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from glass by following the directions on p. 235, vol. 36. -J. T. S. will find a description of the Gatling gun on p. 143, vol. 26 .- A. C. will find a description of draulicpress on p. 315, vol. 35.-A. H. D. will find a description of the nitrate of silver process of making mirrors on p. 267, vol. 31 .- D. S. M. will find directions for kalsomining on p. 351, vol. 24.—P. A. N. does not send sufficient data.—R. F. I. will find directions for building an ice house on p. 251, vol. 31.-E. B., C. F. Q., J. W. B. N. C., G. P., R. K. B., J. F. P., W. H., J. P., and others. who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) O. C. K., of Leipsic, Germany, says: To make lead pipes nearly harmless, as regards the poisonous properties of the lead salts soluble in water. fill the pipes for a short time with dilute sulphuric acid (SO₄H₂+10 or 20 H₂O). The pipes will become covered with a thin coating of sulphate of lead (SO₄Pb), which is far more insoluble in water than the oxyhydrate of lead (Pb OH₂) generally formed.

(2) A. G. says: I have a rough chamois skin leather bag, into which, by some mistake or other, there came some English vermilion, dry. How could I clean it out? A. Vermilion is a compound of mercury with sulphur, and there is no solvent forit that would not damage the materials of the bag. Remove as much of it as you can with a stiff brush. and then cause an energetic stream of water to impinge upon the discolored surface, so as to mechanically carry off the particles of the pigment.

(3) G. B. S. asks: 1. Will tin (old cans, etc.), copperplated, do for the coppers in a gravity battery? A. Yes. 2. Will salt (sodium chloride) do for the saline substance? A. Better use sulphate of zinc. 3. Will common plate (window) glass do for the plate in an electric machine? A. Yes, but it is not the very best.

(4) W. M. M. says: I have a magic lantern, and want to know what kind of oil gives the best light for it. A. Kerosene gives as good a light as any, and better than most others.

(5) C. M. asks: What can be applied as a depilatory on horses, destroying the pigmentary granules yet not destroying the life of the hair? 'The object in view is to brand colored horses with a white brand. A. This is not practicable. The color of the hair above the cuticle may be bleached by the application of chlorine water or nitro-muriatic acid (aqua regia). It is not probable, however, that the action of these will be rapid nough for your purpose.

(6) C. E. H. says: Four years ago I had in a mill an upright shaft of eight inches diameter which. withattachedgearing, weighed several thousand pounds. The toe on which it turned commenced cutting badly. It was impossible to remove the toe. Washers of steel raised the shaft too high out of the step, wore out rapidly, and did not work thoroughly well. I went to a number of machine shops for advice. One told me to grind it out with emery; another said my only course was to take down the shaft and send it by rail to the shop, and none could give me any speedy and economical cure for the trouble. At length I met the rightman, who told me to raise the shaft and put under the toe (in the step) an old-fashioned large-sized copper cent, This I did, and the heating and cutting ceased at once, and the difficulty was permanently overcome. Since then I have put small cents in the steps of millstone spindles and always with good effect. The grooves filled up with the copper, and the toe looked as though it were copperplated and burnished. I even got to introducing a small copper cent under each new spindle, and think that so doing prevented cutting.

(7) A. J. F. asks: How can I set the lenses of an eyepiece to a telescope? It is composed of two plano-convex lenses. A. The Huyghenian eye lens is one third the focus of the field lens, and is placed its own focal length with the focus of the latter.

(8) A. L. S. says: I learn from tables on the heat of water with steam, that 60 lbs. pressure equals 292.6° Fah. Is this the degree of heat under any and all circumstances? A. This is for fresh water. The temperature changes, if the water contains impurities.

(9) G. W. K. savs: I have tan vats which have not been used for some time. I keep them full of water to preserve them. How shall I keep mosquitoes from breeding in them? A. Cover them tightly.

(10) E. C. H. says: I wish to fill up a low place in a lot with a mixture of sand and gravel. How much will it settle after leveling it off 1 foot deep with no packing? Surface of plot is a rich loam, subsoil a clay bottom. A. From ¼ to ½.

What is the thinnest circular saw I can use 10-inches in diameter for sawing 2 inch white oak, saw running on 700 revolutions per minute with 2 horse power? A. One of No. 16 gauge, or about 1 of an inch thick.

(11) I. says: Nearly all lugs or սբբ riveted to steam boilers have three on each side, one of them in the middle of the boiler; so, if either end of the support settles, the whole weight of the boiler of water is hung by the middle. This is all wrong. There should Earth now rotates in 86164'09 seconds, and $\frac{36164'09}{2\times0'22}$ the longest space between the two inside ones. Is not this so? A. Yes. We could not tell you why the former course is pursued, except that common sense is

of stroke over a single cylinder sufficiently long to secure an equal amount of expansion? A. It is claimed that the machinery can be made lighter, with the compound engine, for high grades of expansion. 2. Will highly volatile liquids give more power than water in an engine, from the same fuel? A. Not necessarily.

