

IMPROVED DIE TAP.

This is a new form of tap for screw cutting, the arrangement of which is clearly shown in our engraving. It will be seen that the main body tap, C, remains much the same as in the old standard, minus the thread, but that it is pierced through its centre with a round hole, tapped for a part of its depth; and that into this hole is screwed a pointed spindle, E. At the lower end of the tap, it will be observed, are four screw-cutting dies, *ffff*, fitting into a corresponding number of slots radiating from the center of the tool. These dies have knife edges on the inside, their upper corners being chamfered for the reception of the point of the adjustable screw or spindle referred to.

In the engraving the dies are shown to have been forced out by the adjustable screw to their largest working diameter. To draw them back it is necessary to elevate the screw, E, and gently tap back the dies until they are flush with the turned part of the tap. In this position they close the central hole, leaving only a small pointed indenture at the top formed by the chamfered corners already mentioned. The dies, it will be seen, are concave on their cutting faces. By setting the check nuts, G G, Figs. 1 and 2, on the spindle, E, a large number of holes can be tapped to the same size. A graduated scale can also, if desired, be added for facilitating the adjustment, as shown in Fig. 6. The dies being adjustable, the diameter of the screwed hole can be regulated to $\frac{1}{100}$ inch, and even less. Further only one tap is necessary to cut a full thread, as compared with two and sometimes three used in the ordinary way. Again, the dies, being removable, can be easily re-sharpened, or they may be replaced by others of a different thread. This tap has been found to be specially useful in the cutting of threads in steel tyres of locomotive and carriage wheels (where the tapped bolt fastening is used), also for tapping gas pipes, and in renovating stripped or worn threads.

Mr. John McFethrie, of Kovroff, Russia, is the inventor.

FILTRATION UNDER PRESSURE.

A very important economy is effected, in paper making, sugar refining, and other processes wherein matters are held in suspension in liquid, by forcing the fluid through a filter by pressure, thus recovering valuable material from waste and washings that would not pass through any filtering substance by the mere action of gravity. Mr. A. L. G. Dehne, of Halle, Germany, has introduced several inventions for this purpose, two of which (especially adapted for sugar refineries and chemical works) we illustrate herewith.

The first of these presses, shown in Figs. 1, 2, 3, 4, has a horizontal central admission for the material to be filtered, and is called by the manufacturers a refining press for the claying of sugar, and is used for the filtration of the sirup, as a substitute for the sack or bag filter, the preliminary filtration through bone black and the further filtration of the residue of blood coagulation and juice being omitted.

This press consists of the customary chambers of iron, but no special pump is required for forcing in the matter, as in most cases the pressure of a certain height is sufficient. An apparatus of this kind used at Halle does the mechanical filtration of a thick solution, of about 55 per cent, of about from 800 cwt. to 900 cwt. of raw sugar in 24 hours, in the most satisfactory manner, without the use of any pump, but through the pressure from a reservoir placed about 7 feet above the press.

The residue in the chambers does not form cakes, but exists only in the form of slime, which is easily removed after the filtration has been completed by opening the cock in the front plate. The filter cloths may be changed every 24 hours, and this operation, together with theedulcoration, does not require more than half an hour's time, while no attendance is required by the press during the time of filtration. The general construction of the press will be easily understood from the engraving, the details of the chamber being shown in a larger scale in Figs. 3 and 4. The very handy arrangement has been adopted of carrying the front cast iron plate on rollers, whence the taking out of the chambers, and of the filtering cloths; becomes a matter of the greatest ease and simplicity. The method of fastening together of the chambers and plates is obvious in the engravings.

The second press is represented by Figs. 5 and 6, and has

also a horizontal central admission. It has lately been much adopted in works where a quick separation of mud, slime, or chemical precipitates from fluids has to be made. This apparatus consists of a system of chambers made of wood, or occasionally of brass castings, with sheets of drill cloth placed between them. The fluid to be filtered is forced into the chambers by means of a pressure pump, a separation of the fluid from the mud, slime, etc.; then taking place. The fluid is tapped off perfectly clear, and with a continued

nor add dryers long before using. Use as little dryers as will do the work.

Gall soap, excellent for washing silks or ribbons, may be made by heating one pound of cocoanut oil to 80° Fah., into which half a pound of caustic soda is gradually stirred. To this half a pound of Venice turpentine, previously warmed in another vessel, is added. The kettle is allowed to stand for four hours, subject to a gentle heat, after which the fire is increased until the contents are perfectly clear. One pound of ox gall, followed by two pounds of Castile soap, is then mixed in, and the whole allowed to cool, when it may be cut into cakes.

Never try to extinguish a kerosene fire with water. Smother the flames with blankets or rugs.

