LORILLARD HOUSE BOAT CAIMAN.

The mild climate of a considerable portion of our Southern Atlantic coast, where flowers bloom nearly the whole year through and vegetation but seldom shows the effect of frost, offers temptations to the leading of an outdoor life which are especially attractive to one accustomed to more northern temperatures, and which can with difficulty be resisted by invalid visitors to that section. The primary design of the house boat shown in our first page illustration is to provide a comfortable and luxurious home in which all the delights of such a life can be realized, with as few as possible of its inconveniences, a floating house which can be moved from place to place at will, and anchored in such favored locations as fancy or caprice may dictate. The shallow bayous, lagoons, rivers, and lakes of Florida, in particular, stretching in some cases far into the interior, their banks lined with a semi-tropical verdure, afford the ready channels by which, in such a boat, a great extent of most picturesque and beautiful country can be reached, the varied attractions of the hunting and fishing everywhere found being such as to extort the unqualified admiration of all sportsmen.

The Caiman is but just completed, and was built for Mr. Pierre Lorillard, of New York, by the Pusey & Jones Company, of Wilmington, Del. She is a steel hulled scow, flat on the bottom, with round spoon ends, driven by two small propellers, each operated by a separate engine, the two engines being designed to develop 200 collective horse power. The steel hull portion is 5 feet 6 inches in depth, and her greatest draught is estimated at thirty inches, her speed not being designed to be over eight or nine knots an hour. In fact, speed has hardly been taken into the account, farther than to be sure that she will always be able to make her way where desired, slowly pushing from one point to another. The boat is 97 feet 6 inches long, 26 feet 6 inches extreme breadth at the top and 20 feet wide at the bottom.

The hull, besides affording space for the boiler, engines, and an ample coal supply, serves as a very roomy cellar in which a large ice supply and abundant stores of all kinds can be kept. Upon the hull is built the house proper, the outside of which is of pine wood. The first floor is for the use of the crew and servants, but horses, ponies, dogs, and other animals can be taken on a portion of the inclosed deck forward. The kitchen has a range and hot water boiler, the hot water service extending to the pantry and toilet rooms, and there is a dumb waiter communicating with the pantry just forward of the dining room. The rooms for the crew are aft, and there are rooms on this floor for two maids, two waiters and a valet, besides two small spare rooms for gentlemen. The space and appointments have all been carefully considered with reference to the comfort and convenience of all who will be attached to the boat.

The arrangement of the space on the main deck above, or the top floor of the house, is shown in the plan view on the first page. The fore part is devoted entirely to the use of Mr. Lorillard and his friends. The windows, besides the glass and blinds, are all fitted with a very fine wire netting, as a protection against sand flies and gnats, all sliding easily on frames, that the windows may be entirely opened when desired. The bed rooms will each have a brass bedstead and a large wardrobe, the panels in the doors of the latter having plate glass mirrors. The decorations are to be of white and gilt and ebony and gilt, the ceilings and walls being upholstered in cretonne backed by Canton flannel padding, different colors being employed in different rooms. On the hurricane deck, abaft the pilot house, there will be a studio.

The architect of this novel vessel, Mr. Gustav Hillmann, gave her the name Caiman, which in Spanish signifies an alligator; but it is said that Mr. Lorillard himself made the original drawings for the boat, almost as detailed as those made by the architect, who simply had to put the design into the correct technical shape for the builders. Mr. Hillmann was also the architect of Mr. William Astor's Nourmahal, Mr. Gerry's Electra, the Radha, designed for Mr. Lorillard, and now owned by Mr. Bourke Wolfe, and many other well known vessels.

Besides the Caiman, Mr. Lorillard also owns the Reva, a twin-screw yacht designed by Mr. Hillmann, a staunch, commodious and luxuriously fitted up seagoing vessel designed for general cruising purposes. With this yacht he is able to take in tow another vessel of novel character which he had built as a stable, so that he can take with him, to any locality where he wishes to remain for a time, a few horses for his private use. The steel launch Lillian, built for Mr. Lorillard about two years ago, was illustrated in our issue of February 8, 1890. She is 65 feet long, 10 feet wide, and 6 feet deep, having a triple expansion engine of 75 horse power, and was designed for short shooting excursions on the Florida and Georgian coast. As with all the other craft owned by Mr. Lorillard, she is most sumptuously fitted out, in harmony with the luxury in which he lives.

