh water to the old seaport town of Samos, and consists of three parts. These are: the tunnel proper, 5⅝ feet high and 6 feet wide; a canal about 5 feet deep and nearly 3 feet wide which runs in the middle or on the side of the base of the tunnel, and the aqueduct running in this canal. The aqueduct consists of earthen pipes, each 2½ feet long, 32 to 33 inches in circumference, the sides averaging about 1½ inches in thickness. Every other joint has a hole, for what purpose has not yet been fully explained. Mr. Stamatiades, a Greek archæologist, believes that they were intended to facilitate the cleaning of the pipes, and to make the flow of water easier. The canal is arched over, but twenty-eight manholes were provided to admit the workmen who were charged with cleaning and repairing the aqueduct. The tunnel is not quite straight, forming an elbow about 1,300 feet from one of the entrances. This elbow, according to Stamatiades, was caused by a mistake in the calculations of the engineers, who had none of the instruments used in tunnel building nowadays.

The tunnel starts near a small water course which may have been quite a stream in olden times, pierces the mountain Kastri, which was formerly crowned by the fort Samos, and ends a few hundred yards from the old town of Samos, about ten feet below the surface. From the mountain slope to the city this subterranean aqueduct is protected by a massive stone structure, ending within the walls of the present convent of St. John. The preservation of this work—which is truly wonderful considering the imperfect mechanical resources at the disposal of the builders—for nearly three thousand years is probably due to the care taken by Eupalinos, who in all places where the rock did not seem of sufficient firmness lined the tunnel with several layers of brick, running on the top into a peaked arch.