HOW TO MAKE A MUSHROOM BED.

Previous to making beds (for they may be made at any season of the year), collect a quantity of fresh horse manure that has not been exposed to wet or fermentation; clear it of long straw, so as to leave all the short that has been trodden into the wet interstices of the stable floor, partially dry it, either in a shed, or under a tree; turn it over once or twice till it is half dry; to this add one-fourth of light turf, cut fresh from a pasture field, chopped small with a spade but not sifted; a few decaying oak or beach leaves, and a small portion of sheep manure, mix the whole well together and throw them in a heap till they begin to sweat, then take and spread a layer of the mixture four inches thick on the place where they are intended to be grown, and beat it down firmly with a mallet, and continue this until the bed is not less than a foot thick; should it heat so that there is danger of rotting, make a few holes in the bed with a dibble; of this, however, there is little fear, if the manure and soil have been properly dried. After the heat begins to subside the spawn is to be put in, making holes about nine inches apart, and putting pieces of the spawn about three or four inches square in them, leaving the holes open at the top to allow the steam, if any, to escape; about a fortnight after the spawn has been put in, the holes should be again spawned, in case the first should have received any injury, and also to prolong the bearing of the bed; close them firmly up as soon as the spawn has run through the bed, which can easily be known by examination; the bed is to be covered over with dry soil from a pasture field or common, and firmly pressed, but not beaten, as that would break the threads of spawn, which are fast approaching the state of mushrooms.

Mushrooms are impatient of wet; therefore, wherever they are grown, it is indispensable that they should have a dry bottom; when the beds are in want of water, the best plan is to give them a moderate watering at once, in preference to many light waterings; the water should be warm, and though the crop should be destroyed, they will spring up in a few days with renewed vigor. Mushrooms may be grown in any place that is dry—in a shed, or a stable, in a box, or a drawer; and in either case the process is the same. Covering the beds is injurious, and should not be adopted except in severe weather, or in old beds where the heat is decayed.

Mushrooms are impatient of the extremes either of heat or cold; the proper temperature is from 55° to 60°, and where this cannot be steadily maintained by some means or other, the cultivation of them in the winter season should not be attempted.

The beds made in the manner herein described will be firm, yet elastic, and if the manure has been properly dried there will be little fear of its overheating at the same time its decomposition will be prevented, and that mild heat so congenial to the mushroom will be prolonged. The plentiful use of earth, moreover, will tend to give it that firmness of flesh and fineness of flavor which we seek for in vain in mushrooms grown in the dark.

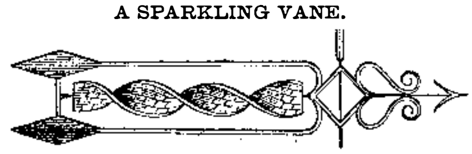
The principal requisites for the successful culture of the mushroom may be thus defined:—never allow the manure to get wet or to ferment, keep a regular heat, and avoid all damp; these, with a moderate share of attention, will ensure a moderate crop of good mushrooms.—*Florist.*

A WONDERFUL CAVE.

MESSRS. EDITORS:—Near the village of Decorah, in Winneshiek county, Iowa, there is a cave which is a great curiosity. It is situated directly opposite the above-named town, on the north side of the upper Iowa river; the entrance to it being about 150 feet above the river. The great peculiarity of this cave is its natural ice-house. The ice commences to form as the weather grows warm from early spring, and continues until the close of summer, advancing in thickness as the heat of the season increases. As the cold comes on in the Fall, the ice begins to decrease; and the colder the weather, the faster does the ice go away. This is the general report of all those who have visited the cave for years back, both in summer and winter. I intend to visit this cave as often as once in two weeks, and report the facts as I find them from time to time. To-day (Feb. 28, 1860) I have made my first *winter* visit, and the following is a correct account of my trip:—A friend and I started at 11 o'clock A. M., and the distance being short, we soon arrived at the foot of the bluff and commenced our ascent. After falling down, scratching our hands on the prickly ash, bruising our shins on the small pieces of rock, pulling ourselves along and up by the little brush, we arrived at the mouth of the cave (which is wide enough for two or three to enter abreast). We then commenced our descent at an angle of about 45°; but we soon had to "single out," as the space grew narrow. Going down this way for about 20 feet, we come to a level spot where a fire had recently been made by some previous explorer, as indicated by the ashes, &c. At this place the main part of the cave leads to the right: at the left there is an opening as large as the main trunk, but it only extends a short distance, runs very high, and has a hole out at the top about as large as a nail keg, some 50 feet up the bluff, which, I suppose answered for a chimney to those who had built the fire. Leaving this place, we went on, sometimes erect, then stooping and crawling, as occasion required, until we came to the end; this being about 200 feet (as near as I could judge) from where we entered; finding no ice or water, the walls were perfectly dry all the way. Now, for the first time, we examined our thermometer, which stood at 36° above zero. After halting until we satisfied ourselves that the thermometer did not vary from the above, we started on our return, stopping at intervals to see if the temperature varied. When we came near the mouth of the cave, the thermometer fell to 34°, then 32°; and, on arriving out in the open air, it settled to only 28° above zero, where it remained. At *this* season of the year, I certainly expected to find ice; as I have seen it 10 inches thick on the walls of this cave in the month of July. J. W. H.

Decorah, Iowa, Feb. 28, 1860.

A SPARKLING VANE.



