ENGINEERING INVENTIONS.

An improved platform for railway cars has been patented by Mr. Samuel M. Beery, of Omaha, Neb. The object is to devise means so the space between the ends of the platforms may be entirely closed, and to this end the invention provides a special construction of sliding platforms.

A car coupling has been patented by Mr. M. H. Merrill, of New Lebanon Center, N. Y. It has few and simple parts, may he cheaply made, and has a positive self-coupling action, so train men need not pass between cars to couple them; the coupling is of same size as the ordinary link and pin drawhead, and may be readily substituted therefor.

A torpedo holding attachment for railway danger signals has been patented by Mr. James A. Bonnell, of New York city. It consists in a bar or rod to hold the torpedo, and connected with the danger signal shaft, so that when the signal is set for "danger" the rod holding the torpedo will be operated, and the torpedo placed and held on the rail, so it will be exploded by a train passing over it.

An improved steam engine has been patented by Mr. Anton Eberhard, of Philadelphia, Pa. The cylinders are curved upon the arc of a circle, and have four pistons connected in pairs by curved piston rods, connected by levers with the slotted lugs of cross heads outer ends of which are connected by crank pins with the fly wheels of the drive shaft.

An improved car axle has been patented by Mr. Francis P. Smith, of Boston, Mass. The axle is in two sections for independent action when running on curves; one part of the axle may turn freely in a sleeve, and revolve independently when running on curves, while otherwise both parts will be bound together and to the sleeve, so as to avoid slack and looseness, and making the divided axle as substantial as the common solid ones.

AGRICULTURAL INVENTIONS.

An improved cultivator has been patented by Messrs. George W. Lilly and James E. Norman, of Center, Mo. Its object is to keep the plows of each part of the cultivator frame at the same distance apart laterally, and at the same angle with the line of draught, whatever lateral movement may be given to the frame in guiding the plows.

A straw stacker has been patented by Mr. Joseph J. Cox, of Lawrence, Kas. It is intended for use in conjunction with a thrashing machine, and convevs the straw as dropped from the carrier of the thrasher to the rick where it is to be stacked. It may be drawn from place to place in the rear of the separator, or it may be permanently coupled thereto.

A revolving harrow has been patented by Mr. Thomas McClelland, of Mattoon, Ill. It bas a frame carrying rollers with teeth for loosening the soil, and rollers with knives to cut up rods, clods, and lumps, cross bars to hold the knives to their work, a platform and its supports to carrythe driver, and a depth regulating weight, the whole promoting thorough harrowing and easy clearing of the harrow teeth from rubbish.

A fertilizer, more especially adapted for tropical countries, has been patented by Mr. William R. Wilkiuson, of Brooklyn, N.Y. It consists of special proportions of bone ash, gypsum, sulphate of iron, sulphate of potash, and dried blood. This fertilizer improves the soil permanently, and produces exceptionally large quantities of saccharine matter. The prepared ingredients in their specified proportions make a compound particularly valuable for orange culture and all tropical fruits and vines, promoting rapid growth, vigorous and healthy plants, increase in yield, and improved quality and flavor.

MECHANICAL INVENTIONS.

A pipe tongs, that may also be used as nippers and as a hammer, has been patented by Mr. James L.Strait, of Thomas, Mo. It is a cheap and strong tool, adapted for quick and easy use in grasping pipes, rods, or bolts, of different sizes, without adjustment,

A machine for forming and cutting links has been patented by Mr. Henry A. Iddings, of Warren, O. The object is to bend and cut the links at one ope ration, instead of using separate machines therefor. The cutting is done slowly, while the bar of metal is being forced around the mandrel, so he link bar isbeing made as it is cut, and with only a moderate use of power.

A machine for forming axle skeins has been patented by Mr. Andrew C. Emmick, of Columbus, O. This machine makes skeins ready for welding more rapidly and uniformly than can be done by hand, especially better as to part extending inside the collar, and pattern plate with an aperture of the shape the ball is to the corrugations forming air spaces between the bands this may be changed definitely from the round to the nid dressir axles to fit the skeins.

An improved pin tag has been patented by : toward each other and away from the body of the wire, then bent laterally under and outwardly.

An improved pipe coupling has been patented by Mr. Robert McConnell, of Omaha, Neb. The coupling tube has a conical end with an enlarged screw threaded portion back thereof, a collared thimble made to form a female cone, a packing between the cones, and a flanged coupling nut.

