For the Scientific American.

Patent Laws.—Subjects of Patents.

In carrying out the views expressed in my last article, page 312, we have only to look at the expansive field presented before us in the Act July 4th, 1836, which declares the subjects of patents to be " any new and useful art, *manufacture* or composition of mat ter, or any new and useful improvement on any art, machine, manufacture, or composition of matter." These phrases allude strictly to the practical—no natural principle being involved. Some have erroneously supposed that a principle could be patented, such as driving a loom by water, if the thing had not been done before. But it is very evident to any acute mind, that an invention in machinery consists in the manner of producing certain results—not the results themselves—for all that the water could do in reference to the power loom was merely to exert a power to drive it. The power in the water which is a natural principle, belongs to all, but a new way of applying that power is patentable, or a new product derived from water would be patentable, such as the manufacture of hydrogen gas by decomposing water by a galvanic current. Sir Humphrey Davy might have patented this.

There is however, in mechanical combinations a principle of action, which is very different from a property of matter. This principle of action is the most difficult to explain clearly of all the points in patent principles. No published work, does it, so as to be a correct guide, and we find the decisions of different judges to be various and unsatisfactory. The patent of Woodworth for planing and tongueing and grooving boards and that of Blanchard for turning gun stocks, have been fruitful sources of litigation, owing to ignorance of the principles of their actions. Where can we find their principles clearly and simply defined ? Nowhere.—There is much public ignorance on this subject, or surely the Patent Office would never have granted so many patents that have been nullified at Courts of Law as infringements of these patents. The reason of this may be owing to that obliquity of mental vision, which is so well versed in " want of novelty" but which cannot comprehend similar principles when presented in different dresses. The policy of having granted those patents is right for all, for it is far more satisfactory to have these things fairly tested by legal process, than an exparte trial or a Patent Office appeal.

We have cited the law of Congress in reference to subject matters of patents. Every person can see the area of the shield which the law would throw over new inventions to protect them. We are afraid that in adjudicating upon aplications for new improvements, some of the Examiners look upon the law in the light which Pollock's rural peasant looked upon the moon, as a light " no bigger than his grandsire's shield." In such a case, (and there have been many such cases) the *guillotine* falls and the victim expires *legally*, a great consolation no doubt to the faithful executioner.

Under the legal construction of the law of 1836, and founded on the principles on which the laws are built, " a new combination of mechanical parts or instruments whereby a new machine is produced, though each of the parts be separately old and well known," is patentable. All machines are made of old parts.—There is no new part about any machine with which we are acquainted, that is not to be found in some other machine. The spinning frame of Arkwright was to be found in all the old rolling mills before Arkwright was born, yet his patent was good. it was a different application and produced a new result, owing to a little difference of arrangement.—It seems strange that such principles could be misunderstood, by our Patent Office, but they certainly are. Combinations and mysterious things to some men, and they can judge only of their nature by reducing them to fractions and substracting every thing from them excepting the last 0. A true soldier when condemned for misdemeanor likes to receive a soldier's death, and the inventor being naturally a sensitive being, likes not the edge nor the look of the *Jack Cade Blade*.

Junius Redivivus.

The Manufacture of Glass.

The History of Glass-making is not very old, but the art is, although it is generally believed that it was a discovery made a few centuries ago. The exhumations of Herculaneum and Pompeii have made us acquainted with one fact of a lost art, " Glass-making," which disappeared during the dark ages and was revived by the Venitians. Venice was anciently celebrated for her glass manufactures and was the first place where window glass was used. The art of glass-making was in far higher excellence two centuries ago, than many would be apt to suppose, yea, we question our superiority, and have no hesitation in saying, that for beautiful colors and fancy work, we were surpassed by the Glass artists of the sixteenth century. In 1699 a work was published in London called "Blancourt on the Art of Glass." It is a very curious book and informs us that many French noblemen in the reign of Louis XVI. were workers of glass, and they worked at the trade with their own hands. A change has come over the scene since then. The art was first introduced into England in 1557 and it was carried on by some of the richest noblemen in the land, the Duke of Buckingham in 1670 being one of the number.

There are two kinds of glass known by the name of " sheet and plate." The *sheet* is blown, the *plate* is cast. German sheet glass is blown into long *cylinders*, which are cut on one side and opened into flat rectangular plates. Crown glass is blown into globes and whilst it is soft, is opened and turned inside out by being rapidly spun round, the centrifugal force " flashing" the glass into circular plates each having a lump of glass in the centre. To this lump the tool is attached, and afterwards forms the well known " bullion" or " bull's eyes," so frequently seen in inferior windows.

Fig. 1.

