New Inventions.

Rapid Sawing.

At the Penn Mills, near Clarion, Pa., no less than 21,072 feet of boards was recently turned out in ten hours by a circular saw of 4½ feet in diameter. The power employed is a steam engine of excellent workmanship, made made by N. Myers & Bro., of Clarion. It is of 16-inch bore, 20 inches stroke, and makes 150 revolutions per minute (500 feet velocity of piston). Two boilers, each 24 feet long, are employed to generate steam; they are 42 inches in diameter, have two 16-inch flues each, and the fuel used is sawdust and waste slabs.

Safety Chemical Matches.

A Frenchman, named M. A. Meunons, has secured a patent in England for an improvement in lucifer matches, with a view to obviate the risks of accidental ignition. To attain this end, the matches are first cut by known means from cubes of wood, the cut being stopped at a short distance from the end of each cube, so as to leave the lower extremities adherent. The upper or free extremity of each packet of splints thus formed, being coated with wax or sulphur, is dipped in one of the following preparations :—Chlorate of potash, two parts; pulverized charcoal, one part; umber, one part: or, chlorate of potass, sulphur and umber in equal parts, thoroughly mixed with glue. The opposite extremity or "cut" of each packet is then painted over with amorphous phosphorus blended with size, so that on separating the matches, the phosphorus is only found on the top of each. The matches thus prepared are ignited by breaking off a small piece of the phosphorized end and rubbing it on the opposite extremity covered with the inflammable preparation.

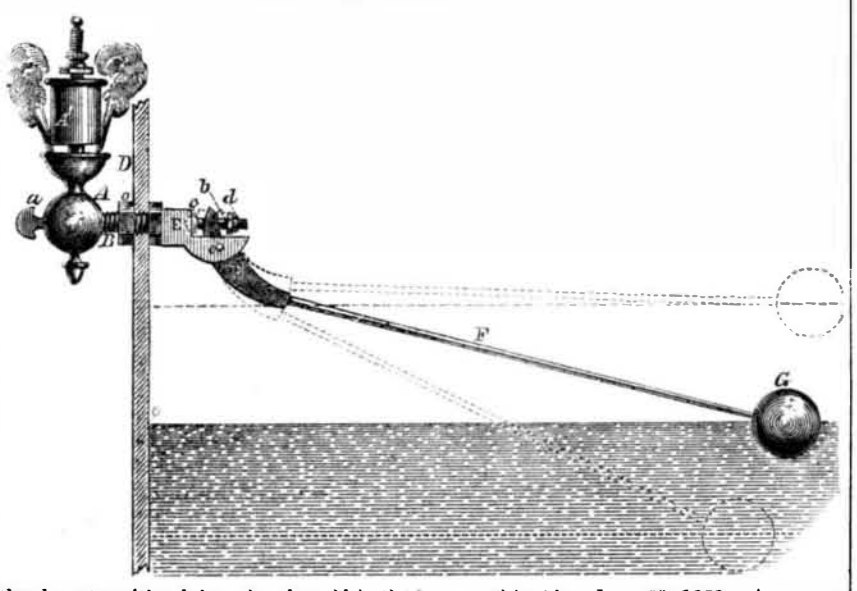
New Boiler Alarm.

This is an ingenious and simple device for the purpose of calling attention by a whistle, when the water falls to so low a level as to endanger the bursting of the boiler by the water falling below the tubes, the introduction of cold water then being very liable to produce an explosion.

This little apparatus consists of a block of metal, A, to which is attached a whistle, A′. D is the front plate of the boiler, through which the invention is secured by the screw, B, and nut, *o*. Through the solid part, E, inside the boiler, a passage is bored, corresponding with one in A, and this is flared out to form a valve seat on the inner surface of E, which is closed by a conical valve, *c*, upon the rod, *b*, the valve being kept home by the pressure of the steam behind it. The other end of this rod passes through a piece, E′, which is hinged by the pivot, *e*, to E, so that it can turn freely round, and by pressing against the nut, *d*, on the valve rod, *b*, bring out the valve, *c*, from its seat, and allow the steam to pass to the whistle, and call attention to the fact that the water is low. To the lower part of E′ a long bar F is attached, having a hollow ball, G, at its end, which floats on the surface of the water.