An improvement in two wheeled vehicles or carts has been patented by Mr. Charles A. Foster, of Elkhart, Ind. The invention consists in supporting bars carried on the axle, and carrying the cart body on springs, so that it does not partake of the motion of the horse, and the vehicle rides easily.

An improved gas engine has been patented by Mr. Harmer Denney, of Blooklyn, N.Y. It has a special arrangement and construction of parts whereby the igniting gas jet can be cut off very rapidly and effectually, and so the concussion produced by the explosion cannot extingnish the igniting jet.

A safety oil tank has been patented by Mr. Samuel Lander, of Bloomington, Ill. This invention consists of a protecting device for the filling tube, fauwhose pivot arms carry the inner ends of pitmen, the cet, and vent of submerged oil tanks, to protect these from brushes running at a uniform speed, under parts from fire and from danger of being struck by lightning.

> A reservoir attachment for ammonia ice machines has been patented by Mr. Perry Small, of Guaymas, Mexico. It provides for separating the oil and black lead taken up by the gas in the pump, so the same will leave the reservoir perfectly pure, and the clogging of the pipes by the oil and plumbago is avoid- Fort Smith, Ark. A perforated paper or metal web, ed

> A sheet metal fastener, formed from a single blank, has been patented by Mr. George W. Trapbagen, of Glens Falls, N. Y. It is more especially intended for securing buckles upon harnesses, carriage tops, perforated web by their own weight when the attacband the like, but may also be used as a clasp or staple for general purposes, being cheap, durable, and easily applied.

> A buckboard wagon has been patented by Mr. John M. Mayer, of Rondout, N. Y. The buckboard works in combination with the axles and peculiar intermediate springs and braces in such a way that latter inserted in slotted side posts with spring catches; the article is made easy riding, strong, and free from rattling noise and lateral or forward and backward movement.

A magnetic call has been patented by Mr. Henry Thau, of New York city. It combines two or more pulls and pairs of electrical contact points, etc., and a pull having an inclined or heveled shoulder for operating contact springs, a toothed sector and magneto-electric machine, in contact with circuit wires and contact springs.

A cap or shield for buckle straps of carriage tops has been patented by Mr. George W. Trapha- dirtand other impurities. gen, of Glens Falls, N. Y. Its object is to avoid the labor of stitching the caps or shields in place, and for this purpose the caps or shields have metallic flanges with tongues that can be passed through the material of the carriage top or curtain and cliuched.

A press for sacking bran, sawdust, and other substances has been patented by Mr. Arthur L. Battson, of Morrisburg, Ontario, Canada. In connection with a receiving case to inclose the sack and keep it in position while being filled, is suitable mechanism for compressing the bran, saw dust, etc., and the sack is held in place until its cover is sewed on.

A miner's safety lamp has been patented by Mr. John L. Williams, of Shenandoah, Pa. There is a sleeve or tube on the wick tube and a wire extending therefrom into a recess in the bottom of the lamp, the wick tube having a flange with a notch for the other tube, and the whole so arranged that the lamp may be extinguished very quickly without opening.

A flour mill feeder has been patented by Mr. Peter Harnist, of Marine, Ill. It provides for a special construction and arrangement of parts to secure uniformity in feeding flour middlings, grain, and other substances to sieves and rollers in flour mills, whereby the feed is delivered in a wide, thin sheet, so as to be evenly distributed.

A machine for hulling and cleaning grain Ind. It consists in a special construction and combination of parts whereby the machine acts upon the wheat by ahrasion, to reduce the hulls to powder, and by atmospheric suction to withdraw the powder and other dirt

A machine for making the bodies of artificial flowers bas been patented by Mr. Louis Lafon, of New York city. In combination with a revolving needle one or more circumferential grooves, in combination or spindle, on which the ball is formed out of fiber, is a have, and in which the ball is revolved while being and the projectile. made to give it the desired shape. ed by Mr. William H. Bryan, of Warm Springs, Va. Beaters with handles are pivoted to work in a sort of arcof which they may also be moved laterally, so as to thoroughly workall the dough or butter between the beaters.

A frictional hinge for mirrors has been pa-Mr. Oscar J. Cohn, of New York city. The invention tented by Mr. James C. Blair, of Columbus, O. It con consists in the peculiar construction, whereby the wire sists, in combination with the frame of a swinging miris bent to form lips with the ends inclined inwardly ror, of an angular bracket with a split pivot, a second angular bracket with an orifice for the passage of the split pivot, and a wedge for expanding the split pivot, the whole to hold the mirror frame stationary at any desired angle.

