ENGINEERING INVENTIONS

A grip for electric cars has been patented by Mr. John C. Henderson, of New York city. In au electric motor drive-car, with a hole in its bottom, is carried a vertical rod with rollers at the lower end, to act as an adjustable clamp on a rail or bar arranged in an underground longitudinally-slotted tube.

A car coupling has been patented by Mr. Edward F. Pendexter, of Milford, Mass. The invention covers a lever held at its inner end on a draw head. and having two prongs, one of which, at the outer end, has a lug on the bottom surface, so the lugs of two opposite prongs engage with each other, and thereby couple the cars. The outer ends of the levers pass through frames projecting from the ends of the cars keeping the levers in proper position, and guiding them while uncoupling the cars.

MECHANICAL INVENTIONS.

An improved vise has been patented by Mr. Henry A. Hyle, of Redwood, N. Y. The jaws are recessed, and in the recesses are cylinders, adapted to be turned in the jaws, these cylinders having recesses or cavities of various shapes, both longitudinal and transverse, for holding objects in horizontal and vertical positions, these cylinders being set according to the shape of the object to be held.

A saw-mill dog has been patented by Mr. William H. Snyder, of Waynesborough, Penn. It is arranged in a sliding head, adjusted by a pinion or toothed segment over a vertical rack bar, affixed to the side of the knee of the log of the carriage, and with a sliding head, pinion, and rack bar is a lever with a loose play about the axis of the pinion, with peculiar

An improved reamer has been patented by Mr. Charles H. Malmedie, of New Bedford, Mass. The invention combines in one device a reamer of fixed diameter, an expanding or adjustable reamer, and a gauge of standard size for determining the diameter of the reamed hole, so great accuracy is obtained, the durability of the tool is increased, and work is done with greater facility.

A felly-boring and spoke-tenoning machine has been patented by Mr. Edwin M. Jenkins, of Browning, Mo. A rotary hollow mandrel, adapted to carry a tenoning head, is combined with a hollow cutter and boring socket, with a shaft arranged to slide in the socket and mandrel, and be screw-clamped thereto. having a key seat along its whole length, and provided with a stop, there being also a chuck and felly clamp. and table arranged to shift up and down to determine the relation of the chuck and clamp to the tool socket.

AGRICULTURAL INVENTIONS.

.....

A corn planter has been patented by Messrs. William Hopper and Isaiah J. Allen, of Jefferson, Iowa. This is an improved mechanism for operating the dropping apparatus, markers or pointers, denters, and driving guides, designed to provide more simple and efficient machines than such as are now in

A grain drill has been patented by Messrs. Moses F. and Thomas A. Foley, of Waveland, Ind. This invention is to adapt grain drills for use in drilling wheat between rows of corn, and the plow beams are made with holes to receive the lower ends of the seedconducting tubes, the tubes, standards, and beams being conveniently connected.

A plow attachment forms the subject of a patent granted to Mr. John O. Cald well, of Goshen, Ga. It is in the nature of a detachable mould board for the turning shovels of a light plow, to prevent the collection of earth, vines, weeds, etc., on their apper portions, the attachment being fixed by two bolts, so as to be quickly applied or removed.

A cotton scraper and cultivator has been patented by Mr. Seth H. Fountain, of Amite City, La. In a cultivator are two front scrapers, beveled and with an open space between them, and two shovels in the rear of each scraper, the scrapers being vertically adjustable and the plows laterally adjustable, and the whole being suitably jointed together, to promote the vigorous growth of small plants.

MISCELLANEOUS INVENTIONS,

A rein guard has been patented by Mr. Charles W. Speaks, of Canal Winchester, Ohio. It is a device for holding the reins raised, so the horse cannot throw its tail over them, and consists of a wire frame; bent and twisted to form standards, with rein rest and

A chain for draperies has been patented by Mr. Christian A. Schmidt, of Hoboken, N. J. The in-vention consists of a chain on which tufts or balls of tis designed for sewing or other small machines that fibrous materials are fixed at suitable intervals, the desired.

A pistol game apparatus has been patented by Mr. John R. Mestier, of Corpus Christi, Texas, In combination with a horizontal revolving table, with stalls for a ball, is a pistol device for dropping the ball into the table while revolving, for playing a game, in by Mr. Paul Kingston, of Hastings, Minn. This fire which the score is to be counted by the number of the escape combines a series of lazy tongs, in pairs constall into which the ball falls.

by Mr. Edwin V. Parker, of Strafford, Vt. Two strips be rendered rigid and firm, and, with guide ropes, may and at their other ends have cross strips, in connection sired elevation, and may be folded compactly when not with a U-shaped standard and a spring clip, whereby a in use. book may be held open and its inclination varied as desired.

