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REFORM THESE ABUSES!

It sometimes occurs in the operations of a machine-shop that the ordinary chucks fitted to lathes will not take in the work to be done, and resort is then had to wooden blocks bolted to the face-plate and turned out to any desired form. Sometimes these blocks are screwed on to the spindle itself, but in either case they cost time and money to make. It would seem from the want of care and attention paid to these necessary appurtenances of a machine-shop that they were considered useless except for temporary purposes, and that the only disposition to be made of them is to leave them around on the floor, under the vice bench or in any hole or corner that is unoccupied by any thing else. Some men find them useful to batter mandrels or arbors into work they are about to turn, to sit upon at noon-time, to build a fire with in the mornings, they find them convenient to punch sheet iron upon; in short, wooden chucks are abused in an infinite variety of ways which seem to us altogether wrong. Put them away in a safe place like any other tool. Assuming that the block will not run true after being shifted from the lathe it can still be re-turned and employed again for work approximating in shape to the first job it received. The block out of which the chuck is made is always the best piece of wood to be had, and it is poor economy to cut up lumber to use, or rather abuse, in the manner set forth above. And in this connection it will not be amiss for us to protest against battering up the centers of shafts or mandrels by carelessness. No good workman needs to have any remonstrance addressed to him on this score; but bad ones are continually guilty of the practice referred to. If a workman wishes to damage his reputation in the eyes of all intelligent artisans he will take a heavy hammer and blunderingly whack away on the delicate center that should be as carefully protected as the pupil of the human eye. Such a course only results in mischief; in a well-regulated shop it is soon found out, and the individual committing this outrage on common sense should be immediately dismissed from the shop. It also looks very knowing, when erecting new work, to use the naked face of the hammer upon finely-polished gibs, keys and straps. If the brass does not go back to its seat, why not examine it to find out the source of the difficulty? Do not smash away on the bright flanges of it with a rough hammer. By so doing the careless artisan will have the mortification of spoiling his employer's property and of creating a reputation for himself which ought to prevent him from obtaining employment until he has changed his method of working. Carelessness and laziness are the parents of such folly as this, and no person but one utterly lost to a sense of mechanical decency would be guilty of it. We are confident that these requests will be met in the right spirit and that good results will be manifest if they are followed.

ROCKETS IN WARFARE.

All persons are familiar with the sky-rocket as used for signalling and pyrotechnic display. It mounts upwards with the velocity of an arrow in a pathway marked with its own fire. The application of rockets as destructive missiles of warfare is plausible in theory, and on some occasions they have been used with advantage, but on the whole, not with perfect satisfaction. There are many persons, however, who believe that rockets may be so improved as to become nearly as effective as artillery. The common sky-rocket is made with a paper case, and is furnished with a stick-tail, the object of which is to keep the mouth of the case (from which the fire escapes) downwards, and the rocket is thus projected by the charge contained within itself. It is said that such missiles were used in India and China, for war purposes, before artillery was known in Europe. These were common sky-rockets, each of which was furnished with a barbed arrow head. Sir William Congreve made a great improvement on the rocket as a war projectile by using a sheet iron, instead of a paper conical case, and supplying it with a central instead of a lateral stick-tail. Rockets have advantages in carrying within themselves their own propulsive power, and they neither require guns nor mortars to project them, consequently they may be carried to situations where it would be difficult or impossible to use artillery. They may also be made quite large, and an infantry soldier might carry one or two and discharge them in commencing an engagement, after which he would not be cumbered with more than his usual arms.

Rockets have also great defects, and these have operated against their general use. Their flight is irregular; they cannot be discharged with advantage against the wind, or across a rapid current of air, hence they are not so reliable as shot and shell fired from guns. The long wooden stick of a rocket acts as a lever for the wind to deflect the iron case, and to such an extent has this deflection occurred in several instances that, like boomerangs, they have returned to the place whence they were started. The Duke of Wellington entertained a strong prejudice against them on this account, yet he had always a rocket brigade attached to his army.