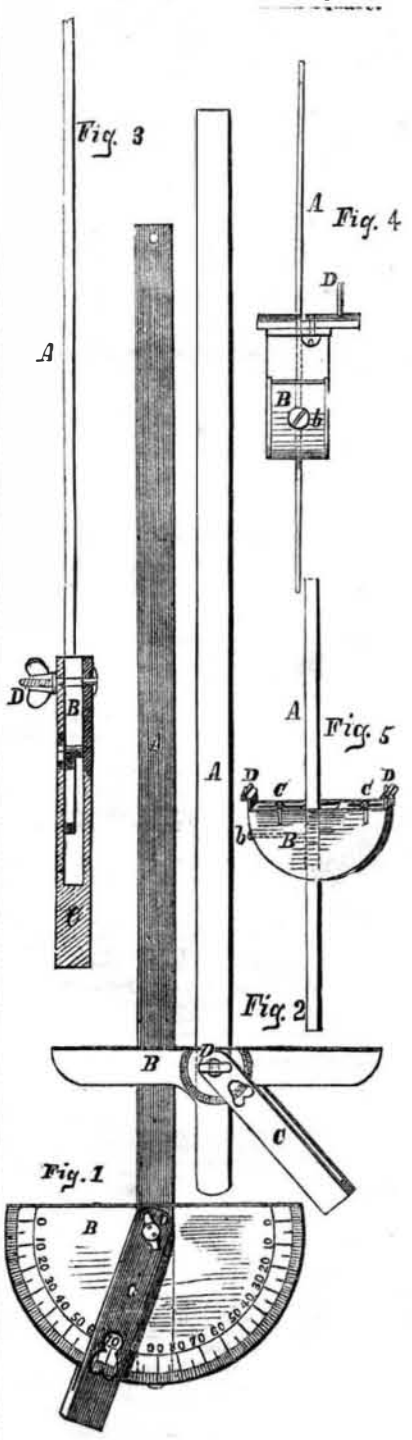
As the water rises and falls in the boiler within proper and safe limits, the ball rises and falls with the water, moving the piece, E′, upon the pivot, *e*; this piece is so shaped that the moment the water approaches the dangerous point, the weight of G and lever, H, is sufficient to force back E′ upon its pivot, *e*, and pull the valve, *c*, from its seat, thus allowing the steam a free passage to the whistle, and it will continue so to do until more water is supplied to the boiler, or the defect in the pumps, if there be one, remedied. Much of the water used for boilers contains a great quantity of solid matter, and this is liable to be deposited around, *c*, and prevent the proper action of the alarm. This has hitherto been a great defect in boiler alarms, but in this one it is provided against, by the addition of the screw, *a*, outside the boiler, so that when the stoker suspects that there is any matter collected at *c*, or at regular intervals, he can, by moving the screw, *a*, force *c* back, and either grind it in its seat, or permit the steam to blow the solid matter away. The ball and lever in the positions indicated by the dotted lines show the range which they have before operating the valve, the lowest position being that in which the ball allows steam to escape and produce a whistle.

MILLER'S BOILER ALARM.



This most valuable device, which is also an ornament to a boiler, is the invention of Alexander Miller, of Cleveland, Ohio, and was patented by him June 29, 1858. Any more particulars that may be desired can be obtained by addressing the inventor, care of Dr. Seelye, at the above place. We have seen certificates from some Steamboat Inspectors, who speak highly of the invention.

Bronson's Bevel and Radial Square.



These two inventions are designed, the one to improve and extend the use of the T-square and make it more completely the *vade mecum* of the draughtsman, and the other to provide a simple instrument by which shafts may be centered with greater facility.

Fig. 1 is a front view of the bevel square. It consists of a straight rule, A, and a semicircular head, B, the lower part of which projects slightly below A like a common square, so that it can be put against the side of a drawing board to rule horizontal lines along the side of A. A pin and nut, D, secures the piece, C, to the square; this piece has a perforation at its end, and a point which allows it to be placed at any angle, and at which it can be secured by tightening the nut, D. This piece, C, being rested against the side of the drawing board, a line at the same angle can be drawn on the paper, guiding the pencil by A, and by turning the square round to the other side of the board a line can be drawn at the same angle in a reverse position. Fig. 2 shows another square on the same principle without the extended semicircle, and with the graduations on the point where A and B join. Fig. 3 is a side view of the same.