A wire fence fastener has been patented by Mr. Charles E. Griffith, of Storm Lake, Iowa. The in- special construction of clamp or holder, with hinged vention consists of a screw with spirally curved eye, attachment of the clamping side pieces to each other to which will hold a fence wire away from a tree, but leave operate with clamping screws passing through the side a free longitudinal play of the wire through the eye, pieces, etc., so a substantial and cheap scrubber can be thus making a simple, cheap, strong, and easily adjust-

A folding kite has been patented by Mr. Joseph Stumpp, of Brooklyn, N. Y. The kite is made with the inclined bars of the frame in two parts, connected at their adjacent ends by sliding tubes, so the parts can be readily separated and the kite rolled into a compact bundle, to promote convenience in storage and transportation.

An improvement in the manufacture of material for electric insulation has been patented by Mr. William V. Wilson, of Jubilee Street, Mile End, Middlesex, Eng. The invention covers the consolidation of wood or vegetable tar by the use of nitro-cellulose, softened in a special manner, and the mode of its application for insulating electric conducting wires.

An improvement in barbed fences has been patented by Mr. Willis K. Gore, of Johnstown, Penn. According to this invention, the top and bottom rail are formed of two wires twisted together, in combination with intermediate vertical plates, with two barbs at each end, bent and passing in opposite directions through the twisted wire.

An apparatus for loosening up and removing sandbars, etc., in rivers and harbors has been patented by Messrs, Larence A. Johnson and N. E. Johnsen, of Portland, Ore. It is a machine with rotary cutting wheels and plows, to be drawn over a river or harbor bottom behind a steamboat or barge, to break the covering or crust that sometimes forms on sand-

A pocket knife has been patented by Mr. Orison Huff, of Lyman, Me. Its peculiar constru adapts it to be opened or closed with one hand, the knife handle being formed of two hollow sections, the rpper one with a collar, pin, and projections, and there being a spring pressed and notched locking plate, so that the knife can be opened with thumb pressure and a slight **j**erk.

An improved boiler has been patented by Mr. Alfred E. Dalley, of Quincy, Mich. This is an improvement of the combined furnace and boiler used by farmers for cooking food for cattle, boiling sirup, etc., and consists in so arranging the flue through which the heat products from the furnace pass that the heat will act more effectually on the bottom than is the case with the present style of furnace and boiler.

An improved letter box has been patented by Mr. Charles F. Maize, of Philadelphia, Penn. This invention covers a special construction of parts of the box, arrangement of guard plates for the newspaper drop, novel self-closing lid for the letter drop, with improved hood, in which the letter drop lid is fitted, to exclude water from the box, all to afford increased security and protection to mail matter deposited in the

An insulator for electric wires has been patented by Mr. William W. Beach, of New York city. The invention consists of an insulating block with grooves to receive the wires, and a tongued piece for holding the wires in the grooves, and a frame adapted to snrround the block, and provided with a series of tongues for partly filling the grooves, so that a series of wires can be held.

A corn sheller has been patented by Mr. Luther Matthews, of Paris, Texas. The invention comprises a double shelling surface of peculiar construction in one plate or bed piece, so a corn sheller with but little weight is produced capable of shelling either one ear, or, by using both hands, two ears at the same time, doing its work easily, and with ready clearance for the shelled corn.

A process for the manufacture of cream tartar forms the subject of a patent issued to Mr. Franz Dietrich, of Munich, Germany. It consists in treating the dissolved argols with phosphoric acid, or its compounds, and then clarifying and discoloring, the mixture being boiled, the clarifying effected with clay, and finally decolorized with animal charcoal, previously treated with muriatic acid.

An improved lock has been patented by Messrs. Rudolf E. Woodrich, of New York, and Charles Langbien, of Brooklyn, N. Y. This lock is made with an extensible casing and bolt, the bolt resting on independent pivoted cam plates, adjusted to be turned by a key inserted through escutcheons screwed into screw-threaded apertures in the casing, thereby holding the casing in place in the drawer or door.

An improvement in hanging doors has been patented by Mr. Alexander H. P. Leuf, of Brooklyn. N. Y. Crossbars are pivoted in recesses in the ends of the door, and have pivots hinged to their ends to engage with sockets let into the door casing, so the door can be opened in either direction and from either end. The pivots, while serving as hinges, are locked in place by spring pressed bolts, which enter grooves in the pivots.

An improved motion transmitter has been are frequently started and stopped, and is controlled by tufts being held on or between the links as may be the foot of the operator. The invention covers a specified cial form of hanger with square socket and square ended shaft, which may be easily changed for different speeds, and the whole is simple, quick acting, and trustworthy.

An extensible fire escape has been patented nected by cross rods, and connecting links with stops A book holder and rest has been patented and braces to engage with the stops, so the device may of wood or metal are united at one end by a bowspring, be adjusted and held by a windlass for use at any de-

> An improved floor scrubber has been patented by Messrs. Peter O. King and Andrew M. Carlson, of Valley City, Dakota Ter. The invention covers a made, and one with increased facility for inserting or removing the rubber or other scrubbing material.

An improvement in pipe and other joints has been patented by Mr. James A. Baldwin, Jr., of East Jaffrey, N. H. It is more particularly for flange joints, and consists in a copper ring, having in its projecting face au annular groove, so made that when the two flanges or pipes are drawn toward each other in tightening up the joint the partially countersunk copper ring will form a close fitting packing between the flanges, so it will resist great pressure, and make the joint equal or superior to a ground one.

