

Mechanics.

WOOD FOR CLOCK PENDULUMS.

An interesting discussion recently took place at a meeting of London clock-makers on compensation pendulums. The general judgment seemed to be in favor of plain wooden pendulums for all sorts of timepieces. One speaker said that wooden pendulum rods were generally in use for turret and church clocks, and also in regulators. Another concurred in that statement, and he thought that if wooden pendulums were good for church clocks, they might usefully be adopted for bracket clocks. He had accordingly altered a very old family clock of that description, and of the best London make, by substituting a wooden for a brass pendulum, with very decided advantage. It might possibly be worth while to make a similar alteration generally; brass, being a cheaper and prettier material, having probably been used by the makers of bracket clocks without consideration. A third maker never used anything but wood when he could help it for railway, church or turret clocks. Another speaker considered that one of the advantages in the use of wood for pendulums might be that, in a fall of temperature, when the rod would be shortened, the hygroscopic property of the wood would come into play, which would tend to lengthen it, and so cause a natural compensation by the thermometric and hygroscopic properties of the wood acting in opposite directions. In some climates that certainly might be the case, though in others they would work together, when the effect would be to increase the error. It was stated that a wooden pendulum with a leaden bob had been fixed to a regulator clock in one of the leading shops, and was keeping excellent time. It was a very simple form of pendulum, and might be made very economically. Further testimony was borne to that form of pendulum. Dr. Mann had used one in Natal, which was simply a rod of varnished wood supporting a cylindrical bob of lead. It was, of course, subjected there to great and rapid changes in the atmospheric pressure and to diversities of heat, but it worked excellently for many years. Subsequently it was replaced by one of Fordsham's best steel pendulums, and though there was some improvement, it was much slighter than might have been expected. In short, it was about as good a pendulum as could be conceived.

OTHER METHODS TO TEMPER CASE SPRINGS.—Having fitted the spring into the case according to your liking, temper it hard by heating and plunging into water. Next polish the small end so that you may be able to see when the color changes; lay it on a piece of copper or brass plate, and hold it over your lamp, with the blaze directly under the largest part of the spring. Watch the polished part of the steel closely, and when you see it turn blue, remove the plate from the lamp, letting all cool gradually together. When cool enough to handle, polish the end of the spring again, place it on the plate, and hold it over the lamp as before. The third bluing of the polished end will leave the spring in proper temper. Any steel article to which you desire to give a spring temper may be treated in the same way.

Another process, said to be good, is to temper the spring as in the first instance; then put it into a small iron ladle, cover it with linseed oil, and hold over a lamp till the oil takes fire. Remove the ladle, but let the oil continue to burn until nearly all consumed; when blown out, re-cover with oil, and hold over the lamp as before. The third burning out of the oil will leave the spring in the right temper.

WARNING TO LOCOMOTIVE ENGINEERS.—Drs. Charles M. Creason and Robert E. Rogers, of this city, says the *Philadelphia Ledger*, well known as experts in chemistry and dynamics, were appointed by the Reading Railroad Company to inquire into and report upon the causes of the recent explosion of the boiler of the express locomotive "Gem," at Mahanoy City, by which five lives were lost. Their report, which is designed to cover the whole scope of a most careful investigation, is not yet made public, but they have arrived at the following specific conclusion, which we give in their own language: "We are, therefore, of the opinion that the explosion of the boiler of the locomotive 'Gem,' was produced by the projection of foam upon the heated crown bars of the furnace, caused by suddenly and widely opening the safety-valve at a time when the water had been permitted to get so low as to overheat the crown of the furnace." This is an important matter that should be carefully noted by locomotive and other engineers.

HORSE-SHOE NAILS ABROAD.—An observing traveller finds much to interest him in the minor economies of a strange people,

and in noticing how differently they do things from the methods he has been accustomed to at home. A friend has presented us with a couple of horse-shoe nails, made in Greece, of the kinds in general use in that country; they are made by hand, and while of the rudest shape, are from the very best Swedish iron. They were sent to this country to ascertain if some of our nail-making machines could be adapted to turn out a similar product. The left-hand and middle engraving show these Grecian nails, while that at the right-hand represents a nail which the writer brought home many years ago from Mexico, and which, until the Grecian product came to hand, he supposed was as rude as it was possible for a nail to be. In the Mexican shoe there is a square hole with sides beveled, into which the lower part of the head of the nail fits snugly, and a horse shod in that manner is protected against slipping on the smooth rocks which in many portions of that country he is often obliged to travel upon.

TO DRAW THE TEMPER FROM DELICATE STEEL PIECES WITHOUT SPRINGING THEM.—Place the articles from which you desire to draw the temper into a common iron clock key. Fill around it with brass or iron filings, and then plug up the open end with a steel, iron, or brass plug, made to fit closely. Take the handle of the key with your pliers and hold its pipe into the blaze of a lamp till near hot, then let it cool gradually. When sufficiently cool to handle, remove the plug, and you will find the article with its temper fully drawn, but in all other respects just as it was before.

You will understand the reason for having the article thus plugged up while passing it through the heating and cooling process, when I tell you that springing always results from the action of changeable currents of atmosphere. The temper may be drawn from cylinders, shafts, pinions, or any other delicate pieces, by this mode, with perfect safety.

HINTS FOR MOLDERS.—To perfectly accomplish the running in of the metal in molding, the following rules have been laid down by a recent writer on the subject: Choose if possible the thickest part of the casting for the runner, and if the casting is deep, run in the metal at the bottom; where the casting has a flange in the form of a pipe, it is generally preferred to run the metal in at the flange; when the casting is thin and has many branches, or when it is of great length, it is advisable to run in the metal in the center; care should be taken to choose a place in the mold, so that the mold will have no tendency to wash any part away in its first rush; and the metal should not be allowed to fall from any height upon a weak part of the mold.

COOLING HOT JOURNALS.—Von Heeren proposes a method of cooling hot journals by a mixture of sulphur and oil or grease. The fine metal dust formed when a journal runs hot, and which strongly acts upon both journals and bearing, forms a sulphide of sulphur. This compound, which grows soft and greasy, does not cause any appreciable amount of friction. It has been very successfully used by the steamers of the North German Lloyd.

—Iron Age.

TO TEMPER CLICKS, RATCHETS, &c.—Clicks, ratchets, or other steel articles requiring a similar degree of hardness, should be tempered in mercurial ointment. The process consists in simply heating to a cherry red and plunging into the ointment. No other mode will combine toughness and hardness to such an extent.

TO DRAW THE TEMPER FROM PART OF A SMALL STEEL ARTICLE.—Hold the part from which you wish to draw the temper with a pair of tweezers, and with your blow-pipe direct the flame upon them—not the article—till sufficient heat is communicated to the article to produce the desired effect.

A softer solder than is used for ordinary brass work is composed of equal parts of zinc and copper. A very hard but fusible solder is composed of two parts zinc and one part copper. This solder is so hard and brittle that it can be easily crumbled in a mortar when cold.

OIL PAINT.—A writer to the *English Mechanic* says: The cheapest and best solution that I know of I accidentally discovered, and it may be worth while to tell how, though very likely some may know of it. In trying experiments for preserving some old letters, amongst others I used successfully a solution of one table-spoonful of vinegar and one ounce of washing soda to a half pint of water. A little of this was spilt on the painted window-sill and in wiping it up the paint came entirely off, leaving the bare board quite clean. Try it; a gallon will not cost 50 cents.