

**THE ALHYDRIC CHAIN.**

M. Toselli is an inventor who for some time past has made a specialty of inventions for the raising of sunken vessels, treasures, and other bodies from the water. His ingenious grapples and submarine diving apparatus we have already illustrated. His latest device is represented in the annexed engraving; and its use is to raise heavy vessel sunk in depths too great for divers to work in efficiently. The apparatus is called the alhydric chain, and it consists of a number of strong impermeable canvas bags fastened together, like so many colossal sausages, by short copper tubes.

The engineer in charge of the operation of placing this chain about a sunken vessel ascends in one of M. Toselli's submarine moles, which is self-moving, and from which the progress of the work can be seen. A telegraph line serves to transmit the directions of the occupant to those working at the surface. Directed in this manner, the people above lower grappels which automatically fix themselves at the points indicated. From each grappel a cord extends which terminates in a buoy which floats at the surface. It follows that, when several of these grappels are attached, the buoys above become arranged in the exact outline of the vessel to be raised. This will be clearly understood from the engraving. This accomplished, the next step is to lower a very heavy grappel, which is caused to attach itself to some strong part of the vessel, the keel of the bowsprit for instance; and to this grappel is fastened the end of the alhydric chain, in lieu of the cord and buoy. The boat carrying the chain then moves around the line of buoys, so that the chain, as it sinks, becomes wound two or three times around the vessel below. A powerful pumping engine then forces air into the cylinders; and when these are filled, their weight, plus that of the ship, is less than that of the water displaced. The result of course is that they rise to the top with the vessel, and sustain the latter until the necessary repairs can be made, or until she can be floated to a place of safety.

**Lavoesium, a New Metal.**

From a communication made to the Société des Sciences Physiques et Naturelles de Bordeaux, we learn that M. Prat has discovered a new metal, which, in honor of Lavoisier, he calls lavoesium. This new metal is of a silvery white color, and is malleable and fusible. It forms crystallizable colorless salts. The following are some of its reactions: When treated with potassa, a hydrated white precipitate is obtained, insoluble in an excess of the precipitant. Ammonia gives a precipitate very soluble in excess. Ferrocyanide of potassium gives a characteristic precipitate similar to the color of the petals of roses *du Bengale*. With hydrosulphuric acid a brown coloration is first obtained; the precipitate afterward changes to a fawn color. Tannin gives a deep yellow-green precipitate.

In the spectroscope the new metal gives: 1. In the indigo-blue, two sets of characteristic lines. 2. In the bright green, two other sets of simpler lines, also characteristic. 3. Some blue, violet, and green secondary lines; in all twenty-three lines. These characteristic lines exactly coincide with those of copper, which would seem to show that the new metal contains copper. Its silvery white color, however, and some of its reactions, especially those with ammonia and ferrocyanide of potassium, constitute properties which distinguish it from any other known metal. According to M. Prat, this body is much more common than he at first supposed, it having been found in many minerals, and especially in iron pyrites. If lavoesium really exists, its therapeutic action and its industrial uses remain to be studied.—*Le Monde Pharmaceutique*.

