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E. T. C. can remove rust stains from calico by the process described on p. 148, vol. 27,-G. F. can fine his ale by the recipe given on p. 75, vol. 31 -G. W. P. will find directions for making a good black tak on 203.vol. 29 -M. will find details of a millstone cement on p.346, vol.30.-S. will find directions for making gutta percha varnish on p. 379, vol. 30.—J. M. W. does not forward any description of the invention on which he asks an opinion, but merely testimonials as to its mer its .- W. P. B. and many others will find booksellers' addresses in our advertising columns. - J. S. B. will find full directions for tinning cast iron on p. 76, vol. 30.

S. T. B. says: A French chemist says: "By fabricating coke, nitrogen can be made." What is the meaning of fabricating coke? A. It means the making of coke by expelling from coal the principal gaseous and liquid matters that it contains. In the manufacture of gas, the coal is placed in retorts and heated; and when the gas passes out of the coal, the residue remaining in the retorts is called coke.

F. B. C. asks: What are other and umber A. Other is a variety of fine clay containing iron. The common colors are yellow and red, the latter being colored by sesquioxide of iron, and the yellow variety by the hydrated sesquioxide. Umber is an ocherous ore of iron, of a brown or blackish brown color, consisting of oxide of iron, oxide of manganese, silica, alumina and water. They are found principally in Europe, although they are widely distributed. The ocher is found in beds some feet in thickness, which lie generally above the colite, and are covered by sandstone or quartzoze sands, more or less ferruginous, and are accompa nied by gray plastic clays, of a yellow or brownish color: all of themsubstances which contribute moreor less to its formation. There are many large mines of it in this country, at Bennington, Vt., and in various other places. Umber is found in Europe, especially in the island of Cyprus, and also in this country in large quantities. They are used as pigments, and as dryers in varnish; also, sometimes, in coloring porcelain.

J. C. W. asks: 1. When a person is writing several hours every day, inhaling the air from ink which is drying so near him, does he receive into the lungs and the blood any thing from the ink which may have a deleterious effect upon the heart or any other organ a. Not from any of the common inks. 2. If only pure water evaporates from ink, would that moisture be likely to affect the lungs of any person bending over the drying paper from morning till night? A. No. 3 According to the sense of smell, when ink is free-ly used, the indications are that something more than pure water rises from ink in drying. If injurious to health, what would be its specific effect? A. Not injurious to health any more than minute particles of dust and saline matters, or tra ceived from other sources. or traces of organic matters re-

P. H. S. asks: Can a calcium light be made so as to be carried in the hand on a foggy day? A. It has not, nor ever can be until some simpler form of apparatus is invented, which will combine the advantage of compactness with the ability to furnish cheaply the continuous flowof gases necessary.

How can a pattern of a pot be drawn, the bottom to be 7 inches in diameter, the top 3% inches across, and the pot 7 inches high? :A. This question is somewhat confused. See Warne's "Sheet Metal Worker's Assistant."

Can colored candles be made to burn with a flam of the same color? For instance, for red, nitrate of strontium might be dissolved in boiling alcoholand the wick soaked init. Boracic acid might be used for green. Can the colors be intensified in any way? A. We doubt very much as to whether the object desired can be accomplished, for various reasons, and certainly not in the way you speak of, from the fact that strontiumnitrate is nearly insoluble in alcohol, consequently very little effect would be produced by a wick steepe in so weak a solution. So also, with boracic acid, which even in the mest concentrated solutions, only tinges the edge or border of the flame.

How can I deposit a thin coat of platinum on meta by a plating process? Can I put it on as a wash, after dissolving in nitro-muristic acid? A. Your best method would be that of electroplating; the best solution to employ is the nitro-muriatic, to which sufficient sods is added to render it neutral. The object to be coated should be cleansed by potash before the process is com-

positive pole of the battery is placed so as to dip into You again write to us without giving your name the solution; the object to be platinated is placed by a wire in connection with the zinc or negative pole, and also placed in the solution. If the battery be not too strong, in a few minutes the object will be coated with

W. H. C. Sr. says: There is a man in our neighborhood who says that, if a boiler with both heads out were set up on end in a body of water (it matters not of what depth, provided the upper end is above wa ter and the lower end sunk in the mud deep enough to prevent water from leaking in), when the boiler is pumped clear of water, the boiler will rise from the mud immediately after being pumped out and refill. I contend the centrary. Who is right? A. Weincline to your opinion. It is an experiment that can very read ily be made with a piece of tin pipe.

D. K. S. says, in answer to J. J.K.'s question in regard to the British man of war sunk at Hell Gate about 1747: I would state that it has been visited by divers for several successive years; with what success as to money obtained. I cannot tell. It is builed deep in the mud and difficult to get at, and can only be visit ed in good weather and at certain times of tide. I have several relics in my possession which were taken from her.

J. O'D. asks: I have often felt the want of ventilation in railway cars, and I have wondered why the companies did not do something towards remedying the evil. But I am not surprised now, having read your article on the subject in a recent number. I was not aware that so many methods had been tried without success. Would it not be well for the companies to offera prize for a successful invention, that would bring all the inventive talent to bear on the subject? should then, I believe, soon have a good method of ventilation. A. The suggestion of our correspondent is an excellent one. Let the rail way companies unite in offering a prize say of Afty thousand dollars, and doubtless the desired invention would be forthcoming.

J. H. McD. asks: The follower on a steam engine of 32 inches diameter (of a condensing engine on a steam boat), pulled off the follower boits, nuts. and fastenings with it, and broke the cylinder, as the piston was coming up with the steam under it, and a vacuum of 26 inches over it (on the follower). It is a disputed question whether the vacuum on the top of the follower had any tendency to pull the follower, or in any way remove it off its scat. A. It did not have any tendency to pull the follower, but did render it easier for the fol ower to be pushed by the pressure on the other side.

S. F. R. asks: If there is a certain quanti-ty of waterina boiler, and that amount of water be converted into steam, would there be the same smount of water when condensed if there were no means of escape? Is there any decrease in water by boiling it? A. Tnere would be the same amount afterwards as before under the given circumstances.

H. L. K. asks: 1. Is an artesian well sunk in the same way and by the same apparatus as a common drive well? A. Not generally. Artesian wells are usually of such depth as to require the hole to be bored by a boring designed for the purpose; whereas the hole of a drive well is commonly made by driving the tube jnto the ground. 2. Is the same kind of piping used in both? A.No, the pipe for artesian wells is put together in sections, in consequence of the extreme length; the ofpefora drive well, being short, is usually in one piece oneendbeing closed and pointed so as to enable it to drive. S. What is the diameter of the pipe used in sinkng an artesian well? A. The size varies from 2 to !

