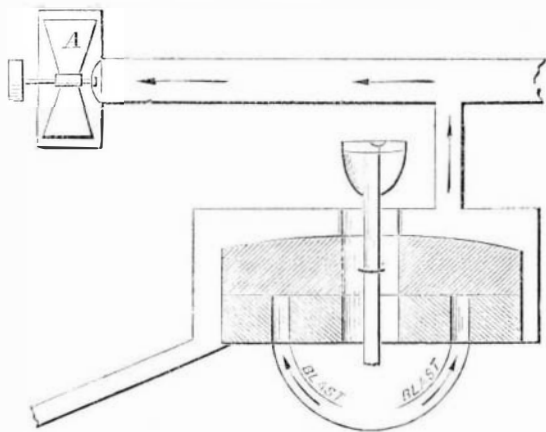


## WORKING MILLSTONES WITH AN AIR BLAST.

Extensive litigation, relating to the use of an air blast in running millstones, have, for some time, occupied a prominent position in English courts. These litigations possess little of interest to our readers, but the patented process which has given rise to the suits, has features of considerable value.

Mr. Bovill, the plaintiff in the action of *Bovill vs. Smith*, in his specification says:

"When working millstones with a blast of air I introduce a pipe to the millstone case, from a fan or other exhausting machine, so as to carry off all the warm dusty air blown through between the stones to a chamber, as hereafter described, by which the dust in the mill is avoided, and grinding improved, and this part of my invention relates only to sucking away the plenum of dusty air forced through the stones, and not to employing a sufficient exhausting power to induce a current of air between the millstones without a blast, this having been before practiced."



Mr. Bovill, in his English patent of 1846, published an arrangement for employing exhausting power to get the desired current of air through the grinding surfaces of the millstones, and at the same time avoid the inconvenience of passing the meal through the exhausting machine, and in 1846, a Mr. Debeaune registered under the Utility Designs Act, a plan of a set of millstones arranged round a central receiver, from the top of which a fan was to carry away, by exhaustion, the stive. The inconvenience sought to be avoided by Mr. Bovill's English patent of 1846 was one supposed to attend the working of Newton's earlier patent of that year, whose drawing showed the exhausting apparatus attached to the meal spout itself, so as to draw both meal and air through the grinding surfaces, and discharge both from the pan into a receiver. Mr. Bovill proposed to draw air through the grinding surfaces by exhaustion, but to avoid passing the meal through the exhausting apparatus, while Debeaune proposed to use the exhaust only to draw away the stive from the receiver, without seeking to increase the current of air between the grinding surfaces.

The defendant in *Bovill vs. Smith* used exhausting power only to draw away the stive from the millstone cases, and to blow it either into the open air, or into a non-porous stive room.

The general method in dispute is shown in the accompanying diagram, in which the stones are shown covered in, and made as near as possible air-tight, being supplied with air from the cold blast, which, when having passed through the stones, is drawn off by the extracting fan, A, thence into a small room, and into the open air.

The method has in various ways been modified and changed in its details; and so many have had a hand in its improvement that it is little wonder extensive litigation has grown out of it. In some instances both blast and exhaust fans have been employed. The air charged with flour dust is in some instances, passed through porous cloth to arrest the flour; and in other cases it is passed into a large room in which, the air emerging through ample screens with little force, the flour settles and is economized.

The advantages claimed are that the stones are kept much cooler, and thus a higher speed may be maintained, and a larger quantity of work performed; but so far as we can learn it has never been very popular in this country, although it has been tried in several large flouring establishments.

## How Dualin is Made.

Wood of soft texture (for instance, pine or poplar) is reduced to small grains, resembling sawdust, treated with diluted acids, and then boiled in a solution of soda. After having been thoroughly dried, by a quick drying process, the cellulose is mixed with—

"No. 1. Niter and nitro-glycerin; or,

"No. 2. Being first changed into nitro-cellulose, by being treated with nitric acid (48° B.) and sulphuric acid (66° B.), it is then mixed with nitro-glycerin.

"No. 3. The dried cellulose is mixed with anhydrous glycerin, until the mass becomes of the consistency of thick broth. This is gradually treated to a bath composed of a mixture of sulphuric acid (66° B.) and nitric acid (48° B.) of eight to ten times its quantity, during which process the greatest care must be taken to stir the heated mixture, and cool it. The stirring is continued for at least half an hour, after which the mixture is placed in a water bath of ten times its quantity. The acid-water being repeatedly drawn off, and replaced by pure water, the mixture is now placed in

a bath of diluted soda-lye. In this, it is stirred from one to two hours, again washed in pure water, and then rendered anhydrous by means of hot water heating, and treating it with concentrated sulphuric acid and chloride of calcium. After having been rendered anhydrous, it is mixed with cellulose, prepared by process described under No. 1, 2, or 4, until a dry and not very greasy powder is obtained. The dust is sifted out, and this, if packed into cartridges, is serviceable.

