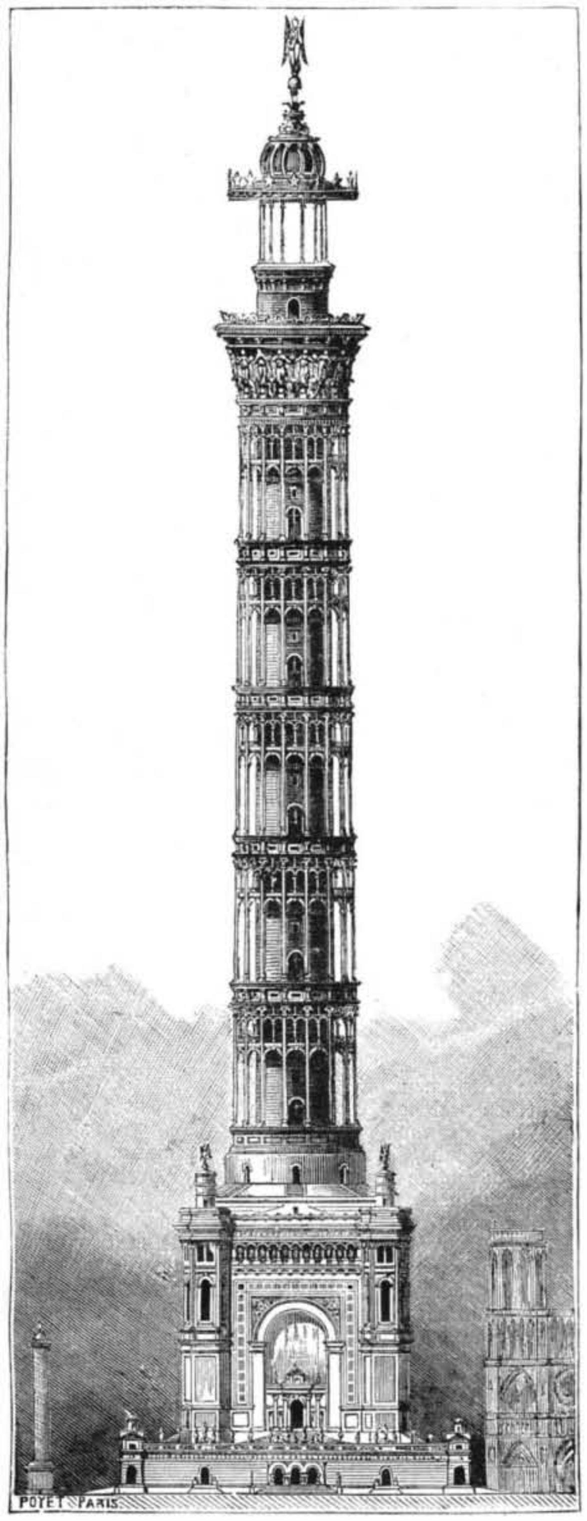
THE "SUN" COLUMN, DESIGNED FOR LIGHTING ENTIRE PARIS.

Mr. J. Bourdais has just presented to the Society of Civil Engineers a project that he has been studying, and that concerns the erection of a masonry tower 300 meters (984 feet) in height.

After an examination of the different geometric profiles realizable, Mr. Bourdais has adopted the column as being more apt than any other form to satisfy the rules of æsthetics, and also as being the most stable. In fact, the highest chimney in the world, that of Saint Rollox near Glasgow, 433 feet in height, has been submitted to numerous storms without suffering therefrom, and, as other chimneys exposed to great wind pressure have never given rise to any accident, it results that a cylindrical form is the one that should be adopted.

In short, Mr. Bourdais' structure would consist of a base 216 feet in height, in which would be established a



PROPOSED ARTIFICIAL SUN FOR PARIS.

permanent museum of electricity. Above this would rise a six story column surmounted by a roof forming a promenade and capable of accommodating 2.000 persons. The central granite core, 60 feet in diameter, would be surrounded with an ornamental framework of iron faced with copper. Ths would be divided into six stories, each containing 16 rooms, 16 feet in height and 50 feet square, designed for aerotherapic treatments. Patients could come here to find a purity of air that is usually met with only on mountains.