(14) G. S. C. asks: Could not hot air balloons be used for aerial navigation, if a light furnace were constructed which would constantly run a hot current into the balloon? A. It would be difficult to carry enough fuel for an extended voyage. Fire balloons have been used successfully for short trips.

(15) A. S. E. says: The centrifugal force on the sea board and that on the top of the highest mountain is considerable. The specific gravity is the same. Let a globe be turned rapidly, and water put on; it climbs to its greatest diameter, and flies off. Two canals are cut at the same declivity, one north and the other south; the velocity is the same in both. Neither does this influence affect the wind. Please explain the law that counteracts this influence and produces the equilibrium? A. There is a slight difference in the effect of gravity at the different levels.

(16) C. G. V. P. says: Is it practicable to heat the passenger cars with the steam from the locomotive? If so, in what manner is the steam conducted from the boiler? It seems to be a failure in Europe, and some of my European friends ask me what the Sci-ENTIFIC AMERICAN thinks about it. A. It might be possible, but it would be necessary to increase the size and weight of locomotives. Steam pipes could be arranged in a similar manner to the air pipes used with continuous brakes.

(17) M. W. H. says: How many lbs. pressure can an ordinary horse exert, when doing its best? A. Between 300 and 400.

1. What is a high pressure engine and boiler? Is it not one that condenses its steam, and uses the water over again? A. In the common acceptation of the term, a high pressure engine is non-condensing. 2. What steam pressure will a vat sustain, if made of 2 inch plank of oak, matched, and covered with heavy sheet iron, both out and inside? It is 3 feet in diameter and 10 feet high? A. Your data are insufficient.

1. How can phosphorus be made into solution for using on gun sights after night and other similar pur-poses? I dissolved some in hot olive oil, also in turpentine, but it settled and formed a hard body as soon as cooled, in both. What is the trouble? A. Probably the ingredients were not pure. 2. What is the coldest temperature in which phosphorus will glow or show light? A. About 32º Fah.

(18) F. R. H. says: I have an iron tank 4 feet in diameter by 12 feet long, in which I put dead stock to be steamed out. This tank is supplied with steam from a portable boiler and engine. The steam dome is 1 foot high, and the pipe rises from the dome 11/2 feet in three turns, and goes 6 feet down into the tank in the bottom. When I turn on the steam to the tank the water blows from the boiler faster than I can pump it into the boiler, at the same time running the steam down. It has only begun acting so lately. Can you tell me how I can overcome this difficulty? A. It is not unlikely that your pump is out of order. You can regulate the amount of steam let into the tank, so that the pump will supply what is taken away.

(19) W. F. A. says: I have tried to bend basswood, but have failed. I gave it a long steaming, and it would break off short. Then I tried a sho t steaming, but it worked in the same way. Can you give mesome information? A. It is very possible that the specimens you tried were not suitable. It may be that any kind of wood can be bent at pleasure, by a proper treatment, but the methods are not generally known. There is now for sale in this country bent-wood furniture, which is, we believe, manufactured abroad by a secret process

(20) A. B. says: I saw in the SCIENTIFIC AMERICAN, of January 20, an engraving of a new water velocipede. Please tell me if the two floats would be better if they were of the shape of a triangle, and what should be the distance between the floats? How long, from end to end, and of what size should the paddle wheel be? What should be the thickness of the floats. and what would be the best material to make them, in case of stones or rocks in the river? A. We think the cigar shape is best for the floats. Their size depends on the load to be carried, and must be calculated for any particular case. Distance apart, 2 to 4 feet, according to capacity, will do. They could be made of light iron, for clearwater, and of wood for rocky places.

(21) F. W. B. asks: What power can I use to run a dental engine and a small polishing lathe head? I have tried water motors, but they fail. A. We think there are water motors in the market that will answer. There are also small steam and electric engines suitable for the purpose.

(22) S. N. M. says: 1. I read that the earth's

atmospheric pressure? Would there be a decided gain in the expense of fuel in thus evaporating water? A. The amount of heat required would be a few per cent less in the case of the vacuum.

(25) A. B. says: 1. We intend to put a siphon to draw the water from a part of mines, the height to which the water has to be lifted perpendicularly is 20 feet from the summit. There is 600 feet of tunnel with a grade towards the other end of 6 inches to the 100 feet. We can extend the pipes to a depth of 35 feet, so that the discharging end will be 18 feet below the suction end. Length of pipe in all will be 700 feet. Will it work? A. It will be necessary to have an air valve at the highest point, which must be opened occasionally or may be made automatic. 2. We intend to use 3 inch gas pipe for the siphon, but the present supply of water will probably run through a 1½ inch pipe, and the water will increase in quantity. Can we regulate the siphon so that the present supply of water will run in a continual stream through the 3 inch pipe by putting a stopcock on the discharging end and keeping it open 1/4 or 1 of the time-as the supply of water varies? A. Yes.