> A safety attachment for gun locks has been patented by Mr. Jeremiah Deyo, of Denton, Mich. It combines great simplicity with a positive lock or hold of the hammer in one or more positions, and can be easily and rapidly adjusted. It consists in a simple lever or pivoted catch, with a standard for carrying and a spring for controlling it, the whole designed to prevent the premature or accidental discharge of guns.

> A headway and leeway indicator for vessels has been patented by Mr. Burton E. Blakeslee, of Cambridge, Md. The invention consists of a device after the general principle of a ship's log, but is more especially designed to indicate the leeway of a vessel, the case being pivoted on its center, and combined with a relatively stationary pointer, so that the scale indicating leeway moves about the pointer.

> A regulator for dynamo electric machines has been patented by Mr. J. Edwin Giles, of Hazleton, Pa. It is designed to obviate the difficulties arising different changes of current, and intended to insure a gradual movement of one or both of the commutator brushes under ordinary variations, and a very rapid movement of one or both brushes with a sudden and considerable increase in the strength of the current.

> A key board attachment for musical instruments has been patented by Mr. Jethro M. Hooper, of with perforations corresponding to the music, is made to pass over a grooved roller; there are levers corresponding to the keys of the instrument, with bearing points on the keys, so they will drop through the holes of the ment is set in accordance with the design of the patent.

> An improved gate has been patented by-Mr. John B. Whiteman, of Centerville, Oregon. It has a long rearwardly projecting weighted top bar pivoted to a supporting post and resting upon a recessed cross bar with two tilting bars, the forward ends of the the spring catches have trip cords supported by bars attached to the side posts, so the gate can be opened by operating one of the trip cords.

> A peanut cleaner and polisher has been patented by Mr. Charles W. Nicholson, of Assamoosick, Va. This is an improvement on a device for the same purpose patented in 1881 by the same patentee and Richard H. Leigh, and consists in a special arrangement of a cylindrical brush within the cylinder of the machine, geared to run in a direction opposite to that of the cylinder, for more thoroughly cleaning the nuts of

> An improved form of carbon for electric lights has been patented by Mr. Walter C. Beckwith, of Allegheny, Pa. The ends of the carbons are so shaped with dovetailed slots and tenons adapted to engage each other, that they may be spliced one upon another, and will then burn right over the splice: there is in connection a holder in which the carbon is similarly fitted, and the arrangement is such that each carbon may be wholly consumed.

> A process of coloring photographs has been patented by Mr. Charles L. Wright, of New York city. It involves the use of egg albumen, neutral sulphate of barium, chloride of ammonium, salicylic acid, and glycerine, printing, toning, and fixing in the usual way Then softening the albumen with concentrated ammonia, and applying the colors in a mixture of albumen salicylic acid, glycerine, aqua ammonia, and water, and setting the color in prints by passing them through a bath of alcohol, water, and nitric acid.

A process of producing artificial marble and rendering it fireproof and waterproof has been patented by Mr. Richard Guelton, of Brighton, Eng. The fabrication is by means of cements, gypsum, or alum, applied to polished surfaces or placed in moulds, fibers being applied to the surfaces to form the veins. An enamel is obtained by laying on one or more coats of varnish, exposing the article to heat after each coat, has been patented by Mr. Samuel K. Todd, of Eugene, j and by polishing the varnished surface with pumice stone and finally with tripoli.

An improved projectile for breech-loading rifled guns has been patented by Mr. John G. Butler, of Watertown, Mass. It is designed to allow of the projectile moving through the rifled barrel with less friction than usual, while securing a good enough fit to take the motion of the rifling, so the projectile has with sheet metal bands to fit said grooves, the ridges of

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mann, Le Doux & Maecker, sole agents, 134 Pearl St., N.Y. For Freight and Passenger Elevators send to L.S. Graves & Son, Rochester, N. Y.

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built to order. E. E. Garvin & Co., 139 Center St., N. Y. Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv., p. 30.

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MISCELLANEOUS INVENTIONS.

Mr. Franklin B. Kendall, of Turnwater, Washington Ter., has patented an improved construc-tion of odorless privies. It has a special arrangement and design of parts to prevent the escape of offensive odors.

A portable door fastener has been patented by Mr. E. F. Pfund, of Sacramento, Cal. It is adapted held by a part which is then set against the door, for which the inventor has devised a novel construction.

A machine for making match splints has It consists of a peculiarly constructed die, in which the rows of holes are arranged parallel toplanes traversing the die at right angles to each other, and their upper edges sharpened to effect the cutting of the entire other special devices and a novel arrangement of parts. | stem.

trimmerhas been patented by Messrs. Thomas J. L.