There is nothing peculiar about the furnaces for sheet glass, and the crucible or "pots" in which the glass or metal is melted, they are in every respect the same as those employed for crown or plate glass; nor is there any very essential difference between the " frit" or composition of raw material for crown or sheet glass, excepting that the materials for the sheet are selected with a greater regard to purity. The mixture of sand, soda and lime, having been made in accordance with the peculiar views of the manufacturer, the " frit" is shovelled cold into the heated pots in which it is subjected to an intense heat from 10 to 20 hours, when it becomes of the consistence of common honey, when the impurities on the surface are removed by skimming, and an assistant plunges an iron pipe of about 5 or 6 feet long, and 10 lbs. weight into the semi fluid glass, and by turning it round gathers a portion of glass on the end of his tube ; after this has become stiff by cooling, the process is repeated until a sufficient quantity is thus obtained, in the shape of an irregular sphere. The pipe is now cooled over a tub of water, and is transferred to the " blower," who, keeping it constantly revolving, lays the glass in the " block," which is a sort of wooden bowl partly filled with water. The peculiar shape of the cavity, and the motion given to the glass by the workman, cause it to assume a shape which he knows by experience to be best adapted to his purpose. It will no doubt seem strange that a piece of hot glass should be plunged into cold water, and this rarely fails to strike a stranger with astonishment, as knowing how soon hot glass is cracked by cold water. That the glass does not crack most probably arises from its non-conducting properties, as well as from its being so very hot and soft that it does not lose sufficient

Fig. 2.

heat, during the time it is immersed, to become brittle ; the spheroidal state which water assumes when in contact with some bodies at very elevated temperatures, also tends to prevent the glass losing heat so rapidly as might be imagined, and the water, in fact, acts only as a lubricating substance between the soft glass and the wood, thus effectually preserving the surface of the former from being injured.

The mass is now in shape, fig. 1, and being blown into and slightly drawn out, by allowing it to hang down from the pipe, it assumes the shape of fig. 2, being a thick pipe a little

Fig. 3.

conical, terminated at the larger end by a mass of glass ; this mass is again supported in the bowl, and by forcing in a strong blast of air, the workman causes the thick end to expand, when the whole presents the appearance of fig. 3, being a kind of short and wide bottle, with an enormously thick bottom ; the sides being kept straight by the form of the hollow in the block. The upper part of the bottle, or the neck and shoulders, is called the " cap," and is of the same thickness as the whole sheet when finished. The cap being finished, the diameter of the bottle determines the future diameter of the cylinder.

These preliminary portions of the manufacture are carried on at the side of an intensely heated furnace, called the " blowing furnace," having several circular openings of much greater diameter than the bottle before described, which being lifted out of the water, is inserted through one of the apertures into the heat, whilst the pipe is supported on a hook fastened for that purpose into the brickwork at the side ; the bottle soon becomes exceedingly hot, and when almost melting, is adroitly withdrawn and held down in a nearly vertical position by the workman, who stands on the edge of an opening called a " grave," and allows the bottle to elongate by the weight of its thick bottom, occasionally forcing air down the pipe, and assisting the force of gravity by swinging or vibrating the pipe and glass like a pendulum.

(*To be continued.*)

To Render Wood Durable.

In preparing wood for the purpose of building, saw it into such lengths as the occasion demands ; next, plunge the planks or beams into a pond of lime-water. The pond is made thirty or forty feet long, five or six feet deep, sixteen or eighteen feet wide ; and the bottom and sides are rendered water-tight. It is then filled with cold water. Before receiving the wood, a qnantity of fresh-burned hot lime is thrown into the pond, which is well stirred with the water, to dissolve as much as possible of it. Into this strongly impregnated solution of lime-water, the wood, in the various shapes it has been sawn into, is then thrown. As lime-water absorbs carbonic acid, from the atmosphere, the lime previously held, dissolved in the water becomes insoluble, and is slowly abstracted from the water, and deposited at the bottom in a solid state, as carbonic of lime ; hence the necessity of now and then throwing in fresh portions of recently calcined lime, that the water may be resaturated with the strongest solution of this caustic alkaline earth.

The timber remains in the water from two to three weeks. The lime is absorbed by the pores of the wood, and appears to destroy the albuminous and saccharine principles, or so changes them that the wood no longer affords the food on which worms subsist. The slight petrifaction which the wood thus undergoes, prevents air and moisture from penetrating it, and renders it almost indestructible. It should be thoroughly seasoned before it is used.

There are some rivers having the quality of turning *wood into stone*, such as a famous lake in Ireland. It is the presence of lime in the water that effects the change. If wood be saturated in strong alum and then dried at an intense heat, it is very durable, and more so, if a little copperas has been used along with the alum.

The Cause of Bad Teeth.

Dr Redfield says that the principal cause of bad teeth is the use of hot food and drinks.—He referred to the dislike which little children showed to taking food of a higher temperature than milk warm, and of the attempt of nurses to satisfy them, and said that by habitually taking food of too high a temperature the mouth becomes insensible of what would scald an infant. If the membrane of the mouth which is a comparatively poor conductor of caloric, suffered from this cause, the teeth suffered much more, for they were excellent conductors, and the heat being conveyed to the nerves of the teeth, caused debility and loss of vitality, and, of course, rottenness of the teeth. Food that was so hot as to burn the tongue, was thrust between the teeth and held there till it had parted with its excessive caloric, and this rendered the destruction of the teeth inevitable ; and as the grinders were most subject to this influence they were the greatest sufferers. By a total reform in society, in respect to this simple law, Dr. Redfield believes man would be exempt from the toothache, and from the necessity of the substituting artificial teeth for natural ones.

A Ready Rule for Farmers.

A "quarter of wheat" is an English measure of eight standard bushels—so if you see that quoted fifty-six shillings, it is seven shillings a bushel. A shilling is twenty-four cents—multiply by seven and you have $1 68 per bushel.