(26) A. A. H. asks: How can I remove ink stains from fabrics, fingers, and paper without injuring the article stained? A. To remove ordinary ink (tanno-gallate of iron) stains, the following treatment is recommended: In many cases lemon juice will often prove efficacious. If this fails, try an aqueous solution of oxalic acid (1 part to 2 parts water) and rub well with a soft cloth. Or use a solution of chloride of tin (1 part to 3 parts water, or pure dilute muriatic acid (1 part to 10 parts water). Apply with a camel's hair brush, and then wash in cold water. Where the colors of the fabric are affected by the above treatment, moisten the spots with fresh milk and cover with fine salt. This should be done before washing. If the fabric is fine and delicate, the stained portions may be dipped in melted tallow and then pressed for some time between layers of warm pipeclay. Stains of indelible ink (made from nitrate of silver) may be removed by moistening them with a brush dipped in a strong aqueous solution of cyanide of potassium, and then well washing the fabric in water. The cyanide solution is very poisonous.

How can I gild book covers, picture frames, etc.? A. Finegold leaf is used for ornamenting books. It is stamped in the covers by a press. On gilt picture frames gold leaf is also used, but in many instances the gold-like finish on these frames is produced by laying on first silver leaf, and then lacquering this with an alcoholic solution of orange shellac, to which is often added gum sandarac and dragon's blood, saffron, gamboge, etc.

(27) J. W. S. says: Can you give me a goodformula for making a fluid extract of annotto? A. Annotto is often adulterated with flour, soap, Venetian red, and red lead. Macerate it with twice its weight of alcohol for several hours and filter.

Please tell me how to make a good stencil ink, which contains no oily matter and will dry quickly? A. Rub up a quantity of lampblack in a mortar with enough of a strong, hot solution of dextrin in water to form a paste, and add a little alum water. Solution of soap is sometimes used in place of the dextrinand water.

(28) J. R. K. asks: By what process can I move the silver from old mirror backs, so that it can be used again? A. If it is silvered, use nitric acid, and crystallize from the solution by evaporation in a small porcelain vessel. If the coating is an amalgam of tin and mercury, use mercury, and loosen the film by rubbingwitha cloth.

I have some walnut furniture finished in shellac. It got wet in moving; and wherever the water touched it, it left a white spot. How can I remedy this? A. Rub the spots with a little oil mixed with Venice turpentine.

Is arsenite of copper called Paris green? A. No. Arsenite of copper is known as Scheele's green; Paris green is an aceto-arsenite of copper.

(29) G. J. H. asks: Is there any way to eparate tin and copper which have been melted together, so that the copper can be used again? A. Most of the tin may be burned out by prolonged exposure to the air at a high temperature. This is the only practical method we know of. Small quantities of the alloy may be dissevered by dissolving it in a slight excess of strong nitric acid. The insoluble oxide of tin will then settle to bottom of the vessel, when the copper solution may be decanted and the copper precipitated out as oxide with an excess of potassa, soda, or lime. This precipitate may be reconverted into metallic copper by first drying it thoroughly, and then mixing it in a crucible with powdered charcoal, and exposing to a high temperature. The tin may be recovered in a similar way.

(30) W. B. M. says: I want to build a tank 48 inches deep by 48 inches wide by 36 inches long, for boiling linseed oil with steam. What amount of pipe will be required to dissolve the manganese used in boil-(22) S. N. M. says: 1. I read that the earth's ing that amount of oil? A. This can best be determined to the protection is retarded 22 seconds a century =0.22 seconds a by experiment. It may require 150 to 200 feet of inch pipe, but this, of course, is dependent on the temperature attained and the length of time allowed for the operation. There are no accurate data on the subject.

The Zero Refrigerator was awarded a grand Centennial medal. Send for book. Lesley, 226 W. 23d St., N. Y.

Etterich's Screw Cutting Tools are in great demand. Catalogue free. Frasse & Co., 62 Chatham St., N. Y.

Patent Scroll and Band Saws. Best and cheapest in use. Cordesman, Egan & Co., Cincinnati, O.

Best Glass Oilers. Cody & Ruthven, Cincinnati, O.



