USE OF SCREW PLATES---TEMPERING SAWS FOR MACHINISTS' USE.

Screw plates and screw dies are often ruined by being used upon iron and steel rough from the forge, and covered with scales. which from their hard, gritty nature, grind away the threads. In all cases the rough scale should be removed from the iron or steel, either by the turning tool, file, or grinding stone, previous to screwing it with the screw plate or the dies. It is not an uncommon practice with some workmen, after they have finished forging a piece of iron work, and while the iron is at a red heat, to immerse it in water and partly cool it, with a view of giving the work a cleaner appearance; but this is a very bad custom, especially when the forging requires to be screwed. It very often happens that the iron contains veins of steel, which harden by immersion; and, though the metal may not be so hard as to prevent its being cut with a hard turning tool, still, when it comes to be screwed with the stocks and dies, or with the dies belonging to the screwing machine, or with the screw plates (which tools are always less hard than the turning tools), it will spoil the dies or the screw plates; and because this hard place or places do not happen to be detected when turning the work (on account of using a very hard tool), the steel the die or screw plate is made of will be thought bad, or badly tempered. The fact is, the work should always be annealed rather than hardened. In all cases when an impure iron is made use of for forgings, and which will subsequently require to be screwed, either with the screw dies or the screw plate, or which may require to be cut with circular cutters or with circular saws, the forgings should always be annealed previous to leaving the smithy. The forgings, of course, will be the better for being annealed, supposing they are to be screwed with the screw tools belonging to the turning lathe; though it is not of so much importance as when they are to be screwed with the dies, or the screw plate, or cut with circular cutters, or circular saws, because the screw tools belonging to the turning-lathe can be ground again, provided they chip from being very hard; whereas, the generality of screw dies, screw-plates, and circular cutters, and even circular saws, when very hard, and once spoilt, will not admit of being again sharpened, but will be practically useless, until they have been annealed, and cut up again, and subsequently hardened. Annealing makes the iron more uniform in temper, and will save much subsequent trouble; it will greatly facilitate the work when fiting it up.

When it is required to harden a large quantity of stout circular saws at once (for cutting metals), they may be enclosed in a sheet-iron case, or box; they will require to be surrounded on all sides with either wood or animal charcoal. Sufficient space, of course, must be left every way for the expansion of the saws; otherwise they will become buckled in heating. After the saws are inclosed and the box luted with clay or loam, the whole may be placed in a suitable furnace or hollow fire and the saws heated to a cherry-red heat (the fire of course must not be urged.) As soon as the whole arrive at the proper uniform temperature, the box must be drawn towards the mouth of the fire, the lid taken off and the saws taken out separately. They may either be taken out of the box with the pliers or by a small rod of iron, having a small hook turned upon one end of it. The saws will require to be immersed edgeways in a trough containing water, the surface of which must be covered with a film of oil. The oil will float of itself upon the surface of the water and burn upon the saw as it passes through it. The burnt oil forms a coating of coal upon the saw, which protects it from the direct action of the water, and lessens the risk of fracture.