An improvement in the manufacture of mosaic and other tiles has been patented by Mr. Jean Larmanjat, of Paris, France. The invention covers a process of brightening the colors of tiles and a mode of moulding them. The brightening is effected by treating the powdered material or cement with soft soap, and the moulding of inlaid designs for ornamental tiles is done in a compound mould, with which the whole of the design may he deposited at one time upon the material forming the base of the tile.

A car door lock has been patented by Mr. James Sharkey, of Honey Creek, Ind. A latch bar is pivoted to the car body below the lower back corner of the door and reaching up at an angle of about 45 degrees to about midway between the vertical edges of the door, where it is connected to form a latch for fastening the door without being locked, and a slide bolt and lock are contrived with the latch bar to lock the door, making a very simple and substantial locking device.

A device for destroying insects has been patented by Mr. Charles J. Gustaveson, of Salt Lake City, Utah Ter. This invention covers an apparatus with a spirit lamp beneath a vessel for raising steam, the latter having a flexible pipe to direct the jet as desired, and, for an insect destroyer, poisonous materials are volatilized, while the apparatus may also be used for disinfecting or fumigating a sick room, by using carbolic acid, or other suitable substance, evaporated with the water, the apparatus having special improve

Business and Lersonal.

The Chargefor Insertion under this head is One Dollar a line for each insertion; about eight words to a line Advertisements must be received at publication office asearly as Thursday morning to appear in next issue

The Hyatt filters and methods guaranteed to render all kinds of turbid water pure and sparkling, at economical cost. The Newark Filtering Co., Newark, N. J.

Mining partner wanted with small capital, German chemist pref. Reference given and required. Address No. 311 Washington Street, New York City.

Stephens Bench Vises are the best in use. See ad., p.173

Those old Indian chiefs drew peaceful inspiration from the pipe. Their talks and treaties were solemnized amid smoke. There was no drugged tobacco then. They got it pure from the Golden Belt of Carolina. Smokers have in Blackwell's Durham Lang Cut the same purity and natural fragrance that bred peace around

For best and cheapest acoustic telephone made, ad dress Percival & Hotton, Portville, Cattaraugus Co., N.Y Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia. Pa.

For Sale.—Wishing to move on to my farm, I offer for Long time given if wished. For terms, etc., address W. M. Preston, Monticello, Jones County, lowa.

If you want the best cushioned Helve Hammer in the world, send to Bradley & Company, Syracuse. N. Y. miles of road laid out are to be finished. The report Sleeve nuts, best, cheapest. Pittsburgh Sleeve Nut W'ks. | treats very thoroughly of the details of the business Iron and Steel Drop Forgings of every description.

R. A. Belden & Co., Danbury, Ct. "The Sweetland Chuck." See ad. p. 108.

Hoisting Engines for Mines, Quarries, Bridge Builders, Railroad Construction, etc. Send for catalogue. Copeland & Bacon, New York.

Iron Planer, Lathe, Drill, and other machine tools of moderndesign. New Haven Mfg. Co., New Haven, Conn. Pumps-Hand & Power, Boiler Pumps. The Goulds Mfg. Co., Seneca Falls, N. Y., & 15 Park Place, New York. Fox's Corrugated Boiler Furnace, illus. p. 354. Hartnann, Le Doux & Maecker, sole agents, 134 Pearl St., N.Y.

Graves & Son, Rochester, N. Y. Best Squaring Shears, Tinners', and Canners' Tools at Niagara Stamping and Tool Company, Buffalo, N. Y. Lathes 14 in. swing, with and without back gears and

For Freight and Passenger Elevators send to L. S.

crew. J. Birkenhead, Mansfield. Mass.

The Best.—The Dueber Watch Case.

If an invention has not been patented in the United Editor declines them. Canada. Costfor Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., Scientific American Patent Agency, 261 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn N. Y. Steam Pumping Machinery of every description. Send for catalogue.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

Railway and Machine Shop Equipment. Send for Monthly Machinery List to the George Place Machinery Company 121 Chambers and 103 Reade Streets, New York.

Wanted.-Patented articles or machinery to make and introduce. Gavnor & Fitzgerald, New Haven. Conn. Presses & Dies, Ferracute Mach.Co , Bridgeton N.J. Supplement Catalogue.-Persons in pursuit of information on any special engineering mechanical, or scientific subject, can have catalogue of contents of the Sci-ENTIFIC AMERICAN SUPPLEMENT sent to them free-The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co . Publishers, New York.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 189 Center St., N. Y. Improved Skinner Portable Engines. Erie, Pa.

Straight Line Engine Co. Syracuse, N. Y. Best in esign, materials, workmanship, governing; no packing. Curtis Pressure Regulator and Steam Trap. Seep. 142.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 141. C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 142.

The Porter Allen High Speed Steam Engine. Southwark Foundry & Mach. Co., 430 Washington Ave., Phil. Pa.

