Notes and Queries

R. S., of Iowa.—If an insulated wire is wound around a soft iron bar, and a magnet is brought in contact with the end of the bar, or sufficiently near to magnetize it, a current of electricity is excited in the surrounding wire, but the current instantly ceases. On removing the exciting magnet another current of electricity passes through the enveloping wire in the opposite direction from the first. As these electric currents are but momentary, they would not work in the way you propose.

O. S., of Ohio.—Meerschaum is silicate of magnesia—composed of the same substances as soapstone. It occurs native in a very pure state, and is also manufactured artificially. For pipes the meerschaum is soaked in oil and wax, and then baked. It is very porous, and the coloring by use is doubtless due to the absorption of smoke. The white spots in your pipe are probably carbonate of lime or some other foreign substance that will not absorb smoke.

R. H., of N. Y.—Your request, that we should republish for your special benefit a recipe that appeared in our paper in December last, is unreasonable. Every line, even in our advertising columns, is worth 40 cents, and you can get a copy of that paper for 10 cents.

G. F., of Minn.—The substance which you send us is a mixture mostly of clay and carbon, the proportion of carbon being perhaps sufficient to call the specimen impure coal. The occurrence of this substance is some indication, though by no means a proof, of the existence of good coal in the vicinity.

H. B. M. asks:—"In case a man buys a patent, has he a right to use the recommendations which the previous owner received from those using the patent, without asking permission of the owner or those that gave the recommendations?" ANS.—There would probably be no impropriety in the use, by the purchaser, of the recommendations.

W. T., of N. H.—After the velocity is imparted to your millstones it will require twice the power to run them at 80 revolutions per minute that it takes to drive them at 40; to impart double velocity requires four times the work.

W. W., of Iowa.—Commencing at a temperature of 32°, the pressure of air is doubled by raising its temperature 490°; with a further increase of 490° its pressure is three times greater than at 32°, and so on.

G. C. W., of Ohio.—A long crank and a large pulley are like a long lever—you can raise a greater weight, but what you gain in power you lose in time.

G. D. G., of N. Y.—India-rubber shoes can be patched by sticking a piece of india rubber over the fracture by means of cement made by dissolving new india rubber (not vulcanized) in spirits of turpentine. The cement can be bought of india-rubber dealers.

A. W. R.—A valid patent cannot be granted for a machine which has been in public use for more than two years without application for a patent by the inventor. A patent issued under such circumstances is invalid and worthless. The invention is public property.

J. P.—Both the maker of the machine and the user are liable for the infringement of a patent.

T. B.—The New York *Ship News* contains the information about duties that you call for.

W. K., of D. C.—Oyster shells will loosen the clinker so that it can be knocked off, when at a dull red. Throw three or four in with the coal, then turn the fire out after they have been in some time, and with a poker (and a blow) detach the clinker.

W. K., of Pa.—We should comply with your request with great pleasure if we had time, but it is unjust to the rest of our readers to ask us to hunt up recipes formerly published, on the supposition that you will at some time send us ten cents.

M. B., of N. Y.—Spelter mixed with 1-20th of its weight of speculum metal makes a good alloy for many purposes, such as chucks for spinning metal work on. It might also answer for hard solder. Speculum metal is 100 copper, 50 tin.

C. H., of Ohio.—Sealing wax for fruit cans is, beeswax ¼ oz., vermilion 1½ oz., shellac 2½ oz., resin 8 oz. Melt the resin, add the shellac, stirring slowly, and lastly the wax. It will be hard when cool. If you desire it plastic, add a piece of lard the size of a walnut.

S. A.—Compressing air by wind-mills is an old idea. So is the use of compressed air for driving cars and other machinery.

T. S., of Ohio.—"Will immersing dull files in sulphuric acid sharpen them, or will it ruin them?" It will ruin them. Try one and see.

F. S., of Ohio.—Alcohol when repeatedly boiled and cooled in an iron or steel vessel will not decrease in bulk, provided the vessel is absolutely tight.

S. J. J., of Pa.—A good way to seal fruit jars is to dip a piece of cotton cloth into a melted mixture of two parts of beeswax and one of rosin, and tie it over the jar.

P. C., of N. Y.—Call at the Police Headquarters to find the rules laid down for examining engineers and licensing them to run engines in this city.

S. B. E.—Slatted floats for steamboat wheels, operating as you suggest, were long ago proposed.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of our reception of their funds.

Correspondence

MESSRS. EDITORS:—Mr. C. H., of New Haven, appears to be very anxious to have the popular fallacy of large pulleys corrected (see page 132, SCIENTIFIC AMERICAN, current volume).

Now, I have been criticised for the last thirty years about a "fallacious" idea I had of making pulleys probably twice as large as the ordinary size, but I could endure the criticism better than I could endure the breaking and slipping of belts. Then again, I was too stingy of power to be constantly wasting it in bending a heavy stubborn belt around a small pulley, and straightening it again as it leaves the pulley—a serious loss when belts are heavy and strong enough to transmit much power through small pulleys. I have seen saw mills (and sash mills at that) running with pulleys on the crank shaft of only 16 to 18 inches in diameter, heavy belts of two or more thicknesses, and 14 to 16 inches wide, and a half-ton weight on the tightening pulley to make the belt adhere to the small pulley sufficient to turn the crank shaft with an eight-inch lever; the consequence was, that the tug of such a tight belt on the journals, and bending and straightening such a stiff heavy belt around so small a pulley wasted about half of their driving power.