W. H. K. Jr. asks: What ought be the thickness at top and at bottom of two square brick stacks, respectively 100 feet and 140 feet high, each having an 8 inch square flue for the entire hight? A. For the 100 feet stack,make the walls 8 feet thick at bottom and 16 inches thick at top, the brickwork being of hard brick and cement mortar.

A. L. D. M. asks: I have a boiler 56 inches long and of 28 inches diameter, with 20 tubes of two inches diameter; the dome is 16x20 inches, of iron 1/4 inch thick. How many pounds steam will be safe to work at highest rate? A. About 50 lbs. per square inch.

M. H. R. says: To become a surveyor, is it eccessary to study at a university? If not, what should I do to become one? A. It would be netter for you to obtainsomeinstruction at a good engineering school. But many surveyors learn their profession by actual practice in the field (which, of course, would be neces sary after leaving school) without the preliminary ed ucation of which you speak. If you are determined to become a good surveyor, you are pretty certain to suc-ceed, whichever course you take.

H. C. T. asks: I wish to supply a tank, situated on top of a levee, with water from a river, the tank being 100 feet from the river, the levee sloping at an angle of 45°. What will be the cheapest way of supplying the tauk, by machinery? A. An ordinary steam pump, if the quantity of water required is small, and a centrifugal pump, or well designed pumping engine, for small quantities.

F. G. H. asks: If a toy balloon were cut loose to go whither it would be blown, what would be the result? Will balloons burst if they rise as high as possible? A. Yes; but they seldom reach a sufficiently nigh altitude, because of the loss of gas.

R. K. asks: The lightning rod on my house runs underground several feet. Would it be any advantage to put a wheelbarrow full of wrought or cast iron turnings at the end of the ro!, letting it bed itself in them? A. It would undoubtedly increase the safety of your house if you place a mass of conducting mate rial, as you propose, into connection with the lower end of your lightning rod. Better dig a trench and spread theiron along in it.

J. J. S. asks: Is magnetic iron sand worked practically at any place in the United States? In Ver mont we could obtain large quantities daily. Being very pure, it would be an inducement to establish works. A. Not to any extent. Much iron sand is tit aniferous, and it would be necessary before mining to see whether it was all magnetite, or contained an inju tious amount of titaniferous iron.

E. C. M. asks: Would a boiler be subject to damage by having a slight blast underneath? If so to what extent? The blastis to be used for the purpose of smelting ore. A. It is not usual to employ a blast of the manner; generally the blast is employed to clean off the bottom of the botlers. Two probabilities present themselves. First, that the blast would increase the rapidity with which the boiler would burn out. Second, that if your blast were mixed with the products of combustion, it would be injured so faras its further menced. A fine platinum wire connected with the employment in the smelting of ores was concerned. I rounding air: and if the shell be strong enough not;

address.

M. P. S. says: Your repeated cautions in regard to lightning rods lead me to ask your advice through your columns upon the following points: 1 have crected at my country residence a water tank and fixtures of rather novel construction. At one corper of thehouse, I have placed an old cylinder boiler, about 30 feet long and 3 feet diameter, standing on end, resting on brick foundation. The upper head has been removed, making a huge water tank. The top projects above the eaves of the roof, but not higher than the peak. It is encessed in an ornamental frame tower connecting with the main building. I propose to keep this tank filled with water by force pump from the well. It is now empty, however. From this tower, iron water pipeslead to the kitchen and bedchambers, and also to the cast iron force pumpin the well, and probably 10 feet down into the water. The house has two ordinary lightning rods on chimneys, leading to the ground on the opposite side of the house. 1.Is this arrangement dangerous? A. The arrangement as described is not to be called exactly dangerous, but might be made much better by a little change. 2. Would lightning be attracted by the large mass of iron of the boiler, rather than by the lightning rods, which are higher? A. If, as would appear, their on tank is in excellent connection with the ground, it is quite possible that lightning mightstrike it or some of the pipes running from it in the house in preference to the lightning rods. 3. If struck, would the lightning tollow the mass of fron to the ground, or pass through the pipes into the well, or enter the chambers through the discharge pipes? A.1f the tank or its connections were struck, the lightning would, without doubt, go to the earth and not into the house. 4. Would it be advisable to put a lightning rod on the outside of the tower leading to the ground? A. A lightning rod on the tower should beput into perfect metallic connection with the tank, and need not extend belowits upper edge. Let the tank and water pipes, in other words, be the lower part of the rod. 5. Would not this last tend to attract the lightning, and in such case would not the electricity be likely to leave the rod and enter the boiler with same effect as if no rod were there? A. Both your suppositions in this paragraph are correct. 6. Will not this large mass of from resting on the ground and this indirect water connection answer the purpose of a conductor? A. This question is already answered in No.4, assuming that the pile into the wellisin perfect metallic connection throughout, with norustor cementjoints. Red lead is an admirable insulator. In the way of advice we would say: Connect all your lightning rodstogether, and also to your iron tank and water, gas, or other pipes, not by separate connections, out so that there is some connection between allas high as possible. If you have a metal roof connect all rods with it. If not, connect them by a good sized conductor running along the ridge of the roof. Bear in mind that, to carry off the heaviest lightniug flashk nown, a copperrod one inchin diameter is not considered too large, and, though of course such flashes are of very rare occurrence, they may come. Hence the great value of uniting your different rods high up. Read our article in vol. 29, p. 26, and our editorial remarks upon a letter, p. 144 of the same vol-

J. E. J. asks: Will acid dissolve resin without destroying its natural qualities? If so, what kind of acid? If not, what will? A. Rosin, or colophone, is a mixture of several restrious acids, namely, phenic, sylvic, colophonic, and sometimes also pinearic acid. It is soluble in nitricacid, but in dissolving suffers decomposition. It is soluble in alcohol and may in this state be used as a varnish. It is soluble also in the

S. C. J. asks: In your book of instructions for obtaining paients, there is a recipe for making ma-rine glue: Take 3 parts gum shellac, 1 part caoutchouc, dissolve in separate vessels in ether free from alcohol, applying a gentle heat. I have been reading that if the odor of other is inhaled, it will produce insensibility, etc., and great care should be taken not to pour it out with a flame below it, otherwise an explosion of a dangerous character might ensue. "Mixed with certain proportions of air, it forms a highly explosive com-pound."—(Zell's Encyctopædia). I wish to make some marine glue, but must confess I am afraid to use ether If it is so dangerous, and would be greatly obliged to hearfromyou further about it. A. There is no necessity in this experiment of pouring the ether out over a flame, or of inhaling it in large enough quantities to produce any effect. Place the ether in bottles, into which drop, respectively, the requisite quantities of shellac and caoutchouc.