J. S. will find directions for making lard oil on p. 283, vol. 30.-H. C. W. should read our articles on the management of boilers on p. 293, vol. 36. As to testing boilers, see p. 246, vol. 34.-W. E. can plate brass, etc., with nickel by the process described on p. 235, vol. 33.-O. E. will find directions for making oil of peppermint on p. 219, vol. 31.-E. O. T. will find an excellent recipe for cement for mending roofs on p. 187, vol. 35.-J. B. will find a recipe for tough glue on p. 43, vol. 32 .-D. A. G. will find directions for making impression paper on p. 378, vol. 28.-T. S. L. can remove paint spots

Why is it that persons at this period of mechanical science place tightening pulleys on the load line or pulling side of a belt? A. We do not know, but we are glad to call attention to these points again. as we have frequently done before.

(12) G. H. A. says: I sometimes preserve eggs in limewater, and they keep well, but look limyafter taking out of the solution, notwithstanding that I let the lime settle in the water till it looks clear, and dip it out, leaving the lime behind. Is there anything that I can put in to remove what little lime stays in the water? A. Wethink filtering will answer the purpose. Place a piece of filtering paper in a funnel, and pour in the liquid.

(13) C. S. O. asks: 1. Has the compound engine any advantage or economy other than shortness

year. Also that two thousand million years ago, the earth was rotating twice as fast as now. I figure thus:

195.327 years ago earth rotated twice as fast as now. Am I wrong? I also find the following: "It therefore follows that she was rotating at about the same rapidity as now, when she became solid: and as the rate of rotation is certainly diminishing, the epoch of solidification cannot be more than ten or twelve millions of years ago." Howcan this be? A. Your calculation does not seem to be correct. The assumption is for 0.22 seconds a year at present. We presume the article gives reasons for the second statement, which is not very alarming to the present generation, even if true.

(23) W. C. W. asks: How will a cast iron vertical boiler, 3 feet high and 15 inches in diameter, shell being 1/2 inch thick, with flat heads 3/4 inch thick, and firebox in base of boiler, with 15 tubes, as compared with a wrought iron one of similarform? A. We think the wrought iron boiler is preferable on many accounts, and advise you not to use cast iron.

(31) W. B. asks: Is there any possible way to get the turpentine taste out of rosin? A. Pulverize the rosin and boil it for some time with a quantity of water; then dry, and fuse it.

(32) O. E. says: I will advise R. L. D., who asks how to harden an eggshell, to lay the egg in vinegarfor two weeks. The shell becomes soft, and you can stretch it like a piece of rubber. Lay it in a strong solution of saltpeter for two weeks, and then you cannot strike it to pieces with a hammer.

(33) A. J. J. asks: How can I make an indelible mixture of nitrate of silver, using oil? A. You may make an emulsion of the nitrate in the oil by rubbing them up together in a mortar. It is better to use glycerin instead of oil. Mordant with a strong solution of carbonate of soda.

(34) H. E. W. asks: 1. In the manufacture of electric annunciators, will malleable iron castings (24) W. H. P. asks: Will it require less answer as well for frames for the magnets, etc., as brass heat to boll away 100 gallons water in vacuo than under castings? A. Yes. 2. If the magnet cores are screwed

directly to the malleable iron frame, without a connecting piece of iron, will it answer as well, the malleable iron acting as the connecting piece? A. Yes. Which pearance thoroughly welded together. In the second is cheaper, to cast small articles in brass, or to cut them with dies? A. Castings will probably be found cheaper.

(35) W. P. E. asks: 1. Have you any knowledge of a speed of 25,000 revolutions per minute having been obtained by a single motion, without gearingof any kind? A. We do not remember having seen or heard of such a device. 2. Could such a speed be advantageously applied, for instance in blowing a steam fog horn for the Signal Service, or for other purposes, provided the machine giving the motion was not too expensive? A. It might be usefully applied to numerous cases, if cheap, simple, and powerful

(36) A. M. W. says, in reply to D. W.'s query as to his singular phenomenon: This does not appear to me at all singular. It is very evident that the bearing, or step, had become dry. It is a common occurrence, where steel runs in or on steel, that the bearing will, if allowed to get dry, become heated to such a degree that the temper is lost, and the surfaces get to degree of compression is required? How is compression cutting and almost weld together. The statement that applied? Should the mixture be heated while under the plate was bent by the hammer shows that the plate compression? What kind of mould is used? How can was soft then, even if it had once been hardened. D.W. we prevent the carbon from adhering to sides of mould? says that sufficient oil was found above the plate collar, A. In his work on "Electricity and the Electric Telebut he does not say that there was oil on the plate where it was most needed. In my experience, I have never known hardened steel to cut or grind together when required for the carbon and exposed to the heat of the properly lubricated, and I think it impossible to produce that effect except by a pressure that would expel every and unfit for use, but by repeatedly soaking it in thick particle of the lubricant. Two hardened steel surfaces syrup of gas tar and reheating it, it at length acquires may be ground together when dry without losing the temper; but they would not adhere with the tenacity that D. W. describes. It is possible that the time taken to raise both stones gave the spindle and plate opportunity to give off the heat to the cast foot and bed. In my opinion, the construction of the oval end spindle would have a tendency to run dry even under common lubrication, as it would only hear on a small part of the end, which might, with the weight of the stone, force itdry. Hardened steel bearings do not often give any notice of being dry, except by refusing to do duty, a very few revolutions being sufficient to announce the fact and ruin the bearing. I would suggest to D. W. that he make his spindle so that its end rests its whole surface on the step with a hole in the latter opposite the center of the spindle. The spindle should be made like a cup, so as sulphate of zinc. Please tell me what more I want to to form a reservoir for the oil, and so deep that the end | make a battery with? A. Get a copper plate, attach the of the spindle shall be immersed.

