# Science and Art.

### Tanning Cotton and Wheel Hubs.

In a letter received from Mr. C. B. Stewart, of Danville, Tex., he states that the durability of cotton cloth is greatly increased by being impregnated with tannin. He has tanned cotton cloth for bags, saddle girths, and negro clothing, and found that it lasted much longer than when untanned. The hubs of wheels and axe handles, he also states, are frequently submitted to the tan liquor at the South, and with good results, their durability being promoted by such treatment. He suggests the application of tannin to all cotton fabrics exposed to the weather, such as awnings, the sails of boats, &c.

Many of our coasting schooners and sloops, we observe, now use sails tanned with oak bark. They last three times longer, at least, than sail cloth not treated with tannin or some other antiseptic agent.

### The Divining Rod a Deception.

The editor of the Saint Croix *Union*, published at Stillwater, Minn., says:—"The divining rod is an arrant humbug, and those using it, pretending that there is in the rod a mysterious and unaccountable virtue, are also humbugs. We know what we say, and intend it, too. Not only will a twig of a sweet apple tree point downwards in our hands, but a bifurcated twig of almost any tree will. We can take a twig of a willow, or an oak, or hickory, or anything, and hold it in our hands and make it turn forty ways for Sunday. It isn't a stream of water beneath us that does it, either, for we can make it point to a heap of ashes, or rock as hard as a nether millstone. It makes no difference.

. . . . We don't deny that water has been frequently found exactly beneath the spot indicated by the divining rod; this has happened in our case more than once, but it is just as true also that, in numberless other cases that have come under our observation, men have dug long—dug deep—and spent stacks of money by digging where these aforesaid mysterious rods have pointed, and found no water."

### Improved Grist Mill Feeder.

Since large stones, driven by power, at a very high velocity, have, in civilized countries, been employed as substitutes for the small hand-mills still in use in the Eastern countries, and from which we may suppose the hint was derived, more or less difficulty has been found in feeding in the grain uniformly, and in preventing the eye or central hole in the running stone from becoming clogged. The great centrifugal force sometimes induces the grain to accumulate against the sides, and, in most cases, the more or less complex devices employed to shake in the grain, are but poor approximations to a uniform feed.

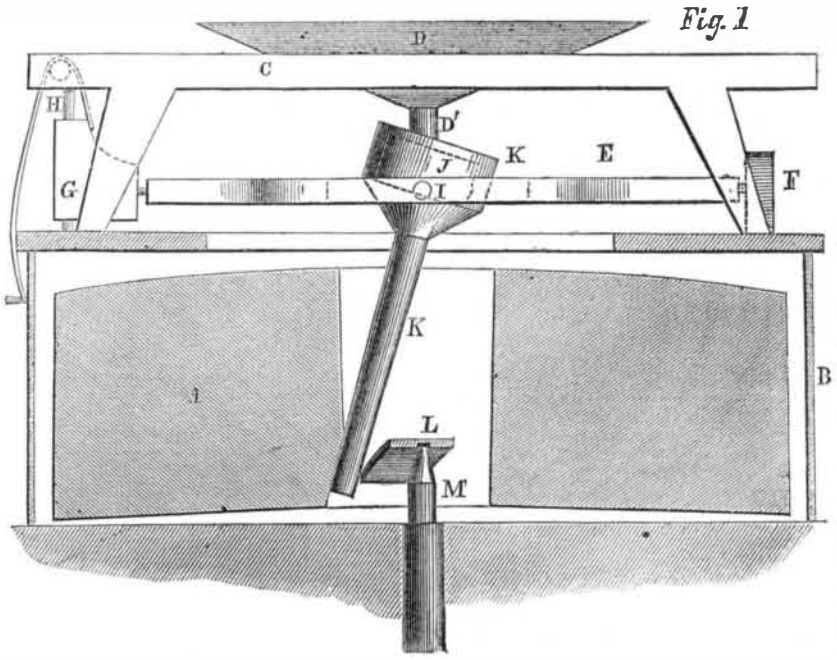
The mill here represented is the subject of two patents, granted to Messrs. M. and C. Painter, of Owing's Mills, Maryland, the first on June 2nd, 1855, and the other on July 1st, 1856. Both are here represented quite clearly. Each figure is a vertical section, the plane of section in Fig. 2 being taken at right angles to that in Fig. 1. A is the upper or runner stone. C is a frame which serves to support the hopper D. D′ is a tube leading down from D, and extending a short depth into the cup J. Neglecting for a moment the action of this cup, which forms the subject of the second patent, we will describe the feeding-tube. M is the upper extremity of the driving-shaft. L is the bail which enables M to support the weight of A. The ordinary driver is employed to transmit the motion of M to A, but is not represented, as it might complicate and confuse the drawing. K is the feeding-tube, which is expanded at the top to form a large cup E, and is supported by pivots I, in an opening in the bar E. The pivots I, allow a swinging of K in one direction, and the bar E, being free to rotate on the pivots F and G, allows it to swing in the other direction, so that it is, in effect, mounted on a universal joint, and swings freely around, but without turning on its axis, as the mill-stone revolves.

J is a cup suspended by wires or slight transverse rods in the centre of E. When in action, it is always filled with grain, and by its swaying alternately in every direction while the tube D′ is stationary, compels a portion of the grain to be continuously pushed over its edge. So long as any grain remains in D, it will be continually supplied through the tube D′, and fed uniformly over the edge of J, at a rate corresponding exactly with the revolutions of A.