C. D. F. asks: 1. Why is it that, when I adjust a telegraph sounder so that, when the circuit is closed, the armature touches the magnet, it (the armature) ture) will still stick to the magnet when I break the circuit? A. Because of the residuary magnetism in the soft iron cores. The armature should never be allowed to touch the poles of the magnet. In ordinary telegraph sounders, set screws are used, to limit the movement of the armature in both upward and downward motion. 2. If, as you say in a late number of your paper, short, thick cores in electro-magnets give greater attractive power, why are such cores used in telegraph instruments? A. They are used for the very reason stated,namely, because of the better results obtained. 3. In making a blue vitriol solution for a Daniell's battery, how much vitriol should I use to a quart of water? A. As much as it will dissolve. 4. Will a leather cup instead of a clay porous cup in Daniell's pattery make more electricity? A. The porous cup is only an accessory in the battery, and takes no part in the generating of the current. A cell in which the cup is of unoiled leather is said to have less internal resistance than one in which an ordinary earthen ware cup is used.

S. F. says: I wish to suggest a form of balloon which may be worth experimenting on, and which I believe has not yet been proposed. I have frequently bacryed that metallic shell ware, and all descriptions of sheet metal work constructed with a view to light. ness and strength are dependent upon the use of curved, duted, or corrugated surfaces for their power to sustain pressure. Itis wonderful what an enermous pressureasimpleconvexiti or covering for any light tin ressel will sustain. It is of course possible to estimate ow much weight it must bear-a convex shell of a given thickness, and proportion of arc of circle-and to ascertain the relative resisting powers of various metallicabells. Now this appears to me to be a feasihe suggestion to make: That a balloon be constructed in the globular or oval form, from sheet metal as thin as possible: this vessel to have but oue aperture, connected by apine to an air pump. Fump out the air to a degree of rarity such that the specific gravity of the halloon and its contents be less than that of the surcollapse, it will of course rise from the ground. This is, in other words, the same thing as saying: Cannot a hollow globe be constructed of sheet metal of uniform thickness, if circular, or of proportional thickness if elliptic, sufficiently strong to resist upon its outside or convex surface, a pressure of not more that fifteen pouncs to every square inch? If the answer to this proposition be an affirmative one, in actual practice demonstrated by experiment, then the greatest difficulty in aeronautic science is removed. After this point of aerial ascension is practically settled, and the balloon constructed on some such plan as to be easy to manage at any altitude, I believe we shall go ahead with aeronautics, and not before. A. One of the earliest flying machines ever made had four sheet copper balloons attached to the corners.

- D. M. asks: What can I coat sheet zinc with (that will not be (tissolved by water) to take away the smell and taste which it gives to water and other things in a refrigerator? Can the taste of the zinc be got rid off in some other way? A. Use paraffin varuish. A solution of paraffin may also be used.
- N. L. T. asks: 1. I have a horizontal boiler of copper 1 foot long by 10 inc.es diameter, the copper being 23.5 inches thick. How much pressure will it stand? A. About 100 ibs. per square inch, if the joints are brazed. 2. The safety valve has ahole of 3.15 inchin diameter, and with the weight at the end of the lever itsees? Oas, (averaupos) upward pressure to raise it. How many ibs pressure are there? A. More data are required, namely, the weight and dimensions of the lever, the weight of the valve and ball, and the distance of each from the fulcrum.
- J. II. B. asks: How can I clean off the rust from a revolver, and prevent it rusting hereafter? A. Clean the rusty parts with brick dust, then brown the parts that have become brightened in cleaning by rubbing them with a rag wetted with nitric acid. To prevent future rusting, have the parts lacquered.
- H. G. L. asks: 1. In a recent issue, I have seen tout correspondents ask how to estimate the horse power of an engine, and in some cases you answer that sufficient dats are not given. On p. 311 of your vol. 30, a correspondent asks what would be the horse power of an engine that has 36 inches stroke and 16 inches diameter of cylinder, running 45, evolutions per minute with 70 lbs steam. What is lacking to enable you to estimate the horse power of the same? A. The mean effective pressure of the steam ou the piston. 2. Willyou please give us the formula and work out the following example for the benefit of your readers: What would be the nominal horse power of an engine of 17 inches bore of cylinier, 17 inches stroke of piston, with 65 lbs. steam pressure, running at 85 revolutions per minute, using common slide valve? What have we omitted in this example, to supply the necessary data? A. The ordinary rule for finding the nominal horse power of a noncondensing engine is as follows: Nominal horse power
- clent data are given. The actual horse power, however, depends upon initial pressure, point of cut-off, amount of wire drawing, back pressure and compression, none of which data are furnished by you. 3. In a recent issue you say that an engine with 21 inches stroke running 90 revoutious per minute has a piston speed of 240 feet per minute. In this reply I differ with you. Then 21 $\times 2 = 48 + 12 = 4 \times 90 = 360$. Am I right? A. You are right.

Suppose a steam hummer has a cylinder 18 inches bore x 22 inches stroke, with lifting block (attached to piston rod) weighing 1,900 lbs. What would be the force of the blow in lbs. struck? If a weight weighing 865 lbs. be elevated 25 feet and let fall (of its own weight), what would be the force of the blow struck in lbs.? Will you give us the formula forthese examples? A. We do not know of any formula by which you can solve these examples.

- G. M. asks: Does clearance between piston head and cylinder, more than sufficient for the safe working of the engine, bely to keep the engine from knocking when it passes the ends, or does it do any good in any way? A. No.
- S. D. Jr. asks: What are the rules for proportioning engines? Will a boiler of 3½ inches diameter x 15 inches length be of sufficient capacity to drive an engine of 1½ inches bore x 2½ inches stroke? The boiler is heated with 3 or 4gas burners. A. It is difficult to give definite rules for such small boilers, as a great deal depends upon the manner in which they are constructed and set. Allow from 15 to 20 square feet of efficient heating surface for each horsepower of the engine.
- W. T. W. asks: If a pendulum 39 inches long strikes once in a second, how long would the pendulum have to be to strike once in a minute? A. 11,700
- C. D. asks: Please give me a simple rule for calculating the pressure on safety valves of steam boilers. For instance, what would be the pressure of valve with weight of lever 41bs., length of lever from fulcrum to weight 22½ laches, from fulcrum to center of valve 2½ (nches and weight on lever 201bs.? A. You do not send enough data, the weight of the valve and stem and the position of the center of gravity of the lever being required. But neglecting the weight of the valve, and supposing the center of gravity of lever to be mid way between the fulcrum and weight: Pressure on valve $\times 2\frac{1}{2} = 4\times 11\cdot 2.5 + 20\times 22\frac{1}{2}$. Whence pressure on valve=198 lbs.
- E. S. W. says: All books say that an artificial horizon to be used with the sextant on land, should be made of mercury, or someother fluid Would it not be equally well to use a mirror or looking glass placed on the ground and leveled by a small spirit level? A. When one considers the error caused by even a very slight divergence from the proper level in measuring the altitude of an object millions of miles away, and remembers that it is very probable some inaccuracy of adjustment will occur, he will be very likely to agree with a friend of ours, who said that the method reminded him of the farmer who guessed at the weight of a stone, after using it to ascertain the weight of his
- J. A. H. Jr. asks: Is it necessary that parties running a steam launch or small steamboat (for their own pleasure or convenience, and not aspublic carriers) should comply with the steamboatlaw requiring the employment of a captain, pilot, and licensed en gincer? A. We think not.
- G. R. C. asks: What would be the effect on a volume of sleam going through a pipe if it came to a place where the pipe turned a right angle? A The pressure would be reduced, on account of the resistance due to the bend, and some of the steam would in general, be condensed.