Though saws are the better for being inclosed in a box and surrounded with charcoal when heating them, still, when a single saw is required to be hardened in a hurry, it will be more expeditious to place it upon a piece of cold sheet-iron, and then to heat the iron and the saw in the midst of the ignited fuel of a hollow fire; and when it arrives at the proper temperature, it must be taken off the plate and immersed in the hardening fluid. By placing the saw upon a piece of cold sheet-iron, it causes the heat to be very slowly applied, and it has a tendency to prevent the saw buckling in heating. Oil alone, or oil in which tallow has been dissolved, is sufficient to give the thinnest kinds of saws a sufficient degree of hardness; but those of a medium thickness are the better for being hardened in solid tallow (the saws may be placed separately between two flat lumps of tallow). Tallow differs from oil in the absorption of heat for its fusion; consequently, a more considerable degree of hardness is given to the steel by the tallow than by the oil; besides, it hardens the steel to a greater depth than oil. Very thin blades of steel may be made sufficiently hard for some purposes by heating the blades to a red heat and then placing them between two heavy surface plates; the surface plates will be better if they be smeared with tallow, previous to putting the blade between them. When the saws are removed from the hardening trough, they are generally brittle and warped; consequently, they will require to be tempered and hammered flat. The tempering may be performed in a variety of ways, depending of course upon the size, shape, and quantity. Circular saws, which are required for sawing hard substances (such as iron or steel), and which have a round spindle hole, about one inch in diameter in them, will require to be tempered to a light straw color. These may be tempered by first brightening their surfaces, and then placing them upon a piece of hot iron. The piece of iron which will be required for tempering these kinds of saws may be made by the following method. Take a piece of round bar iron, one inch in diameter and eight or nine inches in length; heat one end of it and hammer it so as to make it fit into the small square hole in the anvil; at the opposite end of this piece of iron and at about two inches from the extreme end, weld a moderate sized iron collar; the collar should be made of half round iron, so that it will, after it is welded upon the piece of round bar, form a large lump, the shape of a round ball. The object of this large lump is to retain the heat for a considerable time, so that several of the saws may be tempered before the iron will require to be reheated. If two of these lumps were made, one of them could be in the fire becoming heated, whilst the other lump is being used; so that, if it were necessary, a continuance of the process may be kept up. The object of having this lump the shape of a round ball, is that it may not supply the heat too suddenly to the saw. If this lump was made flat, it would supply the heat too suddenly, unless it was used at a very low temperature; it is evident it would not then temper more than one or two of the saws before it would require to be reheated. The object of having this round lump welded upon a piece of round bar, is for the convenience of keeping the lump in position upon the anvil, and to prevent the operator from always being in a stooping position when tempering the saws. The iron being finished, it is now ready to be heated for tempering the saws. The large lump will require to be heated to a red heat, after which the opposite end of the iron must be placed in the hole in the anvil. The saws may now be placed (one at a time) upon the lump; a slow rotary motion must be given to the saw, by the use of a small stick of wood, in order to equalize the heat. The end of the round bar at the top of the lump will help to supply heat and keep the saw in position whilst it is being turned round upon the lump. As soon as a light straw color appears upon the saw, it must be taken off the iron and cooled, either in water or oil; or, if the heat has not been too suddenly applied, the saw may be allowed to cool in the air of its own accord. These kinds of small circular saws are generally, after hardening, convex on one side and concave on the other. This imperfection is owing to the outer part of the saw becoming too small to contain the central part. When the practice of securing the saws upon the spindle by circular plates screwed firmly against each side is adopted, a small degree of regular convexity is not very detrimental, because the plates bring the saw straight; but, when they are convex in a greater degree they will require to be slightly hammered. The outer part of the saw is the part which requires to be hammered, in order to expand the outer part and bring the middle flat.

These kinds of saws may be tempered, and the trouble of brightening their surfaces spared, by smearing them with oil or tallow and holding them one at a time over a slow clear fire until the oil or tallow begins to smoke, after which the saw must be immersed in oil and partly cooled; it must then be held over the fire a second time, until the oil again begins to smoke. If the saw is immersed in the oil and held over the fire a third time, it will ensure a more regular degree of temper. Care must be taken each time the saw is heated not to raise the temperature beyond that which is necessary to cause the oil to smoke; otherwise the saw will become too soft for the purpose it is intended for—namely, cutting hard substances. By this method the saws acquire the same temper as that which they acquire when tempered to a straw color. A large quantity of these kinds of saws may be tempered more expeditiously by threading them upon a piece of iron wire, and then placing them in a proper vessel with as much oil or tallow as will cover them (the wire is for convenience in lifting the saws out of the vessel), and then to place the whole over a small clear fire, or over a gas flame, until the oil or tallow begins to smoke, after which the saws must be taken out. They may then be cooled in water or oil, or they may be allowed to become cool in the air. This indicates the same temper as that called a straw color.—*Ede.*

Preserving Fresh Flowers.

