

THE LONGEST TUNNEL IN THE WORLD.

The Joseph II. mining adit, at Schemnitz, Hungary, begun in 1872, and finished last October, is now the longest tunnel in the world. Its length is 16,538 meters, that of the St. Gothard tunnel being 14,620, and the Mont Cenis tunnel 12,233 meters.

The object of the adit is the drainage of the important gold and silver mines at Schemnitz. It furnishes a geological section more than ten miles in length, and gives not only valuable information as to the downward prolongation of the lodes known in the upper levels, but some new ones have been traversed, and the entire series of rocks, with their mutual limits as well as modification and occasional transitions, are disclosed without interruption. The entire cost of the tunnel was 4,566,000 florins—about \$2,300,000: Its height is 3 meters; width, 1.6 meter.

TIN DISCOVERIES IN MAINE.

From Maine comes the report, and on very trust-worthy authority, of very promising discoveries of tin, which, if verified by subsequent developments, will prove to be of great importance. Thus far we have no tin mines in the United States; a few traces of this metal have been found here and there, but thus far the amount discovered has been trifling, and up to the present time all the tin that is consumed in this country by the immense industries employing tin and tinned iron, is imported from abroad—chiefly from England. The importance, therefore, to the whole country of the discovery of extensive deposits of tin-stone, can hardly be overestimated, since it would enable our domestic industries employing tin, to become independent of foreign supply, and in time perhaps to compete with England in the manufacture of tin-plate, which consumes a large proportion of the tin that is produced.

The tin discoveries here referred to, are reported to have been made near the town of Winslow, a few miles from the capital of the State, where a number of veins of rich tin ore (cassiterite) are said to have been found in a rock formation similar to that in which tin is known to occur elsewhere. Prof. Hitchcock, who has examined the location of the reputed discovery, speaks very favorably of it. He states that the inclosing rock is a micaceous schist, cut by numerous veins of granite, in which latter the tin occurs, associated with other minerals. To be more specific, within a width of thirty feet of this micaceous schist, there are reported to have been noticed twelve granite veins, from $\frac{1}{2}$ inch to 3 inches in width. These granite veins are said to be full of crystals of tin ore, associated with fluorspar, margarite, mispickel, beryl, lepidolite and other minerals. Prof. Hitchcock pronounces the Winslow mine, in its mineralogical, geological and physical features, to be "identical with those common to the stanniferous districts of Europe;" and he adds that "the ore seems to be sufficiently abundant to remunerate quite extensive outlays for mining operations."

Prof. Forrest Shepherd, who has examined the Winslow mine, also reports very favorably upon it. He is reported as saying that the veins are very favorably situated for working, and what is particularly encouraging, that the Winslow deposits are at the surface, equal in quality to the best in Cornwall, while there and elsewhere the veins are rarely remunerative except at great depths.

We trust that the subsequent development of these deposits may justify the encouraging report of their surface indications. We shall not be long left in suspense, since the account from which we glean the foregoing statements adds the information that a company has been formed to develop the Winslow mine, and to extend the exploration for tin into other parts of the State.

THE TOPOPHONE.

Briefly described, the topophone consists of two resonators (or any other sound-receivers) attached to a connecting bar or shoulder rest. The sound receivers are joined by flexible tubes, which unite for part of their length and from which ear tubes proceed. One tube, carries a telescopic device by which its length can be varied. When the two resonators face the direction whence a sound comes, so as to receive simultaneously the same sonorous impulse, and are joined by tubes of equal length, the sound waves received from them will necessarily re-enforce each other, and the second will be augmented. If, on the contrary, the resonator tubes differ in length by half the wavelength of the second, the impulse from the one neutralizes that from the other, and the sound is obliterated.

CEMENTS FOR THE SHOP.

