

back side, which device has been abandoned more to facilitate turning larger objects over the rest carriage than for any faults it possessed in its adjustment.

The common ring around a tool-post with steps or notches has been very extensively used, and answers a good purpose, though not perfectly adjustable. But among all the valuable improvements I think there is none so simple and entirely practicable as the adjustment which we use, and which was invented by our foreman, J. Q. A. Brown; it is simply two rings or circular inclined-planes, each having a thick and thin edge, with the common tool-post in the center; these rings are made of wrought-iron, case-hardened, and are milled on their outer surfaces so that the workmen can turn them easily with their fingers. By placing the thin edge of one and the thick edge of the other together the upper surface is level, but by placing the two thick edges together, the greatest angle is obtained, and any intermediate angle is obtained to the slightest degree by turning one or both of the rings, as the case may require.

In a recent visit to several European machine-shops I was greatly surprised to find little or no attention paid to the subject in question, though they universally use gib rests. In fact, the English—who are the leaders in tool-building in Europe—are far behind the Americans in practical conveniences about tools and labor-saving machinery, though they do excel in massive and expensive tools, which our people are beginning to appreciate.

As I understand one of the aims of your valuable journal is to diffuse a knowledge of the mechanic arts, with all past and present inventions, I have ventured thus to advance the foregoing remarks, hoping that they may interest many of your readers and "draw out" some other communications on the subject, thus helping forward still greater improvements in the construction of machine tools.

WM. B. BEMENT

Philadelphia, Pa., August 22, 1859.

RAIN AT DIFFERENT ELEVATIONS.

MESSEURS. EDITORS:—There is one remarkable fact connected with the fall of rain, which has never yet received satisfactory explanation. Over any given spot more rain falls at the surface of the earth than above it. Herberden made some experiments to explain the fact, in the following manner: he fixed a rain-gage on the square part of the roof of Westminster Abbey (away from the western towers, which might have obstructed the clouds), another on the roof of a neighboring house, and a third on the ground, in the garden of the same. The number of inches of rain caught on the Abbey roof was 12, on the house-top, 18, and in the garden, 22. The illustrious French astronomer, Arago, has for many years noticed the fall of rain, at different heights, at the Observatory of Paris, and his results (with which hundreds of others agree) are like those of Herberden. It is well-known that the quantity of rain which falls at the foot of a mountain is considerably larger than that deposited on the summit of it. Many explanations have been offered of this most curious fact, but none to which the scientific have given sanction. My own explanation of the phenomena is that the rain, in falling, condenses vapor in the whole way of its descent to the ground, and must, therefore, convert a greater amount of it into water at the surface of the earth than at any altitude above it.

H. B. LIVINGSTON.

Laurens, N. Y., August 18, 1859.

MINERALS IN SOUTH-EASTERN MISSOURI.

A correspondent—F. Woolford, of Paton, Mo.—who seems to be fully posted in the manufacture of pottery and porcelain, sends us a description of the minerals of the south-eastern portion of his State, which he has evidently explored very thoroughly. He informs us that, in addition to iron, marble is plentiful in Bollinger and the adjoining counties, and cobalt, nickel, bismuth and antimony have been found, with silver in small quantities and in crystals. But more valuable than these are the kaolin or china clay deposits, which are found on the eastern spurs of the Ozark Mountains, about 14 feet below the surface, and is overlaid with a strata of red friable micaceous rock, resembling gneiss. In some places it is entirely decomposed, and in others it has the external form of feldspar, and is of good quality, being free from iron and other impurities. It is well

adapted to the manufacture of porcelain, iron-stone china, and other wares. There is an extensive mine of pipe or ball clay, free from iron, and which burns very white in the kiln. It will admit of from 20 to 30 per cent. of silex to make a good pottery. There is also an abundance of fine quartz sand, suitable for glass and glazes for the earthenware; and there is a fine clay in the neighborhood which makes excellent fire-bricks, seggurs, glass-pots, and the like. If coal could be found in this region (which, from its granite character, we do not think likely), it would immediately become the Staffordshire of America; but until cheap and easy means are found for the fuel, we are afraid these valuable resources must lie dormant, and not realize the sanguine anticipations of our correspondent.

WEAR OF BOILERS.

MESSEURS. EDITORS:—There is one fact in regard to the wear of ordinary flue boilers which I do not remember to have seen in your journal; it is this, the corrosions of the plates exposed to the fire takes place just at the edge of the overlapping sheet, and the space does not exceed an inch in width, and expands around the boiler, to the water line on either side. I have an old boiler which at this point is not thicker than sheet iron, while the remainder of the sheet is almost as good as new; the furrow is as distinct as if cut with a cold chisel. This matter is worth investigating.

T. LEE.

Central College, Ohio, August 20, 1859.

HOW TO FATTEN CHICKENS.

It is hopeless to attempt to fatten chickens while they are at liberty. They must be put in a proper coop; and this, like most other poultry appurtenances, need not be expensive. To fatten twelve fowls, a coop must be three feet long, eighteen inches high, and eighteen inches deep, made entirely of bars. No part of it solid—neither top, side nor bottom. Discretion must be used according to the sizes of the chickens put up. They do not want room; indeed, the closer they are the better—provided they can all stand up at the same time. Care must be taken to put up such as have been accustomed to be together, or they will fight. If one is quarrelsome, it is better to remove it at once; as, like other bad examples, it soon finds imitators. A diseased chicken should not be put up.

