Practical Hints.

How Old is Glass?—The oldest specimen of pure glass bearing anything like a date is a little moulded lion's head, bearing the name of an Egyptian king of the eleventh dynasty, in the Slade collection at the British Museum. That is to say at a period which may be moderately placed as more than 2,000 years B. C., glass was not only made, but made with a skill which shows that the art was nothing new. The invention of glazing pottery with a film or varnish of glass is so old, that among the fragments which bear inscriptions of the early Egyptian monarchy are beads, possibly of the first dynasty. Of later glass there are numerous examples, such as a bead found at Thebes, which has the name of Queen Hatasoo or Hashep, of the eighteenth dynasty. Of the same period, are vases and goblets and many fragments. It cannot be doubted that the story preserved by Pliny, which assigns the credit of the invention to the Phœnicians, is so far true that these adventurous merchants brought specimens to other countries from Egypt. Dr. Schliemann found discs of glass in the excavations at Mycenæ, though Homer does not mention it as a substance known to him. That the modern art of the glass blower was known long before, is certain from representations among the pictures on the walls of a tomb at Beni Hassan, of the twelfth Egyptian dynasty; but a much older picture, which probably represented the same manufacture, is among the half-obliterated scenes in a chamber of the tomb of Thy, at Sakkara, and dates from the time of the fifth dynasty, a time so remote that it is not possible, in spite of the assiduous researches of many Egyptologers, to give it a date in years.

Preventing Accidents.—An ingenious arrangement to prevent accidents with circular saws, which require incessant watchfulness on the part of the operatives, has been invented. The guard consists of three pieces, viz., the mortise-plate, secured by three bolts to the fence; a radial arm, which is secured and adjusted vertically into the mortise-plate by means of nut and collar; and the covering plate, which is secured and adjusted laterally in the radial arm, in conformity with the adjustment of the saw-fence by means of the thumb-screw. Where several saws of various diameters are used in the same bench, it is advisable to have two or three covering plates, graduating in size to cover the whole series of saws. The apparatus, as described, is in its mode of fixing exceedingly simple. It is to be recommended on account of its simplicity, its cheapness, its immovability when fixed, and for its perfect freedom from being obstructive to the sawyer.

Spontaneous Combustion.—Recent experiments produced spontaneous combustion, with 17 grains of wadding and 67 grains of strong oil varnish, in thirty four minutes; while 200 grains of washed cotton waste, of which a portion was saturated with 750 grains of strong oil varnish, and the remainder wrapped about it, required almost fourteen hours. These materials were placed in a well-sheltered spot, and subjected to a heat from 40 deg. to 65 deg. Fah. Silk did not flame up, but slowly charred. Sponge and wood dust saturated with oils, etc., and subjected to the test, did not ignite.

Treatment of Wood.—Mahogany is a beautiful wood for furniture. Age improves its color, and it may well be left to time and its own natural beauty. When pine is used, it is well to paint it in flatted color, rather than to grain it, and to make it seem what it is not. When pine is stained and varnished it must remain so, but when paint gets shabby it can be renewed. Indian red and slate gray are good colors for ordinary domestic fittings. These may be relieved by patterns and borders of yellow and white. Sometimes a mere line to show the construction or to define an angle will be found very effective.

Saw.—To take the buckles out of a saw, lay it on a hard level surface—the end of a piece of hard timber is best—then take a bar of lead or a sheet of brass or copper, or any other soft metal, or even a tough piece of wood, say half an inch thick, and lay it on the saw over the buckle. Then with a heavy hammer, strike a blow sufficiently heavy enough to straighten the saw under it. By a little practice and experience all the kinks and buckles can be taken clean out. Never strike a saw with the face of a hammer, or it will stretch the blade and make a "kink" in it where it is not required.

Transferring Impressions of Ferns to Wood.—First, well dry your fern-leaves between blotting-paper, then soak them in standard aniline dye (the color you want), take them out, and re-dry them nice and flat, then damp your wood, and lay the fern leaves upon it, and apply pressure. Some beautiful impressions have been taken in the same way.