Benzole magnesia, a simple paste made of calcined magnesia and benzole, will take grease spots out of almost everything, however delicate. A paste of soda and quicklime is good to take oil stains from wood floors. To detect adulteration in tea, burn the ashes. Pure tea, of any grade, will not leave over five per cent of ash, while the adulterated article will yield as high as 45 per cent.

Chloride of calcium or glycerin, added to shoe blacking, will prevent the latter's drying in the box.

It is said that half an ounce of a mixture of 100 parts logwood ground with 1 part of bichromate of potash, will make, with water, a pint of good ink.

Painters estimate that about 1 pound of paint per square yard is required for filling new work, and nearly half a pound for the second coat. The proportion is about half white lead and half oil of turpentine for the filling coat.

A good white cement for marble is made of 8 parts resin and 1 part wax, to which, when well melted together,

4 parts plaster of Paris are added. Use while hot. Cements in general are comparatively brittle, therefore use as little as possible, so that dependence may be made upon its adhesion to the surfaces, and not upon the cohesion of the cement alone.

In using the flat drill, the cutting point should be made thin, so as to penetrate easily, and its form should be such as exactly to fit the inner angle of the try square, which is 90°.

A wash of lime, salt, and white sand is said to afford protection to shingle roofs against accidental conflagration from sparks, etc.

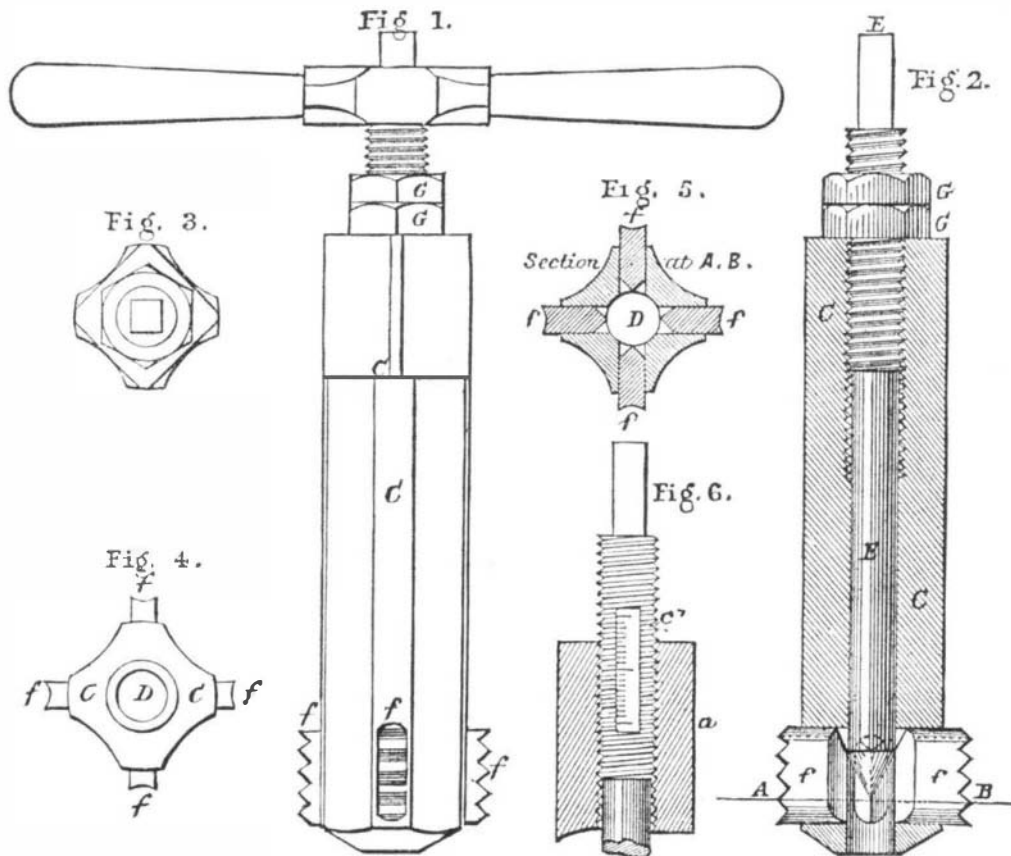
The following are two recently patented recipes for welding copper. The first, by Messrs. C. L. Schurr and W. G. Rehbein, consists in heating borax until all moisture is expelled. The dry residuum is pulverized and applied between

the surfaces of the copper, which are formed in a lap joint. The metal is hammered together cold, then heated and dipped first in fine salt, and then in human feces, for the purpose of excluding the air. Welding may then be easily accomplished. In the second plan, the ends of copper to be welded are hammered out to form the lap. The pieces are then heated, dipped in powdered borax to clean the surfaces, and heated a second time. After the second heat the pieces are dipped in powdered cryolite (or any other anhydrous fluoride or similar salt, which, when heated, will form a liquid flux), and then hammered together on the anvil. The latter is the invention of Mr. E. Renaud, of Washington, D. C.