Smiley and Charles H. Stombs, of San Francisco, Cal. The wick tube has a removable frame with an aperture carrying plates adapted to be opened by the wick in to be jammed in between the door and the casing aud raising it, and so pivoted to the frame as to fall by; in line, means for preventing the rotation of the gravity, so they are automatically closed when the wick is lowered, and the lamp is extinguished and trimmed. An improved separable button has been pabeen patented by Mr. Henry A. Steber, of Utica, N. Y. ! tented by Mr. Albert G. Weber, of New York city. The | veutilated barrel, in which the heads and staves are fitstem secured to the outer disk or head has a groove. the stem being passed into a slot in the inner surface of the inner disk, where there is a locking spring, the cular partition. The barrels can be easily taken apart object being to render the inner disk or head easily de- and the material packed closely, it being designed to block of wood into whole splints, in combination with tached from or attached to the end of the shank or furnish a good means of conveying fruit to market and

A dough or butter worker has been patent- oil or other liquid in any receptacle, has been patented by Messrs. J. O. Schubert and Van H. Bukey, of Parkersburg, W. Va. In combination with a tube of unipan or trough representing a section of a circle, in the form diameter, and open at both ends, there is a valve disk carried by a spring-retained ros, and a vertically acting trip rod engaging therewith, so the tube may be inserted to any depth required in a liquid without agi-An automatic lamp extinguisher and wick tating the same, and when withdrawn bring up a sample of its quality from top to bottom

> A barrel former has been patented by Mr. Thomas H. Lee, of Memphis, Tenn. It provides means the holding the two heads and the partition or a hoop same and for holding the staves parallel with the axis, while they are nailed on to the partition or hoops. The same inventor has likwise obtained a patent for a ted in the ordinary manner, but there is an open space left between each two staves, and there is a central cirreadily returning the barrels. for circular and instructions, No. 17 Union Square.

Sewing Machines and Gun Machinery in Variety. The Pratt & Whitney Co., Hartford, Conn.

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Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 14. C. B. Rogers & Co., Norwich, Conn., Wood Working

Machinery of every kind. See adv., page 14. The Porter-Allen High Speed Steam Engine. South-

work Foundry & Mach. Co., 430 Washington Ave., Phil.Pa. Lightning Screw Plates, Labor-saving Tools, p. 12.

NEW BOOKS AND PUBLICATIONS.

DIE HAUS UND HOTEL TELEGRAPHIE. Bearbeitet von O. Canter. Wien, Pesth, Leip-zig: A. Hartleben's Verlag. Pp. 217, mit 104 Abbildund. Price 3 marks=4 francs.

This little book forms the 14th volume of the electrotechnical library. The author is a practical telegraph man, and gives a full and practical description of the subjects related to electric bells, annunciators, automatic burglar and fire alarms, electric clocks. telephones microphones, etc. In the first chapter the different kinds of batteries are described and illustrated, also current breakers, switches, galvanometers, battery testers, rheostats, etc. Ohm's law is explained, also the meaning of such terms as electromotive force, tension of current, and the effects of induction. In the second chapter the bells, push buttons, receiving, sending, and recording instruments are fully explained with excellent cuts. The third chapter is devoted to automatic instruments, alarms, door contacts, foot contacts, clock contacts, electric winding clocks, door closers, thermoscopes, and automatic fire alarms. In the fourth chapter the wires and cables are described, and directions given for finding and remedying defects and other disturbing causes. The book is intended as a text book for those engaged in putting in house telegraphs, and offers instructive reading for all who are interested in the practical applications of electricity. The mathematical formulas are given for calculating resistances, strength of currents, size of wires, and other important practical data. In the appendix the prices (in Vienna) of the different instruments and supplies are given



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Namesand addresses of correspondents will not be given to inquirers.

Werenewour request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLIE MENT referred to in these columns may be had at the office Price 10 cents each.

Correspondents sending samples of minerals, etc. for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their indentification.

(1) C. A. S. V. G. writes: Take a round stove pipe 6 inches in diameter at both ends and 2 feet long: then compress one end to an oval form so as to fit on to an oval opening in a stove, "compressing without stretching." Does the circular end contain a larger area than the oval end? 'The undersigned says it does. A. The circular end of the pipe has the larger area

(2) E. F. R. Z. asks: Are there saws made to saw imestone? If so, where could I get one? A. Limestone is usually sawed with thin strips of iron and sand. A small piece may be sawed with a machinist's hack saw. A strip of tin stretched upon a frame like a wood saw with emery and water will do very good work for an experiment.

