

Improved Automatic Taper Lathe.

The rapidity with which many kinds of wood turning can be done by the automatic machinery now so extensively used for this purpose is somewhat surprising, the patentees of the lathe represented in the accompanying engraving, claiming to turn at the rate of from 1,000 to 2,000 running feet per hour.

The power is applied on the cone pulley, A, into which is screwed the cutting head having cutters running in the shavings box, B. The cutter head and cone form a hollow mandrel. A belt, C, leads from a pulley on the cone arbor to the shaft under the bed of the lathe, thus giving motion to the feed cone, D, and saw shaft, E. In turning handles—broom handles for instance—the sawed stuff is piled upon the rack, F, when a cam draws forward the frame, and the saw cuts off the sticks to the required length, while, at the same time, a gimlet at each end bores holes through the sticks. The frame then recedes and the mallet, G, operated by a cam, strikes the lower stick, driving it into the feed rollers, H, which are fluted, and draw the stick into the hollow mandrel, whence it passes, after being turned, to a second set of rollers, I. The rollers are adjusted to the size of the stock to be turned by set screws. The taper, swell, or other irregularity on the work is given by a pattern cam operating the upright lever, J, which actuates the ring case that governs vibrating arms in the cutter head. The connecting rod, K, through which the mallet, G, is operated, is coupled so as to be adjusted to any required length of stuff, and the foot of the lever which holds the mallet can also be moved as aid to the same result.

The regular size of the lathe turns from five-eighths of an inch to one and a half inches diameter. By having extra heads this limit may be greatly increased. The manufacturers say that one man, with this machine, can do at least the work of four men with the ordinary lathes. It is capable of turning nearly all sorts of handles, chair stuff, billiard cues, map rollers, etc., giving the work an excellent finish.

Patented April 17, 1866. All communications relative to this latter should be addressed to Finley & Co., Geneseo, N. Y.

Picric Acid and Its Properties.

In a lecture delivered before the Society for the Encouragement of National Industry in France, Dr. Calvert, F. R. S., spoke of a curious application which has been made of the explosive property of its salts. During these last few years, the picrate of potassium has been employed in great quantities by Mr. J. Whitworth, for charging the bombs for destroying the iron plating of ships. When the projectiles thus prepared strike the iron masses, the enormous propelling force with which they are expelled from the gun is instantaneously converted into heat, and to such an extent that the ball becomes red hot, the heat decomposes the picrate of potash, and a violent explosion ensues, owing to the enormous quantities of vapors and gases which are thus produced in an instant of time.

Whilst the alkaline picrates are endowed with such formidable properties, they also possess others which are useful for the alleviation of human misery. Picric acid is an efficacious remedy in intermittent fevers. Persons affected with such types of fever, upon whom quinine has lost all its beneficial effects by continuous usage of it—and this is the case with some of our soldiers who return from India—derive, I am glad to say, wonderful benefit from the use of picric acid and picrates, as Dr. Aspland has proved to be the case at the military hospital at Dukinfield. The knowledge of this fact may be useful in districts in which poor populations exist, for it affords them a cheap febrifuge; and, moreover, picric acid is not dangerous, as arsenical preparations are, nor does it derange the stomach like quinine.

Diffusion.

Some very elegant and simple methods of exhibiting the phenomena of diffusion are given by Herr Merz in a recent number of the *Journal für Praktische Chemie*. A portion of the shell of an egg having been removed by the action of hydrochloric acid, leaving the membrane exposed, the egg is to be suspended in water from the arm of a balance, a counterpoise being placed in the opposite scale. In about half an hour the weight of the egg has sensibly increased, as the position of the balance beam will show, in consequence of the passage of water through the membrane. If, now, alcohol be substituted for the water, and the weights readjusted, so as to bring the beam horizontal, it will soon commence to move in the opposite direction, showing that the egg has become lighter by the diffusion of water into the alcohol. The diffusion of vapor may be exhibited by tying a diaphragm of India rubber—a portion of a small toy balloon will answer the purpose—over the mouth of a funnel, the other end being in communication, by means of an elastic tube, with a vessel of water. The funnel being inverted over a dish containing

ether, which, however, the diaphragm is not to touch, the vapor of this fluid will pass rapidly into the funnel, the air being observed to escape in bubbles in the water at the small end. Remove now the vessel of ether, and the operation will be reversed, the vapor passing through the diaphragm into the atmosphere. In order to fill the vacuum thus created, the water will rise in the tube, the lower part of which should be of glass, to render this apparent, and the diaphragm will

of an ordinary clutch which necessitates such a jar and jolt to the driving power as seriously to interfere with the equal action of the machine. The clutch is at any time and under any circumstances a very poor mechanical contrivance, and its use is avoided, as much as possible, by mechanics.