(37) J. S. B. savs: I have found a specimen of tantalite. Can you tell me anything about this rare mineral? It is said to consist of tantalic acid and iron, and is valuable, especially when found in crystallized forms. May we expect to find it in veins or beds, or on blue vitriol on the copper plate and join the wires for a high or low lands? with sometimes oxide of tin replacing part of the ferrous oxide. Some specimens are nearly destitute of manganese and some contain oxide of copper and lime. Its luster is nearly pure metallic, somewhat adamantine: its color is iron black, and streak reddish brown to black. It is opaque and brittle, and its hardness varies from 6 to 6.5. Its specific gravity is from 7 to 8. It is confined mostly to albite or oligoclase granite, and is usually associated with beryl. It is also found associated with gigantolite in albitic granite, and with lepidolite, black tourmaline, and colorless beryl. The name is usually extended to the American mineral columbite, the average analysis of which gives Si O_2 (80.60), Fe O (15.57), Mn O (5.0), Sn O₂ (a trace).

(38) T. McC. says: 1. I am building a small horizontal steam engine, with 2 inches bore and 4 inches stroke. What size of boiler would I need for it, and what should be the thickness of the iron? A. Make it 15 inches in diameter, 24 inches high, of 1/2, inch iron, for 60 lbs. pressure. 2. What would be the best speed to run it at in order to get the most power? A. You may run it at 250 revolutions a minute. 3. Could I make a cylinder of an engine with 2 inches bore and 4 inches stroke with Babbitt metal. that would stand the steam pressure as well as brass or iron? A. No.

tions as to the violin: There are two or three different tools with which the grooves are cut. One of the best I ever used or saw, I constructed myself; but it cannot well be described in a limited space or without illustrations. With it a perfect groove can be cut around a vio lin plate in half an hour. A perfect groove cannot be made without a tool well adapted to the purpose. The threads mentioned by A. B. are known as purfling, and consist of a thin slip of white holly wood between two similar slips of ebony, and are glued into the groove be-fore the plate receives its final finish. Staining is, in most cases, done upon the wood, with thin, transparent dyes of different composition, and varnish laid on over that in the ordinary manner; but the technicalities of this portion of thesubjectare too numerous for treatment in brief space. See Business and Personal col-

in diameter) about 31/2 inches. It was twisted off about 11/2 inches from the end, and the parts were to all apcase, the point was of about the same dimensions as thefirst; but instead of twisting the pointoff, it turned in the spindle (which of course cut it badly), where it stuck to the plate. After considerable hammering, they were broken apart, but not where they were welded, as part of the plate came away with the point when they separated. I account for it in this way: As long as two metal surfaces that are intended to run together are properly lubricated, we have no grinding or welding if they are proportioned to the work they have to do. In the above cases, the person in charge of them said there was plenty of oil in the pots. It often happens that the passageways get stopped up and the oilfails to reach the parts, and the result is that they grind together almost instantly.

(42) M. D. L. says: We desire to manufacture for our own use in large quantities, carbon plates for batteries, and carbons for electric lamps, of larger size and greater length than we can find in the market. What mixture of materials secures best results? What graph," Prescott says: "The fine dust of coke and coking coal is first put into a close iron mould of the shape furnace. When taken out, the burned mass is porous the necessary solidity and conducting power.

(43) R. J. J. asks: How can I make a galvanic machine for giving shocks from the wire of the telegraph sounder? A. You can get a prettystrong shock from an ordinary telegraph relay, if you have one, and do not want toincur the expense of a special apparatus. The connections are made in the following manner: The relay is joined up in circuit with a battery and mechanical vibrator for interrupting the circuit, and two wires with handles, to be held when taking the shock, are connected to the binding screws of the relay's helices, one wire to each screw.