Flowers may be kept in pretty fair condition, say for a week or ten days, according to the species selected for bouquets and the time of the year, by renewing the water every alternate day, and while doing so rejecting decayed flowers and leaves, and taking care to cut off from the stems immersed in water, with a sharp pair of scissors, about from a quarter to half inch of the length; then should be added to the water about a pinch of salt, and a few grains of saltpetre for every pint of fluid; when flowers are very much faded they may be revived by immersion of the stems for two or three minutes in hot water, or better yet in strong spirits of wine, or Eau de Cologne; in some cases liquid ammonia may be advantageously applied to the stems for a few minutes to revive flowers. These recommendations are applied by several of the largest horticulturists of Ghent and other parts of Belgium, and found to answer in practice very well if properly applied. To keep well, flowers should not, after being cut, be placed in localities where there is tobacco-smoke, or bad ventilation, neither should the rooms be too much heated.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

There are ten marble quarries now in successful operation in West Rutland, Vt., and three others in process of development. The entire thickness of the stone in these quarries is nearly fifty feet, and it is so stratified that it can be easily worked in separate layers, ranging from two to six feet in thickness. Successive stratas frequently present a great variety, both in color and quality, from purest white, the marble so valued by sculptors, to the coarsest of colored rocks, the best often lying in close proximity to the poorest.

One of the last and most important events of the year 1867, was the completion of unbroken communication between this city and the Rocky Mountains. A temporary railway bridge thrown across the Missouri railway at Omaha, was the last link of this line constructed.

A gentleman of San Francisco has made arrangements with European capitalists to introduce the cultivation, on a large scale, of the sugar beet, and to establish factories for the production of raw sugar therefrom, in California. The capitalists have agreed to invest $1,500,000 in the enterprise, and to import six or seven hundred skilled laborers. The California beets, it is said, will yield two per cent more sugar than those of France, and as the industry is now so profitable in the latter country, the prospect is encouraging for its growth in the Golden State.

Prof. Whitney reports that of the sixty-four elementary substances existing in nature, so far as known to chemists, there are but thirty-six which have yet been proven to occur in California in mineral combination, and twenty-three elements are wanting on the Pacific coast. Of these, a few are extremely rare, such as didymium, erbium, lanthanum, thorium, but the absence of others is surprising. Fluorine, a substance of very general distribution, in its most abundant source, fluor spar, seems entirely wanting in California, although it may yet be discovered in the micas. Taking the whole Pacific coast, from British Columbia to Chili, the following facts appear. The paucity of species, considering the extent of region as compared with other parts of the world; the remarkable absence of prominent silicates, especially of the zeolites; the wide spread of the precious metals; the abundance of copper ores, and comparative absence of tin and lead; the similarity in the mineralized condition of the silver; the absence as vein stone of fluor; no mineral species peculiar to the coast.

In the United States, at the beginning of the year 1868 there are now, 38,821.81 miles of railway built and actually operated. The aggregate cost of construction has been $1,660,460,809. Pennsylvania has the greatest number of miles in operation, viz., 4,252.10; Ohio ranks next, with 3,397.84 miles; then Illinois, 3,224.49 miles. Oregon has 19.50 miles. The cost of construction for each mile has been greater in New Jersey than in any other of the States, and in California next, being for the former, $70,857; for the latter, $70,824.

The Tucker Manufacturing Company, in Boston, is the originator of a process for bronzing castings, which possess the color and the true aspect of cast bronze, without being galvanized, or covered with an alloy, as ordinarily done. The process consists in coating the articles to be colored with a very thin layer of some vegetable oil, and exposing them to a temperate heat. The oil, on being decomposed, combines with the film of oxide formed on the surface of the metal, thus yielding that peculiar color of bronzed iron. The temperature to which the castings are brought is not so high as to carbonize the fatty matter; it only reaches that point at which the metal for itself is getting blue. The brown layer thus obtained is said to be as durable and protective as that resulting by the method hitherto practised; at least, the process met with great appreciation in Paris.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

POCKET GRAIN TESTER.—B. Martin, Prairie du Chien, Wis.—The object of this invention is to obtain a neat and light instrument by which the relative weight of grain, as compared with its bulk, may be readily ascertained, and which can be made so small as to be conveniently carried in the pocket.

HAND ROLL AND TWISTING MACHINE.—R. Moxley, Muscatine, Iowa.—This invention consists in a new and more simple and compact arrangement of the parts of a hand roll and twisting machine, by which labor is saved, and the machine more easily operated than heretofore.

PRINTING MACHINE.—James McDermott, Frederick, Md.—This is a hand printing apparatus. The type is held in a curved bed, or turtle, and the inking roller has a corresponding shape. The type are made of India rubber, and are retained in their places by the flanges of the adjustable spacing bars, which rest upon the base piece of each letter. At the end of the bed piece is an inking apparatus, consisting of reservoirs of ink of divers colors, if required, with mouths from which it exudes on to the roller.