- H. P. C. says: I have made a very nice kind of black lik with extract of logwood, bichromate of potash, and prusslate of potash, and for a while it works well. But now it has grown thick as mud, and molds. What can I put in it to keep it thin and liqu'd, to prevent its molding? A. The thickening is probably duc to evaporation. Your bottles should be kept well stoppered. Try a little carbolic acid.
- H. B. T. asks: What power of engine will it take to force a stream of water 4 inches in diameter to a distance of 85 feet through a pipe, the first 60 feet to be forced at an angle of 45°, and the remainder, 25 feet, to be forced perpendicularly into a tank? A. It depends entirely upon the quantity of water required to be forced up the pipe in a given time, which quantity will always be answerable to the capacity of the pump and its number of strokes per minute; this latter will be regulated by the proportion between the area of the pump piston or plunger as compared to the area of the steam piston. The more the area of the latter exceeds the area of the former (the lengths of their strokes being equal), the faster the pump will run; the area of steam piston is commonly the same as that of the pump piston; if the water requires lifting only for forcing, the steam area may be made twice or three times the pump ares. Your first element is therefore the quantity of waterper minuter equired to be forced up
- 1. D. McC. says: Suppose that a boat is floating on perfectly still water, and that the boatbas a sail in the fore part and a large bellows in the back part. Now if air is forced upon the sail from the bellows, would it cause the boat to move? A. The boat would not move by forcing the air against the sail. But by removing the sail and discharging the air from the bellows against the atmosphere, then the boat will move.
- C. W. J. asks: In the case of mill rocks, when the lower rock is stationary, the upper doing the work, is the attraction of gravitation diminished when the rock is in motion? Does it require a greater strength of support to sustain the weight of the upper rock when in motion than at rest? It is contended by some that the weight is less; and they endeavor to maintain their argument by citing, as an illustration, the governor balls of a steam engine, stating that the centrifugal motion destroys, to some degree, the weight of the governor. A. The weight is the same, whether the stone is at rest or in motion.
- G. A. N. asks: 1. Would a boiler made from 3-16 iron, 10% inches in diameter and 26 inches high, with 26 tubes 12 inches long and of 1 inch diameter, with tube sheets ¼ inch thick, be of sufficient power to drive an engine of 2 inches bore and 7 inches stroke? A. No. 2. What will be the fire surface of such a boiler? A. It will depend upon the manner in which it is set. The fire surface may be the surface of the tubes and one end of the boiler, and may have the surface in the shell of the boiler, in addition.
- E. V. asks: Is it possible to compress steam of a low temperature, say 220° Fah., by any of the known means (for example, by a pump) to a press ure of say 901bs. per square inch, without increasing the temperature, and have any such experiments ever been made? A. It can be done by making provision for removing the heat of compression by some method of refrigeration. We do not know of any experiment on the subject.
- P.R.asks: In case of shutting down for 1 or 2 weeks, is it injurious to the boiler not to blow off,but to let the water stand till starting up again? A. If the water is pure, it may be left in the boiler; but if it contains minerals in solution, it is better to blow off and clean the boiler. 2. Which is the best time to blow off, with a pressure of steam or not? A. The best plan, if the water will run out without pressure, is to let it stand for 12 hours after hauling the fire. 3. What effect does oil going in with the feed water have on the boll er? A. It frequently causes priming.
- What is meerschaum? A. It is a hydrous silicate of magnesia, occurring chiefly in Asia Minor.
- I have suffered for the last eight years with a bunion or something of the kind on my foot. How can I get relief? A. Shoes made by a man who understands the anatomy of the footare sometimes efficacious in cases of this kind.
- A. V. asks: Would a sewing machine making a stitch similar to hand sewing be more popular than the present kind? A. Some people might pre-

Suppose I had a hollow iron ball, I foot diameter with the shell & inch thick, what force would it require to hold it 3 feet under water? A. You can readilymake the calculation. The weight of the ball tends to keep it down. The weight of an equal volume of water tends to force it up.

I am an amateur mechanic, and wish to make a cupola on a small scale for casting small articles. Could I do it economically? A. Not unless you have had some practical experience in the matter.

Is there a reward offered for an apparatus for detecting cheating on the part of conductors on railways and street care? If so, by whom, and how much is it? A. There is no reward publicly offered; but the managers of railway companies will doubtless be willing to compensate any one who brings them a useful invention for the purpose set forth in your question.

Would it not be a good idea to use molds for castings made out of wood and saturated with silicate of soda?

A. No.

- Where can I get a book on chemistry for beginners? A You willfind notices of publishers of such works in our advertising columns.
- J. S. S. asks: Is it economy to keep 60 lbs. pressure of steam in boiler when 40 lbs. will do the work required? I am running a steam grist mill and 40 lbs. steam in boiler will drive the rock; but I contend that it is economy to keep 60 lbs. in boiler. A. You do not send sufficient data. If you have an automatic cut-off engine, it would be more economical to maintain the higher boiler pressure.
- S. R. says: A man was killed in a well last summer by gas. The well was completed, being laid in brick and waterlime mortar; the plank curbing and pump were fixed in the same, and the well was probably airtight, with the exception of a very small crack between two planks. The first cold snap that came, a sharp whistling sound could be heard. Our nelghbors are superstitious. We thought the air contracted in the well and the outside air rusbed in through the crack. We placed straws across the crack, and they sucked down. Can you explain it? A. The crack probably connects with some crevice in the earth, which communicates again with some larger chambers or caves in the ground: another being other openings in other localities, opportunity is given for the wind to blow through them.