(44) H. A. H. says: I have a glass jar, about two feet of insulated wire, some blue vitriol and some wire to it, and place it on the bottom of the jar with the wire sticking out. Fill the jar about two thirds full with a weak solution of sulphate of zinc and water, and suspend a zinc casting, provided with a terminal wire, from the top of the jar; let the zinc just dip below the surface of the solution. Now drop a few crystals of A. Tantalite is Fe O, Mn O, TaO₅, short time, when the battery will be ready for action.

> MINERALS, ETC.-Specimens have been received from the following correspondents, and examined, with the result stated:

> Will J. M. P. send us a specimen of the residue from his limestone water ?-G. S. A.-The piece of rock containstitaniferousiron. It would require a quantitative analysis to determine all of the other constituents. It also contains a little arkansite-titanic acid. pieces of metal consist apparently of the iron from your ladle, together with some titanic acid.-J. Z.-So far as we can discover, the segar contains only very strong tobacco. The odor is due to certain essential oils peculiar to tobacco, and cannob well be imitated .--G. H. P.-Itis a variety of mica called muscovite, con sisting of potash, alumina, and silicic acid. It is not valuable.-B. F. C.-It consists principally of carbonate of soda. We do not see that it would be likely to prove very efficacious as a scale preventive. It will not injure the iron.-We have received some minerals in a small pasteboard box without a name on it. No. 1 is chlorite, composed of oxide of iron, magnesia, alumina, and silica. No. 2 is chondrodite-a silicate and fluoride of magnesium. No. 3 is spinel-magnesia and alumina.

D. F. H. asks: How is the tubing of brass (39) H. P. S. says, in reply to A. B.'s ques- band instruments formed, and how are the dents removed from the same?-D. S. says: I have made a few wooden organ pipes, but they do not give more than a whistling sound. Can any one give me the proportions for a middle C?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFICA MERICAN acknowledges with much pleasure, the receipt of original papers and contributions upon the following subjects: On Spiral Springs. By J. T. G. On Man's History. By J. E. W. On Mechanical Science. By E. B. On Kerosene Oil for the Hair. By G. H. S. On the Origin of Solar Light. By G. P. H. On Canceling Postage Stamps. By H. D. M. Also inquiries and answers from the following:

[May 19, 1877.