The engravings accompanying this article show a prospective view of one of Wilder's Patent Punching Presses of the smallest size, without gearing, and a vertical section of the upper or working part. Fig. 1 is the perspective, and Fig. 2 the sectional view. Mechanical perfection is not to be expected, but this machine seems to be capable of no very radical improvement. It is so designed that any size of press required can be made without any considerable change in the construction of the parts.

Fig. 1 is a perspective of the press, which, it will be seen, is of pleasing proportions. The power is applied to the wheel by means of a belt, and actuates the plunger in the usual manner, by cam or eccentric. The stop motion is very simple and smooth in its action. It is a sliding bar, A, at the top of the machine—seen drawn on a larger scale in the vertical section, Fig. 2—carrying a dog, which, when the plunger is at work, locks into a mortise in the revolving disk, B, Fig. 1. This stop motion adds no strain to the press when the machine is working, the strain or wear being no more than if there was no stop motion attached. It is held in a locked position by the foot on the treadle, C, and so long as the treadle is pressed down the press will operate, but if the foot be removed

the plunger will instantly stop and always in the highest position, an advantage of no little moment, as all machinists know. By removing the foot from the treadle as soon as the plunger begins its downward movement, it will make but one stroke and will be unlocked by the dogs, D, Fig. 2, on the shaft and slide. The length of stroke is adjusted by the horizontal worm shaft seen on the front of the machine, and the stroke may be lengthened or shortened when the press is in motion as well as when at rest.

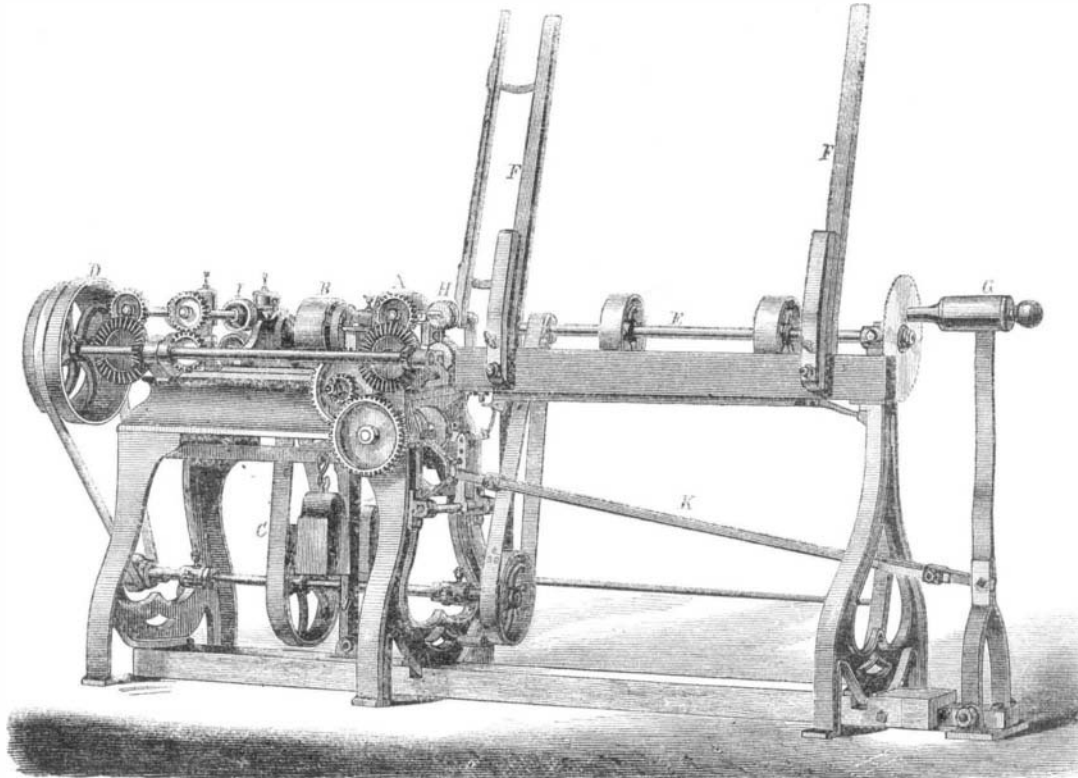
Patented May 28th, 1867. G. & C. Place, 222 Pearl street, New York city, are the agents for this press. Communications respecting the machine should be addressed as above, or to Moses G. Wilder, patentee, West Meriden, Conn.

Artificial Meerschaum.