(3) G. E. writes: Supposing a ship of any nato put it into a tank, then from the tank to the boiler? tionality to sail from any port whatever, and to circum- | A. A keel condenser is a pipe outside of the vessel and navigate the globe, at what point on her course is it generally run alongside of the keel to the stern post. customary to add or drop a day from the calendar, in and then returned again to the engine and connected order that on again reaching her point of departure the to the air pump. The exhaust is into this pipe, and day of the week according to her reckoning may coin-the water of condensation is fresh. It takes no salt cide with the actual local day? A. Marine reckoning water from the sea. 3. What is the principle of a jet is generally assigned to the meridian from which the condenser? A. In a jet condenser the water to condense longitude is reckoned. The chronometers keep the the steam is admitted in a spray or jet, which is met by time at such meridian without regard to the position of the exhaust steam. The water resulting is a little the vessel in longitude. The log book days are from ; brackish, resulting from the mixing of the salt water to sun to sun, and are a serial from the commencement of the condenser with the fresh water of the condensed the voyage. If the vessel has sailed around the world, a steam. day has to be added or deducted at some point of the (15) A. C. G. writes: 1. We have a boiler voyage for a new reckoning. This is usually done at a with a grate surface of 16 sq. feet, 40 flues 3 in. x 16 ft. 180° from Greenwich, which is about middle of Pacific. Whatought to be the size of the smoke stack? A. (4) Le R. T.-Your diagrams of slide valves About 22 in. diameter. 2. What would be the theoretireceived. No. 2 is the most correct. No. 1 is bad, and cal result of a smoke stack one mile high? A. To reduce the draught. Any height beyond the point where No. 3 very bad. No. 2 would be improved by say $\frac{1}{16}$ inch the gases in the chimney are reduced to the temperature to 1/2 inch exhaust lap of the surrounding atmosphere would tend to reduce

What varnish can I nse that will not blister and crack on such slide? A. A good shellac varnish is the article generally used, and will probably answer your purpose. 2. Also repeat method how to "split" a piece of paper, on which there are two engravings on opposite sides. A. How to split a piece of paper will be found on page 99 of SCIENTIFIC AMERICAN for February 17, 1883.

to run till I use so high a temperature that I fuse part of the article which I wish to solder. What solder and what flux should I use, and what part of the blow pipe flame is right? A. A soft silver solder, which is probably the article you need, may be prepared by melting one part of lead; when the latter is fluid add two parts of tin, using a small piece of resin as a flux. In soldering fine work wet the parts to be joined with hydro chloric acid, in which as much zinc has been dissolved as the acid will take up. Borax can be used as a flux, The pointed flame of the blow pipe is best, and should be directed on the parts to be soldered.

(8) A. Z. asks why acetate of soda absorbs more heat than any other material and retains it for a longer period. I have not found the rationale of this in any work on chemistry that I have consulted. I have an idea that the heat absorbing and retaining properties of acetate of soda may be applied to some other practical purposes than that of warming railway cars. A. Sodium acetate has a large percentage of waterof crystallization combined with it, which is enough to dissolve the salt when the crystals are heated. When this liquefaction takes place, a great deal of heat is rendered latent. As the fluid cools, it solidifies and gives out again the latent heat, thus taking a long time to return to its original temperature.

(9) F. F. writes: I see in your answers to correspondents you mention a furniture polish (shellac by cabinet makers: Very pale shellac, 5 lb.; mastic, 7 oz.; alcohol, (90 per cent), 5 or 6 pints; dissolve in the cold with frequent stirring. This is used for French polishing, etc

(10) A. E. I. asks: 1. How the rubber is treated in the manufacture of rubber stamps: and 2. what is used for the mould? A. For answer to 1 and 2 See Scientific American Supplement, No. 83. 3. How to make a "red" gold color in electroplating, with a bath that gives a yellow color. A. The anode used should be of the "red" gold variety of metal, which in its turn will become deposited upon the surface to be plated.

(11) C. Bros. write: We use a tubular boiler, the flues of which are rather thin and weak which method of cleaning the flues would be preferable -with steam from dome or with an iron cleaner? We wish to favor the flues as much as possible. Carry about 20 lb. steam. A. Clean with steam from the dome.

