

## Science and Art.

## Fire.—Slow Combustion and Quick Combustion.

Fire is the gift of Heaven to man, and by its use he is distinguished from all other animals. Not to know the nature and properties of this valuable agent is a voluntary surrender of our dignity. Fire assumes two forms, called slow combustion and quick combustion; in both cases the material burned gives out heat and disappears, nothing happening to attract the eye of a casual observer; nevertheless, slow and quick combustion produce very remarkable results. When substances are burning that are only red hot, they are undergoing the slow combustion; but when they burn with flame, that is called the quick combustion. Illustrations of this difference are common enough. A candle burns with flame—blow it out, and the wick continues to burn for a time red hot. Note the difference of result: while there is flame there is plenty of light, and no smoke; when the flame is extinguished, a strong, odorous vapor arises, familiar to all. A man smokes a cigar, and it is undergoing the slow combustion—the fragrant vapor is his delight—but if the same be put into the fire, or burned with flame, there is no smell of burning tobacco. In ordinary conversation the slow combustion is termed "smoldering," and is always known to be taking place by the familiar "smell of fire" as one of the results. This smell of fire is, in truth, the smell of the vapors arising from a substance burning without flame; agreeable when coming from tobacco or a scented pastil, but quite the reverse when coming from fat, oil, or the like. From want of air, quick combustion may sink into the slow combustion: smoldering bodies, on the contrary, burst into flame by the ready admission of air. Strictly speaking, the slow combustion is but an imperfect burning of the consumable substance, because the vapor that arises is itself capable of burning again; but if the quick combustion take place, the products of the flame cannot be again ignited. We should always burn the coal by quick combustion in firebrick-lined grates; in fact, not as the smoker does with his tobacco, make a rare fume—consume it by slow instead of the quick combustion.

SEPTIMUS PIESSE.

## Manufacturing Ornamental Glass.

The last number of *Newton's London Journal* contains the following specification of G. Rees, of Clerkenwell, Eng., for a simple method of producing ornamental stamped glass.

"This invention consists in an improved method of producing figured or ornamental surface on glass; and for this purpose a sheet of finished glass, either white or colored, of the dimensions required, is employed, which is rendered plastic by heat, and pressed between a pair of metal dies, engraved with the design or pattern which is to be given to the glass. After impressing the pattern upon the glass it is annealed, and is then fit for use in windows, or for ornamental purposes.

In carrying out this invention, a sheet of flat finished glass, either white or colored, of the dimensions required, is made plastic by heating it in a reverberatory furnace. It is then pressed between a pair of metal dies or rollers, engraved with the design, pattern, or description which is to be given to the glass. The dies or rollers may have the pattern raised in the one and sunk in the other; or one of them may be plain, according to the character of the ornamental surface that is to be produced. After impressing the pattern upon the glass, it is annealed in the ordinary manner, when it is fit for use in windows, or for decorative purposes.

In order to indicate the application of these improvements, and to show some of the purposes to which they are suitable, the patentee remarks that ornamental surfaces of glass, produced as described, and hollow on their under side, may be ornamented by gilding, silvering, enameling, painting, staining, or otherwise, so as to produce any determined artistic effect. Another description of figured or ornamental surface may be produced by pressing the glass between dies or rollers, so as to leave the required pattern or inscription in slight relief. After the glass has been annealed, the raised pattern may be removed by,

grinding, when the pattern or inscription will appear dull upon a bright ground; or flashed glass may be thus treated, that is, white glass coated or covered on one side with a colored glass. In this case the pattern will appear white upon a colored ground, or vice versa.

## Restoring old Steel Pens.

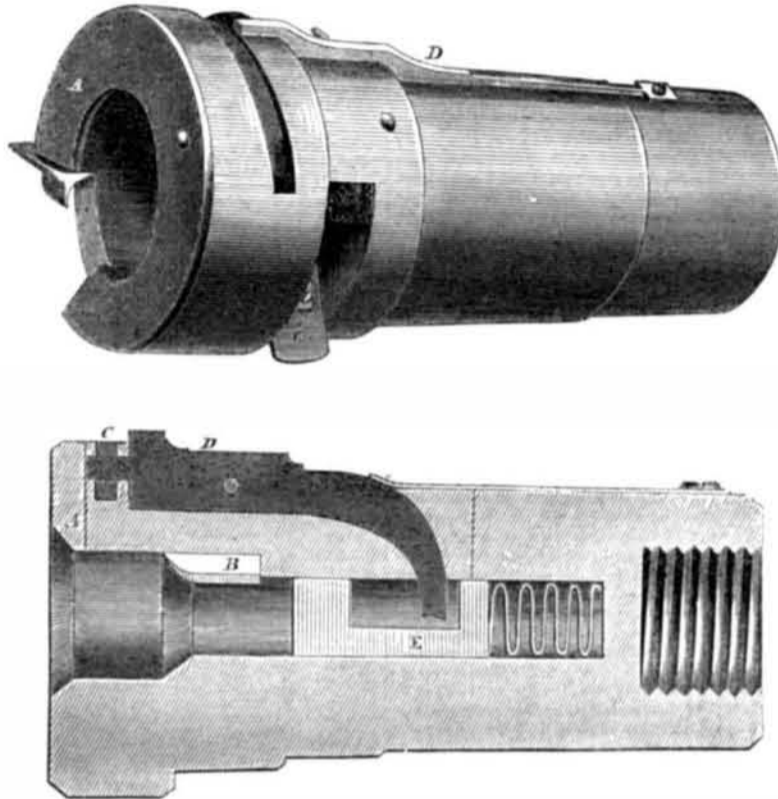
J. Pimont, of Rouen, France, has obtained a patent for the following method of restoring old steel pens which have been thrown aside as worthless, by long use or bad ink.

