It was to Mr. James Brister, manager of the machine department of the *Illustrated London News* for the past seventeen years, that Mr. Ingram intrusted the carrying out of his design. Working from the plans and instructions of Mr. Brister, Messrs. Middleton & Co., of Southwark, finished the machine in little more than two years, whereas, we believe, previous improvements in rotary machines had not been accomplished in less than five years. The machine prints and folds 6500 copies per hour. The second week it was in use for printing a large issue its average work exceeded that of four of the fastest "two-feeders"—a rapidity which may be realized all the more forcibly when we add that whereas the new machine printed both sides of the paper, cut each sheet, and delivered it folded, the old machines simply printed one form in the same time, and did not fold the sheets. There was thus a considerable saving of manual labor, only four men being engaged on the rotary machine, whilst twenty-four men were engaged on the four machines. Let it be added that the "Ingram" machine only occupies the space of an ordinary perfecting machine, and little more needs to be said to prove that it bids fair to effect as great a revolution in the printing of illustrated newspapers as the latest Walter and Hoe rotary machines have effected in the printing of daily newspapers.

THE SUPPOSED MERCURIAL POISONING BY COLORED VULCA-NITE.—An impression has long prevailed that it was possible for the salts of mercury, used to color red valcanite, to exert a poisonous influence where red rubber plates were worn in the mouth; and the attention of the Odontological Society having been strongly drawn to the subject by Dr. Bathurst Woodman's papers (see *Trans. Odont. Soc.*, 1875), relating cases of supposed mercurial poisoning from this cause, a committee was appointed to collect evidence and report upon the subject. Their inquiries have, however, utterly failed to establish the existence of a single case of unquestionable, or even probable, mercurial poisoning due to the use of red vulcanite plates. The committee requested Professor Attfield to make "an investigation of the influence, if Professor Attield to make "an investigation of the influence, it any, of saliva and the other fluids of the human body on the pink and red varieties of vulcanite used by dentists in making artificial teeth-plates, gums, and palates." These tinted varieties of vulcanite are made by heating pink or red "dental rubber," under pressure, to a temperature of 310° to 315° Fah. (154° to 157° C.), the "dental rubber" being prepared by incorporating sulphur and vermilion with pure india-rubber. The following are the results of Dr. Attfield's investigation—1. So far as any estion on man is concerned, vermillion is a harmless substance action on man is concerned, vermillion is a harmless substance. 2. So far as any effect or influence of the vermillion is concerned. the mixture of vermillion, sulphur, and india-rubber, commonly termed "dental rubber," is also a perfectly innocuous substance. 3. Pink or red dental vulcanite, even when placed under the severest conditions of experiment, does not yield any trace of mercury to saliva, or, indeed, to other far more powerful solvents. 4. The metallic pins and braces in dental vulcanite do not displace mercury, or induce the formation of any compound of mercury soluble in saliva or in more powerful solvents. Dr. Attiled is therefore of opinion that vermillion vulcanite teeth-plutes are practically unaffected by saliva, or by any substance which ever gains access to the mouth; and, in short, that the pink and red valcanite artificial gums and palates now so generally worn are absolutely harmless. - Chem. News, XXXV, 265.

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ON FILE MANUFACTURE .- Files are made of bars of steel, rendered doubly hard by a process called *double conversion*, drawn the required size at the tilt hammer, and then shaped, the square and flat ones by the hammer and common anvil only, but those of round, half-round, and three-angled forms, by means of bosses and dies made in the above shapes, which fit into a groove left for them in the anvil. The steel blanks having been thus formed, are next annealed, or softened, to render them capable of being cut, by placing a number of them together in a brick oven, rendered air-tight by filling up all the interstices with sand (to prevent the oxidation of the steel, to which it is very liable, if air be admitted), and then making a fire play as equally as possible all round until they are red hot, when the heat is discontinued, and the steel allowed to cool gradually before it is uncovered. The surface to contain the teeth is now rendered as smooth as possible by grinding or filling; the teeth are then cut with a care-The fully ground chisel, each incision being made separately. next and last process, that of hardening, is performed in various ways by different makers; the ordinary method, however, is to cover the files with a kind of composition or protecting varnish to prevent oxidation and scalding of the steel when heated; and, lastly, they are plunged in cold, fresh water to cool them as

quickly as possible. Some file-makers coat their files, before tempering, with a composition of cow-dung or pig-flour, which not only protects the sharp angles of the cuttings from the action of the fire, but furnish a highly azotized substance, which conduces greatly to still further harden and steelify the finished work. I know several file manufacturers who make use of a bath of melted lead for tempering pnrposes. The files are first coated with a greasy composition to prevent any oxide adhering, then introduced for a short time into melted lead, or the "metallic bath" as it is called, and then plunged into the tapering liquid. The melted lead may be kept covered with charcoal, or other suitable ingredient, to prevent oxidation. In some manufactories a charcoal fire is kept burning on the surface of the melted lead.