Fig. 4 is a side view, and Fig. 5 a front view of the radial square, which is as simple as anything for the same purpose could possibly be. It is often necessary to find the center of the end of a round shaft or piece of wood to "center," as it is called, for turning, and this little instrument does it immediately. A block of wood, B, bound with brass for protection, has a piece of metal, A, passing through it, and A can be fixed in any position by a screw, *b*. Two small projecting pieces, D, are attached, so that they can slide to or from A, and be secured in any position by screws, C.

The method of using is very simple. These pieces, D, act as callipers, and being properly adjusted in relation to A, they are placed on the outside of the shaft with the flat part of A resting against the end of the shaft, a line is then drawn along A, and the whole turned into another position, the pieces, D, still being pressed against the periphery, and A still being kept flat against the end of the shaft, another line is then drawn, and the point of intersection is the center of the shaft. Its principal use, however, is the marking out the teeth of bevel gearing.

These two convenient instruments are the invention of Austin Bronson, No. 102 Elm st., New York, who may be addressed for further information.

Method of Preventing Seasickness.

Of all the ills that human flesh is heir to, there is none so nauseating and thoroughly odious as seasickness, and we have no doubt that all of our readers who have ever been afflicted with it, and again contemplate "going down to the sea in ships," will hail a preventive as a boon more highly prized than a princely diadem. An alleged preventive for seasickness, and illness arising from similar causes, has recently been patented in England by an Italian residing in France, named P. Molinari, which consists in the use of a composition prepared in the following manner :—First, soak in a pint and three-quarters of vinegar for about twelve hours, rue, ½ oz.; turmeric, ½ oz.; green husks of walnuts, ½ oz.; rocon (annatto), ½ oz.; potash, ½ oz., and a poppy head. Then boil the whole for half an hour, and strain through fine linen. Pieces of filtering paper in four or five thicknesses, measuring about ten by seven inches, are to be soaked in the solution, and when dry, sewn around the edges to pieces of some light fabric, wadding being placed between the paper and fabric (or the wadding itself may be soaked in the solution), and tapes attached to the fabric, to attach it to the person. By applying pieces of paper or wadding prepared in the above manner to the pit of the stomach, it is assumed that seasickness, and illness of an analogous character, such as that caused by the shaking of railroad cars and other carriages, will be prevented.

Wearing Apparel.

The London *Medical Times* contains an article on the above subject by Dr. Collier, who has been investigating scientifically the nature of different habiliments as agents for protecting soldiers against high heat. By placing a thin layer of white cotton over a soldier's red woolen cloth coat, exposed to the sun in India, a fall of seven degrees in its temperature soon took place, hence he recommends that the colored clothing of soldiers should be covered with white cotton cloth when they are marching in the hot sunshine. All kinds of clothing he found were capable of absorbing a quantity of moisture from the body. Woolen cloth absorbs the greatest amount, and cotton the least. From this we should conclude that cotton flannel was better than woolen flannel for under garments, an opinion quite contrary to the one generally entertained. The color of clothing has very little sensible influence in reference to the heat of the body, leaving solar heat out of the question. Black, white, red, blue and brown clothes are equally warm, their composition and texture being equal in all other respects.

Cost of Electric Light.

M. Edmond Becquerel, a French *savant*, has been recently engaged in some experiments with a view to determine the comparative cost of electricity as an illuminating agent. He used a battery of zinc and platinum, made with strict attention to economy, and the results were as follows :—

The standard is the light of 350 candles of the best quality, and the cost of

Coal gas, at $1 60 per 1000 c. feet, was	$0 35
Oil (Rape seed), at 17 cents per lb.....	0 60
Stearine candles, at 32 cents per lb.....	2 52
Wax candles, at 52 cents per lb.....	3 12
Electric light.....	0 58

Thus showing that although the electric light is cheaper than candles, it will not at present compete with coal gas, at least until some cheaper battery power be found.

LAC VARNISH.—This is made by dissolving gum lac in alcohol, or in a solution of the carbonate of soda or potash. It is easily made, and is used for many purposes. Oil varnishes are the best for coating iron utensils exposed to the weather, especially the sulphur varnish, which is exceedingly useful for farmers. These varnishes may be made of different colors by adding pigments. Verditer blue is mixed with copal varnish for polished iron work that is to be exposed to the atmosphere.