The old and injured pens are exposed in a

suitable vessel to heat, in a furnace, until their temperature is raised to about a red heat. They are afterwards allowed to cool, and afterwards cleansed from the dirt that may adhere to them. The cleansing process may be performed by shaking them together for some time in a close box containing a little soap and sand.

By this simple process, it is stated, that metal pens hitherto considered to be perfectly spoiled and useless, may be restored to their original state.

## CHUCK FOR MAKING BEDSTEAD PINS.



The accompanying figures are views of the improved Chuck of H. Gross, of Tiffin, Ohio for turning bedstead pins and tenons upon chair stuff.

Figure 1 is a perspective view, and figure 2 is a longitudinal vertical section of the chuck. The body of the chuck is composed of cast-iron, in which three chisels are set. The first one at A, cuts the stick to the size required for the head of the pin; the second at B turns the shaft of the pin to the proper size, and the third chisel at C, attached to the end of lever, D, by pressure of the stick inward, is forced down, and turns the head of the pin, all of which is done without removal or change of the stick until the pin is completed. The end of the lever, D, opposite the chisel is made with a curved shank passing down into the orifice of the chuck, and is operated upon by a follower, E, connected with a spiral spring and against which follower the stick is press-

ed when being cut, forcing the lever upward at this end, while the chisel at the opposite end is brought down upon the stick at the proper time and place to form the head of the pin.

The chuck is so constructed as to be attached to any common lathe, or used separately, as may be desired, and with which one thousand pins per hour can be made by one person. By removing the lever chisel C, the chuck can be profitably used in turning tenons upon chair stuff; the two remaining chisels being set to turn the two sizes generally used, and which may be changed to larger or smaller size by the screw and slot in the chisels.

The patent for this improvement in chucks for turning bed pins was granted on the 23d of September last; the claim can be found on page 26, this volume, *SCIENTIFIC AMERICAN*. For further information apply to the patentee, Henry Gross, Tiffin, Ohio.

## Restoring Old Silk Ribbons.

Old soiled silk ribbons, which, by many persons, are considered worthless, may be rendered almost as good as new, by the performance of a few of the most beautiful experiments in practical chemistry, which can be executed by any lady. Hard or lustrous ribbons cannot be renovated to give satisfaction; satin, plain soft silk, and figured silk ribbons, are the kind to which we allude.

As maroon is a very beautiful color, and is somewhat fashionable this winter for ladies' bonnets, &c., we will describe how to dye old silk ribbons this color. Take pink, light blue, or salmon colored old silk ribbons, and open them out so as to take out all their plaits. They are now to be all sewed together, so as to make a continuous piece, and are ready for the first operation. Now, put a clean tin pan on the fire or the stove, fill it with soft water: cut up a few pieces of scrap soap in it, and bring it up to the boiling point. When the soap is all melted by stirring the water, the suds should feel slippery between the fingers; if they do not, add a little more soap. The vessel containing the soapsuds should just be of sufficient size to hold the ribbon loosely in it; any more suds would be wasted. Now place the ribbon in the suds and boil it for half an hour, keeping it down under the liquor

with a small clean stick whittled to a proper shape. Boiling the ribbon in the soap will remove all the grease and old color. It is now lifted out and washed in water to remove all the soap from it. After this it is stretched out between the fingers, pressed between the two hands, and laid down on a clean table. It is now to be steeped in alum liquor. This is made by dissolving a little alum in a clean stoneware vessel with a little boiling water, then cooling it down with cold water until it is about milk heat. The ribbons are handled for a few minutes in this liquor in such a manner as to lie loose in it, and are sunk under the liquor, where they are to remain one hour. One ounce of alum will be sufficient for a vessel that will contain two quarts of water; this is called the mordant. The ribbons are now taken out and gently rinsed in a little clean cold water, and are now fit to be dyed. Take about four ounces of what is called *hypernic*—red dye-wood—which can be obtained at any druggist's, and boil it for fifteen minutes; and pour the clear liquor into a stone-ware vessel, with as much hot water as will allow the ribbons to be handled freely. Now enter them and draw them between the fingers, and push them down from time to time under the liquor, for ten minutes, when they will have assumed a deep red color. They

are now lifted out, and a very small quantity of the extract of logwood, in liquor, is added to the red wood liquor, all stirred together, and the ribbons again entered and handled for ten minutes longer, when they will have acquired a beautiful maroon color. They are now washed in cold water and hung up to dry.

To dress them, they are sponged on the right side with a little weak liquid of dissolved gum arabic, and ironed on the wrong side with a hot flat-iron.

This finished the operations, which, if carefully performed, will render old ribbons, originally worth three and four shillings per yard, almost equal to new, for a cost not exceeding three cents per yard.

There are hundreds of families in our country who have lots of old ribbons laid past, and held to be no better than waste paper. Let them be brought out and treated as described, when they will be found fit for adorning fashionable new silk hats. Many persons are not aware of the fact, that many of the ribbons which they purchase in stores are re-dyed—changed from unsaleable to saleable colors.

## North-West America.

At a recent meeting held at Toronto, Canada West, for the purpose of endeavoring to get the control of the whole of the possessions of the Hudson Bay Company into the hands of the Canadian Government, it was stated that the climate of North-West America was much milder than that in the same line of latitude on the eastern part of our continent. Wheat can be cultivated far up on the McKenzie river, and the climate of this extensive region is similar to that of Western Europe.



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