CORK EXTRACTOR.—James Morton, Philadelphia, Pa.—This invention relates to a new device for extracting the cork-screw, with the cork, from the neck of a bottle, and consists of three bars, of which one has a socket or cap fitted to its lower end, to be placed upon and around the upper end of the bottle.

FOUNTAIN INKSTAND.—N. Gray Bartlett, Keokuk, Iowa.—This improvement is intended to remedy a defect in ordinary fountain inkstands, and consists in the employment of an overflow chamber, so disposed in the inkstand that its bottom or floor stands slightly above the floor of the duct leading from the reservoir to the pen orifice or fountain tube.

BOXED HONE.—Joseph Potter and Olif Abell, Whitehall, N. Y.—This invention consists in encasing the hone, or whetstone, or other grinding material, in a wooden or other box, in such a manner that its grinding surface projects above the box, and so that it cannot fall out or be easily removed from the box, and in providing a cover for the said box, whereby the grinding surface of the hone may be protected from injury.

CHANGE GATE.—John B. Slawson, New York city.—This invention relates to a gate to be arranged in the doors or walls of railroad cars, stages, and other public vehicles, said gate being so arranged that it can be opened on either side, and that it will at once close itself when released, the gate being connected with a bell, which will be struck whenever the gate is opened.

CULTIVATOR.—A. Bennett, Rockford, Ill.—This invention relates to an improvement in corn cultivators, and consists in the combination and arrangement of a sulky frame mounted on two wheels, and double plow beams attached thereto, for the shovels to work on both sides of a row of corn, in such a manner as to be entirely under the control of the driver in his seat.

MECHANICAL MOVEMENT.—Ephraim Soper, New York city.—This invention relates to a new manner of arranging the cranks of machinery, and consists in fitting gear wheels to the crank, so as to obtain from a stationary pinion, mounted on the wrist pin, additional revolutions or parts of revolutions for the shaft.

DEVICE FOR RAISING CASKS, BARRELS, ETC.—Robert Smith, Brooklyn, N. Y.—This invention relates to a device by which casks, barrels, and other similar articles can be easily transported up or down stairs or steps, and also on level ground, and consists chiefly in the use of a frame, which is provided with a series of wheels on its under side. These wheels are arranged in rows in such a manner that when the frame is drawn up steps one wheel will always be on the edge of a step, and the device can thus be drawn up stairs with ease.

COFFEE MILL.—W. J. Lane, Washington. N. Y.—This invention relates to a new and useful improvement in that class of coffee mills which are fitted in the upper part of a box provided with a drawer and arranged like an ordinary hand mill for grinding spice. The invention consists in the application of a flange to the lever part of the mill for the purpose of giving a downward direction to the ground coffee and preventing it from flying about or being scattered in its discharge from the mill, a contingency attended with considerable annoyance as the ground coffee finds its way between the sides of the drawer and box and every time the drawer is withdrawn from the box the latter requires to be cleaned thoroughly in order to avoid waste and to admit of the ready insertion of the drawer.

STAMP MILL FOR CRUSHING QUARTZ.—George R. Mitchell, Nevada, Colorado.—The chief difficulty attending the operation of stamp mills for crushing quartz consists in the wearing of the stems and the lower boxes of the same, a result due to the adhesion of pulverized rock or quartz to the stems and the introduction of the pulverized rock or quartz into the boxes by the elevation or upward movement of the stems. This invention fully obviates this difficulty and it consists in introducing into the lower boxes of the stems water from a supply pipe and in such a manner as to keep the stems perfectly clear or free from the pulverized quartz and also keep the stems in a perfectly lubricated state.

REAPING AND MOWING MACHINE.—D. S. Fisher, Cedar Spring, Ind.—This invention relates to a new and improved reaping and mowing machine of that class in which the sickle or sickles are driven by a cam and lever in lieu of the ordinary crank and connecting rod. The invention consists in a peculiar construction of the sickle, driving apparatus, grain-discharging device and adjustable wheels on the main frame, whereby a very superior reaper and mower of the class specified is obtained.

EYE GLASSES AND SPECTACLES.—J. J. Bansch, Rochester, N. Y.—This invention consists in constructing and arranging eye glasses or spectacles in such a manner that the two parts which contain the lenses may be adjusted