 ${\bf Ajax\,Metal\,Company,\,Phila.}\,$ Clamer's ${\bf Ajax\,Metals}$ for railroad, rolling mill, engine bearings, cochs, and valves. Drop Forgings. Billings & Spencer Co. See adv., p. 174.

Railroad & Manufacturers' Supplies. Steam Packing of all kinds. Greene, Tweed & Co., 118 Chambers St., N.Y. Job lots in Ruboer Belting, Packing, Tubing, and Hose. 75 per cent off belting. John W. Buckley, 156 South Street, New York.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Emerson's 1884 Book of Saws. New matter. 75,000. ree. Address Emerson, Smith & Co., Beaver Falls, Pa. Hoisting Engines. Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., Philadelphia, Pa.

Best Popular Science Works, 15 cents. J. Fitzgerald publisher, 20 Lafayette Place, N. Y. Catalogue free.

Gould & Eberhardt's Machinists' Tools. See adv.,p. 173. Walrus Leather, Emery, Nickel Anodes, Nickel Salts, and Polishers' Supplies. Greene, Tweed & Co., New York.

Barrel, Keg, Hogshead, Stave Mach'y. See adv. p.173. Nickel Plating .- Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions. etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

For Mill Mach'y & Mill Furnishing, see illus. adv. p.172. Lathes, Planers, Drills, with modern improvements.

The Pratt & Whitney Co., Hartford, Conn. Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 174. For best low price Planer and Matcher, and latest improved Sash. Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

Steam Pumps. See adv. Smith, Vaile & Co., p. 174. Gears.-Grant, 4 Alden St., Boston.-Water motors.

NEW BOOKS AND PUBLICATIONS.

THE MEDICAL DIRECTORY OF PHILADEL PHIA FOR 1884. Edited by Samuel B. Hoppin, M.D. F. Blakiston, Son & Co., Philadelphia. Price, \$1.50.

This is an alphabetical and street list of physicians and directory of dentists, druggists, medical societies, homes, and charitable institutions.

THE PRONUNCIATION OF GERMAN. A Pro-GRESSIVE STUDY OF THE SOUNDS OF THE GERMAN LANGUAGE, WITH DIRECTIONS FOR PRODUCING THEM ACCURATELY. By Charles F. Kroch, A.M., Hoboken, N. J. Published by the author.

The title of this little work is a good resume of its contents. It constitutes No. 1 of a series of drill books by the same author, which are in preparation, and which will treat of the German and French verb. The book is an excellent one for the purpose, being modeled on the "rational method," for which Professor Kroeh is well known.

The Railways and Tramways of New South Wales, according to the report of the Commissioner from Sydney, Sept. 1, 1883, had cost, up to the close of sale my machine and blacksmith shop, which is located from Sydney, Sept. 1, 1883, had cost, up to the close of in a thriving town and doing a good business. Will sell 1882, £16,776,642, and £11,000,000 more had been authorwith or without tools. Also a good house if desired, ized to be raised for the completion of work in progress. The average interest paid for railway loans has been 4.26 per cent. There are 1,3211/2 miles opened for traffic, of which 38 miles have double track, and 889 done and the condition and equipment of the roads.



HINTS TO CORRESPONDENTS.

No attention will be paid to communications nnless ccompanied with the full name and address of the

Names and addresses of correspondents will not be given to inquirers.

We renew our 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

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

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 Supple-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 indenti-

(1) J. M. H. asks how saltpeter acts when used with salt and sugar to preserve meat. What is the effect? A. The action of saltpeter would he that of an antiseptic, that is, it would tend to prevent fermentation or put refaction, Borax or boracic acid is more commonly used as a preservative for meat. The use of sugar in this connection we think would hardly be desirable or even necessary.

(2) W. S. N.—Pearline is simply a trade name given by James Pyle to a soap manufactured by him. We do not know its composition, and cannot tell unless a chemical analysis of it were made, but from its title we think very likely that it contains pearlash, or potassium carbonate. Bluing may be made by treating 1 ounce pure Prussian blue with 2 ounces concentrated hydrochloric acid. Effervescence ensues, and the mixture soon assumes the consistence of a thin paste. This can then be moulded in balls or dried and powdered, or else left for 24 hours, and then dilute with 8 or 9 ounces water and bottle it,

(3) E. L. N.—The paste sent consists of the nominal H.P., Seaton gives the following: rouge (red chalk) mixed with some oil or tallow, probably boiled linseed oil. Powdered tripoli is likewise used in combination with boiled linseed oil as a paste for polishing. The difference in quality found in various samples is probably due to the different degree of fineness to which the rouge or tripoli is ground. A sit is more finely ground, so does it increase in efficiency. Liquid oxygen is not suitable for the production of the 100 lb.; and for the diameter of the H.P. cylinder: oxyhydrogen light.

(4) A. W. G. asks how the polishing paste for cleaning and restoring tarnished nickel is made? A. Use chalk or rouge mixed with tallow.

(5) S. S. asks: How many "Bunsen" cells of 1 gallon capacity will it require to produce an arc light of one-eighth inch carbon candle, length of conducting wires 20 feet? A. Fifteen to twenty.