Vegetable ivory has long been known, but vegetable meerschaum, vegetable horn, or vegetable coral, as they may with strict propriety be called, are late acquisitions, brought before the public for the first time during the late Exposition. The mode of preparation of these substances is as follows: Common potatoes are peeled and macerated for about thirty-six hours in water acidulated with eight per cent of sulphuric acid. After this operation they are dried in blotting paper, and then in hot sand for several days on plates of chalk or plaster of Paris which are changed daily; being compressed at the same time, an excellent imitation of meerschaum, answering well for the carver, or any purpose not requiring a high temperature, will be obtained. Greater hardness, whiteness and elasticity will be produced, if water containing three per cent of soda, instead of eight per cent sulphuric acid is used. And if, after the potatoes have been macerated in the solution of soda, they are boiled in a solution containing nineteen per cent soda, a substance resembling stag's horn, and which may be used for knife handles, etc., will be formed. Turnips may be used instead of potatoes in the production of the artificial horn; and if carrots are substituted for the potatoes, a very excellent artificial coral will be obtained.

NEW METEOROLOGICAL INSTRUMENT.—Prof. De la Rive, of Geneva, has contrived an instrument for measuring the transparency of the atmosphere. The inventor agrees with Pasteur, who supposes that the light dry fog which under certain conditions of the air intercepts the light, is caused by myriads of organic germs floating near the earth, which are washed to the earth by the heavy rains, or are destroyed by severe frosts, thus accounting for the clearness of the atmosphere at these times. Convinced of the truth of these statements, a determination of the state of the air, it seems, would be of benefit in a sanitary point of view; hence the value of this invention. A complete description of the instrument has not fallen under our notice, but it principally consists of a double telescope with a single eye piece, by which two objects at known distances may be compared, and thus the transparency of a measured stratum of air is directly determined.

INCOMBUSTIBLE CLOTHING FOR WOMEN.—It is stated that no ballet dancer of the Queen's Theater, London, is allowed to dance in garments that have not been saturated with a solution of tungstate of soda. This mineral is now extensively used in the laundries of London. It prevents the fabrics with which it is incorporated from blazing, and does not impair the colors or appearance



WEST'S PATENT LATHE FOR TURNING UNEQUAL DIAMETERS.

be curved inwards. These experiments are particularly instructive, and are within the reach of every one. The balance may be extemporized by means of a light bar of wood.

WILDER'S PATENT PUNCHING PRESS.

The power press has become a common tool in our machine shops. As usually built it has serious objections. It is used

Fig. 1

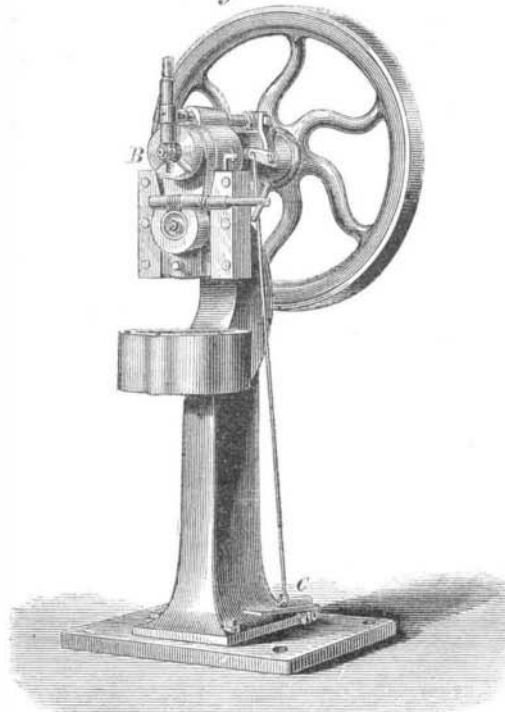
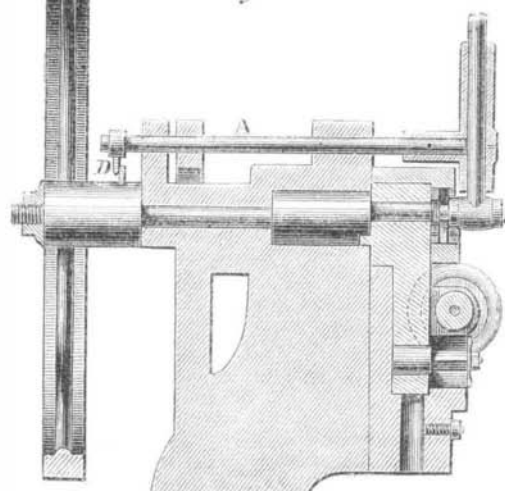


Fig. 2



not only for perforating sheet metals, but latterly for finishing the surfaces of forged pieces to give a better surface and diminish the amount of hand work necessary to produce a good finish. The common power press is actuated by means