BELTING.

Upon this subject, so important to mill and machinery men, the Cincinnati *Artisan* has this to say: Among the valuable elements entering into belt depreciation may be mentioned its length, width and thickness, strain, friction or power to transmit tension, proper adjustment and temperature. If the belt is of leather and oak tanned, it will last one-third longer than a chemical tanned, The manner in which belting is laced or joined together makes a great difference in the wear. Having each end of the pieces to be joined cut off true and square, and laced not too tightly, the wear of the belt may be decreased 20% per year. Some of the methods used to prevent a belt slipping on the pulley are detrimental to its wear, among which may be mentioned powdered resin or pitch which soon penetrates the leather and rots the belt. Roughing the surface by filing is another source of wear. Running a belt too tight on a pulley will generate heat, decompose the oil and organic matter in the belt, and hasten its decay. In having a belt sufficiently tight to convey the power and not slip on the pulleys, or so accurately arranged as to just do the work only, the depreciation on the machine may be decreased 2% a year, and on the belting over 20%. This is further seen when we consider that a three-sixteenth-inch leather belt, three inches wide, has a breaking tension of 2,400 pounds, and an ordinary machine with this size belting can be successfully worked with a permanent tension of 180 pounds. Doubling the tension, whilst it could not break the belt, yet the additional force constantly employed—being an increase of about 1-13 of its breaking tension—is so much useless friction to be overcome, and an additional strain on the entire machine, expended to resist the former and a consequent added element of actual wear.

A belt of unequal thickness will not only run badly, but wear much faster than one of equal thickness thoroughout. Rubber belts depreciate faster than leather. Frequently a few minutes quick motion will roll the gum off in such quantities as to entirely destroy the belt. During freezing weather, if moisture finds its way into the seams, or between the diffrent layers of canvas in rubber belts and becomes frozen, the layers soon tear apart and the belt is ruined.

Using leather belts in damp places, or where steam comes in contact with them, materially hastens depreciation; fully 10% faster than when run in a dry place.

THE DENTAPHONE.

An instrument of very different shape, but used for the same purpose and acting on the same principle as the audiphone, illustrated and described on page 7 of our former number, is the dentaphone, represented in the subjoined wood-cut. It is only the size of a large old-fashioned watch; its hollow interior contains a delicate diaphragm, easily put into vibration by the vibrations of the air, in the same way that the diaphragm of a telephone is vibrated by the sound-waves of the air impinging on its surface, which in fact is also the same as the sound-waves impinge upon the drum of the ear. In place, however, that in the ear these vibrations are communicated by the small bones to the auditory nerves, they are in the dentaphone communicated to those nerves by the teeth and facial bones, and so reach the auditory nerves imbedded in the bones of the skull. There is a mouthpiece attached to the little instrument, which is held between the teeth, and in this way human speech can be conveyed to any deaf person who has not his auditory nerve destroyed, and whose deafness is caused by some other obstruction or imperfection in the channel by which sounds are ordinarily perceived. It has been long known, and it constitutes an interesting experiment, that when a poker or fire-tongs are suspended by a string which is held between the teeth, then any vibration given to the poker or tongs reaches the ear by means of the stretched string, teeth and jaw-bones, and gives the impression of the ringing of a large bell. The motion of the piston and valves of a steam-engine may be heard by pressing a wooden stick with one end against the cylinder and holding the other end between the teeth; and even the ticking of a watch may be heard better by holding it between the teeth than by holding it in front of the ear. The experience gained with the vibrating membranes of the telephone and phonograph have shown how every modulation of speech can thus be communicated to a proper membrane capable of vibration, and the dentaphone is an instrument intended to communicate these vibrations to the organ of hearing without the use of ears.

The instrument is a Cincinnati invention. In that city the American Dentaphone Company has been formed, intended to