amidst the teeth in such manner that they overlap the ends of the quantity of fibres which have been just previously similarly treated, thus admitting of the prepared or combed fibres being doffed or drawn off from the teeth in a continuous sliver, as explained.

INDIA RUBBER BELTING—Robert Hale, of Roxbury, Mass.: I claim the manufacture of machine belting by folding and cementing strips of india rubber cloth by a series of mechanical devices, substantially such as described.

Second, I claim the method described of moistening the seam and applying the india rubber strip thereto, for the purpose set forth.

Third, I claim the manner described of applying the middle for a belt of three or more plys, by means of guides the two being united in the manner set forth.

PHOTOGRAPHIC GROUNDS FOR WOOD ENGRAVERS—Robert Price, of Worcester, Mass.: I do not claim the use of asphaltum varnish and lamp black, or any other varnish or compound when used to produce a pilicle or covering upon surfaces designed for the reception of photographic pictures, as such varnish or pelicle unfits the block for the engraver's use.

But I claim the described varnish, composed of asphaltum varnish, lamp black and ether, when the same is applied to the block by rubbing into its pores in the manner set forth.

SLEIGHS AND CUTTERS—L. B. Randall, of Penn Yan, N. Y.: I claim the parts designated by the letters A, B, C, D, E, F, G, H, I, L, and o, combined as and for the purposes set forth.

FIREARMS—J. B. Read, of Tuscaloosa, Ala.: I claim the providing the upper part of the powder space or chamber of firearms, with angular or wedge shaped projections to be forced into the rear of the projectile in the act of loading, as described.

Also the form of ball represented in my drawings cylindrical at or near its middle portion, with a slight excavation or recess on the inner and under side of the cylindrical part, both ends of the ball to be conoidal or conical.

STAIR STEPS—Charles Robinson, of Cambridgeport, Mass.: I claim beneath each step a spring or springs, so as to give an elastic movement thereto in ascending and descending upon the stairs for the purposes specified.

PIANOFORTE ACTION.—Henry Steinway, of New York City: I disclaim everything described in the letters patent of John H. Morton.

I claim the sliding post, d, and spring g or j, or its equivalent, applied substantially as described, in relation to the jack and key to operate as set forth, in combination with a block, c, on the hammer shank, for the purpose specified.

[By this improvement a more free and easy movement of the action is obtained in repeating, and the hammer can be stopped near the string. An effect is obtained like that produced in the complicated "Erard Grand Action," by very simple devices.]

CYLINDERS FOR PRINTING FABRICS—R. F. Sturges, of Birmingham, Eng., Patented in England, Oct. 16, 1855: I do not limit myself to the precise details herein described and represented, as the same may be varied without departing from the nature of the invention.

I claim the new manufacture of rollers or cylinders for printing fabrics described, that is to say, casting a thick tube of a hard and easily fusible metal or alloy in the interior of a tube of copper or alloy of copper.

CLOTHES POUNDER—Sardis Thomson, of West Otis, Mass.: I claim the bell shaped cylinder, in combination with the piston, piston rod, spring and handle, or other equivalents, to produce the same effect: viz., the cleansing or washing clothes, by agitating the liquid by the pressure of air, substantially the same as described, and to be applied to the purposes set forth.

CLOSE OR OPEN STOVES—Henry Seitz, of St. Marys, Va.: I claim the arrangement in a grate of the plates, O N Q R, supplementary grate bars, i, dust flue, S, air-heating chambers, X X I, and passages, J J, when the whole are disposed as shown, for the purpose set forth.

[By this improvement in open stoves the draft can be increased or diminished as desired, by the "sliding-back.' In stirring the grating the devices employed preven any dust from getting into the apartment—a most usefu arrangement for such stoves, the remedy of a great nuisance in their use.]

LOCKS—Alfred Williams and Edward P. Cummings, of Philadelphia, Pa.: We claim the use of the yoke, c c, the levers, E F, and the stop lever, H, the whole constructed arranged and operated in connection with the disk, N, as set forth.

GATES OF TURBINE WHEELS—L. M. Wright, of Niagara Falls, N. Y.: I do not claim the parts separately.

But I claim their arrangement in the manner described and for the purposes set forth.

METAL-PACKED PISTONS FOR STEAM ENGINES—Geo. W. Cotton, of St. Louis, Mo.: I claim the arrangement for operation together on a single ring packing, of the wedge, b, with its sliding block, M, and radial stretchers, r, spiral springs, n o, and inner sliding steps or blocks, x, substantially as shown and described.

