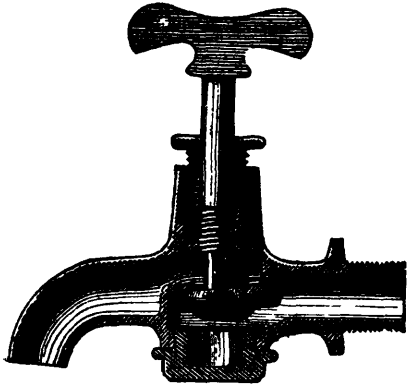


SIMPLE HIGH-PRESSURE TAP.

The introduction of a cheap and simple high-pressure tap would doubtless facilitate the introduction of a constant supply of water in the metropolis, by relieving the companies of the necessity for insisting upon the adoption of rather costly fittings. The illustration shows a form of tap patented by Messrs. Warner and Brown, having a cone (or it may be a disc) closing against a diaphragm or partition within the body or shell, so as to cover an aperture therein, by which, when the cone or disc-valve is removed, the fluid is free to pass. The cone or disc is carried at the end of a spindle, passing through the aperture or water way in the diaphragm or partition; there is also a screw thread formed upon the spindle, and the screwed portion is somewhat larger in diameter than the other parts. A boss is formed upon the shell or body, which has a hole through it, traversed by the



spindle, and which is tapped with a screw thread corresponding to that upon the spindle, so that the latter working in the boss as a screw in a nut draws the cone or disc to its seat. On the side of the shell or body opposite to the boss there is a hole sufficiently large to admit the cone or disc, and when that has been inserted the hole is closed by a plug screwed into it. The part of the spindle beyond the screw thread may pass through a stuffing-box formed in the boss, or it may simply have a conical collar upon it, which when the spindle is screwed in in such a manner as to remove the cone or disc from its seat, and to open the water way, comes down upon the top of the boss, forming a fluid-tight joint, preventing any escape around the spindle. In the figure, which is a section, the spindle is shown passing through a stuffing-box, but in a modification the stuffing-box is dispensed with, and a metal cone fixed on the spindle descends with it and makes a joint sufficiently fluid-tight for most purposes.

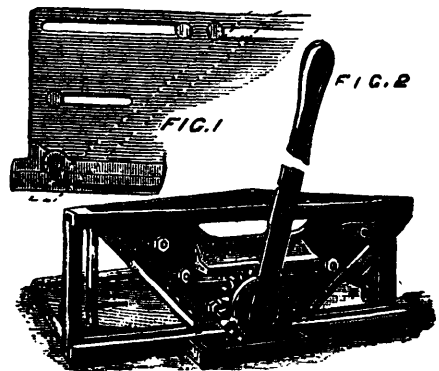
A WONDERFUL LUBRICANT.

Grease has been deprived of one of its constituents by Senor Unciti, which gives it many wonderful qualities, if we may judge from the experiments lately made at the present exhibition of applied science in Paris, France. The *Iron* says: Two open boilers, made of tinned sheet iron, were put upon two coke furnaces of equal intensity; but the bottom of one of the boilers was coated with the grease outside, so as to be in immediate contact with the flame, whereas the other was not so coated. The former began to give off steam in a quarter of an hour, and the latter not until half an hour had elapsed; whence it may be inferred that the grease increases the conductivity of the metal, so that with a given quantity of fuel more water is turned into steam. A brass lubricator, of cylindrical form, filled with the grease, was then plunged into the water in the coated boiler, and, almost immediately, minute particles of the lubricant began to issue from a small hole in one end, rise to the surface, and gradually spread themselves over it. This was to show the application to the interior of a steam boiler for preventing incrustations, three grammes (about $1\frac{1}{4}$ drachms avoird.) being used for each horse-power. The grease is also carried along by the steam into the cylinders, rendering any other lubrication unnecessary. Notwithstanding the cooling effect produced by the lubricator, a large body in proportion, the water in the coated boiler bubbled violently in an hour from the time of its being placed in the fire, whereas the other, not coated, did not boil in an hour and a half, when the experiment was stopped.

A portion of the grease was wiped off from the bottom of the coated boiler and thrown on to the fire, when it immediately flared and was consumed. The tin bottom was as bright as before, but that of the other boiler gave evidence of the action of fire. This was to shew, on a small scale, that boiler plates exposed to the action of the fire do not become burnt. And, indeed, this fact follows as a natural consequence of the other point established, viz.: the increased conductivity given to the plates. Those who witnessed the demonstration were most astonished to see that a stick dipped in the grease made marks on the hot sides of the boiler and furnace as distinct as lines with a drawing-pen, and which did not run together, as they would have done if made with ordinary grease. So far the experiments have been most conclusive, fully bearing out the official certificate of the Spanish government; and it will be interesting to watch the result of a continued application to steam boilers on the scale of actual practice.

A NEW MITRE CUTTER.

The accompanying engraving represents an improved mitre-cutter recently patented by Mr. W. R. Fox, of Rockfall, Conn. Its construction is so simple that it can be readily understood by a glance at the engraving, Fig. 1. The cutters, which are made of the finest cast steel, are secured to a slide that moves in guides along one edge of the bed, and the slide is moved by a pinion placed between the rack on its outer side and a rack on the bed, the pinion being provided with a long lever by which cutters may be moved in either direction with force sufficient for any work that the tool is capable of doing. Upon the bed, Fig. 2, there are gauges and guide marks to which the work is adjusted. At each end of the bed and near the path of the knife there is a pivoted support for the end of the piece being squared.



The tool seems superior to the block plane, says the *Scientific American*, as it will do the work quicker and better. It is particularly useful in squaring across the end of the grain; when used for this purpose, the piece being cut may be backed up by another piece to prevent slivering. The tool is strong and well designed, and well calculated to meet the wants of wood-workers.

TO POLISH IRON OR STEEL.—For those in the metal or hardware trades who wish to obtain that beautiful deep black polish on iron or steel which is so much sought after, all that is required is to boil one part of sulphur in ten parts of oil of turpentine, the product of which is a brown sulphuric oil of disagreeable smell. This should be put on the outside as lightly as possible, and heated over a spirit lamp till the required black polish is obtained.

METALLIC LACES.—Debray uses wires of German silver in the manufacture of metallic laces. He colors metallic foils for the same purpose by depositing upon them iridescent films of oxide of lead. Litharge is dissolved in caustic alkali and the resulting solution is decomposed by a current of constant intensity, the positive pole of the battery being in communication with the metallic surface to be coated.

It is stated that very large quantities of tin plates made from steel are branded charcoal and best charcoal, and so exported, and these plates, it is affirmed, are exceptionally well received, especially for stamping purposes in the United States.