- M. S. C. Jr. asks: 1. Of what horse power do they usually make narrow gage railroad engines? A. One hundred horse power, and over. 2. How much more can a railway engine draw than a road engine of the same horse power? A. From 8 to 10 times as much. 3. What is the average cost of a narrow gage railroad engine, and how much does it cost, more or less, than a road engine? A. It is about the same as the cost of one of the larger sizes of road engines.
- B. G. says: I have a pump barrel, 3-16 inch thick by 5 inches diameter, length 10 inches. Will it be strong enough to make a cylinder for a small engine, and about how many pounds of steam to the square inch will be safefor it? A. You can use it for pressures of from 20 to 25 lbs.
- T. S. S. asks: Do the drive wheels of some locomotives have a lining of wood underneath the tyre? It so, what is the idea? A. Some passenger car wheels are made in this way, but we are not sure whether the plan is employed in the case of locomotive drivers. The object is to deaden the shock and noise.
- L. G. K. says: I am running a twenty-five horse engine, and we have to use hard limestone water, which is so hard that we cannet run more that three or fourdays without blowing out dry and filling up the boiler again. Will a little lime in the tank from which I feed the boiler be of any use in checking the boiler from foaming? If not, what will prevent it? A. A feed water heater, arranged to deposit the mineral substances of the water before it entered the boiler, would be serviceable in this case.
- W. R. asks: Will an iron wire \(\frac{1}{2} \) inch in diameterand 500 feet long be strong enough to draw a load which would require the strength of one horse to pull? The wire is to be supported on rollers 100 feet apart, each roller to be removed as the load reaches it: the wire to be wound around a large stationary wheel turned by waterpower. If the \(\frac{1}{2} \) wire will not answer, what size will? A. It would be better to use a wire rope \(\frac{1}{2} \) inch in dameter.
- C. F. D. asks: Will you give me a rule for lining up propeller shafts? A. We copy the following rule from the "Cadet Engineer," by Long and Buel: Put two straight edges on the slides, one at each end; run a line through their center points, and continue it beyond the shaft. Set a Tsquare on one of the straight edges, making one edge of the blade cut the center point. Then erect a perpendicular, at the center of the shaft, tothe line previously run, by locking it out of wind with the edge of the Tsquare (or arranging it so that, when viewed from a distance, it covers the edge of the Tsquare for the whole length). Then swing the crank, disconnected from the rod, on the centers and half centers, and measure the distances of its face from the two lines. If they vary at different points, the shaft is not in line, and must be adjusted until the distances the same for all points of the revolution.

I have heardengineers speak of working up indicator cards. What working up is there to do after the card has been taken? A. It is usually desirable to ascertain the mean pressure, back pressure, point of cutoff, etc.

- H. B. asks: Is there such a thing as a pickle or solution, capable of removing the sand that adheres to from castings? A. Place your castings in equal parts of oil of vitriol and water; and after they have remained there two days, wash them with clean water, and the sand will be removed.
- A. C. says: I have now in use a steam boller, 2! feet long by 4 inches diameter, with two 16 inch flues; and I want to put in its place a botler 10 feet long by 48 inches diameter, with 75 flues 2½ inches in diameter, with adome 24 inches diameter by 28 inches in diameter, with adome 24 inches diameter by 28 inches high. I wish to know if, with equal draft and setting, the 10 feet boller will make much more steam than the long one, with less fuel. I drive now 2 engines with my present botler, 10x16 inches, making 166 revolutions, cutting offat % stroke; but I have to burn too much fuel. One boller maker tells me that the short tubular boller will make more steam than the old one, with a great deal less fuel, and another boller maker says that the short boller is too small and will have to be crowded too much to do the same work as the long two flue boller. Please give me your opinion. A. We advise youto continue to use the old boller as long as it is serviceable. We incline to the opinion of "another"
- G. L. D. L. asks: What would be the proper speed of an emery wheel, 13 inches to diameter, with 2 inches face, to do the most efficient service with safety? A. About 1,200 revolutions a minute.
- J. E. P. asks: Would not a single cylinder engine of such proportions as to allow the admitted steam to expand to atmospheric pressure be as economical and effective, other things being equal, as one of the compound system? A. Yes.
- J. A. says: I have at my house a large underground brick cistern. Water comes from a French roof, with the upper part tinned, sides slated, conductors (bright tin) inside to the ground, and glazed earthen pipe in the ground. The water is drawn out of a tight when the cistern was built, the top of the roof had had several coats of lead paint. I then bad all the painted patented slate paints, which covers well and appears to be a solid coating The cistern has now been in use 1 slightly of cement: but is odorless and soft. Am I safe in using the water for drinking without fear of polson from the roof? A. The water is probably affected by particles disintegrated from the brick and cement mor tar; probably the sand used in the mortar was loamy We do not think that the lead paint, if covered with a coat of slate paint, since become hard and firm, can much affect the water. An additional filter at the discharging end of the pipe might be used to advantage and the present filter cleaned out and supplied with new material.
- J. T. J. asks: What is the percentage of power or fuel lost by wire-drawing steam from 100 lbs. pressure persquare inch to 60 lbs.? A friend contends that there is no loss, providing the engine is large enough for its work. A. If you suppose steam of 190 lbs. pressure: (1). To be expanded in the cylinder, so as to make the mean pressure 60 lbs., and (2) to be wire-drawin, before admission, to 60 lbs., and to be used in the cylinder without expansion: The loss from wire drawing will be the difference in the amounts of steam required in the two cases, which you can readily calculate for any given ease. In such a case the loss from wire-drawing would be excessive. In general, however, the steam is expanded, as well as wiredrawn, which modifies the loss, though it is always more economical to expand the steam than to reduce the pressure by wire-drawing.