And I further claim forming the joint or break of the single ring packing with overlapping tongues, g K, and wedget, l, of less depth than the packing, and fitting loosely between the beveled ends of the packing and the tongues, g K, at the top and bottom on opposite edges of the packing ring, as set forth.

COTTON SEED PLANTERS—H. L. Justice and John H Galbreath, of Goodlettsville, Tenn.: We claim the combination of rag wheel, d, having adjustable arms, Z, with the movable hopper, f, of a cotton seed planter, the whole being arranged and operated in the manner set forth.

SECURING HUBS TO AXLES—Leonard J. Worden, of Utica, N. Y.: I claim making on the front end of the skane or bush, A, a neck, C, of peculiar form, that is to say, having two or more parts of its periphery of a cylindrical shape, whilst the remaining parts are both cam-shaped and conical, when used in connection with a nut, A', whose internal periphery corresponds with the external periphery of the neck, C, lock plate, L, or its equivalent, the whole being arranged, constructed, and operating in the manner and for the purposes substantially as set forth.

BRICK MACHINES—James Hotchkiss and William H. Scholfield, (assignors to themselves and Wm. R. King,) of Yellow Springs, O.: We claim the combination of the plungers, H H and I I, with the sliding carriers, G G, and mold wheel, E, when the same are so constructed and arranged as to operate in relation to each other, in the manner and for the purposes set forth.

TURNING CYLINDRICAL WOODEN BOXES—Henry Mellish, of Walpole, N. H., (assignor to Charles Pope, of Brookline, Mass: I claim the cutting tools, H x m t, made with cutters or cutting edges, to operate substantially as specified, to cut and plane the box or box cover.

RE-ISSUES.

TURN TABLES—Jacob C. Robie, of Binghamton, N. Y. Patented Aug. 15, 1854: I claim balancing the platform of the turn table upon a transverse shaft or other suitable bearing or bearings resting upon or connected with the carriage which supports said platform, in such a manner that the table, when in a horizontal position, or thereabouts, is elevated above its under supports or end bearings, to admit of its free swing, and so that the table may be depressed at either end to bring the ends of its rails on either side of the carriage into line or level with the rails of the track, for the purposes set forth.

LOOMS FOR WEAVING BRUSSELS CARPETS, &c.—Erastus B. Bigelow, of Boston, Mass. Patented March 10, 1840. Re-issued Oct 9, 1849: First, I claim, in combination with the pile wire or wires for weaving piled fabrics, a grooved receptacle or trough for holding said pile wire or wires in position whilst being pushed into the shed of the warp, substantially as specified.

Second, I claim pushing said pile wire or wires into the shed of the warps by a driver or pusher, substantially as specified.

Third, I claim guiding and supporting the pile wires as they are inserted into the shed of the warps by a guide or guides, through, over, or on which said wires slide, substantially as specified.

GRINDING AND POLISHING METALLIC SURFACES—Richard M. Hoe, of New York City. Patented May 30, 1842. Extended seven years from May 30, 1856: I do not claim broadly, the use of a rotating cylindrical lap or grinding surface for grinding or otherwise reducing or polishing metallic substances.

Nor do I claim giving to such lap or polishing surface in addition to its rotating motion, or traversing motion in the direction of its axis, or as the equivalent thereof, giving to the substance to be operated upon a traversing motion in the direction of the axis of the rotating lap or polishing surface.

But I claim, in combination with the rotary and traversing motion of a cylindrical lap or grinding or polishing surface, substantially as described, the reciprocating motion of the carriage which carries the plate to be reduced or polished at right angles to the traversing motion of the rotating lap, or grinding or polishing surface, or as the equivalent, a rotary motion, substantially as described.

And I also claim constructing the said grinding or otherwise reducing or polishing surface of a series of plates of any suitable substance, with spaces between the several plates, substantially as and for the purpose specified.

DESIGN.

STOVES—Jacob Steffe, James Horton, & John Currie, (assignors to F. H. Church,) of Philadelphia, Pa.

Mechanics' Hand Books.—The Weight of Coal.