The pivot F is supported on a fixed standard,

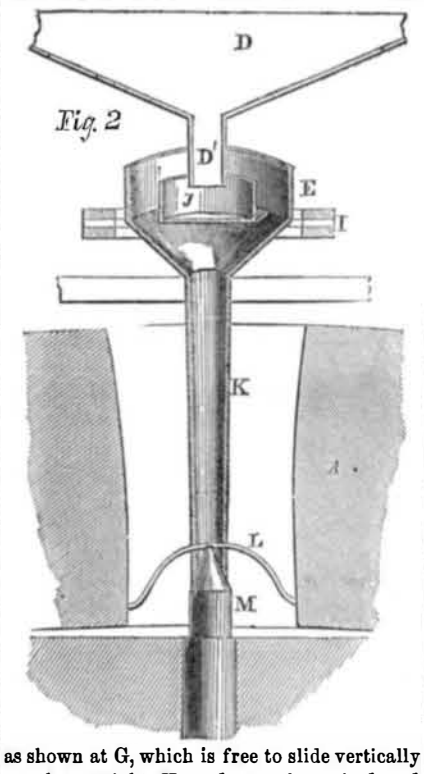
## PAINTER'S GRIST MILL FEEDER.

*Fig. 1*




as represented, but the pivot at the other xtremity of the bar E is carried in a block

*Fig. 2*



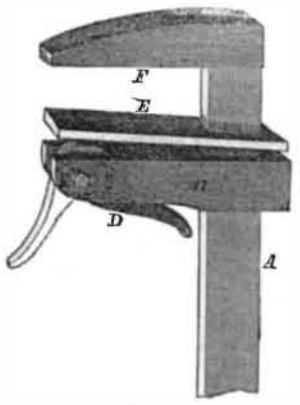

as shown at G, which is free to slide vertically on the upright H, and may be raised and lowered thereon by the aid of a strap, passing over a pulley, and attached to a pin below. By raising or lowering G, the rocking bar E and its attachments are correspondingly affected; and the action of the parts D′ J modified so as to vary the speed at pleasure. This feeder has been thoroughly tried for more than a year past, and will feed with the utmost regularity and precision not only grain of all kinds, but any material however fine, and as it carries down the matter and distributes it evenly around in the bed stone at the verge of the eye, there is no possibility of clogging, and the stone may be run at any speed whatever. The faster they run, the greater the certainty of discharging regularly, as both gravity and centrifugal force carry down the material. The shoe and damsel are entirely dispensed with, and the cost of the apparatus is less than that of the article named. It is exceedingly simple and durable. The inventors believe that no other contrivance has been found so well to surmount all the difficulties at a high speed without interfering with a proper ventilation in the eye of the stone, which latter point is a great desideratum in the manufacture of good flour. The apparatus can be applied to old burrs with ordinary fixtures, in the space of an hour's time, merely by substitution.

For further information, the patentees may be addressed—M. & C. Painter, Owing's Mills, Maryland.

### Gibbs' Universal Adjustable Clamp.

The accompanying figure represents one of those useful devices—an adjustable clamp—so convenient for workers in wood, such as carpenters, and cabinet-makers, for holding planks, boards and other stuffs to be operated upon.

A is the shank, B is the lower sliding jaw, and F the upper stationary jaw, firmly secured




to or forming part of the shank; E is a sliding plate, through which the shank passes. D is a lever, with its end formed with a cam head, placed in a slot in jaw B, and working on a pivot C. The shank A may be made of any length desirable, so that the space between the upper jaw and the plate E may be enlarged or diminished, according to the thickness of stuff to be clamped, and held fast between them.

When stuff is to be taken out or put in the clamp, the lever D is turned in the position represented by the dotted lines; which allows plate E to lie close and flat on the lower jaw or slide rest B. When stuff is to be secured in the clamp, the lever D is turned down as shown, and the cam head then forces the plate E against the stuff and holds it firmly between the plate and jaw F. The sliding plate E presses evenly against the board, and holds it accurately in place, without making an indent, or exerting unequal pressure on it. It is an excellent clamp for cabinet-makers and joiners, also for numerous other purposes, as it can be operated so easily and fastened and unfastened readily, and can be used in the reverse, or the position represented.

A patent was granted for it on the 17th of February last to J. E. A. Gibbs.

For more information, see advertisement on another page, or address Mr. Gibbs, at 702 Chestnut st., Philadelphia, or J. H. Ruckman, of Mill Point, Va.

### Experiments with Breech Loading Rifles.

Telegraphic reports to this city give an account of a trial with breech-loading rifles, which took place at the United States Arsenal, Washington, D. C., on the 24th inst., before the Secretaries of War and the Navy, and a large company of spectators. The following war implements were entered for competition: Colt's rifle carbine and pistol, distance one, two, and four hundred yards; Sharp's rifle and carbine, same distance; Burnsides' "Rhode Island" rifle, same distance; Merills' "Baltimore" rifle and carbine, same distance.

The result of the test applied is not yet ascertained in detail. At one hundred yards, Sharp's rifle proved the most accurate, though there was a spirited contest with Colt's and Burnsides'. At three hundred yards the contest was nearly equal, Sharp's missing once. At four hundred and five hundred yards, Colt's rifle won the day. Burnsides' carbine beat Sharp's at five hundred yards, the latter hitting the target only once in five shots.

The Secretary of the Navy made some excellent shots with Colt's pistols at one hundred yards. Why one rifle was most accurate in aim at one hundred yards and least accurate at five hundred yards has not been made public. There must be a reason for this contradictory action in its performance.

### American Salt.

The annual salt product of the United States amounts to 12,370,000 bushels. New York is the greatest producer, her amount being 6,000,000 bushels; Virginia next, her product being 3,500,000 bushels. In eleven States the manufacture of salt is carried on, the great sources of supply being salt brine obtained from deep wells far removed from the ocean.