The central core would be hollow, so as to permit of all sorts of scientific experiments being tried. Finally, at the summit would be placed an enormous electric lamp, studied by Messrs. Bourdais and Sebillot, that would cast a flood of light over the entire city. This lamp would have an intensity equal to that of two million Carcel burners. The lamp would be surmounted by a statue representing the genius of science. This would make the entire structure 1,180 feet high. We are indebted to *Le Genie Civil* for the accompanying illustration.

A CHEAP BATTERY.

It frequently happens that people living in the country, and far removed from our electrical supply stores, are desirous of having in their possession for experimental or practical use an electric battery, and are discouraged from attempting to secure one by ignorance of proper parties to apply to or the difficulty of transportation. To such as these, and to those who are of an inventive turn of mind, or are fond of "tinkering," perhaps a few hints as to how to make a battery will not be amiss. The cheapness of the form of battery described is also one of its chief virtues, for the cost of the materials required is almost nothing, and the time required for putting together the different parts very little.

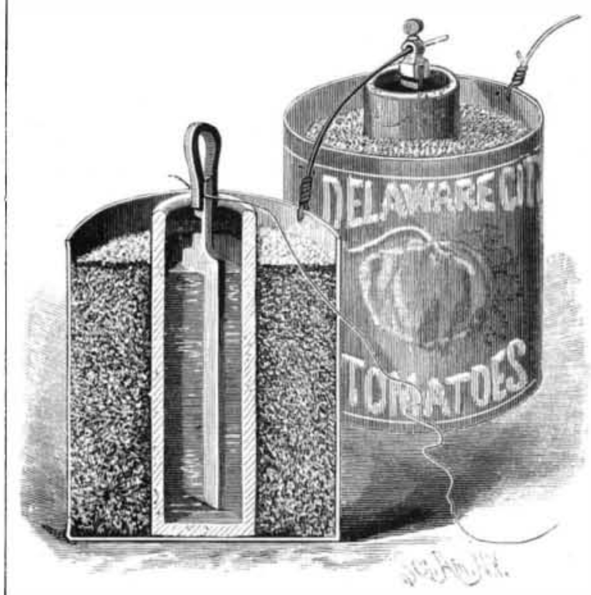
The first step is to secure a strong tin can. The proper article can be purchased at any hardware store, or even this is not necessary, for an ordinary large sized vegetable tin will do. The former is the better, as the joints are better clamped, and less solder is required. If much solder is used in the joints, it will be necessary to coat it with melted pitch while the tin is warm, as the chemical is apt to eat away the solder. Of course the tin cans are used as the outer cells of the battery, and should therefore be as nearly of a size as possible. It is important to secure cans that are well tinned and free from rust and pin holes. The next most important thing is the inner cell. This consists of an ordinary earthenware pot, made commonly of red clay, like a flower pot, and as such cells are made of all sizes by potters, there is little difficulty in obtaining them. These pots are highly porous, as is well known, but before they are suitable for service as cells it is necessary that they should be rendered non-porous in the upper part for about one-third of their height, for a reason that will be seen later. This is accomplished by dipping the pot at different intervals into a bowl containing melted paraffin wax. The wax fills into the rough surface of the clay, and very soon renders it impervious. The space between the two cells is to be filled with iron borings, which may be secured from the lathe of a metal turner, or, if this is not at hand, iron scraps would serve, such as iron wire, old nails, etc., or even old pieces of tin ware thoroughly cut up. Care should be taken, however, that no pieces of copper or brass ware or galvanized wire are mixed in with the borings.

The inner cell is to be filled with the chemical, which should be caustic potash in solution or caustic soda. The former is preferable. The active properties of these alkalies are well known, and they should be kept as far as possible in crockery or glazed vessels, as they will devour cork, tin, zinc, and animal tissue. Every precaution must be taken to prevent the liquid from coming in contact with the skin, as it eats the flesh and causes grievous wounds. This destructive feature of the alkali is the very quality, however, which is active in the production of the electric current. As has been said, zinc is voraciously attacked by the chemical, and it is therefore this element which is employed in this battery for the purpose of generation. A thick plate of zinc should be procured; roofing zinc will do, or if this is not to be procured, rods of zinc, not too thin, however, as the metal soon begins to dissolve in the solution, absorbing the oxygen from the alkali and liberating hydrogen, thus forming an oxide of zinc.