If a defect on a steam cylinder cannot be reached for plugging or melting in a composition, stop the hole with 2 parts sal ammoniac and 8 parts fine iron filings. No sulphur need be used.

RATS EXPELLED.—A gentleman in Burlington, Vt., of an investigating turn of mind, a week or two ago determined to try it again with the rats which infested his house. He purchased a supply of coal tar at the gas works, and placed small quantities of it in the rat holes in his cellar and elsewhere in their runways. The rats, bedaubing themselves, became disgusted with the manner of their entertainment, and speedily left the premises, and have not been seen or heard from since.

The best way to use up scrap brass is to melt it in with new brass, putting it in with the zinc after the copper is melted.



McFETHRIE'S UNIVERSAL DIE TAP.

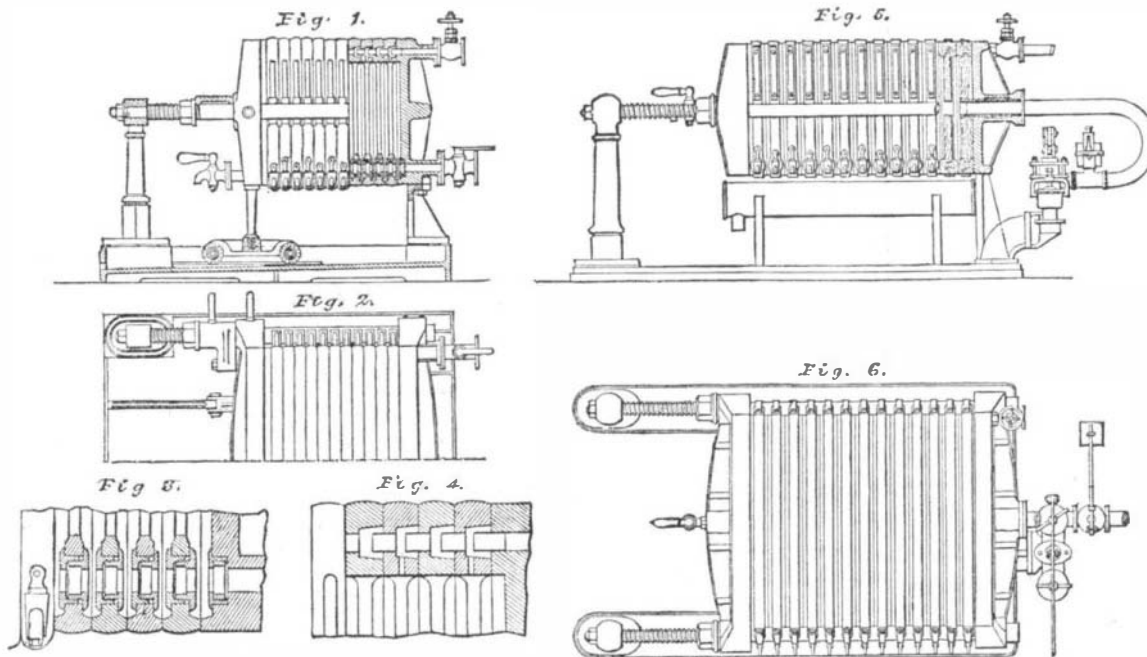
forcing in of fluid, the filtration goes on until the residue in the chambers become solid. The emptying of the apparatus is very simple: the cakes, having formed in the chambers, are easily removed, or fall out when the apparatus is unscrewed. The general construction and fastening of the plates is the same as in the press described above.

Useful Recipes for the Shop, the Household, and the Farm.

Three bushels of clean sand, mingled with half a bushel of good lime and half a bushel of cement, makes an excellent mortar which is not liable to be dislodged by storms.

Dark purple and green slates are the best for roofing; others are liable to fade unequally and produce a disagreeable appearance.

If hammering continually is done in an upper story to such



FILTER PRESSES FOR CHEMICALS AND SUGAR.

an extent as to be annoying on the floors below, the sound may be deadened by sheet india rubber cushions placed under the benches or anvils.

It is very dangerous to allow acid substances, used as food, to stand for any length of time in copper vessels. Preserves, when made in pots of that metal, should be emptied out as soon as possible after cooking.

Do not bring lights near empty whisky, alcohol, benzine, or coal oil barrels. The vapor of the fluid, mingled with the air within, is a dangerous explosive mixture.

Lamp chimneys may be, in a measure, prevented from sudden cracking by immersion in cold water in a suitable vessel, the last being set on the stove until the water boils. The chimney is then removed and allowed to cool slowly.

In painting, do not apply a succeeding coat before the previous one is dry. Do not use a lighter color over a darker one,