"No. 4. The cellulose is charred, finely pulverized, boiled in concentrated niter-lye, and after soda has been added, is rapidly dried, and mixed with nitro-glycerin or dualin, prepared by process No. 1, 2, or 3.

"No. 5. The process of preparing nitro-starch, another ingredient of dualin, is also new. It will prevent the formation of lumps after the starch has been subjected to the acids, and also render the dried preparation less sensitive to dampness.

"a. Starch is thoroughly dried until it assumes a yellowish-brown color. It is then finely pulverized, and mixed with anhydrous glycerin. The mass is slowly placed in a mixture of nitric acid (48° B.) and sulphuric acid (66° B.) of ten times its quantity, during which process the greatest care must again be taken to stir the mixture, and cool it. The stirring is continued for half an hour, when the mixture is placed in a water bath. The acid-water being repeatedly drawn off, and replaced by pure water, the mixture is now placed in a bath of soda-lye, then placed in another water bath, and finally rendered anhydrous by means of hot water heating, and treating it with concentrated sulphuric acid and the chloride of calcium. It is now pressed through a fine sieve, and mixed with either dried pulverized starch that has been treated with niter-lye, or it is mixed with cellulose, prepared as above described, until a dry and not very greasy powder is obtained.

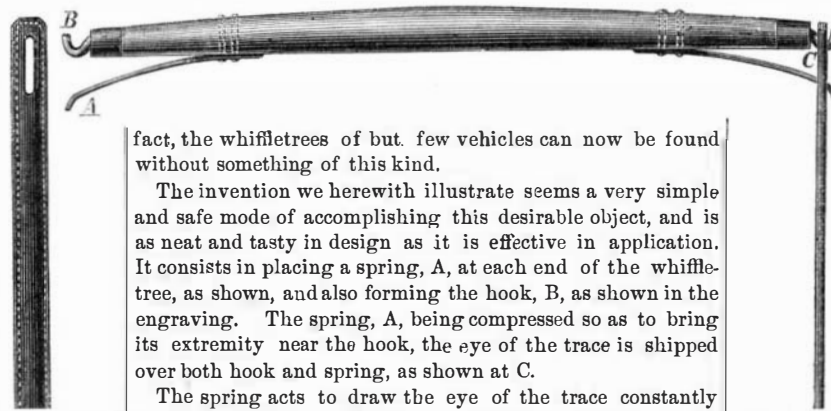
"b. After the starch has been dried, it is mixed with pulverized cellulose, or with the dualin-dust prepared by process No. 3. This mass is then placed in a mixture of nitric acid (48° B.) and sulphuric acid (66° B.), and for the rest, treated as described by process No. 5.

"No. 6. In an entirely analogous manner, mannite is mixed with anhydrous glycerin, and compounded with the other ingredients of dualin."

## WILLIAM'S IMPROVED TRACELOCK.

The detachment of a trace from the whiffletrees of carriages is an accident which has often endangered, and not unfrequently sacrificed the lives of their occupants. When the occupants have escaped without injury, many a young and promising horse has taken fright and has been ruined for life.

Many devices designed to lock traces so that they cannot become detached, unless by design, have been made, and many of them have justly attained a wide popularity. In



fact, the whiffletrees of but few vehicles can now be found without something of this kind.

The invention we herewith illustrate seems a very simple and safe mode of accomplishing this desirable object, and is as neat and tasty in design as it is effective in application. It consists in placing a spring, A, at each end of the whiffletree, as shown, and also forming the hook, B, as shown in the engraving. The spring, A, being compressed so as to bring its extremity near the hook, the eye of the trace is shipped over both hook and spring, as shown at C.

The spring acts to draw the eye of the trace constantly forward so as to prevent its disengagement from the hook except when it is compressed in the manner above described.

The device is exceedingly simple, and it will be seen is very easy to manipulate in the attachment or detachment of the traces. It deserves to become popular.

The inventor will sell either the entire patent or State rights.

Patented, through the Scientific American Patent Agency, Dec. 7, 1869, by Samuel P. Williams, of Rutland, Vt., who may be addressed for further particulars.

## J. D. MICHAEL'S PATENT EGG BOX.

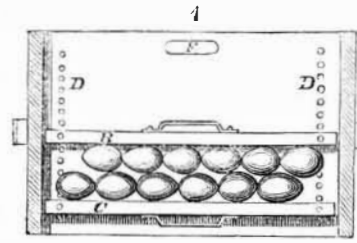
It is generally known that eggs keep much better and longer if frequently turned over, for if left lying on one side any length of time, the yolk will settle or sink until it reaches the shell; the egg is then too stale for use, and will soon be rotten. If turned over every few days, the yolk will not reach the shell so soon, and consequently the egg will keep a great deal longer.

