RECENT INVENTIONS.

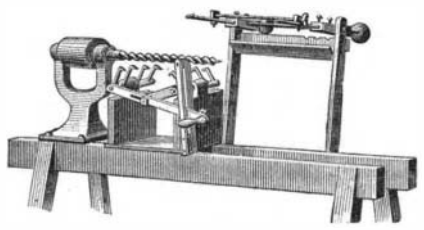
Improved T-Square.

This invention consists of the tongue or shaft of the T-square, made of an equilateral scale, and fitted in the head so that it can be readily taken out and shifted around on its longitudinal axis from side to side, in order that the different scales of the different sides may be set to the work, so that the draughtsman can set his points directly therefrom without the use of the dividers. The tongue of the square is made in the form of the common equilateral triangular scale, with any desired scales printed on it, and the head of the square has an equilateral mortise through it corresponding to the form of the tongue, and has brackets on the back, so that the tongue can be readily taken out and shifted around from side to side to present the different scales to the work on the paper for taking the measures directly from the scale. A binding screw fastens the tongue in the head, and a rabbet is made in the head to fit the edge of the board for keeping the tongue upright. The scales may be printed any desired length on the tongue.

This invention has recently been patented by Mr. Joseph W. Rowe, P. O. Box 2476, New Orleans, La.

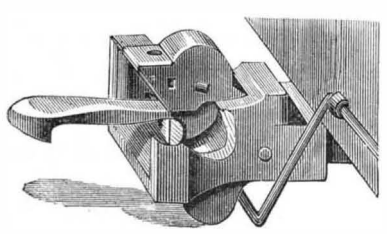
Hub Block Boring Machine.

The hubs of wagon and carriage wheels are commonly made of elm wood, and it is necessary that the central longitudinal aperture of the hub be on the pith line of the block to prevent cracking in seasoning. Mr. John S. Reid, of Muncie, Ind., has patented a device for boring hub-blocks directly on the pith line, which consists of a horizontal frame formed of two beams, upon the upper edge of which a track plate is fastened which overlaps the beam on the inner side. The track carries a sliding block holder provided with dogs, operated by a lever for pressing the dogs into the ends of the block, as shown in the engraving. The block is adjusted to its proper position by means of a swinging-frame, provided at the ends with points which are forced into the pith in the ends of the block. When this adjusting frame holding the block is lowered, the pith line will be on a line with the longitudinal axis of the auger, and if the block is now seized by the block holder and the pith points are removed when the block is moved toward the auger, the hole is bored.



Improved Car Coupling.

A novel improvement in car couplings has been patented by Mr. Thomas McCabe, of St. Joseph, Mo. A drawhead is made with a central vertical slot in which is pivoted a weighted catch, as shown in the engraving. The catch is so pivoted that it tends to fall forward by gravity, and its forward movement is limited by lugs. Instead of using a link, a hook is employed that has its ends beveled on four sides, so that it shall be easily guided into the mouth of the drawhead. The hook is used with the nib down, so that as the end enters the drawhead it will fall over and engage with a crossbar, while the weight of the catch will prevent it from becoming disengaged. For operating the catch a lever is secured to a convenient part of the car and connected to a crank which may be pressed against the lower end of the catch. By means of notches in the guide, the lever may be locked out of contact with the catch, or the catch may be held in a raised position, locking the pin in one side of the drawhead.



IMPROVED CAN OPENER.

The engraving represents an improved can opener recently patented by Mr. William A. Stoddard, of Dallas, Or. The opener has two levers, which operate in conjunction in opening a can, one lever carrying the knives and having a downward motion, the other lever being provided with a platform, on which the can to be opened is supported. The upper lever is acted on by a cam lever, and the lower lever receives its motion from the upper one by links and an intermediate lever. A spring secured to the lower lever and pressing against the intermediate lever returns the parts to their normal position after use. The knives have curved edges, and enter the can top at two diametrically opposite points. The operation is as follows: The can to be opened is placed directly below the knives in an upright position on the plate on the lower lever. By depressing the cam lever the end carrying the knives will be forced downward, the can will be raised, and the knives will be forced into the head of the can and cut out the head. As soon as the cam lever is released the spring returns the parts. The knives can easily be removed in case they are to be sharpened. This can opener is very simple and at the same time capable of doing its work rapidly and well.

STODDARD'S CAN OPENER.

Destruction of Fish by Chloride of Lime.

Mr. A. Anthony Nesbit, who has conducted a long series of experiments in regard to the detention of chloride of lime in water, contributes an interesting paper to the *Chemical News*. The increasing disputes between owners of paper mills and those preserving fish have rendered it advisable that chemists should have a very delicate test for bleaching powder, which is the most deleterious pollution of streams by paper mills. Mr. Nesbit says: I have consequently conducted a long series of experiments, which have resulted in the following method, the delicacy of which is such that it enables us to detect from the two hundredth to the four hundredth part of that quantity of chloride of lime which is injurious to Prussian carp (*Cyprinus gibelio*).

The test used is a starch paste made in the following manner: 100 grs. of iodide of potassium are dissolved in 16 oz. of boiling water, and 100 grs. of starch, mixed with 1 oz. of cold water, are added gradually, and the whole boiled vigorously for thirty minutes (the long boiling being absolutely necessary for the production of the sensitiveness of the test).

This solution should be used as soon as possible after its preparation, as it rapidly decreases in delicacy, and the extraordinary fact must never be lost sight of that an excess of this test entirely destroys the reaction.