- I.E. W. asks: How many square feet are there in a spiral screw, winding 5 times around a shaft 15 feet long and 3½ inches diameter? The depth or width of the screw is 3 inches, and the diameter of screw and shaft together 19½ inches. About 101
- L. & J. ask: Should an architect charge for extra work on a building ordered by owners but entirely outside of specifications, and not superintended by the architect? We have a case in hand on our new office, and think there is no justice in the attempt of the architect to charge for such service, not having rendered any. The work disputed on is such as the digging of clstern, catch basin, ceiling around elevator, overhead in basement, laying brick flooring, etc. The verbal agreement was a certain percentage on contract prices. There were no changes in plans or specifications to architect. We feel that having ordered and superintended the work ourselves, we should not pay commission on it. Your answer will settle the question satisfactorily to both of us. A. You do not say whether the architect superintended the building generally. An arcaitect's commission is divided usually into compensation for office work and for superintendence, from 2½ to 3½ per cent for the former and 5 percent for the whole. Office work is considered the furnishing of plans and specifications, and sometimes working drawings; the percentage for this should be taken on the whole cost of the building, unless so great an addition is made to it as to involve the necessity for an additional plan and specification for said addition from other parties. But in respect to superintendence, the case is different; that part only should be taxed which is actually superintended by the architect.
- J. S. W. asks: I am constructing a bath house in a running stream of fresh water; can I build the foundation walls and the bottom with bricks and commonmortar, providing that I allow the mortar in the walls to thoroughly dry before turning in the water, so that it will be sound and substantial? I know that there is a cement used for walls which are to be in undated, but I desire to use common mortar if it is practicable. A. It will not be safe to use common lime mortar for brickwork under water. You should use a good hydraulic cement and clean, sharp sand, free from loam. It will be the most economical in the end.
- It a hole of an inch in dismeter be drilled through a fresh, green ½ inch plank, will its edges shrink? In other words, will the hole become larger, or remain of the same size? A. The board will shrink without reference to the hole, and the result will be that the hole will hecome after the shrinkage somewhat narrower but of the same length as at first.
- D. & W. P. E. say: Our houses are supplied with water through a 3 inch fron pipe coated on the inside with gas tar; but although the pipe has been laid? years, the water, having little or no mineral deposits in solution, continues to taste very disagreeably of the tar. Can we place any chemical solution in the tank supplying the water, which will remove the taste yet not be injurious? A. It is doubtful whether you can do soly thing that will be successful with the present thes.

present pipe.

We have a frame building, roofed with shingles which have been opened by the sun in large cracks; as our mill is close enough to be burnt if this building was, we would like to ask if there is any cement or composition with which to fill the cracks, which will be fire-oroof and at the same time not be dislodged by rain of frost? A. There are several patent compounds in the market, which are said to be efficacious in such cases.

- We have an elliptical reservoir, 20x50 feet and about 4 feet de(m); the sides are composed of ordinary 18 inch more ar wall, bankedon outside with dirt, and covered on unside and too with Rosendaic cement (2 parts cement to 1 of sand); but last winter the frostcracked off the cement on the top and sides, making the reservoir leak (ike a sievie. What would be best to do to make it tight? A. It will probably be necessary to draw off the water and relay the stones.
- (i, W. C. says: G. N. S. can straighten a gun barrel by constructing an apparatus something like a bow for shooting an arrow. The cord is to be made of silk thread and quite fine. Put the cord through the barrel and strain it with the bow. The barrel must be smooth and ciean. Hold it up, and let the bow hangunder the barrel; and you can easily see where the crook is, and with a blacksmith's hand hammer, on an anvil or the end of a hard wood block, can straighten your barrel.
- G. M. says, in answer to H. E. K., who asks for the best way tomake putty of the colors of differentwoods, walnut, ash, etc.: In my experience, I have found that the best way was to soften up white putty with linseed oil, and then work in dry color or colors until the desired shade is reached. It can be done in small quantities as it is needed, with very little trouble.
- B. W. says, in reply to H. P.: If a mixture in the proportion of a quarter of a pound of lire, made into apaste, and added to a spoonful of powdered alum, be put into 200 gallons of water, it will soften the water, and precipitate vegetable and other matter.
- J. H. says, in reply to C. L, who asks how to can green corn: The following method cannot be excelled: Dissolve 2% ozs. tartaric acid in a pint of water. Of this solution, use one tablespoonful to every pint of corn while the corn is at bolling heat. When opened foruse, add one teaspoonful sodato every three pints of corn.

MINERALS, ETC.—Specimens have been reseived from the following correspondents, and examined with the results stated:

- J.S. McC.—No. 1 is a readily fusible amphibole, with a specific gravity of 3 16. No. 2 is specular from ore. No. 3 is specular iron ore imbedded in quartz —L. S. P. —The powder contains common sait and a number of other substances in small quantities. It is uttarly use less for the jurpose for which it is sold. As it does not prevent in the slightest degree the explosion of these light oils, its sale should be regarded as criminal.—H.M. S.—We are unable, without having the entire plant, to identify it, to see whether any notice of its possessing a fiber had been taken hitherto.—G. H. G.—It is galena, ersulphide of lead.—F. W.—It consists principally of hydrated sesquioxide of iron, with a small amount of
- A. F. P. C. says: I have not succeeded in preserving fish which is oily, on account of the oil becoming rancid in a short time. If this difficulty could be overcome, a very large business might be done in drying saimon in California. It would hardly do to extract the oil, but it might perhaps be neutralized without destroying the flavor of the selmon.—J. T. P. asks:

 1. What kind of sealing wax is best to use in sealing glass jars? I have lost much fruit by the wax not adhering to the glass. 2. Why will tomatoes not keep

wellinglass?-J. A. l'. asis: 1. Is the disease called pip among chickens on the tongue? 2. Will it product death unless cured? 2. Whatis the remedy therefor?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Tempering Steel and Copper. By J.S.M. On the Nickel Plating Patents. By A. D. On the Atmosphere. By H. W.

On Moles. By W. S. N.

On Hardening and Tempering Tools. By J. P.

Also enquiries and answers from the follow-

A.D. H.-W.E. K -F. L.-F. A. R.-W. D. P.-A.J.Q. -N. M.-A. D.-R. Y.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of enquiries analogous to the following are sent: "Please to inform me where I can buy sheet lead, and the price? Where can I purchase a good brick machine? Whose steam engine and boiler would you recommend? Which churn is considered the best? Who makes the best mucilage? Where can I buy the best style of windmills?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

Index of Inventions

FOR WHICH

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> July 14, 1874, AND EACH BEARING THAT DATE.