A thin tang of the plate should be formed to extend up through the covering of the cell, which latter is next to be considered. The object of the covering is to prevent the carbonic acid of the air from reaching the solution and to keep the caustic salt from creeping out. This covering is an important feature, and is made very simply out of a cork or wooden stopper, turned to the proper size to fit the earthen cell, and with a hole in the center for the admission of the tang of the zinc plate. The bung must be thoroughly soaked in paraffine or pitch, and must be sealed with the zinc element in the cell after it has been filled with the caustic alkali. Care should be taken, in filling the battery with this solution, to have the liquid rise considerably above the line of paraffine on the walls of the cell. To render the cell more completely air tight, a rubber band is sometimes used in connection with the wooden bung, this being covered over with the paraffine or pitch after the bung is inserted.

Now, all is ready for connecting the batteries. The cell has already been placed inside the tin can and the borings packed around it, and it is only necessary to join a copper wire to the tang of the zinc or connect it by a simple spring clip, as shown in the engraving, and connect it with the tin of the next battery, the outer cell of each being connected with the inner cell of the next battery.

Owing to the porosity of the clay cell, the borings will very soon become moistened with the alkali; and as neither the iron nor the tin will rust, owing to the

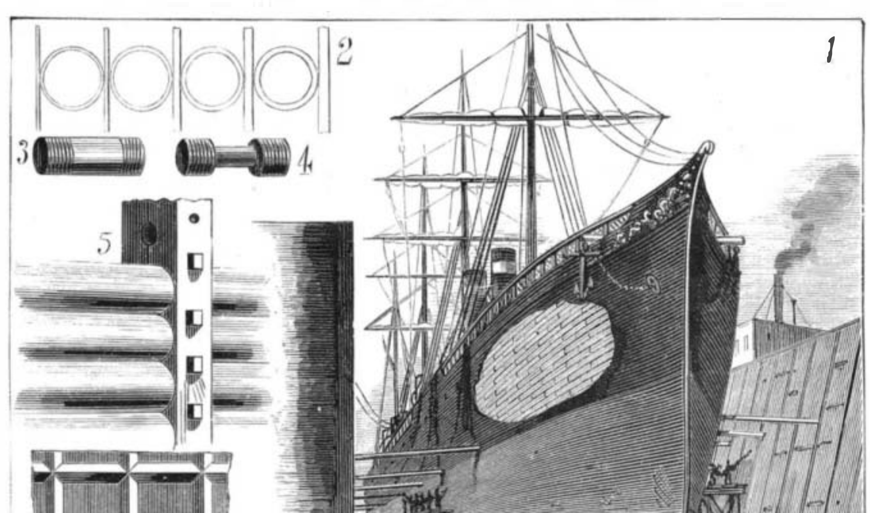


A CHEAP BATTERY.

presence of the alkali, this part of the battery will last for a long time. The zinc will be the first to show signs of decay, and this may need an early renewal, according to amount of work required to be done by the battery. This amount of work also determines the number of batteries that may be required. This battery was invented by Mr. Bennett, of England, and he estimates the cost of its construction at 6d., which estimate, doubling the expense of everything in this country, would bring the cost of each battery to less than 25 cents apiece. These batteries may be found of service in running experimental electric lights and small electric engines.

IMPROVED CONSTRUCTION OF VESSELS.

The object of the invention herewith illustrated is to construct the hull of a vessel of a stronger and more buoyant form than heretofore made, with the same amount of material. The hull is built up of a series of steel tubes, placed side by side and extending transversely the thickness of the vessel, with skins interposed between the tubes and secured to the outer and inner tubes, as shown in Fig. 2. While the tubes remain of the same diameter, the thickness of the steel increases toward the interior of the vessel, thus making the hull thicker and stronger on the inside; the intervening skins or plates also vary in thickness. The lengths of the tube section are comparatively small, and they are joined together at measured intervals by plugs, each length thus forming a watertight compartment. The plugs may be solid or hollow; Figs. 3 and 4 show two forms. The cylindrical ones are employed to join two tubes where no ribs are used between them, while those formed with cylindrical heads are used to join the superimposed tubes at their junction with a rib, Fig. 5, the plugs



ESHELMAN'S IMPROVED METHOD OF CONSTRUCTING VESSELS.