IRON CEMENT FOR CLOSING THE JOINTS OF IRON PIPES.—Take of coarsely powdered iron borings, 5 pounds; powdered sal-ammonic, 2 ounces; sulphur, 1 ounce; and water sufficient to moisten it. This composition hardens rapidly; but if time can be allowed, it sets more firmly without the sulphur. It must be used at soon as mixed, and rammed tightly into the joints.

2. Take sal-ammoniac, 2 ounces; sublimated sulphur, 1 ounce; cast-iron filings or fine turnings, 1 pound; mix in a mortar and keep the powder dry. When it is to be used, mix it with 20 times its weight of clean iron turnings or filings, and grind the whole in a mortar; then wet it with water until it becomes of convenient consistency, when it is to be applied to the joint. After a time it becomes as hard and strong as any part of the metal.

TURNER CEMENT.—Melt one pound of resin in a pan over the fire, and when melted, add one quarter of a pound of pitch. While these are boiling, add brickdust until by dropping a little on a cold stone, you think it hard enough. In winter it may be necessary to add a little tallow. By means of this cement a piece of wood may be fastened to the chuck, which will hold when cool; and when the work is finished, it may be removed by a smart stroke with the tool. Any traces of the cement may be removed from the work by means of benzine.

CEMENT FOR LEATHER BELTING.—One who has tried everything, says that after an experience of fifteen years he has found nothing to equal the following: Common glue and isinglass, equal parts, soaked for ten hours in just enough water to cover them. Bring gradually to a boiling heat, and add pure tannin until the whole becomes ropy, or appears like the white of an egg. Buff off the surfaces to be joined, apply this cement warm, and clamp firmly.

WOLLASTON'S WHITE CEMENT FOR LARGE OBJECTS.—Bees-wax, 1 ounce; resin, 4 ounces; powdered plaster of Paris, 5 ounces. Melt together. To use, warm the edges of the specimen, and apply the cement warm.

"NEW REGISTERED" HAND FRET-SAWING MACHINE.—A real novelty, and one of a most useful kind, has just being brought out by the Britannia Company, Colchester, in the form of a hand fret-sawing machine, which combines the utmost simplicity of arrangement with the most complete efficiency for work. We give an engraving of the machine, which is a mere toy, but a real practical working tool. It measures 10 inches under the arm, will cut $\frac{3}{4}$ -inch thick stuff, is provided with a presser foot with roller to keep the wood firm while being cut, and also with a bright work plate. It is neatly japanned and ornamented in gold, and is fitted with drill and an emery wheel for grinding. We have tested the power of the machine at a tolerably rapid speed and found it capable of turning out admirable work. The saw has the approved true vertical motion of the Company's larger machines, obtained by the cam and disc, so much preferred to the radical movement of those having the saw attached to moving arms. These machines are made by machinery by the interchangeable principle, and can thus be put into the market at a low price, namely, 15s., which includes half-a-dozen saws, drill, emery wheel, turn-screw, and oil can. No better machine can be put into an amateur's workshop.

—THE use of blowers under steam boilers is being gradually abandoned. The disadvantages are numerous. It requires a larger amount of power to run them, and unless the mill is situated away from other buildings causes great annoyance and danger from sparks and cinders. A planing mill at the South End, Boston, was set on fire five times in as many years by sparks. Another mill was set on fire, caused by back draft into the boiler-room. The action of the blast on the crown sheet of boilers is like a blow-pipe, always striking in the same spot, and it is safe to say boilers will last double the time running by natural draft. A mill near Boston started with blowers under six new boilers, and had to renew the crown sheets within two years' time.

SIZE OF GOVERNOR PULLEYS.—The *Manufacturer and Builder* gives the following rule for fixing the size of governor pulleys; To find the diameter of the governor shaft pulley, multiply the number of revolutions of the engine by the diameter of the engine shaft pulley, and divide the product by the number of revolutions of the governor. To find the diameter of the engine shaft pulley, multiply the number of revolutions of the governor by the diameter of the governor shaft pulley, and divide the product by the number of revolutions of the engine.