

Miscellaneous.

EVAPORATING PANS ON STOVES.—An almost universal practice in winter is to place on the stove a pan of water, with a view to purify the air by absorbing the carbonic acid contained in it. Dr. Polli, of Milan, who has long been engaged in investigations on this subject, is wholly opposed to this system. According to him, the water does not absorb carbonic acid, but, on the contrary, adds to it by the decomposition of the carbonate of lime contained in all drinkable water in greater or less proportions. The white encrustations found on the sides of the vessels are, in fact, formed by the deposit of subcarbonates and sulphates of lime, produced by the evaporation of the water, and the principal part of the carbonic acid having been given off to the surrounding atmosphere. M. Polli proposes instead to place on the stove pans, containing quick lime, which after a few days augments in volume and is transformed into carbonate of lime by absorbing the carbonic acid in the air. By this means the atmosphere is constantly purified, but at the same time is rendered very dry. To obviate this inconvenience, vessels containing water may be placed about the room in positions where they are not subject to the immediate action of the fire, and they will give off by their evaporation sufficient humidity to render the air agreeable, without adding to the quantity of carbonic acid already present.

WELDING STEEL HAMMERS.—A correspondent in the *English Mechanic* asks if it is possible to weld a face on a cast steel hammer. The answer given is as follows: "I suppose to make it heavier; this cannot be done even with sheer steel. Many men will assert that they have seen it done many times. Files may be put together very easy and to look sound, but as to their being welded I doubt it very much. Sometimes old swords can be put together to look sound, still they are not so. Many workmen are not aware that there is a kind of steel made, called welded steel; this will account for so much cast steel being welded. I know one firm that sent an order for 100 tons of sheer steel to one of our best steel makers, and they, not having it in stock, sent welding cast steel, and it gave great satisfaction, and as the order came from a Sheffield firm no doubt it was tested very severely as to its welding property. Of course, the firm it was for took it for sheer steel, and no doubt had the order been for cast steel the same would have been sent, that is if no other was in stock. I have some cast steel and I know it is the right sort, and I should like to give anybody a piece who would try to weld it. I have seen this kind of thing tried in many of our best workshops and by some of our best workmen, hundreds of times, and welding files I regard as an old tale."

CHINA PAINTING.—Herewith is a list of tools, &c., necessary for painting of glazed china, and a few directions how to use them:—Paints and flux, oil of lavender, turpentine, fat-oil, brushes, palette knife, small muller, 1 piece of glass to grind and mix colours on. First, be sure the china is perfectly clean and free from grease, then draw the outline of whatever is to be painted on the china with Indian ink mixed with water, carefully but slightly, which will disappear in the firing. Put some colour on the palette with a little flux, and grind it thoroughly with a little turpentine using the muller; then add to this a little oil of lavender and a drop of fat oil, and mix well with palette knife. If wanted thinner, use a little turpentine. The colour should be used thin enough to flow easily, but not to run. You can paint one colour over another without firing, if the first is left a day or two to dry, but for elaborate things several firings will be necessary. There is also a useful little book, viz., "A Hand-book to the Practice of Pottery Painting," by J. C. L. Sparks, published by Lechertier, Barbe, and Co., 90 Regent street, price 1s., where also the paints, &c., can be got.

A CHEAP COMPOSITION FOR STEAM COVERING.—A French firm is using a composition for covering boilers, steam pipes, and similar articles, which is certainly cheap and said to be very effectual. The surfaces are covered with sawdust mixed with flour paste. If the paste is not very liquid, the mixture being used in the form of moderately stiff dough; and the surfaces of the boilers or pipes have been well cleaned from grease, the adhesion is perfect and the material is free from cracks. Five layers of this composition are recommended, each about one-fifth of an inch thick. It is said that one inch of this composition will give better results than double that amount of the materials usually employed. The paste is composed of rough flour without the addition of starch. The mixture can be applied without a trowel, and if there is much exposure, two or three coatings of

tar will render the composition impervious to water. Copper tubes should first be treated to a hot liquid solution of clay so as to increase the adhesion of the sawdust.