The original ideas of Sir William Congreve—the inventor—with respect to the use of rockets in warfare, have never been carried out fully in practice. He suggested three methods of firing them; and infantry, cavalry and artillery were to be furnished with supplies. One method of firing was by a tube singly; second, in a volley from several tubes mounted on a carriage; and thirdly, by a volley from the ground. The rocket tube is a cylinder of brass or iron, corresponding in size with the diameter of the rocket intended to pass through it. Its object is chiefly to give a correct line of flight. (No tubes were used with the earlier Congreve rockets.) This tube can be placed at any angle of elevation, and pointed like a gun. When the proper line of aim is secured, the rocket is thrust into the tube and ignited, when out it rushes on its destructive course. In the English army, the rockets have been fired in volleys from the ground with their heads towards the enemy. For the first hundred yards, they ordinarily pursue a regular course, at an elevation of about five feet eight inches, then they become very irregular in their motions and dart about in all directions. Sometimes they have proved as dangerous to those who discharged them as those they were intended to destroy. In full motion the power of rockets is tremendous, and could they be so improved as to secure certain flight, they would perhaps be as effective in the field, and for bombarding fortified places, as shells. Of course, they cannot penetrate iron plates, or smash down the solid stone walls of forts, but they scatter destruction among the ranks of soldiers, and carry flames into all combustible materials.

THE GALVANIC ACTION BETWEEN IRON AND COPPER IN VESSELS.

When two metals of different degrees of oxidation are connected together in salt water, they form a galvanic battery, and the most oxidizable metal is soon decomposed. Thus copper and iron form a galvanic battery in salt water, and the iron rusts with astonishing rapidity. Copper sheathing cannot therefore be safely employed on iron-plated ships, unless the two metals are completely isolated. Thus far no satisfactory method has been adopted for attaining such a result. Several of the wooden-framed iron-plated ships in the French navy, which have been sheathed on their bottoms with copper, have been found defective. The frigate *La Gloire* is an illustration of this. Her iron armor-plates, extending below the water line, formed an electro-galvanic couple with the copper sheathing through the medium of the salt water. After having been over a year in service, forty tuns of barnacles were scraped from her bottom when she was docked, and much of her iron work was permanently injured. This galvanic action sometimes takes place also in wooden steamers sheathed with copper. A correspondent of *Mitchell's Steam Shipping Journal* states that paddle-wheel steamers frequently foul opposite the arms and rims of the wheels. He had seen the copper sheathing of wooden steamers, both in the navy and merchant service, thickly coated to the extent of one-third the diameter of the wheels, after a voyage to the West Indies, with oysters, barnacles, coralline, worm-shells and weed—the copper becoming negative by the proximity of the iron wheels, which require to be turned frequently, lying in harbor, to prevent the inner arms from being destroyed by galvanic action. The inner arms and rims of the steam-sloop *Cormorant* were reduced to the thickness of a dollar on a single voyage, between Tahiti and Valparaiso, in 1844, and were obliged to be renewed, the copper-sheathing being unusually foul. Iron should not be allowed to come in contact in salt water with either copper or brass in steamers or sailing vessels. Copper and brass feed-pipes for boilers are objectionable on this account. For the same reason care should also be exercised that cables be not allowed to lie in contact with the copper sheathing of sailing vessels.

SEWING MACHINES IN EUROPE.

A paper was read before the Society of Arts, London, on the 8th of April, by Edwin P. Alexander, on the "History and Progress of the Sewing Machine." The credit is given to Mr. Elias Howe, of Cambridge, Mass., as being the inventor of the first practical sewing machine using two threads; and an account of the sewing-machine business in America occupies the greatest portion of that interesting paper. Most of the information relating to American sewing machines has been published in the columns of the Scientific American. Full credit is given to American inventors, and their improvements are highly praised.

As it respects the sewing machine in Europe, it seems that several single-thread and embroidering machines had been invented in England prior to the arrival of Mr. Howe in that country—(after having secured his patent in America in 1846)—but they were all defective. It is stated that Mr. Howe sold his patent in England to William Thomas for a trifling amount, and it has proved very unfortunate for the English people and American manufacturers of sewing machines that Howe's foreign patent should have fallen under the control of such a person. On this head Mr. Alexander says:—"Although the sewing machine was in practical operation in this country before it had been thoroughly recognized in America, it has received no radical improvement at our hands; all the most important improvements being due to American inventors. Its general introduction here was greatly impeded by the refusal of one of our first patentees to grant licenses to make or sell American machines, which by many are preferred to those of English manufacture. Had a more liberal policy been pursued, and licenses granted to all comers at a reasonable rate, the sale of machines would have been quadrupled, endless law proceedings avoided, and the profits to the patentee greatly enhanced. In 1860 the patent in question expired, and the public has since then enjoyed the privilege of selecting those machines best adapted to their special requirements, the majority of which are of American manufacture. The real trade in sewing machines has only existed in England since 1860, but the sewing machine is now beginning to make its way in various departments of manufacture in this country, and a steady demand for family sewing machines is showing itself."

At first there was a strong opposition manifested against them by English operative shoemakers, who struck generally against their employment. These very operatives have since found that their conduct was positively against their own interests. They now consider the machine to have greatly benefited them, especially in the manufacture of the lighter kinds of