ing the rear of the slot open and free for the escape o material that would otherwise clog the cutter, substan tially as described.

REAPING MACHINES—Obed Hussey, of Baltimore, Md. Patented Aug. 7, 1847: I claim the combination of a slot formed between the long and short parts of the guard finger, with an opening in the rear of the short part, substantially as described.

SEWING MACHINES—Joseph P. Martin, of Philadelphia, Pa., (assignor of John A. Bradshaw, of Lowell, Mass.) Patented Nov. 23, 1848: I claim regulating the tension of the thread, after it has been unwound from the bobbin by means of apertures and bars, with, upon or through the thread case, either separate or combined, or by any equivalent means, when said means are within, upon, or form part of the bobbin case itself, for the purpose specified.

Springs or screw bearings upon the bobbin, separately considered, are not claimed.

I claim, secondly, regulating the tension of the shuttle thread in the act of leaving the bobbin, by a combination of one or more screws with a spring, or any yielding or elastic substances, or any equivalent devices for producing the same effect.

SEWING MACHINES—Joseph P. Martin, of Philadelphia, Pa., (assignee of John A. Bradshaw, of Lowell, Mass.) Patented Nov. 23, 1848: I claim the covered shuttle to be used as a sewing machine, or in other words, constructing that portion of the bobbin case which comes in contact with the top, cylindrical, or in any other form which does not present edges in its transverse section.

DESIGNS.

STOVE PLATES—A. C. Barstow, of Providence, R. I.

CLOCK CASES—Elias Ingraham, of Bristol, Conn.

CLOCK CASE FRONTS—Chauncey Jerome, of New Haven, Conn.

[We admire the improvement in taste which is now manifesting itself more generally in our country, viz. to combine beauty of form with usefulness in the article—whether it be a machine, stove plate, or clock case, &c. New designs call forth high inventive powers, and their authors should take care to protect themselves by patents, to derive such advantages from them as cannot otherwise be obtained. The design of Mr. Jerome for clock case fronts exhibits a cultivated taste in its author.]

COOKING STOVE PLATES—N. S. Vedder, (assignor to Smith & Sheldon,) of Troy, N. Y.

ADDITIONAL IMPROVEMENTS.

FILTER—David N. B. Coffin, Jr., of Newton Center, Mass. Patented Sept. 2, 1856: I claim, first, so constructing that part of filter to which the filtering medium is attached, and providing it with a seat in the case, that it may be raised from said seat or turned upon it, so that the water shall be free to pass in from the faucet, through and around the filtering diaphragm, in such manner as to wash away the impurities from the surface of the diaphragm, substantially; also to relieve the force of the stream of water when drawn without filtering.

Second, I also claim in combination with the ring, i the flange, u, for holding in their place the additional layers, as set forth.

Third, I claim the grooves on the outer surface of J, in combination with the ring, whether separate or continuous, like the thread of a screw, with or without a corresponding inside screw formed in the ring, for greater certainty in holding the diaphragm, also the rebate shown, so that the ring may reach a little below the largest part of J, at f and h, for the same purposes.

SAFETY HATCHES FOR WAREHOUSES—William H. Thompson and Fostis P. Morgan, of Biddeford, Me. Patented June 24, 1856: We claim the opening and closing of vertical doors attached to the tube or box of an elevator by means of the action of a traversing car or platform and its attachments, asset forth.

[NOTE—The residence of A. P. Wilson, whose patent claim for improved windmill appears on page 219 of the present Vol. should have been Solon, instead of Salem, Ill.]

Manufacture of Car Axles and Iron Castings.

MESSRS. EDITORS—In the SCIENTIFIC AMERICAN, No. 20, this volume, there is an extract from the *American Mining Magazine*, under the head of "Crystalization of Wrought Iron." In regard to the manufacture of railroad car axles, I am of the opinion that much may be done to improve their strength and durability. The object of our people, apparently, is to manufacture everything cheap, railroad axles forming no exception. This is bad and expensive policy. No one kind of iron ore should ever be used alone in the manufacture of wrought or cast iron.

The experience that I have had for some years in the use of metals from the pigs is this:—I find in all cases that it greatly improves the castings to mix different qualities of iron. I have tried the best brands of the Scotch pig alone, also a large number of American brands, to obtain strong, soft and tough castings—some anthracite and charcoal brands, hot and cold blast, made from magnetic hematite and silicious beds of ores—and in every instance failed to accomplish my object; but when I mixed or crossed the brands I succeeded. I do not believe in the mode which is now in practice in the manufacture of solid car axles. It is generally supposed that old wrought scrap iron is the best for this purpose. The question may be asked why is this? The fibre of this iron is cut too short, and oftentimes pieces of the poorest kinds of iron find their way into the bloom from which an axle is to be made; and these same pieces are laid into the bloom or package of metal crossways, and in this manner the workman attempts to weld or consolidate them for an axle. If the fibre of the iron is thus cut and laid, how can it be possible that this method should make a perfect axle?