CONCERNING CELLULOID.—The correspondent of the *Saturday Evening Post*, who not long ago called attention to a popular error that prevailed respecting this substance (the said error being that celluloid contained gun-cotton for one of its constituents), is called on to explain the recent disastrous explosion, attended with loss of life, that occurred during the past week. His explanation of the constitution of this article, to the effect that it was composed of tissue-paper and camphor subjected "to a chemical process," was as lucid as any one had a right to expect of a correspondent who occasionally dipped into science; and his positive assertion that celluloid contained no gun-cotton is substantiated to the fullest extent by the testimony of one of the manufacturers who was interviewed since this latest explosion, and who is reported to have asserted that no gun-cotton was employed in any part of the manufacture, and that the only materials used in its production were tissue-paper treated with a mixture of nitric and sulphuric acid and camphor!

A NEW METHOD OF MAKING STEAM BOILERS.—An English engineer, named Whitehead, recently exhibited at Owlestan, near Sheffield, a boiler made on a new plan. In making this boiler, a ring of steel is cast and heated; then it is placed upon a large roller, and by the aid of smaller rollers it is enlarged to the requisite dimensions. The ring is run from one end of the roller to the other, and is returned by reversing the machinery. The hads necessary for the completion of the boiler are subsequently put on with bolts. The machinery is rather expensive, and its cost is said to be the point upon which the success of the invention hinges. The inventor claims that within six hours he can construct the shell of a boiler of a more durable nature than those now made with iron or steel plates riveted together. There is no doubt that such a boiler must be stronger, as the danger of tearing the seams on the cylindrical surface, where the strain is the strongest, is done away with by the total absence of such seams.

MAKING SOLDER WIRE.—Solder in the form of wire is very convenient for a great many purposes. To make it, take a sheet of stiff writing or drawing paper and roll it in a conical form, rather broad in comparison with its length. Make a ring of stiff wire to hold it in, attaching a suitable handle to the ring. The point of the cone may first of all be cut off, to leave an orifice of the size required. When filled with molten solder it should be held above a pail of cold water, and the stream of solder flowing from the cone will congeal as it runs, and form the wire. If held a little higher, so that the stream of solder breaks into drops before striking the water, it will form handy, elongated "tears" of metal; but, by holding it still higher, each drop forms a thin concave cup or shell, and as each of these forms have their own peculiar uses in business, many a mechanic will find these hints very useful.

THE BAND SAW ACTION.—The teeth of a circular saw act at varying angles on the grain of the wood; those at the top of a log being ripped, striking the fibres at a more acute angle, and consequently to better advantage than those at the bottom. The band saw teeth, on the contrary, all meet the fibres at the same angle; and this as the table is ordinarily arranged, is as squarely across them as is possible. To remedy this, Mr. Prybil, of New York, inclined the table of one of his band sawing machines about $23\frac{1}{2}^{\circ}$, so that the board to be ripped was fed up-hill, and the teeth met it at a considerable acute angle. He reports that the traction, or effort of feeding, was lessened by one-third, as measured by spring balance. The cutting action under these circumstances was undoubtedly much more favorable than when the teeth struck square across, but no dynamometrical test was made.

AN EFFECTIVE GLUE.—A very effective glue mixture is said to be employed by Turkish artisans in the nice work of attaching diamonds and other jewels to their metal settings. In the production of this substance the method pursued is to dissolve five or six bits of gum mastic, each of the size of a large pea, in as much spirits of wine as will suffice to render it liquid; in another vessel as much isinglass—previously softened in water—is dissolved in brandy as will make a two-ounce vial of strong glue, adding two small bits of gum ammoniac, this being rubbed until dissolved. The whole is then mixed with heat, and kept in a vial closely stopped; when it is to be used, the vial is set in boiling water. This cement resists moisture, and will indissolubly unite two surfaces of polished steel.