(12) E. D. F. writes: If an iron tube be placed on a boiler the same as water glass tube, with an outlet from the boiler at both ends, and a steam tight piston be fitted in the tube, in what part of the tube will the piston stand if the tube be fastened to the boiler the same as water glass tube is, so that the tube will stand about half full of water? Will the piston rise and fall with the water? A. It will rise or fall with the changes in the level of the water, leaving friction out of the question. Of course the piston will settle in the water, until it displaces a quantity equal to its own weight.

(13) J. B. J. writes: 1. I have charge of an ngine 30 x 36 in., 12 in. wrought iron crank shaft, with Babbitt bearing. It is a new engine. Will not run without water when working hard. It is well in line, but the Babbit metal don't seem to have "backbone" to stand up to the work. What is best to be done in the case? I filled the side bearings about two months ago. The metal used was coarse looking. I don't think it was the right kind, for the trouble still remains. A. Your Babbitt metal is probably too soft. It is made of all qualities and degrees of hardness. Very little of it into moulds? A. The softening of the shell is accomthat sold in market is true Babbitt metal. 2. What is meant by hammering Babbitt into a box? A. Hammering the metal is for two purposes-to fill the recess per fectly and harden or condense the metal.

(14) J. A. asks: 1. What is the principle of surface condenser? Is the water that passes overboard from the hot well fresh or salt? A. The water circulated through the tubes and overboard is salt, but the water delivered by the air pump into the hot well should be fresh. 2. What is the principle of a keel condenser? After the exhaust goes into the keel pipes. does it turn into fresh water or does it take water from the sea? Does the air pump take it from the condenser but should be drawn off in freezing weather when the boiler is not in use, otherwise it might freeze and iniure the gauge.

(17) R. O. W. asks what deg as oil is, such as tanners use, also sod oil? A. Degras oil is a dressing for oil finished leather, such ascalfand harness leather, and is used as a filler. It is imported and on (7) J. H. M. writes: I have a difficulty in sale by dealers in tannery supplies. The degrasis com. soldering small silver articles. I can't get the solder, posed of the oil and alkali expressed in making oil dressed leather in Europe, where palm oil is principally used for this purpose. Sod oil is the oil and alkali expressed in the manufacture of oil dressed leather in this country, where fish oils are principally used. In each case their character has something more than that of the simple constituents. on account of their first use for dressing the raw skins.

(18) A. M. asks whether the glass coating described in our issue of August 26, 1882, page 130, will adhere as firmly to sheet iron forms as when applied by oxide. Can it be used with good results on sheet iron forms? A. The enamel stock as described is suitable for sheet iron dishes, that are so made as not to buckle or kink, the same as the porcelain glazed ironware, so much in vogue for kitchen use. We would not recommend it for large surfaces of sheet iron.

(19) P. S. asks how to hang a grindstone on its axle to keep it from wabbling from side to side? A. It requires a pretty fair mechanic to hang a grindstone to run true and stay true. It is supposed that you have no flanges upon the axle. The hole should be at least three-eighths or one-half inch larger than the axle, and both $a\mathbf{x}$ le and hole square; then make double wedges for each of the four sides of the square, all alike and thin enough, so that one wedge from each side will reach clear through the hole. Drive the wedges from each side. If the bole through the stone is true, the wedges will tighten the stone true; if the hole is vernish). Can you inform me where I can get it, or not at right angles to the plane of the stone, it must be how it is prepared? A. The following receipt is used made so, or the wedge corresponding must be altered in the taper to meet the irregularity in the hole.

(20) C. B. writes: If a tangential line should be extended from any point on the earth's surface into justissued by the Department of the Interior. space, what would be the perpendicular distance between said line and the earth's surface at any given distance from the point of contact, say one mile or fifty miles? If this line were to be extended 4,000 miles, the perpendicular would seem to be 4,000 miles, i. e., one-balf the earth's diameter, but at one mile the perpendicular would not be one mile nor anything like it. What is the ratio of increment? A. For ordinary purposes the square of the distance in miles divided by the earth's diameter gives an approximate answer in parts of a mile. The following table is nearly correct:

	•
Distance	Depression
in miles.	in feet.
1	0.637
2	2.669
3	6.006
4 6 8	$ \begin{array}{r} 10^{\circ}677 \\ 24^{\circ}024 \\ 42^{\circ}709 \\ 22^{\circ}709 \end{array} $
10	66' 733
12	96' 095
14	130' 796
16	170' 836