(6) J. C. W. asks: What substance can be used as a conductor of electricity, and yet have but little or no spring? A. Comminuted metals, acidulated water, powdered carbon, lead, soft copper, soft iron, mercury

(7) J. H. D. asks: Is there any substance which can be mixed with ground tale, so as to form a paste which will harden in moulds, and yet he fireproof? A. It can be mixed with hydraulic cement or plaster of Paris, both of which would crack when exposed to heat, Perhaps it would be more desirable to incorporate the talc with kaolin or some clay, satisfactory to you, and bake the product. There would result a sort of earth-

(8) G. S. B. asks: 1. Can magnetic force be transformed into electric force (the force of permanent steel magnets, I mean)? If so, how? A. Yes, by revolving an electro magnet before or between the poles of the permanent magnet, and taking the current from the terminals of the electro magnet by means of a suitable commutator, as in the magneto-electric machine. The telephone magneto call and the magneto-electric American and Supplement. An experimental incanmedical machines are examples of machines producing an electric current from permanent magnets. 2. Having read in Scientific American Reference Book that ice boats on the Hudson River travel faster than the wind, I would like to have the philosophy of it explained, A. See Supplement, No. 214.

(9) W. A. asks: 1. What is the thickness of the carbon used in the Blake transmitter, and how is it made? I have an electric light carbon seven-sixteenths inch diameter, coppered; will it answer to make buttons for transmitter? A. Your carbon is about the right diameter. The thickness of the button is immaterial, from one-eighth to one-quarter inch thick will do. The face of the button must be well polished to secure the purpose. 2. I have several ounces of silk insulated scribed in Supplement No. 142, or had I better use a smaller size? A. Your sample of wire is No. 30 Am. W.G. It will answer a purpose, but is not so good as No. 36. 3. Should the end of a steel bar in telephone upon which the coil is placed be tempered and hardened, or should the whole of the bar be hardened and tempered? A. They will work well either way. Perhaps merely hardening the ends is quite as good a plan

(10) B. V. F. asks: Will two Leclanche batteries of good size heat fine wire so as to be practicable for lighting gas? If not, how many batteries should be used, and what kind and size of wire should be used in either case? A. No. One small cell of plunging bichromate battery will do it. Use half-inch of No. 36 platinum wire. By employing a helix with a magnetic core, your two Leclanche cells may be used to produce a spark that will light gas. See any work on physics for the manner of producing the extra current and spark.

(11) S. J. B. asks what he can use to preserve paste or starch for mounting photographs? A. made? A. Papiermache is made by pasting or gluing Carbolic acid, salicylic acid, and oil of cloves are all used for this purpose. The amount to be used must be very small, probably not over one per cent; frequently a much smaller quantity is used.

(12) S. T. asks how to make solution for cast iron, so it would have coppered surface? A. Make a solution of 2oz, copper sulphate in 1 gt, water, add 1 oz. of sulphuric acid. Clean the iron by pickling it in dilute sulphuric acid, and washing and scrubbing it in practical use. with a wire brush before immersing it in the coppering solution. After removing it from the solution, wash thoroughly with water.

(13) C. O. R. asks: 1. Is there any diamagnetic substance known that is quite or nearly perfect? er than pine—perhaps twenty years. Cottonwood is A. Bismuth is the most diamagnetic substance known. almost as durable when painted and preserved from the 2. Is there any known substance that would allow a weather. Red elm is not durable for this use. 2. What permanent bar magnet to act only in one direction, and is the best and cheapest preservative for that kind of not permanently neutralize or prevent its action in oppositedirection? A. No. 3. What will efficiently neutralize paint, linseed oil, and the brownish red oxide of iron "damp," or carbonic acid in wells? Sometimes in digging wells it nearly overcomes me. I have used lime and lime water, but with unsatisfactory results. A Ventilation is the only efficient remedy. Drive out the foul gases by forcing in fresh air.

(14) G. H. asks: 1. How may eggs long preserved by cold storage or other methods be d tected? called parchment paper. What strength of acid to use, Can they be told without breaking? A. Expert dealers have a way of looking through them at a light, and judge by the shade if they are sound, but it is very doubtful if any one can tell how long they have been

(15) J. D. writes: For finding the nominal horse power of a compound engine we have the rule:

$$\frac{d^2 + D^2}{30} \text{ or } \frac{d^2 + D^2}{32}.$$

According to some makers, the divisor is 30 circular

is, wishing to reckon the diameters of the high and low not more than 4 feet? A. We think about 16 miles per pressure cylinders from the nominal horse power, I hour, if of good model and very light. A plain, simple generally used by builders. Say I have to give the locomotive form of boiler of ample capacity to carry exact diameters for an engine of 140 N.H.P. Which 120 to 140 pounds of steam, having not less than 600 feet rule can I use? A. Of the two formulas submitted, we should prefer that which has 30 for denominator. For

N.H.P. =
$$\frac{d^2 + D^2}{n}$$
, where

d = dia, of H.P. cylinder. D = " L.P. " n = circular inches, which may be 30 to 32 or 33, the lower denominator for the higher pressure, say of 90 or

the diameter of the
$$\sqrt{\frac{N.H.P.\times n}{1+r}}$$
.

where r is the ratio of capacity of the low to the high pressure cylinder, and the diameter of the low pressure cylinder = $d_{\sqrt{r}}$. Example for an engine of 200 N.H.P. the ratio of low pressure to high pressure cylinders be ing 4 and n = 33, then

dia. of H.P. cylinder =
$$\sqrt{\frac{200 \times 33}{1+4}}$$
 = 36·3 inches.