I will now state what course should be taken to make the best solid axle, not that I think, however, that kind of an axle the best. First, the stock should be selected from a mixture of ores, which have been smelted together. Then the pigs when puddled should be well refined and rolled into bars, not too large but of sufficient length for an axle, without being cut between ends. In this manner the fibres will all be laid one way by the rolling process, and that lengthwise. Enough of these should be taken and well welded—say ten or twelve bars to form the axle. By this method a good refined solid axle can be produced without flaws or cracks. I am of the opinion that charcoal pig iron is the best, and should be used exclusively for such purposes. The smallest amount of crystalization in the center of a bar of iron virtually destroys its utility. I also find it so in the manufacture of malleable iron castings, and crystalization in them will cause them to brake like pipe stems, even after they have come from the annealing furnace.

Too hard pig iron is often used in castings. I have seen it so hard that it was impossible to molify it for castings in a furnace made for the purpose. I have taken castings of such metal, melted them over, and tried to run the metal into large moulds, but it would separate from other iron melted with it while in the cupola, and I found it difficult to get it out. The subject of crystalization was noticed in the SCIENTIFIC AMERICAN some months since, in regard to brittle malleable iron castings. It is clear to my mind that their stock was too high or hard, and this was the cause of their brittleness. B. B.

Westmoreland, N. Y., April, 1857.

[The brittle casting of malleabilized iron to which our correspondent refers was *cold short*. The opinions of our correspondent accords with the experience of skillful iron and steel manufacturers. The importance of sound and tough axles for passenger cars and locomotives cannot be overrated. The breaking of axles has caused some of the most serious and fatal accidents on record. The late very fatal occurrence on the Great Western Railway was in all probability, as shown in another column, due to this cause. Scrap iron is decidedly inferior to good native iron. Ames' very extensive works in Connecticut, devoted to the manufacture of locomotive tires and car axles, uses no metal but that direct from the Salisbury ore beds, smelted by charcoal fuel with a cold blast, and subsequently many times drawn out under the heaviest hammers and repiled. Such processes with our best American ores produce work far superior in strength and toughness to the best foreign brands, and absolutely free from the flaws and weak spots incident to the scrap iron blooms. The manufacture of such important forgings as car axles from the very finest iron, in the best known manner, is a point that should merit far more attention than it does; and we mention these works, and the processes therein, as the best with which we are personally familiar, but presume there are others in our country which conduct the work in the same way, and with the like superior results.

Inks and the Manufacture of Paper.

MESSRS. EDITORS.—I notice a communication in the SCIENTIFIC AMERICAN, April 11, upon "Inks," signed H. A. S., which contains a clear explanation of the inferior value of modern paper, for the preservation of either written or printed documents. Nearly all white papers now produced are bleached with chlorine in some form; and since paper stock has risen in price, poorer qualities are used, which require more chlorine and acids, and these latter are removed only with increased washing—and, in fact, mere washing cannot wholly remove them. These substances remaining in the paper discolor it, soften it, and make it furzy so as to clog the type, and act on the ink to make it fade. While it is impossible to remove it by washing, it may be promptly and perfectly neutralized by chemical agents known as anti-chlorines. The use of these articles is universal in Germany and France, as well as England, and they are now used in this country by many of the best manufacturers of both book and writing papers, among whom are Platner & Smith, May & Rogers, and Whyte & Hulbert, of Lee; Brown, of Adams; Carew, of Hadley; Imlay & Weston, of Hartford; Platner & Porter, of Unionsville, and many others. These anti-chlorines are comparatively inexpensive. They render excessive washing, and the loss of pulp, time and power that attend it unnecessary; they preserve the wires, blankets, and other parts of the machinery from destruction, and effectually prevent any change in the color or firmness of the paper or permanency of the ink. The cheapest and best dechlorinating agents are anti-chlorine and anti-chloride of lime, manufactured in Providence, R. I.

H. E.

Iron Water Tanks.

MESSRS. EDITORS—A correspondent of the SCIENTIFIC AMERICAN (J. E. B.) is in the same difficulty that I was some months ago, being in want of a tank to hold water fit for drinking, bathing and culinary purposes. I wanted also to have mine strong enough to bear Croton pressure, so as to carry a waste pipe up to the top of the chimney, and form a lightning conductor. I had one made of iron, No. 16 gage, galvanized, and riveted together with copper rivets. The diameter is about 29 inches by 6 feet high. It holds 215 gallons, and cost $75. The heads are of boiler plate, 1-4 inch thick, and consequently strong enough to lap for connections legs, &c., to stand upon, so as to be entirely independent, and require no wood work around it. I shall be happy to show the tank to him on calling at my house. T. PROSSER,

No. 28 Platt street.

New York, April 10, 1857.

Notes on Science and Foreign Inventions.

Preserving Timber.—R. W. Sievier, of Brussels, Belgium, has patented a process for treating wood to preserve it, which, apparently, embraces some excellent features. The timber is first saturated with certain solutions, then compressed between rollers, so as to close up the interstitial spaces, to render it impervious to air and water, the attacks of insects, and destructive influences of the weather.

The wood to undergo this process is first dried in any manner, to expel moisture and air, then it is plunged into a bath of pitch, rosin, or asphalt, dissolved in turpentine. This part of the process is best accomplished in an air tight iron tank, connected with an air pump for exhausting all the air.