I test a water in the following manner, viz.: two No. 5 beakers of the same shape are filled with water under examination from the brook side and placed on a sheet of white paper, and 5 c. c. of the above solution are run from the burette into one of them; if no blue or violet color occurs at once the water is thrown away, the beaker is refilled, and 1 c. c. run in; if again no reaction, the beaker is again refilled and half a c. c. added, the beaker re-emptied, and so on, till only the tenth of a c. c. is used in the beaker—it being found that the smaller the quantity of chloride of lime present, the smaller the quantity of test required to exhibit it, and when we are dealing with small quantities of the chloride it has to be searched for with varying amounts of the test or it may escape notice.

By judiciously applying the above method I can detect the one two-hundredth of a grain of commercial bleaching powder in one gallon of water, or about one eight-hundredth of a grain of "available chlorine" in a gallon.

Now, from numerous experiments which I have conducted I find that it requires from one to two grains of commercial chloride of lime to inconvenience Prussian carp, consequently we can readily detect in so-called polluted water the one two-hundredth to the one four-hundredth part of the quantity which is injurious to these fish; and hardy as the Prussian carp are, I think it must be conceded that it would be unreasonable to consider that the common trout is two hundred times as delicate.

In future disputes, therefore, between the owners of paper mills and fish preservers there will be no difficulty in deciding whether or no the manufacturer habitually discharges an injurious quantity of chloride of lime into the stream.

I find, however, that chloride of lime in small quantities is rapidly reduced by the action of the organic matter in the water, which fact must not be lost sight of, and every hour's delay in testing it makes it more difficult to indicate pollution.—*Land and Water.*

Bleaching Textile Fibers.

This method is applicable to all textile fibers, either raw or manufactured. The following are the chief points: (*a*) use of bromine as oxidizing agent; (*b*) use of alkaline hypobromites; (*c*) the application of sulphuric acid, either pure or containing nitrous compounds, for the purpose of regenerating the bromine; (*d*) application of method *c* for the direct treatment of the mother liquors from saline waters, as a means of furnishing a convenient source of bromine. (*a*) The material to be bleached is put into a bath of hydrochloric acid (2 to 3 per cent), heated to 60° C., and allowed to remain there twenty-four hours. It is then transferred to a bath of bromine water (2 per cent) for another twenty-four hours, during which time it is kept thoroughly agitated. The material is then removed, the bath neutralized with a dilute solution of caustic soda, and the material returned for twelve hours. It is then transferred to another bath, where it is washed with a 10 per cent solution of soda, and finally with water. (*c*) Though the bromine has lost its oxidizing power it is by no means useless, as it can be recovered by the addition of sulpburic acid. The author states that by this method the bromine can be reused for a large number of times. The sulphate of soda that accumulates in the bath does not interfere with its efficiency for a long time. When that happens the bromine can be recovered as in *d* below. According to the author his method possesses the advantages of economy and the absence of the injurious effect on the fibers liable to the use of chlorine or hypochlorites. (*d*) Mother liquors containing bromine are decomposed with crude sulphuric acid. They are then shaken up with bisulphide of carbon, and the latter separated from the aqueous portion. The resulting solution of bromine in bisulphide of carbon is then agitated with a small quantity of water and fragments of lime, which by this means is converted into a mixture of bromide and hypobromite of calcium, the bisulphide being left in a fit state for further operations. The mixture of bromide and hypobromite of calcium can be decomposed with sulphuric acid and the resulting bromine water, filtered from the calcium sulphate, used again.—*Léon Jousselin, Mon. de la Teint.*

Fireproof Paint.

Various substances have often been proposed as fireproof coatings for the protection of woods employed for building purposes, but most of them have been abandoned as being either too costly or not sufficiently durable. The following process, invented by Messrs. Vildé and Schambeck, seems better fitted to succeed. We borrow a description of it from *La Papeterie.*

The paint consists of 20 parts of finely pulverized glass, 20 parts of finely pulverized porcelain, 20 parts of any sort of stone in powder, 10 parts of calcined lime, and 30 parts of water glass (silicate of soda), such as usually found in commerce.

The solid elements, having been powdered as finely as possible and sifted, are moistened and then intimately mixed with the water glass. This yields a mass of syrupy consistence that may be employed for painting, either alone or mixed with color.

The addition of the lime gives a certain unctuosity to the mass for whitewashing, and its combination with the silicic acid of the soluble glass serves to bind the other materials together. The proportions of the different elements above mentioned may be changed save that of the water glass, which must remain constant. These elements may even be replaced one by another; but it is always well to preserve the lime. Instead of the silicate of soda (soluble glass of soda) soluble glass of potash might be used, but the former is less expensive. The coating is applied with a brush, as other paints are, as uniformly as possible over the surface to be protected. The first coat hardens immediately, and a second one may be applied six hours or more afterward. Two coats are sufficient.

This paint may likewise be employed as a preservative against rust, and used as a coating for iron bridges, etc.

Relative Longevity in Various Occupations.

An interesting exhibit of the mortality in the different walks of life was furnished by the General Register in report on the death-rate of the whole population of England in 1851. From this it appears that out of every thousand persons between the ages of twenty-five and fifty-five, forty died on an average. Classified according to the most favorable mortality, and increasing downward, we have the following tables:

Below the Average.	*Above the Average.*
1. Merchants.	7. Miners.
2. Weavers.	8. Tailors.
3. Cobblers.	9. Bakers.
4. Carpenters.	10. Butchers.
5. Blacksmiths.	11. Liquor dealers.
6. Laborers.	

The mortality of the eleventh class is so great that in good companies they are only admitted with great caution, and on short endowment or term policies.

Mariners, also, are considered poor risks, as 35 per cent of the deaths among them are attributable to accidents. Among miners 25 per cent, among machinists 15 per cent, and among painters, well-diggers, and glaziers 10 per cent die in consequence of casualties. The callings of brewer, typesetter, tinsmith, lithographer, and stonecutter are also in a measure detrimental to a prolonged duration of life.