THE average rainfall of the globe is 36 inches.

Cheap Aluminum.

The *Electrical World* claims that aluminum may fairly be called the foster child of electricity, for up to the time when the Heroult process and its various modifications came to the front the lightest of the important metals was only a chemical curiosity. As the electric processes have been more and more perfected it has come to be a commercial product, and, although not yet used for very many purposes for which it is immediately available, it is likely to assume more and more prominence. An interesting scrap of news comes just at this time from the other side of the water; this is a reduction in the price of aluminum of ordinary grade to so low a figure as fifty-seven cents per pound. This reduction, made by the company at Neuhausen, the largest manufacturers on the Continent, is stated to have resulted in an immense increase in the demand, and presumably, therefore, in the profits of the manufacturers. It is quite possible that the commercial conditions existing here may for the present forbid American manufacturers meeting the current German rate, for to our country's credit be it said that labor is much better paid here than there, but it is, nevertheless, quite clear that it will not be long before the price of aluminum—thanks to the resources of the electrician—is reduced to a point where the metal can be employed for a wide range of uses not now practicable. A fall in price from two dollars to one dollar per pound still leaves the cost so great as to very seriously limit the demand; at fifty or sixty cents a pound, however, aluminum is within reach of effective competition with other materials for a very large variety of work. In this connection it may be stated that a new system of electroplating with aluminum has been discovered. The London *Electrical Review* describes the process as follows: A solution of ammonia alum in warm water is prepared, containing 20 per cent of alum. To this is added a solution containing about the same quantity of pearlash and a little ammonium carbonate. The mixture results in effervescence and in the deposition of a precipitate. The latter is filtered off and well washed with water.

A second solution of ammonia alum, containing sixteen per cent of alum and eight per cent of pure potassium cyanide, is now prepared warm and poured over the precipitate previously obtained, the mixture being then boiled for thirty minutes in a closed iron vessel, jacketed, to insure uniformity of heating.

At this stage about twenty kilogrammes of water are added, and about two kilogrammes more of potassium cyanide, and the whole is kept on the boil for about a quarter of an hour.

The liquid is then filtered from the precipitate, and is now ready for use in the electrolytic bath.

Uses of Unvulcanized Rubber.

There are used in the leather shoe trade annually many thousands of barrels of rubber cement, which is of course unvulcanized rubber in solution. A number of manufactories are run particularly on this sort of work, and their output to a large degree is sold directly to the leather shoe manufacturers. The process is a simple one, Para rubber being used and benzine being the solvent. In order to get the finest, lightest and cleanest cement possible, the outer skins of the hams of Para are taken off, and the inner part, after being stripped and separated into as many parts as possible, is soaked in benzine until it is very much softened and has increased its bulk about four times. This is then put in a large churn run by power, and a little resin is added to increase the sticking qualities. It is then stirred for a number of hours, more benzine being added from time to time until a homogeneous mass is obtained, after which it is barreled and sent to the shoe factories.

A small outlet for this sort of cement is found among photographers for sticking purposes, to whom it is sold after having been very much thinned by the addition of more solvent. For repairing purposes a cement is used to which has been added a little lamp black and a certain quantity of litharge for the purpose of drying after it has been applied. Another form in which unvulcanized gum is sold is that of various packings that are to go in places heated by steam, where the gum, after being put into place, is slowly vulcanized and has a certain life added to it by having missed the first process of vulcanization.

What is known as cut sheet is used largely in this country and abroad. It is nothing more or less than pure gum which has been massed upon a mixing mill and afterward put in a rectangular iron box and pressed into a solid cake. This box is fitted with a traveling arrangement something like that of a planer, so that the cake of rubber can be slowly fed out of one end against a small revolving knife, which cuts it into the thinnest possible sheets. These sheets are used in making balloons, tobacco pouches and articles of that kind. It requires no little skill to make these goods from unvulcanized rubber. To make a perfect sphere, it is a matter of common knowledge among balloon makers that no number of pieces less than seven can be used. The pattern cutters may use nine, eleven, thirteen or fifteen pieces, always going on the odd number, as it is claimed that a balloon made of eight, ten or twelve pieces would not expand evenly.