MESSRS. EDITORS—Those who prepare books of reference for mechanics and civil engineers should be careful in their figures and accurate in their statements, or they become but blind leaders of those they profess to guide. The error of a single figure in a text book in common use may involve vast interests, and cause the loss of thousands of dollars. I am a civil engineer by profession, and have occasionally been led into serious errors by the inaccuracy of works esteemed good authority; and I wish now to point out one glaring error which I have discovered, in the hope that it may lead to a general overhauling of the books. Having had occasion recently to calculate the weight of a cubic yard of coal, or the number of tuns which a vein of a given thickness will yield per acre, I referred to a work called the "Engineers' and Mechanics' Pocket Book," by Charles H. Haswell, and published by Harper & Brothers. On page 225 of the eighth edition, the weights of many different bituminous coals are given, the heaviest of which (the Cumberland coal) is stated to be fifty-four pounds per cubic foot, omitting fractions. Now the weight of a cubic foot of water is one thousand ounces, or sixty-two and a-half pounds. Does Mr. Haswell mean to intimate that coal is lighter than water? The statement professes to be taken from the report of Prof. W. R. Johnson, made in 1844. I cannot believe that Prof. J., who made his report from actual experiments for the United States Government, ever put forth such a statement; and it is not a mere misprint, for the weight of many other bituminous coals are given as still lower, so that the error would seem to be with the author. It may seem but a small matter, but in this case it involved very heavy interests.

You will say, perhaps, that an engineer should be able to verify the correctness of the figures in his text books. This may be so; but if we must in all instances ascertain by observation and experiment the correctness of the authorities who profess to guide us, then books of reference are useless, unless we make them ourselves. D. S. GREEN.

Ralston, Pa., May, 1857.

[We have given place to the above letter for several reasons. Our correspondent has recently calculated the weight per cubic yard of coal, and his calculations *involved heavy interests.* He condemns the assumed weight per cubic foot of coal, as given in Mr. Haswell's book, therefore his calculations must have been based on a different *unit* of weight per cubic foot. But if Haswell's book is wrong, Prof. Johnson was wrong, for assuredly Haswell is perfectly correct in his authority. On pages 590, 591, and 592 of Professor Johnson's report alluded to, the weight per cubic foot of a great variety of coals is given, and they are all lighter than water. The heaviest is Beaver Meadow, Pa., 56·19 pounds per cubic foot. Has our correspondent then, made a wrong calculation? Not likely. But he judges Haswell's book as referring to coal in the mine, whereas it quotes Johnson as referring to broken coal, the kind employed for steam boilers. In Johnson's report it is stated (page 62) that the calculated solid foot of coal in the mine is 92 lbs., in the condition of lumps 53 pounds. It was an error in Prof. Johnson to give the weight of a cubic foot of coal broken in lumps, because it is liable to lead to mistakes, and is unavoidably inexact, as there is a difference of several pounds in the weight of a cubic foot of small and large lump coal—the small weighs most.

Our correspondent is perfectly correct in his allusions to incorrect hand books for engineers and mechanics. Unless they are positively reliable they are worse than useless, as they go forth the propagators of error. A wrong statement in one number of a periodical can be corrected in a subsequent issue; but it is far otherwise with a book, a second edition of which may never be published, or only at a very extended period of time from the first.

One Hundred Tuns of Grass to the Acre.

MESSRS. EDITORS—The statement you published, taken from an English paper, respecting the raising of one hundred tuns of grass on a single acre of land pertaining to Lord Derby's estate, is undoubtedly correct, or very nearly so. I had the pleasure of visiting his Lordship's estate last summer, while on a tour of agricultural observation in England, and I am prepared to believe the statement. My visit was made about the first of June, and they had already secured *two* heavy crops of grass, and it is not improbable that four or five more were cut during the long and favorable season of last year. Four or five crops of the heavy, stout, Italian rye grass is not unusual; and Mr. Mechi, of the celebrated Tiptree Farm, informed me that he had once grown *seven* during the summer. This grass grows with great rapidity in England when stimulated by the rich liquid nutriment so liberally and continuously applied.

Our farmers have yet much to learn respecting the scientific cultivation of the soil. They have yet to learn how bountiful mother earth may be when properly dressed and cared for by the husbandman. It should be observed that the climate of England is much more favorable for the growth of the grasses than our own, owing to its excessive humidity; but still, I do not know why several successive crops may not be produced here by the use of liquid manuring, and by careful systematic culture. JAS. R. NICHOLS.

Haverhill, Mass, May, 1857.

A New Science.—Hydroscopy.

Joseph Gautherot, a mining engineer in France, distinguished by a peculiar talent of observation united with an extraordinary perseverence in investigations of geological strata, has discovered a law of nature which enables him, by examining the features of the surface to direct where subterranean sources of water are to be found. Thus he pointed out the places of digging wells to such an extent that he was honorably rewarded in 1846 by the French Government for his beneficial services to different communities. In the district of Haute Maine a well was thus dug, yielding 12,000 litres of water per hour. The French Government has recently appointed him for Algiers, where at different cities wells are now dug out with the best result; and he is considered among the Christians, Mohammedans, and Jews as a second Moses in the desert.