The food should be ground oats, and may either be put in a trough or on a flat board running along the front of the coop. It may be mixed with water or milk; the latter is better. It should be well slaked, forming a pulp as loose as can be, provided it does not run off the board. They must be well fed three or four times a day—the first time as soon after daybreak as possible or convenient, and then at intervals of four hours. Each meal should be as much and no more than they can eat up clean. When they have done feeding, the board should be wiped, and some gravel may be spread. It causes them to feed and thrive.

After a fortnight of this treatment, you will have good fat fowls. If, however, there are but four to six to be fattened, they must not have so much room as though there were twelve. Nothing is easier than to allot them the proper space; it is only necessary to have two or three pieces of wood to pass between the bars, and form a partition. This may also serve when fowls are put up at different degrees of fatness. This requires attention, or fowls will not keep fat and healthy. As soon as the fowl is sufficiently fattened it must be killed, otherwise it will still get fat, but it will lose flesh. If fowls are intended for the market, of course they are or may be all fattened at once; but if for home consumption, it is better to put them up at such intervals as will suit the time when they are required for the table. When the time arrives for killing, whether they are meant for market or otherwise, they should be fasted, without food or water, for twelve or fifteen hours. This enables them to be kept some time after being killed, even in hot weather.—*London Cottage Gardener.*

A GOOD SUBSTITUTE.—A correspondent writing from Auburn, Ind., says:—"Your paper is the most welcome visitor in my house, and I expect to do without tobacco and whiskey, and take it in." Good! we are glad to know that our friend is going to practice such remarkable self-denial for the sake of our journal.

A COLUMN OF INTERESTING VARIETIES.

It is announced, for the benefit of those persons who did not get a sight of the comet, that it will again appear before the public, for a few nights, in the autumn of 2147.....The most secure fastening of your chamber-door is a common bolt on the inside; if there is none, lock the door, turn the key so that it can be drawn partly out, and put the wash-basin under it, that any attempt to use a jemmy or put in another key will push it out and cause a racket among the crockery, which will be pretty certain to rouse the sleeper and rout the robber.....Barrow, the Chinese traveler, computes that there is more material in the great wall of China than in all the houses of England and Scotland combined.....A short time ago, a lady advertised in the London Times for a housekeeper, and received upwards of 2,000 replies, 500 of which came to hand by the first delivery.....Human hair varies from the 250th to the 600th part of an inch in thickness. The fiber of the coarsest wool is about the 500th, and that of the finest about the 1,500th part of an inch in diameter. Silk-worms' silk is about the 5,000th part of an inch thick; but the spider's line is six times finer, and a single pound of this delicate but strong substance would be sufficient to encompass the globe.....German physiologists affirm that, of 20 deaths of men between 18 and 28 years of age, 10 originate in the waste of the constitution induced by smoking.....A French surgeon has been making experiments upon sores and wounds of persons of frail constitutions, by employing the common hand-bellows to act upon the part for 15 minutes at a time, four times a day. His success is announced, on medical authority, as encouraging.....Sound is always propagated outwards in straight lines, but recoils like a ball when driven against an obstacle which, by its dimensions, is sufficient to intercept the undulation. It will pass with great velocity through glass, and timber, and massive buildings, but is beaten back by mountains and caverns. This reflection of sound produces the beautiful effect of echoes.....The engines of the large ocean steamers make about 200,000 turns in crossing the Atlantic, between Liverpool and New York....With four weights of respectively 1 lb., 3 lbs., 9 lbs. and 27 lbs., any number of pounds, from 1 to 40, may be weighed.....The annual consumption of coal for gas-making in London is estimated at 840,000 tons, the product being 7,728,000 cubic feet of gas.....Boron was some time since crystallized by Messrs. Wohler and Deville, and the product, in brilliancy and hardness, rivaled the diamond.....The widest span yet made in a timber bridge is believed to be that of the Schuylkill bridge, at Philadelphia, the clear opening of which is 340 feet.....The highest mountain in the world is Mount Everest, in the Himalayas. Its height is 29,000 feet, or five and a half miles above the sea.....Veins of coal, having caught fire, sometimes burn for years. An anthracite coal vein, under Broad Mountain, Pa., has been burning for 22 years, and there is no prospect of its extinction whilst more coal remains to be consumed.....The friction of iron journals in brass boxes, with a film of good oil interposed, has been found, in some cases, to be as little as 1-90th of the weight. Ordinarily, it is about 1-30th of the weight; while, if the surfaces are wiped dry from oil, it is about 1-10th.....The power required to drive an 18-inch train of rail rolls, including roughing and finishing, also, one pair of cropping-shears, eight straightening presses, saws, &c., sufficient for making 900 tons of rails weekly, has been found to be 239-horse power. In this case, the rolls made 85 revolutions per minute.....The population of Rome, at the highest period of its power, has been estimated at 6,800,000. The present population of London is about 2,800,000. The entire population of Paris, including that of all its metropolitan suburbs, is about 1,500,000. That of New York, estimated in the same way, is 1,100,000.....Hydraulic mortar was first made in London, in 1796, from the *septaria* in the Isle of Thanet. Roman cement contains from 30 to 40 per cent. of clay, and hardens in a quarter of an hour. When clayey limestones are calcined, the theory is that the silica unites with the alumina, lime and magnesia, forming a silicate which, when mixed with water, takes up water of crystallization, like plaster of Paris, and becomes as hard as rock.....Huntsman, of Attercliffe, near Sheffield, Eng., was the first, in 1760, to make cast-steel.