STAINS FOR WOOD.

BLACK STAIN FOR WHITEWOOD.

Take 1 gallon of water, 1 lb. of logwood chips, $\frac{1}{2}$ lb. of black copperas, $\frac{1}{2}$ lb. of extract of logwood, $\frac{1}{2}$ lb. of indigo blue, 2 oz. of lampblack. Put these into an iron pot and boil them over aslow fire. When the mixture is cool, strain it through a cloth, add $\frac{1}{2}$ oz. of nut-gal. It is then ready for use. This is a good black for all kinds of cheap work.

EBONIZING BLACK.

Take one gallon of strong vinegar, 2 lb. of extract of logwood, $\frac{1}{2}$ lb. of green copperas, $\frac{1}{4}$ lb. of China blue, and 2 oz. of nut-gall. Put these in an iron pot and boil them over a slow fire, till they are well dissolved. When cool the mixture is ready for use. Add to the above $\frac{1}{2}$ pint of iron rust, which may be obtained by scraping rusty hoops, or preferably by steeping iron filings in a solution of acetic acid or strong vinegar.

WALNUT STAIN FOR WHITEWOOD.

Take one gallon of very thin sized shellac; add 1 lb. of dry burnt umber, 1 lb. of dry burnt sienna, and $\frac{1}{4}$ lb. of lampblack. Put these articles into a jug and shake frequently until they are mixed. Apply one coat with a brush. When the work is dry, rub down with fine paper, and apply one coat of shellac or cheap varnish. It will then be a good imitation of solid walnut, and will be adapted for the black boards of nirror-frames, for the back and inside of case-work, and for similar work.

STAIN FOR THE SAP OF BLACK WALNUT.

Take one gallon of strong vinegar, 1 lb. dry burnt umber, 1 lb. dry burnt vandyke brown. Put into a jug and mix well; let the mixture stand one day and it will then be ready for use. Apply this stain to the sap with a piece of fine sponge; it will dry in half an hour. The whole piece is then ready for the filling process. When the work is completed, the stained part cannot be detected even by those who have performed the job. By means of this receipt wood of poor quality and mostly of sap can be used with good effect.

CRIMSON SPIRIT STAIN.

Take 1 quart of alcohol, $3 \text{ oz. of Brazil wood, } \frac{1}{2} \text{ oz. of dragon's blood, } \frac{1}{2} \text{ oz. of cochineal, } 1 \text{ oz. of saffron. Steep to full strength and strain. It is a beautiful stain for violins, work-boxes, and fancy articles.}$

BRIGHT ROSEWOOD STAIN.

Take 1 gallon of alcohol, $1\frac{1}{2}$ lb. of cam wood, $\frac{1}{2}$ lb. of red sanders, 1 lb. of extract of logwood, 2 oz. of aquafortis. When dissolved, it is ready for use. It should be applied in three coats over the whole surface. When dry, rub down to a smooth surface, using for the purpose of very fine paper. The graining is done with iron dust, and the shading with asphaltum, thinned with spirits of turpentine. When the shading is dry, apply ^a thin coat of shellac, and when that is dry, rub down with fine paper. The work is then ready for varnishing.

SATINWOOD STAIN.

Take 1 quart of alcohol, 3 oz. of ground turmeric, 1½ oz. of powdered gamboge. When steeped to its full strength, strain through fine muslin. It is then ready for use. Apply with \$\$ piece of fine sponge, giving the work two coats. When dry, sandpaper down very fine. It is then ready for polish or varnish and is a good imitation of satinwood.

FOR A PURPLE STAIN.

Take 1 lb. of logwood chips, $\frac{2}{3}$ gallon of water, 4 oz. perlash, 2 oz. powdered indigo. Boil the logwood in the water till the full strength is obtained, then add the pearlash and indigo, and when the ingredients are dissolved, the mixture is ready for use, either warm or cold. This gives a beautiful purple.