L. R. BREISACH.

Simple Butter Cooler.

Melted butter is all very well in its right place, but when butter is put upon the tea or breakfast table, having the appearance of being just out of the oven, it is anything but creditable to the housekeeper, and far from satisfactory to those who eat it. Dry toast is positively spoilt if spread with soft butter; indeed, if butter cannot be brought to table at least firm, if not hard, it is better to keep it away altogether. Fortunately, however, it is not necessary to proceed to such desperate measures, as butter can be kept nice and cool in the hottest weather, and that in a very simple manner. Procure a large, new flower-pot of a sufficient size to cover the butter-plate, and also a saucer large enough for the flower-pot to rest in upside down; place a trivet or meat-stand (such as is sent to the oven when a joint is baked) in the saucer, and put on this trivet the plate of butter; now fill the saucer with water, and turn the flower-pot over the butter, so that its bottom edge will be below the water. The hole in the flower-pot must be fitted with a cork; the butter will then be in what we may call an air-tight chamber. Let the whole of the outside of the flower-pot be then thoroughly drenched with water and place it in as cool a spot as you can. If this be done over night, the butter will be as "firm as a rock" at breakfast time; or, if placed there in the morning, the butter will be quite hard for use at tea hour. The reason of this is, that when water evaporates, it produces cold; the porous pot draws up the water which in warm weather quickly evaporates from the sides, and thus cools it, and as no warm air can now get at the butter it becomes firm and cool in the hottest day.

SEPTIMUS PIESSE.

Notes on Science and Foreign Inventions.

New Electro-Magnetic Engine.—A scientific commission has been appointed by the Emperor of the French to test a new electro-magnetic engine, recently brought to Paris by T. Allan, of Edinburgh. This engine has been at work for some time at the engineering establishment of M. Cail, Paris, and with such success that it has inspired much confidence in its economy. It is to be applied to a locomotive at the expense of the French Government, in order to give it a most thorough test. Such at least, are the reports made public respecting it. If Mr. Allan renders an electro-magnetic engine successful, and as economical as a steam engine, he will do something which has been considered an impossibility. Such engines have already been constructed as locomotives both by Davidson in Scotland, and Professor Page in our country, but they were far from being as economical as the *steam horse.*

Copying Inks for Printing.—It has always been held to be a desirable object for some purposes to obtain an ink partly soluble in its character for printing, which can be transferred or copied in the same manner as written letters. For such an ink a patent has lately been obtained by J. Underwood and F. V. Burt, of London. The patentees, in making a black ink, take of nutgalls 14 lbs., of sulphate of iron 6 lbs., of soap 3 lbs., of gum senegal 12 lbs., of thick molasses 6 lbs., of lamp black 6 lbs., of Prussian blue 3 lbs., and of filtered rain water 15 gallons. The nutgalls are first bruised, and then boiled for about three hours, more or less, in half the above named quantity of water, and the clear liquid drawn off. The gum and sulphate of iron are separately dissolved in the remaining quantity of water, and the whole is then mixed with the decoction of nutgalls, and exposed for about twenty-one days, more or less, when the supernatant liquid is drawn off from the deposited matters and sediment. The molasses and soap are now added to the liquid thus drawn off, and the whole evaporated in a water bath to nearly the consistency of ordinary printing ink, and then the lamp black and Prussian blue are mixed with it. The above ingredients will form a black ink; but ink of other colors may be made by using soluble coloring material or materials, such as sulphate of indigo, or carmine dissolved in ammonia, either separately or combined with coloring matter such as now employed in the manufacture of colored printing inks, in lieu of the nutgalls, sulphate of iron. lamp black and Prussian blue used in making ink as described.

Purifying Petroleum.—A few weeks since, we referred to the purifying of this natural hydrocarbon fluid, which is obtained in many parts of our country in great abundance from wells, and we stated that an invention which would render it fit for burning in lamps would be very valuable. We perceive by the London *Engineer* that a patent has been taken out for this purpose by S. White, of Liverpool. The process is not fully described, but it is stated he uses common salt, neutral chromate of potash, sulphuric acid, copperas, and carbonate of soda, in combination, as purifying agents. He distills the petroleum three or four times according to circumstances, and has all the stills going on from the first to the last in one continuous process, from the crude to the finishing operation.

The Directors of the Mint have arranged with the Adams Express Company for the transportation of the new cent coins to all points of the Atlantic States.