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House, portable, J. W. Justice	2,914	Applications have been duly filed and are now pending for the extension of the following Letters Patent. Hear-
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Knitting burrs, adjusting, G. Campbell	2,968	30,398.—BURGLAR PROOF SAFES.—J. R. Floyd. Sept. 30 30,594.—Door Latch.—T. Slaight. October 21.
Lantern, D. Lordon	3,003	EXTENSIONS GRANTED.
Lead, desilvering and refining, G. Luce	2,987	29,137.—CAR COUCH.—W. A. Brown. 29,162.—PLOW.—L. Green.
Leather, etc., waterproofing, A. C. McKnight 153 Looms, selector forhair cloth, W. H. Drew 152 Lozenges, shaping, T. Rober son 153	2,932	29,180.—Hoisting Apparatus.—I. Lemman. 29,200.—Strering Vessels.—F. E. Sickels. 29,212 —Spring Hinge.—A. Acker.
Lumber setting guide, P. Berry	2,963	
Mail bag fastening, H. Dempsey 152 Match safe, L. Jarchow 153	2,976 3,081	29,180.—Hoisting Apparatus.—J. Lemman. DESIGNS PATENTED.
Matches, making friction, J. J. Machade 153 Medical compound, C. Austin	2,939	7,535.—BAS RELIEF.—T. Kappeler, Cambridge, Mass. 7,536 & 7,537.—Muffs.—G. H. Prindle, Philadelphia, Pa.
Medical compound, S. Dixon 152 Medical compound, H. M. Hoyt 153 Medical compound, L. Hutter 153	3,078	7,538 to 7,540.—LAMP BRACKETS.—F. R. Seidensticker West Meriden, Conn.
Medical compound, J. W. Miller	3,008	7,541 to 7,546.—CARPETS.—R. R. Campbell, Lowell, Mass. 7,547.—CARPET.—C. S. Lilley, Lowell, Mass.
Mercury, manipulating ores of, Eames et at 152 Mildew and decay, preventing, Gender et at 152	2,9u3	7.548 & 7.549.—CARPETS.—D. McNair, Lowell, Mass. 7.550 & 7.551.—SLASSWARE.—D. Bennett, Baldwin town-
Milk strainer, J. F. Donkin	3,028	ship, Allegheny county, Pa. 7,552 to 7,557.—CARPETS.—R. R. Campbell, Lowell, Mass 7,558 & 7,559.—CARPETS.—D. McNair, Lowell, Mass.
Mor head, J. Simpson	5,971	7,560 to 7,563.—CENTER PIECES.—J. O'Neil, San Francis co, Cal.
Organ, pneumatic action, T. Winans	3,143	TRADE MARKS REGISTERED.
	5,967	1,872.—HATS AND CAPS.—J. S. Fayerweather & Co., Dan- bury, Conn. 1.873.—Ale.—C. P. Hawkins, New York city.
Paper, perforating, L. A. Upson 153 Photographic pictures, R. H. Chinn 153 Piano action, A. Moeller 153	3,048	1,874.—BEVERAGE.—G. N. Irish, Brooklyn, N. Y. 1,875.—FLOUR.—Metzger & Co., Platte City, Mo.
Piano sound insulator, W. R. Miller	3,101	1,876.—GBEEN PAINT.—Woods, Son & Co., N. Y. city. 1,877.—Cigars.—C. Brewer & Sons, Boston, Mass.
Pipes, etc., manufacturing, Bingham et al 152 Piston for steam cylinders, S. D. Keens 152	2,964	1,878.—CHEWING GUM.—Curtis & Son, Portland, Me. 1,879.—FLOUR.—Bain et al., St. Louis, Mo.
Plane, L Shane 15 Planter, corn, G. W. Brown 15	2,967	1,880.—CUTLERY.—Hermann & Co., New York city. 1,881.—Tobacco.—Beck et al., Chicago, Ill. 1,882.—Books.—McNair et al., Philadelphia, Pa.
Plow, gang, W. O. M. Berry 15 Plow point, J. A. Peek 15 Pocket book, D. M. Reed 15	3,109	SCHEDULE OF PATENT FEES.
Press, cotton, G. W. Grader	3,031	On each Caveat
Press, tobacco packing, M. J. Farmer	3,061 3,084	On issuing each original Patent. \$20 On appeal to Examiners-in-Chief. \$10
Propeller, screw, J.C. Cross	3,108	On appeal to Commissioner of Patents
Pump, rotary, G. Greindl 153 Pump, steam vacuum, W. Burdon 153 Radistor, steam S. R. Wilmot 153	2,896	On application for Extension of Patent
Radiator, steam, S. R. Wilmot	3,140 3,032	On filing a Disclaimer
Railroad switch, A. N. Rankin	3,114 3,097	On application for Design (14 years)
Ruke, horse hay, C. C. Bradley	2,920	CANADIAN PATENTS. LIST OF PATENTS GRANTED IN CANADA
Range, cooking, G. W. White	3.024	JULY 16 TO 20, 1874.
Roof, fireproof, F. J. Hoyt	2,996 2,892	3,658.—D. M. King, Mantua Station, Portage county, O.
Roofs, composition for, J. C. Hyatt	2,997 52,991	U. S. Improvements on potato diggers, called "King's Potato Digger." July 16, 1874.
Sad iron, Rathbun & Shaw	3,074	3 659.—L. Dauze, Montreal, Mentreal Dist., P. Q. 1m. provements on cooking stove, called "Mechanic Store" Into 18 1824
Sash cord fastener, C. B. Clark	3,067	Stove." July 16, 1874. 3,660.—D. Zeigler, Lewistown, Mifflin county, Pa., U. S Improvements in Mechanical movements, called
Saw, M. Chase	2,970 2,955	"Zeigler's Improved Mechanical Movement." July 16 1874.
Scale beams, poise for, J. H. Usher	2,933	3,661.—W. G. Dunn, Greensburgh, Decatur county, Ind. U.S. Improvements on joints of rails for railways

Sewing machine embroiderers, I. M. Rose 153,116,	
Sewing machine, wax thread, E. E. Bean (r)	
Sewing machines, operating, J. H. Race	153,112
Sewing machines, operating, A. G. Brewer	
Shade cord fastener, M. De Penhoel	
Sheep shearing machine, A. H. Kennedy (r)	5,972
Shoe blacking apparatus, B. Dutton, Jr	
Shoe laces, making, W. E. Smith	153,124
Sign, L. Nielander	153,105
Soldering, J. W. Lamb	153,090
Spark arrester, locomotive, J. E. Wootten	153,145
Spirits, rectifying, M. Dondé	
Spoke socket, S. Mitchell	
Squares, tempering blades of, I. J. Robinson	
Stamps, perforating, Ellsworth & Eaton	
	153,107
Stereotype composition, Macrone et al	153,095
Stone, artificial, J. L. Rowland	153,020
Stove and furnace, W. P. Hall	153,073
Stove, cooking, A. Tittel	152,932
Stove lining composition, E. H. Richter	153,017
Stove pipe flue, H. C. Jchnson	153,082
Stove, reservoir cooking, G. G. Wolfe	153,144
Surface try, H. A. Miles	
Table, folding, J. D. Hall	152,947
Table, ironing. St. John & Brunner	153,180
Table slide, extension, A. Z. Bods	153,040
Telegraphs, electric, Foote & Randall153,063,	153,064
Tile machine, C. Stange	152,926
Tobacco cutter, T. H. Gregory	153,076
Tongs, blacksmith's, D. Kunkel	153,061
Tool holder, G. W. Schofield	
Tool holder for sharpening, H. Barry	152,961
Toy, D. Minich	
Trace carrier, J. Thornton	152,930
Treadle mechanism, C. L. Spencer	153,023
Tuck marker, F. Henry	152,948
Turbine wheel, S. Walton	152,958
Tyre tightener, E. H. Wright	
Valve plug and seat, G. A. Hines	152,995
Vehicle axle, Arnold, Chase & Arnold	
Vehicle axle, R. W. & A. W. Davis	152,974
Ventilator and chimney, Hinckley et al	
Vessels, propelling and steering, J. C. Small	
Violins, combination tool for, F. W. White	
Vise, bench, J. B. Wardwell	153,026
Wagon brake, Fulkerson & Guseman	153,065
Wagon, dumping, O. Gunnuldson	153,071
Washing machine, J. C. Burgner	158,045
Washing machine, J. A. Rose	152,918
Watch key, A. C. Norcross	153,011
Water supply regulator, J. Kelly	
Wedge, expansible, R. Nesbitt	
Whip forming mold, J. J. Bohler	
Whip rack, Murphy & Wyckoff	
Windmill, S. M. Abbott	
Window sash, reversible, J. McNamee	
Wire, straightening and cutting, J. Greenwood :	152,959
APPLICATIONS FOR EXTENSION	S.
Applications have been dulyfiled and are now per	

