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SHOP REMEDIES.

A series of lectures by resident physicians and surgeons is being delivered in an Eastern city with the object of giving instruction in "first aid to the injured," including accidents by scalding, burning, cutting, bruising, loss of members, and other accidents. The project of instruction comprehends, for its pupils, members of the police force, nurses, drivers of vehicles, superintendents and foremen of machinery establishments, and the public generally. There is a large amount of common sense knowledge, involving some appreciation of the facts of human bodily structure, that is generally accorded to the medical profession, but which should be the common property of all. It is this sort of knowledge that this movement is intended to impart. There can be no doubt that lives have been lost for want of prompt remedies in extreme contingencies, as in suffocation by drowning, asphyxiation in foul air, and syncope in fits. In most cases the spectators are willing, and even anxious, to aid, but have not the requisite knowledge to make their aid useful.

Probably no occupation—saving that of the railroad engineer and fireman—is so liable to serious accidents as that of the machinist; and every shop ought to have its remedies for accidents; and if such instruction as is being given in Hartford, Conn., this winter is available, some authorized men, foremen, bosses, contractors, and ready men should be sent to the lectures, or they should be given elsewhere. The chances of injury in a shop where machinery are used are greater than the opportunities of immunity from injury; machinery has no conscience, no compassion, no consideration; the victim of its clutches is a victim without hope of redemption. If the shop or manufactory is provided with measurably safe appliances, there is still left the possible contingencies of personal injury; for belts, and pulleys, and connecting gear wheels with shearing, tearing cogs, cannot always be covered against ignorant meddling or unconscious contact.

There should be kept in every shop some ready appliances for accidents, when preventives against accidents are not sufficient. Most shops have their own local remedies, better at home than elsewhere, and generally favorably regarded where tested. So it would be improper to advertise any one remedy as better than another. But there are general remedies, of which there can be no question. A tincture of arnica is known, the world over, as a remedy for bruises, burns, scalds, and fresh wounds, as an external application; so is the salve of diachylum used in all portions of the country. There is also a common sticking plaster that may be bought in sheets or rolls, which is very useful in cuts and bruises. This is not the "court plaster" in common toilet use, but a solid basic linen, with a healing spread on it, that may be obtained at any apothecary's shop. Many ghastly wounds that would leave, in healing, livid and offensive scars are reduced and made merely trifling in character by timely application of adhesive plaster. There should be, in every shop and manufactory, some ready means of prompt attention to wounds, and men should be designated to antedate the arrival of the surgeon. There are plenty of such men in our shops, amply competent for the occasion if selected for the work.

CAST IRON FINISH.

Most of the iron castings used in the manufacture of machines are left in their natural state, that is to say, that legs, standards, struts, lengths, connections, entire frames, and all the attachments of machinery that make a machine an entity, are not machine finished or hand polished. As the casting comes from the mould it must be "pickled," to separate the burned-on sand from the iron. Then the casting is either handscraped with wire brush or with a broken file scraper. In this condition of cleanliness the casting goes into the machine shop. After all the machine work has been done, the painter is called in to "give style" to the machine, to "make it attractive," and meanwhile to "putty up holes."

A better way of managing cast iron is that of using it as iron. Brass and bronze, and even copper, from which both are produced, are used as competent metals; whatever is of bronze or of brass is reckoned in mechanics as of a simple metal; it has its acids to change its color, and does not depend on paint for beauty.

Iron has its capabilities as well as bronze or brass has. It is possible to use plain cast iron without artificial paint, as brass and bronze are used, by acid treatment, and produce very agreeable effects. More than this, the preservative effects of acid on iron are not half understood. A piece of cast iron that has gone through the pickling process from the foundry, and has been left out an entire winter, exposed to the storms of our northern climate, is as clean when taken in, in the spring, as though just from the acid bath—more so, as it is cleaned from the half-adhering scale.