Many grist mills have small pulleys on the spindle, and belts sufficient to drive four run of stone if the belt had speed, as it would have if the pulleys were large enough. The miller levels the bedstone all so nice, then trams the spindle from the face of the bedstone and has it all quite right; but before he grinds he must put on the tightening pulley with a tremendous pressure to make the belt stick on the small pulley, which tightening operation frequently springs the bridge tree, and the spindle is not plumb while grinding, which makes bad work. If he tries to plumb up again, he must take off the tightening pulley before he can turn the spindle, and when the tightening pulley is off the spindle is plumb as before; so he will continue to do bad grinding without knowing the cause, until some "fallacious" individual is sent for to hunt the mysterious mischief out of the mill.

A pulley on the spindle near the diameter of the stone, and driving drum to correspond, and a light and pliable belt make a good rig; and the miller will be pleased to grind thereon four bushels per hour with such an one more than he could with the fashionable-sized pulley and belt tight enough and stiff enough to waste a great portion of power. P. D.

Jersey City, N. J., Feb. 26, 1866.

Pittsburgh Rolling Mills.

MESSRS. EDITORS:—As your rolling-mill readers are numbered by hundreds throughout the country, a letter on the subject may not be uninteresting from this appropriately named "Iron City." Pittsburgh contains between thirty and forty rolling-mills and steel works, five manufactories of gas pipe, four nut and bolt works and founderies innumerable.

The rolling-mills have been pretty generally stopped during the past four weeks, owing to an attempt of the proprietors to reduce the wages of the employees twenty-five per cent; it is supposed by many that this movement on the part of the iron-masters is done more for the purpose of impressing Congress with the necessity of increasing the tariff than any real desire to reduce the workmen.

Five years ago it would have cost some trouble to get a sheet of iron seven or eight feet wide, but since the beginning of the war a revolution has been worked in this as in many other things. The demand for large and heavy plates made by the Government, caused the proprietors of rolling-mills to increase the size of their machinery and furnaces, and now, when the mills are running, making plates of the above size is a daily occurrence. The other day I witnessed them making, at Lyon Shorb & Co's. Works, a plate thirteen feet long, and six and a-half feet wide, three-eighth-inch thick, with surprising ease. The rolls at this mill will weigh fourteen and a half tuns each.

At Morehead & Co's. I also saw them rolling a plate weighing twenty-eight hundred lbs.; the rolls at these works are reversed, so that the iron enters at either side, doing away with the necessity of passing the iron over the top roll to be entered again at the same side. The making of fancy or eccentric-shaped iron is now more common than formerly; the architect or engineer now sends for almost any geometrical shape and has it made. Angle L and T iron are now as common in the rolling mills here as bar iron, almost even cast steel is rolled in nearly as many shapes as iron—agricultural implements demanding almost, every conceivable shape in the vast quantities used for that purpose; here it is made perfect and in quality to equal any in the world; in fact, Pittsburgh cast steel is getting a reputation that is creditable as well as profitable to the manufacturers. L.

Pittsburgh, Feb. 26, 1866.

Burying Cream.

MESSRS. EDITORS:—I will state, for the information for all parties interested, that while living on the Republican Fork River, Kansas, in 1860, I frequently made butter by burying the cream, but found that it did not succeed well when quantities of cream larger than 3 pints were used. The difficulty might be obviated by having the sack long and small round so as to have a sufficiently large surface of the soil in contact with the sack to absorb the cream rapidly. It should be kept in the ground about eighteen hours, and as many inches deep. I used to lay it down at sunset and unearth it the last of the forenoon. The cream should be stiff without curd. Of course where there is much cream it would not do to waste the buttermilk in such a mode as this. J. H. SWAIN.

Boston, Mass., Feb. 19, 1866.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, March 1st, 1866, the President, Prof. S. D. Tillman, in the chair.

RUSTING OF ARMOR PLATES AND IRON BUILDINGS.

The President, in his usual summary of scientific news, read the statement, that has appeared several times in our columns, in regard to the rusting of the armor plates on the French iron-clad ships.

Mr. Dibben remarked that he had seen the statement repeatedly, but it was very unsatisfactory from its incompleteness. There was no explanation of the manner in which the plates are secured.

Dr. Rowell observed that there are numbers of iron ships, with comparatively thin plates, which have lasted many years without suffering materially from rust.

Capt. Maynard said that he could probably explain the matter. Iron ships are protected by being painted inside and out, but the paint upon armor plates can be renewed only on the outside, and the rusting takes place on the back side—next the ship. Capt. Maynard continued—

"There is a large and beautiful iron building within a hundred yards of this place—I allude to Tompkins Market—which can be painted on the outside, but which is plastered inside, so that the iron cannot be reached; and the iron of that building is being very rapidly corroded—it will last but a few years."

WALKING ON ARTIFICIAL LEGS.

Mr. J. W. Weston exhibited an artificial leg invented and manufactured by him. It is made of sheet brass, struck up into form and soldered on the inside, with rings and straps of steel to strengthen and stiffen it in the proper places. The foot is secured by a simple joint with a cushion of pure india-rubber, and the socket for the stump is lined with cork. A young man present, who was wearing one of the legs, walked about before the audience without any cane, and with a very easy gait.

Mr. A. A. Marks then presented the leg invented and manufactured by him. It is a hollow wooden limb, and its principal peculiarity is the foot, which is made of solid india-rubber attached to the leg without any joint whatever. A young man present, wearing one of these limbs, was called on to exhibit his gait, and as he walked back and forth