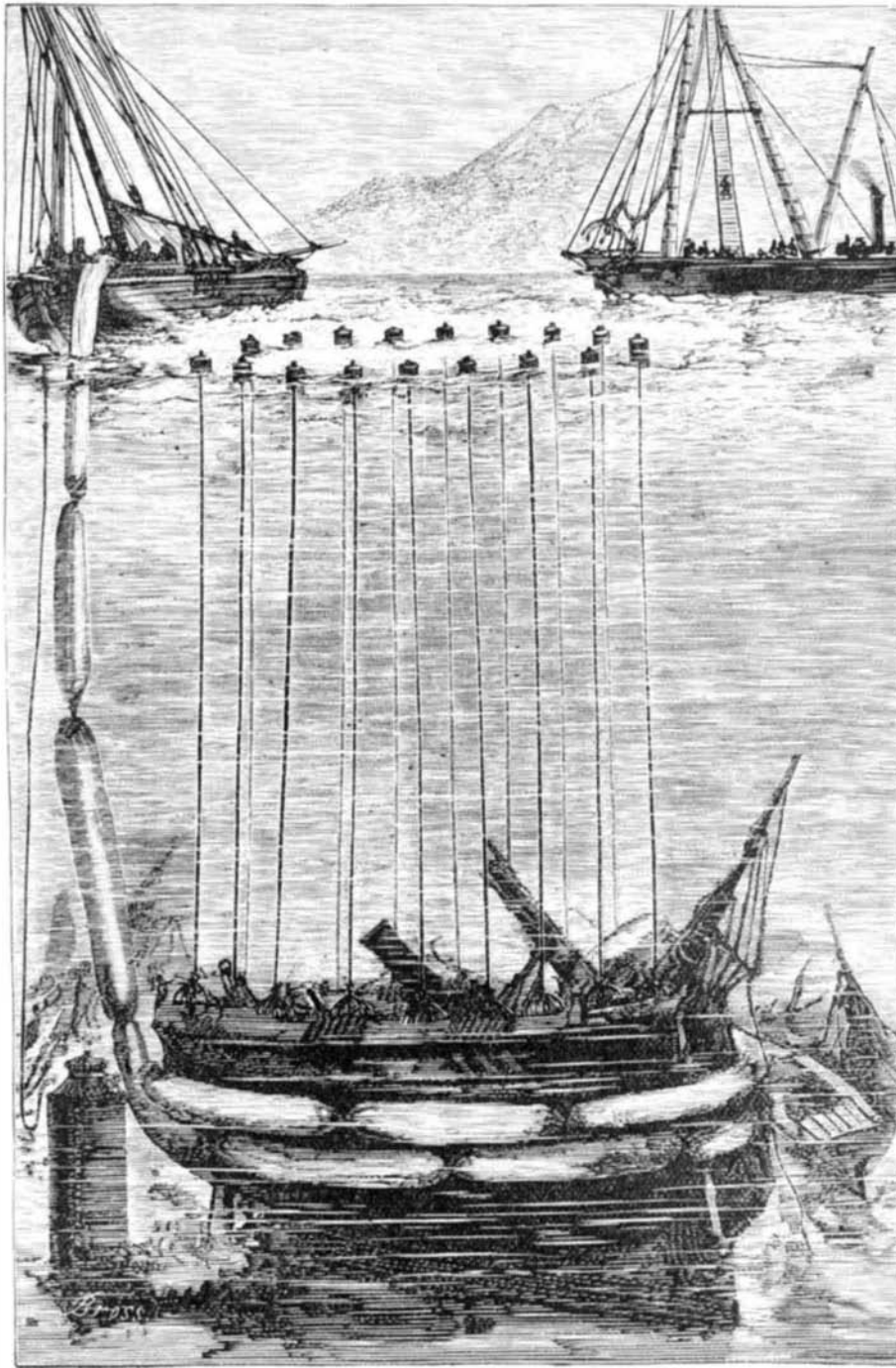
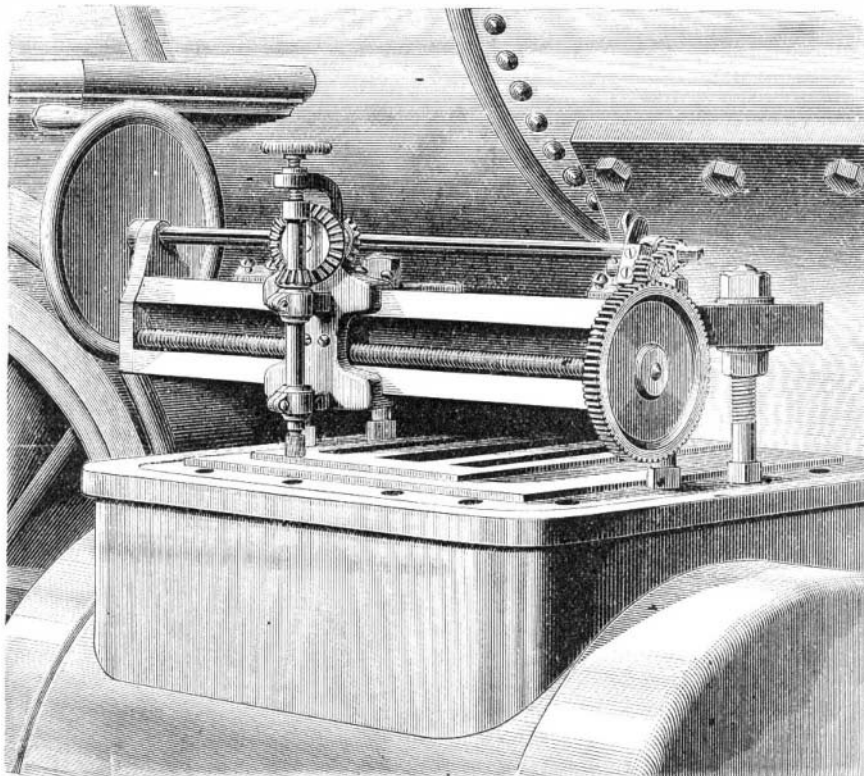
**IMPROVED STEAM CHEST SEAT MILLING MACHINE.**

Those acquainted with locomotive repairing know that the action of the heat in the steam causes the acid in the lubricating tallow to corrode the iron. This is especially noticeable as occurring in the vicinity of the valves and steam chest. In the latter case, the ledge which supports the steam chest is frequently corroded to such an extent as to require repair. To do this necessitates much time and labor, as a recess or groove has to be cut with the chisel; and then brass strips are driven in and trued up to effect a tight joint.