It is a well known fact to persons conversant with natural history and the breeding of fowls, that the fowl when setting is known to turn her eggs over every day. She is taught by instinct that this is necessary. If the eggs were allowed to lie on one side during the three weeks required for hatching, the yolks would settle so that the eggs would spoil or not hatch. The heat from the fowl's body would hasten the spoiling of the eggs if they were allowed to remain in one position.

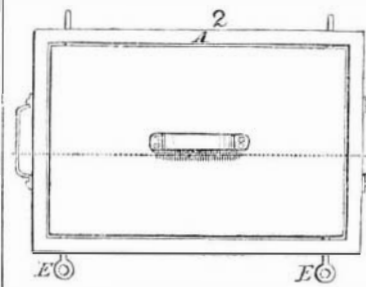
The design of this box is to provide a package for eggs, in which they can readily be turned over all together, whether the box be full or partially filled. This box would be very useful to parties who buy eggs and ship to market, also to persons who have a great many fowls, and especially useful

to retailers of eggs, and in large families. An improvement has been made in the manufacture of these boxes, which will do away with the use of the rods, and make the box simpler and cheaper. For shipping purposes they can be provided with locks to prevent pilfering, while in transit.

Fig. 1 is a side view. Fig. 2 a surface or plan view of the same. The invention consists of a case or box, A, open at top and bottom, provided



with boards, B C, arranged to be moved up and down and secured at any point within by running the rods, E, through the holes, D, and through holes bored in the ends of the boards, B C. Four iron eyes may be attached to each board, B C, to run the rods, E, through, and thus dispense with boring holes in the boards, B C. An additional board like B C, and two additional rods, E E, may be provided to be placed in the middle of large boxes to prevent breakage of eggs by accumulation of weight. Eggs for shipment should be packed with chaff or other packing to prevent breakage. Small boxes for local use need no packing.



articles.

This invention was patented through the Scientific American Patent Agency, Jan. 4, 1870, by J. D. Michael, No. 125 McElderry's Wharf, Baltimore, Md., who can be addressed for further information, rates of territory, etc.

## The Moon as a Terrestrial Motor.

The *Railroad and Travelers Journal* thus discourses:

"An ingenious civil engineer of Marseilles has discovered a mode of using the force of rising and falling tides as a motive power, and he thinks that this new motor can be made serviceable at a great distance from the sea. The name of the discoverer is Ferdinand Tommasi.

"The power of the moon's attraction has been used practically for a long time. The inhabitants of Long Island, while still colonists of Great Britain, ground their wheat and sawed their lumber by moon power. The ocean tide was suffered to fill mill ponds at flood, and the water so gathered and used to drive undershot wheels after the tide had nearly ebbed. By this process, however, only an insignificant part of the tide power was employed. On every mile of ocean coast the power of the tide is sufficient to raise ten million tons a distance of ten feet twice every day. The tidal power exerted in Delaware Bay alone would more than suffice to drive all the machinery now in use in the world. The chief difficulty in applying tide water as a mechanical motor is the want of strength in metals. If a cheap substance could be had of ten times the strength of steel this tide power could be gathered up and utilized. With such a metal a spiral spring, weighing a few hundred lbs. and wound up by the power of the tide,

might be made to propel a railway car a hundred miles by means of a system of wheels like those which are driven by the main spring of a watch. While tidal power is in amount scarcely conceivable for its vastness, it is very slow in its vertical motion, the machinery by which it can be made directly available must therefore be of great strength and dimensions. The utilizing of the tidal motor has long been a subject of study among mechanics and inventors, but the insufficiency of the strength of metals has been constantly in the way of a successful result. The same want is experienced in almost every branch of mechanical invention or improvement. The discovery of some chemical means by which the strength of steel could, without additional cost, be doubled, would realize the dreams even of those who seek the means of useful aerial navigation, and it would result in the application of steam-water and electro-magnetic power to very many new uses."

TO PREVENT THE ESCAPE OF GAS FROM INDIA-RUBBER TUBING.—India-rubber tubing is slightly permeable to gas. The amount which escapes through the walls of the tube is, however, very small; it may be advisable sometimes to render any escape impossible. This can be done by giving the tubing a thin coating of a varnish made by dissolving one part and a half of treacle and two parts of gum arabic in seven parts of white wine and three and a half parts of strong alcohol. The treacle and gum must first be dissolved in the beer or wine, and the alcohol must be added very slowly, constantly stirring the mixture, or the gum will be thrown down.

A PATENTEE, whose business had been conducted through this office, says: "I believe I have made enough from the few lines notice of my invention, printed in the *SCIENTIFIC AMERICAN*, to pay the cost of my patent."