OFFICIAL.		Keys, stock for the manufacture of, W.H.Taylor Knitting needles L. E. Salisbury 189 500 189 501	189,520
INDEX OF INVENTION	S	Lamp burner, Hallas & Weeden Lamp chimney, H. L. Ives	189,542 189,359
Letters Patent of the United States w	ere	Lamp extinguisher, E. C. Blakeslee Lamp, fountain, E. J. Stearns	189,335 189,398
Granted in the Week Ending Anril 10, 1877		Lamp, street and park, J. Stimpson Lamps, lighting night, J. R. Rowlands	189,514 189,499
AND EACH BEABING THAT DATI	E.	Leather cutting die, A. Warren Life boat, sectional, G. Bates	189,4 06 189,297
[Those marked (r) are reissued patents.]	list	Lifting jack, A. R. Hurst Lifting jack, V. Johnson	189,463 189,468
A complete copy of any patent in the almexed including both the specifications and drawings, will invasided from this office for one dollar. In order	ll be	Lightning rods for oil tanks, J. A. Sherriff	189,298 189,326
please state the number and date of the patent desi and remit to Munn & Co. 37 Perk Bow Now York di	ired,	Lock for sliding doors, etc., J. W. Schoonmaker.	189,345 189,392
Amalgamating ores, Laffin & Elliott	89,31 3	Loom, circular, J. E. Gillespie	189,353 189,515
Animaltrap, M. Early	19,346 19,427	Lumber dryer, J.J. Curran	189,482 189.305
Anvil, blacksmith's, H. B. Sevey	89,393 89,434	Milk cooler, B. D. Miller Moistening pad, C. E. Stockder	189,485 189,517
Bale band tightener, J. L. Sheppard	19,325 19,524	Monument, A. Smith Music, electro-pneumatic, W. F. Schmoele <i>et al</i>	189, 327 189,391
Barrels compressing, O. D. Goodell	39,309 39,309 7597	Nail plates, pile for, W. H. Powell Nozzle and sprinkler, N. Malmquist	189,495 189,368
Bed bottom, spring, J. H. Palmer	19,382 19,303	Nutimeg grater, J. Meyer Oven, portable, E. V. Van De Mark	189,375 189,403
Beer, ale, etc., cooler for, F. V. Baudelot	19,331 19,332	Pantaloons, shaping, E. B. Viets, (r)	189,491 7,603
Belt fastener, P. Lyons	19,478 39,415	Paper box, A. Goldback. Pavement, stone, B. F. Camp.	189,454 189,337
Bench plane, G. Gocher	19,453 39,311	Pen, fountain, A. T. Cross Petroleum products, etc., H.W.C. Tweedle.189,401,	189,304 189,402
Blackboard, Kinsley & Packard	89,473 · 19,429	Photographic burnisher, J. H. Ferguson Pianos, hollow support for, J. Fairman	189,348 189,4 4 1
Boot and shoe, J. M. Bibbins	9,333 : 9,444 9,497	Pipe coupling, S. Lightburne, Jr Plow, D. P. Ferguson	189,477 189,443
Boot and shoe last, Batley, Keats & Neil	9,418	Plow, J. C. Jenking.	189,466 189,496
Boot safety sole, Watson & Crane	9,408 9,329	Pump, W. S. Davis,	189,532 189,306
Bridle attachment, S. S. Cummings	9,3 41 9,519	Pump, steam, C. Ahrens	189,428 189,414 189,518
Butter and fruitjar, C. A. Sands	9,390 9,419	Pump pipe joint, etc., J. B. Eads Railwaygate, Fox & Vorwald	189,436 189.447
Car brake, L. T. Hay	9,457 9,334	Railway joint, Palm & Fitzgerald Railway rails, bending, W. R. Jones	189, 38 1 189, 471
Car coupling, J. B. Zink	9,540 9,458	Reverberatory furnace, J. Morrison Revolving firearm, O. Jones	189 ,4 86 189 ,3 60
Carriage top and seat rail, J. W. Post	9,385	Boad scraper, P. Schneider, Sr Safety pin shield, W. A. Butler	189, 324 189,4 25
Chandelier, F S. Shirley	9,509	Sap spout, E. Willis Sash balance, B. S. McCune	189,3 30 189,317
Churn dasher, F. M. Johnson	9,469 9,372	Saw guipe, adjustable, G. W. Baker	189,522 189,416
Clasp for skirt supporters, E. C. Fales	9 ,442 9,449	Saw, scroll, J. A. House	189,461 189,534
Coin, box for holding, C. E. McConnell	9,482 9,538	Sawing machine, M. Rose Sawing machine, scroll, G. H. Truxell	189, 4 98 189, 52 7
Cooking utensil, S. Spoor (r)	7, 6 02 9,430	Scales, platform, H. T. Lawton Scrubbing machine, P. Byrne, Jr	189,475 189,4 26
Cornet, M. Cohn (r).	9,315 7,596 9,405	Seed planter, J. Wafer Seeder and cultivator, W. A. Van Brunt (r)	189,404 7,604
Cotton chopper, J. B. Eaves	9,347 9.396	Seeder and fertilizer, O. Stone	189,516 189, 423
Crayon for marking glass, etc., B. J. Clarke 189 Crockery, ornamenting, E. J. Gerard 189	9,338),450	Sewing extension table, H. G. Crawford	189,446
Cultivator, J. C. Stevens	9 ,51 3 9,483	Shell, B. B. Hotchkiss.	189,358 189,417
Dental engine, G. W. Tripp	9,526 9,409	Show case, W. T. Sherer Skate, roller, R. Gibson	189 ,508 189,451
Dish warmer, J. H. Wright	9,412 9,440	Spelling, teaching, D. A. Willbanks 1 Steam pipe covering, P. Carey 1	189, 585 189, 30 1
Ditching machine, T. T. Fleener	9,390 9,395 9,397	Steam radiator, R. S. Gillespie	189,452 189, 407
Door bolt, R. Eichmuller	9,438 9, 320	Steaming rationes, etc., W. Matner	189,371 189,448
Eave trough cover, J. R. Creighton	9,431	Stop cocklock, H. C. Meyer & Co. (r)	7,598 189,531
Engraved plates, etc., polishing, R. Neale 189 Exercising machine, Hansom & Russell 189	9,377 9,856	Stove drum, Vosburgh & Van Slyck	189,530
Exercising machine, G. W. Wood	9,539 i 9,511	Sugar, clarifying, J. Schwartz	189,504 189,494
Fan attachment, Thompson & Bergstrom),523),541	Suspenders, A. Shenfield	.89,394 89, 321
Fence, iron, Root & Strickland	,323),323	Target, spherical glass, A. H. Bogardus	.89,422 189,497
Fence post, W. B. Markham	9,480 1,364	Threasting machine, concave, J. H. Sharp	189,420 189,507
Fire arms, lock for, I. Robbins	,387 9,455	Tobacco pail cover, F. A. Braymer, Jr	.89,435 .89,299 .89,296
Fire kindler, C. H. Hayden 189 Flour cupboard and knead board, F. M. Mahan 189	9,310 9,479	Toe calks, making, H. C. Field	189,349 189,410
Fly fan, J. F. McMillen	9,373 9,537	Turbine, Osborn & Lybarger	89 ,488 89,295
Fly wheels, etc., balancing, C. Seymour	9,506	Umbrella runner, T. G. Hojer 1 Valve, balanced, W. Stephens	89,4 6 0 89,512
Fuel, artificial, J. Q. A. Ziegler	9,413 9,367	Valve, circular, H. L. Tumy	189,40 0 189,370
Baiter, C. Libby	9,476 7, 60 1	Vehicle hub and box, G. W. Eldridge	189,433 189,439 189,137
Fate, automatic, T. E. Breakey	9,300 9,351	Vehicle spring, J. W. Groat.	189,355
Frain drill, C. E. Patric 189 Frinding hollow ware, etc., W. Scully 189	9,383 9,505	Ventilator, Harrold & Satterlee	189,456 189,376
Frinding machine, S. Bevan (r)	7,595 9,484	Vessels, construction of, N. G. Herreshoff 1 Wagon bed, R. R. Hunt	89,459 89,462
Hammer, riveting, E. Wright	9,378	Wagon box strap bolt, J. Jensen	.89,467 189,344
Harness pad, M. V. Longsworth	,365	Washing machine, S. L. Denney	.89,528 189,343
Hitching, post, W. N. Butchinson),464),389	Washing machine, D. Miller	69,481 89,319 189 207
Hop press, J. Jakel	,465 1,599	Weed hider, McDonel, Thorn & Ewing	189,374 189,386
Horse power, traction, D. T. Gillis 189, Horse protector, W. S. Marsh 189	,354 9,369	Whiffletree attachment, J. D. Lane	189,474 189, 302
Horseshoe machine, W. Roberts	9,322 9,328	Window sash, J. Petri 1 Wire fabric, H. R. Van Eps 1	89,38 4 89,529
Hot water apparatus, E. Lawler	9,314 9,433 1	Wooden rods, etc., making, Smith & Saltar 1 Wrench, J. B. Fox 1	89,510 89,352
Hub, clastic, Sammis & Hayes	9,388 480	wrench, J. D. Lovell, administrator of A. G. Coes. 1 DESIGNS PATENTED.	89,366
Hubrunner, G. F. Kimball	,362 ,424	9.892.—CASSIMERES.—F. S. Bosworth, Providence 1 9.893.—CARPETS.—J. H. Bromley. Philadelphia Pa	R. I.
Hydraulic engine, C. D. Page	9,380 9,421	9,894.—CARPETS.—H. F. Goetz, Boston, Mass. 9,895.—CASSIMERES.—T. Holmes, Brooklyn, N Y.	
ce ax, W. H. Coleman),339 9),525 9	9,896.—SASH HOLDER.—T. Overton, Rockport, Text 9,897.—SIGNS.—A. D. Smith, Cincinnati, Ohio.	18.
xey and knob fastener, W. Neracher (r)	6,600 S 9,503 S 0,591	9,835UASSIMERESW. A. Walton, Providence, F 9,899TOWEL BORDERS, ETCR. T. Webb, Rand town, Ireland	t. I. dalls-