(21) F. P. B. asks: 1. What is the best way of polishing tortoise shell? A. Having scraped the work perfectly smooth and level, rub it with very fine sand paper or Dutch rushes; repeat the rubbing with a bit of felt dipped in very finely powdered charcoal with water, and lastly with rotten stone or putty powder, and finisbed with a piece of soft wash leather, damped with alittle sweet oil: or still better rub it with subnitrate of bismuth by the palm of the hand. 2. What is the way of joining or welding same? A. Provide a pair of pincers or tongs, constructed so as to reach four inches beyond the rivet; then have the tortoise shell filed clean to a lap joint, carefully observing that there is no grease about it. Wet the joint with water, apply the pincers hot, follow them with water, and the shell will he joined as if it were one piece. The heat must not be so great as to burn the shell, therefore try it first on a piece of white paper. 3. How can it be softened so as to force plished by heating it under water and then pressing it into moulds.

(22) S. M. T. writes: If a man should take a light but firm cylinder, 6 or 7 feet in diameter, and 2 or 3 feet deep-like a large shoal tub without a bottom-if he should set the cylinder up on one side, should stand up within it and walk or run, the cylinder would of course revolve around him. Now, could he thus drive the cylinder one mile more quickly than he could run the one mile on the ground, outside of the cylinder, and without using it? A. The man would have to run his mile to the greatest disadvantage. He not only would have to run the full mile, but would have to drive or push the weight of the cylinder, and also overcome the friction and pressure of the air against the cylinder, and would also have torun up hill. We think that he could make the mile quicker by drawing the cylinder after him.

(23) P. S. K. asks: 1. Is the gas that is in

view possible. A. The focus of your graphoscope lens is too short for its diameter, and is probably double convex, which is not the best form for a dialytic telescope. As a rule they are not a very good quality of glass. 2. How can I tell whether my lens is a crown glass or not A. You can tell if it is crown by its greenish shade of color by looking edgewise, or by its specific gravity, which should be from 2:45 to 2:80. 3, Would an achromatic object glass 115 in. diameter, 4 in. focus, do for a finder for a telescope 21/2 in. diameter, 44 in. focus? If so, what would be the diameter and focus of the eye glass? If not, what glasses would I require? A. A concave flint of 7% in. focus, 1% in. diameter, placed about midway of the focus of the object glass, may give you better satisfaction than no glass at all. Your small object glass is good for a finder: use a plano-convex eye glass of ¾ in. focus, ¼ in. diameter. Oneglass is sufficient.

(26) W. S. R. asks what article is used in the manufacture of paper wash basins and buckets to make it adhere together, and what would serve in the same capacity in pressing dry pulp into any shape? Also what would answer if wet pulp is used? A. The articles referred to are generally made by pulping straw, which when in suitable condition is properly moulded and pressed by means of hydraulic pressure into the desired forms.

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

D. G. McD.-This sample has the appearance of being a good fire clay, and if on analysis this opinion is sustained, the clay would be worth \$4 to \$5 per ton in New York. It would be well to submit it to a preliminary fire test and so examine its refractory power .- H. R.-Mica is found in all of the μ ranitic, gneissoid, and schistose areas of this country. The mica is generally found in layers from 3 to 4 feet between various rocks. There are no means of determining the unexposed mineral. See "Mineral Resources of the United States,"

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 25, 1883.

AND EACH BEARING THAT DATE. [Seenoteatend of list about copies of these patents.]

	Acid or partly acid fatty bodies, treating, Bang &	900 825
	Advertising fon A Wiehl	290,827
	Air compressor T F Freeman	290.764
	Amelgemeter I M Thompson	290.815
	Amber manufacture of articles from waste, F. J.	200,010
	Kaldenherg	290.888
	Auger hit J Swan	290812
	Arlebor car P Sweeney	291.006
	Axle. car. F. P. Smith	290,938
	Axle lubricator. car. Howard & Chance	290.987
	Axleskeins.machine for forming, A. C. Emmick.	290,982
	Axle, wagon, S. R. Edney.	290,760
	Barrel lining, P. Uyrich	290,721
	Belt shifter for elevators, automatic, F. W. Fuller.	290,674
	Bicycle seat, B. F. Peet	290,919
	Bird cage sunshade, H. Bishop	290,838
	Bit. See Auger bit. Bridle bit.	-
	Blotter, Davis & Pyles	290,668
	Board. See Electric switch board.	
	Boiler. See Steam boiler.	
	Boiler, A. P. Creque	290.667
	Book cover, removable J. M. Bronson	290,846
	Boot or shoe, G. W. Gregory	290,986
	Bottle stopper, J. M. Lewin	290,897
	Box fastener, C. H. Ball	290,729
	Box fastener. J. G. Leffing well	290.99 2
	Box or package, S. Van Campen	290,819
	Bracket. See Wall bracket	
	Brake. See Vehicle brake.	
	Brick kiln, T. S. Smith	290,939
	Brick molds, machine for sanding, W. Brower	290,736
	Brick molds, machine for sanding, J. A. Buck	290,847
	Bridle and halter, combined, White & Sheridan .	290,826
	Bridle bit, C. A. Chandler	290,859
	Bridle bit, C. Scherling	290,808
	Buckle, J. L. Thomson	290,816
	Burial case, G. Nierstheimer	290,996
	Burial casket fastener, Reynolds & Sander	290,951
	Button fastening, Ivins & Snyder	290,774
	Button fastenings, implement for setting, w. E.	000 000
	Hagan	290,080
	Calendar, discal, Freeman & Richardson,	290,763
	Can top, removable, C. J. Granger	200,000
ĺ	Car brake, automatic, H. S. webster	200.120
ļ	Car prake, electro magnetic, in Kample	200,000
1	Car, railway ila uu, J. U. Perkills	290.746
1	Car starter True & Smith	290,720
,	Carsten H S Wolfe	290.957
1	Cars ventilating W Scott	290.710
	CHINA TOLINING THE TANK TA	