And dia, of L.P. cylinder = 363 \times $\sqrt{4}$ = 726 inches. 2. What relation do the diameters bear to each other, or do the dimensions of high and low pressure cylinders depend upon their areas? A. For steam pressures of, say 80 to 100 lb., the contents (or area of piston of the stroke of both pistons is the same) of the low pressure cylinder is usually 4 times the H.P. cylinder, and for pressures 60 to 80 lb. the ratio is 3.5 to 1.

(16) J. F. B. asks how to make a small incandescent electric lamp, or tell me the number of a SUPPLEMENT describing one, if there is one? I should like to know the material the lights burn on, and the size of it? A It would be difficult for a novice to make a modern incandescent lamp. He would require a glass blower, or would have to learn theart of glass blowing. He would want carbonizing apparatus and the most perfect air pump, and added to all this, a long experience. Full descriptions of the manufacture of these lamps can be found in the back numbers of the SCIENTIFIC descent lamp may be made from a coil No. 36 platinum wire, but it would not answer for continued use.

(17) W. S.-1. The painting and bronzing of radiators retards their heating qualities. 2. The horizontal pipes along the sides of the room are more efficient than when placed vertically, as in radiators, with the same amount of surface in both.

(18) J. D. P.-Ordinary moulding sand is used for zinc castings just as for iron. For heat the zinc should be melted until the vapor from the metal is visible.

(19) S. P. C. asks for a receipt for making carbolic dip into which stock may be plunged for killing lice and mites? A. Use soft soap, 1 gallon; good results. The hard French carbons are best for heat with 30 gallons of water up to a temperature of 140°, then add one quart of crude carbolic acid. Then copper wire (I inclosed sample). I think that it is No. cool down to 110° and dip the sheep or lambs; but for 30; will it answer to wind the spools of telephone deother animals, pour it along the back so that it runs other animals, pour it along the back so that it runs down the sides. Great care must be taken that it is applied to the brisket, under the shoulders and thighs. For the sheep scabmites the temperature should be 120°, and the scabs should be completely broken up by a corn cob.

> (20) H. E. H. asks: 1. Will two cylinders of same stroke, with different diameters and same sized ports, exert the same power? A. No. 2. Will two cylinders of same size exert the same power, if one has but one piston, and the other has two, traveling opposite directions, both having the same sized ports? A. No. 3. What is the average pressure of steam in passenger locomotives while running? A. One hundred and twenty to 140 pounds. 4. What distance could a locomotive pull a train, if its boiler was charged with steam to its average pressure, and the fire was drawn out, before starting, the atmosphere being about 70°? A. This cannot be answered except upon specific conditions—as to capacity of boiler, weight of train and locomotive, grade, condition of track, etc.

> (21) A. B. N. asks how papier mache is sheets of straw or other thick paper together when wet and pressing to the shape of the mould, or making a pulp of the paper material and pressing the pulp into the moulds.

(22) G. W. E. asks if there are any steam or electrical buggies in use? A. There have been several electrical and steam buggies and tricycles invented (mostly in Europe), but they are for the most part not

(23) T. J. T. asks: 1. How long will cotwood when exposed to the open air? A. Common make one of best outdoor paints. 3. What is their value compared with yellow or white pine? A. Southern yellow pine would perhaps be better than basswood or cottonwood, but white pine would be no betterfor outdoor use.

(24) F. J. del C. asks how to make the soand where to obtain or how to make it of the requisite strength? A. To make parchment paper dip ordinary unsized paper for 5 or 6 seconds into dilute sulphuric acid, and wash with weak ammonia water, acid 1 part, water 4 parts.

(25) J. K. asks: 1. What is the greatest speed that could be attained by a steamboat, a screw propeller, in smooth water, of the following dimensions, and what description of boiler or boilers and cal affinity for each other produce heat when brought engines would be the most suitable, and the amount of together, while such bodies as have but little chemical inches, with others 32. However, what I wish to know beam, 14 feet; depth of hold, 6 feet; draught of water, i liquefaction.

would like to know whether there is, or which rule is engine, 12 to 14 inch cylinder, and 12 inch stroke, with 120 to 140 pounds of steam, having not less than 600 feet heating surface.

> A. The sample is dipped. String upon very small wires. Thin the japan with turpentine. Heatthe work to above 200° F., then dip, and hang in oven. Turn the pieces over upon the wire 2 or 3 timeswhile they are disposed to drip. This will make the japan even. If the japan is good, it will stand considerable thinning before it loses its gloss.