EXTENSIONS GRANTED.

DESIGNS PATENTED.

TRADE MARKS REGISTERED.

CANADIAN PATENTS.

1874. 3,661.—W. G. Dunn, Greensburgh, Decatur county, Ind. U.S. Improvements on joints of rails for railways called "Dunn's Adjustable Combination Railway Joint." July16, 1874, Separator middlings, Brennan et al. (r)..... 5,970

3,662.-E. E. Bean, Boston, Suffolk county, Mass., U. S. Improvementsingaslighting apparatus, called "Bean's Pneumatic Electric Gas Lighting Apparatus." July

3.663.—J. C. Todd. Toronto. Ont. Improvements in tov guns, called "Todd's Improved Dog Gun." July 16, 1874.

3,664.-W. Briggs, Montreal, Montreal Dist., P.Q., and L. Senécal, Coteau St. Augustin, Hochelaga county, . Q. Improvement on manure and hay forks, called "Briggs' Combined Manure and Hay Fork." July 20,

3,665.-E. A. C. Pew, Welland, Welland county, Ont. Improvements on peatmachines, called "Pew's Peat Coal Machine." July 20, 1874.

3,666.-G. Stacy, Montreal, Montreal Dist., P. Q. improvements on chisel pointed cut nails and machines formaking the same, called "Stacy's Chisel Pointed Natl." July 20, 1874.

3,667.-T. W. Shaler, Brooklyn, Kings county, N. Y., U.S. Improvements onsignallanterns, called "Shaler's Sig-

nal Lantern." July 20, 1874.
3,668.—W. Baxter, Jr., Newark, Essex county, N. J., U.S. Improvements on compound engines, called "Baxter's Improved Compound Engine." July 20, 1874.

3,669.—W. E. Kelly, New Brunswick, Middlesex county, N. J.,U. S. Improvements on steam generators, called "Kelly's Sectional Boiler." July 20, 1874.

3,670.-G. Forsyth, Seaforth, Huron county, Ont. Improvements in the manufacture of picket fences, called Forsyth's Improved Wire Picket Fence." July 20,

3,671.—R. Dunlop, St. Thomas, Elgincounty, Ont. Improvements on steam and gas fitting wrenches, called "Dunlop's Improved Steam and Gas Fitting Wrench." July 26, 1874.

3,672.-J. E. Harriman, Bangor, Penobscot county, Me .. U. S., assignee of M. L.Norton, same place. Improve men's on lath machines, called "Norton's Improved Lath Machine." July 20, 1874.

3,673.—1. Palmer, Westminster, Middlesex county. Ont. Improvements on a machine for destroying potato bugs, called "Palmer's Potato Bug Killer." July 20,

3.674.-C. E. Patric. Springfield, Clark county, O., U. S. Improvements on a machine for sowing grain broadcast, called "Patric Breadcast Seeding Machine." July 20, 1874.

3,675.-R. Benner, Hamilton, Wentworth county, Ont. Improvements on the art or process of veneering, called "Bennett's New Process of Vencering." July 20, 1874.

3,676.-A. McCannel, Caledon, Pecl county, Ont. Improvements in self-opening gates for railway crossings, called "McCannel's Self-Operating Railway Gate." July 20, 1874.

3,677.-L. O. Cantin, Montreal, P. Q. Improvements in machine for burnishing photographs, called "Cantin's Photograph Bu isher." July 20, 1874.
3,678.—J. Rourk a gston, Frontenac county, Int. Improvements in mospheric engines, called "Rourk's

Automatic At nospheric Engine." July 20, 1871. 8,679.—J. F. Stara, Halifax, N. S. Improvements in material for calking, called "Stair's New Stock Oakum." July20, 1874.

.680 .- T. J. Blake. Pittsburgh, Alleghany county, Pa., U. S. Improvements in the manufacture of smooth back shovels, called "Blake's Smooth Back Shovel."

July 20, 1874. 3,681. G. B. Cornell, Chicago, Cook county, Ill., U. S. Improvements in wrenches for inserting bung bush "scalled "Cornell's Bush Wrench." July 20, 1874. 3,682.—C. U. Jerome, Chicago, Cook county, Ill., U. S. Improvements in moth proof fur cases, called "Jerome's Moth Proof Fur Cases." July 20, 1874.

3,688.-R. P. Colton, Gananogue, Leeds county, Ont. Improvements on harrows, cultivators, and analogous implements, called "Gananogue Improved Harrow." July 20, 1874.

,684.—J. M. Foss, St. Albans, Franklin county, Vt., U.S. Improvements on railway locomotive engines, called "Locomotive Draft Regulator." July 20, 1874.

685.—T. Ford, Plattsville, Oxford county, ont. Machine for cutting the tapering plug end of well tube joints, called "Ford's Pump Tube Jointer." July 20,

8,686.-J. D. Richardson, Houston, Harris county, Texas, U. S. Improvements on springs, called "Richardson's Tensile Spring." July 20,1874.

5637.—J. Ruthven, Levis, Levis county, P. Q. Improve-ments on carbureters, called "Ruthven's Improved Gas Machine."

-O. K. Wood, West Chazy, Clinton county, N.Y. U.S. First extension of No.2,524, for "The Queen of the Harvest Separator." July 20, 1874.
3,689.-O. K. Wood, West Chazy, Clinton county, N. Y.

U.S. Second extension of No. 2,524. for "The Queen of the Harvest Separator." July 20,1874.

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