umn of this issue

(40) D. H. M. says, in reply to D. W.'s query as to the welding of his mill spindle: I suggest that the mill had been in use long enough to wear the lower end of the spindle to such a nice fit on the step that no oil could get under it, which caused friction sufficient to produce heat enough to weld it, and as it was done suddenly, the heat did not extend far in either direction, and the cold metal in connection with it soon cooled it down again. While the oil that it was covered with answered in the place of borax or other welding preparation, and at the same time excluded the atmosphere so that no change of color of the heated parts took place.' I have seen a hardened steel gudgeon that was in the lower end of a water wheel shaft welded to the step when it was three feet under water. The force of the wheel twisted it off a little above where it was welded; and when it was taken out the piece could not be knocked off the step with a sledge hammer.

(41) R. L. C. says, in reply to D. W.'s SCIENTIFIC AMERICAN?" All such personal inquiries eter, and projected from the spindle (which was 4 inches can in this way be expeditiously obtained,

H. P. G.-S.-T. A.-G. H.-W. B.-P. M. G.-J. M. -X, Y, Z,-J, D, H,-W, W,-F, C,-H, R,-G, McC.

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.

Inquiries 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

Hundreds of inquiries analogous to the following are sent: "Who sells square lenses for magic lanterns? Who sells telegraph instruments for learners? Whose is the best theodolite? Who sells the best aniline dyes? Why do not makers of steam plows advertise in the

query as to the millstone spindle and step: I have re- are printed, as will be observed, in the column of "Busi-paired two mill spindles that have had their points ness and Personal," which is specially set apart for ground or welded to the steel plates npon which they that purpose, subject to the charge mentioned at the run. In one case the steel point was 1½ inches in diam- head of that column. Almost any desired information