(27) L. H. D. writes: I am using water taken from a tank lined with ordinary sheet zinc, for greenhouse purposes. I notice, after the foliage of the plants has been regularly sprayed for a month or so, the leaves become spotted with a whitish stain, as though there was a sediment in the water which sticks to the foliage after drying. Do you think this spotting could come from the action of the water on the zinc? What kind of paint or varnish could I use to coat the zinc, which would have no effect on the water? The tank was built and lined about two years ago, and the zinc now shows a roughened surface. Before building the tank I used the same water, but did not notice any stain. The water is changed about once in three or four AND EACH BEARING THAT DATE. days. Tank holds about twelve hundred gallons. A. It is probable that the zinc is the cause of the spotting. Painting the inside of the tank with red oxide of iron and boiled linseed oil will no doubt be a remedy. The oxide of iron is called in trade "Prince's metallic paint." You can mix it yourself. Make it as thick as can be spread easily with a brush. Use no turpentine.

(28) W. F. H. asks: Can you inform me how the cement is made which gas fitters use on joints afterthevare put together and found to leak slightly? It is not the regular red lead and oil I have reference to, but a hard cement which looks like red sealing wax. A. This is called gas fitters' cement. Melt together 4½ parts resin (by weight), 1 part beeswax, then stir in 3 parts Venetian red and pour into moulds made of oiled paper or cold iron moulds.

(29) J. E. E. asks: Does sound travel a reater distance north and south and more rapidly than it does east and west, wind currents being equal? And if so, have electrical currents anything to do with it? A. Experiments upon the velocity and conditions of sound in the atmosphere during the past 150 years have not developed any difference in the velocity or distance of sound as regards the points of the compass. There is a decided difference in velocity and distance, as with or against the wind, as well also with the temperature and humidity of the atmosphere. The velocity increases with the temperature at the rate of 114 feet for each degree above 32° Fahr. The velocity assigned at 32° in dry airis 1089 feet per second, and at 62° 1125 feet per second. There are no experiments known to us in regard to the velocity of sound in different electrical conditions of the atmosphere. We think the electrical influence is imperceptible.

(30) E. G. C. asks regarding the modern method of rendering glass articles iridescent. A. Some information is given in regard to the process as practiced abroad on page 1800 of Scientific American SUPPLEMENT, No. 113. It is also said to be produced by volatilizing tin chloride in the furnace.

(31) N. S. H. asks: 1. For receipts for mucilage and glue combined, called Egyptian Tenexine? A. We are not familiar with the composition of the article mentioned. 2. How is impression paper made? A. Take some thin post or tissue paper, rub the surface oring matter; wipe this preparation well off with a piece of clean rag, and it will be ready for use. 3. How are luminous match safes made? A. See "How to make luminous paint," Scientific American Supplement. Button setting instrument, G. W. Prentice. 294,517 Button fastener, F. A. Smith, Jr. 294,411, 294,517 Button loss, protecting, G. L. Crandal 294,495, 100, 249, 4. What are pocket lights made of? A. Button setting instrument, G. W. Prentice. 294,744 Button, etc., sleeve, S. C. Howard 294,460 July 16, 1881, page 42.

(32) R. H. H. asks: What is the best thing to clean buckskin mittens, and also what will clean a bronze plate lamp banger? A. The following, which is used to clean chamois skins, will probably be satisfactory: Make a solution of weak soda and warm water, rub plenty of softsoap in to the leather, and let remain in soak for two hours, then rub well until quite clean. Rinse well, in a weak solution of soda and yellow soap in warm water, but not in water only, else it dries hard. Afterrinsing, wring it well in a rough towel and dry quickly, then pull it about and crush it well until soft. Car coupling, A. D. Stansbury. 294.696

Cleansing with naphtha will perhaps answer. For the Car coupling, A. D. Stevens. 294.696

brouze plate, if real, use oxalic acid; if imitation, soap | Car door lock, J. Sharkey 294.513 and water will answer.

(33) A. W. B. asks: 1. If borax renders tonwood Linn. (basswood) and red elm last in fence pickets? A. Basswood when well preserved and painted is actility in and by being used as varnish or cement be then soluble and Carriages, canopy holder for children's, A. S. actility is a controlled and carriages, canopy holder for children's, A. S. easily injured by being washed, etc.? A. Yes; although Fitch as it dries up it is less likely to be dissolved off. 2. If Cartridge loader and cap expeller, L. Keller..... shellac is dissolved in spirits, camphor or other resin- Cartridge weighing and assorting machine, P. ous gum may be added to give the varnish a gloss or luster. Can anything be added to produce this effect when water is used as a solvent? A. We would suggest the use of gum arabic for the purpose.

(34) J. J. D. asks: How sulphocyanide of ammonia is prepared? A. This salt may be prepared by mixing hydrocyanic (prussic) acid with ammonium polysulphide (a solution of sulphur in ammonium sulphide), and separating the resulting ammonium sulphocyanide from the precipitated sulphur by filtering. The salt thus produced is in solution, and may then be obtained in the dry state by evaporation to crystallization. In any case it is cheaper and preferable to purchase the sulphocyanide from a wholesale druggist or dealer in sulphocyanide from a w sulphocyanide from a wholesale druggist or dealer in chemicals.