The pickling process is, of course, the first process for all castings that are to be "cleaned." These pickled castings are to be scraped with wire brushes, and possibly to be scraped with broken-off files or similar contrivances. Then follows a rough filing to reduce small protuberances, and a hand chiseling to clean the surface. When all is done, the surface of the casting is in a very unattractive state; it is full of defects—of contour, of shapeliness, of color—so that the unappreciative observer might wonder what the resultant operations would produce. But paint and putty and deft ornamentation usually conceal defects and heighten attractiveness.

There are better means than paint and putty. Some recent experiments give very pleasing results. Small frames of sewing machines, amateur lathes, and reciprocating saws were subjected to a cleaning process by diluted acid, as in the ordinary "pickling" bath. Then they were either cleaned in the tumbling barrel or by hand, to free them from scale. The surface was then wiped or brushed over with rag or brush containing melted paraffine. This process was an easy and rapid one. If the waxy paraffine "held" on some protuberent places in cooling, the entire surface could be dressed to evenness by means of a piece of pine or other soft wood shaped like a chisel or a scraper. On this surface could be painted or gilded any device required by the conditions, the paraffine not forming an artificial and extraneous coating, but simply filling the pores of the iron so as to make a surface. The result was a pleasant gray base—the iron—on which decoration showed finely.

INSIDE CALIPERING.

Even now, with all the improved means of doing accurate work, the "cut and try" method is much too commonly practiced. During less than fifteen minutes' conversation with the proprietor of a first class machine shop recently, the writer noticed that a lathe man removed and replaced a short length arbor, trying it in the bored hole of a wheel, no less than four times; it is sufficient to say that this handling of the arbor occupied more time than did the actual turning of the arbor. Every machinist knows that such a method of doing work is slipshod, and only an exhibition of the "cut and try" no-system. If the arbor had been six inches diameter and as many feet long, and the wheel had weighed a ton, the frequent trials for fit by handling would not have occurred. And if a fit on a large surface can be made without the actual repeated placing of the parts together, it surely ought to be possible on a smaller job.

There is not care enough taken in the instruction of apprentices in measurements by calipers or its equivalent. The calipers may not be an absolute guide; but if it is not, it is as near as the boxwood rule or the steel scale—if it is properly used. The use of inside calipers, and especially of combined inside and outside calipers, ought to be discouraged. Inside calipers is a very deceptive tool; half a dozen measurements may be taken by it from the same hole. Perhaps this uncertainty is owing to the fact that the points of contact and the handling portion form angles with varying proportions as the tool is handled. And yet bored holes must be measured in order to make turned fits.

There is a very simple means of making this measurement—so simple that some readers may smile at it derisively. The method has, however, the merit of tested, practical usefulness. To get the diameter of a bored hole, use a piece of iron wire—a straight wire of about the hole's diameter—and point each end on the grindstone. Hold this wire inside the hole across its diameter. If it is too long, it will bind, and it cannot be readily moved; if it is too short, it will fall if left standing or placed across the diameter. In the one case it may be shortened by filing, and in the other be lengthened by a few light hammer raps. When the two points of the wire engage, and possibly a faint gleam of light may be seen between one and the side of the hole, the diameter is obtained, and by setting the calipers to these points the stud, arbor shaft, or crank pin can be turned to size. The same method is applicable to small holes, and there is no danger of a misfit if the measurement by the pointed wire be well done.

TREATMENT OF STEEL.

Methods of using steel are as many and diverse as are its users; at least, there are few steel using mechanics who agree in all the methods of forging, shaping, hardening, and tempering a tool. The writer was told, recently, by an old, experienced mechanic, that no turning or planing tool for iron should be drawn to temper; they should be left as hard as fire and water could make them. This was news to one who forty years ago used Sanderson's and Jessop's steels, and always drew the lathe and planer tools down to, at least, a straw. But on seeing the process of the older mechanic it was noticed that he permitted the steel to become only a dull red in the lead bath before cooling it. It is probable, also, that the steel was not so high as Sanderson's or Jessop's; it was an American steel that has come into favor within a few years.

A certain forger makes a practice of dressing a tool, after he has forged it to form, by light hammering as long as the hammer can make an impression on the metal. This hammering is continued after the color of heat has left the steel. He insists that this dressing