Goods made of cut sheet are usually cured by the cold process or by the vapor cure, and in some cases are used without any vulcanization at all. Formerly India rubber thread was made of gum treated in much the same manner as the cut sheet, and a great deal of skill was attained in its manipulation. These threads were made so fine that from 7,000 to 8,000 yards of one kind would weigh only one pound. They were used not only in suspender webs and goring, but in Jacquard looms in place of webs, in some looms as many as 3,000 of these threads being used.—*Rubber World.*

The Detection of Hydrocyanic Acid in the Blood.

Professor R. Kobert, director of the Pharmacological Institute at Dorpat, has lately published a little work, which is a valuable addition to our knowledge with regard to analysis of the blood for hydrocyanic acid. The chief result of his experiment has been to prove that hydrocyanic acid forms, with methæmoglobin, a new body called cyanmethæmoglobin, distinguished by its intensely red color, and distinguishable from oxyhæmoglobin and its modified combinations, which are likewise red, by the spectroscope only. Neither the spectrum of oxyhæmoglobin nor that of the alkaline red methæmoglobin, nor any characteristic absorption band, is shown by cyanmethæmoglobin in the spectroscope. It is due to this body that the blood, after hydrocyanic acid poisoning, shows such an intensely red color in all places where methæmoglobin can be found; but as oxyhæmoglobin, which gives the blood its normal color, may with the greatest ease be transformed into methæmoglobin, it is consequently easy to recognize hydrocyanic acid not only in the blood, but with the help of the latter by the following analytical process: A cubic centimeter of blood is diluted with ninety-nine times its volume of distilled water, to which is added, drop by drop, and with continuous shaking, a newly prepared 1 per cent solution of ferrocyanide of potassium. When the blood is free from hydrocyanic acid the liquor changes from red to yellow—that is, methæmoglobin is formed, and the spectrum of the latter is seen. Blood containing hydrocyanic acid does not lose its color, but becomes bright red, and shows no absorption band in the spectrum; or, in other words, cyanmethæmoglobin has been formed. By exactly the same process any organ may be analyzed for hydrocyanic acid if it has first been distilled in acetic acid. It is necessary to observe in all these experiments that neither the diluted blood nor the examined liquids become alkaline, but rather show a slightly acid reaction, because methæmoglobin also becomes red in alkaline liquids.

Professor Kobert gives yet another method to distinguish blood which contains hydrocyanic acid from normal blood, which he bases on the fact that the self-reduction of the blood is arrested by the presence of the smallest quantity of hydrocyanic acid. A 1 per cent solution of normal blood becomes darker when standing, and shows after some hours or days, in place of the oxyhæmoglobin spectrum, the spectrum of reduced hæmoglobin—that is, only one yellowish-green band in place of two such bands. Blood which contains hydrocyanic acid remains under the same circumstances without change.—*Lancet.*

Furnace Shields.

All the puddling furnaces at the works of the Eisenindustrie Menden & Schwerte, in Westphalia, Germany, have been equipped with shields to protect the men from the furnace heat. The shields consist of a rectangular iron screen suspended from an overhead rail, which can be made to cover the whole working side of the furnace, and which can be pushed aside when not required, or when it interferes with the work. The lower end is bent into a gutter, having a slight fall in the direction of its length, and the upper edge is provided on the inside, that nearest the furnace, with a pipe perforated with small holes about three-quarters of an inch apart, which is in connection with the pipe supplying water for cooling the sides of the furnace bed. When in use, the inside of the screen is kept constantly wet from the supply pipe, the jets trickling down the screen; a notch is left at the bottom of the screen for the passage of the rabble, and a short inclined plate is provided for the cinders to run over. With these exceptions, the whole of the furnace is screened by the water-cooled plate.

Colorless Varnish.

Colorless varnish, for use on fine labels or other prints, as well as for whitewood and other spotless articles, is made as follows: Dissolve two and one-half ounces of bleached shellac in one pint of rectified alcohol; to this add five ounces of animal boneblack, which should first be heated, and then boil the mixture for about five minutes. Filter a small quantity of this through filtering paper, and if not fully colorless, add more boneblack and boil again. When this has been done, run the mixture through silk and through filtering paper. When cool it is ready for use. It should be applied with care and uniformity.