(35) D. P. S. asks: Will you tell me through Notes and Queries why it is that certain salts or acids when dissolved or mixed with water produce heat, while others produce cold? A. Bodies having a great chemi-

(36) E. K. B. writes: 1. Will you please ive me the candle power of the calcium light, say the light used by Mr. Stoddard in throwing his pictures upon the screen? A. From 100 to 125 candle power. 2. What are the limes used made of and how? A. The best lime cylinders are made of calcined marble; but (26) I. H. F. sends us a japanned buckle. they are usually cut out of selected pieces of common unslaked lime, which answers very well,

(37) S. J. D. asks: 1. What power is exerted by a screw one-eighth pitch, 1 in. diameter. Pointed angle of 30° working between 2 pins, angle to suit screw; in other words, what weight will they lift? A. What is the length of your lever working the screw, and what pressure do you apply to the end of the lever? 2. What is correct method of finding the pressure on a slide valve? A. There is great difference of opinion as to the correct method - some say it is only that due to the area of all the openings; others that it is that due to the whole surface of the valve when not moving, but less the area of one port when working.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted March 4, 1884,

[See note at end of list about copies of these patents.]

Anæsthetic gases, apparatus for administering,		
A. M. Long		
Annunciator, speaking tube, J. Walter	294,535	
Axle, vehicle, Kennedy & Warner	294.632	
Bag. See Paper bag. School bag.		
Bag holder, E. H. Mor ehouse	294,659	
Bag holder, A. Robinson	294,505	
Bale tie, Garland & Becker	294,609	
Baie tie, wire, W. Hewitt	294,386	
Baling press, J. Watson		
Baling press, duplex, J. La Dow		
Banjo, H. C. Dobson	294,451	
Battery. See Secondary battery.	-	
Battery, A. Haid	294,363	
Bearing, anti-friction, T. R. Ferrall (r)	10,455	
Bearing, self-lubricating, T. R. Ferrall (r)		
Bed spring connector, twin, J. S. Dixon		
Bell tightener, M. L. Russell		
Bessemer converter, H. Schulze-Berge		
Bicycle, E. G. Latta		
Bicycle saddle, F. Lillibridge		
Bicycle saddle spring, O. M. Mitchell		
Billiard tables, automatic chalk holder for, W.	,	
Sherwood	294,516	
Block. See Toy building block.	,510	
Rlower for fire places and stoves adjustable F		

Boot or shoe soles, beating out machine for, J. W. Rogers ... 294.506
Bottle stopper, G. D. Corey ... 294,443
Bottle trap, removable, G. M. McCloskey ... 294,489
Bottles, jars, etc., automatic stopper for, S. P. M.
Tasker ... 294,415
Box. See Fare box. Letter box.

 Box making and covering machine, Manneck & Witte
 294,486

 Bracket, E. S. Hemmenway
 294,385

 Brick, iron paving, J. M. Glenn.
 294,611

 Brick machine, A. Cramer.
 294,368

 Bridge, truss, M. C. Frits
 294,608

 Brush trimming machine, T. Coldwell 294,583
Bubble blower, W. S. Fickett 294.728
 Buckle, automatic rope, S. & F. Seib.
 294,408

 Buckle, harness, W. A. Allen
 294,561

 Burial casket, F. A. Field
 294,456

 Burner. See Hydrocarbon burner.
 294,409
 294.490

 lead, R. S. Waring
 294.549

 Can nozzle, R. C. Anderson
 294,427

 Candy, S. H. Britton 294575 Cannon, pueumatic, W. A. Bartlett 294,348 to 294,353 Car, Briggs & Prichard...... 294,574 Car coupling, A. H. Armstrong. 294,345
Car coupling, W. A. Benjamin. 294,565 Car coupling, Pegram & Kester 294,501 Car coupling, E. F. Pendexter 294,502 Car grip, electric, J. C. Henderson..... Carpet fastener. J. A. Markoe 294,397
Carbureting machine, Tirrill & Wilson 294 527

Chain attachment, watch, H. M. Herring. 294,733
Chain, drive, W. H. Dickey. 294,373
Chain for draperies, C. A. Schmidt. 294,682 Chain link, ornamental, V. Draper. 294,595
Chain link, ornamental, H. M. Herring 294,734 Chain, ornamental, H. A. Church. 294.580 Chair. See Opera chair. Tilting chair.

 Chair, W. H. Beardsley
 294,433

 Charm telescope, C. Hoheisen
 294,467

 Churn cover fastening, Schmidt & Brammer
 294,683

Clip. See Tug clip.
 Clip. See Tug cnp.
 294,552

 Clock, electric, G. B. Webb
 294,552

 Clutch, friction. J. K. Proctor
 294,671

 Cock or faucet, water and steam, J. Richter
 294,674