A very curious and elegant vane for spires may be made, by placing in the center, a spiral or twisted spindle, as shown in the above cut. This spindle should be hung on delicate pivots, and the spaces between the spiral flanches nearly covered with small pieces of looking-glass or thin plates of mica. The least breeze will put it in motion, and as the reflectors will assume every possible position, several of them will be sure to present the reflection of the sun at every revolution, from whatever point it may be viewed, thus producing a constant and very brilliant sparkling.

PHILOSOPHICAL INSTRUMENTS.

At a late meeting of the London Association of Foreman Engineers, Mr. Bickley gave an explanation of several scientific instruments used at the famous Kew Observatory. The *anemometer* employed in measuring the velocity and force of the wind consists of an upright hollow column which supports four arms, each terminating in a hemispherical cup. The arms are united at the center by a socket, and this moves freely over the neck of the column. The wind impinges upon the insides of the cups, and naturally a rotatory motion is given to the arms of the anemometer. A rod connected with the arms, and passing through the column, gives motion to the self-registering machinery below. Every caution to avoid friction is taken. Hence the force and direction of the currents of air passing over the observatory are accurately recorded. The anemometer at Kew is never at rest, there is no such thing as a calm in that locality; and, on one occasion lately, the wind swept over at the rate of 960 miles in 24 hours, or 40 miles an hour. Barometers, thermometers and other instruments are tested at Kew, and sent forth with a warrant of accuracy stamped upon them (when found correct) in the form of the initials "K. O." A very well-made model of an ingenious machine, in use at Kew for measuring the magnetic forces, horizontal and vertical, was explained to the above meeting, and much curious information respecting the extraordinary variations of the magnetic needle was given. This machine registers any fluctuation of the magnetic forces, and some photographic copies of magnetic registers gave evidence of the eccentric nature of those fluctuations. The aurora borealis is one of the greatest disturbers of the magnet.

THE WATER WHEEL EXPERIMENTS AT PHILADELPHIA.

MESSRS. EDITORS:—On page 168 of the present volume of the SCIENTIFIC AMERICAN, in your comments on turbine water wheels, you say. "And if we are correctly informed in regard to the results of experiments at the Philadelphia Water-works, there would seem to be yet wide room for improvement in this department; the best turbines yielding only some 60 per cent of power expended, instead of 80 to 90, as has been heretofore claimed." Your information on this subject is not well founded. The results of our experiments vary from 54 to 87 77-100 per cent, the last being the highest result yet obtained. The center vent wheels all being the lowest in per-centage, they varying from 54 to 61 per cent. The Parker wheel (75 63-100) and the Jonval turbine being the highest, three of them—made by different makers—have produced 76, 82 and 87 77-100 per cent respectively. The Tyler wheel produced 71 per cent, and the Blake wheel nearly 72 per cent. Our experiments have been conducted on the most accurate principles possible, and have been very interesting to the chief engineer and the committee. And I am pleased to say that the wheel-men who have participated in the tests are unanimous in their praise of the tests, and the impartial manner which they are conducted (with but one exception, only, I believe), and if we were disposed to continue the experiments, our apparatus would be occupied for a year longer; but we will be compelled to close the experiments as soon as a few more wheels are tested that are now here waiting. As soon as the tests are closed, the chief engineer will furnish you with the results in tabular form, with a description of each wheel, &c., which will be more full and complete than has ever been published in this or any other country.

O. H. P. PARKER,
Chairman of Committee

Philadelphia, Pa., March 17, 1860.

FAWKES' STEAM PLOW.

Mr. Fawkes, the inventor of the steam plow, has just received the large gold medal awarded to him by the United States Agricultural Society, through the President of the United States, accompanied with the following appropriate letter:—

WASHINGTON, Jan. 25, 1860.

My Dear Sir: I have been requested by the "United States Agricultural Society" to present you the "Grand Gold Medal" awarded to you by the society, at Chicago, in September last. A more agreeable duty could not have been confided to me. The pleasure is enhanced by the consideration that we are both citizens of the good old county of Lancaster. You may feel justly proud of your invention. Whilst those who have made improvements on deadly weapons for the destruction of the human race are receiving honors and rewards from governments, your's has been the far more important and useful task of improving the plow for the benefit of agriculture, and your recompense will consist in the approbation of your countrymen, and the consciousness that you have conferred an important benefit upon mankind.

Your's, very respectfully,
JAMES BUCHANAN.

J. W. FAWKES, ESQ.

The medal is of pure gold, 3 inches in diameter, and nearly a quarter of an inch thick. Its value is estimated at $300.

One of Mr. Fawkes' plows is now being constructed by Miles Greenwood, of Cincinnati, in which several improvements will be introduced, making the machine much lighter without diminishing its power.

RESTORING DAMAGED VELVET.—The *Monitor de la Salud* publishes the following method of restoring velvet to its original condition. It is well-known that when velvet has been wet, not only its appearance is spoiled, but it becomes hard and knotty. To restore its original softness, it must be thoroughly damped on the wrong side, and then held over a very hot iron, care being taken not to let it touch the latter. In a short time the velvet becomes, as it were, new again. The theory of this is very simple. The heat of the iron evaporates the water through the tissue, and forces the vapor out at the upper side; this vapor passing between the different fibers, separates those which adhered together in hard bunches. If the velvet were ironed after damping, an exactly opposite result would be obtained; it is, therefore, necessary that the substance should not come in contact with the heated iron.