The object of the invention illustrated in the annexed engraving is to accomplish this work of grooving, then of truing off the inserted pieces, without skilled labor and in a short time. The machine is supported by four studs, as shown; and motion is imparted to the mill or cutter by a shaft on which slides a suitable gear, meshing into one on the tool carrier or crosshead, the latter being fed to the work, in either direction, by a screw and suitable gearing,

ports on new work; and by replacing the cutter with a drill, holes can be bored for the studs.

This invention has, we are informed, been successfully used in the shops of the Pennsylvania Railroad at Altoona, and is there considered a very useful tool, saving both time and money. Patent pending through the Scientific American Patent Agency. For further particulars and rights to manufacture, address the inventor and patentee, A. H. Campbell, Box 1136, Altoona, Blair county, Pa.

**TOSELLI'S ALHYDRIC CHAIN.****CAMPBELL'S MILLING MACHINE.****Separation of Arsenic from Cobalt and Nickel.**

Most of the common ores of nickel and cobalt contain a considerable quantity of arsenic; and perhaps on this account the crude metallic arsenic is sold in drug stores under the name of "cobalt." The usual method of dissolving the ores, and precipitating the arsenic by sulphuretted hydrogen, is objectionable on account of the disagreeable odor and poisonous properties of this gas. Professor Wöhler avoids this inconvenience by the use of oxalic acid. The ore, *kupfer nickel* or *speiss cobalt*, is dissolved in aqua regia, evaporated, if necessary, so as to expel the excess of acid, and precipitated while boiling hot with carbonate of soda. After washing, the still moist precipitate is treated with an excess of a concentrated solution of oxalic acid. Both metals are thus converted into oxalates, while the arsenic acid goes into solution along with the oxide of iron. The mixture of nickel and cobalt oxalates is thoroughly washed, and may be separated by ammonia according to Langier's process. If the ore contains copper, it should be precipitated by means of finely divided metallic iron that has been reduced by hydrogen. The dissolved iron must afterwards be oxidized to a ferric salt. Speiss cobalt can be deprived of a large portion of its arsenic by previous fusion, care being taken to conduct the operation in such a manner as to prevent injury from the poisonous white arsenious acid evolved.

**The Seventeen Year Locusts.**

Our exchanges from various parts of the country report that the seventeen year locusts have made their appearance in large numbers. A correspondent of the *New York Sun*, from Greenbush, N. Y., writes that they have also appeared in that vicinity: "They first emerge from the ground in the form of a large grub. The wings appear soon afterward, when the locust settles in the nearest tree. The noise made by the insects is a constant shrill humming. They do not eat growing crops, as many suppose, nor do they in any way resemble the ravenous locusts of the West. They devote their time to working in the branches and twigs of all kinds of trees. They plough little grooves in the limbs, in the tender bark next the wood. Their perforations in the trees kill the branches, and the foliage soon turns yellow. In 1860 the locusts did not appear until June, when the trees were in full leaf. In two weeks the woods looked as though they had been subjected to the frosts of November. From all appearances the locusts will be as thick as they were in that year. Stories of the poisonous nature of the sting of this curious insect, which did duty in 1860, creating much alarm, have been revived, but the seventeen year locust is harmless to man and beast. It is an inch and a half long when full grown. It comes out of the ground tail first, and has on its head white marks forming a perfect letter W. In 1860, believers in signs and superstitions declared that the appearance of this cabalistic sign denoted war. In that year the locusts did not entirely disappear until late in the fall. People still living here remember their appearance also in 1843. They were so thick then that the trees were thrashed with whips, and dead locusts carried away by the bushel. They do no permanent injury, but interfere greatly with the year's fruit crop."

**Powder Paper.**

A substitute for gunpowder, invented in England, is called "powder paper;" it is paper impregnated with a mixture of potassic chlorate, nitrate, prussiate, and chromate, powdered wood charcoal, and a little starch. It leaves no greasy residue on the gun, produces less smoke and less recoil, and is less impaired by humidity, and it is  $\frac{1}{2}$  stronger than gunpowder.