If the timber is designed for ship's planking, and to resist the attacks of the *toredo navalis* (ship worm) or other insects, it should be first impregnated with a solution of corrosive sublimate, and then dried before its pores are filled with the bitumen.

When the timber is saturated with the resin solution, it is taken out of the tank and allowed to stand on a frame for some hours to drain itself of all the superfluous fluid. After this it is subjected to the action of powerful pressure between rollers, the surfaces of which may be so formed as to give the shape or form desired to the timber. The pressure squeezes the cells of the wood close together, and owing to these being filled with the resin gum, they become impervious to air and moisture. The pressure on the wood must be commenced very slow and with a small force, otherwise if it be commenced quick and with great force, the fiber will be injured. It is stated that American pine may be compressed into half its original bulk, by slow and careful pressure, and all the strength of its fibers retained. The solution for impregnating the wood may be colored to imitate mahogany, rosewood, and black walnut; and coarse woods thus made to receive as close a grain, and as hard and beautiful surfaces as the most expensive and dearest woods employed for cabinet work.

The same kind of rollers as those employed for rolling iron are the best for carrying out this invention. The wood should be passed several times through them, each time increasing the pressure. It is preferable to compress it after it is sawn into the form of plank, or veneers; but the invention is applicable to timber of every size and form for which pressure machinery can be constructed.

New Fertilizer.—A patent has been taken out by G. Wariner, of Withernsea, Eng., for the use of ground charcoal mixed with glycerine, to be placed among barn-yard liquids for the purpose of absorbing all the ammonia, and thus saving that most valuable fertilizing agent. The compound is stated to be superior to all others yet tried for this purpose. Glycerine cannot be profitably employed by farmers in our country for this purpose, excepting in the neighborhood of soap factories.

Printing Colored Designs on Glass.—Newton's *London Journal* for last month contains an abstract of a novel and ingenious process for printing colors on glass, for which a patent has been secured by Henry Page, of London. The surface of calico, paper, or other suitable material, is coated with size, gum, or starch, and when dry the design is printed on it with colors made up in varnish or oil. The size prevents the printed colors from entering the surface on which the design is printed, and when the whole is dry, may be kept rolled up until wanted to be fixed on the glass.—The glass is now prepared by taking off its polished surface with emery, or other suitable material, and made quite rough. It is then ready to receive a coat of hard white varnish, japan, copal, or other suitable body varnish, and when that is done, and before it dries, the surface of the printed design is turned down upon it, and pressed down evenly. When quite flat the back is wetted with water, which softens the size, and allows the fabric on which the design was printed to come away, leaving only the printed design on the glass. The whole is dried off together, and then washed well in water, to remove any size that may have passed in the transfer. The design or ornament now only requires hardening, and this is effected by placing the glass in a drying stove, oven, or other suitable apparatus. Care must be taken that the heat is applied slowly, and not carried high. The heat must never be carried beyond the degree the nature of the colors will allow without injury.

A New Anesthetic Agent.—The vapor of amylene has been used, it is said, with good effect by Dr. Snow, in King's Hospital, London, as a substitute for chloroform. In the case of a severe operation on the face of a man, although there was some amount of consciousness, complete insensibility to pain was manifest; and when the operation was concluded, which moreover occupied some time, the faculties were very quickly indeed restored, and the man walked to the wards without support, instead of being carried, as after chloroform. In seventeen instances in which Dr. Snow has given the amylene, in not a single case was there any sickness or vomiting, which is a decided advantage over the chloroform, although it requires a much larger amount to be used to produce its desired effects. Dr. Snow believes a substance will yet be found that will produce anesthesia without loss of consciousness.

Straw Paper.—A great deal of paper is now made from straw, but it is coarse and hard—too brittle—and unfit for the purposes of printing upon. Improvements, no doubt, have been made in the manufacture of straw paper within a few years; it has been bleached perfectly white, and made of a tolerable smooth surface, still the best of it is harsh and hard, in comparison with rag-made paper.

An improvement has recently been made in Belgium by M. Helin, by which, it is said, paper of a soft, yet firm and excellent texture, far superior to any hitherto made, can be manufactured from straw.

The common plan of preparing straw for pulp has been to boil it first in alkaline solutions. The new process of M. Helin consists in employing a prior process to ferment the straw, something like that for retting flax. The straw is first steeped entire for sixty hours, or more, in water of 55° to 85°, varying according to the season of the year.—After some hours the water becomes gradually warm and discolored, and an active fermentation takes place; after sixty hours the liquid is suffered to run off, and the straw must be washed with a plentiful supply of water, in order to remove therefrom all the soluble coloring matter. The straw is then drained, and while still damp is subjected to the action of millstones, rolling on a plain surface, or passed between a pair of rollers, in order to flatten it. It is then forced between other rollers furnished with cutters, or other suitable apparatus, whereby the straw may be formed into filaments or fibers, as long and continuous as possible. After this it is dried in the sun, then steeped or boiled in an alkaline solution preparatory to being reduced to pulp, and bleached by any of the methods in common use.

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