(5) J. F. P. asks for the best whitewash. The wash is to be used for rough planks. A. The result of experience in the manufacture of this article is given under the title of "A Durable Whitewash" on page 52 of the Scientific American for July 23, 1881.

the draught (16) J. R. M. writes: In putting up a steam gauge, is it necessary to put a bend in the pipe? If so, what is it done for. Should water be allowed to remain

in the pipe, or should the steam be allowed to act di-

(6) R. M. K. writes: I wish to prepare rectly upon the gauge? A. A bend is given to the pipe lens 234 mches in diameter, 111% sun focus; supposing many pictures (wood cuts, lithographs, etc.) for won- for trapping the water, so that the water only has ac- it to be a single crown glass, what would be the diameder camera, by transferring on plates of tin or tinfoil cess to the gauge, and it is protected from the heat of ter and focus of the flint glass. and distance between slides, to get strong reflection from them on screen. 1. the steam. The water acts directly upon the gauge, them for a dialytic telescope? I would like all the field ;

beer of the same nature as that produced in carbonated drinks? What is the difference, if any? A. The principal gas in both articles is carbon dioxide, or otherwise called carbonic acid gas. 2. What is the usual composition of good bell metal in making good church bells? A. The composition of bell metal varies; generally about 80 per cent copper and 20 per cent tin; small quantities of silver are sometimes added.

(24) U. H. P. writes: Please give composition of a metal that will cast easy and smooth in metal moulds, be white in color, be of right bardness to polish nicely, and will be easily electroplated with silver. Something suitable to make light ornaments of, yet not too soft to burnish the silver on, and to be as cheap or cheaper than brass, and more easily melted. A. The white alloy on page 312 of SCIENTIFIC AMERICAN for May 20, 1882, will probably be suitable for your wants, if not too expensive.

(25) H. U. writes: 1. I have a graphoscope

Carding machine feeding mechanism, S. Driver 290,758
Carriage, child's C. Pfeffer 290.704
Cartridge implement. Christmas & Jonas 290,973
Caster, Brady & Ratcliffe 290,967
Caster, revolving glass, Semple & Ayling 290,804
Chain, C. G. Anderson 290,832
Chain fastener, J. H. Armstrong 290.883
Chain, ornamental, W. J. Johnson 290,688
Chain, roller, W. M. Patt 290,798
Chair. See Surgical chair.
Chair seat, M. V. B. Howe 290,884
Chandelier, extension, L. Hornberger 290,883
Check row dropper, J. H. Warren 290,950
Churn motor, O. E. Perry 290,799
Cider mill, J. W. Allmon et al 290.657
Cigar maker's implement, T. Streat 290 811
Cigar making apparatus, J. R. Williams 290,954
Circles, machine for cutting, J. W. Hicks 290,882
Clamp. See Quilting frame clamp.
Cleaner. See Peanut cleaner.
Clock setting mechanism, electric, J. F. Kettell 290.894
Clothes line, D. H. Murphy 290,995
Clutch, L. C. Pratt 290,706
Clutch, friction, H. E. Eberhardt 290,671
Coffin head rest. E. Hedges 290.682
Collar fastener, horse, W. L. Fries 290,673
Collar. horse, M. Turley (r) 10,431
Commode, Fink & Branson,